



2019 NC1 Landfill Annual Groundwater Report

Nebraska City Generating Station NC1 Ash Disposal Area



*Nebraska City, Nebraska* January 31, 2020

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## **Professional Engineer Certification**

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am duly licensed Professional Engineer under the laws of the Sate of Nebraska.

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Date: /-31-2020

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My license renewal date is December 31, 2020.



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## **Executive Summary**

On April 17, 2015, the U.S. Environmental Protection Agency (EPA) published the final rule for the regulation and management of coal combustion residuals (CCR) under Subtitle D of the Resource Conservation and Recovery Act (RCRA). The CCR rule is formally promulgated in the U.S. Code of Federal Regulations (CFR), Title 40, Part 257. The CCR rule defines a set of requirements for the disposal and handling of CCR within CCR units (defined as either landfills or surface impoundments). This regulation applies to the Omaha Public Power District (OPPD), Nebraska City Generating Station NC1 Ash Disposal Area. The NC1 Ash Disposal Area is an unlined CCR landfill of approximately 52 acres that has historically received CCR for disposal.

The groundwater monitoring system currently includes eight monitoring wells consisting of four (4) upgradient/background monitoring wells, three (3) downgradient monitoring wells, and one (1) down/cross-gradient monitoring well. Groundwater sampling events were conducted by OPPD personnel in April 2019 and October 2019 as continuation of the assessment monitoring program. Results of the analysis for both the April 2019 and October 2019 sampling events did not indicate an SSL; therefore assessment monitoring will continue for the NC1 Ash Disposal Area. The next semi-annual assessment monitoring sampling event is anticipated to be conducted in April 2020.

## 1 Introduction

On April 17, 2015, the U.S. Environmental Protection Agency (EPA) published the final rule for the regulation and management of coal combustion residuals (CCR) under Subtitle D of the Resource Conservation and Recovery Act (RCRA). The CCR rule is formally promulgated in the U.S. Code of Federal Regulations (CFR), Title 40, Part 257. The rule – effective on October 19, 2015 – applies to electric utilities and independent power producers that fall within NAICS code 221112, and facilities that produce or store CCR materials in surface impoundments or landfills (EPA, 2015). The CCR rule defines a set of requirements for the disposal and handling of CCR within CCR units (defined as either landfills or surface impoundments). This regulation applies to the Omaha Public Power District (OPPD), Nebraska City Generating Station. OPPD currently has two (2) active CCR landfills at the Nebraska City Generating Station.

## 1.1 Purpose

Section 40 CFR 257.90(e) specifies that an owner or operator of an existing CCR landfill must prepare an annual groundwater monitoring and corrective action report to summarize any key actions completed, problems encountered, and upcoming activities related to the ground water monitoring system. The information included in this report complies with the requirements established in §257.90(e) of the CCR Rule. This report provides a summary of CCR groundwater monitoring system activities for calendar year 2019.

## 1.2 Facility Information

OPPD has a two-unit fossil fuel-fired generating station (NC1 and NC2), located 5.5 miles southeast of Nebraska City, Nebraska, along the west shore of the Missouri River. This Station has two (2) existing CCR landfills that are permitted under the current Nebraska Department of Environment and Energy (NDEE) Title 132 regulations for fossil fuel combustion ash disposal area: the NC1 Ash Disposal Area and NC2 Ash Disposal Area that are active after the CCR rule effective date of October 19, 2015. This annual report covers the NC1 Ash Disposal Area (NDEE Permit No. NE0054712, Facility ID 58343). The NC1 Ash Disposal Area is an unlined CCR landfill of approximately 52 acres that has historically received CCR for disposal. **Figure 1** identifies the relevant CCR unit for this report and the supporting monitoring well network (§257.105(h)(1)).

## 2 Monitoring Program Summary

The groundwater monitoring system currently includes eight monitoring wells consisting of four (4) upgradient/background monitoring wells, three (3) downgradient monitoring wells, and one (1) down/cross-gradient monitoring well. Monitoring well details for the monitoring network, including the date of installation, is provided in **Table 1** (attached). The location of the monitoring wells in the groundwater monitoring program in respect to the CCR unit, NC1 Ash Disposal Area, are shown in the attached **Figure 1**.



## 2.1 Transition of Monitoring Programs

On January 31, 2018, OPPD published Statistically Significant Increases (SSIs) above the calculated background threshold values (BTVs) for Appendix III constituents (boron, calcium, chloride, sulfate, and total dissolved solids) in downgradient monitoring wells at the NC1 Ash Disposal Area (OPPD, 2018). An alternative source demonstration (ASD) evaluation was conducted for the published SSIs (dated May 1, 2018). The ASD evaluation confirmed the SSIs for the NC1 CCR unit. As a result, OPPD initiated an assessment monitoring program, as required in the CCR Rule and NDEE Title 132, for the NC1 Ash Disposal Area. As a result of initiation of assessment monitoring, a statistical evaluation for Statistically Significant Levels (SSLs) over the Groundwater Protection Standards (GWPS) was conducted for the October 2018 assessment monitoring data. The October 2018 statistical analysis indicated one SSL for arsenic in monitoring well MW-3.

In anticipation of an ASD or delineation activities, an additional upgradient monitoring well (MW-14) was installed in July 2018. Due to the SSL detected in October 2018, an ASD was conducted in April 2019 and the newly installed monitoring well MW-14 was sampled and statistically analyzed to evaluate if the SSL published in the 2018 Annual Report and 2018 Fall NDEE Title 132 report resulted from natural variation in groundwater quality (refer to **Appendix D** for the ASD memorandum). The statistical re-evaluation of the monitoring data, including the additional upgradient monitoring well MW-14, indicated that natural variation of groundwater quality is present and can influence the determination of whether an SSI and/or SSL has occurred. The ASD evaluation showed that arsenic in upgradient monitoring well MW-14 is present at higher concentrations than both the EPA's maximum contaminant level (MCL) and NDEE Title 118 GWPS. As a result of the variability and detected arsenic concentrations in the background monitoring well, the previously published SSL for arsenic at MW-3 was not considered an SSL, and the NC1 Ash Disposal Area remained in assessment monitoring. The monitoring network was sampled and analyzed semi-annually in 2019 as part of the assessment monitoring program. Results of the first semi-annual assessment monitoring sampling event (April 2019) did not indicate an SSL; therefore assessment monitoring continued in October 2019.

## 2.2 Groundwater Monitoring Network Condition Assessment

OPPD personnel evaluated the condition of each monitoring well in the groundwater monitoring network during the semi-annual sampling events in April 2019 and October 2019. During this time period, no repairs were required and the wells were noted in good working condition, concrete pads were intact, and no damage was observed to the protective well casings. However, due to nearby flooding conditions of the Missouri River, monitoring well MW-13 was not accessible and could not be sampled during both semi-annual sampling events. There were no monitoring wells added or abandoned from the certified groundwater monitoring system during 2019.

## 3 Data Evaluation and Summary

## 3.1 Summary of Sampling Activities

Groundwater sampling events were conducted by OPPD personnel in April 2019 and October 2019 as continuation of the assessment monitoring program. Samples were collected in general compliance with §257.90(c), which requires groundwater monitoring be conducted throughout the active life and post-closure care period of the CCR unit for each current background and downgradient well in the monitoring network. The number of samples collected for each background and downgradient well during each groundwater sample event, whether the sample was collected during detection or assessment monitoring programs, and the date of each event is summarized in **Table 2**.

Groundwater sampling was conducted by OPPD personnel in general accordance with the most recent *Groundwater Sampling and Analysis Plan (SAP) Fossil Fuel Combustion Ash Disposal Area – NC1 Ash Disposal Area* submitted to the NDEE in February 2016. Samples were analyzed for Appendix III and Appendix IV constituents during both the April and October 2019 sampling events. Field sampling forms from the 2019 semi-annual sampling events are provided in **Appendix A**. The collected groundwater samples were analyzed by TestAmerica Laboratories, Inc. The laboratory analytical reports are provided in **Appendix B**.

## 3.2 Groundwater Elevations & Flow Direction

Static groundwater level measurements were recorded at the monitoring wells specified in Table 1 prior to purging and sampling activities conducted during the groundwater sampling events. Groundwater measurements of both monitoring network wells and groundwater elevation only wells, as defined in the CCR Groundwater Monitoring System, HDR, 2019, were used to determine groundwater contours. Monitoring well static groundwater elevations are provided in Table 3. Groundwater flow observed during the October 2019 sampling event indicated a flow direction to the south/southwest and an average flow velocity of 0.0135 ft/day to 0.1333 ft/day (based on a range of hydraulic conductivity at the Site of 3.94 ft/day to 39 ft/day, respectively [CCR Groundwater Monitoring System, HDR, 2019]). The groundwater direction October 2019 sampling event shifted slightly from the previous event, where the April 2019 groundwater contours were directed more towards the south/southeast direction towards the Missouri River. The shift in groundwater contour direction is likely due to flooding conditions of the nearby Missouri River. Groundwater elevations will continue to be monitored to determine if the overall groundwater flow direction shifts back towards the south/southeast towards the Missouri River. Based on the groundwater flow directions observed in 2019, the groundwater monitoring network is still applicable to the NC1 Ash Disposal Area and no changes to the monitoring network are recommended at this time.

## 3.3 Assessment Monitoring Groundwater Sampling

As stated above in **Section 2.1**, The NC1 Ash Disposal Area was monitored and analyzed semi-annually in 2019 as part of the assessment monitoring program. As specified in §257.95(b), monitoring network wells should be resampled at least annually for the full Appendix



IV constituent list. In accordance with §257.95(d), monitoring network wells should be resampled at least semi-annually for the full Appendix III constituents and those Appendix IV constituents detected in response to §257.95(b). However, to be conservative, all Appendix III and Appendix IV constituents were analyzed for both the April and October 2019 sampling events. The results of the assessment monitoring events in April 2019 and October 2019 are presented in **Table 4** (Appendix III constituents) and **Table 5** (Appendix IV constituents).

## 3.4 Statistical Analysis Results

In the assessment monitoring program, Appendix III and IV constituents are statistically analyzed to evaluate for SSIs above the calculated BTVs, and Appendix IV constituents are statistically analyzed to evaluate for SSLs above the GWPS. Statistical analysis was performed utilizing Sanitas<sup>TM</sup> Statistical Software in accordance with the methods described in the *Groundwater Monitoring Statistical Methods Certification* (amended July 2018). Results of the statistical analysis of designated in-network downgradient monitoring wells from the April 2019 and October 2019 sampling events are provided in **Appendix C**. Statistically-derived BTVs for Appendix III and IV constituents for detection monitoring are provided in **Table 6**. The established GWPS for all Appendix IV constituents are provided in **Table 7**.

Results of the analysis for both the April 2019 and October 2019 sampling events indicated nine (9) constituent/well pairs at SSIs for Appendix III (detection monitoring) constituents and four (4) constituent/well pairs at SSIs for Appendix IV (assessment monitoring) constituents. Analysis of the Appendix IV (assessment monitoring) constituents indicated there were no SSLs detected above the GWPS during either the April 2019 or October 2019 sampling events.

3.5 Other Information Required under §257.90 through §257.98 No other information is required under Sections §257.90 through §257.98 at this time.

## 4 Key Activities for Upcoming Year

As a continuation of the assessment monitoring program, as required in the CCR Rule, the next semi-annual assessment monitoring sampling event is anticipated to be conducted in April 2020.

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## **Tables**

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**Table 1 - Groundwater Monitoring System** 

Monitoring Well ID	I Dalistani atsul		Location w/ respect to Temporary Ash Disposal Area	Top of Well Casing Elevation (ft. AMSL)			
		Monitoring	Network Wells				
NC2-MW-4	9/8/2004	14.0	Background/Upgradient	919.62			
MW-11	1/16/2004	20.0	Background/Upgradient	918.44			
MW-13	1/26/2016	13.0	Background/Upgradient	918.05			
MW-14	7/12/2018	18.0	Background/Upgradient	920.99			
NC1-MW-2	3/14/1995	17.8	Downgradient	919.42			
NC1-MW-3	3/13/1995	19.5	Downgradient/Cross-gradient	919.85			
NC1-MW4	NC1-MW4 3/13/1995 20.3		Downgradient	919.63			
NC1-MW-9 1/21/1999 20.0			Downgradient 920.09				

**Table 2 - Groundwater Sampling Event Summary**Omaha Public Power District - NC1 Ash Disposal Area

January 2020

Monitoring Well ID	# of Background Samples	Background Sample Dates	# of Detection Monitoring Samples	Detection Monitoring Sample Dates	# of Assessment Monitoring Samples	Assessment Monitoring Sample Dates <sup>[2] [3]</sup>
Current Backgr	ound Monitoring Wells					
NC2-MW-4	8	3/9/2016, 6/7/2016, 10/3/2016, 11/18/2016, 2/14/2017, 4/25/2017, 6/20/2017, 7/13/2017	2	11/8/2017, 3/13/2018 <sup>[1]</sup>	4	6/6/2018, 10/4/2018, 4/8/2019, 10/15/2019
MW-11	8	3/9/2016, 6/7/2016, 10/3/2016, 11/18/2016, 2/14/2017, 4/25/2017, 6/20/2017, 7/13/2017	2	11/8/2017, 3/13/2018 <sup>[1]</sup>	4	6/6/2018, 10/4/2018, 4/8/2019, 10/16/2019
MW-13 <sup>[3]</sup>	8	3/9/2016, 6/7/2016, 10/3/2016, 11/18/2016, 2/14/2017, 4/25/2017, 6/20/2017, 7/13/2017	2	11/8/2017, 3/13/2018 <sup>[1]</sup>	2	6/6/2018, 10/4/2018
MW-14 <sup>[4]</sup>	2	1/15/2019, 3/5/2019	0	NA	3	10/4/2018, 4/8/2019, 10/16/2019
Downgradient M	Monitoring Wells					
NC1-MW-2	8	3/9/2016, 6/7/2016, 10/3/2016, 11/18/2016, 2/14/2017, 4/25/2017, 6/20/2017, 7/13/2017	2	11/8/2017, 3/13/2018 <sup>[1]</sup>	4	6/6/2018, 10/4/2018, 4/8/2019, 10/18/2019
NC1-MW-3	8	3/9/2016, 6/7/2016, 10/3/2016, 11/18/2016, 2/14/2017, 4/25/2017, 6/20/2017, 7/13/2017	2	11/8/2017, 3/13/2018 <sup>[1]</sup>	4	6/6/2018, 10/4/2018, 4/9/2019, 10/18/2019
NC1-MW-4	8	3/9/2016, 6/7/2016, 10/3/2016, 11/18/2016, 2/14/2017, 4/25/2017, 6/20/2017, 7/13/2017	2	11/8/2017, 3/13/2018 <sup>[1]</sup>	4	6/6/2018, 10/4/2018, 4/9/2019, 10/18/2019
NC1-MW-9	8	3/9/2016, 6/7/2016, 10/3/2016, 11/18/2016, 2/14/2017, 4/25/2017, 6/20/2017, 7/13/2017	2	11/8/2017, 3/13/2018 <sup>[1]</sup>	4	6/6/2018, 10/4/2018, 4/10/2019, 10/18/2019

<sup>[1]</sup> The March 13, 2018 Detection Monitoring event was completed as an Alternative Source Evaluation (ASD) due to detected SSIs in November 2017.

<sup>[2]</sup> The June 6, 2018 sampling event was completed for initiation of the Assessment Monitoring Program.

<sup>[3]</sup> MW-13 submerged under water during April and October 2019 sampling events.

<sup>[4]</sup> Monitoring well MW-14 was installed in July 2018; samples will be collected more frequent than semi-annual to obtain the initial 8 background samples. Samples collected during semi-annual events are recorded in corresponding detection or assessment monitoring events.

**Table 3 - Groundwater Elevations**Omaha Public Power District - NC1 Ash Disposal Area *January 2020* 

	NC2-	MW-4	MW	<i>I-</i> 11	MW	<i>I-</i> 13	MW	<i>I</i> -14	NC1-	MW-2	NC1-	MW-3	NC1-	MW-4	NC1-	MW-9
	TOC EI	evation	TOC EI	levation												
	919	9.62	918	3.44	918	3.05	920	).99	919	0.42	919	).85	919	.63	920	0.09
Date	Measured Depth to Water (ft.)	GW Elevation (AMSL)														
3/9/2016	6.95	912.67	6.90	911.54	4.61	913.44			8.90	910.52	8.95	910.90	9.50	910.13	9.30	910.79
6/7/2016	6.06	913.56	5.85	912.59	3.95	914.10			7.04	912.38	7.75	912.10	7.41	N.M.	7.88	912.21
10/3/2016	6.25	913.37	6.34	912.10	4.03	914.02			8.45	910.97	8.35	911.50	9.10	N.M.	8.76	911.33
11/18/2016	6.79	912.83	7.37	911.07	4.43	913.62		MW-14 installed		910.12	9.36	910.49	10.10	909.53	7.75	912.34
2/14/2017	7.52	912.10	7.95	910.49	5.20	912.85	NAVA / 4 /			909.32	9.91	909.94	10.85	908.78	10.41	909.68
4/25/2017	6.20	913.42	6.24	912.20	4.02	914.03		installed '2018	8.10	911.32	8.25	911.60	8.84	910.79	8.65	911.44
6/20/2017	6.75	912.87	7.85	910.59	4.72	913.33	17121	2010	7.60	911.82	7.95	911.90	8.20	911.43	8.15	911.94
7/13/2017	7.10	912.52	6.25	912.19	5.00	913.05			8.40	911.02	8.75	911.10	9.10	910.53	9.10	910.99
11/8/2017	12.20	907.42	10.95	907.49	8.25	909.80			11.55	907.87	11.90	907.95	11.60	908.03	12.10	907.99
3/13/2018	10.18	909.44	9.85	908.59	8.10	909.95			11.50	907.92	11.85	908.00	12.16	907.47	12.22	907.87
6/6/2018	6.80	912.82	6.80	911.64	4.56	913.49			5.30	914.12	7.15	912.70	7.10	912.53	8.90	911.19
10/4/2018	4.14	915.48	4.45	913.99	1.63	916.42	7.35	913.64	5.78	913.64	6.60	913.25	6.66	912.97	6.87	913.22
1/15/2019	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	8.15	912.84	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.
3/5/2019	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	8.75	912.24	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.
4/8/2019	3.53	916.09	3.04	915.40	N.M.	N.M.	5.73	915.26	4.17	915.25	4.69	915.16	4.58	915.05	4.85	915.24
10/14/2019	3.47	916.15	2.90	915.54	N.M.	N.M.	5.75 915.24		3.64	915.78	4.56	915.29	4.33	915.30	4.65	915.44

Notes:

TOC: Top of PVC well casing

N.M. = not measured

AMSL = above mean sea level

Table 4 - Appendix III (Detection Monitoring) Constituents in Groundwater Omaha Public Power District - NC1 Ash Disposal Area January 2020

	Come##****	Darre				ring) Constitu		TDO
	Constituent	Boron	Calcium	Chloride	Fluoride*	pH S.U.	Sulfate	TDS
	Reporting Unit 3/9/2016	<b>mg/L</b> <0.2	<b>mg/L</b> 131	<b>mg/L</b> <5	<b>mg/L</b> <0.5	6.94	<b>mg/L</b> 46.2	<b>mg/L</b> 546
	6/7/2016	<0.2	129	<5	<0.5	6.95	45.6	660
	10/3/2016	< 0.2	127	<5	< 0.5	7.33	32	542
	11/18/2016	<0.2	132	<5	1.1	7.30	33.6	574
	2/14/2017	<0.2	148	<5	<0.5	7.72	39.3	544
	4/25/2017	<0.2	122	<5	< 0.5	7.28	38.3	594
NC2-MW-4	6/20/2017 7/13/2017	<0.2	119 112	<5 <5	<0.5 <0.5	7.13 7.98	33.1 32.7	558 664
	11/8/2017	<0.2	133	<5	<0.5	7.96	43.5	556
	3/13/2018	<0.2	138	<5	0.53	6.71 / 7.28 **	42.6	478
	6/6/2018	<0.2	128	<5	<0.5	7.15	43.9	542
	10/4/2018	< 0.2	117	<5	< 0.5	6.81	42.4	520
	4/8/2019	< 0.2	137	<5.	< 0.5	6.71	40.9	560
	10/15/2019	< 0.2	142	5.38	< 0.5	6.57	35.0	528
	3/9/2016	0.811	99.6	<5	<0.5	7.07	128	468
	6/7/2016	0.704	93.4	5.16	<0.5	7.16	27.1	536
	10/3/2016	1.35	107	<5 <5	< 0.5	7.36	122	528
	11/18/2016 2/14/2017	1.38 1.25	115 118	<5 8.57	0.95 2.09	7.32 7.18	119 113	512 532
	4/25/2017	1.02	102	6.17	1.44	7.16	94.7	508
A.M. 4.4	6/20/2017	0.843	76.1	<5	0.562	7.19	80.4	400
MW-11	7/13/2017	1.01	69.9	<5	0.538	7.62	74.2	520
	11/8/2017	1.05	87.2	<5	0.62	6.95	120	492
	3/13/2018	0.63	77.1	<5	< 0.5	7.00 / 7.69 **	109	302
	6/6/2018	0.737	86.5	5.09	<0.5	7.16	145	428
	10/4/2018	1.14	96.5	5.60	0.568	6.93	148	486
	4/8/2019 10/16/2019	0.698 1.53	91.3 132	14.3 15.3	<0.5	7.41 6.64	126 164	470 608
	3/9/2016	<0.2	96.3	11.8	0.558 <0.5	7.20	44.8	408
	6/7/2016	<0.2	87.1	11.7	<0.5	7.14	39.3	484
	10/3/2016	<0.2	85.4	10.7	<0.5	7.37	29.7	388
	11/18/2016	<0.2	86.2	9.65	0.647	7.14	34.4	410
	2/14/2017	<0.2	106	20.7	3.64	7.29	39.9	472
	4/25/2017	< 0.2	93.5	12.1	0.80	7.36	38.9	430
MW-13	6/20/2017	<0.2	88.6	12.7	0.51	7.17	35.6	456
10100-10	7/13/2017	<0.2	94.1	12.5	< 0.5	8.09	39.8	592
	11/8/2017 3/13/2018	<0.2	90.2 93.8	12.7 12.7	0.608 <0.5	7.00 6.89 / 7.51**	37.4 38.2	498 388
	6/6/2018	<0.2	99.4	12.7	<0.5	6.84	70.4	504
	10/4/2018	<0.2	87.3	14.1	0.738	6.88	33.6	410
	4/8/2019 <sup>[1]</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/15/2019 <sup>[1]</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/4/2018	0.226	129	9.07	0.751	6.85	59.1	700
	1/15/2019	0.257	116	8.61	<0.5	6.53	51.9	730
MW-14	3/5/2019	0.231	155	9.76	< 0.5	6.70	59.8	752
	4/8/2019	0.296	156	8.46	< 0.5	6.81	43.2	840
	10/15/2019	0.272	155	6.99	< 0.5	6.52	24.2	600
	3/9/2016	0.301	122	<5	0.664	6.84	90.2	456
	6/7/2016 10/3/2016	0.205	94.4	<5 <5	<0.5	6.99	60.1	404
	11/18/2016	0.327	103 121	<5 <5	<0.5 1.82	7.29 7.01	39.8 59.5	370 516
	2/14/2017	0.333	121	<5 <5	< 0.5	7.01	99.1	580
	4/25/2017	0.226	87	<5	1.4	7.40	59.8	536
JOA NAVA	6/20/2017	<0.2	112	<5	<0.5	7.12	54.4	496
NC1-MW-2	7/13/2017	0.225	110	<5	< 0.5	7.48	44.5	524
	11/8/2017	< 0.2	135	<5	0.55	7.02	121	592
	3/13/2018	<0.2	94	<5	0.57	6.85 / 7.53 **	61	362
	6/6/2018	0.27	88.8	<5	<0.5	7.06	48.3	344
	10/4/2018	<0.2 <0.2	115 111	<5 <5	<0.5 <0.5	6.78 6.68	70.0	400 418
	4/8/2019 10/18/2019	0.305	112	<5 <5	<0.5	6.84	66.3 52.0	332
	3/9/2016	1.88	227	14.3	0.508	6.73	457	1150
	6/7/2016	2.56	213	18.4	< 0.5	6.9	446	1180
	10/3/2016	1.63	147	10.5	<0.5	7.33	326	794
	11/18/2016	1.66	156	9	3.91	7.05	149	732
NC1-MW-3		1.66	170	11	2.97	7.56	286	852
	4/25/2017	1.97	166	10.1	0.974	7.27	338	924
	6/20/2017	2.42	155	10.5	0.591	6.99	361	1070
	7/13/2017	2.55	169	7.81	0.603	7.85	334	1080

Table 4 - Appendix III (Detection Monitoring) Constituents in Groundwater

January 2020

			Арр	endix III (Dete	ection Monito	ring) Constitue	ents	
	Constituent	Boron	Calcium	Chloride	Fluoride*	рН	Sulfate	TDS
	Reporting Unit	mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
	3/13/2018	1.97	154	10.8	< 0.5	6.85 / 7.42 **	362	846
	6/6/2018	2.6	155	12.5	< 0.5	6.40	324	948
NC1-MW-3	10/4/2018	2.32	163	8.88	0.541	7.15	432	944
	4/9/2019	2.33	186	7.96	< 0.5	7.32	427	1040
	10/18/2019	2.42	166	9.91	0.527	7.08	361	760
	3/9/2016	1.83	227	10.5	< 0.5	7.25	373	896
	6/7/2016	1.22	107	<5	< 0.5	7.29	344	667
	10/3/2016	1.29	104	<5	< 0.5	7.52	262	546
	11/18/2016	1.4	124	<5	0.876	7.25	310	712
	2/14/2017	1.59	139	<5	< 0.5	7.48	295	760
	4/25/2017	1.39	102	5.19	< 0.5	7.39	244	582
NC1-MW-4	6/20/2017	1.16	89.9	<5	< 0.5	7.22	210	448
INC I-IVIVV-4	7/13/2017	1.41	88.2	<5	< 0.5	7.62	196	696
	11/8/2017	1.13	97.6	6.39	< 0.5	7.05	234	480
	3/13/2018	1.21	111	6.04	< 0.5	7.16 / 7.31 **	250	560
	6/6/2018	1.45	145	<5	< 0.5	7.60	294	822
	10/4/2018	1.15	115	5.39	0.569	7.41	263	580
	4/9/2019	1.28	120	5.78	< 0.5	7.65	231	586
	10/18/2019	1.34	151	5.64	0.501	7.33	238	572
	3/9/2016	3.7	125	<5	0.547	7.08	284	808
	6/7/2016	2.44	126	<5	< 0.5	6.90	133	660
	10/3/2016	3.57	149	<5	0.578	7.58	244	740
	11/18/2016	4.44	181	6.31	3.4	7.08	270	944
	2/14/2017	2.5	139	5.95	1.78	7.52	247	770
	4/25/2017	2.5	164	5.8	0.934	7.12	291	1100
NC1-MW-9	6/20/2017	1.39	174	5.69	< 0.5	7.06	218	870
INC 1-IVIVV-9	7/13/2017	1.68	144	<5	0.68	7.58	159	792
	11/8/2017	2.65	167	5.77	0.735	7.16	344	846
	3/13/2018	2.6	132	5.74	< 0.5	6.93 / 7.48 **	276	754
	6/6/2018	2.45	149.0	<5	0.732	5.80	221	708
	10/4/2018	1.28	148	8.56	0.777	7.27	158	678
	4/10/2019	2.59	164	5.34	< 0.5	7.03	184	756
	10/18/2019	1.31	157	5.13	0.605	7.06	206	780

<sup>[1]</sup> MW-13 submerged under water during April and October 2019 sampling events, therfore N/A designates well was not sampled.

<sup>\*</sup> Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).

\*\* The first pH value obtained in the field during the ASD sampling event on March 13, 2018 and was found to be an outlier due to equipment errors. The second pH value was a verification sample obtained in the field on March 19, 2018.

**Table 5 - Appendix IV Constituents in Groundwater** Omaha Public Power District - NC1 Ash Disposal Area *January 2020* 

								Ap	pendix IV Cor	stituents						
	Constituent	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
	Reporting Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
	3/9/2016	< 0.001	< 0.002	0.281	< 0.001	< 0.0005	< 0.005	< 0.0005	< 0.5	0.00199	< 0.05	< 0.0002	0.00272	1.54	< 0.005	< 0.001
	6/7/2016	< 0.001	< 0.002	0.293	< 0.001	< 0.0005	< 0.005	< 0.0005	< 0.5	0.000951	< 0.05	< 0.0002	0.00283	1.21	< 0.005	< 0.001
	10/3/2016	< 0.001	< 0.002	0.283	< 0.001	< 0.0005	< 0.005	< 0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.00421	1.19	< 0.005	< 0.001
	11/18/2016	< 0.001	< 0.002	0.283	< 0.001	<0.0005	< 0.005	<0.0005	1.1	0.00127	< 0.05	< 0.0002	0.00288	0.984	< 0.005	< 0.001
	2/14/2017	< 0.001	< 0.002	0.300	< 0.001	<0.0005	< 0.005	0.00129	< 0.5	0.0032	< 0.05	< 0.0002	0.0028	0.894	< 0.005	< 0.001
	4/25/2017	< 0.001	<0.002	0.300	< 0.001	<0.0005	< 0.005	<0.0005	< 0.5	0.000714	< 0.05	< 0.0002	0.00323	1.23	< 0.005	< 0.001
NC2-MW-4	6/20/2017	< 0.001	< 0.002	0.258	< 0.001	< 0.0005	< 0.005	<0.0005	< 0.5	0.000754	< 0.05	< 0.0002	0.00551	1.16	0.00593	< 0.001
	7/13/2017	< 0.001	< 0.002	0.236	< 0.001	<0.0005	< 0.005	<0.0005	< 0.5	0.000787	< 0.05	< 0.0002	0.00326	0.76	< 0.005	< 0.001
	3/13/2018	< 0.001	< 0.002	0.297	< 0.001	<0.0005	< 0.005	<0.0005	0.53	0.00192	0.0318	< 0.0002	< 0.002	1.71	0.0112	< 0.001
	6/6/2018	< 0.001	< 0.002	0.329	< 0.001	<0.0005	< 0.005	0.000502	< 0.5	0.00154	0.0292	< 0.0002	0.0049	1.9	0.008	< 0.001
	10/4/2018	N.S. <sup>[1]</sup>	< 0.002	0.321	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	< 0.0005	< 0.5	0.000565	0.0332	N.S. <sup>[1]</sup>	0.00707	1.13	< 0.005	N.S. <sup>[1]</sup>
	4/8/2019	< 0.001	< 0.002	0.351	< 0.001	< 0.0005	< 0.005	< 0.0005	< 0.5	< 0.0005	0.0351	< 0.0002	0.00283	0.980	< 0.005	< 0.001
	10/15/2019	< 0.001	<0.002	0.390	< 0.001	0.000138	< 0.005	< 0.0005	< 0.5	< 0.0005	0.0343	< 0.0002	0.00412	1.22	< 0.005	< 0.001
	3/9/2016	< 0.001	< 0.002	0.215	< 0.001	< 0.0005	< 0.005	< 0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.00361	0.714	< 0.005	< 0.001
	6/7/2016	< 0.001	< 0.002	0.212	< 0.001	< 0.0005	< 0.005	< 0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.00477	0.589	< 0.005	< 0.001
	10/3/2016	< 0.001	<0.002	0.233	< 0.001	<0.0005	< 0.005	<0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.0082	1.1	< 0.005	< 0.001
	11/18/2016	< 0.001	< 0.002	0.251	< 0.001	< 0.0005	< 0.005	<0.0005	0.95	< 0.0005	< 0.05	< 0.0002	0.00659	1.13	< 0.005	< 0.001
	2/14/2017	< 0.001	< 0.002	0.246	< 0.001	< 0.0005	< 0.005	< 0.0005	2.09	< 0.0005	< 0.05	< 0.0002	0.00471	0.225	< 0.005	< 0.001
	4/25/2017	< 0.001	< 0.002	0.249	< 0.001	< 0.0005	< 0.005	<0.0005	1.44	< 0.0005	< 0.05	< 0.0002	0.005	0.358	< 0.005	< 0.001
MW-11	6/20/2017	0.00235	< 0.002	0.156	< 0.001	< 0.0005	< 0.005	0.000549	0.562	< 0.0005	< 0.05	< 0.0002	0.00788	0.398	< 0.005	< 0.001
	7/13/2017	< 0.001	< 0.002	0.146	< 0.001	< 0.0005	< 0.005	0.00085	0.538	< 0.0005	< 0.05	0.000262	0.00905	0.397	< 0.005	< 0.001
	3/13/2018	< 0.001	0.00272	0.154	< 0.001	< 0.0005	< 0.005	0.00104	< 0.5	< 0.0005	0.0143	< 0.0002	0.00269	0.414	0.00503	< 0.001
	6/6/2018	< 0.001	<0.002	0.172	< 0.001	<0.0005	< 0.005	0.000779	< 0.5	0.00118	0.0123	< 0.0002	0.00996	0.494	0.0071	< 0.001
	10/4/2018	N.S. <sup>[1]</sup>	< 0.002	0.185	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	< 0.0005	0.568	< 0.0005	0.0197	N.S. <sup>[1]</sup>	0.00883	0.958	< 0.005	N.S. <sup>[1]</sup>
	4/8/2019	< 0.001	< 0.002	0.162	< 0.001	< 0.0005	< 0.005	< 0.0005	< 0.5	0.000519	0.0162	< 0.0002	0.00609	0.228	< 0.005	< 0.001
	10/16/2019	< 0.001	0.00497	0.255	< 0.001	< 0.0001	< 0.005	0.00305	0.558	< 0.0005	0.0201	< 0.0002	0.0120	0.684	< 0.00500	< 0.001
	3/9/2016	< 0.001	0.00492	0.302	< 0.001	<0.0005	< 0.0005	0.000817	< 0.5	< 0.0005	< 0.05	< 0.0002	< 0.002	1.14	< 0.005	< 0.001
	6/7/2016	< 0.001	0.00591	0.317	< 0.001	< 0.0005	< 0.0005	0.00118	< 0.5	0.000623	< 0.05	< 0.0002	< 0.002	0.69	< 0.005	< 0.001
	10/3/2016	< 0.001	0.00709	0.319	< 0.001	< 0.0005	< 0.0005	0.00103	< 0.5	< 0.0005	< 0.05	< 0.0002	0.00264	1.01	< 0.005	< 0.001
	11/18/2016	< 0.001	0.0058	0.333	< 0.001	< 0.0005	< 0.0005	0.000916	0.647	< 0.0005	< 0.05	< 0.0002	0.00235	0.745	< 0.005	< 0.001
	2/14/2017	< 0.001	0.00304	0.349	< 0.001	< 0.0005	< 0.0005	0.000925	3.64	< 0.0005	< 0.05	< 0.0002	0.00228	0.532	< 0.005	< 0.001
	4/25/2017	< 0.001	0.00269	0.358	< 0.001	<0.0005	< 0.0005	0.00141	0.80	0.000522	< 0.05	< 0.0002	< 0.002	0.429	< 0.005	< 0.001
MW-13	6/20/2017	< 0.001	0.00268	0.311	< 0.001	<0.0005	< 0.0005	0.00119	0.51	0.00171	< 0.05	< 0.0002	<0.002	0.483	< 0.005	< 0.001
	7/13/2017	< 0.001	0.00325	0.33	< 0.001	<0.0005	< 0.0005	0.00108	< 0.5	< 0.0005	< 0.05	< 0.0002	0.00206	0.502	< 0.005	< 0.001
	3/13/2018	<0.001	0.00283	0.305	< 0.001	<0.0005	< 0.0005	0.00222	< 0.5	0.00102	0.0265	<0.0002	< 0.002	0.412	< 0.005	< 0.001
	6/6/2018	< 0.001	0.00262	0.282	< 0.001	<0.0005	< 0.0005	0.00236	< 0.5	0.00577	0.0423	< 0.0002	< 0.002	1.89	0.00553	< 0.001
	10/4/2018	N.S. <sup>[1]</sup>	0.00965	0.388	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	0.00191	0.738	0.00216	0.0316	N.S. <sup>[1]</sup>	0.00243	1.62	< 0.005	N.S. <sup>[1]</sup>
	4/8/2019 <sup>[2]</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/15/2019 <sup>[2]</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**Table 5 - Appendix IV Constituents in Groundwater** Omaha Public Power District - NC1 Ash Disposal Area *January 2020* 

								Ap	pendix IV Cor	stituents						
	Constituent	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
	Reporting Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
	10/4/2018	< 0.001	0.0330	0.306	< 0.001	< 0.0005	< 0.005	0.00290	0.751	< 0.0005	0.0480	< 0.0002	0.00293	1.48	< 0.005	< 0.001
	1/15/2019	< 0.001	0.0301	0.309	< 0.001	< 0.0005	< 0.005	0.00424	< 0.5	< 0.0005	0.0507	< 0.0002	< 0.002	1.20	< 0.005	< 0.001
MW-14	3/5/2019	< 0.001	0.0253	0.301	< 0.001	< 0.0005	< 0.005	0.00477	< 0.5	< 0.0005	0.0569	< 0.0002	0.00227	1.75	< 0.005	< 0.001
	4/8/2019	< 0.001	0.0368	0.309	< 0.001	< 0.0005	< 0.005	0.00391	< 0.5	< 0.0005	0.0557	< 0.0002	< 0.002	1.03	< 0.005	< 0.001
	10/16/2019	< 0.001	0.0893	0.359	< 0.001	< 0.0001	< 0.005	0.00265	< 0.5	< 0.0005	0.0528	< 0.0002	< 0.002	1.81	< 0.005	< 0.001
	3/9/2016	< 0.001	< 0.002	0.123	< 0.001	< 0.0005	< 0.0005	< 0.0005	0.664	< 0.0005	< 0.05	< 0.0002	0.0444	0.495	< 0.005	< 0.001
	6/7/2016	< 0.001	< 0.002	0.0956	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.0718	0.305	< 0.005	< 0.001
	10/3/2016	< 0.001	< 0.002	0.104	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.12	0.586	< 0.005	< 0.001
	11/18/2016	< 0.001	< 0.002	0.126	< 0.001	< 0.0005	< 0.0005	< 0.0005	1.82	< 0.0005	< 0.05	< 0.0002	0.095	0.415	< 0.005	< 0.001
	2/14/2017	< 0.001	< 0.002	0.123	< 0.001	<0.0005	< 0.0005	< 0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.0654	0.254	< 0.005	< 0.001
	4/25/2017	< 0.001	< 0.002	0.0889	< 0.001	< 0.0005	< 0.0005	< 0.0005	1.4	< 0.0005	< 0.05	< 0.0002	0.0489	0.396	< 0.005	< 0.001
NC1-MW-2	6/20/2017	< 0.001	< 0.002	0.116	< 0.001	<0.0005	< 0.0005	< 0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.038	0.174	< 0.005	< 0.001
	7/13/2017	< 0.001	< 0.002	0.122	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.0374	0.375	< 0.005	< 0.001
	3/13/2018	< 0.001	< 0.002	0.125	< 0.001	< 0.0005	< 0.0005	< 0.0005	0.57	< 0.0005	< 0.01	< 0.0002	0.0446	0.656	< 0.005	< 0.001
	6/6/2018	< 0.001	< 0.002	0.122	< 0.001	< 0.0005	< 0.0005	0.00143	< 0.5	0.000713	< 0.01	< 0.0002	0.0711	0.615	< 0.005	< 0.001
	10/4/2018	N.S. <sup>[1]</sup>	< 0.002	0.153	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	< 0.0005	< 0.5	0.000795	< 0.01	N.S. <sup>[1]</sup>	0.0680	1.01	< 0.005	N.S. <sup>[1]</sup>
	4/8/2019	< 0.001	<0.002	0.126	< 0.001	< 0.0005	< 0.005	<0.0005	<0.5	<0.0005	< 0.01	<0.0002	0.0803	0.494	<0.005	< 0.001
	10/18/2019	< 0.001	<0.002	0.179	<0.001	0.000230	< 0.005	0.000548	<0.5	<0.0005	0.0117	<0.0002	0.0872	0.334	< 0.005	<0.001
	3/9/2016	< 0.001	0.0135	0.112	< 0.001	<0.0005	< 0.0005	0.00239	0.508	< 0.0005	< 0.05	< 0.0002	< 0.002	0.0759	< 0.005	< 0.001
	6/7/2016	<0.001	0.00901	0.111	<0.001	<0.0005	<0.0005	0.00364	<0.5	<0.0005	< 0.05	<0.0002	<0.002	0.81	<0.005	<0.001
	10/3/2016	<0.001	0.00761	0.0887	<0.001	<0.0005	<0.0005	0.00267	<0.5	<0.0005	< 0.05	<0.0002	<0.002	0.15	<0.005	<0.001
	11/18/2016	<0.001	0.031	0.101	<0.001	<0.0005	<0.0005	0.00334	3.91	<0.0005	< 0.05	<0.0002	<0.002	0.736	<0.005	<0.001
	2/14/2017	<0.001	0.0248	0.092	<0.001	<0.0005	<0.0005	0.00268	2.97	0.000553	< 0.05	<0.0002	<0.002	0.436	<0.005	<0.001
	4/25/2017	<0.001	0.0131	0.106	<0.001	<0.0005	<0.0005	0.00144	0.974	<0.0005	< 0.05	<0.0002	<0.002	0.242	<0.005	<0.001
NC1-MW-3		<0.001	0.0195	0.115	<0.001	<0.0005	<0.0005	0.00196	0.591	<0.0005	< 0.05	<0.0002	<0.002	0.711	<0.005	<0.001
140 1-10100-0	7/13/2017	<0.001	0.0302	0.116	<0.001	< 0.0005	< 0.0005	0.00257	0.603	<0.0005	< 0.05	<0.0002	< 0.002	0.339	<0.005	<0.001
	3/13/2018	<0.001	0.0111	0.0786	<0.001	<0.0005	< 0.0005	0.00192	<0.5	< 0.0005	0.0262	<0.0002	< 0.002	0.728	< 0.005	<0.001
	6/6/2018	<0.001	0.0412	0.128	<0.001	<0.0005	< 0.0005	0.00219	<0.5	0.00296	0.0325	<0.0002	0.0021	0.922	<0.005	<0.001
	10/4/2018	N.S. <sup>[1]</sup>	0.0352	0.120	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	0.00120	0.541	0.000833	0.0326	N.S. <sup>[1]</sup>	<0.0021	1.12	< 0.005	N.S. <sup>[1]</sup>
	4/9/2019	<0.001	0.0332	0.141	<0.001	<0.0005	<0.005	0.00120	<0.5	< 0.0005	0.0320	<0.0002	<0.002	0.348	< 0.005	<0.001
	10/18/2019	<0.001	0.0143	0.0936	<0.001	<0.0003	<0.005	0.00230	0.527	<0.0005	0.0271	<0.0002	<0.002	0.348	<0.005	<0.001
	3/9/2016		0.00336	0.135				<0.00162					0.0053	0.753		
		<0.001			<0.001	<0.0005	<0.0005		< 0.5	<0.0005	<0.05	<0.0002			<0.005	<0.001
	6/7/2016	<0.001	0.0029	0.100	<0.001	<0.0005	<0.0005	<0.0005	< 0.5	<0.0005	<0.05	<0.0002	0.017	0.37	<0.005	<0.001
	10/3/2016	<0.001	0.0032	0.090	<0.001	<0.0005	<0.0005	<0.0005	< 0.5	<0.0005	<0.05	<0.0002	0.0297	0.343	<0.005	<0.001
	11/18/2016	<0.001	0.00254	0.115	<0.001	<0.0005	<0.0005	<0.0005	0.876	<0.0005	<0.05	<0.0002	0.0199	0.182	<0.005	<0.001
	2/14/2017	<0.001	0.00433	0.119	<0.001	<0.0005	<0.0005	<0.0005	< 0.5	0.00052	<0.05	<0.0002	0.0139	0.301	<0.005	<0.001
NIO4 B WAY 4	4/25/2017	<0.001	0.00344	0.0968	<0.001	<0.0005	<0.0005	<0.0005	< 0.5	<0.0005	<0.05	<0.0002	0.0249	0.313	<0.005	<0.001
NC1-MW-4	6/20/2017	<0.001	0.00334	0.0679	<0.001	<0.0005	<0.0005	<0.0005	< 0.5	<0.0005	<0.05	<0.0002	0.0356	0.0408	<0.005	<0.001
	7/13/2017	< 0.001	0.00381	0.0687	<0.001	<0.0005	<0.0005	<0.0005	< 0.5	<0.0005	< 0.05	<0.0002	0.0317	0.0901	<0.005	< 0.001
	3/13/2018	<0.001	0.00265	0.0781	<0.001	<0.0005	<0.0005	<0.0005	<0.5	<0.0005	0.0114	<0.0002	0.0207	0.286	<0.005	<0.001
	6/6/2018	<0.001	0.00821	0.129	<0.001	<0.0005	<0.0005	0.000636	<0.5	<0.0005	0.01	<0.0002	0.0422	0.577	<0.005	<0.001
	10/4/2018	N.S. <sup>[1]</sup>	0.00641	0.0975	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	<0.0005	0.569	<0.0005	0.0135	N.S. <sup>[1]</sup>	0.0233	0.802	<0.005	N.S. <sup>[1]</sup>
	4/9/2019	<0.001	0.00223	0.0652	<0.001	<0.0005	<0.005	<0.0005	<0.5	<0.0005	0.011	<0.0002	0.0269	0.0157	<0.005	<0.001
	10/18/2019	< 0.001	0.00347	0.119	< 0.001	< 0.0001	< 0.005	0.000642	0.501	< 0.0005	0.0137	< 0.0002	0.0183	-0.000469U	< 0.005	< 0.001

Table 5 - Appendix IV Constituents in Groundwater

			Appendix IV Constituents													
	Constituent	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
	Reporting Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
	3/9/2016	< 0.001	0.00995	0.0865	< 0.001	< 0.0005	< 0.0005	0.00121	0.547	< 0.0005	< 0.05	< 0.0002	0.0111	0.629	0.0634	< 0.001
	6/7/2016	< 0.001	0.00624	0.0816	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.5	< 0.0005	< 0.05	< 0.0002	0.0204	0.577	0.00958	< 0.001
	10/3/2016	< 0.001	0.00605	0.0847	< 0.001	< 0.0005	< 0.0005	0.000683	0.578	< 0.0005	< 0.05	< 0.0002	0.0435	0.23	0.0388	< 0.001
	11/18/2016	< 0.001	0.00828	0.106	< 0.001	< 0.0005	< 0.0005	0.000648	3.4	< 0.0005	< 0.05	< 0.0002	0.0222	1.13	0.0162	< 0.001
	2/14/2017	< 0.001	0.0122	0.0836	< 0.001	< 0.0005	< 0.0005	0.00147	1.78	< 0.0005	< 0.05	< 0.0002	0.0169	0.425	0.0138	< 0.001
	4/25/2017	< 0.001	0.0164	0.115	< 0.001	< 0.0005	< 0.0005	0.00124	0.934	<0.0005	< 0.05	< 0.0002	0.0473	0.592	0.0101	< 0.001
NC1-MW-9	6/20/2017	< 0.001	0.01	0.114	< 0.001	< 0.0005	< 0.0005	0.00295	< 0.5	<0.0005	< 0.05	< 0.0002	0.0486	0.473	< 0.005	< 0.001
	7/13/2017	< 0.001	0.00885	0.0952	< 0.001	< 0.0005	< 0.0005	0.000878	0.68	< 0.0005	< 0.05	< 0.0002	0.0302	0.294	< 0.005	< 0.001
	3/13/2018	< 0.001	0.0107	0.0838	< 0.001	< 0.0005	< 0.0005	0.00063	< 0.5	< 0.0005	0.0198	< 0.0002	0.0354	0.412	< 0.005	< 0.001
	6/6/2018	< 0.001	0.0114	0.111	< 0.001	< 0.0005	< 0.0005	0.00109	0.732	<0.0005	0.0189	< 0.0002	0.0474	0.827	< 0.005	< 0.001
	10/4/2018	N.S. <sup>[1]</sup>	0.0101	0.109	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	N.S. <sup>[1]</sup>	0.00492	0.777	<0.0005	0.0201	N.S. <sup>[1]</sup>	0.0399	1.39	< 0.005	N.S. <sup>[1]</sup>
	4/10/2019	<0.001	0.00681	0.153	< 0.001	< 0.0005	< 0.005	0.00559	<0.5	<0.0005	0.0254	<0.0002	0.0196	0.415	0.0120	< 0.001
	10/18/2019	< 0.001	0.00784	0.165	< 0.001	0.000100	< 0.005	0.00323	0.605	< 0.0005	0.0310	< 0.0002	0.0230	0.695	< 0.005	< 0.001

<sup>\*</sup> Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).

<sup>&</sup>lt; symbol indicates analyte not detected above the reporting limit, which is the value shown following the "<" symbol.

<sup>&</sup>quot;U" data qualifier (radium) indicates parameter was analyzed for but not detected above limiting critieria (such as, but not limited to: minimum detectable concentration; total uncertainty; reporting limit) as defined in the analytical laboratory data package.

N.S. = Not Sampled

<sup>[1] =</sup> Constituent not sampled because only detected Appendix IV constituents were tested, in accordance with 40 CFR 257.95(d)(1)

<sup>[2]</sup> MW-13 submerged under water during April and October 2019 sampling events, therefore N/A designates well not sampled.

Table 6 - Background Threshold Values for Assessment Monitoring

Constituents	Units	Background Threshold Values (UTLs)
Appendix III		•
Boron	mg/l	1.38
Calcium	mg/l	145
Chloride	mg/l	20.7
Fluoride [1]	mg/l	3.51
pH (LPL) [2]	SU	6.57
pH (UPL) <sup>[3]</sup>	SU	7.83
Sulfate	mg/l	148
TDS	mg/l	680
Appendix IV		
Antimony	mg/l	0.00235
Arsenic	mg/l	0.033
Barium	mg/l	0.372
Beryllium	mg/l	0.001
Cadmium	mg/l	0.0005
Chromium	mg/l	0.005
Cobalt	mg/l	0.00477
Lead	mg/l	0.006
Lithium	mg/l	0.0569
Mercury	mg/l	0.000262
Molybdenum	mg/l	0.00996
Radium 226 + 228	pCi/l	2.16
Selenium	mg/l	0.0139
Thallium	mg/l	0.001

 $<sup>^{[1]}</sup>$  Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).

<sup>[2]</sup> Indicates the lower bound of the range is the lower prediction limit (LPL).

<sup>[3]</sup> Indicates the upper bound is the upper prediction limit (UPL).

**Table 7 - Established Groundwater Protection Standards** 

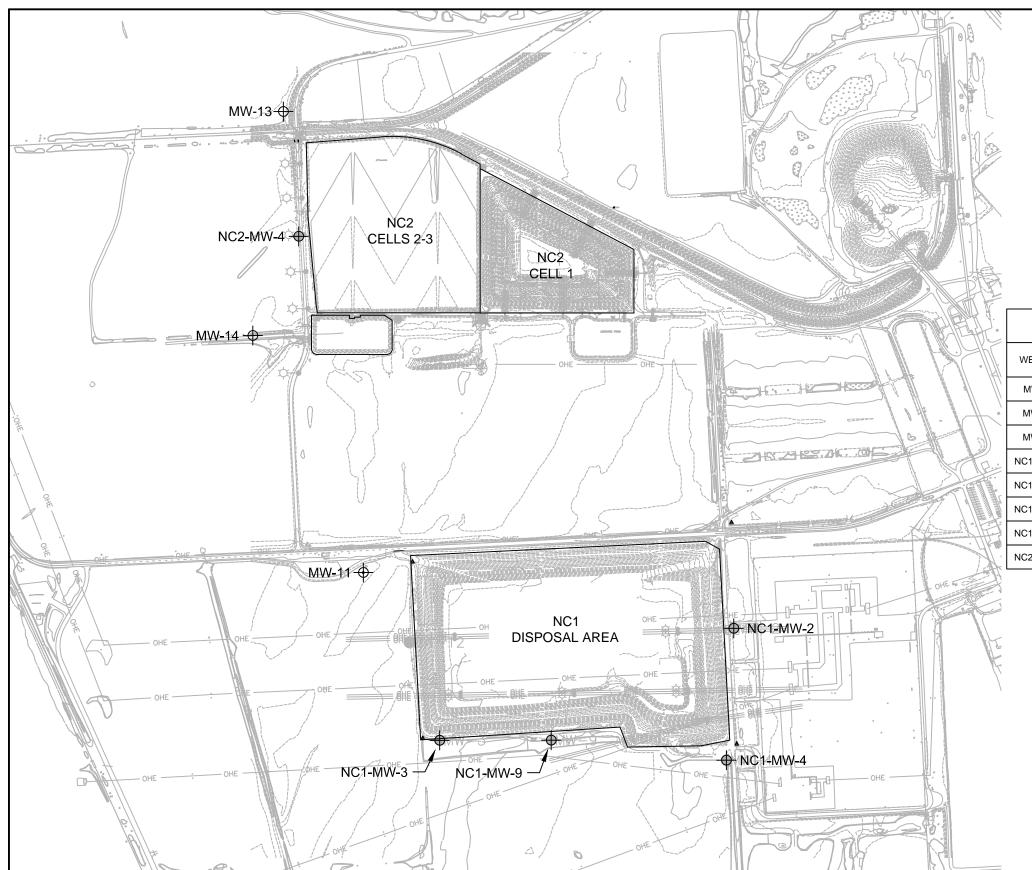
Constituents	Units	Established Groundwater Protection Standard (GWPS) <sup>[1]</sup>
Appendix IV		
Antimony	mg/l	0.006
Arsenic	mg/l	$0.033^{[2]}$
Barium	mg/l	2.0
Beryllium	mg/l	0.004
Cadmium	mg/l	0.005
Chromium	mg/l	0.1
Cobalt	mg/l	0.006
Flouride	mg/l	4.0
Lead	mg/l	0.015
Lithium	mg/l	0.0569 <sup>[2]</sup>
Mercury	mg/l	0.002
Molybdenum	mg/l	0.1
Radium 226 + 228 <sup>[2]</sup>	pCi/l	5.0
Selenium	mg/l	0.05
Thallium	mg/l	0.002

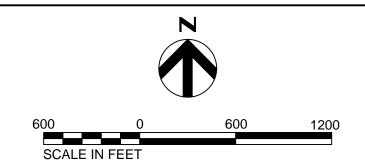
<sup>[1]</sup> GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2); unless otherwise specified.

<sup>[2]</sup> GWPS is established as the upper prediction limit (UPL) when the background level is higher than the U.S. EPA MCL or the GWPS specified in §257.95(h)(2).

## Figures







	MONITORING WELL NETWORK												
WELL ID	NORTHING	EASTING	ELEVATION	WELL DEPTH	LOCATION WITH RESPECT TO TEMPORARY ASH DISPOSAL AREA								
MW-11	315305.1442	2808934.3111	918.4400	20.0000	BACKGROUND / UPGRADIENT								
MW-13	318186.6391	2808434.6816	918.0500	13.0000	BACKGROUND / UPGRADIENT								
MW-14	316786.4705	2808244.0290	920.9900	18.0000	BACKGROUND / UPGRADIENT								
NC1-MW-2	314956.7160	2811249.0294	919.4200	17.8000	DOWNGRADIENT								
NC1-MW-3	314256.4530	2809411.6769	919.8500	19.5000	DOWNGRADIENT / CROSS GRADIENT								
NC1-MW-4	314132.4875	2811203.5495	919.6300	20.3000	DOWNGRADIENT								
NC1-MW-9	314257.3846	208108.9290	920.0900	20.0000	DOWNGRADIENT								
NC2-MW-4	317405.8952	2808530.8049	919.6200	14.0000	BACKGROUND / UPGRADIENT								

## NOTES:

- 1. TOP OF CASING ELEVATION DETERMINED BY SURVEY DATA OBTAINED JUNE 2019.
- 2. BGS = BELOW GROUND SURFACE





OPPD NEBRASKA CITY ASH LANDFILL NEBRASKA CITY UNIT 1 - NC1 MONITORING WELL LOCATION MAP

JANUARY 2020

FIGURE

01

# Appendix A

Field Sampling Forms



## **NEBRASKA CITY STATION**

Water Levels Prior to Purging

NC1MW2	Date of Sampling	4/8/2019	Time of Sampling	8:53	Static Water Level 4.17
NC1MW3	Date of Sampling	4/8/2019	Time of Sampling	9:22	Static Water Level 4.69
NC1MW3D	Date of Sampling	4/8/2019	Time of Sampling	9:24	Static Water Level 6.36
NC1MW4	Date of Sampling	4/8/2019	Time of Sampling	9:09	Static Water Level 4.58
NC1MW4D	Date of Sampling	4/8/2019	Time of Sampling	9:11	Static Water Level 3.32
NC1MW5	Date of Sampling		Time of Sampling		Static Water Level
NC1MW6	Date of Sampling		Time of Sampling		Static Water Level
NC1MW6D	Date of Sampling		Time of Sampling		Static Water Level
NC1MW7	Date of Sampling	4/8/2019	Time of Sampling	8:38	Static Water Level 3.68
NC1MW8	Date of Sampling	4/8/2019	Time of Sampling	8:39	Static Water Level 3.98
NC1MW9	Date of Sampling	4/8/2019	Time of Sampling	9:18	Static Water Level 4.85
NC1MW9D	Date of Sampling	4/8/2019	Time of Sampling	9:16	Static Water Level 6.24
NC1MW11	Date of Sampling	4/8/2019	Time of Sampling	9:00	Static Water Level 3.04
NC1MW12	Date of Sampling	4/8/2019	Time of Sampling	9:04	Static Water Level 4.89
NC1MW14	Date of Sampling	4/8/2019	Time of Sampling	7:52	Static Water Level 5.73
NC1MW16	Date of Sampling		Time of Sampling		Static Water Level
NC1MW17	Date of Sampling		Time of Sampling		Static Water Level
NC2MW4	Date of Sampling	4/8/2019	Time of Sampling	7:47	Static Water Level 3.53
NC2MW13	Date of Sampling		Time of Sampling		Static Water Level
NC2MW2	Date of Sampling	4/8/2019	Time of Sampling	8:27	Static Water Level 6.70
NC2MW3	Date of Sampling		Time of Sampling		Static Water Level
NC2MW4	Date of Sampling	4/8/2019	Time of Sampling	7:47	Static Water Level 3.53
NC2MW5	Date of Sampling	4/8/2019	Time of Sampling	8:09	Static Water Level 4.56
NC2MW6	Date of Sampling	4/8/2019	Time of Sampling	8:12	Static Water Level 4.18
NC2MW7	Date of Sampling	4/8/2019	Time of Sampling	8:34	Static Water Level 2.74
NC2MW8	Date of Sampling		Time of Sampling		Static Water Level
NC2MW13	Date of Sampling		Time of Sampling		Static Water Level

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle Uhing (79776), Bryan Lorence
Monitoring Well Identification - Sample Number: MW2 - 4	Date: 4/9/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Cloudy, Partly Sunny, 65°F

#### **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	8:53	Pump Start Time	10:48
Static Water Level (+/- 0.01 feet)*	4.17	Purge Rate (mL/minute)	200
Bottom of Well Casing (+/- 0.01 feet)*	16.40	Time to Purge Well (hours:minutes)	0:23
Pump Intake Elevation (+/- 0.01 feet)*	Not Measured	Purge and Sample Equipment: Dedicated Bladder	Pump with
2" Well Casing Volume (L)	755	QED Flow Controller and Nitrogen Gas, Graduated Measurin, Bucket and Cup, Multi-Parameter Water Meter, and Electror	
Actual Volume of Water Purged (mL)	4 600	Water Level Indicator	and Electronic

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

#### **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
10:53	1,000	11.54	1.98	97.8	6.55	0.653	4.40
10:56	1,600	11.48	1.79	52.5	6.62	0.652	4.43
10:59	2,200	11.45	1.70	32.3	6.65	0.651	4.47
11:02	2,800	11.48	1.33	22.4	6.68	0.649	4.46
11:05	3,400	11.50	1.24	19.2	6.68	0.648	4.47
11:08	4,000	12.10	1.17	16.3	6.68	0.650	4.47
11:11	4,600	12.14	1.19	13.4	6.68	0.653	4.46

Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
11:11	4,600	12.14	1.19	13.4	6.68	0.653	4.46
Duplicate?	No	Preservation?	Cool on Ice, H	NO <sub>3</sub> for Metals	Pump Rate	(mL/minute)	200

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	4/9/2019, 7:54

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle Uhing (79776), Bryan Lorence
Monitoring Well Identification - Sample Number: MW3 - 7	Date: 4/9/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Partly Cloudy, Sunny, 70°F

#### **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	9:22	Pump Start Time	15:14
Static Water Level (+/- 0.01 feet)*	4.69	Purge Rate (mL/minute)	200
Bottom of Well Casing (+/- 0.01 feet)*	22.20	Time to Purge Well (hours:minutes)	0:33
Pump Intake Elevation (+/- 0.01 feet)*	Not Measured	Purge and Sample Equipment: Dedicated Bladder	Pump with
2" Well Casing Volume (L)	10 81	QED Flow Controller and Nitrogen Gas, Graduated Measurin  Bucket and Cup, Multi-Parameter Water Meter, and Electro	
Actual Volume of Water Purged (mL)	C 400	Water Level Indicator	and Licetionic

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

#### **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
15:19	1,000	12.97	1.56	860	7.34	1.30	4.78
15:22	1,600	12.96	1.06	<1,000	7.32	1.32	4.82
15:25	2,200	12.47	0.89	<1,000	7.18	1.31	4.87
15:28	2,800	12.70	0.85	<1,000	7.08	1.32	4.91
15:31	3,400	12.34	0.74	318	7.27	1.32	4.94
15:34	4,000	12.53	0.67	143	7.28	1.33	4.94
15:37	4,600	12.50	0.64	72.2	7.35	1.33	4.95
15:40	5,200	12.49	0.59	37.2	7.36	1.33	4.97
15:43	5,800	12.49	0.59	24.4	7.29	1.34	4.97
15:47	6,400	12.45	0.58	24.6	7.32	1.34	4.97

Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
15:47	6,400	12.45	0.58	24.6	7.32	1.34	4.97
Duplicate?	Yes, DUP 2	Preservation?	Cool on Ice, HNO <sub>3</sub> for Metals		Pump Rate	(mL/minute)	200

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	4/9/2019, 7:54

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle Uhing (79776), Bryan Lorence
Monitoring Well Identification - Sample Number: MW4 - 5	Date: 4/9/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Cloudy, Partly Sunny, 66°F

#### **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	9:09	Pump Start Time	12:45
Static Water Level (+/- 0.01 feet)*	4.58	Purge Rate (mL/minute)	350
Bottom of Well Casing (+/- 0.01 feet)*	17.70	Time to Purge Well (hours:minutes)	0:32
Pump Intake Elevation (+/- 0.01 feet)*	i Not ivieasureu	red Purge and Sample Equipment: Dedicated Bladder Pump QED Flow Controller and Nitrogen Gas, Graduated Meas Bucket and Cup, Multi-Parameter Water Meter, and Ele	
2" Well Casing Volume (L)	I X 101		
Actual Volume of Water Purged (mL)	11 200	Water Level Indicator	and Electronic

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

#### **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Leve (feet)
12:56	3,850	12.76	1.96	36.0	7.63	0.873	4.68
12:59	4,900	12.68	1.58	18.8	7.61	0.870	4.69
13:02	5,950	12.75	1.33	12.8	7.65	0.867	4.72
13:05	7,000	12.92	1.16	10.8	7.66	0.870	4.75
13:08	8,050	13.05	0.99	10.5	7.65	0.874	4.77
13:11	9,100	13.04	0.89	8.8	7.64	0.871	4.78
13:14	10,150	13.27	0.81	7.9	7.65	0.870	4.79
13:17	11,200	13.17	0.80	6.9	7.65	0.872	4.81

Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

	Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
I	13:17	11,200	13.17	0.80	6.9	7.65	0.872	4.81
I	Duplicate?	Yes, DUP1	Preservation?	Cool on Ice, HNO <sub>3</sub> for Metals		or Metals Pump Rate (mL/minute)		200

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	4/9/2019, 7:54

Notes / Unusual Occurrences: Initial purge water had unusual brown sediments. Purged until clear before recording parameter data.

Facility Name: OPPD Nebraska City Station 2	Sampler Name(s): Kyle Uhing (79776), Bryan Lorence
Monitoring Well Identification - Sample Number: <b>MW4 - 1</b>	Date: 4/8/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Clear, Sunny, 66°F

#### **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	7:47	Pump Start Time	10:03
Static Water Level (+/- 0.01 feet)*	3.53	Purge Rate (mL/minute)	200
Bottom of Well Casing (+/- 0.01 feet)*		Time to Purge Well (hours:minutes)	0:42
Pump Intake Elevation (+/- 0.01 feet)*	i Not ivieasureu	red Purge and Sample Equipment: Dedicated Bladder Pump QED Flow Controller and Nitrogen Gas, Graduated Mea Bucket and Cup, Multi-Parameter Water Meter, and Ele	
2" Well Casing Volume (L)	h //		
Actual Volume of Water Purged (mL)	0.400	Water Level Indicator	and Electronic

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

#### **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
10:08	` '	11.51	12.01	152	6.55	0.932	4.92
	1,000						
10:11	1,600	11.33	11.08	88.4	6.52	0.932	5.47
10:15	2,400	11.26	10.20	57.8	6.52	0.933	6.02
10:18	3,000	11.12	10.05	58.5	6.52	0.933	6.14
10:21	3,600	11.03	1.95	62.1	6.53	0.931	6.19
10:24	4,200	11.15	1.89	56.8	6.57	0.932	6.26
10:27	4,800	11.09	6.89	53.6	6.58	0.931	6.32
10:30	5,400	11.16	7.00	45.6	6.59	0.930	6.38
10:33	6,000	11.19	6.84	39.1	6.63	0.932	6.44
10:36	6,600	11.13	8.52	34.3	6.65	0.929	6.57
10:39	7,200	11.09	8.51	30.4	6.66	0.929	6.64
10:42	7,800	11.07	8.24	27.0	6.68	0.930	6.69
10:45	8,400	11.03	8.04	24.1	6.71	0.930	6.72
	1						
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Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
10:45	8,400	11.03	8.04	24.1	6.71	0.930	6.72
Duplicate?	No	Preservation?	Cool on Ice, HNO <sub>3</sub> for Metals		Pump Rate (mL/minute)		200

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi	
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse	
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing	
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	4/8/2019, 5:46	

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle Uhing (79776)
Monitoring Well Identification - Sample Number: MW9 - 9	Date: 4/10/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Partly Cloudy, Sunny, 58°F

#### **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	9:18	Pump Start Time	9:54
Static Water Level (+/- 0.01 feet)*	4.85	Purge Rate (mL/minute)	250
Bottom of Well Casing (+/- 0.01 feet)*	22.40	Time to Purge Well (hours:minutes)	0:20
Pump Intake Elevation (+/- 0.01 feet)*	Not Measured	Purge and Sample Equipment: Dedicated Bladder Pump  QED Flow Controller and Nitrogen Gas, Graduated Mea  Bucket and Cup, Multi-Parameter Water Meter, and Ele	
2" Well Casing Volume (L)	10.87		
Actual Volume of Water Purged (mL)	E 000	Water Level Indicator	and Licetionic

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

#### **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Leve (feet)
9:59	1,250	12.05	1.95	<1,000	7.06	1.14	4.92
10:02	2,000	11.84	1.46	490	7.03	1.14	4.95
10:05	2,750	11.89	1.31	110	7.03	1.14	4.98
10:08	3,500	11.78	1.07	59.4	7.03	1.14	5.00
10:11	4,250	11.80	1.13	31.7	7.03	1.14	5.03
10:14	5,000	11.75	1.16	21.6	7.03	1.16	5.03

Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
10:14	5,000	11.75	1.16	21.6	7.03	1.16	5.03
Duplicate?	No	Preservation?	Cool on Ice, HNO <sub>3</sub> for Metals		Pump Rate (mL/minute)		250

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi	
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse	
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing	
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	4/10/2019, 8:05	

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle Uhing (79776), Bryan Lorence		
Monitoring Well Identification - Sample Number: MW11 - 3	Date: 4/8/2019		
Wellhead Inspection (Condition): Compliant	Weather Conditions: Clear, Sunny, 74°F		

#### **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	9:00	Pump Start Time	17:44	
Static Water Level (+/- 0.01 feet)*	3.04	Purge Rate (mL/minute)	250	
Bottom of Well Casing (+/- 0.01 feet)*	21.85	Time to Purge Well (hours:minutes)	0:26	
Pump Intake Elevation (+/- 0.01 feet)*	Not Measured	Purge and Sample Equipment: Dedicated Bladder Pump with QED Flow Controller and Nitrogen Gas, Graduated Measuring Bucket and Cup, Multi-Parameter Water Meter, and Electronic Water Level Indicator		
2" Well Casing Volume (L)	1161			
Actual Volume of Water Purged (mL)	6 500			

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

#### **Groundwater Parameter Data**

Time	Volume Purged		DO (mg/L)	Turbidity	рН	Conductivity	Water Level
	(mL)	(°C)	, 0, ,	(NTU)	•	(mS/cm)	(feet)
17:49	1,250	13.83	1.74	14.7	7.27	0.724	3.20
17:52	2,000	13.42	1.15	11.9	7.28	0.722	3.22
17:55	2,750	13.33	0.94	13.4	7.33	0.725	3.27
17:58	3,500	13.49	0.79	14.9	7.33	0.721	3.27
18:01	4,250	13.74	0.68	15.4	7.36	0.719	3.27
18:04	5,000	13.89	0.63	15.7	7.38	0.720	3.27
18:07	5,750	13.92	0.56	15.2	7.40	0.723	3.28
18:10	6,500	14.00	0.55	16.7	7.41	0.723	3.27
	<u> </u>						

Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
18:10	6,500	14.00	0.55	16.7	7.41	0.723	3.27
Duplicate?	No	Preservation?	Cool on Ice, HNO <sub>3</sub> for Metals		Pump Rate (mL/minute)		250

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi	
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse	
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing	
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	4/8/2019, 5:46	

				•		. •	
Facility Name: C	PPD Nebraska Ci	ity Station 2		Sampler Name(	s): Kyle Uhing (79	776)	
Monitoring Wel	l Identification - S	Sample Number:	MW13	Date:			
Wellhead Insped	ction (Condition):	:		Weather Condit	tions:		
Groundwater N	leasurements an	d Purge Data		•			
Time of Water L	evel Measureme	ent		Pump Start Time	e		
Static Water Lev	/el (+/- 0.01 feet)	*		Purge Rate (mL/minute)			
Bottom of Well	Casing (+/- 0.01 f	eet)*	15.19	Time to Purge V	Vell (hours:minut	es)	
Pump Intake Ele	evation (+/- 0.01 f	feet)*			ole Equipment: Do		
2" Well Casing V	/olume (L)				oller and Nitroge		
	of Water Purged (	(mL)	0	Water Level Ind	, Multi-Paramete	r Water Meter, a	ind Electronic
			the edge of the		monitoring well	casing using an e	lectronic
water level ind							
Groundwater Pa				T =			
Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	pН	Conductivity (mS/cm)	Water Level (feet)
	(IIIL)	( C)		(NTO)		(III3/CIII)	(leet)
				<del> </del>			
		Not Sampl	ed - Well Sເ	ıbmerged Ur	nder Water		
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	l l						
	ated to Dryness?			Recharge time?			
Groundwater Sa	ample Informatio			T =			
Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
Dunlingto		Procesuation?		<u> </u>	Dumn Date /	ml/minutal	
Duplicate? Sample Physica	Characteristics	Preservation?		Equipment Info	Pump Rate (	init/inifiute)	
Sample Clarity	. Characteristics						
Sample Color				QED Pump Control Information  Decontamination Procedure			
Sample Odor				Instrument Calil			
	r Observed? If so	thickness?		Date and Time of			
Notes / Unusual		, chickingss:		Pace and Time (	or canbration		
in a succession of the success							

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle Uhing (79776), Bryan Lorence		
Monitoring Well Identification - Sample Number: MW14 - 2	Date: 4/8/2019		
Wellhead Inspection (Condition): Compliant	Weather Conditions: Clear, Sunny, 68°F		

## **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	7:52	Pump Start Time	11:26
Static Water Level (+/- 0.01 feet)*	5.73	Purge Rate (mL/minute)	250
Bottom of Well Casing (+/- 0.01 feet)*	Not Measured	Time to Purge Well (hours:minutes) 0	
Pump Intake Elevation (+/- 0.01 feet)*	Not Measured	Purge and Sample Equipment: Dedicated Bladder Pump wit QED Flow Controller and Nitrogen Gas, Graduated Measuri Bucket and Cup, Multi-Parameter Water Meter, and Electro Water Level Indicator	
2" Well Casing Volume (L)			
Actual Volume of Water Purged (mL)	0.000		

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

## **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
11:31	1,250	13.20	6.70	125	6.73	1.28	8.44
11:34	2,000	12.80	7.98	71.5	6.78	1.27	9.88
11:37	2,750	12.82	8.06	66.9	6.79	1.28	10.74
11:40	3,500	12.64	4.06	53.6	6.78	1.28	11.06
11:43	4,250	12.58	8.23	51.6	6.81	1.27	11.14
11:46	5,000	12.77	7.99	43.9	6.79	1.27	11.20
11:49	5,750	12.71	7.84	39.4	6.80	1.27	11.23
11:52	6,500	12.68	7.24	32.8	6.83	1.27	11.28
11:55	7,250	12.70	7.16	29.6	6.81	1.26	11.30
11:58	8,000	12.67	7.04	25.0	6.81	1.26	11.31
		_	_				

Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
11:58	8,000	12.67	7.04	25.0	6.81	1.26	11.31
Duplicate?	No	Preservation?	Cool on Ice, H	NO₃ for Metals	Pump Rate	(mL/minute)	250

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	4/8/2019, 5:46

Date:	4/8/2019
Time:	5:46

Person Calibrating Instrument: Kyle K. Uhing

Instrument Type	Instrument Brand	Instrument Model	Instrument Serial Number
Multiparameter Water	Horiba	U-5000/U-52	KE3AGWPR/NTKDC76Y
Meter	Horiba	0-3000/0-32	RESAGWI NJIVIKDE/01

Parameter:	Reading	Units
pH 4	4.00	SU
Conductivity	4.49	μS/cm
Turbidity	0.0	NTU
DO	10.44	mg/L

Comments:	
The Horiba was calibrated using pH 4.0 AutoCal buffer solution.	
SU = Standard Units	

Date:	4/9/2019
Time:	7:54

Person Calibrating Instrument: Kyle K. Uhing

Instrument Type	Instrument Brand	Instrument Model	Instrument Serial Number	
Multiparameter Water	Horiba	U-5000/U-52	KE3AGWPR/NTKDC76Y	
Meter	Horiba	0-3000/0-32	KESAGWFIYINTKDC/01	

Parameter:	Reading	Units
pH 4	3.99	SU
Conductivity	4.48	μS/cm
Turbidity	0.1	NTU
DO	10.11	mg/L

Comments:	
The Horiba was calibrated using pH 4.0 AutoCal buffer solution.	
SU = Standard Units	

Date: 4/10/2019 Time: 8:05

Person Calibrating Instrument: Kyle K. Uhing

Instrument Type	Instrument Brand	Instrument Model	Instrument Serial Number	
Multiparameter Water	Horiba	U-5000/U-52	KE3AGWPR/NTKDC76Y	
Meter	Horiba	0-3000/0-32	RESAGWFN/NTRDC/01	

Parameter:	Reading	Units
pH 4	4.00	SU
Conductivity	4.52	μS/cm
Turbidity	0.0	NTU
DO	10.02	mg/L

Comments:	
The Horiba was calibrated using pH 4.0 AutoCal buffer solution.	
SU = Standard Units	

## **NEBRASKA CITY STATION**

Water Levels Prior to Purging (Feet Below TOC)

NC1MW2	Date of Sampling	10/14/2019	Time of Sampling	14:52	Static Water Level 3.64
NC1MW3	Date of Sampling	10/14/2019	Time of Sampling	16:19	Static Water Level 4.56
NC1MW4	Date of Sampling	10/14/2019	Time of Sampling	16:10	Static Water Level 4.33
NC1MW5	Date of Sampling	10/14/2019	Time of Sampling	NM	Static Water Level NM
NC1MW6	Date of Sampling	10/14/2019	Time of Sampling	NM	Static Water Level NM
NC1MW7	Date of Sampling	10/14/2019	Time of Sampling	14:58	Static Water Level 3.01
NC1MW8	Date of Sampling	10/14/2019	Time of Sampling	14:59	Static Water Level 3.33
NC1MW9	Date of Sampling	10/14/2019	Time of Sampling	16:24	Static Water Level 4.65
NC2MW2	Date of Sampling	10/14/2019	Time of Sampling	15:21	Static Water Level 6.34
NC2MW3	Date of Sampling	10/14/2019	Time of Sampling	15:18	Static Water Level 0.21*
NC2MW4	Date of Sampling	10/14/2019	Time of Sampling	14:28	Static Water Level 3.47
NC2MW5	Date of Sampling	10/14/2019	Time of Sampling	15:04	Static Water Level 4.48
NC2MW6	Date of Sampling	10/14/2019	Time of Sampling	15:10	Static Water Level 3.75
NC2MW7	Date of Sampling	10/14/2019	Time of Sampling	15:27	Static Water Level 2.27
NC2MW8	Date of Sampling	10/14/2019	Time of Sampling	15:48	Static Water Level 2.38
MW11	Date of Sampling	10/14/2019	Time of Sampling	14:41	Static Water Level 2.90
MW12	Date of Sampling	10/14/2019	Time of Sampling	14:45	Static Water Level 4.77
MW13	Date of Sampling	10/14/2019	Time of Sampling	NM	Static Water Level NM
MW14	Date of Sampling	10/14/2019	Time of Sampling	14:33	Static Water Level 5.75

## NOTES:

TOC = Top of Casing

NM = Not Measured, Inaccessible

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle K. Uhing (79776)
Monitoring Well Identification - Sample Number: MW2 - 4	Date: 10/18/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Partly Cloudy, Sunny, Windy, 57°F

## **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	9:46	Pump Start Time	9:49
Static Water Level (+/- 0.01 feet)*	3.77	Purge Rate (mL/minute)	300
Bottom of Well Casing (+/- 0.01 feet)*	16.40	Time to Purge Well (hours:minutes)	0:23
Pump Intake Elevation (+/- 0.01 feet)*	inot ivieasureu		•
2" Well Casing Volume (L)	7 90	QED Flow Controller and Nitrogen Gas, Graduated Measu  Bucket and Cup, Multi-Parameter Water Meter, and Elect	
Actual Volume of Water Purged (mL)	C 000	Water Level Indicator	and Electronic

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

## **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
9:54	1,500	16.99	1.77	14.2	6.26	0.609	3.80
9:57	2,400	17.58	1.48	13.2	6.52	0.598	3.81
10:00	3,300	17.55	1.52	10.7	6.59	0.591	3.81
10:03	4,200	17.59	1.48	10.9	6.69	0.599	3.81
10:06	5,100	17.68	1.45	9.8	6.83	0.600	3.81
10:09	6,000	17.67	1.44	8.7	6.83	0.599	3.81
10:12	6,900	17.65	1.42	8.3	6.84	0.599	3.81

Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
10:12	6,900	17.65	1.42	8.3	6.84	0.599	3.81
Duplicate?	No	Preservation?	Cool on Ice, H	NO₃ for Metals	Pump Rate	(mL/minute)	300

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	10/18/2019, 8:01

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle K. Uhing (79776)
Monitoring Well Identification - Sample Number: MW3 - 6	Date: 10/18/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Clear, Sunny, Breezy, 66°F

## **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	11:29	Pump Start Time	11:32
Static Water Level (+/- 0.01 feet)*	4.61	Purge Rate (mL/minute)	300
Bottom of Well Casing (+/- 0.01 feet)*	22.20	Time to Purge Well (hours:minutes)	0:20
Pump Intake Elevation (+/- 0.01 feet)*	Not Measured	Purge and Sample Equipment: Dedicated Bladder	Pump with
2" Well Casing Volume (L)	10.86	QED Flow Controller and Nitrogen Gas, Graduate Bucket and Cup, Multi-Parameter Water Meter, a	•
Actual Volume of Water Purged (mL)	6 000	Water Level Indicator	ina Licettonic

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

## **Groundwater Parameter Data**

Time	Volume Purged		DO (mg/L)	Turbidity	рН	Conductivity	Water Level
	(mL)	(°C)	50 (mg/L)	(NTU)	p.i.	(mS/cm)	(feet)
11:37	1,500	15.80	1.83	51.6	7.22	1.32	4.61
11:40	2,400	15.42	9.12	51.0	7.22	1.31	4.61
11:43	3,300	15.38	8.37	29.2	7.18	1.31	4.61
11:46	4,200	15.34	8.22	22.3	7.09	1.31	4.61
11:49	5,100	15.34	8.27	14.1	7.11	1.31	4.61
11:52	6,000	15.32	8.11	10.9	7.08	1.30	4.61
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Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
11:52	6,000	15.32	8.11	10.9	7.08	1.30	4.61
Duplicate?	No	Preservation?	Cool on Ice, H	NO₃ for Metals	Pump Rate	(mL/minute)	300

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	10/18/2019, 8:01

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle K. Uhing (79776)
Monitoring Well Identification - Sample Number: MW4 - 5	Date: 10/18/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Partly Cloudy, Sunny, Breezy, 60°F

## **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	10:42	Pump Start Time	10:45
Static Water Level (+/- 0.01 feet)*	4.41	Purge Rate (mL/minute)	300
Bottom of Well Casing (+/- 0.01 feet)*		Time to Purge Well (hours:minutes)	0:20
Pump Intake Elevation (+/- 0.01 feet)*	inot ivieasureu		•
2" Well Casing Volume (L)	1 871	QED Flow Controller and Nitrogen Gas, Graduate Bucket and Cup, Multi-Parameter Water Meter, a	•
Actual Volume of Water Purged (mL)	6 000	Water Level Indicator	and Electronic

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

## **Groundwater Parameter Data**

Time	Volume Purged (mL)	•	DO (mg/L)	Turbidity	рН	Conductivity (mS/cm)	Water Leve (feet)
10.50		(°C)		(NTU)	7.04		
10:50	1,500	16.44	1.27	23.8	7.34	0.942	4.38
10:53	2,400	16.44	0.81	13.3	7.31	0.952	4.38
10:56	3,300	16.52	0.70	10.0	7.32	0.956	4.38
10:59	4,200	16.56	0.70	8.2	7.33	0.957	4.38
11:02	5,100	16.59	0.66	8.2	7.34	0.958	4.38
11:05	6,000	16.56	0.61	6.9	7.33	0.957	4.38
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Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
11:05	6,000	16.56	0.61	6.9	7.33	0.957	4.38
Duplicate?	No	Preservation?	Cool on Ice, H	NO₃ for Metals	Pump Rate	(mL/minute)	300

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	10/4/2018, 6:01

Facility Name: OPPD Nebraska City Station 2	Sampler Name(s): Kyle K. Uhing (79776)
Monitoring Well Identification - Sample Number: <b>MW4 - 1</b>	Date: 10/15/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Clear, Windy, 54°F

## **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	10:42	Pump Start Time	10:44
Static Water Level (+/- 0.01 feet)*	3.53	Purge Rate (mL/minute)	300-350
Bottom of Well Casing (+/- 0.01 feet)*		Time to Purge Well (hours:minutes)	0:32
Pump Intake Elevation (+/- 0.01 feet)*	inot ivieasureu		•
2" Well Casing Volume (L)	677	QED Flow Controller and Nitrogen Gas, Graduate Bucket and Cup, Multi-Parameter Water Meter, a	•
Actual Volume of Water Purged (mL)	10 100	Water Level Indicator	ina Licetronic

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

## **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Leve (feet)
10:49	1,750	15.52	1.58	12.3	6.07	0.882	4.17
10:52	2,800	15.61	1.32	5.8	6.17	0.879	5.56
10:55	3,850	15.78	1.60	5.6	6.22	0.876	6.32
10:58	4,900	15.91	1.95	6.9	6.26	0.874	6.82
11:01	5,950	15.92	1.97	8.9	6.34	0.873	7.05
11:04	6,850	15.89	1.94	10.5	6.41	0.873	7.05
11:07	7,750	15.87	1.87	10.5	6.48	0.873	7.04
11:10	8,650	15.85	1.62	10.1	6.51	0.873	7.04
11:13	9,550	15.85	1.63	10.4	6.55	0.873	7.02
11:16	10,450	15.84	1.60	10.2	6.57	0.873	7.00
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Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
11:16	10,450	15.84	1.60	10.2	6.57	0.873	7.00
Duplicate?	No	Preservation?	Cool on Ice, HNO <sub>3</sub> for Metals		NO <sub>3</sub> for Metals Pump Rate (mL/minute)		300

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	10/15/2019, 9:29

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle K. Uhing (79776)
Monitoring Well Identification - Sample Number: MW9 - 7	Date: 10/18/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Clear, Sunny, Breezy, 68°F

## **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	12:17	Pump Start Time	12:19	
Static Water Level (+/- 0.01 feet)*	4.74	Purge Rate (mL/minute)	350	
Bottom of Well Casing (+/- 0.01 feet)*		Time to Purge Well (hours:minutes)	0:20	
Pump Intake Elevation (+/- 0.01 feet)*	I NOT IVICASAICA	Purge and Sample Equipment: Dedicated Bladder Pump wi		
2" Well Casing Volume (L)	1 10 90	QED Flow Controller and Nitrogen Gas, Graduated Measurir Bucket and Cup, Multi-Parameter Water Meter, and Electro Water Level Indicator		
Actual Volume of Water Purged (mL)	7 000			

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

## **Groundwater Parameter Data**

Time	Volume Purged		DO (mg/L)	Turbidity	рН	Conductivity	Water Level
	(mL)	(°C)	DO (1116/12)	(NTU)	p.i.	(mS/cm)	(feet)
12:24	1,750	15.62	1.35	222	7.17	1.22	4.74
12:27	2,800	15.43	1.22	66.9	7.13	1.22	4.74
12:30	3,850	15.33	1.17	24.3	7.11	1.20	4.74
12:33	4,900	15.28	1.18	11.3	7.10	1.18	4.74
12:36	5,950	15.19	1.13	10.0	7.08	1.18	4.74
12:39	7,000	15.18	1.15	6.0	7.06	1.18	4.74

Well Evacuated to Dryness?

Recharge time? Not Measured

## **Groundwater Sample Information**

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
12:39	7,000	15.18	1.15	6.0	7.06	1.18	4.74
Duplicate?	Yes, DUP1	Preservation?	Cool on Ice, HNO <sub>3</sub> for Metals		NO <sub>3</sub> for Metals Pump Rate (mL/minute)		350

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	10/18/2019, 8:01

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle K. Uhing (79776)
Monitoring Well Identification - Sample Number: MW11 - 3	Date: 10/16/2019
Wellhead Inspection (Condition): Compliant	Weather Conditions: Overcast, Breezy, 47°F

## **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	11:30	Pump Start Time 11:32		
Static Water Level (+/- 0.01 feet)*	3.07	Purge Rate (mL/minute)	300	
Bottom of Well Casing (+/- 0.01 feet)*		Time to Purge Well (hours:minutes)	0:11	
Pump Intake Elevation (+/- 0.01 feet)*	NOL Wiedsureu			
2" Well Casing Volume (L)	1160	QED Flow Controller and Nitrogen Gas, Graduated Measurin Bucket and Cup, Multi-Parameter Water Meter, and Electrol Water Level Indicator		
Actual Volume of Water Purged (mL)	2 200			

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

## **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Leve (feet)
11:37	1,500	14.64	1.72	9.5	6.67	0.891	3.09
11:40	2,400	14.69	1.68	6.7	6.64	0.905	3.10
11:43	3,300	14.70	1.67	4.7	6.64	0.909	3.10
	1						
	1						

Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
11:43	3,300	14.70	1.67	4.7	6.64	0.91	3.10
Duplicate?	No	Preservation?	Cool on Ice, HNO <sub>3</sub> for Metals		NO <sub>3</sub> for Metals Pump Rate (mL/minute)		300

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Clear	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Odorless	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	10/16/2019, 9:08

	Field	Notes F	or Mon	itoring W	/ell Sam	pling		
Facility Name:	OPPD Nebraska Ci	ity Station 1		Sampler Name(s): Kyle K. Uhing (79776)				
Monitoring We	ell Identification - S	Sample Number:	MW13	Date:				
Wellhead Inspe	ection (Condition):	: Compliant (See	Notes)	Weather Conditions:				
	Measurements an		<u> </u>					
Time of Water	Level Measureme	ent	NM	Pump Start Time				
Static Water Level (+/- 0.01 feet)*			NM	Purge Rate (mL/r	minute)			
	II Casing (+/- 0.01 f		15.19	Time to Purge W		tes)		
	levation (+/- 0.01 f			Purge and Sampl	le Equipment: D	edicated Bladder	Pump with	
2" Well Casing				QED Flow Controller and Nitrogen Gas, Graduated Measuring				
	of Water Purged (	(mL)		Bucket and Cup,		er Water Meter, a	and Electronic	
*Measurement water level in	t collected from a	defined point on	the edge of the	Water Level India e surveyed top of r	monitoring well	casing using an e	lectronic	
Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)	
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	uated to Dryness?			Recharge time?		-		
Groundwater	Sample Information Volume Purged			Touchidia.		Conductivity	Water Level	
Sample Time	(mL)	remperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	(feet)	
	(2)	( 6)		(1110)		(11137 cm)	(icct)	
Duplicate?		Preservation?	Cool on Ice. F	HNO <sub>3</sub> for Metals	Pumn Rate	(mL/minute)		
•	al Characteristics	Treservation.		Equipment Infor		(III.) IIIIIIdee)		
Sample Clarity				QED Pump Contr				
Sample Color				Decontamination	n Procedure			
Sample Odor				Instrument Calib	ration By			

Date and Time of Calibration

Notes / Unusual Occurrences: Monitoring Well Not Accessible Due To Flood Conditions

Immiscible Layer Observed? If so, thickness?

Facility Name: OPPD Nebraska City Station 1	Sampler Name(s): Kyle K. Uhing (79776)		
Monitoring Well Identification - Sample Number: MW14 - 2	Date: 10/16/2019		
Wellhead Inspection (Condition): Compliant	Weather Conditions: Overcast, Breezy, 44°F		

## **Groundwater Measurements and Purge Data**

Time of Water Level Measurement	10:37	Pump Start Time	10:39
Static Water Level (+/- 0.01 feet)*	5.80	Purge Rate (mL/minute)	250-300
Bottom of Well Casing (+/- 0.01 feet)*	Not Measured	Time to Purge Well (hours:minutes)	0:20
Pump Intake Elevation (+/- 0.01 feet)*	Not Measured	Purge and Sample Equipment: Dedicated Bladder Pump with QED Flow Controller and Nitrogen Gas, Graduated Measuring Bucket and Cup, Multi-Parameter Water Meter, and Electroni	
2" Well Casing Volume (L)	Not Measured		
Actual Volume of Water Purged (mL)	E 600	Water Level Indicator	

<sup>\*</sup>Measurement collected from a defined point on the edge of the surveyed top of monitoring well casing using an electronic water level indicator.

## **Groundwater Parameter Data**

Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Leve (feet)
10:44	1,250	14.62	2.45	8.0	6.22	1.20	7.22
10:47	2,000	14.51	1.84	10.2	6.38	1.19	7.89
10:50	2,900	14.51	1.68	9.0	6.44	1.19	8.47
10:53	3,800	14.53	1.40	9.3	6.48	1.18	8.93
10:56	4,700	14.44	1.36	9.3	6.51	1.18	9.15
10:59	5,600	14.40	1.32	9.0	6.52	1.18	9.22
				<u> </u>		<u> </u>	

Well Evacuated to Dryness?

Recharge time? Not Measured

## Groundwater Sample Information

Sample Time	Volume Purged (mL)	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	рН	Conductivity (mS/cm)	Water Level (feet)
10:59	5,600	14.40	1.32	9.0	6.52	1.18	9.22
Duplicate?	No	Preservation?	Cool on Ice, H	NO <sub>3</sub> for Metals	Pump Rate (	(mL/minute)	300

Sample Physical Characteristics Equipment Information

Sample Clarity	Clear	QED Pump Control Information	CPM-2, 27/3, ~20 psi
Sample Color	Light Yellow	Decontamination Procedure	Alconox and DI Water Rinse
Sample Odor	Sulfur	Instrument Calibration By	Kyle K. Uhing
Immiscible Layer Observed? If so, thickness?	No	Date and Time of Calibration	10/16/2019, 9:08

Date:	10/15/2019
Time:	9:29

Person Calibrating Instrument: Kyle K. Uhing

Instrument Type	Instrument Brand	Instrument Model	Instrument Serial Number	
Multi-Parameter Water	Horiba	U-5000/U-52	KE3AGWPR/NTKDC76Y	
Meter	Horiba	0-3000/0-32	RESAGWFN/NTRDE/01	

Parameter:	Reading	Units
pH 4	4.00	NA
Conductivity	4.31	μS/cm
Turbidity	0.0	NTU
DO	10.10	mg/L

Comments:
The Horiba was calibrated using pH 4.0 AutoCal buffer solution.

Date:	10/16/2019
Time:	9:08

Person Calibrating Instrument: Kyle K. Uhing

Instrument Type	Instrument Brand	Instrument Model	Instrument Serial Number	
Multi-Parameter Water	Horiba	U-5000/U-52	KE3AGWPR/NTKDC76Y	
Meter	Horiba	0-3000/0-32	KESAGWFR/MTRDC/01	

Parameter:	Reading	Units
pH 4	4.00	NA
Conductivity	4.49	μS/cm
Turbidity	0.0	NTU
DO	10.10	mg/L

Comments:	
The Horiba was calibrated using pH 4.0 AutoCal buffer solution.	

Date:	10/18/2019
Time:	8:01

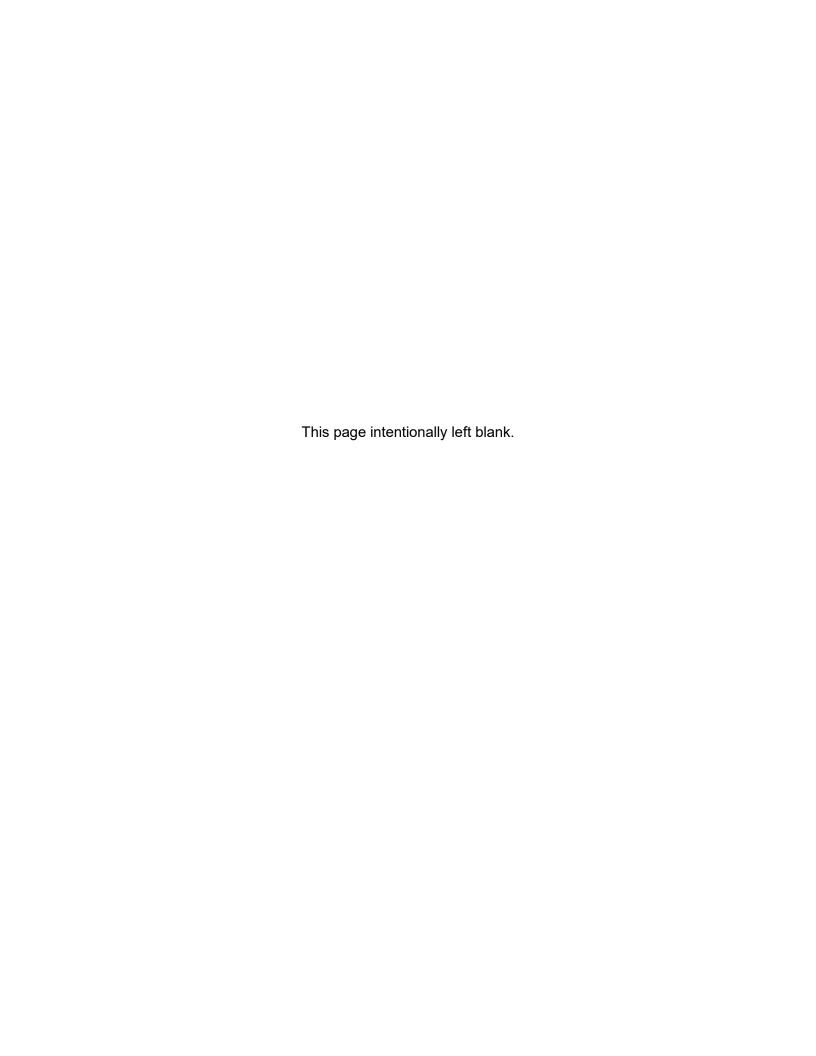
Person Calibrating Instrument: Kyle K. Uhing

Instrument Type	Instrument Brand	Instrument Model	Instrument Serial Number		
Multiparameter Water Meter	parameter Water Horiba		KE3AGWPR/NTKDC76Y		

Parameter:	Reading	Units
pH 4	pH 4 4.00	
Conductivity	4.50	μS/cm
Turbidity	0.0	NTU
DO	10.42	mg/L

Comments:
The Horiba was calibrated using pH 4.0 AutoCal buffer solution.

# Appendix B Laboratory Analytical Reports





# **Environment Testing TestAmerica**

## **ANALYTICAL REPORT**

Eurofins TestAmerica, Cedar Falls 704 Enterprise Drive Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-153107-1

Client Project/Site: Nebraska City Unit 1

Revision: 1

## For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 5/6/2019 10:08:23 AM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

----- LINKS -----

**Review your project** results through

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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## **Case Narrative**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-153107-1

Job ID: 310-153107-1

Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative** 

Job Narrative 310-153107-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 4/11/2019 11:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were -0.7° C, -0.3° C, 1.0° C and 1.2° C.

#### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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## **Sample Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-153107-1

Lab Sample ID	Client Sample ID	Matrix	Collected Received
310-153107-1	MW2	Ground Water	04/09/19 11:11 04/11/19 11:30
310-153107-2	MW3	Ground Water	04/09/19 15:47 04/11/19 11:30
310-153107-3	MW4	Ground Water	04/09/19 13:17 04/11/19 11:30
310-153107-4	MW9	Ground Water	04/10/19 10:14 04/11/19 11:30
310-153107-5	DUP1	Ground Water	04/09/19 00:00 04/11/19 11:30
310-153107-6	DUP2	Ground Water	04/09/19 00:00 04/11/19 11:30

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Client Sample ID: MW2 Lab Sample ID: 310-153107-1

Analyte	Result Qualifie	er RL	MDL Unit	Dil Fac D	Method	Prep Type
Sulfate	66.3	5.00	mg/L		9056A	Total/NA
Barium	0.126 F1	0.00200	mg/L	1	6020A	Total/NA
Calcium	111	0.500	mg/L	1	6020A	Total/NA
Molybdenum	0.0803	0.00200	mg/L	1	6020A	Total/NA
Total Dissolved Solids	418	30.0	mg/L	1	SM 2540C	Total/NA

Client Sample ID: MW3 Lab Sample ID: 310-153107-2

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac	D Me	ethod	Prep Type
Chloride	7.96	5.00	mg/L	. 5	90	)56A	Total/NA
Sulfate	427	20.0	mg/L	. 20	90	)56A	Total/NA
Arsenic	0.0143	0.00200	mg/L	. 1	60	20A	Total/NA
Barium	0.0938	0.00200	mg/L	. 1	60	20A	Total/NA
Boron	2.33	0.200	mg/L	. 1	60	20A	Total/NA
Calcium	186	0.500	mg/L	. 1	60	20A	Total/NA
Cobalt	0.00250	0.000500	mg/L	. 1	60	20A	Total/NA
Lithium	0.0271	0.0100	mg/L	. 1	60	20A	Total/NA
Total Dissolved Solids	1040	60.0	mg/L	. 1	SN	M 2540C	Total/NA

Client Sample ID: MW4 Lab Sample ID: 310-153107-3

Analyte	Result Qua	alifier RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.78	5.00		mg/L		_	9056A	Total/NA
Sulfate	231	5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00223	0.00200		mg/L	1		6020A	Total/NA
Barium	0.0652	0.00200		mg/L	1		6020A	Total/NA
Boron	1.28	0.200		mg/L	1		6020A	Total/NA
Calcium	120	0.500		mg/L	1		6020A	Total/NA
Lithium	0.0110	0.0100		mg/L	1		6020A	Total/NA
Molybdenum	0.0269	0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	586	30.0		ma/L	1		SM 2540C	Total/NA

Client Sample ID: MW9 Lab Sample ID: 310-153107-4

Analyte	Result Qu	ualifier RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.34	5.00		mg/L	5	_	9056A	Total/NA
Sulfate	184	5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00681	0.00200		mg/L	1		6020A	Total/NA
Barium	0.153	0.00200		mg/L	1		6020A	Total/NA
Boron	2.59	0.200		mg/L	1		6020A	Total/NA
Calcium	164	0.500		mg/L	1		6020A	Total/NA
Cobalt	0.00559	0.000500		mg/L	1		6020A	Total/NA
Lithium	0.0254	0.0100		mg/L	1		6020A	Total/NA
Molybdenum	0.0196	0.00200		mg/L	1		6020A	Total/NA
Selenium	0.0120	0.00500		mg/L	1		6020A	Total/NA
Total Dissolved Solids	756	30.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: DUP1 Lab Sample ID: 310-153107-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.95		5.00		mg/L	5	_	9056A	Total/NA
Fluoride	0.581		0.500		mg/L	5		9056A	Total/NA
Sulfate	228		5.00		mg/L	5		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

5/6/2019 (Rev. 1)

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## **Detection Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-153107-1

**Client Sample ID: DUP1 (Continued)** 

Lab Sample ID: 310-153107-5

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Arsenic	0.00207	0.00200	mg/L		6020A	Total/NA
Barium	0.0661	0.00200	mg/L	1	6020A	Total/NA
Boron	1.28	0.200	mg/L	1	6020A	Total/NA
Calcium	119	0.500	mg/L	1	6020A	Total/NA
Lithium	0.0108	0.0100	mg/L	1	6020A	Total/NA
Molybdenum	0.0267	0.00200	mg/L	1	6020A	Total/NA
Total Dissolved Solids	644	30.0	mg/L	1	SM 2540C	Total/NA

**Client Sample ID: DUP2** 

Analyte	Result Quali	ifier RL	MDL Unit	Dil Fac	D Method	Prep Type
Chloride	7.76	5.00	mg/L	5	9056A	Total/NA
Sulfate	431	20.0	mg/L	20	9056A	Total/NA
Arsenic	0.0180	0.00200	mg/L	1	6020A	Total/NA
Barium	0.0974	0.00200	mg/L	1	6020A	Total/NA
Boron	2.29	0.200	mg/L	1	6020A	Total/NA
Calcium	186	0.500	mg/L	1	6020A	Total/NA
Cobalt	0.00312	0.000500	mg/L	1	6020A	Total/NA
Lithium	0.0259	0.0100	mg/L	1	6020A	Total/NA
Total Dissolved Solids	972	30.0	mg/L	1	SM 2540C	Total/NA

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Lab Sample ID: 310-153107-1

**Matrix: Ground Water** 

Job ID: 310-153107-1

Date Collected: 04/09/19 11:11 Date Received: 04/11/19 11:30

**Client Sample ID: MW2** 

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			04/16/19 11:16	5
Fluoride	<0.500		0.500		mg/L			04/16/19 11:16	5
Sulfate	66.3		5.00		mg/L			04/16/19 11:16	5
Method: 6020A - Metals	(ICP/MS)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		04/12/19 08:40	04/24/19 23:29	1
Arsenic	<0.00200		0.00200		mg/L		04/12/19 08:40	04/25/19 15:17	1
Barium	0.126	F1	0.00200		mg/L		04/12/19 08:40	04/24/19 23:29	1
Beryllium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/25/19 15:17	1
Boron	<0.200		0.200		mg/L		04/12/19 08:40	04/24/19 23:29	1
Cadmium	< 0.000500		0.000500		mg/L		04/12/19 08:40	04/24/19 23:29	1
Calcium	111		0.500		mg/L		04/12/19 08:40	04/24/19 23:29	1
Chromium	<0.00500		0.00500		mg/L		04/12/19 08:40	04/25/19 15:17	1
Cobalt	<0.000500		0.000500		mg/L		04/12/19 08:40	04/25/19 15:17	1
Lead	<0.000500		0.000500		mg/L		04/12/19 08:40	04/24/19 23:29	1
Lithium	<0.0100		0.0100		mg/L		04/12/19 08:40	04/24/19 23:29	1
Molybdenum	0.0803		0.00200		mg/L		04/12/19 08:40	04/24/19 23:29	1
Selenium	<0.00500		0.00500		mg/L		04/12/19 08:40	04/24/19 23:29	1
Thallium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/24/19 23:29	1
Method: 7470A - Mercury	y (CVAA)								
Analyte	• •	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/12/19 09:48	04/15/19 15:18	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Lab Sample ID: 310-153107-2

**Matrix: Ground Water** 

Job ID: 310-153107-1

Date Collected: 04/09/19 15:47 Date Received: 04/11/19 11:30

**Client Sample ID: MW3** 

Method: 9056A - Anions,	lon Chromatography							
Analyte	Result Qualifier	RL	MDL (	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.96	5.00	i	mg/L			04/16/19 11:31	5
Fluoride	<0.500	0.500	ı	mg/L			04/16/19 11:31	5
Sulfate	427	20.0	ı	mg/L			04/16/19 11:47	20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		04/12/19 08:40	04/24/19 23:46	
Arsenic	0.0143		0.00200		mg/L		04/12/19 08:40	04/25/19 15:27	
Barium	0.0938		0.00200		mg/L		04/12/19 08:40	04/24/19 23:46	•
Beryllium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/25/19 15:27	
Boron	2.33		0.200		mg/L		04/12/19 08:40	04/24/19 23:46	
Cadmium	<0.000500		0.000500		mg/L		04/12/19 08:40	04/24/19 23:46	
Calcium	186		0.500		mg/L		04/12/19 08:40	04/24/19 23:46	
Chromium	<0.00500		0.00500		mg/L		04/12/19 08:40	04/25/19 15:27	
Cobalt	0.00250		0.000500		mg/L		04/12/19 08:40	04/25/19 15:27	
Lead	<0.000500		0.000500		mg/L		04/12/19 08:40	04/24/19 23:46	
Lithium	0.0271		0.0100		mg/L		04/12/19 08:40	04/24/19 23:46	
Molybdenum	<0.00200		0.00200		mg/L		04/12/19 08:40	04/24/19 23:46	•
Selenium	<0.00500		0.00500		mg/L		04/12/19 08:40	04/24/19 23:46	
Thallium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/24/19 23:46	

Method: 7470A - Mercury (CVA	A)						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200	0.000200	mg/L		04/12/19 09:48	04/15/19 15:21	1

General Chemistry Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1040	60.0	mg/L			04/12/19 11:57	1

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Lab Sample ID: 310-153107-3

**Matrix: Ground Water** 

Job ID: 310-153107-1

Matri

MDL Unit

mg/L

Prepared

Date Collected: 04/09/19 13:17 Date Received: 04/11/19 11:30

Analyte

**Total Dissolved Solids** 

**Client Sample ID: MW4** 

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.78		5.00		mg/L			04/16/19 12:03	- 5
Fluoride	<0.500		0.500		mg/L			04/16/19 12:03	5
Sulfate	231		5.00		mg/L			04/16/19 12:03	Ę
Method: 6020A - Meta	ils (ICP/MS)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		04/12/19 08:40	04/24/19 23:49	1
Arsenic	0.00223		0.00200		mg/L		04/12/19 08:40	04/25/19 15:31	1
Barium	0.0652		0.00200		mg/L		04/12/19 08:40	04/24/19 23:49	1
Beryllium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/25/19 15:31	•
Boron	1.28		0.200		mg/L		04/12/19 08:40	04/24/19 23:49	
Cadmium	<0.000500		0.000500		mg/L		04/12/19 08:40	04/24/19 23:49	•
Calcium	120		0.500		mg/L		04/12/19 08:40	04/24/19 23:49	•
Chromium	<0.00500		0.00500		mg/L		04/12/19 08:40	04/25/19 15:31	
Cobalt	<0.000500		0.000500		mg/L		04/12/19 08:40	04/25/19 15:31	
Lead	<0.000500		0.000500		mg/L		04/12/19 08:40	04/24/19 23:49	
Lithium	0.0110		0.0100		mg/L		04/12/19 08:40	04/24/19 23:49	
Molybdenum	0.0269		0.00200		mg/L		04/12/19 08:40	04/24/19 23:49	
Selenium	<0.00500		0.00500		mg/L		04/12/19 08:40	04/24/19 23:49	
Thallium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/24/19 23:49	
Method: 7470A - Merc	cury (CVAA)								
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Mercury	<0.000200		0.000200		mg/L		04/12/19 09:48	04/15/19 15:23	

RL

30.0

Result Qualifier

586

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Dil Fac

Analyzed 04/12/19 11:57

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Lab Sample ID: 310-153107-4

**Matrix: Ground Water** 

Job ID: 310-153107-1

Date Collected: 04/10/19 10:14 Date Received: 04/11/19 11:30

Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW9** 

	Method: 9056A - Anions	s, Ion Chromatography							
	Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Chloride	5.34	5.00		mg/L			04/16/19 13:05	5
	Fluoride	<0.500	0.500		mg/L			04/16/19 13:05	5
	Sulfate	184	5.00		mg/L			04/16/19 13:05	5
Ì									

Analyte	Result	Qualifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100	0.00100		mg/L		04/12/19 08:40	04/25/19 15:34	
Arsenic	0.00681	0.00200		mg/L		04/12/19 08:40	04/25/19 15:34	
Barium	0.153	0.00200		mg/L		04/12/19 08:40	04/24/19 23:53	•
Beryllium	<0.00100	0.00100		mg/L		04/12/19 08:40	04/25/19 15:34	
Boron	2.59	0.200		mg/L		04/12/19 08:40	04/24/19 23:53	
Cadmium	<0.000500	0.000500		mg/L		04/12/19 08:40	04/25/19 15:34	
Calcium	164	0.500		mg/L		04/12/19 08:40	04/24/19 23:53	
Chromium	<0.00500	0.00500		mg/L		04/12/19 08:40	04/25/19 15:34	•
Cobalt	0.00559	0.000500		mg/L		04/12/19 08:40	04/25/19 15:34	•
Lead	<0.000500	0.000500		mg/L		04/12/19 08:40	04/24/19 23:53	
Lithium	0.0254	0.0100		mg/L		04/12/19 08:40	04/24/19 23:53	•
Molybdenum	0.0196	0.00200		mg/L		04/12/19 08:40	04/24/19 23:53	
Selenium	0.0120	0.00500		mg/L		04/12/19 08:40	04/25/19 15:34	
Thallium	< 0.00100	0.00100		mg/L		04/12/19 08:40	04/24/19 23:53	

Analyte	Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
Mercury	<0.000200	0.000200	mg/L	04/12/19 09:48	04/15/19 15:25	1
General Chemistry	Basult Qualifian	DI.	MDI IInit	D. Duamanad	A	Dil Faa

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	756		30.0		mg/L	<del></del>		04/12/19 13:49	1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Lab Sample ID: 310-153107-5

**Matrix: Ground Water** 

Job ID: 310-153107-1

Date Collected: 04/09/19 00:00 Date Received: 04/11/19 11:30

**Client Sample ID: DUP1** 

- Method: 9056A - Anions, Ion Chromatography										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	5.95		5.00		mg/L			04/16/19 13:21	5	
Fluoride	0.581		0.500		ma/l			04/16/19 13:21	5	

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.95	5.00	mg/L			04/16/19 13:21	5
Fluoride	0.581	0.500	mg/L			04/16/19 13:21	5
Sulfate	228	5.00	mg/L			04/16/19 13:21	5

Method: 6020A - Meta Analyte	als (ICP/MS) Result (	Qualifier RL	MDL Uni	<b>+</b> 1	D Prepared	Analyzed	Dil Fa
	<0.00100	0.00100			04/12/19 08:40		Diria
Antimony	<0.00100		mg.	L			
Arsenic	0.00207	0.00200	mg.	Ľ	04/12/19 08:40	04/25/19 15:37	•
Barium	0.0661	0.00200	mg.	Ľ	04/12/19 08:40	04/24/19 23:56	
Beryllium	<0.00100	0.00100	mg	Ľ	04/12/19 08:40	04/25/19 15:37	•
Boron	1.28	0.200	mg.	Ľ	04/12/19 08:40	04/24/19 23:56	•
Cadmium	<0.000500	0.000500	mg.	'L	04/12/19 08:40	04/24/19 23:56	•
Calcium	119	0.500	mg	L	04/12/19 08:40	04/24/19 23:56	
Chromium	<0.00500	0.00500	mg.	'L	04/12/19 08:40	04/25/19 15:37	•
Cobalt	<0.000500	0.000500	mg.	'L	04/12/19 08:40	04/25/19 15:37	•
Lead	<0.000500	0.000500	mg	L	04/12/19 08:40	04/24/19 23:56	
Lithium	0.0108	0.0100	mg.	'L	04/12/19 08:40	04/24/19 23:56	•
Molybdenum	0.0267	0.00200	mg.	'L	04/12/19 08:40	04/24/19 23:56	•
Selenium	<0.00500	0.00500	mg.	L	04/12/19 08:40	04/24/19 23:56	
Thallium	<0.00100	0.00100	mg.	Ľ	04/12/19 08:40	04/24/19 23:56	

Method: 7470A - Mercury (CVA	AA)						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200	0.000200	mg/L		04/12/19 09:48	04/15/19 15:27	1

General Chemistry Analyte	Result	Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	644		30.0	mg/L			04/12/19 11:57	1

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Lab Sample ID: 310-153107-6

Date Collected: 04/09/19 00:00 Date Received: 04/11/19 11:30

**Client Sample ID: DUP2** 

**Matrix: Ground Water** 

Job ID: 310-153107-1

Method: 9056A - Anions, Analyte	_	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.76		5.00		mg/L			04/16/19 13:52	
Fluoride	<0.500		0.500		mg/L			04/16/19 13:52	5
Sulfate	431		20.0		mg/L			04/16/19 18:37	20
Method: 6020A - Metals (I	CP/MS)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		04/12/19 08:40	04/25/19 00:10	1
Arsenic	0.0180		0.00200		mg/L		04/12/19 08:40	04/25/19 15:44	1
Barium	0.0974		0.00200		mg/L		04/12/19 08:40	04/25/19 00:10	1
Beryllium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/25/19 15:44	1
Boron	2.29		0.200		mg/L		04/12/19 08:40	04/25/19 00:10	1
Cadmium	<0.000500		0.000500		mg/L		04/12/19 08:40	04/25/19 00:10	1
Calcium	186		0.500		mg/L		04/12/19 08:40	04/25/19 00:10	1
Chromium	< 0.00500		0.00500		mg/L		04/12/19 08:40	04/25/19 15:44	1
Cobalt	0.00312		0.000500		mg/L		04/12/19 08:40	04/25/19 15:44	1
Lead	<0.000500		0.000500		mg/L		04/12/19 08:40	04/25/19 00:10	1
Lithium	0.0259		0.0100		mg/L		04/12/19 08:40	04/25/19 00:10	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/19 08:40	04/25/19 00:10	1
Selenium	<0.00500		0.00500		mg/L		04/12/19 08:40	04/25/19 00:10	1
Thallium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/25/19 00:10	1
Method: 7470A - Mercury	(CVAA)								
Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/12/19 09:48	04/15/19 15:29	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	972		30.0		mg/L			04/12/19 11:57	1

## **Definitions/Glossary**

Client: Omaha Public Power District Job ID: 310-153107-1 Project/Site: Nebraska City Unit 1

Qualifiers

RPD

TEF

TEQ

Metals Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not
	applicable.
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Toxicity Equivalent Factor (Dioxin) Toxicity Equivalent Quotient (Dioxin)

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-236282/3

**Matrix: Water** 

**Analysis Batch: 236282** 

**Client Sample ID: Method Blank** 

**Prep Type: Total/NA** 

MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Chloride 1.00 mg/L 04/16/19 09:42 <1.00 Fluoride < 0.100 0.100 mg/L 04/16/19 09:42 04/16/19 09:42 Sulfate <1.00 1.00 mg/L

Lab Sample ID: LCS 310-236282/4

**Matrix: Water** 

**Analysis Batch: 236282** 

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

Spike LCS LCS %Rec. Analyte Added Result Qualifier Limits Unit D %Rec Chloride 10.0 9.987 100 90 - 110 mg/L Fluoride 2.00 2.000 mg/L 100 90 - 110 Sulfate 10.0 10.19 mg/L 102 90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-235588/1-A **Client Sample ID: Method Blank** 

**Matrix: Water** 

Analysis Batch: 237143

Prep Type: Total/NA **Prep Batch: 235588** 

Analysis Dalcii. 231 143								Fieb Datcii.	233300
	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		04/12/19 08:40	04/24/19 23:12	1
Barium	<0.00200		0.00200		mg/L		04/12/19 08:40	04/24/19 23:12	1
Beryllium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/24/19 23:12	1
Boron	<0.200		0.200		mg/L		04/12/19 08:40	04/24/19 23:12	1
Cadmium	<0.000500		0.000500		mg/L		04/12/19 08:40	04/24/19 23:12	1
Calcium	<0.500		0.500		mg/L		04/12/19 08:40	04/24/19 23:12	1
Chromium	<0.00500		0.00500		mg/L		04/12/19 08:40	04/24/19 23:12	1
Cobalt	<0.000500		0.000500		mg/L		04/12/19 08:40	04/24/19 23:12	1
Lead	<0.000500		0.000500		mg/L		04/12/19 08:40	04/24/19 23:12	1
Lithium	<0.0100		0.0100		mg/L		04/12/19 08:40	04/24/19 23:12	1
Molybdenum	<0.00200		0.00200		mg/L		04/12/19 08:40	04/24/19 23:12	1
Selenium	<0.00500		0.00500		mg/L		04/12/19 08:40	04/24/19 23:12	1
Thallium	<0.00100		0.00100		mg/L		04/12/19 08:40	04/24/19 23:12	1

Lab Sample ID: MB 310-235588/1-A

**Matrix: Water** 

**Analysis Batch: 237264** 

**Client Sample ID: Method Blank** 

Prep Type: Total/NA

**Prep Batch: 235588** 

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Arsenic <0.00200 0.00200 04/12/19 08:40 04/25/19 15:00 mg/L

MB MB

Lab Sample ID: LCS 310-235588/2-A

**Matrix: Water** 

Analysis Batch: 237143

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Prep Batch: 235588

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Antimony	0.0200	0.01866		mg/L		93	80 - 120	
Barium	0.0400	0.03799		mg/L		95	80 - 120	
Boron	0.880	0.8710		mg/L		99	80 - 120	
Cadmium	0.0200	0.01907		mg/L		95	80 - 120	

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-235588/2-A		Client Sample ID: Lab Control Sample
Matrix: Water		Prep Type: Total/NA
Analysis Batch: 237143		Prep Batch: 235588

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Calcium	2.00	1.967		mg/L		98	80 - 120	
Lead	0.0200	0.01910		mg/L		95	80 - 120	
Lithium	0.100	0.09130		mg/L		91	80 - 120	
Molybdenum	0.0400	0.03644		mg/L		91	80 - 120	
Selenium	0.0400	0.03776		mg/L		94	80 - 120	
Thallium	0.0160	0.01546		mg/L		97	80 - 120	

Lab Sample ID: LCS 310-235588/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 237264** 

**Prep Batch: 235588** LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Arsenic 0.0400 0.04453 mg/L 111 80 - 120 Beryllium 0.0200 0.02033 mg/L 102 80 - 120 Chromium 0.0400 0.04004 mg/L 100 80 - 120 Cobalt 0.0200 0.01976 mg/L 99 80 - 120

Lab Sample ID: 310-153107-1 MS **Client Sample ID: MW2 Matrix: Ground Water** Prep Type: Total/NA

Analysis Batch: 237143	Sample	Sample	Spike	MS	MS				Prep Batch: 235588 %Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Antimony	<0.00100		0.0200	0.02075		mg/L		104	75 - 125
Barium	0.126	F1	0.0400	0.1627		mg/L		91	75 - 125
Boron	<0.200		0.880	1.041		mg/L		102	75 - 125
Cadmium	<0.000500		0.0200	0.02056		mg/L		103	75 <sub>-</sub> 125
Calcium	111		2.00	111.9	4	mg/L		48	75 - 125
Lead	<0.000500		0.0200	0.01969		mg/L		98	75 - 125
Lithium	<0.0100		0.100	0.09942		mg/L		92	75 - 125
Molybdenum	0.0803		0.0400	0.1180		mg/L		94	75 - 125
Selenium	<0.00500		0.0400	0.03994		mg/L		100	75 - 125
Thallium	<0.00100		0.0160	0.01585		mg/L		99	75 - 125

Lab Sample ID: 310-153107-1 MS **Client Sample ID: MW2 Matrix: Ground Water** Prep Type: Total/NA Analysis Batch: 237264 Prep Batch: 235588

Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Unit D %Rec Limits <0.00200 0.0400 75 - 125 Arsenic 0.04478 mg/L 112

Lab Sample ID: 310-1					C	lient Sample I	
Cobalt	<0.000500	0.0200	0.01926	mg/L	95	75 - 125	
Chromium	<0.00500	0.0400	0.03906	mg/L	98	75 - 125	
Beryllium	<0.00100	0.0200	0.02025	mg/L	101	75 - 125	
	*****						

watrix: Ground water									Prep iy	pe: rot	ai/NA
Analysis Batch: 237143									Prep Ba	itch: 23	<b>35588</b>
-	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Antimony	<0.00100		0.0200	0.01960		mg/L		98	75 - 125	6	20
Barium	0.126	F1	0.0400	0.1537	F1	mg/L		69	75 - 125	6	20

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Method: 6020A - Metals (ICP/MS) (Continued)

< 0.00100

Lab Sample ID: 310-15310 Matrix: Ground Water Analysis Batch: 237143	7-1 MSD							С	lient Sam Prep Ty Prep Ba	pe: Tot	al/NA
-	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Boron	<0.200		0.880	1.046		mg/L		102	75 - 125	0	20
Cadmium	<0.000500		0.0200	0.01957		mg/L		98	75 - 125	5	20
Calcium	111		2.00	109.6	4	mg/L		-68	75 - 125	2	20
Lead	<0.000500		0.0200	0.01861		mg/L		93	75 - 125	6	20
Lithium	<0.0100		0.100	0.09911		mg/L		92	75 - 125	0	20
Molybdenum	0.0803		0.0400	0.1122		mg/L		80	75 - 125	5	20
Selenium	<0.00500		0.0400	0.03866		mg/L		97	75 - 125	3	20

0.01499

mg/L

Lab Sample ID: 310-153107-1 MSD **Client Sample ID: MW2 Matrix: Ground Water** Prep Type: Total/NA **Analysis Batch: 237264 Prep Batch: 235588** Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit D %Rec Limits RPD Limit 0.0400 0.04404 75 - 125 2 20 Arsenic < 0.00200 mg/L 110 Beryllium <0.00100 0.0200 0.01959 20 mg/L 98 75 - 125 Chromium < 0.00500 0.0400 0.03865 97 20 mg/L 75 - 125 Cobalt < 0.000500 0.0200 0.01896 mg/L 75 - 125 20

0.0160

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-235611/1-A

**Matrix: Water** 

Thallium

Analysis Batch: 235884

MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 04/12/19 09:48 04/15/19 14:46 Mercury < 0.000200 0.000200 mg/L

Lab Sample ID: LCS 310-235611/2-A

**Matrix: Water** 

Mercury

Analysis Batch: 235884

Analyte

Spike Added 0.00167

LCS LCS Result Qualifier

0.001667

Unit mg/L

%Rec 100

Limits 80 - 120

**Client Sample ID: Method Blank** 

75 - 125

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-235636/1

**Matrix: Water** 

**Analysis Batch: 235636** 

MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Total Dissolved Solids 30.0 04/12/19 11:57 <30.0 mg/L

Lab Sample ID: LCS 310-235636/2

**Matrix: Water** 

**Analysis Batch: 235636** 

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit %Rec Limits **Total Dissolved Solids** 1000 996.0 mg/L 100 90 - 110

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**Client Sample ID: Lab Control Sample** 

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

**Prep Batch: 235611** 

Prep Type: Total/NA **Prep Batch: 235611** 

%Rec.

**Client Sample ID: Method Blank** Prep Type: Total/NA

Prep Type: Total/NA

## **QC Sample Results**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-153107-1

Prep Type: Total/NA

RPD

14

RPD

Limit

Dil Fac

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: 310-153107-B-7 DU

**Matrix: Ground Water** Analysis Batch: 235636

Lab Sample ID: MB 310-235657/1

Sample Sample Result Qualifier

1100

DU DU 960.0

Result Qualifier

Unit mg/L

**Client Sample ID: Method Blank Prep Type: Total/NA** 

Client Sample ID: 310-153107-B-7 DU

MB MB

Result Qualifier <30.0

RL 30.0 **MDL** Unit mg/L Prepared

04/12/19 13:49 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Analyzed

Lab Sample ID: LCS 310-235657/2 **Matrix: Water** 

**Analysis Batch: 235657** 

**Analysis Batch: 235657** 

Analyte

Total Dissolved Solids

**Matrix: Water** 

**Total Dissolved Solids** 

**Total Dissolved Solids** 

Analyte

Spike Added 1000

LCS LCS Result Qualifier 990.0

Unit mg/L

D %Rec 99

Limits 90 - 110

%Rec.

Client: Omaha Public Power District Job ID: 310-153107-1 Project/Site: Nebraska City Unit 1

## HPLC/IC

## **Analysis Batch: 236282**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-153107-1	MW2	Total/NA	Ground Water	9056A	
310-153107-2	MW3	Total/NA	<b>Ground Water</b>	9056A	
310-153107-2	MW3	Total/NA	Ground Water	9056A	
310-153107-3	MW4	Total/NA	Ground Water	9056A	
310-153107-4	MW9	Total/NA	<b>Ground Water</b>	9056A	
310-153107-5	DUP1	Total/NA	Ground Water	9056A	
310-153107-6	DUP2	Total/NA	Ground Water	9056A	
310-153107-6	DUP2	Total/NA	Ground Water	9056A	
MB 310-236282/3	Method Blank	Total/NA	Water	9056A	
LCS 310-236282/4	Lab Control Sample	Total/NA	Water	9056A	

#### **Metals**

## **Prep Batch: 235588**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	latrix Method	
310-153107-1	MW2	Total/NA	Ground Water	3010A	
310-153107-2	MW3	Total/NA	<b>Ground Water</b>	3010A	
310-153107-3	MW4	Total/NA	<b>Ground Water</b>	3010A	
310-153107-4	MW9	Total/NA	Ground Water	3010A	
310-153107-5	DUP1	Total/NA	<b>Ground Water</b>	3010A	
310-153107-6	DUP2	Total/NA	<b>Ground Water</b>	3010A	
MB 310-235588/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-235588/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-153107-1 MS	MW2	Total/NA	<b>Ground Water</b>	3010A	
310-153107-1 MSD	MW2	Total/NA	Ground Water	3010A	

## **Prep Batch: 235611**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-153107-1	MW2	Total/NA	Ground Water	7470A	
310-153107-2	MW3	Total/NA	<b>Ground Water</b>	7470A	
310-153107-3	MW4	Total/NA	<b>Ground Water</b>	7470A	
310-153107-4	MW9	Total/NA	Ground Water	7470A	
310-153107-5	DUP1	Total/NA	<b>Ground Water</b>	7470A	
310-153107-6	DUP2	Total/NA	<b>Ground Water</b>	7470A	
MB 310-235611/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-235611/2-A	Lab Control Sample	Total/NA	Water	7470A	

## Analysis Batch: 235884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-153107-1	MW2	Total/NA	Ground Water	7470A	235611
310-153107-2	MW3	Total/NA	<b>Ground Water</b>	7470A	235611
310-153107-3	MW4	Total/NA	Ground Water	7470A	235611
310-153107-4	MW9	Total/NA	Ground Water	7470A	235611
310-153107-5	DUP1	Total/NA	<b>Ground Water</b>	7470A	235611
310-153107-6	DUP2	Total/NA	<b>Ground Water</b>	7470A	235611
MB 310-235611/1-A	Method Blank	Total/NA	Water	7470A	235611
LCS 310-235611/2-A	Lab Control Sample	Total/NA	Water	7470A	235611

## **Analysis Batch: 237143**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-153107-1	MW2	Total/NA	Ground Water	6020A	235588

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Client: Omaha Public Power District
Project/Site: Nebraska City Unit 1

**Metals (Continued)** 

## **Analysis Batch: 237143 (Continued)**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-153107-2	MW3	Total/NA	Ground Water	6020A	235588
310-153107-3	MW4	Total/NA	<b>Ground Water</b>	6020A	235588
310-153107-4	MW9	Total/NA	Ground Water	6020A	235588
310-153107-5	DUP1	Total/NA	<b>Ground Water</b>	6020A	235588
310-153107-6	DUP2	Total/NA	<b>Ground Water</b>	6020A	235588
MB 310-235588/1-A	Method Blank	Total/NA	Water	6020A	235588
LCS 310-235588/2-A	Lab Control Sample	Total/NA	Water	6020A	235588
310-153107-1 MS	MW2	Total/NA	<b>Ground Water</b>	6020A	235588
310-153107-1 MSD	MW2	Total/NA	Ground Water	6020A	235588

#### **Analysis Batch: 237264**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-153107-1	MW2	Total/NA	Ground Water	6020A	235588
310-153107-2	MW3	Total/NA	<b>Ground Water</b>	6020A	235588
310-153107-3	MW4	Total/NA	Ground Water	6020A	235588
310-153107-4	MW9	Total/NA	Ground Water	6020A	235588
310-153107-5	DUP1	Total/NA	Ground Water	6020A	235588
310-153107-6	DUP2	Total/NA	Ground Water	6020A	235588
MB 310-235588/1-A	Method Blank	Total/NA	Water	6020A	235588
LCS 310-235588/2-A	Lab Control Sample	Total/NA	Water	6020A	235588
310-153107-1 MS	MW2	Total/NA	Ground Water	6020A	235588
310-153107-1 MSD	MW2	Total/NA	Ground Water	6020A	235588

# **General Chemistry**

## Analysis Batch: 235636

/NIA		
/NA Grour	nd Water SM 2540C	
/NA Grour	nd Water SM 2540C	
/NA Grour	nd Water SM 2540C	
/NA Grour	nd Water SM 2540C	
/NA Grour	nd Water SM 2540C	
/NA Water	r SM 2540C	
/NA Water	r SM 2540C	
/NA Groun	nd Water SM 2540C	
	/NA Grour /NA Water /NA Water	/NA Ground Water SM 2540C /NA Water SM 2540C /NA Water SM 2540C

## **Analysis Batch: 235657**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-153107-4	MW9	Total/NA	Ground Water	SM 2540C	<del>-</del>
MB 310-235657/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-235657/2	Lab Control Sample	Total/NA	Water	SM 2540C	

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Job ID: 310-153107-1

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Job ID: 310-153107-1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Lab Sample ID: 310-153107-1

**Matrix: Ground Water** 

Client Sample ID: MW2
Date Collected: 04/09/19 11:11
Date Received: 04/11/19 11:30

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	236282	04/16/19 11:16	MLU	TAL CF
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237143	04/24/19 23:29	SAD	TAL CF
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237264	04/25/19 15:17	SAD	TAL CF
Total/NA	Prep	7470A			235611	04/12/19 09:48	JNR	TAL CF
Total/NA	Analysis	7470A		1	235884	04/15/19 15:18	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	235636	04/12/19 11:57	MDK	TAL CF

Lab Sample ID: 310-153107-2

TAL CF

Matrix: Ground Water

Date Collected: 04/09/19 15:47 Date Received: 04/11/19 11:30

Client Sample ID: MW3

Batch **Batch** Dilution Batch Prepared **Prep Type** Туре Method Run Factor Number or Analyzed Analyst Lab Total/NA Analysis 9056A 5 236282 04/16/19 11:31 MLU TAL CF Total/NA Analysis 9056A 20 236282 04/16/19 11:47 MLU TAL CF Total/NA Prep 3010A 235588 04/12/19 08:40 HED TAL CF Total/NA 6020A 237143 04/24/19 23:46 SAD TAL CF Analysis 1 Total/NA Prep 3010A 235588 04/12/19 08:40 HED TAL CF Total/NA 6020A 237264 04/25/19 15:27 SAD TAL CF Analysis 1 Total/NA Prep 7470A 235611 04/12/19 09:48 JNR TAL CF Total/NA 235884 04/15/19 15:21 JNR TAL CF Analysis 7470A 1

Client Sample ID: MW4

Date Collected: 04/09/19 13:17

Lab Sample ID: 310-153107-3

Matrix: Ground Water

235636 04/12/19 11:57 MDK

Date Received: 04/11/19 11:30

Analysis

SM 2540C

Total/NA

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	236282	04/16/19 12:03	MLU	TAL CF
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237143	04/24/19 23:49	SAD	TAL CF
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237264	04/25/19 15:31	SAD	TAL CF
Total/NA	Prep	7470A			235611	04/12/19 09:48	JNR	TAL CF
Total/NA	Analysis	7470A		1	235884	04/15/19 15:23	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	235636	04/12/19 11:57	MDK	TAL CF

Client Sample ID: MW9

Lab Sample ID: 310-153107-4

Matrix: Ground Water

Date Received: 04/11/19 11:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	236282	04/16/19 13:05	MLU	TAL CF

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Client Sample ID: MW9

Date Collected: 04/10/19 10:14 Date Received: 04/11/19 11:30 Lab Sample ID: 310-153107-4

**Matrix: Ground Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237143	04/24/19 23:53	SAD	TAL CF
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237264	04/25/19 15:34	SAD	TAL CF
Total/NA	Prep	7470A			235611	04/12/19 09:48	JNR	TAL CF
Total/NA	Analysis	7470A		1	235884	04/15/19 15:25	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	235657	04/12/19 13:49	MDK	TAL CF

Client Sample ID: DUP1 Lab Sample ID: 310-153107-5

Date Collected: 04/09/19 00:00 Matrix: Ground Water
Date Received: 04/11/19 11:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A			236282	04/16/19 13:21	MLU	TAL CF
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237143	04/24/19 23:56	SAD	TAL CF
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237264	04/25/19 15:37	SAD	TAL CF
Total/NA	Prep	7470A			235611	04/12/19 09:48	JNR	TAL CF
Total/NA	Analysis	7470A		1	235884	04/15/19 15:27	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	235636	04/12/19 11:57	MDK	TAL CF

Client Sample ID: DUP2

Date Collected: 04/09/19 00:00

Lab Sample ID: 310-153107-6

Matrix: Ground Water

Date Collected: 04/09/19 00:00 Date Received: 04/11/19 11:30

=	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	236282	04/16/19 13:52	MLU	TAL CF
Total/NA	Analysis	9056A		20	236282	04/16/19 18:37	MLU	TAL CF
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237143	04/25/19 00:10	SAD	TAL CF
Total/NA	Prep	3010A			235588	04/12/19 08:40	HED	TAL CF
Total/NA	Analysis	6020A		1	237264	04/25/19 15:44	SAD	TAL CF
Total/NA	Prep	7470A			235611	04/12/19 09:48	JNR	TAL CF
Total/NA	Analysis	7470A		1	235884	04/15/19 15:29	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	235636	04/12/19 11:57	MDK	TAL CF

**Laboratory References:** 

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

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# **Accreditation/Certification Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-153107-1

## **Laboratory: Eurofins TestAmerica, Cedar Falls**

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	IHLAP		101044	11-01-20
Georgia	State Program	4	IA100001 (OR)	09-29-19
Illinois	NELAP	5	200024	11-29-19
lowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-20
Minnesota	NELAP	5	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	1	3349	08-22-19
North Dakota	State Program	8	R-186	09-29-19
Oregon	NELAP	10	IA100001	09-29-19
USDA	Federal		P330-19-00003	01-02-22

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# **Method Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-153107-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

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# Cooler/Sample Receipt and Temperature Log Form

Client Information	
Client: Omaha Public Pow	er District
City/State: Omaha STATE	IE Project: Nebraska City Unit
Receipt Information	
Date/Time Received: DATE 4-11-19	130 Received By: KP
Delivery Type: UPS FedEx	FedEx Ground US Mail Spee-Dee
☐ Lab Courier ☐ TA Field Serv	vices Client Drop-off Other:
Condition of Cooler/Containers	
Sample(s) received in Cooler? Yes	No If yes: Cooler ID:
Multiple Coolers? Yes	No If yes: Cooler # of
Cooler Custody Seals Present? Yes	No If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present? Yes	No If yes: Sample custody seals intact? Yes No
Trip Blank Present?	No If yes: Which VOA samples are in cooler? ↓
Temperature Record	
	Dry ice Other: NONE
Thermometer ID:	Correction Factor (°C):
• Temp Blank Temperature – If no temp blank, or temp bla	ink temperature above criteria, proceed to Sample Container Temperature
Uncorrected Temp (°C): ( . \	Corrected Temp (°C):
Sample Container Temperature	
Container type(s) used:	CONTAINER 2
Uncorrected Temp (°C): TEMP 1 TEMP 2	Corrected Temp (°C): TEMP 1 TEMP 2
Exceptions Noted	
If temperature exceeds criteria, was sample(         a) If yes: Is there evidence that the chilling	
2) If temperature is <0°C, are there obvious sig (e.g., bulging septa, broken/cracked bottles,	ns that the integrity of sample containers is compromised? frozen solid?)
Note: If yes, contact PM before proceeding. If no, pro	ceed with login
Additional Comments	

Document: CF-LG-WI-002

Revision: 24 Date: 03/07/2019 General temperature criteria is 0 to 6°C Bacteria temperature criteria is 0 to 10°C



Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: DDDD		
City/State: CITY DMOMA	STATE	Project: Nebraska CHy Unit 1
Receipt Information	100	1 TODIASHA ON ONLI
Date/Time Received: DATE	TIME 1130	Received By:
Delivery Type: ☐ UPS ☐ FedEx		FedEx Ground US Mail Spee-Dec
Lab Courier TA Fie	eld Services	Client Drop-off Other:
Condition of Cooler/Containers		
Sample(s) received in Cooler? Yes	☐ No	If yes: Cooler ID:
Multiple Coolers?	☐ No	If yes: Cooler # 2 of 4
Cooler Custody Seals Present? Yes	☐ No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present? Yes	₩o	If yes: Sample custody seals intact? Yes No
Trip Blank Present? Yes	No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
Coolant: Wet ice Blue ice	☐ Dry ice	Other: NONE
11		
Thermometer ID: M		Correction Factor (°C): (). ()
	emp blank tem	Correction Factor (°C): (). ()
• Temp Blank Temperature – If no temp blank, or t	emp blank tem	
	emp blank tem	perature above criteria, proceed to Sample Container Temperature
• Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C): – ()	emp blank tem	perature above criteria, proceed to Sample Container Temperature
• Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C): – () ( ) • Sample Container Temperature  Container type(s) used: CONTAINER 1	TEMP 2	Corrected Temp (°C):
• Temp Blank Temperature – if no temp blank, or to Uncorrected Temp (°C): – O — C • Sample Container Temperature  Container type(s) used:  CONTAINER 1		Corrected Temp (°C): 7  CONTAINER 2
• Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C): – () ( ) • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C): TEMP 1	TEMP 2 ample(s) rece	Corrected Temp (°C): CONTAINER 2  Corrected Temp (°C): TEMP 1  Corrected Temp (°C): TEMP 1  TEMP 2  Cived same day of sampling? Yes No
Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C):      Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was same and if yes: Is there evidence that the container type (°C):	TEMP 2 ample(s) rece chilling proce	Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  TEMP 1  TEMP 2  Temp 2  Temp 2  Temp 2  Temp 2  Temp 3  Temp 4  Temp 4  Temp 5  Temp 5  Temp 6  Temp 7  Temp 7  Temp 8  Temp 8  Temp 8  Temp 9  Temp 9  Temp 9  Temp 9  Temp 1  Temp 9  Temp 1  Temp 9  Temp 1  Temp 2
Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C):      Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was satisfy as a lify yes: Is there evidence that the color.	ample(s) rece chilling proce ous signs that ottles, frozer	Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  TEMP 1  TEMP 2  Temp 2  Temp 2  Temp 2  Temp 3  Temp 4  Temp 4  Temp 5  Temp 1  Temp 6  Temp 1  Temp 7  Temp 1  Temp 1  Temp 2  Temp 1  Temp 2  Temp 1  Temp 2  Temp 2
• Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C): — (CONTAINER 1)  • Sample Container Temperature  Container type(s) used: CONTAINER 1  Uncorrected Temp (°C): TEMP 1  Exceptions Noted  1) If temperature exceeds criteria, was same a) If yes: Is there evidence that the container type (°C): (e.g., bulging septa, broken/cracked by the same plane is the container type (°C): (e.g., bulging septa, broken/cracked by the same plane is the same	ample(s) rece chilling proce ous signs that ottles, frozer	Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  TEMP 1  TEMP 2  Temp 2  Temp 2  Temp 2  Temp 3  Temp 4  Temp 4  Temp 5  Temp 1  Temp 6  Temp 1  Temp 7  Temp 1  Temp 1  Temp 2  Temp 1  Temp 2  Temp 1  Temp 2  Temp 2
Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C):      Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was saa) If yes: Is there evidence that the container type (°C):  Container type(s) used:  TEMP 1  If temperature exceeds criteria, was saa) If yes: Is there evidence that the container type (°C):  Note: If yes, contact PM before proceeding. If	ample(s) rece chilling proce ous signs that ottles, frozer	Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  TEMP 1  TEMP 2  Temp 2  Temp 2  Temp 2  Temp 3  Temp 4  Temp 4  Temp 5  Temp 1  Temp 6  Temp 1  Temp 7  Temp 1  Temp 1  Temp 2  Temp 1  Temp 2  Temp 1  Temp 2  Temp 2
Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C):      Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was saa) If yes: Is there evidence that the container type (°C):  Container type(s) used:  TEMP 1  If temperature exceeds criteria, was saa) If yes: Is there evidence that the container type (°C):  Note: If yes, contact PM before proceeding. If	ample(s) rece chilling proce ous signs that ottles, frozer	Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  TEMP 1  TEMP 2  Temp 2  Temp 2  Temp 2  Temp 3  Temp 4  Temp 4  Temp 5  Temp 1  Temp 6  Temp 1  Temp 7  Temp 1  Temp 1  Temp 2  Temp 1  Temp 2  Temp 1  Temp 2  Temp 2

Document: CF-LG-WI-002

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1/

Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: () PPD		
City/State: City/State:	STATE	Project: Nebraska Caty Unit 1
Receipt Information		100010.7203 Will Ollin
Date/Time Received: DATE	TIME 1120	Received By:
Delivery Type: ☐ UPS ☐ FedEx		FedEx Ground US Mail Spee-Dee
Lab Courier TA Fie	ld Services	Client Drop-off Other:
Condition of Cooler/Containers		
Sample(s) received in Cooler? Yes	☐ No	If yes: Cooler ID:
Multiple Coolers?	☐ No	If yes: Cooler # 3 of 4
Cooler Custody Seals Present? Yes	☐ No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present? Yes	<b>⋈</b> No	If yes: Sample custody seals intact? Yes No
Trip Blank Present?	No	If yes: Which VOA samples are in cooler? ↓
Temperature Record  Coolant: Wet ice Blue ice	☐ Dry ice	Other: NONE
	Diyicc	NONE
Thermometer ID: \ \		
Thermometer ID: \( \sum_{\text{or temp Blank Temperature}} \)		Correction Factor (°C): - D . \
1-1		Correction Factor (°C): - O . \ perature above criteria, proceed to Sample Container Temperature
• Temp Blank Temperature – If no temp blank, or to		Correction Factor (°C): - D . \
• Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C):		Correction Factor (°C): - O . \ perature above criteria, proceed to Sample Container Temperature
Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C):     Sample Container Temperature Container type(s) used:  CONTAINER 1		Correction Factor (°C): - O . \ Decrature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C): \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C):     Sample Container Temperature  Container type(s) used:  CONTAINER 1	emp blank tem	Correction Factor (°C): - O . \ Decrature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C): \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Temp Blank Temperature – If no temp blank, or to Uncorrected Temp (°C):     Sample Container Temperature Container type(s) used:  Uncorrected Temp (°C):  TEMP 1	TEMP 2	Correction Factor (°C):
Temp Blank Temperature — If no temp blank, or to Uncorrected Temp (°C):     Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was same a) If yes: Is there evidence that the container type (°C):    Temp 1	emp blank tem	Correction Factor (°C):
• Temp Blank Temperature — If no temp blank, or to Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sa a) If yes: Is there evidence that the container type (°C):  2) If temperature is <0°C, are there obviously bulging septa, broken/cracked but Note: If yes, contact PM before proceeding. If	remp blank temp remp 2 imple(s) receivilling proceivilling proceivilling broken	Correction Factor (°C):
Temp Blank Temperature — If no temp blank, or to Uncorrected Temp (°C):     Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sa a) If yes: Is there evidence that the county of the container type (°C):  2) If temperature is <0°C, are there obvious (e.g., bulging septa, broken/cracked becomes to the container type (°C):    Temperature   September   Septembe	remp blank temp remp 2 imple(s) receivilling proceivilling proceivilling broken	Correction Factor (°C):
• Temp Blank Temperature — If no temp blank, or to Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sa a) If yes: Is there evidence that the container type (°C):  2) If temperature is <0°C, are there obviously bulging septa, broken/cracked but Note: If yes, contact PM before proceeding. If	emp blank temperature of the second signs that ottles, frozer	Correction Factor (°C):
• Temp Blank Temperature — If no temp blank, or to Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sa a) If yes: Is there evidence that the container type (°C):  2) If temperature is <0°C, are there obviously bulging septa, broken/cracked but Note: If yes, contact PM before proceeding. If	emp blank temperature of the second signs that ottles, frozer	Correction Factor (°C):

Document: CF-LG-WI-002

**TestAmerica** 

THE LEADER IN ENVIRONMENTAL TESTING



Place COC scanning label here

# Cooler/Sample Receipt and Temperature Log Form

Client Information			ALP ON SERVICE
Client: 6 PRD			
City/State: OWAMA	STATE	Project: Nebruska aty Uni	+1
Receipt Information			
Date/Time Received: DATE UNG	TIME 1130	Received By:	
Delivery Type: UPS FedEx	(	FedEx Ground US Mail	Spee-Dee
Lab Courier TA Fie	eld Services	Client Drop-off Other:	
Condition of Cooler/Containers		的数据,但是是自己的数据,但可以为,And Made And	
Sample(s) received in Cooler? Yes	☐ No	If yes: Cooler ID:	
Multiple Coolers?   ✓ Yes	☐ No	If yes: Cooler # 4 of 4	
Cooler Custody Seals Present? Yes	☐ No	If yes: Cooler custody seals intact?	Yes No
Sample Custody Seals Present? Yes	₩ No	If yes: Sample custody seals intact?	Yes No
Trip Blank Present?	□ No	If yes: Which VOA samples are in coole	r? ↓
Temperature Record			
Coolant: Wet ice Blue ice	Dry ice	Other: NOI	NE
Thermometer ID: M		Correction Factor (°C): - O . \	
• Temp Blank Temperature – If no temp blank, or	temp blank temp	perature above criteria, proceed to Sample Contain	ner Temperature
Uncorrected Temp (°C): - D. 2		Corrected Temp (°C): - 0.3	
Sample Container Temperature		<b>的是一种人们的人们的人们的</b>	
Container type(s) used:		CONTAINER 2	
Uncorrected Temp (°C):	TEMP 2	Corrected Temp (°C):	TEMP 2
Exceptions Noted			
If temperature exceeds criteria, was s     a) If yes: Is there evidence that the			□ No □ No
<ol> <li>If temperature is &lt;0°C, are there obvious (e.g., bulging septa, broken/cracked between)</li> </ol>		the integrity of sample containers is comsolid?)	promised?
Note: If yes, contact PM before proceeding. I	f no, proceed wi	th login	
Additional Comments			

Document: CF-LG-WI-002

TestAmerica Cedar Falls

Project   Company   Comp	Phone (319) 277-2401 Fax (319) 277-2425									W 0.0 III	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
The Properties of the Properties   The	Client Information	Kile M. W		эм: es, Shaw	M m			Carrier Tra	cking No(s):	COC No:	
The property of the property	Cilent Contact Kyle Uhing	-		ilt: wn.hayes	@testar	mericain	moo:			Page:	
The Revented (days)	Company: Omaha Public Power District						nalvs	is Reguested		Job #:	
1   1   1   1   1   1   1   1   1   1	Address: 444 South 16th Street Mall	Due Date Requested:			-					Preservation (	
	City. Omaha	TAT Requested (days):			,	_		ejejini		A - HCL B - NaOH C - Zn Acetate	M - Hexane N - None O - AsNaO2
10   10   10   10   10   10   10   10	State, Zip: NE, 68102-2247				(ercur)			S tebine		D - Nitric Acid E - NaHSO4	P - Na204S Q - Na2SO3
Sample Date   Sample Date   Sample	Phone:	#Od#		(0	M A07			eluc		G - Amchlor H - Ascorbic Aci	
	Email: kkuhing@oppd.com	WO#,		(oN		CONTRACTOR		hloride		1-Ice J-DI Water	
	Project Name: Nebraska City Unit 1	Project		10 88	- 22			O ¥9\$0			W - pH 4-5 Z - other (specify)
	Site:	SSOW#:		A) as		Andrea ver		6 pue			
	Sample Identification	Sample		M\SM m101n9				2540C TDS, TSS			Instructions/Note:
High 2004   12-17   GW   X   X   X   X   X   X   X   X   X		X	- m	X	1						
High 26th   15:17   GW   X   X   X   X   X   X   X   X   X	MW2	19/2019 1	GW		×		×	×			
	MW3	13619	GW	×		×	×	×			
1/10/2019   10/2019   11	MW4	19/2019 1	GW	×		×	×	×			
1/9   20c	MW9	110/2019	GW	×		×	×	×			
U/II   2019   U/II   U/III   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/III   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/III   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/III   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/III   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/III   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/III   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/III   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/III   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/II   U/III	DUP1	Bac/b/h	GW	×		×	×	×			
U  0  30    U  1  0  0  0    U  1  0  0  0    U  1  0  0  0  0    U  1  0  0  0  0    U  1  0  0  0  0    U  1  0  0  0  0  0  0  0  0  0  0  0  0  0	DUP2	1/19/2019	GW	×		×	×	×			
1/10   2014   1/15   GW   X   X   X   X   X   X   X   X   X	МW3D	12019	GW			×					
Honorth   He Hazard Identification   Honorth	MW4D		GW			×					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   A loop	MW9D	=	GW			×					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   A company			-								
inquished by:    Date:   Time:   Method of Shipment:   Date:   Time:   Method of Shipment:   Date/Time:   Dat	96		diological	Sam	ple Disp	bosal (A	fee m	ay be assessed	if samples are	retained longer tha	n 1 month)
Time:   Date:   Time:   Date:   Time:   Method of Shipment:   Date:	Deliverable Requested: I, II, III, IV, Other (specify)										
Company   Configuration   Configuration   Company   Configuration	Empty Kit Relinquished by:							Meth	od of Shipment:		
Date/Time: Company Received by: Date/Time: Company Received by: Date/Time: Da	Lake K. U	Sold			- V		7	)	Date/Time:		154
bals Intact: Custody Seal No.:  A No	4	CI 6110		4	Received to	N.			Date/Time:	113	Company
	als Intact				Cooler Ten	noeratureis	O Cand	Other Remarks:	-		
					2000	lo manada	Canal Canal	Carol volledno.			

Temperature readings:

310-153107

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Client Sample ID	<u>Lab ID</u>	Container Type	Container pH	Preservative Added (mls)	Lot #
MW2	310-153107-A-1	Plastic 250ml - with Nitric Acid	<2		
MW2	310-153107-B-1	Plastic 250ml - w/nitric - dis	<2		
MW2	310-153107-C-1	Plastic 1 liter - Nitric Acid	<2		
MW2	310-153107-D-1	Plastic 1 liter - Nitric Acid	<2		
MW2	310-153107-E-1	Plastic 1 liter - Nitric Acid (diss)	<2		
MW2	310-153107-F-1	Plastic 1 liter - Nitric Acid (diss)	<2		
MW3	310-153107-A-2	Plastic 250ml - with Nitric Acid	<2		
MW3	310-153107-B-2	Plastic 250ml - w/nitric - dis	<2		
MW3	310-153107-C-2	Plastic 1 liter - Nitric Acid	<2		
MW3	310-153107-D-2	Plastic 1 liter - Nitric Acid	<2		
MW3	310-153107-E-2	Plastic   liter - Nitric Acid (diss)	<2		
MW3	310-153107-F-2	Plastic I liter - Nitric Acid (diss)	<2		
MW4	310-153107-A-3	Plastic 250ml - with Nitric Acid	<2		
MW4	310-153107-B-3	Plastic 250ml - w/nitric - dis	<2		
MW4	310-153107-E-3	Plastic 1 liter - Nitric Acid (diss)	<2		
MW4	310-153107-F-3	Plastic 1 liter - Nitric Acid (diss)	<2		
MW4	310-153107-G-3	Plastic 1 liter - Nitric Acid	<2		
MW4	310-153107-11-3	Plastic 1 liter - Nitric Acid	<2		
MW9	310-153107-A-4	Plastic 250ml - with Nitric Acid	<2		
MW9	310-153107-B-4	Plastic 250ml - w/nitric - dis	<2		
MW9	310-153107-E-4	Plastic 1 liter - Nitric Acid (diss)	<2		
MW9	310-153107-F-4	Plastic 1 liter - Nitric Acid (diss)	<2		
MW9	310-153107-G-4	Plastic 1 liter - Nitric Acid	<2		
MW9	310-153107-H-4	Plastic 1 liter - Nitric Acid	<2		
DUPI	310-153107-A-5	Plastic 250ml - with Nitric Acid	<2		
DUPI	310-153107-B-5	Plastic 250ml - w/nitric - dis	<2		
DUPI	310-153107-E-5	Plastic 1 liter - Nitric Acid (diss)	<2		
DUPI	310-153107-F-5	Plastic 1 liter - Nitric Acid (diss)	<2		
DUPI	310-153107-G-5	Plastic 1 liter - Nitric Acid	<2		
DUP1	310-153107-H-5	Plastic 1 liter - Nitric Acid	<2		
DUP2	310-153107-A-6	Plastic 250ml - with Nitric Acid	<2		
DUP2	310-153107-B-6	Plastic 250ml - w/nitric - dis	<2		
DUP2	310-153107-E-6	Plastic 1 liter - Nitric Acid (diss)	<2		
DUP2	310-153107-F-6	Plastic 1 liter - Nitric Acid (diss)	<2		
OUP2	310-153107-G-6	Plastic 1 liter - Nitric Acid	<2		
DUP2	310-153107-H-6	Plastic 1 liter - Nitric Acid	<2		
4W3D	310-153107-A-7	Plastic 250ml - with Nitric Acid	<2		
Page 1 of 2					

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot#
MW3D	310-153107-C-7	Plastic 1 liter - Nitric Acid	<2		
MW3D	310-153107-D-7	Plastic 1 liter - Nitric Acid	<2		
MW4D	310-153107-A-8	Plastic 250ml - with Nitric Acid	<2		
MW4D	310-153107-C-8	Plastic 1 liter - Nitric Acid	<2		
MW4D	310-153107-D-8	Plastic 1 liter - Nitric Acid	<2		
MW9D	310-153107-A-9	Plastic 250ml - with Nitric Acid	<2		
MW9D	310-153107-C-9	Plastic I liter - Nitric Acid	<2		
MW9D	310-153107-D-9	Plastic 1 liter - Nitric Acid	<2		

Client: Omaha Public Power District

Job Number: 310-153107-1

Login Number: 153107 List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Spoerre, Autumn R

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# **Environment Testing TestAmerica**

# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls 704 Enterprise Drive Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-152964-1

Client Project/Site: Nebraska City Unit 1

Revision: 2

#### For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 5/6/2019 9:55:23 AM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

----- LINKS -----

**Review your project** results through

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

# **Table of Contents**

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#### **Case Narrative**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152964-1

Job ID: 310-152964-1

Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative** 

Job Narrative 310-152964-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 4/10/2019 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was  $0.8^{\circ}$  C.

#### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# **Sample Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152964-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-152964-1	MW14	Ground Water	04/08/19 11:58	04/10/19 09:10
310-152964-2	MW11	Ground Water	04/08/19 18:10	04/10/19 09:10

4

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# **Detection Summary**

RL

5.00

5.00

0.00200

0.00200

0.200

0.500

0.0100

150

**MDL** Unit

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

Result Qualifier

8.46

43.2

0.0368

0.309

0.296

0.00391

0.0557

156

840

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Client Sample ID: MW14

Analyte

Chloride

Sulfate

Arsenic

Barium

Boron

Calcium

Cobalt

Lithium

**Total Dissolved Solids** 

Job ID: 310-152964-1

**Prep Type** 

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Dil Fac D Method

9056A

9056A

6020A

6020A

6020A

6020A

6020A

6020A

SM 2540C

5

5

1

1

1

1

Lab Sample ID: 310-152964-1	

#### Client Sample ID: MW11 Lab Sample ID: 310-152964-2

0.000500

Analyte	Result Qua	alifier RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	14.3	5.00		mg/L	5	_	9056A	Total/NA
Sulfate	126	5.00		mg/L	5		9056A	Total/NA
Barium	0.162	0.00200		mg/L	1		6020A	Total/NA
Boron	0.698	0.200		mg/L	1		6020A	Total/NA
Calcium	91.3	0.500		mg/L	1		6020A	Total/NA
Lead	0.000519	0.000500		mg/L	1		6020A	Total/NA
Lithium	0.0162	0.0100		mg/L	1		6020A	Total/NA
Molybdenum	0.00609	0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	470	30.0		mg/L	1		SM 2540C	Total/NA

# **Client Sample Results**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Lab Sample ID: 310-152964-1

Job ID: 310-152964-1

Date Collected: 04/08/19 11:58 Date Received: 04/10/19 09:10

Client Sample ID: MW14

Matrix:	Ground	Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.46		5.00		mg/L			04/10/19 22:35	5
Fluoride	<0.500		0.500		mg/L			04/10/19 22:35	5
Sulfate	43.2		5.00		mg/L			04/10/19 22:35	5
Method: 6020A - Metals (I	CP/MS)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		04/11/19 08:00	04/18/19 21:20	1
Arsenic	0.0368		0.00200		mg/L		04/11/19 08:00	04/18/19 21:20	1
Barium	0.309		0.00200		mg/L		04/11/19 08:00	04/18/19 21:20	1
Beryllium	<0.00100		0.00100		mg/L		04/11/19 08:00	04/18/19 21:20	1
Boron	0.296		0.200		mg/L		04/11/19 08:00	04/22/19 12:13	1
Cadmium	< 0.000500		0.000500		mg/L		04/11/19 08:00	04/18/19 21:20	1
Calcium	156		0.500		mg/L		04/11/19 08:00	04/18/19 21:20	1
Chromium	< 0.00500		0.00500		mg/L		04/11/19 08:00	04/18/19 21:20	1
Cobalt	0.00391		0.000500		mg/L		04/11/19 08:00	04/18/19 21:20	1
Lead	<0.000500		0.000500		mg/L		04/11/19 08:00	04/18/19 21:20	1
Lithium	0.0557		0.0100		mg/L		04/11/19 08:00	04/18/19 21:20	1
Molybdenum	<0.00200		0.00200		mg/L		04/11/19 08:00	04/19/19 23:36	1
Selenium	<0.00500		0.00500		mg/L		04/11/19 08:00	04/18/19 21:20	1
Thallium	<0.00100		0.00100		mg/L		04/11/19 08:00	04/18/19 21:20	1
Method: 7470A - Mercury	(CVAA)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/12/19 09:34	04/15/19 14:21	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	840		150		mg/L			04/10/19 14:38	1

# **Client Sample Results**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Lab Sample ID: 310-152964-2

**Matrix: Ground Water** 

Job ID: 310-152964-1

Date Collected: 04/08/19 18:10 Date Received: 04/10/19 09:10

**Client Sample ID: MW11** 

Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
14.3	5.00		mg/L			04/10/19 22:51	5
<0.500	0.500		mg/L			04/10/19 22:51	5
126	5.00		mg/L			04/10/19 22:51	5
P/MS)							
	14.3 <0.500	Result   Qualifier   RL	Result   Qualifier   RL   MDL	Result   Qualifier   RL   MDL   Unit   mg/L	Result   Qualifier   RL   MDL   Unit   D	Result   Qualifier   RL   MDL   Unit   D   Prepared	Result 14.3         Qualifier         RL 5.00         MDL mg/L mg/L mg/L         D Prepared 04/10/19 22:51         Analyzed 04/10/19 22:51           <0.500

Method: 6020A - Meta Analyte	Result Qu	ualifier RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100	0.00100	mg/L		04/11/19 08:00	04/18/19 21:23	
Arsenic	<0.00200	0.00200	mg/L		04/11/19 08:00	04/18/19 21:23	
Barium	0.162	0.00200	mg/L		04/11/19 08:00	04/18/19 21:23	
Beryllium	<0.00100	0.00100	mg/L		04/11/19 08:00	04/18/19 21:23	
Boron	0.698	0.200	mg/L		04/11/19 08:00	04/22/19 12:26	
Cadmium	<0.000500	0.000500	mg/L		04/11/19 08:00	04/18/19 21:23	
Calcium	91.3	0.500	mg/L		04/11/19 08:00	04/18/19 21:23	
Chromium	<0.00500	0.00500	mg/L		04/11/19 08:00	04/18/19 21:23	
Cobalt	<0.000500	0.000500	mg/L		04/11/19 08:00	04/18/19 21:23	
Lead	0.000519	0.000500	mg/L		04/11/19 08:00	04/18/19 21:23	1
Lithium	0.0162	0.0100	mg/L		04/11/19 08:00	04/18/19 21:23	•
Molybdenum	0.00609	0.00200	mg/L		04/11/19 08:00	04/19/19 23:39	•
Selenium	<0.00500	0.00500	mg/L		04/11/19 08:00	04/18/19 21:23	1
Thallium	<0.00100	0.00100	mg/L		04/11/19 08:00	04/18/19 21:23	

I hallium	<0.00100	0.00100		mg/L		04/11/19 08:00	04/18/19 21:23	1
Method: 7470A - Mercury (CVA	•				_			
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200	0.000200		mg/L		04/12/19 09:34	04/15/19 14:23	1
General Chemistry								

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	470	30.0	mg/L			04/10/19 14:38	1

5/6/2019 (Rev. 2)

## **Definitions/Glossary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1

Job ID: 310-152964-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

Limit of Detection (Dep/DOE)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radi

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Job ID: 310-152964-1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-235649/3

**Matrix: Water** 

Analysis Batch: 235649

**Client Sample ID: Method Blank** Prep Type: Total/NA

MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Chloride 1.00 mg/L 04/10/19 15:44 <1.00 Fluoride 0.100 04/10/19 15:44 < 0.100 mg/L 04/10/19 15:44 Sulfate <1.00 1.00 mg/L

Lab Sample ID: LCS 310-235649/4 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 235649

		LCS LCS			%Rec.
Analyte A	dded R	Result Qualifier	Unit D	%Rec	Limits
Chloride	7.50	7.261	mg/L	97	90 - 110
Fluoride	1.50	1.472	mg/L	98	90 - 110
Sulfate	7.50	7.490	mg/L	100	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-235364/1-A Client Sample ID: Method Blank

**Matrix: Water** 

Analysis Batch: 236162

Prep Type: Total/NA **Prep Batch: 235364** 

	MB	MB						•	
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		04/11/19 08:00	04/17/19 13:18	1
Arsenic	<0.00200		0.00200		mg/L		04/11/19 08:00	04/17/19 13:18	1
Barium	<0.00200		0.00200		mg/L		04/11/19 08:00	04/17/19 13:18	1
Beryllium	<0.00100		0.00100		mg/L		04/11/19 08:00	04/17/19 13:18	1
Cadmium	<0.000500		0.000500		mg/L		04/11/19 08:00	04/17/19 13:18	1
Calcium	<0.500		0.500		mg/L		04/11/19 08:00	04/17/19 13:18	1
Chromium	<0.00500		0.00500		mg/L		04/11/19 08:00	04/17/19 13:18	1
Cobalt	<0.000500		0.000500		mg/L		04/11/19 08:00	04/17/19 13:18	1
Lead	<0.000500		0.000500		mg/L		04/11/19 08:00	04/17/19 13:18	1
Lithium	<0.0100		0.0100		mg/L		04/11/19 08:00	04/17/19 13:18	1
Molybdenum	<0.00200		0.00200		mg/L		04/11/19 08:00	04/17/19 13:18	1
Selenium	<0.00500		0.00500		mg/L		04/11/19 08:00	04/17/19 13:18	1
Thallium	<0.00100		0.00100		mg/L		04/11/19 08:00	04/17/19 13:18	1

Lab Sample ID: MB 310-235364/1-A Client Sample ID: Method Blank Prep Type: Total/NA

**Matrix: Water** 

Analysis Batch: 236351 **Prep Batch: 235364** MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Boron <0.200 0.200 mg/L 04/11/19 08:00 04/18/19 12:03

Lab Sample ID: LCS 310-235364/2-A

**Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 236162** Prep Batch: 235364

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Antimony	0.0200	0.01900		mg/L		95	80 - 120	
Arsenic	0.0400	0.04362		mg/L		109	80 - 120	
Barium	0.0400	0.03867		mg/L		97	80 - 120	
Beryllium	0.0200	0.01913		mg/L		96	80 - 120	

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Job ID: 310-152964-1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-235364/2-A	Client Sample ID: Lab Control Sample
Matrix: Water	Prep Type: Total/NA

**Analysis Batch: 236162** Spike LCS LCS

Prep Batch: 235364 %Rec.

Analyte	Added	Result Qualifier	Unit	D %Rec	Limits
Cadmium	0.0200	0.01848	mg/L	92	80 - 120
Calcium	2.00	1.956	mg/L	98	80 - 120
Chromium	0.0400	0.03703	mg/L	93	80 - 120
Cobalt	0.0200	0.01821	mg/L	91	80 - 120
Lead	0.0200	0.01891	mg/L	95	80 - 120
Lithium	0.100	0.09724	mg/L	97	80 - 120
Molybdenum	0.0400	0.03562	mg/L	89	80 - 120
Selenium	0.0400	0.03884	mg/L	97	80 - 120
Thallium	0.0160	0.01474	mg/L	92	80 - 120

Lab Sample ID: LCS 310-235364/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 237088** Prep Batch: 235364 Spike LCS LCS %Rec. Added Result Qualifier Limits Analyte Unit %Rec Boron 0.880 0.8462 mg/L 96 80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-235608/1-A Client Sample ID: Method Blank

**Matrix: Water** 

Analysis Batch: 235884

Prep Batch: 235608 MB MB Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac 04/12/19 09:34 04/15/19 13:42 Mercury <0.000200 0.000200 mg/L

Lab Sample ID: LCS 310-235608/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 235884** Prep Batch: 235608 Spike LCS LCS %Rec.

%Rec **Analyte** Added Result Qualifier Unit Limits Mercury 0.00167 0.001628 mg/L 80 - 120

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-235365/1 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 235365

MB MB Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Total Dissolved Solids 30.0 04/10/19 14:38 <30.0 mg/L

Lab Sample ID: LCS 310-235365/2 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 235365** 

Spike LCS LCS %Rec. Analyte Added Result Qualifier Limits Unit %Rec **Total Dissolved Solids** 1000 998.0 mg/L 100 90 - 110

Eurofins TestAmerica, Cedar Falls

Prep Type: Total/NA

# **QC Association Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-152964-1

## HPLC/IC

## Analysis Batch: 235649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152964-1	MW14	Total/NA	Ground Water	9056A	
310-152964-2	MW11	Total/NA	Ground Water	9056A	
MB 310-235649/3	Method Blank	Total/NA	Water	9056A	
LCS 310-235649/4	Lab Control Sample	Total/NA	Water	9056A	

#### **Metals**

#### **Prep Batch: 235364**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method Prep Batch
310-152964-1	MW14	Total/NA	Ground Water	3010A
310-152964-2	MW11	Total/NA	<b>Ground Water</b>	3010A
MB 310-235364/1-A	Method Blank	Total/NA	Water	3010A
LCS 310-235364/2-A	Lab Control Sample	Total/NA	Water	3010A

#### **Prep Batch: 235608**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152964-1	MW14	Total/NA	Ground Water	7470A	
310-152964-2	MW11	Total/NA	<b>Ground Water</b>	7470A	
MB 310-235608/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-235608/2-A	Lab Control Sample	Total/NA	Water	7470A	

#### Analysis Batch: 235884

	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
	310-152964-1	MW14	Total/NA	Ground Water	7470A	235608
	310-152964-2	MW11	Total/NA	<b>Ground Water</b>	7470A	235608
	MB 310-235608/1-A	Method Blank	Total/NA	Water	7470A	235608
L	LCS 310-235608/2-A	Lab Control Sample	Total/NA	Water	7470A	235608

#### **Analysis Batch: 236162**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-235364/1-A	Method Blank	Total/NA	Water	6020A	235364
LCS 310-235364/2-A	Lab Control Sample	Total/NA	Water	6020A	235364

## **Analysis Batch: 236351**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-235364/1-A	Method Blank	Total/NA	Water	6020A	235364

## **Analysis Batch: 236393**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152964-1	MW14	Total/NA	Ground Water	6020A	235364
310-152964-2	MW11	Total/NA	Ground Water	6020A	235364

## **Analysis Batch: 236650**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152964-1	MW14	Total/NA	Ground Water	6020A	235364
310-152964-2	MW11	Total/NA	Ground Water	6020A	235364

## **Analysis Batch: 236725**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152964-1	MW14	Total/NA	Ground Water	6020A	235364
310-152964-2	MW11	Total/NA	<b>Ground Water</b>	6020A	235364

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# **QC Association Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152964-1

## Metals

## **Analysis Batch: 237088**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-235364/2-A	Lab Control Sample	Total/NA	Water	6020A	235364

# **General Chemistry**

## Analysis Batch: 235365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152964-1	MW14	Total/NA	Ground Water	SM 2540C	
310-152964-2	MW11	Total/NA	Ground Water	SM 2540C	
MB 310-235365/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-235365/2	Lab Control Sample	Total/NA	Water	SM 2540C	

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Client Sample ID: MW14

Date Collected: 04/08/19 11:58

Lab Sample ID: 310-152964-1

Matrix: Ground Water

Date Received: 04/10/19 09:10

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	235649	04/10/19 22:35	MLU	TAL CF
Total/NA	Prep	3010A			235364	04/11/19 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	236393	04/18/19 21:20	SAD	TAL CF
Total/NA	Prep	3010A			235364	04/11/19 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	236650	04/19/19 23:36	SAD	TAL CF
Total/NA	Prep	3010A			235364	04/11/19 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	236725	04/22/19 12:13	SAD	TAL CF
Total/NA	Prep	7470A			235608	04/12/19 09:34	JNR	TAL CF
Total/NA	Analysis	7470A		1	235884	04/15/19 14:21	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	235365	04/10/19 14:38	MDK	TAL CF

Client Sample ID: MW11

Date Collected: 04/08/19 18:10

Lab Sample ID: 310-152964-2

Matrix: Ground Water

Date Received: 04/10/19 09:10

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	235649	04/10/19 22:51	MLU	TAL CF
Total/NA	Prep	3010A			235364	04/11/19 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	236393	04/18/19 21:23	SAD	TAL CF
Total/NA	Prep	3010A			235364	04/11/19 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	236650	04/19/19 23:39	SAD	TAL CF
Total/NA	Prep	3010A			235364	04/11/19 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	236725	04/22/19 12:26	SAD	TAL CF
Total/NA	Prep	7470A			235608	04/12/19 09:34	JNR	TAL CF
Total/NA	Analysis	7470A		1	235884	04/15/19 14:23	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	235365	04/10/19 14:38	MDK	TAL CF

**Laboratory References:** 

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

Eurofins TestAmerica, Cedar Falls

# **Accreditation/Certification Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152964-1

## **Laboratory: Eurofins TestAmerica, Cedar Falls**

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	IHLAP		101044	11-01-20
Georgia	State Program	4	IA100001 (OR)	09-29-19
Illinois	NELAP	5	200024	11-29-19
lowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-20
Minnesota	NELAP	5	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	1	3349	08-22-19
North Dakota	State Program	8	R-186	09-29-19
Oregon	NELAP	10	IA100001	09-29-19
USDA	Federal		P330-19-00003	01-02-22

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# **Method Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152964-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

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# Cooler/Sample Receipt and Temperature Log Form

client: OMaha Public Power	District
City/State: CITY Omaha STATE	Project: Nebrasia City Unit 1
Receipt Information	
Date/Time Received: DATE 4-10-19 TIME 910	Received By: KP
Delivery Type: UPS FedEx	FedEx Ground US Mail Spee-Dee
☐ Lab Courier ☐ TA Field Services	Client Drop-off Other:
Condition of Cooler/Containers	
Sample(s) received in Cooler? Yes No	If yes: Cooler ID:
Multiple Coolers? Yes No	If yes: Cooler # of
Cooler Custody Seals Present? Yes No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present? Yes No	If yes: Sample custody seals intact? Yes No
Trip Blank Present? Yes No	If yes: Which VOA samples are in cooler? ↓
Temperature Record	
Coolant: Wet ice Blue ice Dry ice	Other: NONE
Thermometer ID:	Correction Factor (°C):
	perature above criteria, proceed to Sample Container Temperature
Uncorrected Temp (°C):	Corrected Temp (°C):
Uncorrected Temp (°C):  • Sample Container Temperature  CONTAINER 1	Corrected Temp (°C): 68
Uncorrected Temp (°C):	Corrected Temp (°C):
Uncorrected Temp (°C):  • Sample Container Temperature  CONTAINER 1	Corrected Temp (°C): 68
Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  CONTAINER 1  TEMP 1  TEMP 2	Corrected Temp (°C): 6 8
Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  TEMP 1  TEMP 2	Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes  No
Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) recease a) If yes: Is there evidence that the chilling process.	Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes  No ss began?  Yes  No the integrity of sample containers is compromised?
Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) recease a) If yes: Is there evidence that the chilling proce	Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling? Yes No ss began?  Yes No the integrity of sample containers is compromised? solid?)  Yes No
Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) recease a) If yes: Is there evidence that the chilling process.  2) If temperature is <0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles, frozer	Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes No  ss began?  Yes No  the integrity of sample containers is compromised? solid?)  Yes No
Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) recease a) If yes: Is there evidence that the chilling process.  2) If temperature is <0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles, frozer Note: If yes, contact PM before proceeding. If no, proceed with the process of the proceeding of the proceeding of the proceeding of the proceeding of the proceed with the process of the proceeding of the	Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes No  ss began?  Yes No  the integrity of sample containers is compromised? solid?)  Yes No
Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) recease a) If yes: Is there evidence that the chilling process.  2) If temperature is <0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles, frozer Note: If yes, contact PM before proceeding. If no, proceed with the process of the proceeding of the proceeding of the proceeding of the proceeding of the proceed with the process of the proceeding of the	Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes No  ss began?  Yes No  the integrity of sample containers is compromised? solid?)  Yes No

Document: CF-LG-WI-002

TestAmerica Cedar Falls FestAmerica Omaha SC 704 Enterprise Drive Cedar Falls Code Enterprise Of the Code Enterpri

Phone (319) 277-2401 Fax (319) 277-2425										ŀ					
Client Information	Sampler			Lab Pi Haye	Lab PM: Hayes, Shawn M	M M				Car	Carrier Tracking No(s)	No(s):		COC No:	
Client Contact: Kyle Uhing	Phone:			E-Mail: shawr	.hayes	@test	america	E-Mail: shawn.hayes@testamericainc.com	8					Page:	
Company: Omaha Public Power District								Ana	Analysis Requested	edne	sted			Job #:	
Address: 444 South 16th Street Mall	Due Date Requested:	ted:			100	-				$\vdash$				Preservation Codes	
City.	TAT Requested (days):	lays):			11.5		etellu	ćino.						A - HCL B - NaOH C - Zn Acetate	M - Hexane N - None O - AsNaO2
State, Zlp: NE, 68102-2247						ercury		1eM A0		-				D - Nitric Acid E - NaHSO4	
Phone:	# OA				-	M A07		747 br		-				G - Amchior	
Email: kkuhina@oppd.com	WO#.														
Project name: Nebraska City Unit 1	TestAmerica Project #: 31007558	ot #:								_					W - pH 4-5 Z - other (sp
Site:	**************************************													ot con	
Sample Identification	Sample Date	Sample	Sample Type (C=comp,	Matrix (W=water, S=solid, O=wasteioll, BT=Tiessa A=AF)	Field Filtered S	Total 9315_Ra22	2540C TDS, TSS	Dissolved GCR I	munimulA					Total Number of	Special Instructions/Note:
	X	X	7 (0)	1	X	1-	z	+-	+	$\vdash$					
NC2MW4	P1/2/2019	10.45		GW	×	V	×	\ \	×	$\vdash$				See attached list	d list.
MW14				GW	×	×	×	×	×					See attached list	d list.
MW11	4/18/3914	18,10		GW	×	×	×	×	×					See attached list	J list.
	-									++++					
Possible Hazard Identification  Non-Hazard Flammable Skin Irritant Deliverable Requested: I, II, III, IV, Other (specify)	Poison B Unk	Unknown 🔲 F	Radiological		San	nple Di ☐Retu	le Disposal (A t Return To Client	I (A fe	e may b	e asse □ Disp	assessed if san Disposal By Lab	amples ab	are ret	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)  Return To Client Disposal By Lab Archive For Mon	Months Months
Empty Kit Relinquished by:	E d	Date:		П	Time:		4			П	Method o	Method of Shipment:		K	
Relinquished by: Relinquished by Relinquished by	Date/Time: 1/4	9 16	0000	Company Company	4	Received by:	d by.	T X	7		1	Date/Time:	7   2	000 6	Company Company
Custody Seals Intact: Custody Seal No.:				A	Ť	Cooler Te	Cooler Temperature(s)	rre(s) c	C and Other Remarks:	Remark	30		-		

# Login Container Summary Report

310-152964

Temperature readings: \_\_\_\_\_

Client Sample ID	<u>Lab ID</u>	Container Type	Container pH	Added (mls)	Lot #
MW14	310-152964-A-1	Plastic 250ml - w/nitric - dis	<2		
MW14	310-152964-B-1	Plastic 250ml - with Nitric Acid	<2		
MW14	310-152964-D-1	Plastic 1 liter - Nitric Acid (diss)	<2		
MW14	310-152964-E-1	Plastic 1 liter - Nitric Acid (diss)	<2		
MW14	310-152964-F-1	Plastic 1 liter - Nitric Acid	<2		
MW14	310-152964-G-1	Plastic 1 liter - Nitric Acid	<2		
MW11	310-152964-A-2	Plastic 250ml - w/nitric - dis	<2		
MW11	310-152964-B-2	Plastic 250ml - with Nitric Acid	<2	***************************************	
MW11	310-152964-D-2	Plastic 1 liter - Nitric Acid (diss)	<2		
MWII	310-152964-E-2	Plastic 1 liter - Nitric Acid (diss)	<2		
MWII	310-152964-F-2	Plastic 1 liter - Nitric Acid	<2	-	
MWII	310-152964-G-2	Plastic 1 liter - Nitric Acid	<2		

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Client: Omaha Public Power District

Job Number: 310-152964-1

Login Number: 152964 List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Homolar, Dana J

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# **Environment Testing TestAmerica**

# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls 704 Enterprise Drive Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-152964-2

Client Project/Site: Nebraska City Unit 1

#### For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 5/30/2019 12:27:25 PM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

----- LINKS -----

**Review your project** results through Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

# **Table of Contents**

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#### **Case Narrative**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152964-2

Job ID: 310-152964-2

Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative** 

Job Narrative 310-152964-2

#### Comments

No additional comments.

#### Receipt

The samples were received on 4/10/2019 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.8° C.

#### **RAD**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Field Service / Mobile Lab

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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### **Sample Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152964-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset II
310-152964-1	MW14	Ground Water	04/08/19 11:58	04/10/19 09:10	
310-152964-2	MW11	Ground Water	04/08/19 18:10	04/10/19 09:10	

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Job ID: 310-152964-2

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

**Client Sample ID: MW14** Lab Sample ID: 310-152964-1

Date Collected: 04/08/19 11:58 **Matrix: Ground Water** 

Date Received: 04/10/19 09:10

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.342		0.111	0.116	1.00	0.0950	pCi/L	04/29/19 11:42	05/21/19 21:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.7		40 - 110					04/29/19 11:42	05/21/19 21:40	1

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.401		0.103	0.109	1.00	0.0655	pCi/L	04/30/19 14:23	05/28/19 07:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					04/30/19 14:23	05/28/19 07:22	

Method: 9320 - Rad	ium-228 (GFF	PC)								
	•	•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.774		0.299	0.308	1.00	0.421	pCi/L	04/29/19 13:58	05/14/19 08:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.7		40 - 110					04/29/19 13:58	05/14/19 08:55	1
Y Carrier	88.6		40 - 110					04/29/19 13:58	05/14/19 08:55	1

Method: 9320 - Ra	dium-228 (GFF	C) - Dissol	ved							
	•	•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.632		0.242	0.249	1.00	0.337	pCi/L	04/30/19 15:01	05/16/19 08:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					04/30/19 15:01	05/16/19 08:39	1
Y Carrier	90.5		40 - 110					04/30/19 15:01	05/16/19 08:39	1

Method: Ra226_Ra22	8 (D) - Com	bined Radi	ium-226 and F	Radium-228	- Dissolv	/ed				
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.03		0.263	0.272	5.00	0.337	pCi/L		05/30/19 09:05	1

Method: Ra226_Ra22	28 - Combine	ed Radium-	226 and Rad	ium-228						
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	1.12		0.319	0.329	5.00	0.421	pCi/L	_	05/22/19 09:03	1

2

Job ID: 310-152964-2

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

**Client Sample ID: MW11** 

Lab Sample ID: 310-152964-2

Matrix: Ground Water

Date Collected: 04/08/19 18:10 Date Received: 04/10/19 09:10

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.117	· · · · · · · · · · · · · · · · · · ·	0.0687	0.0695	1.00	0.0772	pCi/L	04/29/19 11:42	05/21/19 21:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.0		40 - 110					04/29/19 11:42	05/21/19 21:40	1

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0711	U	0.0588	0.0592	1.00	0.0816	pCi/L	04/30/19 14:23	05/28/19 07:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.2	-	40 - 110					04/30/19 14:23	05/28/19 07:22	1

	dium-228 (GFF	PC)								
	•	•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.576		0.293	0.298	1.00	0.441	pCi/L	04/29/19 13:58	05/14/19 08:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.0		40 - 110					04/29/19 13:58	05/14/19 08:55	1
Y Carrier	92.7		40 - 110					04/29/19 13:58	05/14/19 08:55	1

Method: 9320 - Ra	dium-228 (GFF	PC) - Dissol	ved							
	-		Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.157	U	0.201	0.201	1.00	0.333	pCi/L	04/30/19 15:01	05/16/19 08:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.2		40 - 110					04/30/19 15:01	05/16/19 08:39	1
Y Carrier	90.8		40 - 110					04/30/19 15:01	05/16/19 08:39	1

	8 (D) - Com	bined Rad	lium-226 and	Radium-22	8 - Dissolv	/ed					
			Count	Total							
			Uncert.	Uncert.							
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	P	repared	Analyzed	Dil Fac
Radium 226 and 228	0.228	U	0.209	0.210	5.00	0.333	pCi/L			05/30/19 09:05	1

Method: Ra226_Ra22	28 - Combine	ed Radium-	226 and Rad	ium-228						
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	0.693		0.301	0.306	5.00	0.441	pCi/L		05/22/19 09:03	1
226 + 228										

### **Definitions/Glossary**

Client: Omaha Public Power District

Job ID: 310-152964-2

Project/Site: Nebraska City Unit 1

#### **Qualifiers**

	-
_	_

DL

Qualifier Qualifier Description

U Result is less than the sample detection limit.

### **Glossary**

Abbreviation	These commonly used abbreviations may or may not be present in this report.						
n	Listed under the "D" column to designate that the result is reported on a dry weight basis						
%R	Percent Recovery						
CFL	Contains Free Liquid						
CNF	Contains No Free Liquid						
DER	Duplicate Error Ratio (normalized absolute difference)						
Dil Fac	Dilution Factor						

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample DLC Decision Level Concentration (Radiochemistry)

Detection Limit (DoD/DOE)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

Eurofins TestAmerica, Cedar Falls

5/30/2019

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-152964-2

### Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-426052/23-A

**Matrix: Water** 

Analysis Batch: 429273

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 426052

	MB	MB	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03084	U	0.0466	0.0467	1.00	0.0806	pCi/L	04/29/19 11:42	05/21/19 21:41	1

Total

Count

MB MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac 04/29/19 11:42 05/21/19 21:41 Ba Carrier 102 40 - 110

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 160-426052/1-A **Matrix: Water** 

**Matrix: Water** 

Analysis Batch: 429225

Prep Type: Total/NA

**Prep Batch: 426052** 

Total Spike LCS LCS Uncert. %Rec. Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits Radium-226 9.982 1.00 75 - 125 11.4 1.07 0.0952 pCi/L

LCS LCS

Qualifier Carrier %Yield I imits Ba Carrier 97.7 40 - 110

Lab Sample ID: LCSD 160-426052/2-A

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

**Prep Batch: 426052** 

Analysis Batch: 429225 Total

Spike LCSD LCSD

RER Uncert. %Rec. Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits RER Limit Radium-226 1.05 1.00 0.106 pCi/L 86 11 4 9 802 75 - 125 0.09

LCSD LCSD

%Yield Qualifier Carrier Limits Ba Carrier 92.7 40 - 110

Lab Sample ID: MB 160-426264/23-A Client Sample ID: Method Blank

**Matrix: Water** Prep Type: Total/NA Analysis Batch: 429838 **Prep Batch: 426264** Count Total

MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL MDC Unit Prepared Analyzed Dil Fac Radium-226 0.04470 Ū 0.0508 0.0509 1.00 0.0815 pCi/L 04/30/19 14:23 05/28/19 16:12

> MR MR

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac 04/30/19 14:23 Ba Carrier 98.0 40 - 110 05/28/19 16:12

Lab Sample ID: LCS 160-426264/1-A

**Matrix: Water** Prep Type: Total/NA Analysis Batch: 429838 **Prep Batch: 426264** 

Total

LCS LCS %Rec. Spike Uncert. Added Result Qual RL Analyte  $(2\sigma + / -)$ MDC Unit %Rec Limits Radium-226 11.4 9.772 1.02 1.00 0.0841 pCi/L 86 75 - 125

Eurofins TestAmerica, Cedar Falls

Client Sample ID: Lab Control Sample

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-152964-2

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-426264/1-A

Lab Sample ID: LCSD 160-426264/2-A

**Matrix: Water** 

**Matrix: Water** 

Analysis Batch: 429838

Analysis Batch: 429838

LCS LCS

Carrier **%Yield Qualifier** Limits Ba Carrier 40 - 110 949

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

**Prep Batch: 426264** 

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

**Prep Batch: 426264** 

Total

LCSD LCSD RER Spike Uncert. %Rec. Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits RER Limit Radium-226 0.998 1.00 11.4 9.515 0.0865 pCi/L 84 75 - 125 0.13

LCSD LCSD

%Yield Carrier Qualifier Limits Ba Carrier 92.1 40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-426058/23-A

**Matrix: Water** 

Analysis Batch: 428152

Client Sample ID: Method Blank

Prep Type: Total/NA

**Prep Batch: 426058** 

Count Total MB MB Uncert. Uncert. Analyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC Unit Prepared Analyzed Dil Fac Radium-228 0.08499 Ū 0.196 0.196 1.00 0.337 pCi/L 04/29/19 13:58 05/14/19 08:55

> MΒ MB

Qualifier Carrier %Yield Limits Prepared Dil Fac Analyzed Ba Carrier 102 40 - 110 04/29/19 13:58 05/14/19 08:55 Y Carrier 91.6 40 - 110 04/29/19 13:58 05/14/19 08:55

Total

Lab Sample ID: LCS 160-426058/1-A

**Matrix: Water** 

Analysis Batch: 428139

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

**Prep Batch: 426058** 

Spike LCS LCS Uncert. %Rec. Added MDC Unit Analyte RL %Rec Limits Result Qual  $(2\sigma + / -)$ Radium-228 9.21 8.942 1.04 1.00 0.369 pCi/L 97 75 - 125

LCS LCS

Carrier %Yield Qualifier Limits Ba Carrier 97.7 40 - 110 Y Carrier 89.0 40 - 110

Lab Sample ID: LCSD 160-426058/2-A Client Sample ID: Lab Control Sample Dup

**Matrix: Water** 

Analysis Batch: 428139

Prep Type: Total/NA

**Prep Batch: 426058** 

				iotai							
	Spike	LCSD	LCSD	Uncert.					%Rec.		RER
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	RER	Limit
Radium-228	9.21	9.100		1.06	1.00	0.379	pCi/L	99	75 - 125	0.08	1

Eurofins TestAmerica, Cedar Falls

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Prep Type: Total/NA

**Prep Batch: 426058** 

### Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCSD 160-426058/2-A

Lab Sample ID: MB 160-426271/23-A

**Matrix: Water** 

Analysis Batch: 428139

LCSD LCSD

Carrier	%Yield	Qualifier	Limits
Ba Carrier	92.7		40 - 110
Y Carrier	90.1		40 - 110

Client Sample ID: Lab Control Sample Dup

Client Sample ID: Method Blank

**Prep Batch: 426271** 

Prep Type: Total/NA

**Matrix: Water** Prep Type: Total/NA Analysis Batch: 428668

Total Count MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL MDC Unit Prepared Analyzed Dil Fac Radium-228 0.1409 U 0.248 0.249 1.00 0.420 pCi/L 04/30/19 15:01 05/16/19 08:43

MB MB Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 98.0 40 - 110 04/30/19 15:01 05/16/19 08:43 Y Carrier 87.5 40 - 110 04/30/19 15:01 05/16/19 08:43

Lab Sample ID: LCS 160-426271/1-A Client Sample ID: Lab Control Sample

0.998

**Matrix: Water** 

Analyte

Radium-228

Analysis Batch: 428666

Spike

Added

9.20

LCS LCS

Result

8.580

**Prep Batch: 426271** Total %Rec. Uncert.  $(2\sigma + / -)$ RL MDC Unit %Rec Limits

0.343 pCi/L

1.00

LCS LCS Qualifier Carrier %Yield Limits Ba Carrier 94.9 40 - 110 Y Carrier 90.5 40 - 110

Lab Sample ID: LCSD 160-426271/2-A

**Matrix: Water** 

Analysis Batch: 428666

Client Sample ID: Lab Control Sample Dup

75 - 125

93

Prep Type: Total/NA **Prep Batch: 426271** 

Total %Rec. RER

LCSD LCSD Spike Uncert. Analyte Added Result Qual (2σ+/-) RL MDC Unit %Rec Limits RER Limit Radium-228 9.20 8.930 1.03 1.00 0.330 pCi/L 0.17

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 92.1 40 - 110 Y Carrier 90.8 40 - 110

### **QC Association Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1

Job ID: 310-152964-2

Rad

Prep Batch: 426052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method Prep Batcl
310-152964-1	MW14	Total/NA	Ground Water	PrecSep-21
310-152964-2	MW11	Total/NA	Ground Water	PrecSep-21
MB 160-426052/23-A	Method Blank	Total/NA	Water	PrecSep-21
LCS 160-426052/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21
LCSD 160-426052/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21

#### Prep Batch: 426058

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152964-1	MW14	Total/NA	Ground Water	PrecSep_0	
310-152964-2	MW11	Total/NA	<b>Ground Water</b>	PrecSep_0	
MB 160-426058/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-426058/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-426058/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

#### Prep Batch: 426264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152964-1	MW14	Dissolved	Ground Water	PrecSep-21	: -
310-152964-2	MW11	Dissolved	Ground Water	PrecSep-21	
MB 160-426264/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-426264/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-426264/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

#### **Prep Batch: 426271**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152964-1	MW14	Dissolved	Ground Water	PrecSep_0	
310-152964-2	MW11	Dissolved	Ground Water	PrecSep_0	
MB 160-426271/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-426271/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-426271/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

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4.6

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Eurofins TestAmerica, Cedar Falls

#### **Lab Chronicle**

Client: Omaha Public Power District Job ID: 310-152964-2

Project/Site: Nebraska City Unit 1

Date Received: 04/10/19 09:10

**Client Sample ID: MW14** Lab Sample ID: 310-152964-1 Date Collected: 04/08/19 11:58

**Matrix: Ground Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	PrecSep-21			426264	04/30/19 14:23		TAL SL
Dissolved	Analysis	9315		1	429838	05/28/19 07:22	KLS	TAL SL
Total/NA	Prep	PrecSep-21			426052	04/29/19 11:42		TAL SL
Total/NA	Analysis	9315		1	429273	05/21/19 21:40	CDR	TAL SL
Dissolved	Prep	PrecSep_0			426271	04/30/19 15:01		TAL SL
Dissolved	Analysis	9320		1	428666	05/16/19 08:39	KLS	TAL SL
Total/NA	Prep	PrecSep_0			426058	04/29/19 13:58		TAL SL
Total/NA	Analysis	9320		1	428152	05/14/19 08:55	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	429294	05/22/19 09:03	SMP	TAL SL
Dissolved	Analysis	Ra226_Ra228 (D)		1	430223	05/30/19 09:05	SMP	TAL SL

**Client Sample ID: MW11** Date Collected: 04/08/19 18:10 Lab Sample ID: 310-152964-2

**Matrix: Ground Water** 

Date Received: 04/10/19 09:10

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	PrecSep-21			426264	04/30/19 14:23		TAL SL
Dissolved	Analysis	9315		1	429838	05/28/19 07:22	KLS	TAL SL
Total/NA	Prep	PrecSep-21			426052	04/29/19 11:42		TAL SL
Total/NA	Analysis	9315		1	429273	05/21/19 21:40	CDR	TAL SL
Dissolved	Prep	PrecSep_0			426271	04/30/19 15:01		TAL SL
Dissolved	Analysis	9320		1	428666	05/16/19 08:39	KLS	TAL SL
Total/NA	Prep	PrecSep_0			426058	04/29/19 13:58		TAL SL
Total/NA	Analysis	9320		1	428152	05/14/19 08:55	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	429294	05/22/19 09:03	SMP	TAL SL
Dissolved	Analysis	Ra226_Ra228 (D)		1	430223	05/30/19 09:05	SMP	TAL SL

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

### **Accreditation/Certification Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-152964-2

#### Laboratory: Eurofins TestAmerica, Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	IHLAP		101044	11-01-20
Georgia	State Program	4	IA100001 (OR)	09-29-19
Illinois	NELAP	5	200024	11-29-19
lowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-20
Minnesota	NELAP	5	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	1	3349	08-22-19
North Dakota	State Program	8	R-186	09-29-19
Oregon	NELAP	10	IA100001	09-29-19
USDA	Federal		P330-19-00003	01-02-22

#### Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD		L2305	04-06-22
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-19 *
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-19 *
Hawaii	State Program	9	NA	06-30-19
Illinois	NELAP	5	200023	11-30-19
lowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19 *
New York	NELAP	2	11616	03-31-20
North Dakota	State Program	8	R207	06-30-19 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-13	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19 *
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

<sup>\*</sup> Accreditation/Certification renewal pending - accreditation/certification considered valid.

### **Method Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152964-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
Ra226_Ra228 (D)	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### **Protocol References:**

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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# Cooler/Sample Receipt and Temperature Log Form

Client Information	
client: OMaha Public Power	District
City/State: CITY Omaha STATE	Project: Nebrasia City Unit 1
Receipt Information	
Date/Time Received: DATE 4-10-19 TIME 910	Received By: KP
Delivery Type: UPS FedEx	FedEx Ground US Mail Spee-Dee
☐ Lab Courier ☐ TA Field Services	Client Drop-off Other:
Condition of Cooler/Containers	
Sample(s) received in Cooler? Yes No	If yes: Cooler ID:
Multiple Coolers? Yes No	If yes: Cooler # of
Cooler Custody Seals Present? Yes No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present? Yes No	If yes: Sample custody seals intact? Yes No
Trip Blank Present? Yes No	If yes: Which VOA samples are in cooler? ↓
Temperature Record	
Coolant: Wet ice Blue ice Dry ice	Other: NONE
	Other: NONE  Correction Factor (°C):
Coolant: Wet ice Blue ice Dry ice	Correction Factor (°C):
Coolant: Wet ice Blue ice Dry ice Thermometer ID:	Correction Factor (°C):
Coolant:  Wet ice  Blue ice  Dry ice  Thermometer ID:    • Temp Blank Temperature – If no temp blank, or temp blank temp	Correction Factor (°C): +O .\ Derature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):
Coolant:  Wet ice  Blue ice  Dry ice Thermometer ID:    • Temp Blank Temperature – If no temp blank, or temp blank temp Uncorrected Temp (°C):	Correction Factor (°C):
Coolant: Wet ice Blue ice Dry ice Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank temp Uncorrected Temp (°C):  • Sample Container Temperature	Correction Factor (°C): +O .\ Derature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):
Coolant: Wet ice Blue ice Dry ice Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank temp Uncorrected Temp (°C):  • Sample Container Temperature Container type(s) used:	Correction Factor (°C):  Derature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  TEMP 1  TEMP 2
Coolant:  Wet ice  Blue ice  Dry ice  Thermometer ID:   • Temp Blank Temperature – If no temp blank, or temp blank temp  Uncorrected Temp (°C):   • Sample Container Temperature  Container type(s) used:    Uncorrected Temp (°C):    TEMP 1    TEMP 2	Correction Factor (°C):  Derature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes  No
Coolant: Wet ice Blue ice Dry ice  Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank temp  Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  TEMP 1  TEMP 2  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) rece	Correction Factor (°C):  Derature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes  No  ss began?  Yes  No  the integrity of sample containers is compromised?
Coolant:  Wet ice  Blue ice  Dry ice  Thermometer ID:   • Temp Blank Temperature – If no temp blank, or temp blank temp  Uncorrected Temp (°C):   • Sample Container Temperature  Container type(s) used:    Uncorrected Temp (°C):    Exceptions Noted  1) If temperature exceeds criteria, was sample(s) rece  a) If yes: Is there evidence that the chilling proces  2) If temperature is <0°C, are there obvious signs that	Correction Factor (°C):  Derature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes  No  ss began?  The integrity of sample containers is compromised?  solid?)  Yes  No
Coolant: Wet ice Blue ice Dry ice  Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank temp  Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) rece  a) If yes: Is there evidence that the chilling proces  2) If temperature is <0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles, frozen	Correction Factor (°C):  Derature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes  No  ss began?  The integrity of sample containers is compromised?  solid?)  Yes  No
Coolant: Wet ice Blue ice Dry ice  Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank temp  Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) rece  a) If yes: Is there evidence that the chilling proces  2) If temperature is <0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles, frozen  Note: If yes, contact PM before proceeding. If no, proceed with the process of the proceeding of the proceeding of the proceeding of the proceeding.	Correction Factor (°C):  Derature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes  No  ss began?  The integrity of sample containers is compromised?  solid?)  Yes  No
Coolant: Wet ice Blue ice Dry ice  Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank temp  Uncorrected Temp (°C):  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C):  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) rece a) If yes: Is there evidence that the chilling proces  2) If temperature is <0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles, frozen  Note: If yes, contact PM before proceeding. If no, proceed with	Correction Factor (°C):  Derature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C):  TEMP 1  TEMP 2  ived same day of sampling?  Yes  No ss began?  Yes  No the integrity of sample containers is compromised? solid?)  Yes  No

Document: CF-LG-WI-002

Revision: 24 Date: 03/07/2019

TestAmerica Cedar Falls restAmerica Omaha SC 704 Enterprise Drive Cedar Falls 704 Enterprise Drive Cedar Falls, 1A 50613 Phone (319) 277-2401 Fax (319) 277-2425

Client Information   Control Information	0212 12 (010) VI 12 2 12 (010) VI 12 12 12 12 12 12 12 12 12 12 12 12 12					l								
The control of the	Client Information	Sampler		Haye	s, Shaw	N				Carner	acking No(s):		COC No:	
10   10   10   10   10   10   10   10	Client Contact: Kyle Uhing	Phone:		E-Mail shaw	n.hayes	@testa	merical	nc.con	_				Page:	
100	Company: Omaha Public Power District							Analy	Sis Re	dieste			Job #:	
10   10   10   10   10   10   10   10	Address: 444 South 16th Street Mall	Due Date Requested:			100	H		-				F	Preservation Co	
100   100	City:	TAT Requested (days):			413			Licon					A - HCL B - NaOH C - Zn Acetate	
10   10   10   10   10   10   10   10	State, Zip: NE, 68102-2247					eccni		ISM AU					D - Nitric Acid E - NaHSO4	
1000000000000000000000000000000000000	Phone:	PO#			(	M A07		/\$/ PL					G - Amchlor	
Sample Date   Sample Date   Sample Date   Sample Date   Sample   Sample Date   Sample   Sample Date   Sample Date   Sample Date   Sample Date   Sample   Sample Date   S	Email: kkuhing@oppd.com	,#OM			(o)							S		
Sample Date   Martix   Sample   Martix   Sample	Project Name: Nebraska City Unit 1	TestAmerica Project #: 31007558			10 29							iedist	and the same	W - pH 4-5 Z - other (specify)
Sample Date Time Gardon Matrix 15 (***)  Sample Carrier Matrix 15 (*	Site:	SSOW#;			A) as							noo lo	- Day name to	
	Sample Identification	Sam	0	Matrix (W=weter, S=solid, O=weste/oil, BT=Tissue, A=Air)	Perform MS/M:				munimulA			Total Number o		nstructions/Note:
1   1   1   1   1   1   1   1   1   1		/ \		ation Code:	X		-	-				X		
Fig. 26   11.56   12.0   12.	NC2MW4		25	GW		-		-	×				See attached list.	
Ne hazard Identification    HG 300	MW14		8	GW	×				×				See attached list.	
Sample Disposal (A fee may be assessed if samples are retained longer than 1 nr cequested; I. III. IV. Other (specify)  Inquished by:  Date:	MW11		0	GW	×			-	×				See attached list.	
trad Identification  Sample Disposal (A fee may be assessed if samples are retained longer than 1 in a class that the company content inquisition is a content in a content inquisition in														
card Identification       Sample Disposal (A fee may be assessed if samples are retained longer than 1 n         card Identification       Skin Irritant       Date:       Return To Client       Disposal By Lab       Archive For         linquished by:       Date:       Time:       Method of Shipment         Inquished by:       Date:       Time:       Method of Shipment         Inquished by:       Date:       Time:       Date:       Date:         Inquished by:       Date:       Date:       Date:       Date:         Indiangle:       Date:       Date:       Date:       Date:         A No.       A No.       Cooler Temperature(s) C and Other Remarks:       Date:       Date:												##		
Time:   Time	Possible Hazard Identification Non-Hazard Flammable Skin Irritant Deliverable Recursed 1 III III V Other (snecity)	Poison B	☐ Radiologica	,	Sam	ple Dis Retur	posal	A fee	may be	assesse Disposal	if samples By Lab	are retair	ned longer than thive For	1 month) Months
Time:   Time:   Date:   Time:   Date:   Time:   Date:   Time:   Date:   Date	(final de la constant				4	1								
A   A   A   A   A   A   A   A   A   A	Empty Kit Relinquished by:	Date:			- 1	9	<	1	,	Me	hod of Shipmen	ıt		
Received by:  Company Received by:  Cooler Temperature(s) C and Other Remarks:  A No.		Date/Time: 1/9/26/9	00	Odd Company	A	eceived	4	4	57		Date/Tir	-	0000	Company Company
Custody Seal No.:		Date/Time:		Company	œ	eceived	Dy:	~			Date/Li	10	8	Company
				4	0	ooler Te	mperatur	υ I	nd Other	Remarks:				

4/10/2019

# Login Container Summary Report

310-152964

Temperature readings: \_\_\_\_\_

Client Sample ID	<u>Lab ID</u>	Container Type	Container pH	Added (mls)	Lot #
MW14	310-152964-A-1	Plastic 250ml - w/nitric - dis	<2	-	
MW14	310-152964-B-1	Plastic 250ml - with Nitric Acid	<2		-
MW14	310-152964-D-1	Plastic 1 liter - Nitric Acid (diss)	<2		
MW14	310-152964-E-1	Plastic 1 liter - Nitric Acid (diss)	<2		
MW14	310-152964-F-1	Plastic 1 liter - Nitric Acid	<2		
MW14	310-152964-G-1	Plastic 1 liter - Nitric Acid	<2		
MWII	310-152964-A-2	Plastic 250ml - w/nitric - dis	<2		
MW11	310-152964-B-2	Plastic 250ml - with Nitric Acid	<2	-	
MW11	310-152964-D-2	Plastic 1 liter - Nitric Acid (diss)	<2		
MWII	310-152964-E-2	Plastic 1 liter - Nitric Acid (diss)	<2		
MWII	310-152964-F-2	Plastic 1 liter - Nitric Acid	<2		
MWII	310-152964-G-2	Plastic 1 liter - Nitric Acid	<2		

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Client: Omaha Public Power District

Job Number: 310-152964-2

Login Number: 152964

List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1 Creator: Homolar, Dana J

Question Answer Comment Radioactivity wasn't checked or is </= background as measured by a survey N/A The cooler's custody seal, if present, is intact. True N/A Sample custody seals, if present, are intact. The cooler or samples do not appear to have been compromised or True tampered with. True Samples were received on ice. Cooler Temperature is acceptable. True Cooler Temperature is recorded. True COC is present. True COC is filled out in ink and legible. True COC is filled out with all pertinent information. True Is the Field Sampler's name present on COC? True There are no discrepancies between the containers received and the COC. True Samples are received within Holding Time (excluding tests with immediate True HTs) Sample containers have legible labels. True Containers are not broken or leaking. True Sample collection date/times are provided. True Appropriate sample containers are used. True Sample bottles are completely filled. True Sample Preservation Verified. True There is sufficient vol. for all requested analyses, incl. any requested True MS/MSDs Containers requiring zero headspace have no headspace or bubble is True <6mm (1/4"). Multiphasic samples are not present. True

True

N/A

Eurofins TestAmerica, Cedar Falls

Samples do not require splitting or compositing.

Residual Chlorine Checked.

### **Login Sample Receipt Checklist**

Client: Omaha Public Power District Job Number: 310-152964-2

Login Number: 152964 List Source: Eurofins TestAmerica, St. Louis List Number: 2

List Creation: 04/11/19 06:01 PM

Creator: Hellm, Michael

Oreator: Heilin, Michael		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job ID: 310-152964-2

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water Prep Type: Total/NA

_			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
310-152964-1	MW14	90.7	
310-152964-2	MW11	91.0	
Tracer/Carrier Lege	nd		
Ba Carrier = Ba Carr	ier		

Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water Prep Type: Dissolved

			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
310-152964-1	MW14	102	
310-152964-2	MW11	95.2	
Tracer/Carrier Leger	nd		

Method: 9315 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
LCS 160-426052/1-A	Lab Control Sample	97.7	
LCS 160-426264/1-A	Lab Control Sample	94.9	
LCSD 160-426052/2-A	Lab Control Sample Dup	92.7	
LCSD 160-426264/2-A	Lab Control Sample Dup	92.1	
MB 160-426052/23-A	Method Blank	102	
MB 160-426264/23-A	Method Blank	98.0	
Tracer/Carrier Legend			
Ba Carrier = Ba Carrier			<del></del>

Method: 9320 - Radium-228 (GFPC)

Matrix: Ground Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
310-152964-1	MW14	90.7	88.6	
310-152964-2	MW11	91.0	92.7	
Tracer/Carrier Legend				
Ba Carrier = Ba Carrier				
Y Carrier = Y Carrier				

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### **Tracer/Carrier Summary**

Client: Omaha Public Power District Job ID: 310-152964-2

Project/Site: Nebraska City Unit 1

Method: 9320 - Radium-228 (GFPC)

**Matrix: Ground Water Prep Type: Dissolved** 

				Percent Yield (Acceptance Limits)
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
310-152964-1	MW14	102	90.5	
310-152964-2	MW11	95.2	90.8	
Tracer/Carrier Lege	nd			

Ba Carrier = Ba Carrier Y Carrier = Y Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
LCS 160-426058/1-A	Lab Control Sample	97.7	89.0	
LCS 160-426271/1-A	Lab Control Sample	94.9	90.5	
LCSD 160-426058/2-A	Lab Control Sample Dup	92.7	90.1	
LCSD 160-426271/2-A	Lab Control Sample Dup	92.1	90.8	
MB 160-426058/23-A	Method Blank	102	91.6	
MB 160-426271/23-A	Method Blank	98.0	87.5	

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier



# **Environment Testing TestAmerica**

# **ANALYTICAL REPORT**

Eurofins TestAmerica, Cedar Falls 704 Enterprise Drive Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-152983-1

Client Project/Site: Nebraska City Unit 1/Unit 2

Revision: 1

For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 5/6/2019 10:01:01 AM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

..... LINKS .....

Review your project results through

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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### **Case Narrative**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2 Job ID: 310-152983-1

Job ID: 310-152983-1

Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative** 

Job Narrative 310-152983-1

#### Comments

No additional comments.

#### Receipt

The sample was received on 4/10/2019 9:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5° C.

#### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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## **Sample Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2 Job ID: 310-152983-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-152983-1	NC2MW4	Ground Water	04/08/19 10:45	04/10/19 09:10

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### **Detection Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2 Job ID: 310-152983-1

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### Client Sample ID: NC2MW4

### Lab Sample ID: 310-152983-1

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac I	) Method	Prep Type
Sulfate	40.9	5.00	mg/L		9056A	Total/NA
Barium	0.351	0.00200	mg/L	1	6020A	Total/NA
Calcium	137	0.500	mg/L	1	6020A	Total/NA
Lithium	0.0351	0.0100	mg/L	1	6020A	Total/NA
Molybdenum	0.00283	0.00200	mg/L	1	6020A	Total/NA
Total Dissolved Solids	560	30.0	mg/L	1	SM 2540C	Total/NA

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### **Client Sample Results**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2

Lab Sample ID: 310-152983-1

**Matrix: Ground Water** 

Job ID: 310-152983-1

**Client Sample ID: NC2MW4** Date Collected: 04/08/19 10:45 Date Received: 04/10/19 09:10

Method: 9056A - Anions, I Analyte	_	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			04/16/19 10:24	5
Fluoride	<0.500		0.500		mg/L			04/16/19 10:24	5
Sulfate	40.9		5.00		mg/L			04/16/19 10:24	5
Method: 6020A - Metals (I	CP/MS)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		04/11/19 08:03	04/23/19 17:25	1
Arsenic	<0.00200		0.00200		mg/L		04/11/19 08:03	04/23/19 17:25	1
Barium	0.351		0.00200		mg/L		04/11/19 08:03	04/23/19 17:25	1
Beryllium	<0.00100		0.00100		mg/L		04/11/19 08:03	04/23/19 17:25	1
Boron	<0.200		0.200		mg/L		04/11/19 08:03	04/24/19 13:31	1
Cadmium	<0.000500		0.000500		mg/L		04/11/19 08:03	04/23/19 17:25	1
Calcium	137		0.500		mg/L		04/11/19 08:03	04/23/19 17:25	1
Chromium	<0.00500		0.00500		mg/L		04/11/19 08:03	04/23/19 17:25	1
Cobalt	<0.000500		0.000500		mg/L		04/11/19 08:03	04/23/19 17:25	1
Lead	<0.000500		0.000500		mg/L		04/11/19 08:03	04/23/19 17:25	1
Lithium	0.0351		0.0100		mg/L		04/11/19 08:03	04/23/19 17:25	1
Molybdenum	0.00283		0.00200		mg/L		04/11/19 08:03	04/23/19 17:25	1
Selenium	<0.00500		0.00500		mg/L		04/11/19 08:03	04/23/19 17:25	1
Thallium	<0.00100		0.00100		mg/L		04/11/19 08:03	04/23/19 17:25	1
Method: 7470A - Mercury	(CVAA)								
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/12/19 09:48	04/15/19 15:06	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	560		30.0		mg/L			04/10/19 14:38	1

### **Definitions/Glossary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1/Unit 2

Job ID: 310-152983-1

Glossary

ML

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit

NC Not Calculated
ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit
QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

Minimum Level (Dioxin)

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Job ID: 310-152983-1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-236282/3

**Matrix: Water** 

**Analysis Batch: 236282** 

**Client Sample ID: Method Blank** 

**Prep Type: Total/NA** 

	IVID	IVID							
Analyte	Result	Qualifier	RL	MDL U	Jnit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	m	ng/L			04/16/19 09:42	1
Fluoride	<0.100		0.100	m	ng/L			04/16/19 09:42	1
Sulfate	<1.00		1.00	m	ng/L			04/16/19 09:42	1
	Chloride Fluoride	Analyte         Result           Chloride         <1.00	Chloride <1.00 Fluoride <0.100	Analyte         Result Chloride         Qualifier          RL            Fluoride         <1.00	Analyte         Result Chloride         Qualifier          RL NIO         MDL Transport         RL NIO         RL NIO         RL NIO	Analyte         Result Chloride         Qualifier          RL NION         MDL PRIOR INTERPRETATION         Unit MDL PRIOR INTERPRETATION           Fluoride         <0.100	Analyte         Result Chloride         Qualifier Chloride         RL chloride         MDL mg/L         Unit mg/L         D mg/L           Fluoride         <0.100	Analyte         Result Chloride         Qualifier         RL NDL RIVER         MDL mit mg/L mg/L         D mg/L         Prepared           Fluoride         <0.100	Analyte         Result Chloride         Qualifier Chloride         RL NID CHION (NO.10)         MDL

Lab Sample ID: LCS 310-236282/4

**Matrix: Water** 

**Analysis Batch: 236282** 

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

7 <b>,</b> 0.0	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	10.0	9.987		mg/L		100	90 - 110	
Fluoride	2.00	2.000		mg/L		100	90 - 110	
Sulfate	10.0	10.19		mg/L		102	90 - 110	

Lab Sample ID: 310-152983-1 MS

Client Sample ID: NC2MW4 **Matrix: Ground Water** Prep Type: Total/NA Analysis Batch: 236282

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	<5.00		25.0	26.35		mg/L		94	80 - 120	
Fluoride	<0.500		5.00	5.121		mg/L		102	80 - 120	
Sulfate	40.9		25.0	66.68		mg/L		103	80 - 120	

Lab Sample ID: 310-152983-1 MSD

**Matrix: Ground Water** 

**Analysis Batch: 236282** 

	,	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
1	Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
(	Chloride	<5.00		25.0	26.26		mg/L		93	80 - 120	0	15
F	Fluoride	< 0.500		5.00	5.129		mg/L		103	80 - 120	0	15
٤	Sulfate	40.9		25.0	66.63		mg/L		103	80 - 120	0	15

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-235436/1-A

**Matrix: Water** 

Analysis Batch: 236992

**Client Sample ID: Method Blank** Prep Type: Total/NA **Prep Batch: 235436** 

Client Sample ID: NC2MW4

Prep Type: Total/NA

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		04/11/19 08:03	04/23/19 17:18	1
Arsenic	<0.00200		0.00200		mg/L		04/11/19 08:03	04/23/19 17:18	1
Barium	<0.00200		0.00200		mg/L		04/11/19 08:03	04/23/19 17:18	1
Beryllium	<0.00100		0.00100		mg/L		04/11/19 08:03	04/23/19 17:18	1
Cadmium	<0.000500		0.000500		mg/L		04/11/19 08:03	04/23/19 17:18	1
Calcium	<0.500		0.500		mg/L		04/11/19 08:03	04/23/19 17:18	1
Chromium	<0.00500		0.00500		mg/L		04/11/19 08:03	04/23/19 17:18	1
Cobalt	<0.000500		0.000500		mg/L		04/11/19 08:03	04/23/19 17:18	1
Lead	<0.000500		0.000500		mg/L		04/11/19 08:03	04/23/19 17:18	1
Lithium	<0.0100		0.0100		mg/L		04/11/19 08:03	04/23/19 17:18	1
Molybdenum	<0.00200		0.00200		mg/L		04/11/19 08:03	04/23/19 17:18	1
Selenium	<0.00500		0.00500		mg/L		04/11/19 08:03	04/23/19 17:18	1

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5/6/2019 (Rev. 1)

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2 Job ID: 310-152983-1

### Method: 6020A - Metals (ICP/MS) (Continued)

<0.00100

Lab Sample ID: MB 310-235436/1-A

**Matrix: Water** 

Analyte

Thallium

**Analysis Batch: 236992** 

**Client Sample ID: Method Blank** 

Prep Type: Total/NA Prep Batch: 235436

MB MB Result Qualifier RL MDL Unit D Prepared Analyzed

mg/L

Lab Sample ID: MB 310-235436/1-A **Client Sample ID: Method Blank** 

0.00100

**Matrix: Water** 

**Analysis Batch: 237088** 

MR MR

Prep Type: Total/NA

04/11/19 08:03 04/23/19 17:18

Prep Batch: 235436

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Boron <0.200 0.200 mg/L 04/11/19 08:03 04/24/19 13:25

Lab Sample ID: LCS 310-235436/2-A **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

**Matrix: Water** 

**Analysis Batch: 236992** 

**Prep Batch: 235436** LCS LCS %Rec.

Spike Analyte Added Result Qualifier Unit %Rec Limits D **Antimony** 0.0200 0.02005 100 80 - 120 mg/L 0.0400 Arsenic 0.04188 mg/L 105 80 - 120Barium 0.0400 0.04149 mg/L 104 80 - 120Beryllium 0.0200 0.01964 98 80 - 120 mg/L Cadmium 0.0200 0.02115 mg/L 106 80 - 120 Calcium 2.00 2.142 mg/L 107 80 - 120 Chromium 0.0400 0.04108 103 80 - 120 mg/L Cobalt 0.0200 0.02001 mg/L 100 80 - 120Lead 0.0200 0.02074 104 mg/L 80 - 120 Lithium 0.100 0.1042 mg/L 104 80 - 120 Molybdenum 0.0400 0.03924 mg/L 98 80 - 120 Selenium 0.0400 0.04057 mg/L 101 80 - 120 Thallium 0.0160 0.01615 mg/L 101 80 - 120

Lab Sample ID: LCS 310-235436/2-A **Client Sample ID: Lab Control Sample Matrix: Water** 

**Analysis Batch: 237088** 

Prep Type: Total/NA Prep Batch: 235436 %Rec.

Spike LCS LCS Analyte Added Result Qualifier Unit %Rec Limits 0.880 mg/L Boron 0.8324 80 - 120

Lab Sample ID: 310-152983-1 DU Client Sample ID: NC2MW4 **Matrix: Ground Water** Prep Type: Total/NA

Analysis Batch: 236992 Pren Batch: 235436

RP	
171	PD
D Lim	nit
IC 2	20
IC 2	20
.5 2	20
IC 2	20
IC 2	20
09 2	20
IC 2	20
IC 2	20
IC 2	20
05 2	20
N N O N N N N N N N N N N N N N N N N N	PD Lin

Eurofins TestAmerica, Cedar Falls

Dil Fac

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2 Job ID: 310-152983-1

Prep Type: Total/NA

Prep Batch: 235436

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-152983-1 DU Client Sample ID: NC2MW4

**Matrix: Ground Water Analysis Batch: 236992** 

	Sample	Sample	DU	DU				RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D	RPD	Limit
Molybdenum	0.00283		0.002672		mg/L		 6	20
Selenium	<0.00500		<0.00500		mg/L		NC	20
Thallium	<0.00100		<0.00100		mg/L		NC	20

Lab Sample ID: 310-152983-1 DU Client Sample ID: NC2MW4 Prep Type: Total/NA

**Matrix: Ground Water Analysis Batch: 237088** 

Prep Batch: 235436 Sample Sample DU DU RPD Analyte Result Qualifier Result Qualifier Unit RPD Limit D <0.200 Boron <0.200 mg/L NC 20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-235611/1-A **Client Sample ID: Method Blank** Prep Type: Total/NA

**Matrix: Water** 

**Analysis Batch: 235884** 

MR MR

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Mercury < 0.000200 0.000200 mg/L 04/12/19 09:48 04/15/19 14:46

Lab Sample ID: LCS 310-235611/2-A

**Matrix: Water** 

**Analysis Batch: 235884** 

Spike Added Analyte Mercury 0.001667

0.00167

LCS LCS

Result Qualifier Unit mg/L

D %Rec 100 **Prep Batch: 235611** %Rec. Limits

Prep Type: Total/NA

Prep Type: Total/NA

**Prep Batch: 235611** 

80 - 120

**Client Sample ID: Lab Control Sample** 

Client Sample ID: Lab Control Sample

Method: SM 2540C - Solids, Total Dissolved (TDS)

Client Sample ID: Method Blank Lab Sample ID: MB 310-235365/1 **Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 235365** 

MR MR

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Total Dissolved Solids <30.0 30.0 mg/L 04/10/19 14:38

Lab Sample ID: LCS 310-235365/2

**Matrix: Water** 

**Analysis Batch: 235365** 

LCS LCS Spike %Rec. Added Result Qualifier Limits Unit D %Rec 1000 **Total Dissolved Solids** 998.0 mg/L 100 90 - 110

Eurofins TestAmerica, Cedar Falls

### **QC Association Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2 Job ID: 310-152983-1

### HPLC/IC

### **Analysis Batch: 236282**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152983-1	NC2MW4	Total/NA	Ground Water	9056A	
MB 310-236282/3	Method Blank	Total/NA	Water	9056A	
LCS 310-236282/4	Lab Control Sample	Total/NA	Water	9056A	
310-152983-1 MS	NC2MW4	Total/NA	Ground Water	9056A	
310-152983-1 MSD	NC2MW4	Total/NA	Ground Water	9056A	

#### Metals

### **Prep Batch: 235436**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152983-1	NC2MW4	Total/NA	Ground Water	3010A	
MB 310-235436/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-235436/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-152983-1 DU	NC2MW4	Total/NA	Ground Water	3010A	

### **Prep Batch: 235611**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152983-1	NC2MW4	Total/NA	Ground Water	7470A	
MB 310-235611/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-235611/2-A	Lab Control Sample	Total/NA	Water	7470A	

#### **Analysis Batch: 235884**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152983-1	NC2MW4	Total/NA	Ground Water	7470A	235611
MB 310-235611/1-A	Method Blank	Total/NA	Water	7470A	235611
LCS 310-235611/2-A	Lab Control Sample	Total/NA	Water	7470A	235611

### **Analysis Batch: 236992**

Lab Sample ID 310-152983-1	Client Sample ID NC2MW4	Prep Type Total/NA	Matrix Ground Water	Method 6020A	Prep Batch 235436
MB 310-235436/1-A	Method Blank	Total/NA	Water	6020A	235436
LCS 310-235436/2-A	Lab Control Sample	Total/NA	Water	6020A	235436
310-152983-1 DU	NC2MW4	Total/NA	Ground Water	6020A	235436

#### **Analysis Batch: 237088**

<b>Lab Sample ID</b> 310-152983-1	Client Sample ID  NC2MW4	Prep Type Total/NA	Matrix Ground Water	Method 6020A	Prep Batch 235436
MB 310-235436/1-A	Method Blank	Total/NA	Water	6020A	235436
LCS 310-235436/2-A	Lab Control Sample	Total/NA	Water	6020A	235436
310-152983-1 DU	NC2MW4	Total/NA	Ground Water	6020A	235436

### **General Chemistry**

### Analysis Batch: 235365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152983-1	NC2MW4	Total/NA	Ground Water	SM 2540C	
MB 310-235365/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-235365/2	Lab Control Sample	Total/NA	Water	SM 2540C	

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### **Lab Chronicle**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2 Job ID: 310-152983-1

Lab Sample ID: 310-152983-1

**Matrix: Ground Water** 

Client Sample ID: NC2MW4 Date Collected: 04/08/19 10:45 Date Received: 04/10/19 09:10

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	236282	04/16/19 10:24	MLU	TAL CF
Total/NA	Prep	3010A			235436	04/11/19 08:03	HED	TAL CF
Total/NA	Analysis	6020A		1	236992	04/23/19 17:25	SAD	TAL CF
Total/NA	Prep	3010A			235436	04/11/19 08:03	HED	TAL CF
Total/NA	Analysis	6020A		1	237088	04/24/19 13:31	SAD	TAL CF
Total/NA	Prep	7470A			235611	04/12/19 09:48	JNR	TAL CF
Total/NA	Analysis	7470A		1	235884	04/15/19 15:06	JNR	TAL CF
Total/NA	Analysis	SM 2540C		1	235365	04/10/19 14:38	MDK	TAL CF

#### **Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

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### **Accreditation/Certification Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2 Job ID: 310-152983-1

### **Laboratory: Eurofins TestAmerica, Cedar Falls**

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	IHLAP		101044	11-01-20
Georgia	State Program	4	IA100001 (OR)	09-29-19
Illinois	NELAP	5	200024	11-29-19
lowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-20
Minnesota	NELAP	5	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	1	3349	08-22-19
North Dakota	State Program	8	R-186	09-29-19
Oregon	NELAP	10	IA100001	09-29-19
USDA	Federal		P330-19-00003	01-02-22

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### **Method Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1/Unit 2 Job ID: 310-152983-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 704 Enterprise Drive, Cedar Falls, IA 50613, TEL (319)277-2401

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310-152983 Chain of Custody

# Cooler/Sample Receipt and Temperature Log Form

Client: OMaha Public Power  City/State: CITY Maha STATE  Receipt Information  Date/Time Received: DATE   10-19 TIME   10  Delivery Type: UPS   FedEx  Lab Courier TA Field Services  Condition of Cooler/Containers  Sample(s) received in Cooler? Yes No  Multiple Coolers? Yes No  Cooler Custody Seals Present? Yes No  sample Custody Seals Present? Yes No  rip Blank Present? Yes No	Project: Ne braska City unit 2, u  CCR,  Received By:          FedEx Ground
Date/Time Received:  Date/Time	Received By: CCR  Received By: CCR  FedEx Ground US Mail Spee-Dee  Client Drop-off Other:  If yes: Cooler ID:  If yes: Cooler # of  If yes: Cooler custody seals intact? Yes No  If yes: Sample custody seals intact? Yes No
Date/Time Received:  Date/Time	Received By: CCR  Received By: CCR  FedEx Ground US Mail Spee-Dee  Client Drop-off Other:  If yes: Cooler ID:  If yes: Cooler # of  If yes: Cooler custody seals intact? Yes No  If yes: Sample custody seals intact? Yes No
Delivery Type: UPS FedEx  Lab Courier TA Field Services  Condition of Cooler/Containers  Sample(s) received in Cooler? Yes No  Multiple Coolers? Yes No  Cooler Custody Seals Present? Yes No  sample Custody Seals Present? Yes No	Received By: P  FedEx Ground US Mail Spee-Dee Client Drop-off Other:  If yes: Cooler ID:  If yes: Cooler # of  If yes: Cooler custody seals intact? Yes No  If yes: Sample custody seals intact? Yes No
Delivery Type: UPS FedEx  Lab Courier TA Field Services  Condition of Cooler/Containers  Sample(s) received in Cooler? Yes No  Multiple Coolers? Yes No  Cooler Custody Seals Present? Yes No  sample Custody Seals Present? Yes No	Client Drop-off Other:
Condition of Cooler/Containers  Sample(s) received in Cooler? Yes No  Multiple Coolers? Yes No  Cooler Custody Seals Present? Yes No  sample Custody Seals Present? Yes No	If yes: Cooler ID:  If yes: Cooler # of  If yes: Cooler custody seals intact? Yes No  If yes: Sample custody seals intact? Yes No
Aultiple Coolers?  Yes No  No  No  Cooler Custody Seals Present?  Yes No  ample Custody Seals Present?  Yes No	If yes: Cooler ID:  If yes: Cooler # of  If yes: Cooler custody seals intact?  Yes  No  If yes: Sample custody seals intact? Yes  No
Multiple Coolers? Yes No Cooler Custody Seals Present? Yes No ample Custody Seals Present? Yes No	If yes: Cooler # of  If yes: Cooler custody seals intact?  Yes  No  If yes: Sample custody seals intact?  Yes  No
Cooler Custody Seals Present? Yes No	If yes: Cooler custody seals intact? Yes No  If yes: Sample custody seals intact? Yes No
ample Custody Seals Present? Yes No	If yes: Sample custody seals intact? Yes No
rip Blank Present? Yes No	If yes: Which VOA samples are in cooler? ↓
emperature Record  oolant: Wet ice Blue ice Dry ice	☐ Other: NONE
hermometer ID: 5	Correction Factor (°C):
Temp Blank Temperature – If no temp blank, or temp blank temp	perature above criteria, proceed to Sample Container Temperature
ncorrected Temp (°C): 2.4	Corrected Temp (°C): 2 5
Sample Container Temperature  CONTAINER 1	
ontainer type(s) used:	CONTAINER 2
ncorrected Temp (°C):	Corrected Temp (°C): TEMP 1 TEMP 2
cceptions Noted	
If temperature exceeds criteria, was sample(s) receiva) if yes: Is there evidence that the chilling process	
If temperature is <0°C, are there obvious signs that	the integrity of sample containers is compromised?
(e.g., bulging septa, broken/cracked bottles, frozen	solid?) Yes No
Note: If yes, contact PM before proceeding. If no, proceed with iditional Comments	h login
iditional Comments	

Document: CF-LG-Wi-002 Revision: 24 Date: 03/07/2019

carverage requested. I, II, III, IV, Oner (specify)	Special Instructions/QC Requirements:	2C Requirements:	
Empty Kit Relinquished by:	Date:	Method of Shibment:	
Reinquished by: 4	Comogov		
printer u disto	1000 Sec. 174	Date(Time, O A DA S Company	1.
Reinquished by 7	Date/Tipe:	130 0000 6/20	+
	SC 200 000 000 000 0000 0000000000000000	Product DataTime Company	1
G Reinquighed by: \ 0	1	CHICAN 1-10-19 710	
(F	-Consumer - Consumer -	Date/Time: Company	1
Custody Seals Intact: Custody Seal No.:	Captan Temporal	100	
A Yes Δ No	Siamendina aros	Cooker I emperature(s) "C and Other Remarks:	
1)			

Secret  TW Requested (days):  FO #:  WO #:  TO #:  Sample Date   Type   Sample   Company    Sample Date   Type   Type   Type    Sample Date   Type   Type   Type   Type   Type    Sample Date   Type   Type	Client Information	Sampler.			Lab PM Haves	Lab PM: Haves, Shawn M	W un			Carr	Carrier Tracking No(s):	io(s):	COC No:	
Control   Cont	Client Contact: Kyle Uhing	Phone:			E-M	alt:	0	1		T			Page:	
The Project of Control of Contr	Company: Omaha Public Power District						of Contract of Con	TIED I	CCOM	1			Job #:	
MAY Requested (Eary)   MAY Requested (Eary)	Address: 444 South 16th Street Mall 9E/EP1	Due Date Reques	ad:			E	-	E	manysi	enbew s	sted	F	Preservation	Codes:
Sample Date Time Gegraph Intrinse and Sample (Yea or No)    Continue Contin	Gity. Omaha	TAT Requested (d	ays):			_	822a						A - HCL B - NBOH	
Sample Date Time Geograph Intrinse and Sample (Yea or No)    Sample Date   Protection   Protecti	State, Zp: NE, 68102-2247												C - Zn Agetate D - Nitric Acid	
Sample Date  Sample Date  Sample Date  Time  Garpini  Fresh Martin  Protein Martin  Sample Date  Time  Garpini  Fresh Martin  Fr	Phone: 402-636-2515(Tel)	₩O#											F - MeOH F - MeOH G - Amdhior	
Sample Date Time Committee Date Time Date Date Date Date Date Date Date Dat	Email:  kkuhing@oppd.com	#OM				(0)							H - Ascorbic I - Ice	용
Sample Date Sample Matrix Canary Matrix Canary Cana	Project Name: Nebraska City Unit 2 CCR	TestAmerica Project 31007558	**			N TO 8								V - MCAA W - ph 4-5
Sample Date Time of Company Co	Site:	S&OW#:				SD (Ye	_							(description)
Preservation Code: XX	Sample Identification	Sample Date	Sample	Sample Type (C=comp, G=grab)	Matrix (Wwester, Swelld, Owesteloli, STVTosse, Audit)	Field Filtered S Perform MS/MS								
		X	X		tion Code:	X	0	+	+	F	+	+		al Instructions/Note:
The continued	NC2MW4	4612019	11.30	9	GW		×	>	+	I	+	+	Appendix III	
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)    Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   Second   Instructional/OC Requirements:   Method of Shomen:   Method of Shomen:   Time:														
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  Special Instructional/OR Requirements:  Date:  Date: Date:  Date						+					+			
Date:   Date								-			+	+		
Sample Disposal (A fee may be essessed if samples are retained longer than 1 month)    Poison B											+	+		
Semple Disposal (A fee may be assessed if samples are retained longer than 1 month)    Semple Disposal (A fee may be assessed if samples are retained longer than 1 month)   Special Instructions/OC Requirements:   Months														
ant Doison B Unknown Ractiological Special Instructions/OC Requirements:    Date:   Time:   Ti								+			+			
Semple Disposal (A fee may be assessed if samples are retained longer than 1 month)    Poison B	Premit to Harard Infantitionalism	-												
Date: Method of Shipment:  Date/Time: 144 264 0900 Company Received by: Date/Time: Date/Time: Company Received by: Cooler Temperature(s) **C and Other Remarks: Company Company Company Company Company Cooler Temperature(s) **C and Other Remarks: Company Company Company Company Company Cooler Temperature(s) **C and Other Remarks: Company Comp	ant		-	adiological		Samp	Return	osal (A To Client	fee may	Dispost	ed if samp	iles are ret	ained longer than rchive For	1 month) Months
Date/Time: 149/3e/9 0900 Company Received by: Date/Time: Date/Time: Company Received by: Date/Time: Date/Time: Company Received by: Configuration: Company Received by: Configuration: Company Company Received by: Configuration: Configuration: Company Co	Empty Kit Relinquished by					obec	ai instru	ctions/Q(	Requir	J. 200				
Date   Time:   Date   Time:   Company   Pecewagiby:	Reinquished by: 3		Date:				0	0		ŕ	fethod of Ship	ment:		
Custody Seal No.:	1		5		6	8 8	Ad place	4	17		O	1 .1		Commy
Custody Seal No.:	DS I		7		Company	15	Seived by:	COS	75	mage	7)	$\alpha$	0	Company
						S	oler Temp	erature(s)	C and Oth	er Remarks:	1			

**TestAmerica** 

TestAmerica Cedar Falls TestAmerica Omaha SC Chain of Custody Record

704 Enterprise Drive Cedar Falls, IA 50613 Phone (319) 277-2425

# Login Container Summary Report

310-152983

Temperature readings:					
Client Sample ID	<u>Lab ID</u>	Container Type	Container pH	Preservative Added (mls)	Lot #
NC2MW4	310-152983-A-1	Plastic 250ml - w nitric - dis	<2		
NC2MW4	310-152983-B-1	Plastic 250ml - with Nitric Acid	<2	11111	
NC2MW4	310-152983-D-1	Plastic 1 liter - Nitric Acid (diss)	<2		
NC2MW4	310-152983-E-1	Plastic I liter - Nitric Acid (diss)	<2		
NC2MW4	310-152983-F-1	Plastic 1 liter - Nitric Acid	<2		
NC2MW4	310-152983-G-1	Plastic 1 liter - Nitric Acid	<2		

Page 1 of 1

Client: Omaha Public Power District

Job Number: 310-152983-1

Login Number: 152983 List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Bindert, Lindsay A

oroator: Bindort, Emdody A		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <a href="mailto:smaller">66mm (1/4").</a>	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# **Environment Testing TestAmerica**

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls 704 Enterprise Drive Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-152983-2

Client Project/Site: Nebraska City Unit 1

For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 5/30/2019 12:38:49 PM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

----- LINKS -----

**Review your project** results through Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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## **Case Narrative**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152983-2

Job ID: 310-152983-2

Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative** 

Job Narrative 310-152983-2

#### Comments

No additional comments.

#### Receipt

The sample was received on 4/10/2019 9:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was  $2.5^{\circ}$  C.

#### RAD

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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## **Sample Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152983-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-152983-1	NC2MW4	Ground Water	04/08/19 10:45	04/10/19 09:10	

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-152983-2

Client Sample ID: NC2MW4
Date Collected: 04/08/19 10:45
Date Received: 04/10/19 09:10

Lab Sample ID: 310-152983-1

Matrix: Ground Water

Method: 9315 - Rac	dium-226 (GFF	PC)								
mounour sono real	a.a 220 (O	•,	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.211		0.0879	0.0900	1.00	0.0859	pCi/L	04/29/19 11:42	05/21/19 21:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
		-								

Ba Carrier	96.6		40 - 110					04/29/19 11:42	05/21/19 21:41	1
- Method: 9315 - Ra	ndium-226 (GFF	PC) - Dissol	ved							
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.224		0.0904	0.0927	1.00	0.0856	pCi/L	04/30/19 14:23	05/28/19 07:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					04/30/19 14:23	05/28/19 07:22	1

Method: 9320 - Ra	dium-228 (GFF	PC)								
	•	•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.532		0.294	0.298	1.00	0.450	pCi/L	04/29/19 13:58	05/14/19 08:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.6		40 - 110					04/29/19 13:58	05/14/19 08:55	1
Y Carrier	92.7		40 - 110					04/29/19 13:58	05/14/19 08:55	1

ium-228 (GFF	C) - Dissolv	ved							
•	,	Count	Total						
		Uncert.	Uncert.						
Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
0.756		0.233	0.243	1.00	0.294	pCi/L	04/30/19 15:01	05/16/19 08:39	1
%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
100		40 - 110					04/30/19 15:01	05/16/19 08:39	1
89.0		40 - 110					04/30/19 15:01	05/16/19 08:39	1
	Result 0.756	Result Qualifier 0.756  %Yield Qualifier 100	Nesult   Qualifier   (2σ+/-)     0.756   0.233     WYield   Qualifier   Limits     100   40 - 110	Count Uncert. Uncert.	Count   Total   Uncert.   Uncert.	Count Uncert. Uncert.   Uncert.	Count Uncert. Uncert. Uncert.	Count Uncert. Uncert. Uncert.   Vincert.   Vincert.	Count Uncert. Uncert. Uncert.   U

Method: Ra226_Ra22	8 (D) - Com	bined Rad	lium-226 and	Radium-22	8 - Dissolv	/ed				
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepa	red Analyzed	Dil Fac
Radium 226 and 228	0.980		0.250	0.260	5.00	0.294	pCi/L		05/30/19 09:0	5 1

Method: Ra226_Ra22	28 - Combine	ed Radium-	226 and Rad	ium-228						
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	0.743		0.307	0.311	5.00	0.450	pCi/L		05/22/19 09:03	1
226 + 228										

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## **Definitions/Glossary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1

Job ID: 310-152983-2

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#### **Qualifiers**

R	a	d
		u

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

**Glossary** 

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
~	

CFL Contains Free Liquid
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-152983-2

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-426052/23-A

**Matrix: Water** 

Analysis Batch: 429273

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 426052

	МВ	MB	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03084	U	0.0466	0.0467	1.00	0.0806	pCi/L	04/29/19 11:42	05/21/19 21:41	1

Total

Count

MB MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac 05/21/19 21:41 04/29/19 11:42 Ba Carrier 102 40 - 110

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 160-426052/1-A **Matrix: Water** 

Analysis Batch: 429225

Prep Type: Total/NA

**Prep Batch: 426052** 

				iotai						
	Spike	LCS	LCS	Uncert.					%Rec.	
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	
Radium-226	11.4	9.982		1.07	1.00	0.0952	pCi/L	88	75 - 125	

LCS LCS

Qualifier Carrier %Yield Limits Ba Carrier 97.7 40 - 110

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

**Prep Batch: 426052** 

Lab Sample ID: LCSD 160-426052/2-A **Matrix: Water** 

Analysis Batch: 429225

Total RER Spike LCSD LCSD Uncert. %Rec. Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits RER Limit Radium-226 1.05 1.00 0.106 pCi/L 86 11.4 9 802 75 - 125 0.09

LCSD LCSD

%Yield Qualifier Limits Carrier Ba Carrier 92.7 40 - 110

Lab Sample ID: MB 160-426264/23-A Client Sample ID: Method Blank

**Matrix: Water** 

Analysis Batch: 429838

Prep Type: Total/NA

**Prep Batch: 426264** Count Total

MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL MDC Unit Prepared Analyzed Dil Fac Radium-226 0.04470 Ū 0.0508 0.0509 1.00 0.0815 pCi/L 04/30/19 14:23 05/28/19 16:12

> MR MR

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac 04/30/19 14:23 Ba Carrier 98.0 40 - 110 05/28/19 16:12

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 160-426264/1-A

Analysis Batch: 429838

**Matrix: Water** Prep Type: Total/NA **Prep Batch: 426264** 

Total LCS LCS %Rec. Spike Uncert. Added Result Qual RL Analyte  $(2\sigma + / -)$ MDC Unit %Rec Limits Radium-226 11.4 9.772 1.02 1.00 0.0841 pCi/L 86 75 - 125

Eurofins TestAmerica, Cedar Falls

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152983-2

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-426264/1-A

Matrix: Water

Analysis Batch: 429838

LCS LCS

 Carrier
 %Yield
 Qualifier
 Limits

 Ba Carrier
 94.9
 40 - 110

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

Prep Batch: 426264

Lab Sample ID: LCSD 160-426264/2-A

**Matrix: Water** 

Analysis Batch: 429838

**Client Sample ID: Lab Control Sample Dup** 

Prep Type: Total/NA

Prep Batch: 426264

Total

LCSD LCSD RER Spike Uncert. %Rec. Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits RER Limit Radium-226 0.998 1.00 11.4 9.515 0.0865 pCi/L 84 75 - 125 0.13

LCSD LCSD

 Carrier
 %Yield Ba Carrier
 Qualifier 92.1
 Limits 40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-426058/23-A Client Sample ID: Method Blank

Total

Count

Matrix: Water

Analysis Batch: 428152

Prep Type: Total/NA

Prep Type: Total/NA

Prep Batch: 426058

мв мв Uncert. Uncert. Analyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC Unit Prepared Analyzed Dil Fac Radium-228 0.08499 Ū 0.196 0.196 pCi/L 04/29/19 13:58 05/14/19 08:55 1.00 0.337

MB MB

Qualifier Carrier %Yield Limits Prepared Dil Fac Analyzed Ba Carrier 102 40 - 110 04/29/19 13:58 05/14/19 08:55 Y Carrier 91.6 40 - 110 04/29/19 13:58 05/14/19 08:55

Total

Lab Sample ID: LCS 160-426058/1-A

**Matrix: Water** 

Analysis Batch: 428139

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

**Prep Batch: 426058** 

Spike LCS LCS Uncert. %Rec.

Analyte Added RL MDC Unit %Rec Limits Result Qual  $(2\sigma + / -)$ Radium-228 9.21 8.942 1.04 1.00 0.369 pCi/L 97 75 - 125

LCS LCS

 Carrier
 % Yield Page 10 Page 10 Page 11 Page 12 Page 1

Lab Sample ID: LCSD 160-426058/2-A

**Matrix: Water** 

Analysis Batch: 428139

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 426058

Total LCSD LCSD Spike Uncert. %Rec. RER Analyte Added Result Qual (2σ+/-) RL MDC Unit %Rec Limits RER Limit Radium-228 1.00 9.21 9.100 1.06 0.379 pCi/L 99 75 - 125 0.08

Eurofins TestAmerica, Cedar Falls

Page 8 of 20

5/30/2019

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-152983-2

## Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCSD 160-426058/2-A

Lab Sample ID: MB 160-426271/23-A

Lab Sample ID: LCS 160-426271/1-A

**Matrix: Water** 

**Matrix: Water** 

**Matrix: Water** 

Analysis Batch: 428666

Analysis Batch: 428139

Analysis Batch: 428668

LCSD LCSD

Carrier	%Yield	Qualifier	Limits
Ba Carrier	92.7		40 - 110
Y Carrier	90.1		40 - 110

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA **Prep Batch: 426058** 

Client Sample ID: Method Blank

Prep Type: Total/NA

Dil Fac

**Prep Batch: 426271** 

Count Total MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL MDC Unit Prepared Analyzed 04/30/19 15:01 05/16/19 08:43 Radium-228 0.1409 U 0.248 0.249 1.00

мв мв

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	98.0		40 - 110	04/30/19 15:01	05/16/19 08:43	1
Y Carrier	87.5		40 - 110	04/30/19 15:01	05/16/19 08:43	1

0.420 pCi/L

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

**Prep Batch: 426271** 

Prep Type: Total/NA

Total Uncert.

LCS LCS Spike

%Rec. Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits Radium-228 9.20 8.580 1.00 0.998 0.343 pCi/L 93 75 - 125

LCS LCS

Carrier	%Yield	Qualifier	Limits
Ba Carrier	94.9		40 - 110
Y Carrier	90.5		40 - 110

Lab Sample ID: LCSD 160-426271/2-A Client Sample ID: Lab Control Sample Dup

**Matrix: Water** 

Analysis Batch: 428666

**Prep Batch: 426271** Total Spike LCSD LCSD %Rec. RER Uncert.

Analyte Added Result Qual (2σ+/-) RL MDC Unit %Rec Limits RER Limit Radium-228 9.20 8.930 1.03 1.00 0.330 pCi/L 0.17

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 92.1 40 - 110 Y Carrier 90.8 40 - 110

Eurofins TestAmerica, Cedar Falls

## **QC Association Summary**

Client: Omaha Public Power District Job ID: 310-152983-2 Project/Site: Nebraska City Unit 1

#### Rad

Prep Batch: 4260	)52
------------------	-----

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152983-1	NC2MW4	Total/NA	Ground Water	PrecSep-21	
MB 160-426052/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-426052/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-426052/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

#### Prep Batch: 426058

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method Prep Batch
310-152983-1	NC2MW4	Total/NA	Ground Water	PrecSep_0
MB 160-426058/23-A	Method Blank	Total/NA	Water	PrecSep_0
LCS 160-426058/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0
LCSD 160-426058/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0

#### Prep Batch: 426264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method Prep Bat	ch
310-152983-1	NC2MW4	Dissolved	Ground Water	PrecSep-21	_
MB 160-426264/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-426264/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-426264/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

#### Prep Batch: 426271

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-152983-1	NC2MW4	Dissolved	Ground Water	PrecSep_0	
MB 160-426271/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-426271/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-426271/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep 0	

## **Lab Chronicle**

Client: Omaha Public Power District Job ID: 310-152983-2

Project/Site: Nebraska City Unit 1

Client Sample ID: NC2MW4

Date Collected: 04/08/19 10:45
Date Received: 04/10/19 09:10

Lab Sample ID: 310-152983-1

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	PrecSep-21			426264	04/30/19 14:23		TAL SL
Dissolved	Analysis	9315		1	429838	05/28/19 07:22	KLS	TAL SL
Total/NA	Prep	PrecSep-21			426052	04/29/19 11:42		TAL SL
Total/NA	Analysis	9315		1	429273	05/21/19 21:41	CDR	TAL SL
Dissolved	Prep	PrecSep_0			426271	04/30/19 15:01		TAL SL
Dissolved	Analysis	9320		1	428666	05/16/19 08:39	KLS	TAL SL
Total/NA	Prep	PrecSep_0			426058	04/29/19 13:58		TAL SL
Total/NA	Analysis	9320		1	428152	05/14/19 08:55	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	429294	05/22/19 09:03	SMP	TAL SL
Dissolved	Analysis	Ra226_Ra228 (D)		1	430223	05/30/19 09:05	SMP	TAL SL

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-152983-2

#### Laboratory: Eurofins TestAmerica, Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	IHLAP		101044	11-01-20
Georgia	State Program	4	IA100001 (OR)	09-29-19
Illinois	NELAP	5	200024	11-29-19
Iowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-20
Minnesota	NELAP	5	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	1	3349	08-22-19
North Dakota	State Program	8	R-186	09-29-19
Oregon	NELAP	10	IA100001	09-29-19
USDA	Federal		P330-19-00003	01-02-22

#### Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD		L2305	04-06-22
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-19 *
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-19 *
Hawaii	State Program	9	NA	06-30-19
Illinois	NELAP	5	200023	11-30-19
lowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19 *
New York	NELAP	2	11616	03-31-20
North Dakota	State Program	8	R207	06-30-19 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-13	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19 *
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

Eurofins TestAmerica, Cedar Falls

<sup>\*</sup> Accreditation/Certification renewal pending - accreditation/certification considered valid.

## **Method Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 Job ID: 310-152983-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
Ra226_Ra228 (D)	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### **Protocol References:**

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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# Cooler/Sample Receipt and Temperature Log Form

Client Information	return and the second	remperature Log Form
Client: OMaha Pu	ble Dave	or Distance
City/State: CITY OMaha	STATE	er District
Receipt Information	~ ~ ~ ~ ~ ~ ~ ~ ~	Project: Ne braska City unit 7. 4
Date/Time Received: DATE	10-19 TIME 910	Project: Nebraska City Unit Z, CR
Delivery Type: UPS	FedEx	n n
		FedEx Ground US Mail Spee-Dee
Condition of Cooler/Containers	TA Field Service	s Client Drop-off Other:
Sample(s) received in Cooler?		
	Yes No	If yes: Cooler ID:
Multiple Coolers?	Yes No	If yes: Cooler # of
Cooler Custody Seals Present?	Yes No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present?	☐ Yes ☐ No	If yes: Sample custody seals intact? Yes No
Trip Blank Present?	Yes No	If yes: Which VOA samples are in cooler? ↓
		The are in cooler t
	lue ice Dry ic	ce Other: NONE
hermometer ID: 5		Correction Factor (°C):
Temp Blank Temperature – if no temp i	blank, or temp blank ten	nperature above criteria, proceed to Sample Container Temperature
meentected remp ( c).	2.4	Corrected Temp (°C): 2 5
Samuela Cantalana		
Sample Container Temperature	VINER 1	
Sample Container Temperature ontainer type(s) used:  CONTA	AINER 1	CONTAINER 2
ontainer type(s) used:  CONTAINER TEMP 1  CONTAINER TEMP 1	TEMP 2	
Sample Container Temperature ontainer type(s) used: container type(s) used: container type(s) used: container Temperature container type(s) used:	TEMP 2	CONTAINER 2  Corrected Temp (°C): TEMP 1 TEMP 2
container Temperature ontainer type(s) used: container	TEMP 2	CONTAINER 2  Corrected Temp (°C): TEMP 1 TEMP 2  eived same day of sampling? Yes No.
Sample Container Temperature ontainer type(s) used: CONTAINER Incorrected Temp (°C): Container type(s) used: CONTAINER CONTAIN	TEMP 2 a, was sample(s) rece nat the chilling proce	CONTAINER 2  Corrected Temp (°C): TEMP 1 TEMP 2  eived same day of sampling? Yes No ess began? Yes No
Sample Container Temperature ontainer type(s) used:  ncorrected Temp (°C):  KCEPTION Noted  If temperature exceeds criteria a) If yes: Is there evidence the lift temperature is <0°C, are then	TEMP 2  1, was sample(s) recent the chilling proceure obvious signs that	CONTAINER 2  Corrected Temp (°C): TEMP 1 TEMP 2  eived same day of sampling? Yes No ess began? Yes No  t the integrity of sample containers is compromised?
ontainer type(s) used:  container type(s) used	TEMP 2  1, was sample(s) recent the chilling proceure obvious signs that	CONTAINER 2  Corrected Temp (°C): TEMP 1 TEMP 2  eived same day of sampling? Yes No ess began? Yes No  t the integrity of sample containers is compromised?
Sample Container Temperature CONTAINER TYPE(s) used: CONTAINER TYPE(s) used: CONTAINER TYPE(s) used: CONTAINER TYPE(s) used: CONTAINER TYPE(s) CONTAINER CONTA	TEMP 2  1, was sample(s) recent the chilling procent recent recen	CONTAINER 2  Corrected Temp (°C): TEMP 1 TEMP 2  eived same day of sampling? Yes No ess began? Yes No  t the integrity of sample containers is compromised? n solid?) Yes No

TestAmerica-Cedar Falls Page 14 of 20

Document: CF-LG-WI-002 Revision: 24 Date: 03/07/2019

TestAmerica Cedar Falls   eStAmerica Codar Falls   eStAmerica Codar Falls   La 50613 Phone (319) 277-2405	l estAmerica Omana S 268	SC	Chain of Custody Record	tody F	Seco	5							les les	TestAmerica	731
Client Information	Sampler.			Lab PM Havee	PM:	Mun	1			Carrier Tracking No(s)	ng No(s):		COC No:		. [
Client Contact: Kyle Uhing	Phone:			EME	E-Mail:					Т			Page:		- 1
Company: Omaha Public Power District				0	mr.naye	SQUESTS	menca	and.co	E .				Job #:		
Address: 444 South 16th Street Mail	Due Date Reques	:payean			E	-		Ana	ysis k	Analysis Requested	F	F	Preservation Codes	on Codes:	
City. Omaha	TAT Requested (c	ed (days):						Am			_		A - HCL B - NgOH		
State, Zip: NE, 68102-2247	I					Amou		oneM A					C - Zn Aceta D - Nitric Ac	8 n	
Phone:	PO#.					oM A0		/0.L.b.T. I					F-Mach		
Email:  Kuhira@oppd.com	WO#:					_							H - Ascorbic	Acid	
Project Name: Nebrasika City Unit 1	TestAmerica Project #: 31007558													V - MCAA W - pH 4-6 Z - other fenerals	
Side	SSOW#							_					MINISTER OF STREET	(Airpade) saco	
Sample Identification	Sample Date	Sample	Sample Type (C=comp,	Matrix (www. Prests. Orestsiol.	S besettis blef SMISM mnohe	otal 9315_Razzi otal CCR Motale	540C TDS, TSS,	issolved 9315_R	wnujwnj				to redmuM lat		
	$\backslash$	X		Preservation Code:		+-	+-		+	+	+	1		Special instructions/Note:	
NCSMW4	4/8/2019	10:45		GW	×	1~	×	×	×		+	1	See attached list.	d Hst.	T
MW14	1/8/309	1.58		WĐ	×	×	+	+	+-	+	+	1	See attached list.	d Rst.	T
MAV11	1/6/301	18,10		GW	×	×	×	×	-		t	1	See attached list.	d list.	T
	-							$\vdash$							TT
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						-		-							T
						+		+				1	1		
								H	H			$\Box$			_
Possible Hazard Identification  Non-Hazard Planmable Skin Initiant Deliverable Requested: I, III, IV, Other (specify)	☐ Poison B ☐ Unknown		Rediological		Sem	Ple Diss	fe Disposal ( A 1 Return To Client	A fee	may be	assessed if sam Disposal By Lab	and de	- refail	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)  Return To Client Disposal By Lab Archive For Mon	an 1 month) Months	
Empty Kit Relinquished by:		Date:			Time:			1		Method	Method of Shipment:				
Relinquaries by	DateTime. 4/9/	0 MOR/6/	0060	Ud Miles	α	No.	L	4	7	1	Celedine Contract	. 10	000	1) Company C+ 1	_
1	d . d . d	19 16	000	Trees ompeny	4		9	B	17	Bindeh	Date/Time	19	101	Company	1
Custody Seals Intact: Custody Seal No.:					0	ooier Tem	perature	(s) <sub>e</sub> C s	Cooler Temperature(s) <sup>®</sup> C and Other Remarics	emarks:				Aitedury	
					l	ı	I	ı							_

# Login Container Summary Report 310-152983

Temperature readings:					
Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot #
NC2MW4	310-152983-A-1	Plastic 250ml - w nitric - dis	<2		100
NC2MW4	310-152983-B-1	Plastic 250ml - with Nitric Acid			
NC2MW4	310-152983-D-1	Plastic 1 liter - Nitric Acid (diss)	<2		-
NC2MW4	310-152983-E-1	Plastic 1 liter - Nitric Acid (diss)	<2		
NC2MW4	310-152983-F-1	Plastic 1 liter - Nitric Acid	<2		
NC2MW4	310-152983-G-1	Plastic 1 liter - Nitric Acid	<2	-	
			-		

Page 1 of 1

Client: Omaha Public Power District

Job Number: 310-152983-2

Login Number: 152983

List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Bindert, Lindsay A

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey neter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or ampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <a href="mailto:semm">&lt;6 mm</a> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client: Omaha Public Power District

Job Number: 310-152983-2

Login Number: 152983 List Source: Eurofins TestAmerica, St. Louis List Number: 2

List Creation: 04/11/19 06:01 PM

Creator: Hellm, Michael

Question Answer Comment
Radioactivity wasn't checked or is = background as measured by a survey True meter.</td
The cooler's custody seal, if present, is intact. N/A
Sample custody seals, if present, are intact.  N/A
The cooler or samples do not appear to have been compromised or tampered with.
Samples were received on ice. N/A
Cooler Temperature is acceptable. True
Cooler Temperature is recorded. True 18.0
COC is present. True
COC is filled out in ink and legible.
COC is filled out with all pertinent information.
Is the Field Sampler's name present on COC? N/A
There are no discrepancies between the containers received and the COC. True
Samples are received within Holding Time (excluding tests with immediate True HTs)
Sample containers have legible labels. True
Containers are not broken or leaking.
Sample collection date/times are provided.  True
Appropriate sample containers are used. True
Sample bottles are completely filled. True
Sample Preservation Verified. True
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs  True
Containers requiring zero headspace have no headspace or bubble is N/A <6mm (1/4").
Multiphasic samples are not present. N/A
Samples do not require splitting or compositing.
Residual Chlorine Checked.

Eurofins TestAmerica, Cedar Falls

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Job ID: 310-152983-2

Method: 9315 - Radium-226 (GFPC)

**Matrix: Ground Water** Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
310-152983-1	NC2MW4	96.6	
Tracer/Carrier Legend			
Ba Carrier = Ba Carrier	•		

Method: 9315 - Radium-226 (GFPC)

**Prep Type: Dissolved Matrix: Ground Water** 

			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
310-152983-1	NC2MW4	100	
Tracer/Carrier Lege	nd		
Ba Carrier = Ba Carr	rier		

Method: 9315 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
LCS 160-426052/1-A	Lab Control Sample	97.7	
LCS 160-426264/1-A	Lab Control Sample	94.9	
LCSD 160-426052/2-A	Lab Control Sample Dup	92.7	
LCSD 160-426264/2-A	Lab Control Sample Dup	92.1	
MB 160-426052/23-A	Method Blank	102	
MB 160-426264/23-A	Method Blank	98.0	
Tracer/Carrier Legend			

Method: 9320 - Radium-228 (GFPC)

**Matrix: Ground Water** Prep Type: Total/NA

-				Percent Yield (Acceptance Limits)
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
310-152983-1	NC2MW4	96.6	92.7	
Tracer/Carrier Legend				
Ba Carrier = Ba Carrier				
Y Carrier = Y Carrier				

Method: 9320 - Radium-228 (GFPC)

**Matrix: Ground Water Prep Type: Dissolved** 

				Percent Yield (Acceptance Limits)
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
310-152983-1	NC2MW4	100	89.0	
Tracer/Carrier Legend				
Ba Carrier = Ba Carrier				

Eurofins TestAmerica, Cedar Falls

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## **Tracer/Carrier Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1

Y Carrier = Y Carrier

Job ID: 310-152983-2

Method: 9320 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

				Percent Yield (
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
LCS 160-426058/1-A	Lab Control Sample	97.7	89.0	
LCS 160-426271/1-A	Lab Control Sample	94.9	90.5	
LCSD 160-426058/2-A	Lab Control Sample Dup	92.7	90.1	
LCSD 160-426271/2-A	Lab Control Sample Dup	92.1	90.8	
MB 160-426058/23-A	Method Blank	102	91.6	
MB 160-426271/23-A	Method Blank	98.0	87.5	
Tracer/Carrier Legend				
Ba Carrier = Ba Carrier				
Y Carrier = Y Carrier				

Eurofins TestAmerica, Cedar Falls

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# **Environment Testing TestAmerica**

## **ANALYTICAL REPORT**

Eurofins TestAmerica, Cedar Falls 3019 Venture Way Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-153107-2

Client Project/Site: Nebraska City Unit 1 CCR

Revision: 1

For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 7/22/2019 3:58:00 PM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

·····LINKS ·······

Review your project results through

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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## **Case Narrative**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-153107-2

Job ID: 310-153107-2

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative 310-153107-2

#### Comments

No additional comments.

#### Receipt

The samples were received on 4/11/2019 11:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were -0.7° C, -0.3° C, 1.0° C and 1.2° C.

#### **RAD**

Method(s) 9315: Radium-226 Prep Batch 160-427459

The LCS spike recovery (70%) was below the lower limit (75%) indicating a potential low bias to sample results. This appears to be due to a somewhat higher than normal barium carrier recovery (109%). If this carrier value were truncated to 100% for the calculation, the spike recovery would be within QC limits (76%). Further, the LCSD run on this batch was within limits demonstrating acceptable method performance. The laboratory does not believe this excursion significantly affects the sample results.

Method(s) 9315: Radium-226 Prep Batch: 160-430942

Ra-226 is reported without a 21-day waiting period to ensure short-lived alpha-emitting radium isotopes (e.g. Ra-224) have decayed out. The Ra-226 result should be considered to be potentially high biased. Associated samples have activity below the RL. The results are reported with this narrative.

MW2 (310-153107-1), MW3 (310-153107-2), MW4 (310-153107-3), DUP1 (310-153107-5), DUP2 (310-153107-6), (LCS 160-430942/1-A), (LCSD 160-430942/2-A) and (MB 160-430942/8-A)

Method(s) 9320: Ra-228 Prep Batch 160-432420

The detector used to count the LCSD (Orange 1) failed its beta background for 6/26. This excursion does not directly affect client samples. The LCS and LCSD both were within QC limits demonstrating acceptable method performance. The data is reported. MW2 (310-153107-1), MW3 (310-153107-2), MW4 (310-153107-3), DUP1 (310-153107-5), DUP2 (310-153107-6), (LCS 160-432420/1-A), (LCSD 160-432420/2-A) and (MB 160-432420/8-A)

Method(s) 9320: Ra-228 Prep Batch 160-430972

The detector used to count the LCSD (Orange 1) failed its beta background for 6/26. This excursion does not directly affect client samples. The LCS and LCSD both were within QC limits demonstrating acceptable method performance. The data is reported. MW2 (310-153107-1), MW3 (310-153107-2), MW4 (310-153107-3), MW9 (310-153107-4), DUP1 (310-153107-5), DUP2 (310-153107-6), MW3D (310-153107-7), MW4D (310-153107-8), MW9D (310-153107-9), (LCS 160-430972/1-A), (LCSD 160-430972/2-A) and (MB 160-430972/18-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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## **Sample Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-153107-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Ass
310-153107-1	MW2	Ground Water	04/09/19 11:11	04/11/19 11:30	-
310-153107-2	MW3	Ground Water	04/09/19 15:47	04/11/19 11:30	
310-153107-3	MW4	Ground Water	04/09/19 13:17	04/11/19 11:30	
310-153107-4	MW9	Ground Water	04/10/19 10:14	04/11/19 11:30	
310-153107-5	DUP1	Ground Water	04/09/19 00:00	04/11/19 11:30	
310-153107-6	DUP2	Ground Water	04/09/19 00:00	04/11/19 11:30	

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-153107-1

**Matrix: Ground Water** 

Job ID: 310-153107-2

Date Collected: 04/09/19 11:11 Date Received: 04/11/19 11:30

**Client Sample ID: MW2** 

adium-226 (0	GFPC)	Count Uncert.	Total Uncert.						
Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
0.123		0.0808	0.0816	1.00	0.107	pCi/L	06/05/19 12:57	07/02/19 10:12	1
%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
93.5		40 - 110					06/05/19 12:57	07/02/19 10:12	1
	Result 0.123	Result Qualifier  0.123  %Yield Qualifier	Count Uncert.	Count   Total   Uncert.   Uncert.   Uncert.   Uncert.   (2σ+/-)   (2σ+/-)	Count   Total   Uncert.   Uncert.   Uncert.   Uncert.   Uncert.   O.123   O.0808   O.0816   O.0816	Count   Total   Uncert.   Uncert.   Uncert.   Uncert.   Uncert.   O.123   O.0808   O.0816   O.0816   O.107   O.107	Count   Total   Uncert.   Uncert.   Uncert.   Count   Uncert.   Uncert.	Count   Total   Uncert.   Uncert.   Uncert.   Result   Qualifier   (2σ+/-)   (2σ+/-)   RL   MDC   Unit   Prepared   O.123   0.0808   0.0816   1.00   0.107   pCi/L   O6/05/19 12:57     Prepared   Prepared	Count   Total   Uncert.   Uncert.   Uncert.   Count   Uncert.   Uncert.   Count   Uncert.   Uncert.   Count   Uncert.   Count   Uncert.   Count   Uncert.   Count   Unit   Prepared   Analyzed   Analyzed   O.123   O.0808   O.0816   O.107   O.107

Method: 9320 - R	adium-228 (	GFPC)								
		•	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.372	U	0.308	0.310	1.00	0.494	pCi/L	06/05/19 13:24	06/26/19 11:52	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.5		40 - 110					06/05/19 13:24	06/26/19 11:52	1
Y Carrier	79.6		40 - 110					06/05/19 13:24	06/26/19 11:52	1

Method: Ra226_Ra	228 - Con	nbined Ra	dium-226 a	nd Radiur	n-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.494		0.318	0.321	5.00	0.494	pCi/L		07/17/19 09:19	1

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-153107-2

**Matrix: Ground Water** 

Job ID: 310-153107-2

Client Sample ID: MW3
Date Collected: 04/09/19 15:47
Date Received: 04/11/19 11:30

Method: 9315 - Ra	ndium-226 (	GFPC)	Count Uncert.	Total Uncert.					
Analyte Radium-226	0.102	Qualifier U	( <b>2σ+/-)</b> 0.0896	(2σ+/-) 0.0901	1.00	MDC 0.134	 Prepared 06/05/19 12:57	Analyzed 07/02/19 10:12	Dil Fac
Carrier Ba Carrier	<b>%Yield</b> 94.4	Qualifier	Limits 40 - 110				<b>Prepared</b> 06/05/19 12:57	Analyzed 07/02/19 10:12	Dil Fac

Method: 9320 - I	Radium-228 (	(GFPC)	Count	Total						
Analyte	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.246		0.254	0.255	1.00	0.414	pCi/L	06/05/19 13:24		1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					06/05/19 13:24	06/26/19 11:53	1
Y Carrier	81.5		40 - 110					06/05/19 13:24	06/26/19 11:53	1

Method: Ra226 Ra2	228 - Con	nbined Ra	dium-226 a	nd Radium	1-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.348	Ū	0.269	0.270	5.00	0.414	pCi/L		07/17/19 09:19	1

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-153107-3

**Matrix: Ground Water** 

Job ID: 310-153107-2

Date Collected: 04/09/19 13:17 Date Received: 04/11/19 11:30

**Client Sample ID: MW4** 

Method: 9315 - Ra	dium-226 (	(GFPC)	Count Uncert.	Total Uncert.					
Analyte Radium-226	Result 0.00878	Qualifier U	( <b>2σ+/-)</b> 0.0453	( <b>2σ+/-)</b> 0.0453	1.00	MDC 0.0893	 Prepared 06/05/19 12:57	Analyzed 07/15/19 15:01	Dil Fac
Carrier Ba Carrier	<b>%Yield</b> 94.6	Qualifier	<b>Limits</b> 40 - 110				<b>Prepared</b> 06/05/19 12:57	<b>Analyzed</b> 07/15/19 15:01	Dil Fac

Method: 9320 -	Radium-228 (	(GFPC)	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.00690	U	0.243	0.243	1.00	0.433	pCi/L	06/05/19 13:24	06/26/19 11:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.6		40 - 110					06/05/19 13:24	06/26/19 11:53	1
Y Carrier	79.6		40 - 110					06/05/19 13:24	06/26/19 11:53	1

Method: Ra226 Ra2	28 - Con	nbined Rad	dium-226 a	nd Radium	1-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0157	Ū	0.247	0.247	5.00	0.433	pCi/L	_	07/17/19 09:19	1

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-153107-4

**Matrix: Ground Water** 

Job ID: 310-153107-2

Client Sample ID: MW9
Date Collected: 04/10/19 10:14
Date Received: 04/11/19 11:30

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.136		0.0761	0.0771	1.00	0.0998	pCi/L	06/05/19 12:57	07/16/19 11:45	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.6		40 - 110					06/05/19 12:57	07/16/19 11:45	1

Method: 9320 - I	Radium-228 (	(GFPC)	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.279	U	0.254	0.255	1.00	0.409	pCi/L	06/05/19 13:24	06/26/19 11:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.6		40 - 110					06/05/19 13:24	06/26/19 11:53	1
Y Carrier	79.6		40 - 110					06/05/19 13:24	06/26/19 11:53	1

Method: Ra226 Ra	228 - Com	bined Rad	dium-226 a	nd Radiur	n-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.415		0.265	0.266	5.00	0.409	pCi/L		07/17/19 09:19	1

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-153107-5

**Matrix: Ground Water** 

Job ID: 310-153107-2

Client Sample ID: DUP1
Date Collected: 04/09/19 00:00
Date Received: 04/11/19 11:30

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0313	U	0.0786	0.0786	1.00	0.145	pCi/L	06/05/19 12:57	07/02/19 10:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.1		40 - 110					06/05/19 12:57	07/02/19 10:24	1

Method: 9320 - F	Radium-228 (	(GFPC)	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
										- Dil i ac
Radium-228	0.196	U	0.271	0.272	1.00	0.453	pCi/L	06/05/19 13:24	06/26/19 11:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.1		40 - 110					06/05/19 13:24	06/26/19 11:53	1
Y Carrier	80.0		40 - 110					06/05/19 13:24	06/26/19 11:53	1

Method: Ra226 Ra2	228 - Con	bined Ra	dium-226 a	nd Radium	1-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.227	U	0.282	0.283	5.00	0.453	pCi/L	_	07/17/19 09:19	1

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-153107-6

**Matrix: Ground Water** 

Job ID: 310-153107-2

Client Sample ID: DUP2
Date Collected: 04/09/19 00:00
Date Received: 04/11/19 11:30

	Radium-226 (	,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0979	U	0.0808	0.0812	1.00	0.116	pCi/L	06/05/19 12:57	07/02/19 10:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110					06/05/19 12:57	07/02/19 10:24	1

Method: 9320 - I	Radium-228 (	(GFPC)	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.161	U	0.245	0.245	1.00	0.411	pCi/L	06/05/19 13:24	06/26/19 11:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110					06/05/19 13:24	06/26/19 11:53	1
Y Carrier	82.2		40 - 110					06/05/19 13:24	06/26/19 11:53	1

Method: Ra226 Ra2	28 - Con	bined Rad	dium-226 a	nd Radium	1-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.259	Ū	0.258	0.258	5.00	0.411	pCi/L	_	07/17/19 09:19	1

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## **Definitions/Glossary**

Client: Omaha Public Power District
Project/Site: Nebraska City Unit 1 CCR

Job ID: 310-153107-2

#### **Qualifiers**

Rad

Qualifier Qualifier Description

U Result is less than the sample detection limit.

## **Glossary**

Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-153107-2

## Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-430963/18-A

Count

**Matrix: Water** 

**Matrix: Water** 

Analysis Batch: 433407

Client Sample ID: Method Blank Prep Type: Total/NA

**Prep Batch: 430963** 

MB MB Uncert. Uncert. Result Qualifier **MDC** Unit Analyte  $(2\sigma + / -)$  $(2\sigma + / -)$ RI Prepared Analyzed Dil Fac Radium-226 0.03779 U 06/05/19 12:57 07/02/19 13:32 0.0600 0.0601 1.00 0.105 pCi/L

Total

MB MB

Carrier Qualifier Limits %Yield Prepared Analyzed Dil Fac Ba Carrier 40 - 110 06/05/19 12:57 07/02/19 13:32 105

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 430963

**Analysis Batch: 433408** Total Spike LCS LCS Uncert.

%Rec. Added RLAnalyte Result Qual  $(2\sigma + / -)$ MDC Unit %Rec Limits Radium-226 8.968 0.968 1.00 0.110 pCi/L 79 75 - 125 11.4

LCS LCS

Lab Sample ID: LCS 160-430963/1-A

Carrier %Yield Qualifier I imits 40 - 110 Ba Carrier 100

Lab Sample ID: LCSD 160-430963/2-A **Client Sample ID: Lab Control Sample Dup** 

**Analysis Batch: 433410** 

**Matrix: Water** Prep Type: Total/NA **Prep Batch: 430963** 

Total

Spike LCSD LCSD RER Uncert. %Rec. Analyte Added  $(2\sigma + / -)$ RL**MDC** Unit %Rec Limits Result Qual RER Limit Radium-226 11.4 9.097 0.976 1.00 0.127 pCi/L 80 75 - 125 0.07

LCSD LCSD

Carrier %Yield Qualifier Limits Ba Carrier 101 40 - 110

#### Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-430972/18-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 432948 Prep Batch: 430972 Count Total

MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-228 0.07694 Ū 0.213 0.213 1.00 0.367 pCi/L 06/05/19 13:24 06/26/19 11:54

MB MB Dil Fac Carrier **%Yield Qualifier** Limits Prepared Analyzed Ba Carrier 105 40 - 110 06/05/19 13:24 06/26/19 11:54 82.2 40 - 110 06/05/19 13:24 06/26/19 11:54 Y Carrier

## **QC Sample Results**

Client: Omaha Public Power District Job ID: 310-153107-2 Project/Site: Nebraska City Unit 1 CCR

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-430972/1-A **Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA Prep Batch: 430972** Analysis Batch: 432948

Total

				. Ottai					
	Spike	LCS	LCS	Uncert.				%Rec.	
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	
Radium-228	9.08	9.745		1.13	1.00	0.405 pCi/L	107	75 - 125	

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 100 40 - 110 Y Carrier 77.8 40 - 110

Lab Sample ID: LCSD 160-430972/2-A **Client Sample ID: Lab Control Sample Dup** 

**Matrix: Water Prep Type: Total/NA** Analysis Batch: 432948 **Prep Batch: 430972** 

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	Spike	LCSD	LCSD	Uncert.				%Rec.		RER	
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	RER	Limit	
Radium-228	9.08	9.520		1.10	1.00	0.355 pCi/L	105	75 - 125	0.10	1	
		Analyte Added	Analyte Added Result	Analyte Added Result Qual	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Spike LCSD LCSD Uncert.  Analyte Added Result Qual (2σ+/-) RL	Spike LCSD LCSD Uncert.  Analyte Added Result Qual (2σ+/-) RL MDC Unit	Analyte Added Result Qual (2σ+/-) RL MDC Unit %Rec	Spike LCSD LCSD Uncert. %Rec. Analyte Added Result Qual (2σ+/-) RL MDC Unit %Rec Limits	Spike LCSD LCSD Uncert. %Rec. Analyte Added Result Qual (2σ+/-) RL MDC Unit %Rec Limits RER	Spike LCSD LCSD Uncert.

	LCSD	LCSD	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	101		40 - 110
Y Carrier	80.4		40 - 110

## **QC Association Summary**

Client: Omaha Public Power District
Project/Site: Nebraska City Unit 1 CCR

Job ID: 310-153107-2

## Rad

## **Prep Batch: 430963**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-153107-1	MW2	Total/NA	Ground Water	PrecSep-21	
310-153107-2	MW3	Total/NA	<b>Ground Water</b>	PrecSep-21	
310-153107-3	MW4	Total/NA	<b>Ground Water</b>	PrecSep-21	
310-153107-4	MW9	Total/NA	Ground Water	PrecSep-21	
310-153107-5	DUP1	Total/NA	<b>Ground Water</b>	PrecSep-21	
310-153107-6	DUP2	Total/NA	<b>Ground Water</b>	PrecSep-21	
MB 160-430963/18-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-430963/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-430963/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

## **Prep Batch: 430972**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-153107-1	MW2	Total/NA	Ground Water	PrecSep_0	
310-153107-2	MW3	Total/NA	<b>Ground Water</b>	PrecSep_0	
310-153107-3	MW4	Total/NA	<b>Ground Water</b>	PrecSep_0	
310-153107-4	MW9	Total/NA	Ground Water	PrecSep_0	
310-153107-5	DUP1	Total/NA	<b>Ground Water</b>	PrecSep_0	
310-153107-6	DUP2	Total/NA	<b>Ground Water</b>	PrecSep_0	
MB 160-430972/18-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-430972/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-430972/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep 0	

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Client Sample ID: MW2

Date Collected: 04/09/19 11:11 Date Received: 04/11/19 11:30 Lab Sample ID: 310-153107-1

**Matrix: Ground Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			430963	06/05/19 12:57	ORM	TAL SL
Total/NA	Analysis	9315		1	433407	07/02/19 10:12	KLS	TAL SL
Total/NA	Prep	PrecSep_0			430972	06/05/19 13:24	ORM	TAL SL
Total/NA	Analysis	9320		1	432948	06/26/19 11:52	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	435084	07/17/19 09:19	SMP	TAL SL

Client Sample ID: MW3 Lab Sample ID: 310-153107-2

Date Collected: 04/09/19 15:47

Date Received: 04/11/19 11:30

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			430963	06/05/19 12:57	ORM	TAL SL
Total/NA	Analysis	9315		1	433407	07/02/19 10:12	KLS	TAL SL
Total/NA	Prep	PrecSep_0			430972	06/05/19 13:24	ORM	TAL SL
Total/NA	Analysis	9320		1	432948	06/26/19 11:53	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	435084	07/17/19 09:19	SMP	TAL SL

Client Sample ID: MW4 Lab Sample ID: 310-153107-3

Date Collected: 04/09/19 13:17

Date Received: 04/11/19 11:30

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			430963	06/05/19 12:57	ORM	TAL SL
Total/NA	Analysis	9315		1	434854	07/15/19 15:01	CDR	TAL SL
Total/NA	Prep	PrecSep_0			430972	06/05/19 13:24	ORM	TAL SL
Total/NA	Analysis	9320		1	432948	06/26/19 11:53	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	435084	07/17/19 09:19	SMP	TAL SL

Client Sample ID: MW9 Lab Sample ID: 310-153107-4

Date Collected: 04/10/19 10:14 Matrix: Ground Water

Date Received: 04/11/19 11:30

-	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			430963	06/05/19 12:57	ORM	TAL SL
Total/NA	Analysis	9315		1	435022	07/16/19 11:45	CDR	TAL SL
Total/NA	Prep	PrecSep_0			430972	06/05/19 13:24	ORM	TAL SL
Total/NA	Analysis	9320		1	432948	06/26/19 11:53	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	435084	07/17/19 09:19	SMP	TAL SL

## **Lab Chronicle**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-153107-5

**Matrix: Ground Water** 

Job ID: 310-153107-2

Date Collected: 04/09/19 00:00 Date Received: 04/11/19 11:30

**Client Sample ID: DUP1** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			430963	06/05/19 12:57	ORM	TAL SL
Total/NA	Analysis	9315		1	433407	07/02/19 10:24	KLS	TAL SL
Total/NA	Prep	PrecSep_0			430972	06/05/19 13:24	ORM	TAL SL
Total/NA	Analysis	9320		1	432948	06/26/19 11:53	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	435084	07/17/19 09:19	SMP	TAL SL

Lab Sample ID: 310-153107-6

Matrix: Ground Water

Date Collected: 04/09/19 00:00 Date Received: 04/11/19 11:30

**Client Sample ID: DUP2** 

Γ	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21	<del></del>		430963	06/05/19 12:57	ORM	TAL SL
Total/NA	Analysis	9315		1	433407	07/02/19 10:24	KLS	TAL SL
Total/NA	Prep	PrecSep_0			430972	06/05/19 13:24	ORM	TAL SL
Total/NA	Analysis	9320		1	432948	06/26/19 11:53	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	435084	07/17/19 09:19	SMP	TAL SL

**Laboratory References:** 

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-153107-2

# **Laboratory: Eurofins TestAmerica, Cedar Falls**

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	IHLAP		101044	11-01-20
Georgia	State		IA100001 (OR)	09-29-19
Georgia	State Program	4	IA100001 (OR)	09-29-19
Illinois	NELAP	5	200024	11-29-19
Illinois	NELAP		200024	11-29-19
lowa	State Program	7	007	12-01-19
Kansas	NELAP	7	E-10341	01-31-20
Minnesota	NELAP	5	019-999-319	12-31-19
Minnesota	NELAP		019-999-319	12-31-19
Minnesota (Petrofund)	State Program	1	3349	08-22-19
North Dakota	State Program	8	R-186	09-29-19
Oregon	NELAP	10	IA100001	09-29-19
Oregon	NELAP		IA100001	09-29-19
USDA	Federal		P330-19-00003	01-02-22

#### Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP		L2305	04-06-22
ANAB	DoD		L2305	04-06-22
ANAB	DOE		L2305.01	04-06-22
Arizona	State		AZ0813	12-08-19
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-20
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-20
Florida	NELAP		E87689	06-30-20
Illinois	NELAP	5	200023	11-30-19
lowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-20
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19 *
Missouri	State Program	7	780	06-30-19 *
Nevada	State Program	9	MO000542018-1	07-31-19 *
New Jersey	NELAP	2	MO002	06-30-20
New York	NELAP	2	11616	03-31-20
New York	NELAP		11616	04-01-20
North Dakota	State Program	8	R207	06-30-19 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State		9997	08-31-19
Oklahoma	State Program	6	9997	08-31-19 *
Pennsylvania	NELAP	3	68-00540	02-28-20
Pennsylvania	NELAP		68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-19 *
Texas	NELAP	6	T104704193-18-13	07-31-19 *
Texas	NELAP		T104704193-19-13	07-31-20
US Fish & Wildlife	Federal		058448	07-31-19

<sup>\*</sup> Accreditation/Certification renewal pending - accreditation/certification considered valid.

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Eurofins TestAmerica, Cedar Falls

# **Accreditation/Certification Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-153107-2

### Laboratory: Eurofins TestAmerica, St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19 *
Virginia	NELAP	3	460230	06-14-20
Virginia	NELAP		10310	06-14-20
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

<sup>\*</sup> Accreditation/Certification renewal pending - accreditation/certification considered valid.

# **Method Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-153107-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### **Protocol References:**

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### **Laboratory References:**

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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# Cooler/Sample Receipt and Temperature Log Form

Client Information	
Client: Omaha Public Power STATE	District
City/State: Omaha STATE	Project: Nebraska City Unit 1
Pacaint Information	70 01 01 011
Date/Time Received: DATE 11-19 TIME 130	Received By: KP
Delivery Type: UPS FedEx	FedEx Ground US Mail Spee-Dee
☐ Lab Courier ☐ TA Field Services	Client Drop-off Other:
Condition of Cooler/Containers	
Sample(s) received in Cooler? Yes No	If yes: Cooler ID:
Multiple Coolers? Yes No	If yes: Cooler # of
Cooler Custody Seals Present? Yes No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present? Yes No	If yes: Sample custody seals intact? Yes No
Trip Blank Present? Yes No	If yes: Which VOA samples are in cooler? ↓
Temperature Record	
Coolant: Wet ice Blue ice Dry i	ce Other: NONE
Thermometer ID:	Correction Factor (°C):
• Temp Blank Temperature – If no temp blank, or temp blank to	emperature above criteria, proceed to Sample Container Temperature
Uncorrected Temp (°C): ( . \	Corrected Temp (°C):
Sample Container Temperature	
Container type(s) used: CONTAINER 1	CONTAINER 2
Uncorrected Temp (°C): TEMP 1 TEMP 2	Corrected Temp (°C): TEMP 1 TEMP 2
Exceptions Noted	
If temperature exceeds criteria, was sample(s) re     a) If yes: Is there evidence that the chilling pro	
If temperature is <0°C, are there obvious signs the (e.g., bulging septa, broken/cracked bottles, froz	nat the integrity of sample containers is compromised? en solid?) Yes No
NOTE: If yes, contact PM before proceeding. If no, proceed	with login
Additional Comments	

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# Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: DPPD		
City/State: DMaha	STATE	Project: NEWYOSKA CHY UNIT 1
Receipt Information		
Date/Time Received: DATE	TIME 1130	Received By:
Delivery Type: ☐ UPS ☐ FedEx		FedEx Ground US Mail Spee-De
Lab Courier TA Fiel	ld Services	Client Drop-off Other:
Condition of Cooler/Containers		
Sample(s) received in Cooler? Yes	☐ No	If yes: Cooler ID:
Multiple Coolers?   ☐Yes	☐ No	If yes: Cooler # 2 of 4
Cooler Custody Seals Present? Yes	☐ No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present? Yes	₩No	If yes: Sample custody seals intact? Yes No
Trip Blank Present?	No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
Coolant: Wet ice Blue ice	Dry ice	Other: NONE
Thermometer ID: M		Correction Factor (°C): (). ()
		0
• Temp Blank Temperature – If no temp blank, or te	emp blank temp	perature above criteria, proceed to Sample Container Temperature
	emp blank temp	
Temp Blank Temperature – If no temp blank, or temp Uncorrected Temp (°C): – () (     Sample Container Temperature	emp blank temp	perature above criteria, proceed to Sample Container Temperature
Uncorrected Temp (°C): -66	emp blank temp	perature above criteria, proceed to Sample Container Temperature
• Sample Container Temperature  Container type(s) used:  CONTAINER 1	emp blank temp	Corrected Temp (°C):
Uncorrected Temp (°C): - () (  • Sample Container Temperature  Container type(s) used:  CONTAINER 1		Corrected Temp (°C): (CONTAINER 2
Uncorrected Temp (°C): -6 6  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C): TEMP 1 T	EMP 2 mple(s) rece	Corrected Temp (°C): CONTAINER 2  Corrected Temp (°C): TEMP 1  TEMP 2  ived same day of sampling? Yes No
Uncorrected Temp (°C): - C C  • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C): TEMP 1  Exceptions Noted  1) If temperature exceeds criteria, was satisfy a container type of the container ty	mple(s) rece	Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  Corrected Temp (°C):  TEMP 1  TEMP 2  Temp 2  Temp 2  Temp 2  Temp 3  Temp 4  Temp 5  Temp 5  Temp 6  Temp 1  Temp 7  Temp 8  Temp 9  Temp 1  Temp 9  Temp 1  Temp 1  Temp 2
Uncorrected Temp (°C): - CONTAINER 1  Container type(s) used:  Uncorrected Temp (°C): TEMP 1  Exceptions Noted  1) If temperature exceeds criteria, was satisfy a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was satisfy as a series of the container type (°C): Temperature exceeds criteria, was a series of the container type (°C): Temperature exceeds criteria, was a series of the container type (°C): Temperature exceeds criteria, was a series of the container type (°	mple(s) rece hilling proces ous signs that ottles, frozen	Corrected Temp (°C): TEMP 1 TEMP 2  Corrected Temp (°C): Yes No ss began? Yes No St began?
Uncorrected Temp (°C): Container Temperature  Container type(s) used:  Uncorrected Temp (°C): Container 1  Uncorrected Temp (°C): Container 1  Exceptions Noted  1) If temperature exceeds criteria, was sa a) If yes: Is there evidence that the container 1  2) If temperature is <0°C, are there obvious (e.g., bulging septa, broken/cracked box	mple(s) rece hilling proces ous signs that ottles, frozen	Corrected Temp (°C): TEMP 1 TEMP 2  Corrected Temp (°C): Yes No ss began? Yes No St began?
Uncorrected Temp (°C): CONTAINER 1  Container type(s) used: CONTAINER 1  Uncorrected Temp (°C): TEMP 1  Exceptions Noted  1) If temperature exceeds criteria, was sa a) If yes: Is there evidence that the container type (°C): Temperature is <0°C, are there obviously, bulging septa, broken/cracked but Note: If yes, contact PM before proceeding. If	mple(s) rece hilling proces ous signs that ottles, frozen	Corrected Temp (°C): TEMP 1 TEMP 2  Corrected Temp (°C): Yes No ss began? Yes No St began?
Uncorrected Temp (°C): CONTAINER 1  Container type(s) used: CONTAINER 1  Uncorrected Temp (°C): TEMP 1  Exceptions Noted  1) If temperature exceeds criteria, was sa a) If yes: Is there evidence that the container type (°C): Temperature is <0°C, are there obviously, bulging septa, broken/cracked but Note: If yes, contact PM before proceeding. If	mple(s) rece hilling proces ous signs that ottles, frozen	Corrected Temp (°C): TEMP 1 TEMP 2  Corrected Temp (°C): Yes No ss began? Yes No St began?

Document: CF-LG-WI-002



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# Cooler/Sample Receipt and Temperature Log Form

Client Information	
Client: () PP D	
City/State: City/State: STATE	Project: Nebraska Caty Unit
Receipt Information	1 100015.72 03 CMA CANA
Date/Time Received: DATE 54110	Received By:
Delivery Type: ☐ UPS ☐ FedEx	FedEx Ground US Mail Spee-Dee
Lab Courier TA Field Service	es Client Drop-off Other:
Condition of Cooler/Containers	
Sample(s) received in Cooler? Yes No	
Multiple Coolers? ☑ Yes ☐ No	If yes: Cooler # $\frac{3}{4}$ of $\frac{4}{4}$
Cooler Custody Seals Present? Yes No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present? Yes No	If yes: Sample custody seals intact? Yes No
Trip Blank Present? Yes No	If yes: Which VOA samples are in cooler? ↓
Temperature Record	AND THE RESIDENCE OF THE PROPERTY OF THE PROPE
	y ice Other: NONE
	y ice Other: NONE  Correction Factor (°C): - O . \
Coolant: Wet ice Blue ice Dr	
Coolant: Wet ice Blue ice Dr	Correction Factor (°C): - D . \
Coolant: Wet ice Blue ice Dry Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank	Correction Factor (°C): - O . \ temperature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):   O
Coolant: Wet ice Blue ice Dry Thermometer ID: \( \sum_{\circ}\) • Temp Blank Temperature – If no temp blank, or temp blank Uncorrected Temp (°C): \( \circ_{\circ}\)	Correction Factor (°C): - O . \ temperature above criteria, proceed to Sample Container Temperature
Coolant: Wet ice Blue ice Dro Thermometer ID:   • Temp Blank Temperature – If no temp blank, or temp blank Uncorrected Temp (°C):   • Sample Container Temperature	Correction Factor (°C): - O . \ temperature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):   O
Coolant: Wet ice Blue ice Dro Thermometer ID:   • Temp Blank Temperature – If no temp blank, or temp blank Uncorrected Temp (°C):   • Sample Container Temperature Container type(s) used:	Correction Factor (°C): - O . \ temperature above criteria, proceed to Sample Container Temperature Corrected Temp (°C): \ O \  CONTAINER 2
Coolant: Wet ice Blue ice Dry Thermometer ID: \( \)  • Temp Blank Temperature – If no temp blank, or temp blank Uncorrected Temp (°C): \( \)  • Sample Container Temperature Container type(s) used:  Uncorrected Temp (°C): TEMP 1  TEMP 2	Correction Factor (°C):
Coolant: Wet ice Blue ice Dream Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank Uncorrected Temp (°C): • Sample Container Temperature  Container type(s) used:  Uncorrected Temp (°C): TEMP 1 TEMP 2  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) a) If yes: Is there evidence that the chilling processors and the components of the componen	Correction Factor (°C):\ temperature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C): TEMP 1  TEMP 2  received same day of sampling? Yes No rocess began? Yes No that the integrity of sample containers is compromised?
Coolant: Wet ice Blue ice Dro Thermometer ID: \( \)  • Temp Blank Temperature – If no temp blank, or temp blank Uncorrected Temp (°C): \( \)  • Sample Container Temperature  Container type(s) used: CONTAINER 1  Uncorrected Temp (°C): TEMP 1  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) a) If yes: Is there evidence that the chilling pro 2) If temperature is <0°C, are there obvious signs	Correction Factor (°C):\ temperature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C): TEMP 1  TEMP 2  received same day of sampling? Yes No rocess began? Yes No that the integrity of sample containers is compromised? ozen solid?) Yes No
Coolant: Wet ice Blue ice Draw Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank Uncorrected Temp (°C): .\ • Sample Container Temperature Container type(s) used:  Uncorrected Temp (°C): TEMP 1 TEMP 2  Exceptions Noted  1) If temperature exceeds criteria, was sample(s) a) If yes: Is there evidence that the chilling process of the component of the compon	Correction Factor (°C):\ temperature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C): TEMP 1  TEMP 2  received same day of sampling? Yes No rocess began? Yes No that the integrity of sample containers is compromised? ozen solid?) Yes No
Coolant: Wet ice Blue ice Dro Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank Uncorrected Temp (°C):  • Sample Container Temperature Container type(s) used:  Uncorrected Temp (°C):   Exceptions Noted  1) If temperature exceeds criteria, was sample(s) a) If yes: Is there evidence that the chilling pro 2) If temperature is <0°C, are there obvious signs (e.g., bulging septa, broken/cracked bottles, from Note: If yes, contact PM before proceeding. If no, process	Correction Factor (°C):\ temperature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C): TEMP 1  TEMP 2  received same day of sampling? Yes No rocess began? Yes No that the integrity of sample containers is compromised? ozen solid?) Yes No
Coolant: Wet ice Blue ice Dro Thermometer ID:  • Temp Blank Temperature – If no temp blank, or temp blank Uncorrected Temp (°C):  • Sample Container Temperature Container type(s) used:  Uncorrected Temp (°C):   Exceptions Noted  1) If temperature exceeds criteria, was sample(s) a) If yes: Is there evidence that the chilling pro 2) If temperature is <0°C, are there obvious signs (e.g., bulging septa, broken/cracked bottles, from Note: If yes, contact PM before proceeding. If no, process	Correction Factor (°C):\ temperature above criteria, proceed to Sample Container Temperature  Corrected Temp (°C):  CONTAINER 2  Corrected Temp (°C): TEMP 1  TEMP 2  received same day of sampling? Yes No rocess began? Yes No that the integrity of sample containers is compromised? ozen solid?) Yes No

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# Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: 6 PRD		
City/State: CITY ST	TATE	Project: Nebraska aty Unit 1
Receipt Information	NC	100010cotoc Origi Otter
DATE TI	113D	Received By: 409
Delivery Type: UPS FedEx		FedEx Ground US Mail Spee-Dee
☐ Lab Courier ☐ TA Field S	Services [	Client Drop-off Other:
Condition of Cooler/Containers		是但是是1000年,1000年,1000年,1000年,1000年,1000年
Sample(s) received in Cooler? Yes	No	If yes: Cooler ID:
Multiple Coolers?	No	If yes: Cooler # 4 of 4
Cooler Custody Seals Present? Yes [	☐ No	If yes: Cooler custody seals intact? 🗹 Yes 🗌 No
Sample Custody Seals Present? Yes	√ No	If yes: Sample custody seals intact? Yes No
Trip Blank Present?	√No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
Coolant: Wet ice Blue ice	Dry ice	Other: NONE
Thermometer ID: /\/		Correction Factor (°C): -().
• Temp Blank Temperature – If no temp blank, or temp	p blank tempe	erature above criteria, proceed to Sample Container Temperature
Uncorrected Temp (°C): - D. 2		Corrected Temp (°C): - 0.3
Sample Container Temperature		
Container type(s) used:		CONTAINER 2
Uncorrected Temp (°C): TEMP 1 TEM	P 2	Corrected Temp (°C): TEMP 1 TEMP 2
Exceptions Noted	A 2 19 19	
1) If temperature exceeds criteria, was samp	ple(s) receiv	ved same day of sampling? Yes No
a) If yes: Is there evidence that the chill		
	ling process	s began? Yes No the integrity of sample containers is compromised?
2) If temperature is <0°C, are there obvious	signs that	the integrity of sample containers is compromised? solid?)
If temperature is <0°C, are there obvious (e.g., bulging septa, broken/cracked bott)	signs that	the integrity of sample containers is compromised? solid?)
2) If temperature is <0°C, are there obvious (e.g., bulging septa, broken/cracked bottl  Note: If yes, contact PM before proceeding. If no,	signs that	the integrity of sample containers is compromised? solid?)
2) If temperature is <0°C, are there obvious (e.g., bulging septa, broken/cracked bottl  Note: If yes, contact PM before proceeding. If no,	signs that	the integrity of sample containers is compromised? solid?)

Document: CF-LG-WI-002

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TestAmerica

TestAmerica Omaha SC

Chain of Custody Record

Phone (319) 277-2401 Fax (319) 277-2425

Cedar Falls, IA 50613

704 Enterprise Drive

**TestAmerica Cedar Falls** 

N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - NaZS2O3
S - H2SO4
T - TSP Dodecahydr Special Instructions/Note: Company Ver: 08/04/2016 U - Acetone V - MCAA W - pH 4-5 Months Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return To Client — Disposal By Lab — Archive For Moni Preservation Codes: A HCL
B NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
J - Di Water
K - EDTA W 113 10 COC No: Total Number of containers 04/110/19 Method of Shipment: Disposal By Lab **Analysis Requested** Sooler Temperature(s) C and Other Remarks × × × × × 2540C TDS, TSS and 9056A Chloride, Fluoride, Sulfate shawn.hayes@testamericainc.com × × × × × × × × × × × Dissolved CCR Metals List Metals and 7470A Mercury × × × 5540C TDS and 9056A Chloride, Fluoride, Sulfate sceived by × × × × × × × × Lab PM: Hayes, Shawn M E-Mail: × × × × × × × × × Total 9315\_Ra226, 9320\_Ra228 Perform MS/MSD (Yes or No) Time: D × × ts. Preservation Code: GW GW GW GW GW GW GW GW GW Radiological Type (C=comp, G=grab) Sample MANA 700 15:35 17.03 Sample 11-0 1 Date: Unknown TAT Requested (days): Due Date Requested: 0/2 16/20i9 4/101/h 19/2019 Plac/19/4 419/2019 Sample Date 110/2019 Pio6/P/4 4/10/2019 19/2019 4/9/2er9 1/9/Jain TestAmerica Pro 31007558 Poison B Skin Irritant Non-Hazard Flammaure Deliverable Requested: I, II, III, IV, Other (specify) Custody Seal No. Possible Hazard Identification Omaha Public Power District Empty Kit Relinquished by: 444 South 16th Street Mall Custody Seals Intact: Client Information Sample Identification Nebraska City Unit 1 kkuhing@oppd.com State, Zip: NE, 68102-2247 quished by: Kyle Uhing Omaha MW4D D6WM MW3D DUP1 DUP<sub>2</sub> 6MM MW3 MW4

# Login Container Summary Report

310-153107

Temperature readings:					_
Client Sample ID	<u>Lab ID</u>	Container Type	Container pH	Preservative Added (mls)	Lot #
MW2	310-153107-A-1	Plastic 250ml - with Nitric Acid	<2		
MW2	310-153107-B-1	Plastic 250ml - w/nitric - dis	<2		
MW2	310-153107-C-1	Plastic 1 liter - Nitric Acid	<2		
MW2	310-153107-D-1	Plastic 1 liter - Nitric Acid	<2		
MW2	310-153107-E-1	Plastic 1 liter - Nitric Acid (diss)	<2		
MW2	310-153107-F-1	Plastic 1 liter - Nitric Acid (diss)	<2		
MW3	310-153107-A-2	Plastic 250ml - with Nitric Acid	<2		
MW3	310-153107-B-2	Plastic 250ml - w/nitric - dis	<2		
MW3	310-153107-C-2	Plastic 1 liter - Nitric Acid	<2		
MW3	310-153107-D-2	Plastic 1 liter - Nitric Acid	<2		
MW3	310-153107-E-2	Plastic 1 liter - Nitric Acid (diss)	<2		
MW3	310-153107-F-2	Plastic I liter - Nitric Acid (diss)	<2		
MW4	310-153107-A-3	Plastic 250ml - with Nitric Acid	<2		
MW4	310-153107-B-3	Plastic 250ml - w/nitric - dis	<2		
MW4	310-153107-E-3	Plastic I liter - Nitric Acid (diss)	<2		
MW4	310-153107-F-3	Plastic I liter - Nitric Acid (diss)	<2		
MW4	310-153107-G-3	Plastic 1 liter - Nitric Acid	<2		
MW4	310-153107-H-3	Plastic 1 liter - Nitric Acid	<2		
MW9	310-153107-A-4	Plastic 250ml - with Nitric Acid	<2		
MW9	310-153107-B-4	Plastic 250ml - w/nitric - dis	<2		
MW9	310-153107-E-4	Plastic 1 liter - Nitric Acid (diss)	<2		
MW9	310-153107-F-4	Plastic 1 liter - Nitric Acid (diss)	<2		
MW9	310-153107-G-4	Plastic 1 liter - Nitric Acid	<2		
MW9	310-153107-H-4	Plastic 1 liter - Nitric Acid	<2		
DUPI	310-153107-A-5	Plastic 250ml - with Nitric Acid	<2		
DUPI	310-153107-B-5	Plastic 250ml - w/nitric - dis	<2		
DUPI	310-153107-E-5	Plastic 1 liter - Nitric Acid (diss)	<2		
DUPI	310-153107-F-5	Plastic 1 liter - Nitric Acid (diss)	<2		
DUPI	310-153107-G-5	Plastic 1 liter - Nitric Acid	<2		
DUP1	310-153107-H-5	Plastic 1 liter - Nitric Acid	<2		
DUP2	310-153107-A-6	Plastic 250ml - with Nitric Acid	<2		
OUP2	310-153107-B-6	Plastic 250ml - w/nitric - dis	<2		
OUP2	310-153107-E-6	Plastic 1 liter - Nitric Acid (diss)	<2		
DUP2	310-153107-F-6	Plastic 1 liter - Nitric Acid (diss)	<2		
DUP2	310-153107-G-6	Plastic 1 liter - Nitric Acid	<2		******
DUP2	310-153107-H-6	Plastic 1 liter - Nitric Acid	<2	-	
4W3D	310-153107-A-7	Plastic 250ml - with Nitric Acid	<2		
Page 1 of 2					

Client Sample ID	<u>Lab ID</u>	Container Type	Container pH	Added (mls)	Lot#
MW3D	310-153107-C-7	Plastic 1 liter - Nitric Acid	<2		
MW3D	310-153107-D-7	Plastic 1 liter - Nitric Acid	<2		
MW4D	310-153107-A-8	Plastic 250ml - with Nitric Acid	<2		
MW4D	310-153107-C-8	Plastic 1 liter - Nitric Acid	<2		
MW4D	310-153107-D-8	Plastic 1 liter - Nitric Acid	<2		
MW9D	310-153107-A-9	Plastic 250ml - with Nitric Acid	<2		
MW9D	310-153107-C-9	Plastic 1 liter - Nitric Acid	<2		
MW9D	310-153107-D-9	Plastic 1 liter - Nitric Acid	<2		-

Client: Omaha Public Power District Job Number: 310-153107-2

Login Number: 153107 List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Spoerre, Autumn R

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <a href="fembeddings">66mm (1/4").</a>	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client: Omaha Public Power District

Job Number: 310-153107-2

Login Number: 153107

List Number: 2

Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 04/16/19 03:37 PM

oreator. Tremm, who have		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	20.0

True True

True

True

N/A

N/A

True

N/A

Cooler Temperature is recorded.	True
COC is present.	True
COC is filled out in ink and legible.	True
COC is filled out with all pertinent information.	True
Is the Field Sampler's name present on COC?	N/A
There are no discrepancies between the containers received and the COC.	True
Samples are received within Holding Time (excluding tests with immediate HTs)	True
Sample containers have legible labels.	True
Containers are not broken or leaking.	True
Sample collection date/times are provided.	True

There is sufficient vol. for all requested analyses, incl. any requested

Containers requiring zero headspace have no headspace or bubble is

1

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Appropriate sample containers are used.

Sample bottles are completely filled. Sample Preservation Verified.

Multiphasic samples are not present.

Residual Chlorine Checked.

Samples do not require splitting or compositing.

MS/MSDs

<6mm (1/4").

Job ID: 310-153107-2

Project/Site: Nebraska City Unit 1 CCR

Client: Omaha Public Power District

Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water Prep Type: Total/NA

<u> </u>			Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	
310-153107-1	MW2	93.5	
310-153107-2	MW3	94.4	
310-153107-3	MW4	94.6	
310-153107-4	MW9	94.6	
310-153107-5	DUP1	92.1	
310-153107-6	DUP2	93.2	
Tracer/Carrier Leg	gend		
Ba Carrier = Ba Ca	rrier		

**Method: 9315 - Radium-226 (GFPC)** 

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
LCS 160-430963/1-A	Lab Control Sample	100	
LCSD 160-430963/2-A	Lab Control Sample Dup	101	
MB 160-430963/18-A	Method Blank	105	
Tracer/Carrier Legenc	i		
Ba Carrier = Ba Carrier	•		

Method: 9320 - Radium-228 (GFPC)

Matrix: Ground Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
310-153107-1	MW2	93.5	79.6	
310-153107-2	MW3	94.4	81.5	
310-153107-3	MW4	94.6	79.6	
310-153107-4	MW9	94.6	79.6	
310-153107-5	DUP1	92.1	80.0	
310-153107-6	DUP2	93.2	82.2	
Tracer/Carrier Lege	end			
Ba Carrier = Ba Car	rier			
Y Carrier = Y Carrie	r			

**Method: 9320 - Radium-228 (GFPC)** 

Matrix: Water Prep Type: Total/NA

<b>Lab Sample ID</b> LCS 160-430972/1-A LCSD 160-430972/2-A MB 160-430972/18-A	Client Sample ID Lab Control Sample Lab Control Sample Dup Method Blank	Ba Carrier (40-110) 100 101 105	Y Carrier (40-110) 77.8 80.4 82.2	Percent Yield (Acceptance Limits)
Tracer/Carrier Legend				
Ba Carrier = Ba Carrier				
Y Carrier = Y Carrier				

Eurofins TestAmerica, Cedar Falls

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7/22/2019 (Rev. 1)

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<u> 13</u>



# **Environment Testing TestAmerica**

# **ANALYTICAL REPORT**

Eurofins TestAmerica, Cedar Falls 3019 Venture Way Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-167718-1

Client Project/Site: Nebraska City Unit 1 CCR/Landfill

#### For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 10/30/2019 1:51:26 PM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

LINKS .....

Review your project results through

Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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#### **Case Narrative**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-1

Job ID: 310-167718-1

Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative** 

Job Narrative 310-167718-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/17/2019 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7° C.

#### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

J-1077 10-1

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4.0

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# **Sample Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-167718-1	MW11	Water	10/16/19 11:43	10/17/19 09:15	
310-167718-2	MW14	Water	10/16/19 10:59	10/17/19 09:15	

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# **Detection Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Client Sample ID: MW11 Lab Sample ID: 310-167718-1

Analyte	Result	Qualifier RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	15.3	5.00		mg/L	5	_	9056A	Total/NA
Fluoride	0.558	0.500		mg/L	5		9056A	Total/NA
Sulfate	164	5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00497	0.00200		mg/L	1		6020A	Total/NA
Barium	0.255	0.00200		mg/L	1		6020A	Total/NA
Boron	1.53	0.200		mg/L	1		6020A	Total/NA
Calcium	132	0.500		mg/L	1		6020A	Total/NA
Cobalt	0.00305	0.000500		mg/L	1		6020A	Total/NA
Lithium	0.0201	0.0100		mg/L	1		6020A	Total/NA
Molybdenum	0.0120	0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	608	60.0		mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW14

Lab Sample ID: 310-167718-2

Analyte	Result	Qualifier RL	MDL	Unit	Dil Fac	D Method	Prep Type
Chloride	6.99	5.00		mg/L	5	9056A	Total/NA
Sulfate	24.2	5.00		mg/L	5	9056A	Total/NA
Arsenic	0.0893	0.00200		mg/L	1	6020A	Total/NA
Barium	0.359	0.00200		mg/L	1	6020A	Total/NA
Boron	0.272	0.200		mg/L	1	6020A	Total/NA
Calcium	155	0.500		mg/L	1	6020A	Total/NA
Cobalt	0.00265	0.000500		mg/L	1	6020A	Total/NA
Lithium	0.0528	0.0100		mg/L	1	6020A	Total/NA
Total Dissolved Solids	600	60.0		mg/L	1	SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

10/30/2019

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Job ID: 310-167718-1

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# **Client Sample Results**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Client Sample ID: MW11 Lab Sample ID: 310-167718-1

Matrix: Water

Job ID: 310-167718-1

Date Collected: 10/16/19 11:43 Date Received: 10/17/19 09:15

**General Chemistry** 

**Total Dissolved Solids** 

Analyte

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15.3		5.00		mg/L			10/22/19 09:09	5
Fluoride	0.558		0.500		mg/L			10/22/19 09:09	5
Sulfate	164		5.00		mg/L			10/22/19 09:09	5
Method: 6020A - Metals (ICP/MS)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 20:06	1
Arsenic	0.00497		0.00200		mg/L		10/18/19 08:00	10/21/19 20:06	1
Barium	0.255		0.00200		mg/L		10/18/19 08:00	10/21/19 20:06	1
Beryllium	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 20:06	1
Boron	1.53		0.200		mg/L		10/18/19 08:00	10/21/19 20:06	1
Cadmium	<0.000100		0.000100		mg/L		10/18/19 08:00	10/21/19 20:06	1
Calcium	132		0.500		mg/L		10/18/19 08:00	10/21/19 20:06	1
Chromium	<0.00500		0.00500		mg/L		10/18/19 08:00	10/21/19 20:06	1
Cobalt	0.00305		0.000500		mg/L		10/18/19 08:00	10/21/19 20:06	1
Lithium	0.0201		0.0100		mg/L		10/18/19 08:00	10/21/19 20:06	1
Lead	<0.000500		0.000500		mg/L		10/18/19 08:00	10/21/19 20:06	1
Molybdenum	0.0120		0.00200		mg/L		10/18/19 08:00	10/21/19 20:06	1
Selenium	<0.00500		0.00500		mg/L		10/18/19 08:00	10/21/19 20:06	1
Thallium	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 20:06	1
Method: 7470A - Mercury (CVAA)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/23/19 13:26	10/24/19 12:53	1

RL

60.0

MDL Unit

mg/L

D

Prepared

Analyzed

10/23/19 12:25

Result Qualifier

608

Eurofins TestAmerica, Cedar Falls

A

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12 12

Dil Fac

### **Client Sample Results**

Client: Omaha Public Power District

Analyte

**Total Dissolved Solids** 

Project/Site: Nebraska City Unit 1 CCR/Landfill

Client Sample ID: MW14 Lab Sample ID: 310-167718-2

Date Collected: 10/16/19 10:59 Date Received: 10/17/19 09:15

**Matrix: Water** 

Job ID: 310-167718-1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.99		5.00		mg/L			10/22/19 09:26	- 5
Fluoride	< 0.500		0.500		mg/L			10/22/19 09:26	5
Sulfate	24.2		5.00		mg/L			10/22/19 09:26	5
Method: 6020A - Metals (ICP/MS) Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 20:11	1
Arsenic	0.0893		0.00200		mg/L		10/18/19 08:00	10/21/19 20:11	1
Barium	0.359		0.00200		mg/L		10/18/19 08:00	10/21/19 20:11	1
Beryllium	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 20:11	1
Boron	0.272		0.200		mg/L		10/18/19 08:00	10/21/19 20:11	1
Cadmium	<0.000100		0.000100		mg/L		10/18/19 08:00	10/21/19 20:11	1
Calcium	155		0.500		mg/L		10/18/19 08:00	10/21/19 20:11	1
Chromium	<0.00500		0.00500		mg/L		10/18/19 08:00	10/21/19 20:11	1
Cobalt	0.00265		0.000500		mg/L		10/18/19 08:00	10/21/19 20:11	1
Lithium	0.0528		0.0100		mg/L		10/18/19 08:00	10/21/19 20:11	1
Lead	<0.000500		0.000500		mg/L		10/18/19 08:00	10/21/19 20:11	1
Molybdenum	<0.00200		0.00200		mg/L		10/18/19 08:00	10/21/19 20:11	1
Selenium	<0.00500		0.00500		mg/L		10/18/19 08:00	10/21/19 20:11	1
Thallium	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 20:11	1
Method: 7470A - Mercury (CVAA)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/23/19 13:26	10/24/19 12:55	1

RL

60.0

MDL Unit

mg/L

D

Prepared

Analyzed

10/23/19 12:25

Result Qualifier

600

Dil Fac

### **Definitions/Glossary**

Client: Omaha Public Power District

Job ID: 310-167718-1

Project/Site: Nebraska City Unit 1 CCR/Landfill

#### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

10/30/2019

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-1

### Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-258135/3

**Matrix: Water** 

Analysis Batch: 258135

Client Sample ID: Method Blank

Prep Type: Total/NA

мв мв MDL Unit Dil Fac Analyte Result Qualifier RL Prepared Analyzed Chloride 1.00 10/22/19 04:39 <1.00 mg/L Fluoride <0.100 0.100 mg/L 10/22/19 04:39 Sulfate <1.00 1.00 mg/L 10/22/19 04:39

Lab Sample ID: LCS 310-258135/4

**Matrix: Water** 

Analysis Batch: 258135

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	 10.0	10.05		mg/L		100	90 - 110	
Fluoride	2.00	2.051		mg/L		103	90 - 110	
Sulfate	10.0	10.12		mg/L		101	90 - 110	

#### Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-257296/1-A

**Matrix: Water** 

Analysis Batch: 257738

Client Sample ID: Method Blank

Prep Type: Total/NA

**Prep Batch: 257296** 

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 19:08	1
Arsenic	<0.00200		0.00200		mg/L		10/18/19 08:00	10/21/19 19:08	1
Barium	<0.00200		0.00200		mg/L		10/18/19 08:00	10/21/19 19:08	1
Beryllium	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 19:08	1
Boron	<0.200		0.200		mg/L		10/18/19 08:00	10/21/19 19:08	1
Cadmium	<0.000100		0.000100		mg/L		10/18/19 08:00	10/21/19 19:08	1
Calcium	<0.500		0.500		mg/L		10/18/19 08:00	10/21/19 19:08	1
Chromium	<0.00500		0.00500		mg/L		10/18/19 08:00	10/21/19 19:08	1
Cobalt	<0.000500		0.000500		mg/L		10/18/19 08:00	10/21/19 19:08	1
Lithium	<0.0100		0.0100		mg/L		10/18/19 08:00	10/21/19 19:08	1
Lead	<0.000500		0.000500		mg/L		10/18/19 08:00	10/21/19 19:08	1
Molybdenum	<0.00200		0.00200		mg/L		10/18/19 08:00	10/21/19 19:08	1
Selenium	<0.00500		0.00500		mg/L		10/18/19 08:00	10/21/19 19:08	1
Thallium	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 19:08	1

Lab Sample ID: LCS 310-257296/2-A

**Matrix: Water** 

Analysis Batch: 257738

Client Sample ID: Lab Control Sample

Prep Type: Total/NA Prep Batch: 257296

Spike LCS LCS %Rec. Added Result Qualifier D %Rec Limits Analyte Unit Antimony 0.0400 0.03297 mg/L 82 80 - 120 Arsenic 0.0800 0.07551 mg/L 94 80 - 120 Barium 0.0800 0.08431 105 80 - 120 mg/L Beryllium 0.0400 0.04271 107 80 - 120 mg/L Boron 1.758 mg/L 80 - 120 1.76 100 Cadmium 0.0400 0.04368 mg/L 109 80 - 120 Calcium 4.00 4.522 mg/L 113 80 - 120 Chromium 0.0800 0.08580 mg/L 107 80 - 120 0.0400 Cobalt 0.04271 mg/L 107 80 - 120

Eurofins TestAmerica, Cedar Falls

10/30/2019

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Job ID: 310-167718-1

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-257296/2-A

Analysis Batch: 257738

Client Sample ID: Lab Control Sample **Matrix: Water** Prep Type: Total/NA

**Prep Batch: 257296** 

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Lithium	0.200	0.1996		mg/L		100	80 - 120	
Lead	0.0400	0.04276		mg/L		107	80 - 120	
Molybdenum	0.0800	0.07243		mg/L		91	80 - 120	
Selenium	0.0800	0.08048		mg/L		101	80 - 120	
Thallium	0.0320	0.03341		mg/L		104	80 - 120	

Lab Sample ID: 310-167718-1 DU Client Sample ID: MW11

**Matrix: Water** 

Analysis Batch: 257738

Prep Type: Total/NA

**Prep Batch: 257296** 

	Sample	Sample	DU	DU				RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D	RPD	Limit
Antimony	<0.00100		<0.00100		mg/L		NC	20
Arsenic	0.00497		0.004711		mg/L		5	20
Barium	0.255		0.2374		mg/L		7	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Boron	1.53		1.456		mg/L		5	20
Cadmium	<0.000100		<0.000100		mg/L		NC	20
Calcium	132		121.9		mg/L		8	20
Chromium	<0.00500		<0.00500		mg/L		NC	20
Cobalt	0.00305		0.002775		mg/L		10	20
Lithium	0.0201		0.01784		mg/L		12	20
Lead	<0.000500		<0.000500		mg/L		NC	20

0.01097

< 0.00500

< 0.00100

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-257977/1-A

**Matrix: Water** 

Molybdenum

Selenium

Thallium

Analysis Batch: 258195

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

9

NC

NC

20

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Prep Batch: 257977

Analyte Result Qualifier MDL Unit Prepared Analyzed Dil Fac <0.000200 0.000200 mg/L 10/23/19 13:26 Mercury 10/24/19 12:38

Lab Sample ID: LCS 310-257977/2-A

**Matrix: Water** 

Analysis Batch: 258195

mg/L

mg/L

mg/L

Prep Type: Total/NA

Prep Batch: 257977

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit %Rec Limits 0.00167 0.001528 Mercury mg/L 92 80 - 120

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-257962/1

**Matrix: Water** 

Analysis Batch: 257962

Client Sample ID: Method Blank

Prep Type: Total/NA

MB MB

мв мв

0.0120

< 0.00500

<0.00100

Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Total Dissolved Solids <30.0 30.0 10/23/19 12:25 mg/L

Eurofins TestAmerica, Cedar Falls

10/30/2019

### **QC Sample Results**

Client: Omaha Public Power District

Job ID: 310-167718-1

Project/Site: Nebraska City Unit 1 CCR/Landfill

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 310-257962/2 **Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA** 

Analysis Batch: 257962

Spike LCS LCS %Rec. Analyte Added Result Qualifier %Rec Limits Unit Total Dissolved Solids 1000 988.0 mg/L 99 90 - 110

Lab Sample ID: 310-167718-1 DU Client Sample ID: MW11 Prep Type: Total/NA

**Matrix: Water** 

Analysis Batch: 257962

	Sample	Sample	DU	DU				RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D	RPD	Limit
Total Dissolved Solids	608		532.0		mg/L		 13	24

# **QC Association Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-1

#### HPLC/IC

#### Analysis Batch: 258135

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method Prep Batch
310-167718-1	MW11	Total/NA	Water	9056A
310-167718-2	MW14	Total/NA	Water	9056A
MB 310-258135/3	Method Blank	Total/NA	Water	9056A
LCS 310-258135/4	Lab Control Sample	Total/NA	Water	9056A

#### **Metals**

#### **Prep Batch: 257296**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method Prep Batch
310-167718-1	MW11	Total/NA	Water	3010A
310-167718-2	MW14	Total/NA	Water	3010A
MB 310-257296/1-A	Method Blank	Total/NA	Water	3010A
LCS 310-257296/2-A	Lab Control Sample	Total/NA	Water	3010A
310-167718-1 DU	MW11	Total/NA	Water	3010A

#### Analysis Batch: 257738

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167718-1	MW11	Total/NA	Water	6020A	257296
310-167718-2	MW14	Total/NA	Water	6020A	257296
MB 310-257296/1-A	Method Blank	Total/NA	Water	6020A	257296
LCS 310-257296/2-A	Lab Control Sample	Total/NA	Water	6020A	257296
310-167718-1 DU	MW11	Total/NA	Water	6020A	257296

#### **Prep Batch: 257977**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167718-1	MW11	Total/NA	Water	7470A	
310-167718-2	MW14	Total/NA	Water	7470A	
MB 310-257977/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-257977/2-A	Lab Control Sample	Total/NA	Water	7470A	

#### Analysis Batch: 258195

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167718-1	MW11	Total/NA	Water	7470A	257977
310-167718-2	MW14	Total/NA	Water	7470A	257977
MB 310-257977/1-A	Method Blank	Total/NA	Water	7470A	257977
LCS 310-257977/2-A	Lab Control Sample	Total/NA	Water	7470A	257977

### **General Chemistry**

#### Analysis Batch: 257962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167718-1	MW11	Total/NA	Water	SM 2540C	- <u> </u>
310-167718-2	MW14	Total/NA	Water	SM 2540C	
MB 310-257962/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-257962/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-167718-1 DU	MW11	Total/NA	Water	SM 2540C	

Eurofins TestAmerica, Cedar Falls

10/30/2019

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#### **Lab Chronicle**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

**Client Sample ID: MW11** Lab Sample ID: 310-167718-1

Date Collected: 10/16/19 11:43 Matrix: Water

Date Received: 10/17/19 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	258135	10/22/19 09:09	CJT	TAL CF
Total/NA	Prep	3010A			257296	10/18/19 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	257738	10/21/19 20:06	SAD	TAL CF
Total/NA	Prep	7470A			257977	10/23/19 13:26	HIS	TAL CF
Total/NA	Analysis	7470A		1	258195	10/24/19 12:53	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	257962	10/23/19 12:25	MDK	TAL CF

Client Sample ID: MW14 Lab Sample ID: 310-167718-2 Date Collected: 10/16/19 10:59 Matrix: Water

Date Received: 10/17/19 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	258135	10/22/19 09:26	CJT	TAL CF
Total/NA	Prep	3010A			257296	10/18/19 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	257738	10/21/19 20:11	SAD	TAL CF
Total/NA	Prep	7470A			257977	10/23/19 13:26	HIS	TAL CF
Total/NA	Analysis	7470A		1	258195	10/24/19 12:55	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	257962	10/23/19 12:25	MDK	TAL CF

Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Job ID: 310-167718-1

### **Accreditation/Certification Summary**

Client: Omaha Public Power District

Job ID: 310-167718-1

Project/Site: Nebraska City Unit 1 CCR/Landfill

#### Laboratory: Eurofins TestAmerica, Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	Industrial Hygiene Laboratory	101044	11-01-20
	Accreditation Program (IHLAP)		
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-20
Georgia	State	IA100001 (OR)	09-29-20
Illinois	NELAP	200024	11-29-19
Iowa	State	007	12-01-19
Kansas	NELAP	E-10341	01-31-20
Minnesota	NELAP	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	3349	08-22-21
Oregon	NELAP	IA100001	09-29-20
USDA	US Federal Programs	P330-19-00003	01-02-22

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### **Method Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

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Environment Testing TestAmerica



### Cooler/Sample Receipt and Temperature Log Form

	Per de la companya de		Nine (2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
Client Information				
Client: Omak	19 Pub	Tural P	ower Brist	
City/State: CITY	, Na	NF-	Project:	
Receipt Information				
Date/Time Received:	0/17/19	D9K	Received By:	
Delivery Type: UPS	FedEx		FedEx Ground US Mail Spee-Dee	
☐ Lab C	ourier 🗌 Lab Fie	ld Services [	Client Drop-off Other:	
Condition of Cooler/Conta	iners			
Sample(s) received in Co	oler? Yes	□No	If yes: Cooler ID:	
Multiple Coolers?	☐ Yes	₽No	If yes: Cooler # of	
Cooler Custody Seals Pre	esent? Yes	□No	If yes: Cooler custody seals intact? ☐ Yes ☐ No	
Sample Custody Seals Pr	esent? Yes	No	If yes: Sample custody seals intact?☐ Yes ☐ No	
Trip Blank Present?	☐ Yes	No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record				
Coolant: Wet ice	☐ Blue ice	☐ Dry ice	☐ Other:	
Thermometer ID:	0		Correction Factor (°C):	
• Temp Blank Temperature	- If no temp blank, or	temp blank tem	perature above criteria, proceed to Sample Container Temperature	
Uncorrected Temp (°C):	()	7	Corrected Temp (°C):	
<ul> <li>Sample Container Tempe</li> </ul>	rature			
Container(s) used:	CONTAINER 1		CONTAINER 2	
Uncorrected Temp (°C):				
Corrected Temp (°C):				
Exceptions Noted				
1) If temperature exceeds criteria, was sample(s) received same day of sampling?    Yes   No   Yes   No   No				
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?)				
Note: If yes, contact PM before proceeding. If no, proceed with login				
Additional Comments				
			*	

Document: CF-LG-WI-002

Revision: 25 Date: 06/17/2019 General temperature criteria is 0 to  $6^{\circ}\text{C}$  Bacteria temperature criteria is 0 to  $10^{\circ}\text{C}$ 

**TestAmerica** TestAmerica Omaha SC

THE LEADER IN ENVIRONMENTAL TESTING

Chain of Custody Record

Cedar Falls, IA 50613 Phone (319) 277-2401 Fax (319) 277-2425

**TestAmerica Cedar Falls** 

704 Enterprise Drive

S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify) Special Instructions/Note: See attached list for specific analysis. See attached list for specific analysis. N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2SO3 See attached list for specific at Months Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) Preservation Codes Oges F - MeOH G - Amchlor H - Ascorbic Acid 205 A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4 J - DI Water K - EDTA L - EDA COC No: Archive For Date/Time: 10-19 Date/Time: 0-[7-(9] Date/Time: Total Number of containers Method of Shipment: arrier Tracking No(s) Disposal By Lab **Analysis Requested** Cooler Temperature(s) C and Other Remarks Special Instructions/QC Requirements shawn.hayes@testamericainc.com Return To Client 3 × × N 3315 and 9320 Radium 226+228 Combined ed by B × × 540C TDS, 9056A Chloride, Fluoride, Sulfate Hayes, Shawn M 5020A Total Metals CCR/Title Attached CCR/Title 132 List M × × Z 0 Time: Z z Lab PM: Company Euro E-Mail: 3 Preservation Code: Matrix M 2 T 3 Radiological (C=comp, G=grab) Sample 死 K O 3 di. 0 5,05 Sample 11:43 10.53 Time Date: Unknown TAT Requested (days): Date/Time: Due Date Requested: estAmerica Project # (531) 226-2515 Sample Date Kyle K. Uhing 6/10/10/ 6/19/10 31007559 SSOW#: Poison B Skin Irritant Deliverable Requested: I, II, III, IV, Other (specify) Custody Seal No.: Vebraska City Station Unit 1 CCR/Landfill Non-Hazard Hammable 444 South 16th Street Mall 9E/EP1 Possible Hazard Identification Omaha Public Power District Nebraska City Station Unit Empty Kit Relinquished by: Custody Seals Intact: Client Information Sample Identification State, Zip: NE, 68102-2247 (531) 226-2515 detalman PANNED drhown a Kyle Uhing Omaha MW11 MW14

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- Total metals: antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lead, lithium, molybdenum, selenium, and thallium via USEPA Method 6020A
- Radium 226+228 Combined via USEPA Method 9315 and 9320
- Mercury via USEPA Method 7470A
- TDS via SM 2540C
- Chloride, fluoride, and sulfate via USEPA Method 9056A

10/17/2019

# Login Container Summary Report 310-167718

Temperature readings:

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot#
MW11	310-167718-A-1	Plastic 250ml - with Nitric Acid	<2		
MW11	310-167718-C-1	Plastic 1 liter - Nitric Acid	<2		
MW11	310-167718-D-1	Plastic 1 liter - Nitric Acid	<2		
MW14	310-167718-A-2	Plastic 250ml - with Nitric Acid	<2		
MW14	310-167718-C-2	Plastic 1 liter - Nitric Acid	<2		
MW14	310-167718-D-2	Plastic 1 liter - Nitric Acid	<2		

Client: Omaha Public Power District

Job Number: 310-167718-1

Login Number: 167718

List Number: 1

Creator: Bovy, Lorrainna L

List Source: Eurofins TestAmerica, Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey neter.</td <td>N/A</td> <td></td>	N/A	
he cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or ampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
here are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
here is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is 6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Cedar Falls



# **Environment Testing TestAmerica**

# **ANALYTICAL REPORT**

Eurofins TestAmerica, Cedar Falls 3019 Venture Way Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-167718-2

Client Project/Site: Nebraska City Unit 1 CCR/Landfill

For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 11/22/2019 9:05:38 AM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

----- LINKS -----

**Review your project** results through Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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#### **Case Narrative**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-2

Job ID: 310-167718-2

Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative** 

Job Narrative 310-167718-2

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/17/2019 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.7° C.

#### **RAD**

Method PrecSep\_0: Radium 228 Prep Batch 160-447622:

The following samples had light yellow discoloration: MW14 (310-167718-2).

Method PrecSep-21: Radium 226 Prep Batch 160-447621:

The following samples had light yellow discoloration: MW14 (310-167718-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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## **Sample Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Lab Sample ID Client Sample ID Matrix Collected Received Asset ID 310-167718-1 MW11 Water 10/16/19 11:43 10/17/19 09:15 310-167718-2 MW14 Water 10/16/19 10:59 10/17/19 09:15

Job ID: 310-167718-2

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## **Client Sample Results**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

**Client Sample ID: MW11** Lab Sample ID: 310-167718-1

Date Collected: 10/16/19 11:43 **Matrix: Water** Date Received: 10/17/19 09:15

Method: 9315 - Radium-226 (GFPC) Total Count Uncert. Uncert. Analyte Result Qualifier MDC Unit (2σ+/-) (2σ+/-) RL Prepared Analyzed Dil Fac

Radium-226 0.0608 U 1.00 0.138 pCi/L 10/24/19 17:52 11/15/19 14:32 0.0821 0.0823 Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 90.4 40 - 110 10/24/19 17:52 11/15/19 14:32

Method: 9320 - Radium-228 (GFPC) Count Total Uncert. Uncert. Result Qualifier (2σ+/-) Analyte (2σ+/-) RL MDC Unit Prepared Analyzed Dil Fac 0.272 1.00 0.377 pCi/L 10/24/19 18:25 11/06/19 08:57 0.266 Radium-228 0.624 Carrier Qualifier Limits Prepared Analyzed Dil Fac %Yield Ba Carrier 90.4 40 - 110 10/24/19 18:25 11/06/19 08:57 40 - 110 10/24/19 18:25 11/06/19 08:57 Y Carrier 84.9

Method: Ra226 Ra228 - Combined Radium-226 and Radium-228 Uncert. Uncert. Analyte Result Qualifier Prepared  $(2\sigma + / -)$  $(2\sigma + / -)$ RL MDC Unit Analyzed Dil Fac 0.684 Combined Radium 0.278 0.284 5.00 0.377 pCi/L 11/22/19 08:16

226 + 228

Job ID: 310-167718-2

## **Client Sample Results**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

**Client Sample ID: MW14** Lab Sample ID: 310-167718-2

Date Collected: 10/16/19 10:59 Date Received: 10/17/19 09:15

**Matrix: Water** 

Job ID: 310-167718-2

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.515		0.154	0.161	1.00	0.160	pCi/L	10/24/19 17:52	11/15/19 14:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.5		40 - 110					10/24/19 17:52	11/15/19 14:32	1

Method: 9320 - Rad	ium-228 (GFF	PC)								
	•	•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.30		0.354	0.373	1.00	0.444	pCi/L	10/24/19 18:25	11/06/19 08:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.5		40 - 110					10/24/19 18:25	11/06/19 08:57	1
Y Carrier	86.4		40 - 110					10/24/19 18:25	11/06/19 08:57	1

Method: Ra226_Ra2	28 - Combine	ed Radium	-226 and Rad	ium-228						
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	1.81		0.386	0.406	5.00	0.444	pCi/L		11/22/19 08:16	1

### **Definitions/Glossary**

Client: Omaha Public Power District

Job ID: 310-167718-2 Project/Site: Nebraska City Unit 1 CCR/Landfill

**Qualifiers** 

Rad

Qualifier **Qualifier Description** 

Result is less than the sample detection limit.

**Glossary** 

Abbreviation These commonly used abbreviations may or may not be present in this report.

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery CFL Contains Free Liquid Contains No Free Liquid **CNF** 

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin) Limit of Detection (DoD/DOE) LOD Limit of Quantitation (DoD/DOE) LOQ

MDA Minimum Detectable Activity (Radiochemistry) MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit Minimum Level (Dioxin) ML

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

**Quality Control** QC

**RER** Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) Toxicity Equivalent Quotient (Dioxin) TEQ

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-2

## Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-447621/20-A

**Matrix: Water** 

Analysis Batch: 450674

Analysis Batch: 450674

Client Sample ID: Method Blank

Prep Type: Total/NA

**Prep Batch: 447621** 

**Prep Batch: 447621** 

			Oount	iotai							
	MB	MB	Uncert.	Uncert.							
analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit		Prepared	Analyzed	Dil Fac
Radium-226	-0.03233	U	0.0605	0.0606	1.00	0.136	pCi/L		10/24/19 17:52	11/15/19 16:36	1
		nalyte Result	nalyte Result Qualifier	MB Uncert.  nalyte Result Qualifier (2σ+/-)	MB Uncert. Uncert. unalyte Result Qualifier (2σ+/-) (2σ+/-)	MB MB Uncert. Uncert.  Inalyte Result Qualifier (2σ+/-) (2σ+/-) RL	MB MB Uncert. Uncert.  analyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC	MB MB Uncert. Uncert.  nalyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC Unit	MB MB Uncert. Uncert.  analyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC Unit	MB MB Uncert. Uncert.  Analyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC Unit Prepared	MB MB Uncert. Uncert.  analyte Result Qualifier (2σ+/-) (2σ+/-) RL MDC Unit Prepared Analyzed

Total

Count

MB MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac 11/15/19 16:36 10/24/19 17:52 Ba Carrier 89 8 40 - 110

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 160-447621/1-A **Matrix: Water** Prep Type: Total/NA

Total Spike LCS LCS Uncert. %Rec. Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits Radium-226 10.32 1.09 1.00 75 - 125 11.4 0.142 pCi/L

> LCS LCS %Yield Qualifier Limits 40 - 110 92.5

> > MB MB

9.42

#### Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-447622/20-A

**Matrix: Water** 

Carrier

Ba Carrier

Analysis Batch: 449305

Client Sample ID: Method Blank

Prep Type: Total/NA **Prep Batch: 447622** 

			Count	Total						
	MB	MB	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1328	U	0.248	0.249	1.00	0.422	pCi/L	10/24/19 18:25	11/06/19 09:02	1

Carrier Qualifier Prepared Dil Fac %Yield Limits Analyzed Ba Carrier 10/24/19 18:25 89.8 40 - 110 11/06/19 09:02 Y Carrier 87.5 40 - 110 10/24/19 18:25 11/06/19 09:02

1.19

1.00

0.384

pCi/L

Lab Sample ID: LCS 160-447622/1-A

**Matrix: Water** 

Radium-228

Analysis Batch: 449235

Client Sample ID: Lab Control Sample

75 - 125

112

Prep Type: Total/NA **Prep Batch: 447622** 

Total Spike LCS LCS %Rec. Uncert. Limits Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec

10.53

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 92.5 40 - 110 89.3 40 - 110 Y Carrier

11/22/2019

## **QC Association Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-2

## Rad

### **Prep Batch: 447621**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167718-1	MW11	Total/NA	Water	PrecSep-21	
310-167718-2	MW14	Total/NA	Water	PrecSep-21	
MB 160-447621/20-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-447621/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

## **Prep Batch: 447622**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167718-1	MW11	Total/NA	Water	PrecSep_0	
310-167718-2	MW14	Total/NA	Water	PrecSep_0	
MB 160-447622/20-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-447622/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

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1 1

4.0

#### **Lab Chronicle**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Analysis

Ra226 Ra228

**Client Sample ID: MW11** Lab Sample ID: 310-167718-1 Date Collected: 10/16/19 11:43

Matrix: Water

Job ID: 310-167718-2

Date Received: 10/17/19 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			447621	10/24/19 17:52	ORM	TAL SL
Total/NA	Analysis	9315		1	450674	11/15/19 14:32	SCB	TAL SL
Total/NA	Prep	PrecSep_0			447622	10/24/19 18:25	ORM	TAL SL
Total/NA	Analysis	9320		1	449235	11/06/19 08:57	KLS	TAL SL

Client Sample ID: MW14 Lab Sample ID: 310-167718-2

Date Collected: 10/16/19 10:59

451578 11/22/19 08:16

SMP

TAL SL

**Matrix: Water** Date Received: 10/17/19 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			447621	10/24/19 17:52	ORM	TAL SL
Total/NA	Analysis	9315		1	450674	11/15/19 14:32	SCB	TAL SL
Total/NA	Prep	PrecSep_0			447622	10/24/19 18:25	ORM	TAL SL
Total/NA	Analysis	9320		1	449235	11/06/19 08:57	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	451578	11/22/19 08:16	SMP	TAL SL

Laboratory References:

Total/NA

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

## **Accreditation/Certification Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-2

### Laboratory: Eurofins TestAmerica, Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	Industrial Hygiene Laboratory	101044	11-01-20
	Accreditation Program (IHLAP)		
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-20
Georgia	State	IA100001 (OR)	09-29-20
Illinois	NELAP	200024	11-29-19
lowa	State	007	12-01-19
Kansas	NELAP	E-10341	01-31-20
Minnesota	NELAP	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	3349	08-22-21
Oregon	NELAP	IA100001	09-29-20
USDA	US Federal Programs	P330-19-00003	01-02-22

#### Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
California	Los Angeles County Sanitation	10259	06-30-20
	Districts		
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-19
lowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	12-01-19

Eurofins TestAmerica, Cedar Falls

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## **Method Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Method **Method Description** Protocol Laboratory 9315 Radium-226 (GFPC) SW846 TAL SL TAL SL Radium-228 (GFPC) SW846 9320 TAL SL Ra226\_Ra228 Combined Radium-226 and Radium-228 TAL-STL PrecSep\_0 Preparation, Precipitate Separation None TAL SL PrecSep-21 Preparation, Precipitate Separation (21-Day In-Growth) None TAL SL

#### Protocol References:

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Job ID: 310-167718-2

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## Environment Testing TestAmerica



10-167718 Chain of Custody

## Cooler/Sample Receipt and Temperature Log Form

Client Information	
Client: Omana Public Power Birist	
City/State: State Project:	
Receipt Information DATE ( TIME	
Date/Time Received: DATE 19/19 TIME Received By: Ce	
Delivery Type: ☐ UPS	)ee
☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:	_
Condition of Cooler/Containers	
Sample(s) received in Cooler? Yes No If yes: Cooler ID:	
Multiple Coolers?	
Cooler Custody Seals Present? Yes No If yes: Cooler custody seals intact? Yes N	0
Sample Custody Seals Present? Yes No If yes: Sample custody seals intact? Yes N	0
Trip Blank Present?	
Temperature Record	
Coolant: Wet ice Blue ice Dry ice Other: NONE	
Thermometer ID: Correction Factor (°C):	
Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature	е
Uncorrected Temp (°C): Corrected Temp (°C):	
Sample Container Temperature  CONTAINER 1  CONTAINER 2	
Container(s) used:  CONTAINER 1  CONTAINER 2	
Uncorrected Temp (°C):	
Corrected Temp (°C):	
Exceptions Noted	575
1) If temperature exceeds criteria, was sample(s) received same day of sampling?	
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?)	
Note: If yes, contact PM before proceeding. If no, proceed with login	19801
Additional Comments	

Document: CF-LG-WI-002

Revision: 25 Date: 06/17/2019 General temperature criteria is 0 to 6°C Bacteria temperature criteria is 0 to 10°C

**TestAmerica** TestAmerica Omaha &C 268

Chain of Custody Record

704 Enterprise Drive Cedar Falls, IA 50613 Phone (319) 277-2401 Fax (319) 277-2425

TestAmerica Cedar Falls

lient Information	Sampler. Kyle K. Uhing		- 3	Hayes	Lab PM: Hayes, Shawn M	Wn M				Carner	Camer Tracking No(s):	s);	8	COC No:			_
ent Contact: vie Uhing	Phone: (531) 226-2515			E-Mail:	t: vn. have	selles	america	E-Mail: shawn haves@testamericaing.com	_				Page:	:01			
yo Oming mpany:	0107-077 (100)			5	2	200		20.00		-			Job #:	*			_
maha Public Power District								Anal	sis Re	Analysis Requested	pe			í			-
idress: 44 South 16th Street Mall 9E/EP1	Due Date Requested	:pe				88							Pre	Preservation Codes:			_
y: maha	TAT Requested (days	ys):				s 'Aino							ė ė o	NaOH Zn Acetate		e 02	
ate, Zp: E, 68102-2247							977						0 00	Nitric Acid NaHSO4		33	
ione: 331) 226-2515	# Od												ĖĠĖ	F - MeOH G - Amchlor H - Ascorbic Acid		R - Na2S2SO3 S - H2SO4 T - TSP Dodecahydrate	_
nail: kuhing@oppd.com	WO#:				(0)									I - Ice J - DI Water			_
oject Name: ebraska City Station Unit 1 CCR/Landfill	TestAmerica Project # 31007559	#1			A 10 E	Jeil !								K - EDTA L - EDA	W - ph 4-5 Z - other (s	(kjpecify)	_
te: ebraska City Station Unit 1	SSOW#:				A) as	itle 132								Other:			
ample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (w=water, S=solld, O=wastsfoll, BT=TISSUG, A=Alt)	Field Filtered : MSM mohe9	6020A Total Met T/ROO bedoettA	9315 and 9320 R						TedmuM latoT	Special	Special Instructions/Note:	s/Note:	
	X	X	Preserva	Preservation Code:			OZ						X	1	X	\/	
Egunva			BRL	*	*	-	A De						4	eattached #	Secretached tist for specific analysis	analysie.	_
griffine			*	10	N	M	18 N							s attached lis	See attached list for specific analysis:	anatysis:	_
CHRAMA			A	N	4	3	18						\$	e-attached-lic	See attached list for apacific analysis.	analysis.	_
granuel			4	MA	*	100	18K 8K						A	a attached lis	stached list for specific analysis	analysis.	_
IW11	10/16/19	Eh:11	9	S. C.	z	×	×						4 Set	e attached lis	See attached list for specific analysis	analysis.	
IW14	10/16/19	10.63	9	W	z	×	×						4. Set	e attached lis	See attached list for specific analysis	analysis.	_
/refin	/ /		M	N. Carlotte	3	N C	ON ON						8	e attached lis	See attached list for epecific analysis	analysis.	T
Identification	2.00				Sar	- Indu	isposa	/ (A fee	may be	assesse	ed if sam	oles are r	stained le	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	1 month)		$\neg$
Non-Hazard Flammable Skin Irritant eliverable Requested: I, II, III, IV, Other (specify)	Poison B Unknown		Radiologica		Spe	Ret	Return To Client al Instructions/QC	Client ns/QC R	Special Instructions/QC Requirements	Disposa ents:	Disposal By Lab		Archive For	For	Months	s	_
mpty Kit Relinquished by:		Date:			Time:		0			2	Method of Shipment:	pment:					1
elinquished by:	Date/Time:	15		Company		Received by:	John Control	1-	N		0		61.0	1505	1	2	T 1
sinquismed by	Date/Time:	1	88	Company Company		Received by:	ed by:	7	7	B	5 6	Oate/Time:	6)-1	Odrs	Company	R	
Custody Seals Intact: Custody Seal No.:						Cooler	Temperal	ure(s) °C a	Cooler Temperature(s) °C and Other Remarks	Remarks:							
								1		1							1

# NC1 CCR/Title132 Sample Analysis (Some Parameters Need Reported Separate From Others [See COCs])

- Total metals: antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lead, lithium, molybdenum, selenium, and thallium via USEPA Method 6020A
- Radium 226+228 Combined via USEPA Method 9315 and 9320
- Mercury via USEPA Method 7470A
- TDS via SM 2540C
- Chloride, fluoride, and sulfate via USEPA Method 9056A

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10/17/2019

## Login Container Summary Report 310-167718

Temperature readings:

Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot#
MW11	310-167718-A-1	Plastic 250ml - with Nitric Acid	<2		
MW11	310-167718-C-1	Plastic 1 liter - Nitric Acid	<2		
MW11	310-167718-D-1	Plastic 1 liter - Nitric Acid	<2		
MW14	310-167718-A-2	Plastic 250ml - with Nitric Acid	<2		
MW14	310-167718-C-2	Plastic 1 liter - Nitric Acid	<2		
MW14	310-167718-D-2	Plastic 1 liter - Nitric Acid	<2		

Client: Omaha Public Power District

Job Number: 310-167718-2

Login Number: 167718

List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Bovy, Lorrainna L

ordator. Bovy, corrumna c	
Question	Answer Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td>	N/A
The cooler's custody seal, if present, is intact.	True
Sample custody seals, if present, are intact.	N/A
The cooler or samples do not appear to have been compromised or tampered with.	True
Samples were received on ice.	True
Cooler Temperature is acceptable.	True
Cooler Temperature is recorded.	True
COC is present.	True
COC is filled out in ink and legible.	True
COC is filled out with all pertinent information.	True
s the Field Sampler's name present on COC?	True
There are no discrepancies between the containers received and the COC.	True
Samples are received within Holding Time (excluding tests with immediate HTs)	True
Sample containers have legible labels.	True
Containers are not broken or leaking.	True
Sample collection date/times are provided.	True
Appropriate sample containers are used.	True
Sample bottles are completely filled.	True
Sample Preservation Verified.	True
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True
Containers requiring zero headspace have no headspace or bubble is <a href="fam:40mm">6mm (1/4")</a> .	True
Multiphasic samples are not present.	True
Samples do not require splitting or compositing.	True
Residual Chlorine Checked.	N/A

Eurofins TestAmerica, Cedar Falls

Client: Omaha Public Power District

Job Number: 310-167718-2

Login Number: 167718 List Source: Eurofins TestAmerica, St. Louis List Number: 2

List Creation: 10/18/19 01:29 PM

Creator: Hellm, Michael

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	22.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Cedar Falls

## **Tracer/Carrier Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR/Landfill

Job ID: 310-167718-2

Method: 9315 - Radium-226 (GFPC)

**Matrix: Water** Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
310-167718-1	MW11	90.4	
310-167718-2	MW14	80.5	
LCS 160-447621/1-A	Lab Control Sample	92.5	
MB 160-447621/20-A	Method Blank	89.8	
Tracer/Carrier Legend			
Ba Carrier = Ba Carrier			

Method: 9320 - Radium-228 (GFPC)

**Matrix: Water** Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
310-167718-1	MW11	90.4	84.9	
310-167718-2	MW14	80.5	86.4	
CS 160-447622/1-A	Lab Control Sample	92.5	89.3	
MB 160-447622/20-A	Method Blank	89.8	87.5	

Ba Carrier = Ba Carrier Y Carrier = Y Carrier

# ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls 3019 Venture Way Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-167720-1

Client Project/Site: Nebraska City Unit1/2 CCR and Landfill

**TestAmerica** 

For:

🗱 eurofins

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 10/30/2019 3:28:35 PM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

LINKS .....

Review your project results through

Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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#### **Case Narrative**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Job ID: 310-167720-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative 310-167720-1

#### Comments

No additional comments.

#### Receipt

The sample was received on 10/17/2019 9:45 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was  $0.0^{\circ}$  C.

#### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Job ID: 310-167720-1

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## **Sample Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-167720-1	NC2MW4	Water	10/15/19 11:16	10/17/19 09:45	

Job ID: 310-167720-1

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## **Detection Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Client Sample ID: NC2MW4

Lab Sample ID: 310-167720-1

Job ID: 310-167720-1

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Chloride	5.38	5.00	mg/L	5	9056A	Total/NA
Sulfate	35.0	5.00	mg/L	5	9056A	Total/NA
Barium	0.390	0.00200	mg/L	1	6020A	Total/NA
Cadmium	0.000138	0.000100	mg/L	1	6020A	Total/NA
Calcium	142	0.500	mg/L	1	6020A	Total/NA
Lithium	0.0343	0.0100	mg/L	1	6020A	Total/NA
Molybdenum	0.00412	0.00200	mg/L	1	6020A	Total/NA
Total Dissolved Solids	528	60.0	mg/L	1	SM 2540C	Total/NA

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## **Client Sample Results**

Client: Omaha Public Power District

**Client Sample ID: NC2MW4** 

Method: 7470A - Mercury (CVAA)

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Lab Sample ID: 310-167720-1

Matrix: Water

Job ID: 310-167720-1

Date Collected: 10/15/19 11:16 Date Received: 10/17/19 09:45

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.38	5.00	mg/L			10/22/19 10:17	5
Fluoride	<0.500	0.500	mg/L			10/22/19 10:17	5
Sulfate	35.0	5.00	mg/L			10/22/19 10:17	5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100	0.0	0100		mg/L		10/18/19 08:00	10/21/19 18:58	
Arsenic	<0.00200	0.0	0200		mg/L		10/18/19 08:00	10/21/19 18:58	
Barium	0.390	0.0	0200		mg/L		10/18/19 08:00	10/21/19 18:58	•
Beryllium	<0.00100	0.0	0100		mg/L		10/18/19 08:00	10/21/19 18:58	
Boron	<0.200	(	0.200		mg/L		10/18/19 08:00	10/21/19 18:58	•
Cadmium	0.000138	0.00	0100		mg/L		10/18/19 08:00	10/21/19 18:58	•
Calcium	142		0.500		mg/L		10/18/19 08:00	10/21/19 18:58	
Chromium	<0.00500	0.0	0500		mg/L		10/18/19 08:00	10/21/19 18:58	•
Cobalt	<0.000500	0.00	0500		mg/L		10/18/19 08:00	10/21/19 18:58	
Lead	<0.000500	0.00	0500		mg/L		10/18/19 08:00	10/21/19 18:58	
Lithium	0.0343	0	.0100		mg/L		10/18/19 08:00	10/21/19 18:58	•
Molybdenum	0.00412	0.0	0200		mg/L		10/18/19 08:00	10/21/19 18:58	•
Selenium	<0.00500	0.0	0500		mg/L		10/18/19 08:00	10/21/19 18:58	· · · · · · · · ·
Thallium	< 0.00100	0.0	0100		mg/L		10/18/19 08:00	10/21/19 18:58	

Analyte Mercury	Result < 0.000200	Qualifier	RL 0.000200	MDL	Unit mg/L	D	Prepared 10/23/19 13:26	Analyzed 10/24/19 12:57	Dil Fac
General Chemistry Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	528		60.0		mg/L			10/18/19 14:14	1

## **Definitions/Glossary**

Client: Omaha Public Power District Job ID: 310-167720-1

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Glossary

These commonly used abbreviations may or may not be present in this report.
Listed under the "D" column to designate that the result is reported on a dry weight basis
Percent Recovery
Contains Free Liquid
Contains No Free Liquid
Duplicate Error Ratio (normalized absolute difference)
Dilution Factor
Detection Limit (DoD/DOE)
Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Data stine (DaD/DOE)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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## QC Sample Results

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-258135/3

**Matrix: Water** 

**Analysis Batch: 258135** 

**Client Sample ID: Method Blank** 

**Prep Type: Total/NA** 

Job ID: 310-167720-1

MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Chloride 1.00 mg/L 10/22/19 04:39 <1.00 Fluoride 0.100 mg/L 10/22/19 04:39 < 0.100 Sulfate 10/22/19 04:39 <1.00 1.00 mg/L

Lab Sample ID: LCS 310-258135/4

**Matrix: Water** 

Analysis Batch: 258135

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit Limits D %Rec Chloride 10.0 10.05 mg/L 100 90 - 110 Fluoride 2.00 2.051 mg/L 103 90 - 110 Sulfate 10.0 10.12 mg/L 101 90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-257291/1-A

**Matrix: Water** 

**Analysis Batch: 257738** 

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 257291

Analysis Daton. 201100								Trep Baten. 207201	
	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100	-	0.00100		mg/L		10/18/19 08:00	10/21/19 17:46	1
Arsenic	<0.00200		0.00200		mg/L		10/18/19 08:00	10/21/19 17:46	1
Barium	<0.00200		0.00200		mg/L		10/18/19 08:00	10/21/19 17:46	1
Beryllium	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 17:46	1
Boron	<0.200		0.200		mg/L		10/18/19 08:00	10/21/19 17:46	1
Cadmium	<0.000100		0.000100		mg/L		10/18/19 08:00	10/21/19 17:46	1
Calcium	<0.500		0.500		mg/L		10/18/19 08:00	10/21/19 17:46	1
Chromium	<0.00500		0.00500		mg/L		10/18/19 08:00	10/21/19 17:46	1
Cobalt	<0.000500		0.000500		mg/L		10/18/19 08:00	10/21/19 17:46	1
Lead	<0.000500		0.000500		mg/L		10/18/19 08:00	10/21/19 17:46	1
Lithium	<0.0100		0.0100		mg/L		10/18/19 08:00	10/21/19 17:46	1
Molybdenum	<0.00200		0.00200		mg/L		10/18/19 08:00	10/21/19 17:46	1
Selenium	<0.00500		0.00500		mg/L		10/18/19 08:00	10/21/19 17:46	1
Thallium	<0.00100		0.00100		mg/L		10/18/19 08:00	10/21/19 17:46	1

Lab Sample ID: LCS 310-257291/2-A

**Matrix: Water** 

Analysis Batch: 257738

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

**Prep Batch: 257291** 

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Antimony	0.0400	0.03317		mg/L		83	80 - 120	
Arsenic	0.0800	0.07489		mg/L		94	80 - 120	
Barium	0.0800	0.08444		mg/L		106	80 - 120	
Beryllium	0.0400	0.04176		mg/L		104	80 - 120	
Boron	1.76	1.733		mg/L		98	80 - 120	
Cadmium	0.0400	0.04273		mg/L		107	80 - 120	
Calcium	4.00	4.432		mg/L		111	80 - 120	
Chromium	0.0800	0.08526		mg/L		107	80 - 120	
Cobalt	0.0400	0.04207		mg/L		105	80 - 120	

Eurofins TestAmerica, Cedar Falls

10/30/2019

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Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Job ID: 310-167720-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-257291/2-A **Matrix: Water** 

**Client Sample ID: Lab Control Sample** 

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Prep Type: Total/NA **Prep Batch: 257291** 

**Analysis Batch: 257738** Spike LCS LCS %Rec. Added Result Qualifier Limits **Analyte** Unit D %Rec Lead 0.0400 0.04257 80 - 120 mg/L 106 Lithium 0.200 mg/L 98 80 - 120 0.1966 Molybdenum 0.0800 0.07061 mg/L 88 80 - 120

0.07899

Thallium 0.0320 0.03374 Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-257977/1-A

**Matrix: Water** 

Selenium

**Analyte** 

Mercury

Analysis Batch: 258195

MB MB

Result Qualifier

Result Qualifier

<30.0

< 0.000200

RL

Spike

Added

0.00167

0.000200

0.0800

**MDL** Unit mg/L

LCS LCS

0.001528

RL

30.0

Result Qualifier

**MDL** Unit

mg/L

mg/L

mg/L

Unit

mg/L

D

Analyzed Dil Fac

Prep Type: Total/NA

Lab Sample ID: LCS 310-257977/2-A

**Matrix: Water** 

**Analysis Batch: 258195** 

**Analyte** 

Mercury

Lab Sample ID: MB 310-257430/1

Method: SM 2540C - Solids, Total Dissolved (TDS)

**Matrix: Water** 

**Analysis Batch: 257430** 

MB MB

Analyte Total Dissolved Solids

Lab Sample ID: LCS 310-257430/2

**Matrix: Water** 

**Total Dissolved Solids** 

**Analysis Batch: 257430** 

Analyte

Prep Batch: 257977

Prepared 10/23/19 13:26 10/24/19 12:38

80 - 120

80 - 120

Client Sample ID: Method Blank

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Prep Batch: 257977

%Rec. %Rec Limits 92 80 - 120

Analyzed

10/18/19 14:14

Client Sample ID: Method Blank

Prep Type: Total/NA

Dil Fac

Prepared

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

LCS LCS Spike %Rec. Added Result Qualifier Unit Limits %Rec 1000 1004 mg/L 100 90 - 110

Eurofins TestAmerica, Cedar Falls

10/30/2019

## **QC Association Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

## HPLC/IC

### **Analysis Batch: 258135**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167720-1	NC2MW4	Total/NA	Water	9056A	
MB 310-258135/3	Method Blank	Total/NA	Water	9056A	
LCS 310-258135/4	Lab Control Sample	Total/NA	Water	9056A	

#### **Metals**

### **Prep Batch: 257291**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167720-1	NC2MW4	Total/NA	Water	3010A	<u> </u>
MB 310-257291/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-257291/2-A	Lab Control Sample	Total/NA	Water	3010A	

### **Analysis Batch: 257738**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167720-1	NC2MW4	Total/NA	Water	6020A	257291
MB 310-257291/1-A	Method Blank	Total/NA	Water	6020A	257291
LCS 310-257291/2-A	Lab Control Sample	Total/NA	Water	6020A	257291

#### **Prep Batch: 257977**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167720-1	NC2MW4	Total/NA	Water	7470A	
MB 310-257977/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-257977/2-A	Lab Control Sample	Total/NA	Water	7470A	

#### **Analysis Batch: 258195**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167720-1	NC2MW4	Total/NA	Water	7470A	257977
MB 310-257977/1-A	Method Blank	Total/NA	Water	7470A	257977
LCS 310-257977/2-A	Lab Control Sample	Total/NA	Water	7470A	257977

## **General Chemistry**

### **Analysis Batch: 257430**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167720-1	NC2MW4	Total/NA	Water	SM 2540C	
MB 310-257430/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-257430/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Job ID: 310-167720-1

## **Lab Chronicle**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

**Client Sample ID: NC2MW4** 

Date Collected: 10/15/19 11:16 Date Received: 10/17/19 09:45 Lab Sample ID: 310-167720-1

**Matrix: Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	258135	10/22/19 10:17	CJT	TAL CF
Total/NA	Prep	3010A			257291	10/18/19 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	257738	10/21/19 18:58	SAD	TAL CF
Total/NA	Prep	7470A			257977	10/23/19 13:26	HIS	TAL CF
Total/NA	Analysis	7470A		1	258195	10/24/19 12:57	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	257430	10/18/19 14:14	MDK	TAL CF

#### **Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

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## **Accreditation/Certification Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Job ID: 310-167720-1

## Laboratory: Eurofins TestAmerica, Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory	101044	11-01-20
	Accreditation Program (IHLAP)		
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-20
Georgia	State	IA100001 (OR)	09-29-20
Illinois	NELAP	200024	11-29-19
lowa	State	007	12-01-19
Kansas	NELAP	E-10341	01-31-20
Minnesota	NELAP	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	3349	08-22-21
Oregon	NELAP	IA100001	09-29-20
USDA	US Federal Programs	P330-19-00003	01-02-22

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## **Method Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Job ID: 310-167720-1

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# **Environment Testing TestAmerica**



Cooler/Sample Receipt and Temperature L

Client Information	
Client: Comara Diabili	Power
City/State: CITY STATE	Project:
Receipt Information	r roject.
Date/Time Received: DATE 0/17/9 Auc	Received By:
Delivery Type: ☐ UPS	FedEx Ground US Mail Spee-Des
☐ Lab Courier ☐ Lab Field Services [	
Condition of Cooler/Containers	Grant Brop-on Grant Gran
Sample(s) received in Cooler? Yes No	If yes: Cooler ID:
Multiple Coolers?	If yes: Cooler # of
Cooler Custody Seals Present? Yes No	If yes: Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present?	If yes: Sample custody seals intact? Yes No
Trip Blank Present? ☐ Yes ☐ No	If yes: Which VOA samples are in cooler? 1
Temperature Record	
Coolant: Wet ice Blue ice Dry ice	☐ Other:
Thermometer ID:	Correction Factor (°C):
• Temp Blank Temperature - If no temp blank, or temp blank temp	erature above criteria, proceed to Sample Container Temperature
Uncorrected Temp (°C):	Corrected Temp (°C):
Sample Container Temperature	
Container(s) used:	CONTAINER 2
Uncorrected Temp (°C):	21
Corrected Temp (°C):	
Exceptions Noted	
If temperature exceeds criteria, was sample(s) receive     a) If yes: Is there evidence that the chilling process to	d same day of sampling?
<ol> <li>If temperature is &lt;0°C, are there obvious signs that the (e.g., bulging septa, broken/cracked bottles, frozen so</li> </ol>	e integrity of sample containers is compromised?
NOTE: If yes, contact PM before proceeding. If no, proceed Additional Comments	with login

Document: CF-LG-WI-002

Revision: 25 Date: 06/17/2019

Command   Comm	hain of Custody	Services Services Services The State of the
Phone   District   Pro 8   Pro 9   P		Carrier Tracking No(s): COC No:
Street Mail 9E/EP1		Page:
Station Unit 1 CCR/Landfill   Storm   Pole   Station Unit 1 CCR/Landfill   Storm   Sample Date   Three Gample   CC-comp.   Company   Three Cample   CC-comp.   Company   Compa		Job #:
1	0	Preservation Codes
10   1   1   1   1   1   1   1   1   1		A - HCL B - NaOH C - Zh Acetete
Sample   Date   Sample   Date   Sample   Sample   Sample   Clarent	elii AG	D - Nitric Acid E - NaHSO4
Sample Date Time Graph Matrix Poject #: Sample Date Time Graph Natrix   Sample   Sam	1 7470 1 7410 1 54110	F - MeOH G - Amchier
Station Unit 1 CCR/Landfill Station Unit 1 CCR/Landfill Station Unit 1 CCR/Landfill Station Unit 1 Sample Date Sample Date Time Gargrab Instrument Sample (Gargrab) Instrument Sample (Gargrab) Instrument Sample Date Time Gargrab) Instrument Sample Date Time Gargrab Instrument Sample Date Winner Area (Gargrab) Instrument Sample Date Winner Area (Gargrab) Instrument Sample Date Winner Area (Gargrab) Instrument Sample Date Winner (Gargrab) Instrument Sample Date Winner (Gargrab) Instrument Sample Date Sample Date Sample Date Sample Date (Gargrab) Company	ON NO (O) 132 Lis	
Station Unit 1 Sample Date Time Sample (Cacomp, Sysowe) Time Sample (Cacom	Yes ov N	A FOTA
## Sample Date   Sample   C=Comp.   Sample   C=C=Comp.   Sample   C=C=C=C=C=C=C=C=C=C=C=C=C=C=C=C=C=C=C	SE (Veries	sinco i
10/15/19	Sample (Wrener, Type (Wrener, Type (Wrener, Type Sample (C.Comp. Sangat, Included CCR) (C.Comp. Sangat, Included Comp. Time Gagrab) professor, Asky)	o tedinum listo
10/15/19	Preservation Code: XX D N I	Special Instructions/Note:
and identification  and I femmable Skin britant Poison B Unknown I Radiological  riquished by:    All of   All of   Block   Company   Co		No.
and identification  Additional Identification  Additional Identification  Date:    Date:		Neil Daviners on P
and identification  and Identification  and Identification  and Identification  and Identification  company  company  company  company  company  company		
and identification and I flammable Skin tritant Poison B Unknown Radiological equested: I. II. III. IV. Other (specify) nquished by:    Date:   Date:		
and Identification and Internable Skin Intent Poison B Unknown Radiological equested: I. II. IV. Other (specify) nquished by:    Date:   Date:		
and Identification  and Identification  and Internable Skin Initiant Poison B Unknown Radiological  cquished by:    Date:   Da		
and Identification  and Internable Skin Initiant Poison B Unknown Radiological  cquested: I. II. III. IV. Other (specify)  Internated by:  Date/Time;		
and identification  and Interesting In III. IV. Other (specify)  Applied by:  Date:  Date: Date		
and interesting and interestin		
Date: Date: Tin	ant   Poison B   Unknown  Radiological	Semple Disposal ( A fee may be assessed if samples are retained longer than 1 month)  Return To Client Disposal By Leb Archive For Mon
Date/Time:   Dat	Date	
Delection   Delection   Delection   1800   Company   Percent	Uate: Time: Company Recei	
Data/Time: Company	1800 Comment (2010)	19 1505
- 8	Company	Date-Time: Company
Custody Seals Intact: Custody Seal No.:  A Yes A No	Cooler Temperature(s) *C and Other Remarks	arks

# NC1 CCR/Title132 Sample Analysis (Some Parameters Need Reported Separate From Others [See COCs])

- Total metals: antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lead, lithium, molybdenum, selenium, and thallium via USEPA Method 6020A
- Radium 226+228 Combined via USEPA Method 9315 and 9320
- Mercury via USEPA Method 7470A
- TDS via SM 2540C
- Chloride, fluoride, and sulfate via USEPA Method 9056A

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## Login Container Summary Report

310-167720

Temperature readings: Container Preservative Client Sample ID Lab ID Container Type pΗ Added (mls) Lot# NC2MW4 310-167720-A-1 Plastic 250ml - with Nitric Acid <2 NC2MW4 310-167720-C-1 Plastic | liter - Nitric Acid <2 NC2MW4 310-167720-D-I Plastic 1 liter - Nitric Acid <2

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Client: Omaha Public Power District

Job Number: 310-167720-1

Login Number: 167720 List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Bovy, Lorrainna L

oroator: Bovy, corraining E		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# **Environment Testing TestAmerica**

## **ANALYTICAL REPORT**

Eurofins TestAmerica, Cedar Falls 3019 Venture Way Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-167720-2

Client Project/Site: Nebraska City Unit1/2 CCR and Landfill

#### For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 11/22/2019 9:09:06 AM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

LINKS .....

Review your project results through

Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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### **Case Narrative**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Job ID: 310-167720-2

Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative** 

Job Narrative 310-167720-2

#### Comments

No additional comments.

#### Receipt

The sample was received on 10/17/2019 9:45 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was  $0.0^{\circ}$  C.

#### RAD

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Job ID: 310-167720-2

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# **Sample Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Client Sample ID	Matrix	Collected	Received	Asset ID
<u> </u>				
NC2MW4	Water	10/15/19 11:16	10/17/19 09:45	

Job ID: 310-167720-2

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Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Client Sample ID: NC2MW4 Lab Sample ID: 310-167720-1

Date Collected: 10/15/19 11:16 Date Received: 10/17/19 09:45

**Matrix: Water** 

Job ID: 310-167720-2

n-226 (GFP	C)								
•	•	Count	Total						
		Uncert.	Uncert.						
Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
0.248		0.113	0.115	1.00	0.138	pCi/L	10/24/19 17:52	11/15/19 14:32	1
%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
88.3		40 - 110					10/24/19 17:52	11/15/19 14:32	1
	Result 0.248 %Yield	%Yield Qualifier	Count Uncert.	Result 0.248         Qualifier Qualifier         (2σ+/-) (2σ+/-) (2σ+/-) (2σ+/-)           %Yield Qualifier Limits         Limits	Result 0.248         Qualifier Qualifier         (2σ+/-) (2σ	Count   Total   Uncert.   Uncert.   Uncert.   Count   Uncert.   Uncert.	Count   Total   Uncert.   Uncert.   Uncert.     Result   Qualifier   (2σ+/-)   (2σ+/-)   RL   MDC   Unit     O.248   O.113   O.115   1.00   O.138   pCi/L	Count Uncert. Uncert. Uncert.	Count   Total   Uncert.   Uncert.   Uncert.   Count   Uncert.   Uncert.   Uncert.   Count   Uncert.   Uncert.   Uncert.   Count   Uncert.   Count   Uncert.   Count   Uncert.   Count   Uncert.   Count   Uncert.   Prepared   Analyzed   Analyzed   Count   Count

Method: 9320 - Ra	dium-228 (GFF	PC)								
	•	•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.969		0.313	0.325	1.00	0.416	pCi/L	10/24/19 18:25	11/06/19 08:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		40 - 110					10/24/19 18:25	11/06/19 08:57	1
Y Carrier	84.9		40 - 110					10/24/19 18:25	11/06/19 08:57	1

Method: Ra226_Ra2	28 - Combin	ed Radium	-226 and Rad	ium-228						
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	1.22		0.333	0.345	5.00	0.416	pCi/L		11/22/19 08:16	1

#### **Definitions/Glossary**

Client: Omaha Public Power District

Job ID: 310-167720-2 Project/Site: Nebraska City Unit1/2 CCR and Landfill

**Qualifiers** 

Rad

Qualifier **Qualifier Description** 

Result is less than the sample detection limit.

**Glossary** 

Abbreviation These commonly used abbreviations may or may not be present in this report.

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery CFL Contains Free Liquid Contains No Free Liquid **CNF** 

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin) Limit of Detection (DoD/DOE) LOD Limit of Quantitation (DoD/DOE) LOQ

MDA Minimum Detectable Activity (Radiochemistry) MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit Minimum Level (Dioxin) ML

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

Quality Control QC

**RER** Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) Toxicity Equivalent Quotient (Dioxin) TEQ

Job ID: 310-167720-2

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-447621/20-A

**Matrix: Water** 

Analysis Batch: 450674

Client Sample ID: Method Blank

Prep Type: Total/NA

**Prep Batch: 447621** 

MB Uncert. Uncert. Analyte Result Qualifier MDC Unit Dil Fac  $(2\sigma + / -)$  $(2\sigma + / -)$ RL Prepared Analyzed Radium-226 -0.03233 U 0.0605 0.0606 1.00 0.136 pCi/L 10/24/19 17:52 11/15/19 16:36

Total

Count

ΜB MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac 10/24/19 17:52 11/15/19 16:36 Ba Carrier 89.8 40 - 110

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 160-447621/1-A **Matrix: Water** 

Analysis Batch: 450674

Prep Type: Total/NA

**Prep Batch: 447621** 

Total Spike LCS LCS Uncert. %Rec. Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits Radium-226 10.32 1.00 75 - 125 11.4 1.09 0.142 pCi/L

LCS LCS

ΜB MB

Qualifier Carrier %Yield Limits 40 - 110 Ba Carrier 92.5

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-447622/20-A

**Matrix: Water** 

Analysis Batch: 449305

Client Sample ID: Method Blank

Prep Type: Total/NA

**Prep Batch: 447622** 

-			Count	Total					-	
	MB	MB	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1328	U	0.248	0.249	1.00	0.422	pCi/L	10/24/19 18:25	11/06/19 09:02	1

Qualifier Prepared Dil Fac Carrier %Yield Limits Analyzed 40 - 110 10/24/19 18:25 11/06/19 09:02 Ba Carrier 89.8 Y Carrier 87.5 40 - 110 10/24/19 18:25 11/06/19 09:02

Lab Sample ID: LCS 160-447622/1-A

**Matrix: Water** 

Analysis Batch: 449235

Client Sample ID: Lab Control Sample

%Rec.

Prep Type: Total/NA

Prep Batch: 447622

Total LCS LCS Spike Uncert.

Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits Radium-228 9.42 10.53 1.19 1.00 0.384 pCi/L 112 75 - 125

LCS LCS

Carrier %Yield Qualifier Limits Ba Carrier 92.5 40 - 110 40 - 110 Y Carrier 89.3

Eurofins TestAmerica, Cedar Falls

# **QC Association Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Job ID: 310-167720-2

### Rad

### **Prep Batch: 447621**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167720-1	NC2MW4	Total/NA	Water	PrecSep-21	
MB 160-447621/20-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-447621/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

#### **Prep Batch: 447622**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167720-1	NC2MW4	Total/NA	Water	PrecSep_0	- <del> </del>
MB 160-447622/20-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-447622/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

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### **Lab Chronicle**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Client Sample ID: NC2MW4 Lab Sample ID: 310-167720-1

Date Collected: 10/15/19 11:16

**Matrix: Water** Date Received: 10/17/19 09:45

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			447621	10/24/19 17:52	ORM	TAL SL
Total/NA	Analysis	9315		1	450674	11/15/19 14:32	SCB	TAL SL
Total/NA	Prep	PrecSep_0			447622	10/24/19 18:25	ORM	TAL SL
Total/NA	Analysis	9320		1	449235	11/06/19 08:57	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	451578	11/22/19 08:16	SMP	TAL SL

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Job ID: 310-167720-2

# **Accreditation/Certification Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Job ID: 310-167720-2

#### Laboratory: Eurofins TestAmerica, Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	101044	11-01-20
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-20
Georgia	State	IA100001 (OR)	09-29-20
Illinois	NELAP	200024	11-29-19
Iowa	State	007	12-01-19
Kansas	NELAP	E-10341	01-31-20
Minnesota	NELAP	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	3349	08-22-21
Oregon	NELAP	IA100001	09-29-20
USDA	US Federal Programs	P330-19-00003	01-02-22

#### Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-19
lowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	12-01-19

Eurofins TestAmerica, Cedar Falls

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### **Method Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Method **Method Description** Protocol Laboratory 9315 Radium-226 (GFPC) SW846 TAL SL TAL SL Radium-228 (GFPC) SW846 9320 TAL SL Ra226\_Ra228 Combined Radium-226 and Radium-228 TAL-STL PrecSep\_0 Preparation, Precipitate Separation None TAL SL PrecSep-21 Preparation, Precipitate Separation (21-Day In-Growth) None TAL SL

#### Protocol References:

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Job ID: 310-167720-2

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# Environment Testing TestAmerica



Cooler/Sample Receipt and Temperature L 310-167720 Chain or

Client Information	
Client: Omara Dublis	Parter
City/State: STATE	Project:
Receipt Information	,
Date/Time Received: DATE 0/17/9 Auc	Received By:
Delivery Type: UPS FedEx	FedEx Ground US Mail Spee-Dee
☐ Lab Courier ☐ Lab Field Services ☐	
Condition of Cooler/Containers	
Sample(s) received in Cooler? — Yes No	If yes: Cooler ID:
Multiple Coolers? ☐ Yes ☐ No	If yes: Cooler # of
Cooler Custody Seals Present? Yes No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present? Yes No	If yes: Sample custody seals intact? Yes No
Trip Blank Present? ☐ Yes ☐ No	If yes: Which VOA samples are in cooler?
Temperature Record	
Coolant: Wet ice Blue ice Dry ice	☐ Other:
	Correction Factor (°C):
<ul> <li>Temp Blank Temperature – If no temp blank, or temp blank temperature</li> </ul>	erature above criteria, proceed to Sample Container Temperature
11	Corrected Temp (°C):
Sample Container Temperature	
Container(s) used:	CONTAINER 2
Uncorrected Temp (°C): 9 1 11 NO 2 P	1
Corrected Temp (°C):	
Exceptions Noted	
<ol> <li>If temperature exceeds criteria, was sample(s) received</li> <li>a) If yes: Is there evidence that the chilling process b</li> </ol>	
<ol> <li>If temperature is &lt;0°C, are there obvious signs that the (e.g., bulging septa, broken/cracked bottles, frozen soli</li> </ol>	integrity of sample containers is compromised?
Note: If yes, contact PM before proceeding. If no, proceed a Additional Comments	with login

Document: CF-LG-WI-002

Revision: 25 Date: 06/17/2019

TestAmerica Cedar Falls											4
704 Enterprise Drive Cedar Falls, IA 50613 Phone (319) 277-2401 Fax (319) 277-2425	Chair	Chain of Custody Record	tody Re	cord		TestAmerica Ome 268	ica Omr 268			lest.	lestAmeric
Client Information	Sampler: Kyle K. Uhing		Lab PM Haves	Shawn			Carrier Tra	Carrier Tracking No(s):		COC No:	
Clent Contact: Kyle Uhina	Phone. (F341 338 3545		E-Mail:	E-Mail:			Т			Page:	
Company: Omaha Public Power District	Closed Section 1		Susaw	.nayes@i	estamenc	ainc.com	4	-	Ť	Job #:	-
Address: 444 South 16th Street Mail 9F/FP1	Due Date Requested:		T	E	L	Analysis	Analysis Requested		Ŧ	Preservation Codes	odes:
city: Omaha	TAT Requested (days):		T	Attached						A · HCL B · NaOH	
State, Zp: NE, 68102-2247				eeg 'A						C - Zn Acetate D - Nitric Acid	
Phone: (531) 226-2515	PO#:				Suifat		_			F - MeOH G - Amahlor	
Email: kkuhing@oppd.com	WO#			-	oride,		-			H - Ascorbic Acid	
Project Name. Nebraska City Station Unit 2 CCR	TestAmerica Project #: 31007559		T	oM no a	ide, Flu				-	J - DI Water K - EDTA L - EDA	V - MCAA W - ph 4-5 Z - other (specify)
Sie: Nebraska City Station Unit 2	SSOW#:		T	D (Yes	oldo A					Other:	
Sample Identification	Sample Date Time	Sample Type (C=comp,	The same of the sa	ield Fiftered S erform MS/RMS D20A Total Meta CR List	540C TDS, 9056 315 and 9320 Re				to tedmust ist		
	X	Preserva	রা	d X	gz Z	+	+	+	•	Special	Special Instructions/Note
NC2MW4	10/15/19 11/11	1	T	1	+	+	+	+	7	200 attached liet	See attached liet for energic seeken
	+	+	T	1	<	1	-		4		ior specific analys
		1	T		+	#	+				
					I		-	+	+		
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Daneith Hannel Ideallinet											
de Skin fritant	Poison B Unknown	Radiological		Sample	Disposal	(A fee may be	Disposed B.	Sample Disposel ( 4 fee may be assessed if samples are retained longer than 1 month)	etained	longer than 1	month)
				Special	nstruction	Special Instructions/QC Requirements	ents:	רמה	Arcuin	a rot	Months
Empty Kit Relinquished by:	Date:		F	Time:		-	Metho	Method of Shipment:			
Reinquished by:	DateTime:	5:05	omeany	Recei	Received by	114		Date/Time:	10.10	15051	Company
Relinquished by Relinquished W	PO-10-19		Sept. B	Received	Van C	N. C.	12	Detertime:	1		Company
>	Date/Time:	ŏ	Company	Recei	Received by.		-	Date/Time:	1		Company
Δ Yes Δ No				Coole	r Temperatu	Cooler Temperature(s) °C and Other Remarks	Remarks:				

# NC2 CCR Sample Analysis (Some Parameters Need Reported Separate From Others [See COCs])

- Total metals: aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lithium, lead, molybdenum, selenium, and thallium via USEPA Method 6020A
- Radium 226+228 Combined via USEPA Method 9315 and 9320
- Mercury via USEPA Method 7470A
- TDS via SM 2540C
- Chloride, fluoride, and sulfate via USEPA Method 9056A

# Login Container Summary Report 310-167720

Temperature readings: _					
Client Sample ID	Lab ID	Container Type	Container pH	Preservative Added (mls)	Lot#
NC2MW4	310-167720-A-I	Plastic 250ml - with Nitric Acid	<2		
NC2MW4	310-167720-C-I	Plastic 1 liter - Nitric Acid	<2		
NC2MW4	310-167720-D-I	Plastic I liter - Nitric Acid	0		

Client: Omaha Public Power District

Job Number: 310-167720-2

Login Number: 167720

List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Bovy, Lorrainna L

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Cedar Falls

Client: Omaha Public Power District

Job Number: 310-167720-2

Login Number: 167720 List Source: Eurofins TestAmerica, St. Louis List Number: 2

List Creation: 10/18/19 01:29 PM

Creator: Hellm, Michael

oreator. Heilin, Michael		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	22.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Cedar Falls

# **Tracer/Carrier Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit1/2 CCR and Landfill

Job ID: 310-167720-2

Method: 9315 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
310-167720-1	NC2MW4	88.3	
LCS 160-447621/1-A	Lab Control Sample	92.5	
MB 160-447621/20-A	Method Blank	89.8	
Tracer/Carrier Legend			
Ba Carrier = Ba Carrier			<del></del>

Method: 9320 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
310-167720-1	NC2MW4	88.3	84.9	
LCS 160-447622/1-A	Lab Control Sample	92.5	89.3	
MB 160-447622/20-A	Method Blank	89.8	87.5	
Tracer/Carrier Legend				
Ba Carrier = Ba Carrier				
Y Carrier = Y Carrier				

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Eurofins TestAmerica, Cedar Falls

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# **Environment Testing TestAmerica**

# **ANALYTICAL REPORT**

Eurofins TestAmerica, Cedar Falls 3019 Venture Way Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-167942-1

Client Project/Site: Nebraska City Unit 1 CCR

For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 10/31/2019 3:42:39 PM

Shawn Hayes, Senior Project Manager (319)229-8211

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----- LINKS -----

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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#### **Case Narrative**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-1

Job ID: 310-167942-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative 310-167942-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/19/2019 9:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.2° C and 2.2° C.

#### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# **Sample Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-167942-1	NC1MW2	Water	10/18/19 10:12	10/19/19 09:05	
310-167942-2	NC1MW3	Water	10/18/19 11:52	10/19/19 09:05	
310-167942-3	NC1MW4	Water	10/18/19 11:05	10/19/19 09:05	
310-167942-4	NC1MW9	Water	10/18/19 12:39	10/19/19 09:05	
310-167942-5	DUP-1	Water	10/18/19 00:00	10/19/19 09:05	

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

**Client Sample ID: NC1MW2** 

Job ID: 310-167942-1

Lab Sample ID: 310-167942-1

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Sulfate	52.0	5.00	mg/L	5	9056A	Total/NA
Barium	0.179	0.00200	mg/L	1	6020A	Total/NA
Boron	0.305	0.200	mg/L	1	6020A	Total/NA
Cadmium	0.000230	0.000100	mg/L	1	6020A	Total/NA
Calcium	112	0.500	mg/L	1	6020A	Total/NA
Cobalt	0.000548	0.000500	mg/L	1	6020A	Total/NA
Lithium	0.0117	0.0100	mg/L	1	6020A	Total/NA
Molybdenum	0.0872	0.00200	mg/L	1	6020A	Total/NA
Total Dissolved Solids	332	60.0	mg/L	1	SM 2540C	Total/NA

# **Client Sample ID: NC1MW3**

## Lab Sample ID: 310-167942-2

Analyte	Result (	Qualifier RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	9.91	5.00		mg/L	5	_	9056A	Total/NA
Fluoride	0.527	0.500		mg/L	5		9056A	Total/NA
Sulfate	361	20.0		mg/L	20		9056A	Total/NA
Arsenic	0.0333	0.00200		mg/L	1		6020A	Total/NA
Barium	0.135	0.00200		mg/L	1		6020A	Total/NA
Boron	2.42	0.200		mg/L	1		6020A	Total/NA
Calcium	166	0.500		mg/L	1		6020A	Total/NA
Cobalt	0.00182	0.000500		mg/L	1		6020A	Total/NA
Lithium	0.0316	0.0100		mg/L	1		6020A	Total/NA
Total Dissolved Solids	760	60.0		mg/L	1		SM 2540C	Total/NA

# Client Sample ID: NC1MW4

## Lab Sample ID: 310-167942-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.64		5.00		mg/L	5	_	9056A	Total/NA
Fluoride	0.501		0.500		mg/L	5		9056A	Total/NA
Sulfate	238		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00347		0.00200		mg/L	1		6020A	Total/NA
Barium	0.119		0.00200		mg/L	1		6020A	Total/NA
Boron	1.34		0.200		mg/L	1		6020A	Total/NA
Calcium	151		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.000642		0.000500		mg/L	1		6020A	Total/NA
Lithium	0.0137		0.0100		mg/L	1		6020A	Total/NA
Molybdenum	0.0183		0.00200		mg/L	1		6020A	Total/NA
Total Dissolved Solids	572		60.0		mg/L	1		SM 2540C	Total/NA

## **Client Sample ID: NC1MW9**

## Lab Sample ID: 310-167942-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.13		5.00		mg/L	5	_	9056A	Total/NA
Fluoride	0.605		0.500		mg/L	5		9056A	Total/NA
Sulfate	206		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00784		0.00200		mg/L	1		6020A	Total/NA
Barium	0.165		0.00200		mg/L	1		6020A	Total/NA
Boron	1.31		0.200		mg/L	1		6020A	Total/NA
Cadmium	0.000100		0.000100		mg/L	1		6020A	Total/NA
Calcium	157		0.500		mg/L	1		6020A	Total/NA
Cobalt	0.00323		0.000500		mg/L	1		6020A	Total/NA
Lithium	0.0310		0.0100		mg/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

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10/31/2019

# **Detection Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-1

Lab Sample ID: 310-167942-4

Lab Sample ID: 310-167942-5

# Client Sample ID: NC1MW9 (Continued)

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Molybdenum	0.0230	0.00200	mg/L		6020A	Total/NA
Total Dissolved Solids	780	60.0	mg/L	1	SM 2540C	Total/NA

## **Client Sample ID: DUP-1**

Analyte	Result Q	Qualifier RL	MDL	Unit	Dil Fac D	Method	Prep Type
Chloride	5.24	5.00		mg/L	5	9056A	Total/NA
Fluoride	0.583	0.500		mg/L	5	9056A	Total/NA
Sulfate	205	5.00		mg/L	5	9056A	Total/NA
Arsenic	0.00823	0.00200		mg/L	1	6020A	Total/NA
Barium	0.169	0.00200		mg/L	1	6020A	Total/NA
Boron	1.35	0.200		mg/L	1	6020A	Total/NA
Calcium	163	0.500		mg/L	1	6020A	Total/NA
Cobalt	0.00333	0.000500		mg/L	1	6020A	Total/NA
Lithium	0.0319	0.0100		mg/L	1	6020A	Total/NA
Molybdenum	0.0240	0.00200		mg/L	1	6020A	Total/NA
Total Dissolved Solids	764	30.0		mg/L	1	SM 2540C	Total/NA

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-167942-1

**Matrix: Water** 

Job ID: 310-167942-1

Date Collected: 10/18/19 10:12 Date Received: 10/19/19 09:05

**Client Sample ID: NC1MW2** 

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			10/25/19 14:17	5
Fluoride	<0.500		0.500		mg/L			10/25/19 14:17	5
Sulfate	52.0		5.00		mg/L			10/25/19 14:17	5
Method: 6020A - Metals (I	CP/MS)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		10/23/19 07:59	10/26/19 01:07	1
Arsenic	<0.00200		0.00200		mg/L		10/23/19 07:59	10/26/19 01:07	1
Barium	0.179		0.00200		mg/L		10/23/19 07:59	10/26/19 01:07	1
Beryllium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/26/19 01:07	1
Boron	0.305		0.200		mg/L		10/23/19 07:59	10/26/19 01:07	1
Cadmium	0.000230		0.000100		mg/L		10/23/19 07:59	10/26/19 01:07	1
Calcium	112		0.500		mg/L		10/23/19 07:59	10/26/19 01:07	1
Chromium	< 0.00500		0.00500		mg/L		10/23/19 07:59	10/26/19 01:07	1
Cobalt	0.000548		0.000500		mg/L		10/23/19 07:59	10/26/19 01:07	1
Lithium	0.0117		0.0100		mg/L		10/23/19 07:59	10/26/19 01:07	1
Lead	<0.000500		0.000500		mg/L		10/23/19 07:59	10/26/19 01:07	1
Molybdenum	0.0872		0.00200		mg/L		10/23/19 07:59	10/26/19 01:07	1
Selenium	<0.00500		0.00500		mg/L		10/23/19 07:59	10/26/19 01:07	1
Thallium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/26/19 01:07	1
Method: 7470A - Mercury	(CVAA)								
Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/28/19 10:32	10/29/19 08:57	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	332		60.0		mg/L			10/23/19 12:05	1

10/31/2019

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

**Client Sample ID: NC1MW3** 

Lab Sample ID: 310-167942-2

**Matrix: Water** 

Job ID: 310-167942-1

Date Collected: 10/18/19 11:52	
Date Received: 10/19/19 09:05	

Method: 9056A - Anions, Analyte		apny Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.91		5.00		mg/L			10/25/19 14:33	5
Fluoride	0.527		0.500		mg/L			10/25/19 14:33	5
Sulfate	361		20.0		mg/L			10/25/19 15:22	20
Method: 6020A - Metals (I	CP/MS)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		10/23/19 07:59	10/29/19 16:51	1
Arsenic	0.0333		0.00200		mg/L		10/23/19 07:59	10/29/19 16:51	1
Barium	0.135		0.00200		mg/L		10/23/19 07:59	10/26/19 01:31	1
Beryllium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/29/19 16:51	1
Boron	2.42		0.200		mg/L		10/23/19 07:59	10/29/19 16:51	1
Cadmium	<0.000100		0.000100		mg/L		10/23/19 07:59	10/26/19 01:31	1
Calcium	166		0.500		mg/L		10/23/19 07:59	10/29/19 16:51	1
Chromium	<0.00500		0.00500		mg/L		10/23/19 07:59	10/29/19 16:51	1
Cobalt	0.00182		0.000500		mg/L		10/23/19 07:59	10/29/19 16:51	1
Lithium	0.0316		0.0100		mg/L		10/23/19 07:59	10/29/19 16:51	1
Lead	< 0.000500		0.000500		mg/L		10/23/19 07:59	10/26/19 01:31	1
Molybdenum	<0.00200		0.00200		mg/L		10/23/19 07:59	10/29/19 16:51	1
Selenium	<0.00500		0.00500		mg/L		10/23/19 07:59	10/29/19 16:51	1
Thallium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/26/19 01:31	1
Method: 7470A - Mercury	(CVAA)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/28/19 10:32	10/29/19 08:59	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	760		60.0		mg/L			10/23/19 12:05	1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-167942-3

**Matrix: Water** 

Job ID: 310-167942-1

<b>Date</b>	<b>Collected:</b>	10/18/19	11:05
<b>Date</b>	Received:	10/19/19	09:05

**Total Dissolved Solids** 

Client Sample ID: NC1MW4

Method: 9056A - Anions, Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.64		5.00		mg/L			10/25/19 15:38	5
Fluoride	0.501		0.500		mg/L			10/25/19 15:38	5
Sulfate	238		5.00		mg/L			10/25/19 15:38	5
Method: 6020A - Metals (I	CP/MS)								
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		10/23/19 07:59	10/26/19 01:34	1
Arsenic	0.00347		0.00200		mg/L		10/23/19 07:59	10/26/19 01:34	1
Barium	0.119		0.00200		mg/L		10/23/19 07:59	10/26/19 01:34	1
Beryllium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/31/19 12:44	1
Boron	1.34		0.200		mg/L		10/23/19 07:59	10/31/19 12:44	1
Cadmium	<0.000100		0.000100		mg/L		10/23/19 07:59	10/26/19 01:34	1
Calcium	151		0.500		mg/L		10/23/19 07:59	10/31/19 12:44	1
Chromium	<0.00500		0.00500		mg/L		10/23/19 07:59	10/26/19 01:34	1
Cobalt	0.000642		0.000500		mg/L		10/23/19 07:59	10/26/19 01:34	1
Lithium	0.0137		0.0100		mg/L		10/23/19 07:59	10/31/19 12:44	1
Lead	< 0.000500		0.000500		mg/L		10/23/19 07:59	10/26/19 01:34	1
Molybdenum	0.0183		0.00200		mg/L		10/23/19 07:59	10/26/19 01:34	1
Selenium	<0.00500		0.00500		mg/L		10/23/19 07:59	10/26/19 01:34	1
Thallium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/26/19 01:34	1
Method: 7470A - Mercury	(CVAA)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/28/19 10:32	10/29/19 09:05	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

60.0

mg/L

572

10/23/19 12:05

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

**Client Sample ID: NC1MW9** 

Lab Sample ID: 310-167942-4

**Matrix: Water** 

Job ID: 310-167942-1

Date Collected: 10/18/19 12:39	9				
Date Received: 10/19/19 09:09	5				
Method: 9056A - Anions, Ior	Chromatography				
•					
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared
1					•

Method: 9056A - Anions	, Ion Chromatography						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.13	5.00	mg/L			10/25/19 16:10	5
Fluoride	0.605	0.500	mg/L			10/25/19 16:10	5
Sulfate	206	5.00	mg/L			10/25/19 16:10	5

Method: 6020A - Meta Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100		mg/L		10/23/19 07:59	10/29/19 16:53	
Arsenic	0.00784		0.00200		mg/L		10/23/19 07:59	10/29/19 16:53	
Barium	0.165		0.00200		mg/L		10/23/19 07:59	10/26/19 01:37	•
Beryllium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/29/19 16:53	
Boron	1.31		0.200		mg/L		10/23/19 07:59	10/29/19 16:53	•
Cadmium	0.000100		0.000100		mg/L		10/23/19 07:59	10/26/19 01:37	•
Calcium	157		0.500		mg/L		10/23/19 07:59	10/29/19 16:53	
Chromium	<0.00500		0.00500		mg/L		10/23/19 07:59	10/26/19 01:37	•
Cobalt	0.00323		0.000500		mg/L		10/23/19 07:59	10/26/19 01:37	
Lithium	0.0310		0.0100		mg/L		10/23/19 07:59	10/29/19 16:53	
Lead	<0.000500		0.000500		mg/L		10/23/19 07:59	10/26/19 01:37	
Molybdenum	0.0230		0.00200		mg/L		10/23/19 07:59	10/29/19 16:53	
Selenium	<0.00500		0.00500		mg/L		10/23/19 07:59	10/26/19 01:37	
Thallium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/26/19 01:37	

Method: 7470A - Mercury (CVA	<b>AA</b> )						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200	0.000200	mg/L		10/28/19 10:32	10/29/19 09:08	1

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	780	60.0	mg/L			10/23/19 12:05	1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-167942-5

**Matrix: Water** 

Job ID: 310-167942-1

Date	Collected:	10/18/19	00:00
<b>Date</b>	Received:	10/19/19	09:05

**Total Dissolved Solids** 

**Client Sample ID: DUP-1** 

Method: 9056A - Anions Analyte		apny Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.24		5.00		mg/L			10/25/19 16:26	
Fluoride	0.583		0.500		mg/L			10/25/19 16:26	į
Sulfate	205		5.00		mg/L			10/25/19 16:26	5
Method: 6020A - Metals	(ICP/MS)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Antimony	<0.00100	-	0.00100		mg/L		10/23/19 07:59	10/29/19 16:56	1
Arsenic	0.00823		0.00200		mg/L		10/23/19 07:59	10/29/19 16:56	1
Barium	0.169		0.00200		mg/L		10/23/19 07:59	10/26/19 01:41	1
Beryllium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/29/19 16:56	1
Boron	1.35		0.200		mg/L		10/23/19 07:59	10/29/19 16:56	1
Cadmium	<0.000100		0.000100		mg/L		10/23/19 07:59	10/26/19 01:41	1
Calcium	163		0.500		mg/L		10/23/19 07:59	10/29/19 16:56	1
Chromium	< 0.00500		0.00500		mg/L		10/23/19 07:59	10/29/19 16:56	1
Cobalt	0.00333		0.000500		mg/L		10/23/19 07:59	10/29/19 16:56	•
Lithium	0.0319		0.0100		mg/L		10/23/19 07:59	10/29/19 16:56	
Lead	<0.000500		0.000500		mg/L		10/23/19 07:59	10/26/19 01:41	1
Molybdenum	0.0240		0.00200		mg/L		10/23/19 07:59	10/29/19 16:56	
Selenium	<0.00500		0.00500		mg/L		10/23/19 07:59	10/29/19 16:56	1
Thallium	<0.00100		0.00100		mg/L		10/23/19 07:59	10/26/19 01:41	1
Method: 7470A - Mercur	y (CVAA)								
Analyte	• • •	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/28/19 10:32	10/29/19 09:10	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

30.0

764

mg/L

Eurofins TestAmerica, Cedar Falls

10/24/19 08:58

# **Definitions/Glossary**

Client: Omaha Public Power District Job ID: 310-167942-1 Project/Site: Nebraska City Unit 1 CCR

Glossary

LOD

LOQ

Ciossaiy							
Abbreviation	These commonly used abbreviations may or may not be present in this report.						
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis						
%R	Percent Recovery						
CFL	Contains Free Liquid						
CNF	Contains No Free Liquid						
DER	Duplicate Error Ratio (normalized absolute difference)						
Dil Fac	Dilution Factor						
DL	Detection Limit (DoD/DOE)						
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample						
DLC	Decision Level Concentration (Radiochemistry)						
EDL	Estimated Detection Limit (Dioxin)						

MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDI	Method Detection Limit

Limit of Detection (DoD/DOE)

Limit of Quantitation (DoD/DOE)

MLMinimum Level (Dioxin) NC Not Calculated

Not Detected at the reporting limit (or MDL or EDL if shown) ND

PQL **Practical Quantitation Limit** 

QC **Quality Control** 

RER Relative Error Ratio (Radiochemistry)

Reporting Limit or Requested Limit (Radiochemistry) RL

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) **TEQ** Toxicity Equivalent Quotient (Dioxin)

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Job ID: 310-167942-1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

## Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-258664/3

**Matrix: Water** 

Analysis Batch: 258664

Client Sample ID: Method Blank

Prep Type: Total/NA

	IVID	IVID							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			10/25/19 04:42	1
Fluoride	<0.100		0.100		mg/L			10/25/19 04:42	1
Sulfate	<1.00		1.00		mg/L			10/25/19 04:42	1
_									

Lab Sample ID: LCS 310-258664/4

**Matrix: Water** 

Analysis Batch: 258664

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

7 maryolo Datom 2000 i	Spi	ke LCS	LCS			%Rec.	
Analyte	Add	ed Resulf	t Qualifier U	Jnit D	%Rec	Limits	
Chloride	10	0.0 10.10	<u> </u>	ng/L	101	90 - 110	
Fluoride	2.	00 2.093	3 m	ng/L	105	90 - 110	
Sulfate	10	0.0 10.04	m	ng/L	100	90 - 110	

#### Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-257893/1-A

**Matrix: Water** 

**Analysis Batch: 258465** 

**Client Sample ID: Method Blank** Prep Type: Total/NA

**Prep Batch: 257893** 

MB MB Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Antimony <0.00100 0.00100 10/23/19 07:59 10/26/19 01:00 mg/L Arsenic < 0.00200 0.00200 mg/L 10/23/19 07:59 10/26/19 01:00 Barium 0.00200 10/23/19 07:59 10/26/19 01:00 < 0.00200 mg/L Beryllium < 0.00100 0.00100 mg/L 10/23/19 07:59 10/26/19 01:00 Boron mg/L 10/23/19 07:59 10/26/19 01:00 < 0.200 0.200 Cadmium < 0.000100 0.000100 mg/L 10/23/19 07:59 10/26/19 01:00 Calcium < 0.500 0.500 10/23/19 07:59 10/26/19 01:00 mg/L 10/23/19 07:59 10/26/19 01:00 Chromium < 0.00500 0.00500 mg/L Cobalt < 0.000500 0.000500 mg/L 10/23/19 07:59 10/26/19 01:00 10/23/19 07:59 10/26/19 01:00 Lithium <0.0100 0.0100 mg/L Lead < 0.000500 0.000500 mg/L 10/23/19 07:59 10/26/19 01:00 0.00200 10/23/19 07:59 10/26/19 01:00 Molybdenum < 0.00200 mg/L Selenium < 0.00500 0.00500 mg/L 10/23/19 07:59 10/26/19 01:00 Thallium < 0.00100 0.00100 mg/L 10/23/19 07:59 10/26/19 01:00

Lab Sample ID: LCS 310-257893/2-A

**Matrix: Water** 

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

**Analysis Batch: 258465 Prep Batch: 257893** Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits 0.0800 Barium 0.06746 mg/L 84 80 \_ 120 Beryllium 0.0400 0.03635 mg/L 91 80 - 120 85 80 - 120 Boron 1.76 1.490 mg/L Cadmium 0.0400 0.03497 87 80 - 120 mg/L Calcium 4.00 3.537 mg/L 88 80 - 120 Chromium 0.0800 0.06523 mg/L 82 80 - 120 Cobalt 0.0400 0.03320 83 80 - 120 mg/L Lithium 0.200 0.1676 mg/L 84 80 - 1200.0400 Lead 0.03445 mg/L 80 - 120

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10/31/2019

Client: Omaha Public Power District Job ID: 310-167942-1 Project/Site: Nebraska City Unit 1 CCR

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-257893/2-A				Clier	nt Sa	mple ID	: Lab Control Sample
Matrix: Water							Prep Type: Total/NA
Analysis Batch: 258465							<b>Prep Batch: 257893</b>
_	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits

0.06664

0.02792

mg/L

mg/L

0.0800

0.0320

Lab Sample ID: LCS 310-257893/2-A Matrix: Water Analysis Batch: 258764	Spike	LCS	LCS	Clic	ent Saı	mple ID	Prep Type: Total/NA Prep Batch: 257893 %Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Antimony	0.0400	0.03581		mg/L		90	80 - 120
Arsenic	0.0800	0.07469		mg/L		93	80 - 120
Molybdenum	0.0800	0.07696		mg/L		96	80 - 120

Method: 7470A - Mercury (CVAA)

Selenium

Thallium

Lab Sample ID: MB 310-258509/1-A **Client Sample ID: Method Blank Matrix: Water** Prep Type: Total/NA

**Prep Batch: 258509 Analysis Batch: 258722** MB MB

Result Qualifier **MDL** Unit Analyte RLAnalyzed Dil Fac Prepared Mercury 0.000200 10/28/19 10:32 10/29/19 08:19 < 0.000200 mg/L

Lab Sample ID: LCS 310-258509/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 258722 Prep Batch: 258509** Spike LCS LCS %Rec. Added Result Qualifier Limits **Analyte** Unit D %Rec Mercury 0.00167 0.001591 mg/L 95 80 - 120

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-257956/1 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 257956** 

Lab Sample ID: LCS 310-257956/2

MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Total Dissolved Solids 30.0 10/23/19 12:05 <30.0 mg/L

Matrix: Water							Prep Typ	oe: Total	/NA
Analysis Batch: 257956									
-	Spike	LCS	LCS				%Rec.		
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Total Dissolved Solids	1000	1004		mg/L		100	90 - 110		

Lab Sample ID: MB 310-258097/1 **Client Sample ID: Method Blank** 

**Matrix: Water** 

**Analysis Batch: 258097** 

MB MB Analyte Result Qualifier RLUnit Analyzed Dil Fac Prepared 30.0 **Total Dissolved Solids** <30.0 mg/L 10/24/19 08:58

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80 - 120

80 - 120

87

Dil Fac

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

# **QC Sample Results**

Client: Omaha Public Power District Job ID: 310-167942-1 Project/Site: Nebraska City Unit 1 CCR

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 310-258097/2 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA Analysis Batch: 258097

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Total Dissolved Solids 1000 982.0 mg/L 98 90 - 110

**Client Sample ID: DUP-1** Lab Sample ID: 310-167942-5 DU **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 258097

RPD DU DU Sample Sample Result Qualifier RPD Limit Result Qualifier Unit D **Total Dissolved Solids** 764 774.0 mg/L

# **QC Association Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-1

## HPLC/IC

### Analysis Batch: 258664

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-1	NC1MW2	Total/NA	Water	9056A	
310-167942-2	NC1MW3	Total/NA	Water	9056A	
310-167942-2	NC1MW3	Total/NA	Water	9056A	
310-167942-3	NC1MW4	Total/NA	Water	9056A	
310-167942-4	NC1MW9	Total/NA	Water	9056A	
310-167942-5	DUP-1	Total/NA	Water	9056A	
MB 310-258664/3	Method Blank	Total/NA	Water	9056A	
LCS 310-258664/4	Lab Control Sample	Total/NA	Water	9056A	

### **Metals**

### **Prep Batch: 257893**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-1	NC1MW2	Total/NA	Water	3010A	
310-167942-2	NC1MW3	Total/NA	Water	3010A	
310-167942-3	NC1MW4	Total/NA	Water	3010A	
310-167942-4	NC1MW9	Total/NA	Water	3010A	
310-167942-5	DUP-1	Total/NA	Water	3010A	
MB 310-257893/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-257893/2-A	Lab Control Sample	Total/NA	Water	3010A	

### **Analysis Batch: 258465**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-1	NC1MW2	Total/NA	Water	6020A	257893
310-167942-2	NC1MW3	Total/NA	Water	6020A	257893
310-167942-3	NC1MW4	Total/NA	Water	6020A	257893
310-167942-4	NC1MW9	Total/NA	Water	6020A	257893
310-167942-5	DUP-1	Total/NA	Water	6020A	257893
MB 310-257893/1-A	Method Blank	Total/NA	Water	6020A	257893
LCS 310-257893/2-A	Lab Control Sample	Total/NA	Water	6020A	257893

### **Prep Batch: 258509**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-1	NC1MW2	Total/NA	Water	7470A	
310-167942-2	NC1MW3	Total/NA	Water	7470A	
310-167942-3	NC1MW4	Total/NA	Water	7470A	
310-167942-4	NC1MW9	Total/NA	Water	7470A	
310-167942-5	DUP-1	Total/NA	Water	7470A	
MB 310-258509/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-258509/2-A	Lab Control Sample	Total/NA	Water	7470A	

### **Analysis Batch: 258722**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-1	NC1MW2	Total/NA	Water	7470A	258509
310-167942-2	NC1MW3	Total/NA	Water	7470A	258509
310-167942-3	NC1MW4	Total/NA	Water	7470A	258509
310-167942-4	NC1MW9	Total/NA	Water	7470A	258509
310-167942-5	DUP-1	Total/NA	Water	7470A	258509
MB 310-258509/1-A	Method Blank	Total/NA	Water	7470A	258509
LCS 310-258509/2-A	Lab Control Sample	Total/NA	Water	7470A	258509

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# **QC Association Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-1

### **Metals**

### Analysis Batch: 258764

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-2	NC1MW3	Total/NA	Water	6020A	257893
310-167942-4	NC1MW9	Total/NA	Water	6020A	257893
310-167942-5	DUP-1	Total/NA	Water	6020A	257893
LCS 310-257893/2-A	Lab Control Sample	Total/NA	Water	6020A	257893

### **Analysis Batch: 259018**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-3	NC1MW4	Total/NA	Water	6020A	257893

# **General Chemistry**

## Analysis Batch: 257956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-1	NC1MW2	Total/NA	Water	SM 2540C	_
310-167942-2	NC1MW3	Total/NA	Water	SM 2540C	
310-167942-3	NC1MW4	Total/NA	Water	SM 2540C	
310-167942-4	NC1MW9	Total/NA	Water	SM 2540C	
MB 310-257956/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-257956/2	Lab Control Sample	Total/NA	Water	SM 2540C	

### **Analysis Batch: 258097**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-5	DUP-1	Total/NA	Water	SM 2540C	
MB 310-258097/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-258097/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-167942-5 DU	DUP-1	Total/NA	Water	SM 2540C	

0-16/942-1

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Job ID: 310-167942-1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Client Sample ID: NC1MW2

Date Collected: 10/18/19 10:12 Date Received: 10/19/19 09:05

Lab Sample ID: 310-167942-1

**Matrix: Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	258664	10/25/19 14:17	CJT	TAL CF
Total/NA	Prep	3010A			257893	10/23/19 07:59	HED	TAL CF
Total/NA	Analysis	6020A		1	258465	10/26/19 01:07	SAD	TAL CF
Total/NA	Prep	7470A			258509	10/28/19 10:32	ACJ	TAL CF
Total/NA	Analysis	7470A		1	258722	10/29/19 08:57	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	257956	10/23/19 12:05	MDK	TAL CF

Lab Sample ID: 310-167942-2 Client Sample ID: NC1MW3 Date Collected: 10/18/19 11:52

**Matrix: Water** 

Date Received: 10/19/19 09:05

Analysis

Analysis

SM 2540C

Total/NA

Γ	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	258664	10/25/19 14:33	CJT	TAL CF
Total/NA	Analysis	9056A		20	258664	10/25/19 15:22	CJT	TAL CF
Total/NA	Prep	3010A			257893	10/23/19 07:59	HED	TAL CF
Total/NA	Analysis	6020A		1	258465	10/26/19 01:31	SAD	TAL CF
Total/NA	Prep	3010A			257893	10/23/19 07:59	HED	TAL CF
Total/NA	Analysis	6020A		1	258764	10/29/19 16:51	SAD	TAL CF
Total/NA	Prep	7470A			258509	10/28/19 10:32	ACJ	TAL CF
Total/NA	Analysis	7470A		1	258722	10/29/19 08:59	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	257956	10/23/19 12:05	MDK	TAL CF

Client Sample ID: NC1MW4 Lab Sample ID: 310-167942-3

Date Collected: 10/18/19 11:05 Date Received: 10/19/19 09:05

Batch Dilution Batch **Prepared** Batch **Prep Type** Method Factor Number or Analyzed Type Run Analyst Lab Total/NA 9056A 5 258664 10/25/19 15:38 CJT TAL CF Analysis Total/NA Prep 3010A 257893 10/23/19 07:59 HED TAL CF Total/NA 6020A TAL CF Analysis 1 258465 10/26/19 01:34 SAD Total/NA 3010A 257893 10/23/19 07:59 HED TAL CF Prep Total/NA 6020A TAL CF Analysis 1 259018 10/31/19 12:44 SAD Total/NA Prep 7470A 258509 10/28/19 10:32 ACJ TAL CF TAL CF Total/NA 7470A 258722 10/29/19 09:05 HIS

Lab Sample ID: 310-167942-4 Client Sample ID: NC1MW9

257956 10/23/19 12:05 MDK

1

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Date Collected: 10/18/19 12:39 **Matrix: Water** Date Received: 10/19/19 09:05

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	258664	10/25/19 16:10	CJT	TAL CF
Total/NA	Prep	3010A			257893	10/23/19 07:59	HED	TAL CF
Total/NA	Analysis	6020A		1	258465	10/26/19 01:37	SAD	TAL CF

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TAL CF

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**Matrix: Water** 

### **Lab Chronicle**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-167942-4

Matrix: Water

Job ID: 310-167942-1

Client Sample ID: NC1MW9
Date Collected: 10/18/19 12:39
Date Received: 10/19/19 09:05

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			257893	10/23/19 07:59	HED	TAL CF
Total/NA	Analysis	6020A		1	258764	10/29/19 16:53	SAD	TAL CF
Total/NA	Prep	7470A			258509	10/28/19 10:32	ACJ	TAL CF
Total/NA	Analysis	7470A		1	258722	10/29/19 09:08	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	257956	10/23/19 12:05	MDK	TAL CF

Client Sample ID: DUP-1 Lab Sample ID: 310-167942-5

Date Collected: 10/18/19 00:00 Matrix: Water Date Received: 10/19/19 09:05

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	258664	10/25/19 16:26	CJT	TAL CF
Total/NA	Prep	3010A			257893	10/23/19 07:59	HED	TAL CF
Total/NA	Analysis	6020A		1	258465	10/26/19 01:41	SAD	TAL CF
Total/NA	Prep	3010A			257893	10/23/19 07:59	HED	TAL CF
Total/NA	Analysis	6020A		1	258764	10/29/19 16:56	SAD	TAL CF
Total/NA	Prep	7470A			258509	10/28/19 10:32	ACJ	TAL CF
Total/NA	Analysis	7470A		1	258722	10/29/19 09:10	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	258097	10/24/19 08:58	SAS	TAL CF

Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

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# **Accreditation/Certification Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-1

# Laboratory: Eurofins TestAmerica, Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	101044	11-01-20
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-20
Georgia	State	IA100001 (OR)	09-29-20
Illinois	NELAP	200024	11-29-19
lowa	State	007	12-01-19
Kansas	NELAP	E-10341	01-31-20
Minnesota	NELAP	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	3349	08-22-21
Oregon	NELAP	IA100001	09-29-20
USDA	US Federal Programs	P330-19-00003	01-02-22

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#### **Method Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

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# **Environment Testing TestAmerica**



#### Cooler/Sample Receipt and Temperature Log Form

Client Information	
Client: Off)	
City/State: Omala STATE	Project: NE City Shibon Unit
Pecaint Information	
Date/Time Received: DATE 0/19/19	Received By: MCH
Delivery Type: ☐ UPS ☐ FedEx Sat	☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☐ Lab Courier ☐ Lab Field Services	☐ Client Drop-off ☐ Other:
Condition of Cooler/Containers	
Sample(s) received in Cooler? X Yes No	If yes: Cooler ID: SD
Multiple Coolers? Yes Yes	If yes: Cooler # of
Cooler Custody Seals Present? ☐ Yes ☐ No	If yes: Cooler custody seals intact? ☐Yes ☐ No
Sample Custody Seals Present?    Yes    No	If yes: Sample custody seals intact?☐ Yes ☐ No
Trip Blank Present? ☐ Yes ☑ No	If yes: Which VOA samples are in cooler? ↓
Temperature Record	等。1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年
Coolant: Wet ice Blue ice Dry ice	Other: NONE
Thermometer ID:	Correction Factor (°C): -0./
• Temp Blank Temperature - If no temp blank, or temp blank te	mperature above criteria, proceed to Sample Container Temperature
Uncorrected Temp (°C):	Corrected Temp (°C):
Sample Container Temperature	
Container(s) used:	CONTAINER 2
Uncorrected Temp (°C):	
Corrected Temp (°C):	
Exceptions Noted	
If temperature exceeds criteria, was sample(s) rece     a) If yes: Is there evidence that the chilling process	
If temperature is <0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles, frozen)	
Note: If yes, contact PM before proceeding. If no, proceeding.	eed with login
Additional Comments	
	-

Document: CF-LG-WI-002

Revision: 25 Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C Bacteria temperature criteria is 0 to 10°C

10/31/2019

# Environment Testing TestAmerica

Place COC scanning label here

## Cooler/Sample Receipt and Temperature Log Form

Client Information	是一种的 (E) 是 (E)	
Client: Off)		
City/State: CITY Omalia	STATE Proje	ct: NE City Station Unit
Receipt Information		
Date/Time Received: DATE 0/19/19	TIME 0905 Recei	ived By: MCH
Delivery Type: ☐ UPS ☐ FedEx	Sat  FedE	Ex Ground US Mail Spee-Dee
☐ Lab Courier ☐ Lab Field	d Services  Clier	nt Drop-off Other:
Condition of Cooler/Containers		。 19
Sample(s) received in Cooler? X Yes	☐ No If yes:	Cooler ID: #9
Multiple Coolers?	No MAN If yes:	Cooler # of
Cooler Custody Seals Present? Yes	☐ No If yes:	Cooler custody seals intact? Yes No
Sample Custody Seals Present?	No If yes:	Sample custody seals intact? Yes No
Trip Blank Present?	No If yes:	Which VOA samples are in cooler? ↓
Temperature Record		2.日益为10万里的首果。2.15万日,10万里 10万里
Coolant: 🗹 Wet ice 🔲 Blue ice	☐ Dry ice ☐ C	Other: NONE
Thermometer ID:		ction Factor (°C): -O./
• Temp Blank Temperature - If no temp blank, or t	emp blank temperature	above criteria, proceed to Sample Container Temperature
Uncorrected Temp (°C): 1.3	Corre	cted Temp (°C):
Sample Container Temperature		LOONTAINEDO
Container(s) used:		CONTAINER 2
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
If temperature exceeds criteria, was same     a) If yes: Is there evidence that the chil		
If temperature is <0°C, are there obvious (e.g., bulging septa, broken/cracked bott)	s signs that the inte les, frozen solid?)	egrity of sample containers is compromised?  Yes No
Note: If yes, contact PM before proceeding.	If no, proceed with I	ogin
Additional Comments		第35-117-11-12-11-11-11-11-11-11-11-11-11-11-11-

Document: CF-LG-WI-002

Revision: 25 Date: 06/17/2019 General temperature criteria is 0 to 6°C Bacteria temperature criteria is 0 to 10°C

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Cedar Falls, IA 50613 Phone (319) 277-2401 Fax (319) 277-2425	S	cliail of custouy necord	atony R	200		restAmerica Omaha SC 268	ica Omał 268	a SC		THE LEADER IN	THE LEADER IN ENVIRONMENTAL TES
Client Information	Sampler: Kyle K. Uhing		Lab PM: Hayes	s, Shawn I	5		Carrier T	Carrier Tracking No(s):		COC No:	
Client Contact: Kyle Uhing	Phone: (531) 226-2515		E-Mail: shaw	ı.hayes@t	testameri	E-Mail: shawn.hayes@testamericainc.com				Page:	
Company: Omaha Public Power District						Analysis	Analysis Requested	P		Job #:	
Address: 444 South 16th Street Mall 9E/EP1	Due Date Requested:			98						Preservation Codes	:sepo
City. Omaha	TAT Requested (days):			rcury, S						A - HCL B - NaOH C - Zn Acetate	M - Hexane N - None O - AsNaO2
State, Zip: NE, 68102-2247				ieM A	_					D - Nitric Acid E - NaHSO4	P - Na204S Q - Na2S03
Phone: (531) 226-2515	#O#							_		G - Amchlor H - Ascorbic Acid	
Email: kkuhing@oppd.com	WO#.			(0					-	I - Ice J - DI Water	U - Acetone V - MCAA
Project Name: Nebraska City Station Unit 1 CCR/Landfill	TestAmerica Project #: 31007559			N 10 SE	J 'epiro			_	menist	K - EDTA L - EDA	W - ph 4-5 Z - other (specify)
Site: Nebraska City Station Unit 1	SSOW#:			SD (Ye	eA Chic				of con	Other:	
Sample Identification	Sample Date Time	Sample Type ole (C=comp, e G=grab)	Matrix (W=water, S=solid, O=westsloil, BT=Tissue, A=Atr)	Field Filtered : MSM myone Ferroral Mer Missched CCRT	5240C TDS, 905				Total Number	Special	Special Instructions/Note:
	X	1	Preservation Code:	X	z				X		
NC1MW2	10/18/19 10:12	0	W	×	×				4	*	See attached list for specific analysis
NC1MW3	16/18/19 11:5A	0 B	W	×	×				4	-	See attached list for specific analysis
NC1MW4	10/19/19 11:05	0 0	W	×	×				4	The second	See attached list for specific analysis
NC1MW9	PE:C1 8/8/10/	50	W	×	×				4	Access to the last of the last	See attached list for specific analysis
Morph			**	*	M M				*	See attached list fo	therepecificantlyst
Necessary		*	My	*	*				3	86	attached list for specific enalysis
DUP1	1918/19	0	W	×	×				4		See attached list for specific analysis
	-										
Identification		-		Sample	e Dispos	al (A fee ma	The assesse	d if samples	are retain	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	1 month)
Non-Hazard Flammable Skin Irritant Deliverable Requested: I, II, III, IV, Other (specify)	Unknown	Radiological	le le	Special	Return To Client al Instructions/QC	Special Instructions/QC Requirements:	Disposal By Lab rements:	By Lab	Arch	Archive For	Months
Empty Kit Relinquished by:	Date:			Time:	1		Me	Method of Shipment:			
Relinquished by John H. Uluning	1016 369 14:35	15:	Company	Rec	Received by:	Ŧ	1	Date/Tim	Date/Time: 19	1437	Company
Relinquished by: Relinquished by:	Date/Time:	700	Company Company	5	Received by:	MAK		Date/Time:	0/14/14	5060	Company Company
Custody Seals Intact: Custody Seal No.:				Coo	der Temper	Cooler Temperature(s) °C and Other Remarks	ther Remarks:				
				1.	1	1	1	9	7	5	3

# Login Container Summary Report

310-167942

Temperature readings: \_

Client Sample ID	<u>Lab ID</u>	Container Type	Container pH	Preservative Added (mls)	Lot #
NC1MW2	310-167942-A-1	Plastic 250ml - with Nitric Acid	<2		
NC1MW2	310-167942-C-1	Plastic 1 liter - Nitric Acid	<2		
NC1MW2	310-167942-D-1	Plastic 1 liter - Nitric Acid	<2		
NCIMW3	310-167942-A-2	Plastic 250ml - with Nitric Acid	<2		
NC1MW3	310-167942-C-2	Plastic 1 liter - Nitric Acid	< 2		
NCIMW3	310-167942-D-2	Plastic 1 liter - Nitric Acid	<2		
NC1MW4	310-167942-A-3	Plastic 250ml - with Nitric Acid	<2		
NC1MW4	310-167942-C-3	Plastic 1 liter - Nitric Acid	<2	4	
NC1MW4	310-167942-D-3	Plastic 1 liter - Nitric Acid	<2		
NC1MW9	310-167942-A-4	Plastic 250ml - with Nitric Acid	<2		
NC1MW9	310-167942-C-4	Plastic 1 liter - Nitric Acid	<2		
NCIMW9	310-167942-D-4	Plastic 1 liter - Nitric Acid	<2		
DUP	310-167942-A-5	Plastic 250ml - with Nitric Acid	<2		
DUP	310-167942-C-5	Plastic 1 liter - Nitric Acid	<2		
DUP	310-167942-D-5	Plastic 1 liter - Nitric Acid	<2		

Client: Omaha Public Power District Job Number: 310-167942-1

Login Number: 167942 List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Spoerre, Autumn R

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <a href="fembedding-16">6</a> mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**Eurofins TestAmerica, Cedar Falls** 



# **Environment Testing TestAmerica**

# **ANALYTICAL REPORT**

Eurofins TestAmerica, Cedar Falls 3019 Venture Way Cedar Falls, IA 50613 Tel: (319)277-2401

Laboratory Job ID: 310-167942-2

Client Project/Site: Nebraska City Unit 1 CCR

#### For:

Omaha Public Power District Attn: Accounts Payable, 4E/EP-5 444 South 16th Street Mall Omaha, Nebraska 68102-2247

Attn: Kyle Uhing

Authorized for release by: 12/13/2019 10:55:15 AM

Shawn Hayes, Senior Project Manager (319)229-8211

shawn.hayes@testamericainc.com

----- LINKS -----

**Review your project** results through Total Access

**Have a Question?** 



Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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#### **Case Narrative**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-2

Job ID: 310-167942-2

Laboratory: Eurofins TestAmerica, Cedar Falls

**Narrative** 

Job Narrative 310-167942-2

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/19/2019 9:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.2° C and 2.2° C.

#### **RAD**

Radium-226 prep batch 160-44751

The following samples needs to be re-digested/re-extracted due to sample switch with the LCS and LCSD. NC1MW2 (310-167942-1), NC1MW3 (310-167942-2), NC1MW4 (310-167942-3), NC1MW9 (310-167942-4) and DUP-1 (310-167942-5).

Method PrecSep-21: Radium 226 Prep Batch 160-451213:

The following samples were prepared at a reduced aliquot due to insufficient volume for re-prep:NC1MW2 (310-167942-1), NC1MW3 (310-167942-2), NC1MW4 (310-167942-3), NC1MW9 (310-167942-4) and DUP-1 (310-167942-5).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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#### **Sample Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-167942-1	NC1MW2	Water	10/18/19 10:12	10/19/19 09:05
310-167942-2	NC1MW3	Water	10/18/19 11:52	10/19/19 09:05
310-167942-3	NC1MW4	Water	10/18/19 11:05	10/19/19 09:05
310-167942-4	NC1MW9	Water	10/18/19 12:39	10/19/19 09:05
310-167942-5	DUP-1	Water	10/18/19 00:00	10/19/19 09:05

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-167942-1

Job ID: 310-167942-2

**Matrix: Water** 

Client	Sample	ID: N	C1MW2
--------	--------	-------	-------

Date Collected: 10/18/19 10:12 Date Received: 10/19/19 09:05

Method: 9315 - Radi	ium-226 (GFF	PC)								
	•	•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.157	U	0.185	0.186	1.00	0.304	pCi/L	11/19/19 18:01	12/11/19 07:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	78.8		40 - 110					11/19/19 18:01	12/11/19 07:06	1

Method: 9320 - Ra	dium-228 (GFF	PC)								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.177	U	0.362	0.362	1.00	0.616	pCi/L	10/24/19 07:55	11/06/19 18:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		40 - 110					10/24/19 07:55	11/06/19 18:50	1
Y Carrier	72.9		40 - 110					10/24/19 07:55	11/06/19 18:50	1

Method: Ra226 Ra22	28 - Combin	ed Radium	-226 and Radi	um-228						
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.334	U	0.407	0.407	5.00	0.616	pCi/L		12/13/19 09:38	1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-167942-2

**Matrix: Water** 

Job ID: 310-167942-2

**Client Sample ID: NC1MW3** 

Date Collected: 10/18/19 11:52 Date Received: 10/19/19 09:05

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.102	U	0.134	0.135	1.00	0.225	pCi/L	11/19/19 18:01	12/11/19 08:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.9		40 - 110					11/19/19 18:01	12/11/19 08:53	1

Method: 9320 - Ra	dium-228 (GFF	PC)								
		•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0432	U	0.343	0.343	1.00	0.602	pCi/L	10/24/19 07:55	11/06/19 18:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.3		40 - 110					10/24/19 07:55	11/06/19 18:50	1
Y Carrier	71.4		40 - 110					10/24/19 07:55	11/06/19 18:50	1

Method: Ra226 Ra	a228 - Combin	ed Radium	n-226 and Rad	lium-228						
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.146	U	0.368	0.369	5.00	0.602	pCi/L		12/13/19 09:38	1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Lab Sample ID: 310-167942-3

Job ID: 310-167942-2

**Matrix: Water** 

Client Sai	nple ID:	NC1MW4
------------	----------	--------

Date Collected: 10/18/19 11:05 Date Received: 10/19/19 09:05

Method: 9315 - Rad	dium-226 (GFF	PC)								
	•	•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0559	U	0.118	0.118	1.00	0.258	pCi/L	11/19/19 18:01	12/11/19 08:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.8		40 - 110					11/19/19 18:01	12/11/19 08:53	1

Method: 9320 - Ra	adium-228 (GFF	PC)								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0555	U	0.316	0.316	1.00	0.549	pCi/L	10/24/19 07:55	11/06/19 18:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.3		40 - 110					10/24/19 07:55	11/06/19 18:50	1
Y Carrier	89.3		40 - 110					10/24/19 07:55	11/06/19 18:50	1

Method: Ra226_Ra2	28 - Combin	ed Radium-	226 and Rad	ium-228						
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.000469	U	0.337	0.337	5.00	0.549	pCi/L		12/13/19 09:38	1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

**Client Sample ID: NC1MW9** 

Lab Sample ID: 310-167942-4

**Matrix: Water** 

Job ID: 310-167942-2

Date Collected: 10/18/19 12:39 Date Received: 10/19/19 09:05

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.100	U	0.150	0.150	1.00	0.256	pCi/L	11/19/19 18:01	12/11/19 08:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.3		40 - 110					11/19/19 18:01	12/11/19 08:53	1

Method: 9320 - Ra	dium-228 (GFF	PC)								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.595		0.286	0.291	1.00	0.422	pCi/L	10/24/19 07:55	11/06/19 18:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					10/24/19 07:55	11/06/19 18:50	1
Y Carrier	85.2		40 - 110					10/24/19 07:55	11/06/19 18:50	1

Method: Ra226_Ra22	28 - Combin	ed Radium-	226 and Rad	ium-228						
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.695		0.323	0.327	5.00	0.422	pCi/L	_	12/13/19 09:38	1

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Date Received: 10/19/19 09:05

**Client Sample ID: DUP-1** Lab Sample ID: 310-167942-5 Date Collected: 10/18/19 00:00

**Matrix: Water** 

Job ID: 310-167942-2

Method: 9315 - Radiu	ım-226 (GFF	PC)								
	•	•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.124	U	0.142	0.143	1.00	0.232	pCi/L	11/19/19 18:01	12/11/19 08:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.6		40 - 110					11/19/19 18:01	12/11/19 08:53	1

Method: 9320 - Ra	idium-228 (GFF	PC)								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.246	U	0.301	0.302	1.00	0.497	pCi/L	10/24/19 07:55	11/06/19 18:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.2		40 - 110					10/24/19 07:55	11/06/19 18:50	1
Y Carrier	82.2		40 - 110					10/24/19 07:55	11/06/19 18:50	1

Method: Ra226_Ra228	- Combine	ed Radium-	226 and Rad	ium-228						
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.370	U	0.333	0.334	5.00	0.497	pCi/L		12/13/19 09:38	1

#### **Definitions/Glossary**

Client: Omaha Public Power District Job ID: 310-167942-2

Project/Site: Nebraska City Unit 1 CCR

#### **Qualifiers**

_	_

Qualifier	Qualifier Description
11	Dec 102-1 (here the constitution of the Park

Result is less than the sample detection limit.

#### **Glossary**

- · · · · · · · · · · · · · · · · · · ·	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)

Limit of Quantitation (DoD/DOE) LOQ MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry) MDL Method Detection Limit

Minimum Level (Dioxin) ML

NC Not Calculated

Not Detected at the reporting limit (or MDL or EDL if shown) ND

PQL Practical Quantitation Limit

**Quality Control** QC

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) TEQ Toxicity Equivalent Quotient (Dioxin)

Eurofins TestAmerica, Cedar Falls

12/13/2019

Total

Uncert.

 $(2\sigma + / -)$ 

0.124

RL

1.00

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Count

Uncert.

 $(2\sigma + / -)$ 

0.124

Limits

40 - 110

LCS LCS

LCSD LCSD

Result Qual

24 10

Qual

Result

24.79

RER

Limit

12/11/19 08:53 Analyzed Dil Fac 12/11/19 08:53

Dil Fac

Job ID: 310-167942-2

Prep Type: Total/NA **Prep Batch: 451213** 

Client Sample ID: Method Blank

Analyzed

Client Sample ID: Lab Control Sample Prep Type: Total/NA

Prepared

11/19/19 18:01

Prepared

11/19/19 18:01

**Prep Batch: 451213** 

Total Uncert. %Rec.  $(2\sigma + / -)$ RL MDC Unit %Rec Limits 2.59 1.00 109 75 - 125 0.293 pCi/L

MDC Unit

0.280 pCi/L

MDC Unit

0.245 pCi/L

LCS LCS Qualifier %Yield Limits 71.6 40 - 110

MB

MB MB

%Yield

79 7

0.007399

Result Qualifier

Ū

Qualifier

Spike

Added

22.7

Spike

Added

Lab Sample ID: LCSD 160-451213/2-A

Lab Sample ID: LCS 160-451213/1-A

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-451213/23-A

**Matrix: Water** 

Analyte

Carrier

Analyte

Carrier

Analyte

Ba Carrier

Radium-226

Ba Carrier

**Matrix: Water** 

Analysis Batch: 453945

Radium-226

Analysis Batch: 453945

**Matrix: Water** 

Analysis Batch: 453945

Client Sample ID: Lab Control Sample Dup

%Rec

106

%Rec.

Limits

75 - 125

Prep Type: Total/NA **Prep Batch: 451213** 

RER

0.13

Radium-226 22.7 LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 82.4 40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-447520/23-A

**Matrix: Water** 

Analysis Batch: 449305

Client Sam	ple ID	: Method	l Blank
	Dron	Type: To	otal/NA

Prep Type: Total/NA **Prep Batch: 447520** 

Count Total MB MB Uncert. Uncert. Analyte Qualifier MDC Unit Result  $(2\sigma + / -)$  $(2\sigma + / -)$ RL Prepared Analyzed Dil Fac Radium-228 0.09098 Ū 0.245 0.245 1.00 0.421 pCi/L 10/24/19 07:55 11/06/19 18:50

Total

Uncert.

 $(2\sigma + / -)$ 

2.47

RL

1.00

MΒ MB Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 104 40 - 110 10/24/19 07:55 11/06/19 18:50 Y Carrier 89.0 40 - 110 10/24/19 07:55 11/06/19 18:50

#### **QC Sample Results**

Client: Omaha Public Power District Job ID: 310-167942-2

Project/Site: Nebraska City Unit 1 CCR

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-447520/1-A **Client Sample ID: Lab Control Sample** 

**Matrix: Water** 

Analysis Batch: 449235

**Prep Type: Total/NA** 

Prep Batch: 447520

				Total						
	Spike	LCS	LCS	Uncert.					%Rec.	
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	
Radium-228	9.42	9.798		1.20	1.00	0.537	pCi/L	104	75 - 125	

LCS LCS

Carrier	%Yield	Qualifier	Limits
Ba Carrier	88.4		40 - 110
Y Carrier	74.8		40 - 110

Lab Sample ID: LCSD 160-447520/2-A Client Sample ID: Lab Control Sample Dup

**Matrix: Water** 

Analysis Batch: 449235

**Prep Type: Total/NA** 

Prep Batch: 447520

•				Total				•		
	Spike	LCSD	LCSD	Uncert.				%Rec.		RER
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	RER	Limit
Radium-228	9.42	8.280		1.04	1.00	0.488 pCi/L	88	75 - 125	0.68	1

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 85.3 40 - 110 40 - 110 Y Carrier 83.7

#### **QC Association Summary**

Client: Omaha Public Power District

Project/Site: Nebraska City Unit 1 CCR

Job ID: 310-167942-2

Rad

Prep Batch: 447520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-1	NC1MW2	Total/NA	Water	PrecSep_0	
310-167942-2	NC1MW3	Total/NA	Water	PrecSep_0	
310-167942-3	NC1MW4	Total/NA	Water	PrecSep_0	
310-167942-4	NC1MW9	Total/NA	Water	PrecSep_0	
310-167942-5	DUP-1	Total/NA	Water	PrecSep_0	
MB 160-447520/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-447520/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-447520/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

**Prep Batch: 451213** 

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-167942-1	NC1MW2	Total/NA	Water	PrecSep-21	-
310-167942-2	NC1MW3	Total/NA	Water	PrecSep-21	
310-167942-3	NC1MW4	Total/NA	Water	PrecSep-21	
310-167942-4	NC1MW9	Total/NA	Water	PrecSep-21	
310-167942-5	DUP-1	Total/NA	Water	PrecSep-21	
MB 160-451213/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-451213/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-451213/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

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Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Client Sample ID: NC1MW2

Date Collected: 10/18/19 10:12 Date Received: 10/19/19 09:05 Lab Sample ID: 310-167942-1

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			451213	11/19/19 18:01	ORM	TAL SL
Total/NA	Analysis	9315		1	453945	12/11/19 07:06	AJD	TAL SL
Total/NA	Prep	PrecSep_0			447520	10/24/19 07:55	EJQ	TAL SL
Total/NA	Analysis	9320		1	449305	11/06/19 18:50	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	454196	12/13/19 09:38	SMP	TAL SL

**Client Sample ID: NC1MW3** 

Date Collected: 10/18/19 11:52 Date Received: 10/19/19 09:05 Lab Sample ID: 310-167942-2

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			451213	11/19/19 18:01	ORM	TAL SL
Total/NA	Analysis	9315		1	453945	12/11/19 08:53	AJD	TAL SL
Total/NA	Prep	PrecSep_0			447520	10/24/19 07:55	EJQ	TAL SL
Total/NA	Analysis	9320		1	449305	11/06/19 18:50	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	454196	12/13/19 09:38	SMP	TAL SL

Client Sample ID: NC1MW4

Date Collected: 10/18/19 11:05

Date Received: 10/19/19 09:05

Lab Sample ID: 310-167942-3

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			451213	11/19/19 18:01	ORM	TAL SL
Total/NA	Analysis	9315		1	453945	12/11/19 08:53	AJD	TAL SL
Total/NA	Prep	PrecSep_0			447520	10/24/19 07:55	EJQ	TAL SL
Total/NA	Analysis	9320		1	449305	11/06/19 18:50	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	454196	12/13/19 09:38	SMP	TAL SL

**Client Sample ID: NC1MW9** 

Date Collected: 10/18/19 12:39

Date Received: 10/19/19 09:05

Lab Campic i	D. 010 10/042 4
	Matrix: Water

Lab Sample ID: 310-167942-4

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			451213	11/19/19 18:01	ORM	TAL SL
Total/NA	Analysis	9315		1	453945	12/11/19 08:53	AJD	TAL SL
Total/NA	Prep	PrecSep_0			447520	10/24/19 07:55	EJQ	TAL SL
Total/NA	Analysis	9320		1	449305	11/06/19 18:50	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	454196	12/13/19 09:38	SMP	TAL SL

#### **Lab Chronicle**

Client: Omaha Public Power District Job ID: 310-167942-2

Project/Site: Nebraska City Unit 1 CCR

Date Received: 10/19/19 09:05

**Client Sample ID: DUP-1** Lab Sample ID: 310-167942-5 Date Collected: 10/18/19 00:00

Matrix: Water

Batch Dilution Batch Batch Prepared Prep Type Туре Method Run Factor Number or Analyzed Analyst Lab Total/NA Prep PrecSep-21 451213 11/19/19 18:01 ORM TAL SL Total/NA Analysis 9315 453945 12/11/19 08:53 AJD TAL SL 1 Total/NA Prep PrecSep\_0 447520 10/24/19 07:55 EJQ TAL SL Total/NA 9320 449305 11/06/19 18:50 TAL SL Analysis 1 KLS Total/NA Analysis Ra226 Ra228 454196 12/13/19 09:38 TAL SL

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

#### **Accreditation/Certification Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-2

#### Laboratory: Eurofins TestAmerica, Cedar Falls

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	<b>Expiration Date</b>
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	101044	11-01-20
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-20
Georgia	State	IA100001 (OR)	09-29-20
Illinois	NELAP	200024	11-29-19 *
Iowa	State Program	007	12-01-19 *
Kansas	NELAP	E-10341	01-31-20
Minnesota	NELAP	019-999-319	12-31-19
Minnesota (Petrofund)	State Program	3349	08-22-21
North Dakota	State	R-186	09-30-20
Oregon	NELAP	IA100001	09-29-20
USDA	US Federal Programs	P330-19-00003	01-02-22

#### Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	12-31-19

<sup>\*</sup> Accreditation/Certification renewal pending - accreditation/certification considered valid.

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Eurofins TestAmerica, Cedar Falls

#### **Method Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR Job ID: 310-167942-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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# **Environment Testing TestAmerica**



#### Cooler/Sample Receipt and Temperature Log Form

Client Information					
Client: Off)					
City/State: Omala STATE	Project: NE City Shibon Unit				
Pecaint Information					
Date/Time Received: DATE 0/19/19	Received By: MCH				
Delivery Type: ☐ UPS ☐ FedEx Sat	☐ FedEx Ground ☐ US Mail ☐ Spee-Dee				
☐ Lab Courier ☐ Lab Field Services	☐ Client Drop-off ☐ Other:				
Condition of Cooler/Containers					
Sample(s) received in Cooler? X Yes No	If yes: Cooler ID: SD				
Multiple Coolers? Yes Yes	If yes: Cooler # of				
Cooler Custody Seals Present? ☐ Yes ☐ No	If yes: Cooler custody seals intact? ☐Yes ☐ No				
Sample Custody Seals Present?    Yes    No	If yes: Sample custody seals intact?☐ Yes ☐ No				
Trip Blank Present? ☐ Yes ☑ No	If yes: Which VOA samples are in cooler? ↓				
Temperature Record	等。1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年,1000年				
Coolant: Wet ice Blue ice Dry ice	Other: NONE				
Thermometer ID:	Correction Factor (°C): -0./				
• Temp Blank Temperature - If no temp blank, or temp blank te	mperature above criteria, proceed to Sample Container Temperature				
Uncorrected Temp (°C):	Corrected Temp (°C):				
Sample Container Temperature					
Container(s) used:	CONTAINER 2				
Uncorrected Temp (°C):					
Corrected Temp (°C):					
Exceptions Noted					
1) If temperature exceeds criteria, was sample(s) rece	1) If temperature exceeds criteria, was sample(s) received same day of sampling?  A) If yes: Is there evidence that the chilling process began?  A) Yes  A) No				
If temperature is <0°C, are there obvious signs that (e.g., bulging septa, broken/cracked bottles, frozen)					
Note: If yes, contact PM before proceeding. If no, proceeding.	eed with login				
Additional Comments					
	-				

Document: CF-LG-WI-002

Revision: 25 Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C Bacteria temperature criteria is 0 to 10°C

# Environment Testing TestAmerica

Place COC scanning label here

## Cooler/Sample Receipt and Temperature Log Form

Client Information	(P) (4) (2) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A
Client: Off D	
City/State: Omalia STATE	Project: NE City Station Unit
Descint Information	
Date/Time Received: DATE 0/19/19	Received By: MKH
Delivery Type: ☐ UPS	☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☐ Lab Courier ☐ Lab Field Service	es Client Drop-off Other:
Condition of Cooler/Containers	
Sample(s) received in Cooler?   ☐ Yes ☐ No	If yes: Cooler ID: #9
Multiple Coolers?   X Yes   → No-	MAN If yes: Cooler # of
Cooler Custody Seals Present? ☐ Yes ☐ No	If yes: Cooler custody seals intact? Yes No
Sample Custody Seals Present?  Yes No	If yes: Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present? ☐ Yes ☑ No	If yes: Which VOA samples are in cooler? 1
Temperature Record	(4) (4) (4) (4) (4) (4) (4) (4) (4) (4)
Coolant: Wet ice Blue ice Dry	ice Other: NONE
Thermometer ID: M	Correction Factor (°C): -O./
• Temp Blank Temperature - If no temp blank, or temp blank	k temperature above criteria, proceed to Sample Container Temperature
Uncorrected Temp (°C): 1.3	Corrected Temp (°C):
Sample Container Temperature	
Container(s) used:	CONTAINER 2
Uncorrected Temp (°C):	
Corrected Temp (°C):	
Exceptions Noted	
If temperature exceeds criteria, was sample(s) re     a) If yes: Is there evidence that the chilling pro	
If temperature is <0°C, are there obvious signs to (e.g., bulging septa, broken/cracked bottles, froz	that the integrity of sample containers is compromised? ten solid?)
Note: If yes, contact PM before proceeding. If no, pr	roceed with login
Additional Comments	

Document: CF-LG-WI-002

Revision: 25 Date: 06/17/2019

General temperature criteria is 0 to 6°C Bacteria temperature criteria is 0 to 10°C Eurofins TestAmerica, Cedar Falls

Page 19 of 24

TestAmerica Cedar Falls										•	TectAmerica	ico
704 Enterprise Drive Cedar Falls, 1A 50613	_	Shain o	f Cus	Chain of Custody Record	ecor		TestAmerica Omaha SC	ca Oma	iha SC			2
								268			THE LEADER IN ENVIRONMENTAL TESTING	AL TESTING
Client Information	Sampler: Kyle K. Uhing			Lab PM Hayes	Lab PM: Hayes, Shawn M	Σ		Carrier	Carrier Tracking No(s):	0	COC No:	
Client Contact: Kyle Uhing	Phone: (531) 226-2515			E-Mail:	n.hayes@	testame	E-Mail: shawn.hayes@testamericainc.com			a	Page:	
Company: Omaha Public Power District							Analysi	Analysis Requested	pe	7	Job#:	
Address: 444 South 16th Street Mall 9E/EP1	Due Date Requested:	;pe			68						Code	
City: Omaha	TAT Requested (days):	iys):			eg 'Kunc		_				A - HCL M - Hexane B - NaOH N - None C - Zn Acetate	- 0
State, Zip: NE, 68102-2247					oneM A	93	_					v (5 E)
Phone: (531) 226-2515	# OA						peug				F - MeOH R - Na2S2S G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Do	R - Na2S2SO3 S - H2SO4 T - TSP Dodecahydrate
Email: kkuhing@oppd.com	WO#;				(0)	2000	woo e					
Project Name: Nebraska City Station Unit 1 CCR/Landfill	TestAmerica Project #: 31007559	#1			s or N	Fide, F	774077			SALES CHOICES	K - EDTA W - ph 4-5 L - EDA Z - other (specify)	pecify)
Site: Nebraska City Station Unit 1	SSOW#.				SD (Ye	eA Chic	шпірез			NOON PARKET NAMED IN	Other:	
Samole Identification	Sample Date	Sample	Sample Type (C=comp, G=crab)	Matrix (w-water, S-solid, O-waste/oll,	ield Filtered : MSM myone MSM Total Met	540C TDS, 905	9 0326 bns 316			redmuN leto	Society of the second	, mark
	X	X	$\neg$	-		ZZ	6			1	opecial ilistractions/note.	MOIE.
NC1MW2	10/18/19	10:i2	9	8	×	×	×			4	See attached list for specific analysis.	nalysis.
NC1MW3	10/18/19	11:5a	9	×	×	×	×			4	See attached list for specific analysis.	nalysis.
NC1MW4	10/18/19	1.08	O	M	×	×	×			4	See attached list for specific analysis.	nalysis.
NC1MW9	1/0/18/19	17:39	O	*	×	×	×			4	See attached list for specific analysis.	nalysis.
Mode				*	*	*	3			*	See attached list for specifical	- Alekan
Assessed			*	M	-	*	-			3	See attached list for specific analysis	natysts.
DUP1	1918 19	)	9	W	×	×	×			4	See attached list for specific analysis	nalysis.
	-											
ant	☐ Poison B ☐ Unknown		Radiological		Samp	le Dispo	ole Disposal ( A fee ma Return To Client	y be assess	assessed if samples	are retained long	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)  Return To Client Disposal By Lab Months	
Deliverable Requested: I, II, III, IV, Other (specify)					Specie	I Instruc	Special Instructions/QC Requirements:	irements:				
Empty Kit Relinquished by:		Date:			Time:	1			Method of Shipment:			
Relinquished by	Date/Time:	18.3		Compeny	Re	Received by:	于	1	Date/Tin	Pate/Time; 19	1437 CEVI	2

# Login Container Summary Report

310-167942

Temperature readings: \_

Client Sample ID	<u>Lab ID</u>	Container Type	Container pH	Preservative Added (mls)	Lot #
NC1MW2	310-167942-A-1	Plastic 250ml - with Nitric Acid	<2	_	
NC1MW2	310-167942-C-1	Plastic 1 liter - Nitric Acid	<2		
NC1MW2	310-167942-D-1	Plastic 1 liter - Nitric Acid	<2		
NCIMW3	310-167942-A-2	Plastic 250ml - with Nitric Acid	<2		
NC1MW3	310-167942-C-2	Plastic 1 liter - Nitric Acid	<2		
NCIMW3	310-167942-D-2	Plastic 1 liter - Nitric Acid	<2		
NC1MW4	310-167942-A-3	Plastic 250ml - with Nitric Acid	<2		
NC1MW4	310-167942-C-3	Plastic 1 liter - Nitric Acid	<2	4	
NC1MW4	310-167942-D-3	Plastic 1 liter - Nitric Acid	<2	-	
NCIMW9	310-167942-A-4	Plastic 250ml - with Nitric Acid	<2		
NCIMW9	310-167942-C-4	Plastic 1 liter - Nitric Acid	<2		
NCIMW9	310-167942-D-4	Plastic 1 liter - Nitric Acid	<2		
DUP	310-167942-A-5	Plastic 250ml - with Nitric Acid	<2		
DUP	310-167942-C-5	Plastic 1 liter - Nitric Acid	<2		
DUP	310-167942-D-5	Plastic I liter - Nitric Acid	<2		

Client: Omaha Public Power District

Job Number: 310-167942-2

Login Number: 167942 List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Spoerre, Autumn R

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Cedar Falls

Job Number: 310-167942-2

Client: Omaha Public Power District

Login Number: 167942

List Source: Eurofins TestAmerica, St. Louis

List Creation: 10/22/19 11:01 AM

List Number: 2 Creator: Harris, Lorin C

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

### **Tracer/Carrier Summary**

Client: Omaha Public Power District Project/Site: Nebraska City Unit 1 CCR

Method: 9315 - Radium-226 (GFPC)

**Matrix: Water** Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ba Carrier	
Lab Sample ID	Client Sample ID	(40-110)	
310-167942-1	NC1MW2	78.8	
310-167942-2	NC1MW3	80.9	
310-167942-3	NC1MW4	81.8	
310-167942-4	NC1MW9	80.3	
310-167942-5	DUP-1	80.6	
LCS 160-451213/1-A	Lab Control Sample	71.6	
LCSD 160-451213/2-A	Lab Control Sample Dup	82.4	
MB 160-451213/23-A	Method Blank	79.7	
Tracer/Carrier Legend			

Method: 9320 - Radium-228 (GFPC)

Prep Type: Total/NA **Matrix: Water** 

				Percent Yield (Acceptance Limits)
		Ba Carrier	Y Carrier	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
310-167942-1	NC1MW2	85.9	72.9	
310-167942-2	NC1MW3	89.3	71.4	
310-167942-3	NC1MW4	85.3	89.3	
310-167942-4	NC1MW9	101	85.2	
310-167942-5	DUP-1	91.2	82.2	
LCS 160-447520/1-A	Lab Control Sample	88.4	74.8	
LCSD 160-447520/2-A	Lab Control Sample Dup	85.3	83.7	
MB 160-447520/23-A	Method Blank	104	89.0	

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

Job ID: 310-167942-2



# Appendix C

Spring and Fall 2019 Statistical Memos





# **Technical Memorandum**

Date: Tuesday, July 30, 2019

To: Omaha Public Power District (OPPD)

From: HDR Engineering, Inc.

Summary of Statistical Analysis and Evaluation for SSLs

Subject: Nebraska City Station NC1 Ash Disposal Area

Spring 2019 CCR Groundwater Monitoring Network

Omaha Public Power District (OPPD) operates a two-unit (Unit 1 and Unit 2) fossil fuel-fired generating plant at the Nebraska City Station (Station) southeast of Nebraska City, Nebraska. The Station has two existing Coal Combustion Residuals (CCR) landfills for fossil fuel combustion ash disposal; the NC1 Ash Disposal Area and the NC2 Ash Disposal Area. Both NC1 and NC2 Ash Disposal Areas are subject to the U.S. Environmental Protection Agency's (USEPA's) final CCR Rule. This memorandum provides a discussion and evaluation of the NC1 Ash Disposal Area. The NC1 Ash Disposal Area is an unlined CCR landfill which encompasses a total area of approximately 52 acres.

Groundwater sampling was completed as part of an assessment monitoring program for the NC1 CCR unit in April 2019 (as specified in §257.95(d) and Title 132 Chapter 7 Section <u>005.06</u>). The statistical analysis of groundwater data was performed in accordance with the methods described in the *Groundwater Monitoring Statistical Certification* for the Nebraska City Station – NC1 Combustion Ash Landfill, amended July 31, 2018 and the facility's most recent SAP as permitted under Title 132. Sampling results used to update background threshold values (BTVs) were obtained during monitoring events performed between March 2016 and October 2018. Downgradient sampling results from the April 2019 assessment monitoring were used to evaluate for statistically significant increases (SSIs) over background and statistically significant levels (SSLs) over the groundwater protection standard (GWPS). The calculated BTVs and the evaluation for SSIs over background for the Appendix III (Detection Monitoring) constituents and Appendix IV (Assessment Monitoring) constituents are provided in **Table 1**. The calculated lower confidence levels (LCLs) and the evaluation for SSLs over the GWPS for the Appendix IV constituents are provided in **Table 2**.

Table 1. Summary of Evaluation for SSIs over Background (April 2019)

Well ID:			NC1-MW2	NC1-MW3	NC1-MW4	NC1-MW9	
Constituent	BTV (UPL):	Unit	Assessment Monitoring Results in accordance with §257.95(d)(1)  – April 2019				
Appendix III Constituents							
Boron	1.38	mg/L	<0.2	<u>2.33</u>	1.28	<u>2.59</u>	
Calcium	145	mg/L	111	<u>186</u>	120	<u>164</u>	
Chloride	20.7	mg/L	<5	7.96	5.78	5.34	
Fluoride	3.51	mg/L	<0.5	<0.5	<0.5	<0.5	



Table 1. Summary of Evaluation for SSIs over Background (April 2019)

Well ID:			NC1-MW2	NC1-MW3	NC1-MW4	NC1-MW9
Constituent	BTV (UPL):	Unit	Assessment M		s in accordance wi oril 2019	th §257.95(d)(1)
рН	6.57 - 7.83*	SU	6.68	7.32	7.65	7.03
Sulfate	148	mg/L	66.3	<u>427</u>	<u>231</u>	<u>184</u>
TDS	680	mg/L	418	<u>1040</u>	586	<u>756</u>
		A	ppendix IV Const	ituents		
Antimony	0.00235	mg/L	<0.001	<0.001	<0.001	<0.001
Arsenic	0.033	mg/L	<0.002	0.0143	0.00223	0.00681
Barium	0.372	mg/L	0.126	0.0938	0.0652	0.153
Beryllium	0.001	mg/L	<0.001	<0.001	<0.001	<0.001
Cadmium	0.0005	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Chromium	0.005	mg/L	<0.005	<0.005	<0.005	<0.005
Cobalt	0.00477	mg/L	<0.0005	0.00250	<0.0005	<u>0.00559</u>
Fluoride	3.51	mg/L	<0.5	<0.5	<0.5	<0.5
Lead	0.006	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.0569	mg/L	<0.01	0.0271	0.011	0.0254
Mercury	0.000262	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	0.00996	mg/L	0.0803	<0.002	0.0269	<u>0.0196</u>
Radium 226+228	2.16	pCi/L	0.494	0.348	0.0157	0.415
Selenium	0.0139	mg/L	<0.005	<0.005	<0.005	0.012
Thallium	0.001	mg/L	<0.001	<0.001	<0.001	<0.001

**Bold and underlined** concentration indicates an SSI over background.

Table 2. Summary of Evaluation for SSLs over GWPS (April 2019)

Well ID:			NC1-MW2	NC1-MW3	NC1-MW4	NC1-MW9			
Constituent	GWPS	Unit	Confiden	Confidence Intervals in accordance with §257.95(d)(1)					
Antimony	0.006 <sup>[1]</sup>	mg/L	0.001	0.001	0.001	0.001			
Arsenic	0.01 <sup>[1]</sup>	mg/L	0.002	0.01504	0.002965	0.008252			
Barium	2.00 <sup>[1]</sup>	mg/L	0.1101	0.09786	0.08292	0.019104			
Beryllium	0.004 <sup>[1]</sup>	mg/L	0.001	0.001	0.001	0.001			
Cadmium	0.005 <sup>[1]</sup>	mg/L	0.0005	0.0005	0.0005	0.0005			
Chromium	0.1 <sup>[1]</sup>	mg/L	0.005	0.005	0.005	0.005			
Cobalt	0.006 <sup>[1]</sup>	mg/L	0.0005	0.002011	0.0005	0.0008585			
Fluoride	4.00[1]	mg/L	0.5	0.5	0.5	0.5			
Lead	0.015 <sup>[1]</sup>	mg/L	0.0005	0.0005	0.0005	0.0005			
Lithium	0.0423 <sup>[2]</sup>	mg/L	0.01	0.0325	0.0114	0.0201			
Mercury	0.002[1]	mg/L	0.0002	0.0002	0.0002	0.0002			
Molybdenum	0.1 <sup>[1]</sup>	mg/L	0.05248	0.002	0.01909	0.02488			
Radium 226+228	5.0 <sup>[1]</sup>	pCi/L	0.3532	0.3842	0.2335	0.4407			
Selenium	0.05 <sup>[1]</sup>	mg/L	0.005	0.005	0.005	0.005			
Thallium	0.002 <sup>[1]</sup>	mg/L	0.001	0.001	0.001	0.001			

**Bold and underlined** concentration indicates an SSL over the GWPS.

<sup>\*</sup> indicates the lower bound of the range is the lower prediction limit (LPL). The upper bound is the upper prediction limit (UPL).

<sup>[1]</sup> GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2).

<sup>[2]</sup> GWPS is established as the UPL when the background level is higher than the U.S. EPA MCL.



# **Technical Memorandum**

Date: Friday, January 31, 2020

To: Omaha Public Power District (OPPD)

From: HDR Engineering, Inc.

Summary of Statistical Analysis and Evaluation for SSLs

Subject: Nebraska City Station NC1 Ash Disposal Area

Fall 2019 CCR Annual Groundwater Monitoring Report

Omaha Public Power District (OPPD) operates a two-unit (Unit 1 and Unit 2) fossil fuel-fired generating plant at the Nebraska City Station (Station) southeast of Nebraska City, Nebraska. The Station has two existing Coal Combustion Residuals (CCR) landfills for fossil fuel combustion ash disposal; the NC1 Ash Disposal Area and the NC2 Ash Disposal Area. Both NC1 and NC2 Ash Disposal Areas are subject to the U.S. Environmental Protection Agency's (USEPA's) final CCR Rule and Nebraska Department of Environment and Energy's (NDEE) Title 132 regulations for fossil fuel combustion ash disposal areas. This memorandum provides a discussion and evaluation of the NC1 Ash Disposal Area. The NC1 Ash Disposal Area is an unlined CCR landfill which encompasses a total area of approximately 52 acres.

Groundwater sampling was completed as part of an assessment monitoring program for the NC1 CCR unit in October 2019 (as specified in §257.95(d) and Title 132 Chapter 7 Section 005.06). The statistical analysis of groundwater data was performed in accordance with the methods described in the *Groundwater Monitoring Statistical Certification* for the Nebraska City Station – NC1 Combustion Ash Landfill, amended July 31, 2018 and the facility's most recent SAP as permitted under Title 132. Sampling results used to update background threshold values (BTVs) were obtained during monitoring events performed between March 2016 and October 2018. Downgradient sampling results from the October 2019 assessment monitoring were used to evaluate for statistically significant increases (SSIs) over background and statistically significant levels (SSLs) over the groundwater protection standard (GWPS). The calculated BTVs and the evaluation for SSIs over background for the Appendix III (Detection Monitoring) constituents and Appendix IV (Assessment Monitoring) constituents are provided in **Table 1**. The calculated lower confidence levels (LCLs) and the evaluation for SSLs over the GWPS for the Appendix IV constituents are provided in **Table 2**.

Table 1. Summary of Evaluation for SSIs over Background (October 2019)

		Well ID:	NC1-MW2	NC1-MW3	NC1-MW4	NC1-MW9
Constituent	BTV (UPL):	Unit	Asses	sment Monitorin	g Results – Octob	er 2019
	De	tection Mo	nitoring (Appendi	ix III) Constituen	ts	
Boron	1.38	mg/L	0.305	<u>2.42</u>	1.34	1.31
Calcium	145	mg/L	112	<u>166</u>	<u>151</u>	<u>157</u>
Chloride	20.7	mg/L	<5	9.91	5.64	5.13
Fluoride	3.51	mg/L	<0.5	0.527	0.501	0.605
рН	6.57 - 7.83*	SU	6.84	7.08	7.33	7.06



Table 1. Summary of Evaluation for SSIs over Background (October 2019)

		Well ID:	NC1-MW2	NC1-MW3	NC1-MW4	NC1-MW9
•						
Constituent	BTV (UPL):	Unit	Asses	sment Monitorin	g Results – Octob	er 2019
Sulfate	148	mg/L	52.0	<u>361</u>	<u>238</u>	<u>206</u>
TDS	680	mg/L	332	<u>760</u>	572	<u>780</u>
	Asse	essment M	onitoring (Appen	dix IV) Constitue	ents	
Antimony	0.00235	mg/L	<0.001	<0.001	<0.001	<0.001
Arsenic	0.033	mg/L	<0.002	0.0333	0.00347	0.00784
Barium	0.372	mg/L	0.179	0.135	0.119	0.165
Beryllium	0.001	mg/L	<0.001	<0.001	<0.001	<0.001
Cadmium	0.0005	mg/L	0.000230	<0.0001	<0.0001	0.000100
Chromium	0.005	mg/L	<0.005	<0.005	<0.005	<0.005
Cobalt	0.00477	mg/L	0.000548	0.00182	0.000642	0.00323
Fluoride	3.51	mg/L	<0.5	0.527	0.501	0.605
Lead	0.006	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Lithium	0.0569	mg/L	0.0117	0.0316	0.0137	0.0310
Mercury	0.000262	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	0.00996	mg/L	0.0872	<0.002	<u>0.0183</u>	0.0230
Radium 226+228	2.16	pCi/L	0.334	0.146	-0.000469U	0.695
Selenium	0.0139	mg/L	<0.005	<0.005	<0.005	<0.005
Thallium	0.001	mg/L	<0.001	<0.001	<0.001	<0.001

**Bold and underlined** concentration indicates an SSI over background.

Table 2. Summary of Evaluation for SSLs over GWPS (October 2019)

Well ID:			NC1-MW2	NC1-MW3	NC1-MW4	NC1-MW9		
Constituent	GWPS	Unit	Lower Confide	Lower Confidence Levels – Assessment Monitoring (Appendix IV) Constituents – October 2019				
Antimony	0.006 <sup>[1]</sup>	mg/L	0.001	0.001	0.001	0.001		
Arsenic	0.033[2]	mg/L	0.002	0.0162	0.003	0.0082		
Barium	2.00 <sup>[1]</sup>	mg/L	0.1119	0.010	0.085	0.0930		
Beryllium	0.004 <sup>[1]</sup>	mg/L	0.001	0.001	0.001	0.001		
Cadmium	0.005 <sup>[1]</sup>	mg/L	0.00023	0.0001	0.0001	0.0001		
Chromium	0.1 <sup>[1]</sup>	mg/L	0.005	0.005	0.005	0.005		
Cobalt	0.006 <sup>[1]</sup>	mg/L	0.0005	0.002	0.0005	0.0009		
Fluoride	4.00 <sup>[1]</sup>	mg/L	0.5	0.5	0.5	0.547		
Lead	0.015 <sup>[1]</sup>	mg/L	0.0005	0.0005	0.0005	0.0005		
Lithium	0.0569[2]	mg/L	0.01	0.0325	0.0135	0.0254		
Mercury	0.002 <sup>[1]</sup>	mg/L	0.0002	0.0002	0.0002	0.0002		
Molybdenum	0.1 <sup>[1]</sup>	mg/L	0.0549	0.002	0.0190	0.0247		
Radium 226+228	5.0 <sup>[1]</sup>	pCi/L	0.3511	0.355	0.2037	0.464		
Selenium	0.05 <sup>[1]</sup>	mg/L	0.005	0.005	0.005	0.005		
Thallium	0.002[1]	mg/L	0.001	0.001	0.001	0.001		

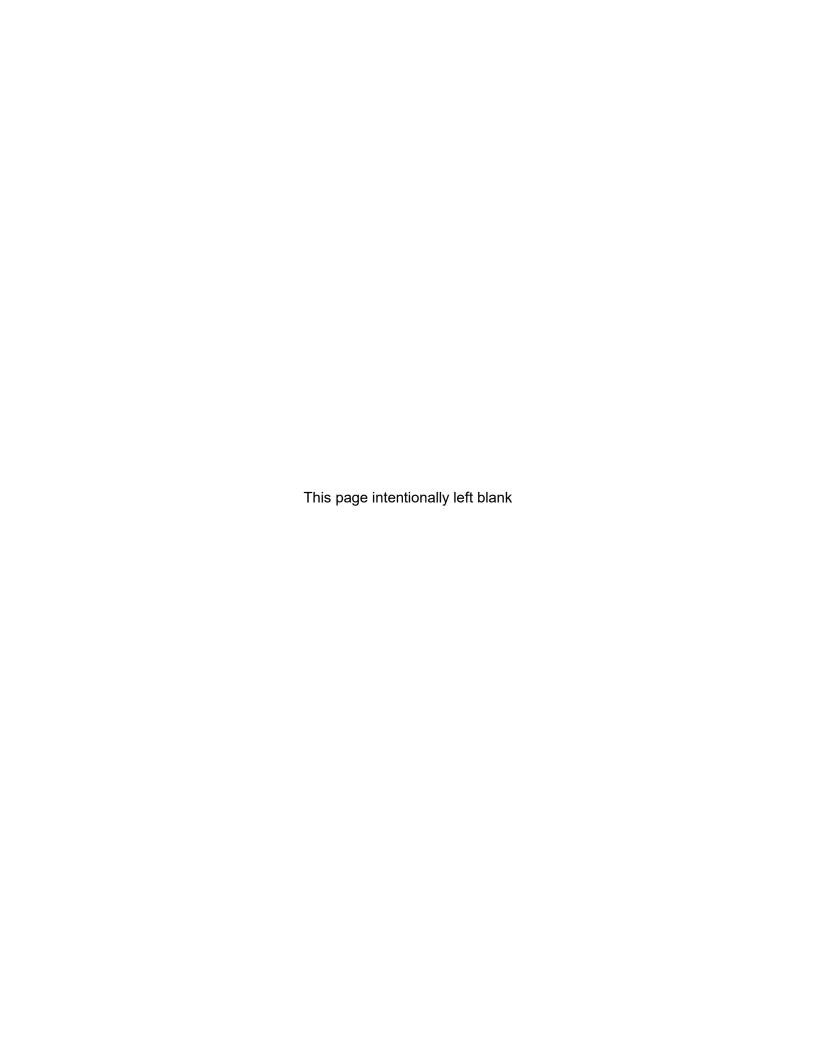
**Bold and underlined** concentration indicates an SSL over the GWPS.

<sup>\*</sup> indicates the lower bound of the range is the lower prediction limit (LPL). The upper bound is the upper prediction limit (UPL).

<sup>[1]</sup> GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2).

<sup>[2]</sup> GWPS is established as the UPL when the background level is higher than the U.S. EPA MCL.

# Appendix D April 2019 ASD Memo





# Memo

Date: Sunday, April 07, 2019

To: Omaha Public Power District (OPPD)

From: HDR Engineering, Inc.

Alternative Source Demonstration Evaluation for SSLs

Subject: Nebraska City Station NC1 Ash Disposal Area

**CCR Groundwater Monitoring** 

Omaha Public Power District (OPPD) operates a two-unit (Unit 1 and Unit 2) fossil fuel-fired generating plant at the Nebraska City Station (Station) southeast of Nebraska City, Nebraska. The Station has two existing Coal Combustion Residuals (CCR) landfills for fossil fuel combustion ash disposal; the NC1 Ash Disposal Area and the NC2 Ash Disposal Area. Both NC1 and NC2 Ash Disposal Areas are subject to the U.S. Environmental Protection Agency's (USEPA's) final CCR Rule. This memorandum provides a discussion and evaluation of the NC1 Ash Disposal Area. The NC1 Ash Disposal Area is an unlined CCR landfill which encompasses a total area of approximately 52 acres.

On January 31, 2019, OPPD published, in the 2018 Annual Groundwater Monitoring and Corrective Action Report (2018 Annual Report), an Appendix IV constituent at a statistically significant level (SSL) in one of the downgradient monitoring wells at the NC1 Ash Disposal Area<sup>[1]</sup>. The statistical evaluation for SSLs over the Groundwater Protection Standards (GWPS) conducted for the October 2018 assessment monitoring data indicated one SSL for arsenic in monitoring well MW-3.

As required by the CCR Rule, the owner must either initiate an assessment of corrective measures as required by §257.96; or demonstrate that a source other than the CCR unit caused the SSL, that the SSL resulted from an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Due to the complexities of hydrogeological conditions and the nature of statistical testing, there are numerous reasons why a statistically significant result may not be an indication of an actual release from the regulated unit. It is reasonable to allow for a separate demonstration, including statistical factors, once an SSL occurs to determine whether the detected level is actually due to a contaminant release.

The objective of this memorandum is to document an alternative source demonstration (ASD) for the SSL (i.e. arsenic at MW-3) published in the 2018 Annual Report at the NC1 Ash Disposal Area. In anticipation of an ASD or delineation activities, an additional upgradient monitoring well (MW-14) was installed. As part of this ASD, MW-14 was sampled and statistically analyzed in this memorandum to evaluate if the SSL published in the 2018 Annual Report resulted from natural variation in groundwater quality.



# Groundwater Monitoring Well Installation & Sample Analysis

To evaluate the potential of natural variation, upgradient monitoring well MW-14 was installed on July 12, 2018 and is located northwest of the NC1 Ash Disposal Area. Table 1 provides a summary of the updated monitoring well network, including MW-14, for the NC1 Ash Disposal Area. The "CCR Groundwater Monitoring System" certification will be updated to include the addition of MW-14 to the groundwater monitoring network.

Table 1. NC1 Ash Disposal Area monitoring network

Monitoring Well ID	Date Installed	Well Depth (feet bgs)	Location w/ respect to NC1 Ash Disposal Area	Top of Well Casing Elevation (feet AMSL)
NC2-MW-4	09/08/2004	14.0	Background/Upgradient	919.40
MW-11	01/16/2004	20.0	Background/Upgradient	918.35
MW-13	01/26/2016	13.0	Background/Upgradient	917.69
MW-14	07/12/2018	18.0	Background/Upgradient	921.00
NC1-MW-2	03/14/1995	17.8	Downgradient	919.39
NC1-MW-3	03/13/1995	19.5	Downgradient/Cross-gradient	919.80
NC1-MW-4	03/13/1995	20.3	Downgradient	919.81
MW-9	01/21/1999	20.0	Downgradient	920.14

Groundwater samples were collected at MW-14 by OPPD personnel on October 4, 2018; January 15, 2019; and March 5, 2019. Groundwater samples were analyzed by Test America Laboratories, Inc. in Cedar Falls, Iowa for the full Appendix III and Appendix IV constituent lists. Additionally, dissolved samples were collected during the January and March 2019 sampling events by field filtering the groundwater sample using a 0.45 µm inline disposable filter to evaluate the total metals and dissolved metals detected. Analytical results for total arsenic and dissolved arsenic at MW-14 are provided in Table 2. Results in Table 2 indicate total arsenic detections and dissolved arsenic detections were within 0.01 mg/L of each other; indicating the detected arsenic is present as dissolved arsenic in the groundwater. The full laboratory analytical reports will be included in the 2019 Annual Groundwater Monitoring & Corrective Action Report. The results of the ASD sampling events are further discussed in the Statistical Re-evaluation section of this memorandum.

Table 2. Arsenic Detections in MW-14

Date Sampled	Total Arsenic (mg/L)	Dissolved Arsenic (mg/L)
10/04/2018	0.0330	N/A
01/15/2019	0.0301	0.0295
03/05/2019	0.0253	0.0185



## Statistical Re-evaluation

To evaluate a potential in natural variability of arsenic near the NC1 Ash Disposal Area, a statistical analyses was completed using the new upgradient monitoring well MW-14 as part of the pooled upgradient data from background wells (refer to Table 1). Groundwater samples from the NC1 Ash Disposal Area monitoring network were statistically re-evaluated for background threshold values (BTVs) by using interwell upper prediction limits (UPLs). The UPLs calculated for each constituent as part of this ASD used the pooled data from the four upgradient monitoring wells collected from March 2016 to March 2019. The previous UPLs reported prior to this ASD evaluation did not include data from MW-14 and instead consisted of pooled March 2016 to March 2018 data from MW-11, MW-13, and NC2-MW-4. The BTVs for Appendix III constituents and Appendix IV constituents for both events are presented in Table 3 and Table 4, respectively.

A comparison of the resulting UPLs in Table 3 shows comparable but slightly different values for calcium, fluoride, pH, and TDS; as expected from the relatively small background sample sizes. The UPLs for boron, chloride, and sulfate did not change with the additional samples. The UPLs for these constituents follow a nonparametric distribution; therefore, the UPL is set as the maximum observed background value (i.e. 148 mg/L for sulfate observed on 10-4-2018). Overall, the eight statistically significant increase (SSIs) for Appendix III constituents detected in the 2018 Annual Report remain unchanged with the additional data from MW-14; with the exception of total dissolved solids (TDS) at MW-9. By updating the UPL, an SSI is not detected for TDS at MW-9. The change in the UPL values with the additional upgradient data from MW-14 indicates that background variation influences the determination of whether an SSI has occurred.

Table 3. Background Threshold Values (UPL<sup>1,2</sup>) for Appendix III Constituents

Monitoring Event	Reporting Date	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	TDS (mg/L)
Assessment Monitoring	Jan. 2019	1.38	141	20.7	3.64	7.80 - 6.67 <sup>1</sup>	148	640
ASD Evaluation	Apr. 2019	1.38	145	20.7	3.51	7.83 – 6.57 <sup>1</sup>	148	680

#### Notes:

A comparison of the resulting UPLs in Table 4 shows comparable but slightly different values for barium, lead, lithium, molybdenum, combined radium and selenium; as expected from the relatively small background sample sizes. The UPLs for antimony, beryllium, cadmium, chromium, mercury, and thallium did not change with the additional samples. The UPLs for antimony and mercury follow a nonparametric distribution; therefore, the UPL is set as the maximum observed background value (i.e. 0.000262 mg/L for mercury observed on 7-13-2017 & 0.00235 mg/L for antimony observed on 6-20-2017). The remaining constituents (beryllium, cadmium, chromium, and thallium) were not detected in the four background wells; therefore, the UPLs are set as the laboratory reporting limit. The largest changes in the UPLs were observed for arsenic and cobalt due to higher detections of these constituents in the background well MW-14. The increase in the UPLs for arsenic and cobalt indicate the influence of background variation.

<sup>&</sup>lt;sup>1</sup> BTVs have been reported to three significant figures to maintain the same level of precision as the results reported by the laboratory.

<sup>&</sup>lt;sup>2</sup>Indicates the lower bound of the range is the lower prediction limit (LPL). The upper bound is the upper prediction limit (UPL).



Overall, the eight statistically significant increase (SSIs) for Appendix IV constituents at the four downgradient monitoring wells detected in the 2018 Annual Report remain unchanged with the additional data from MW-14; the exception being arsenic at NC1-MW-4 and MW-9. With the updated UPL for arsenic, NC1-MW-4 and MW-9 are not detected as SSIs. The change in the UPLs with the additional upgradient data from MW-14 indicates that background variation influences the determination of whether an SSI has occurred for Appendix IV constituents.

The GWPS established as part of the Assessment Monitoring event published in January 2019 is provided in Table 4 and were re-evaluated as part of this ASD evaluation. As shown in Table 4, the BTV for arsenic and lithium were above the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2). In accordance with the NC1 Groundwater Monitoring Statistical Certification<sup>[2]</sup> and 40 CFR 257.95(h), the upper tolerance limits (UTLs) were used to establish GWPS for Appendix IV constituents where background concentration for which the background level is higher than the MCL or the GWPS specified in §257.95(h)(2).

Analytical sampling results for downgradient monitoring well MW-3 published in the 2018 Annual Report are provided in Table 4. As part of this ASD evaluation, a statistical re-evaluation was completed at MW-3. As shown in Table 4, arsenic at MW-3 remains above the updated BTV indicating an SSI over background.

Table 4. SSI Determination for MW-3: BTVs (UPL) & GWPS for Appendix IV Constituents

		MW-3	B	TVs	GWF	PS <sup>[1]</sup>
Constituent	Units	Detections – Published Jan. 2019	Assessment Monitoring – Jan. 2019	ASD Evaluation – Apr. 2019	Assessment Monitoring – Jan. 2019	ASD Evaluation – Apr. 2019
Antimony	mg/L	N.S.*	0.00235	0.00235	0.006	0.006
Arsenic	mg/L	0.0352	0.00965	0.033	0.01	0.033 <sup>[2]</sup>
Barium	mg/L	0.141	0.400	0.372	2.0	2.0
Beryllium	mg/L	N.S.*	0.001 <sup>[4]</sup>	0.001 <sup>[4]</sup>	0.004	0.004
Cadmium	mg/L	N.S.*	0.0005 <sup>[4]</sup>	0.0005 <sup>[4]</sup>	0.005	0.005
Chromium	mg/L	N.S.*	0.005 <sup>[4]</sup>	0.005 <sup>[4]</sup>	0.1	0.1
Cobalt	mg/L	0.00120	0.00236	0.00477	0.006	0.006
Fluoride <sup>[3]</sup>	mg/L	0.541	3.64	3.51	4.0	4.0
Lead	mg/L	0.000833	0.00577	0.006	0.015	0.015
Lithium	mg/L	0.0326	0.0423	0.0569	0.0423 <sup>[2]</sup>	0.0569 [2]
Mercury	mg/L	N.S.*	0.000262	0.000262	0.002	0.002
Molybdenum	mg/L	<0.002	0.0100	0.00996	0.10	0.10
Radium 226 + 228	pCi/L	1.12	1.84	2.16	5.0	5.0
Selenium	mg/L	<0.005	0.011	0.0139	0.05	0.05
Thallium	mg/L	N.S.*	0.001 <sup>[4]</sup>	0.001 <sup>[4]</sup>	0.002	0.002

#### Notes:

**Bold** indicates an SSI over background

N.S.\* = Not sampled; Constituent not sampled because only detected Appendix IV constituents were tested, in accordance with 40 CFR 257.95(d)(1).

<sup>&</sup>lt;sup>1</sup>GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2); unless otherwise specified.

<sup>&</sup>lt;sup>2</sup>GWPS is established as the upper tolerance limit (UTL) when the background level is higher than the U.S. EPA MCL or the GWPS specified in §257.95(h)(2).

<sup>&</sup>lt;sup>3</sup> Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).

<sup>&</sup>lt;sup>4</sup> Constituent was not detected above the laboratory reporting limit (RL) for the background wells; therefore, the BTV is set at the laboratory RL.



In accordance with the statistical procedures specified in the NC1 Groundwater Monitoring Statistical Certification <sup>[2]</sup>, the lower confidence limit (LCL) is calculated to determine if an SSL above the GWPS is detected. OPPD published an SSL in the 2018 Annual Report for arsenic in MW-3. A re-evaluation of the SSL was completed as part of this ASD utilizing the updated GWPS for arsenic. Results of the statistical re-evaluation for an SSL at MW-3 is provided in Table 5. The LCL was re-calculated to determine if there is an exceedance above the GWPS. As shown in Table 5, the LCL for both the Assessment Monitoring and the ASD evaluation are below the GWPS; therefore, the SSL previously published at MW-3 is not considered an SSL and is not associated with a release from the NC1 Ash Disposal Area.

Table 5. SSL Determination for Arsenic in MW-3

Monitoring Well ID	Constituent	Detection - Published Jan. 2019	GWPS	Lower Confidence Limit		
				Assessment Monitoring – Jan. 2019	ASD Evaluation – Apr. 2019	SSL (Yes/No)
MW-3	Arsenic (mg/L)	0.0352	0.033	0.0151	0.0151	No <sup>[1]</sup>

Notes:

# Summary

The statistical re-evaluation of the monitoring data, including the additional upgradient monitoring well MW-14, indicated that natural variation of groundwater quality is present and can influence the determination of whether an SSI and/or SSL has occurred. The ASD evaluation shows that arsenic in upgradient monitoring well MW-14 is present at higher concentrations than the EPA's MCL. As a result of the variability and detected arsenic concentrations in the background monitoring well, the previously published SSL for arsenic at MW-3 is not considered an SSL, and the NC1 Ash Disposal Area will remain in assessment monitoring.

# **Key Upcoming Activities**

As a result of this ASD, OPPD intends to conduct the following activities:

- Update the NC1 Groundwater Monitoring Network certification to include monitoring well MW-14 as an upgradient/background monitoring well for the NC1 Ash Disposal Area.
- Continue monitoring groundwater in the Assessment Monitoring program, in accordance with the CCR Rule §257.95 for the NC1 Ash Disposal Area.
- Continue more frequent groundwater monitoring at MW-14 to collect five additional rounds of samples to complete the eight initial background monitoring samples.

<sup>&</sup>lt;sup>1</sup>The lower confidence limit (LCL) is below the GWPS; therefore so SSL has been detected.



## References

<sup>[1]</sup>OPPD, 2019. (Omaha Public Power District). 2018 NC1 CCR Landfill Annual Groundwater Monitoring and Corrective Action Report. Nebraska City, Nebraska, January 31, 2019.

<sup>[2]</sup>OPPD, 2018. (Omaha Public Power District). *NC1 CCR Landfill Groundwater Monitoring Statistical Certification*. Nebraska City, Nebraska, July 2018.

## Certification

Date:

#### **Professional Engineer Certification**

I hereby certify to the best of my knowledge that the information contained in this document is appropriate for evaluating the groundwater monitoring data and verify its use for an alternative source demonstration at the Nebraska City Station's NC1 Ash Disposal Area.

I am duly licensed Professional Engineer under the laws of the State of Nebraska.

Print Name:	Megan B. Seymour

Signature: Mey b. Segre

License #: E-1593

My license renewal date is December 31, 2020.