2021 Annual Groundwater Monitoring and Corrective Action Report

Nelson Dewey Generating Station Slag Pond
Cassville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25221071.00 | January 31, 2022

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OVERVIEW OF CURRENT STATUS

Nelson Dewey Generating Station, Slag Pond
2021 Annual Report

In accordance with §257.90(e)(6), this section at the beginning of the annual report provides an overview of the current status of groundwater monitoring and corrective action programs for the coal combustion residual (CCR) units. Supporting information is provided in the text of the annual report.

Category	Rule Requirement	Site Status
Monitoring Status – Start of Year	(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Detection
Monitoring Status – End of Year	(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Detection
Statistically Significant Increases (SSIs)	(iii) If it was determined that there was a statistically significant increase over background for one or more constituents listed in appendix III to this part pursuant to §257.94(e):	
	(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such; and an increase	<u>April 2021</u> Boron: B-7R, B-11A, B-11B, B-11R, B-31A, B-31R Calcium: B11R Fluoride: B-11B Field pH: B-11B, B-31A Sulfate: B-11B, B-11R, B-31R Total Dissolved Solids (TDS): B-11B, B-11R <u>October 2021</u> Boron: B-11A, B-11B, B-11R, B-31A, B-31R Calcium: B-11R Field pH: B-11B Sulfate: B-11B, B-11R TDS: B-11B, B-11R

Category	Rule Requirement	Site Status
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Alternative Source Demonstrations prepared for October 2020 and April 2021 events during 2021. Assessment monitoring not required. Alternative sources for October 2021 SSIs will be evaluated in 2022.
Statistically Significant Levels (SSL) Above Groundwater Protection Standard	(iv) If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in appendix IV to this part pursuant to §257.95(g) include all of the following:	Not applicable In detection monitoring
	(A) Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;	
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	
	(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	
Selection of Remedy	(v) Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Not applicable In detection monitoring
Corrective Action	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not applicable In detection monitoring

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1.0 INTRODUCTION

This 2021 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the Coal Combustion Residuals (CCR) Rule [40 CFR 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2021 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit. The site location is shown on **Figure 1**.

This report covers the period of groundwater monitoring from January 1, 2021, through December 31, 2021.

The groundwater monitoring system for the Nelson Dewey Generating Station (NED) Slag Pond monitors a single CCR unit:

- NED Slag Pond (existing surface impoundment – closed January 2018)

The system is designed to detect monitored constituents at the waste boundary of the Slag Pond as required by 40 CFR 257.91(d). The groundwater monitoring system consists of one background well and six downgradient monitoring wells (**Table 1** and **Figure 3**).

During 2017 and early 2018, the Slag Pond CCR unit was closed by leaving the CCR in place and installing a final cover system, in accordance with §257.102(d). Closure certification was completed on January 31, 2018.

The closed CCR landfill adjacent to the Slag Pond is not subject to regulation under the CCR rule, and is regulated by the Wisconsin Department of Natural Resources. The CCR landfill was initially licensed in 1976 and received fly ash from NED until it was closed in phases between 1996 and 2001.

2.0 BACKGROUND

To provide context for the annual report, the following background information is provided in this section of the report, prior to the annual report requirements sections:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Information

The uppermost geologic formation beneath the NED plant that meets the definition of the "uppermost aquifer," as defined by section 257.53 of the CCR Rule, is the surficial alluvial aquifer. The alluvial aquifer consists of Mississippi River valley sand and gravel deposits. This deposit is prevalent along the edges of the entire Mississippi River valley in southwestern Wisconsin. A map of the regional glacial geology in the area is included in **Appendix A**.

The alluvial aquifer is underlain by dolomitic bedrock of the Prairie du Chien Group. A bedrock geology map of the area is provided in **Appendix A**. The dolomite bedrock is also an aquifer and is likely hydraulically connected to the alluvial aquifer above.

Regionally, groundwater flow is generally to the southwest and discharges to the Mississippi River.

2.1.2 Site Information

Soil boring logs for monitoring wells installed at the site also generally indicate sand and gravel soils within the monitored depths. During drilling of CCR well B-7R, the unconsolidated materials were identified as consisting primarily of poorly graded, medium to coarse grained sand, and silty sand. The boring log for the previously installed background monitoring well B-26 shows silt and poorly graded sand as the primary unconsolidated materials at this location. The boring logs for the CCR monitoring wells are provided in **Appendix B**. All CCR monitoring wells are screened within the unconsolidated glacial aquifer.

The groundwater flow direction in the vicinity of the plant is generally southwest toward the Mississippi River. Historically, infiltration at the former Slag Pond, former fly ash basin, and the former Wisconsin Pollutant Discharge Elimination System (WPDES) ponds caused groundwater mounding to be present around these features; however, these ponds have now all been closed and are no longer sources of infiltration.

Although historic site water level measurements have generally indicated that groundwater flow is toward the Mississippi River, groundwater flow in the Slag Pond area is influenced by variations in river water levels. During periods of high river water levels, the flow temporarily reverses and the river discharges to the shallow sand and gravel aquifer. The water table map for the April 2021 monitoring event (**Figure 4**), when river levels were high, shows localized groundwater flow to the northeast from the river converging with regional flow to the southwest in the area of the closed Slag Pond. From the Slag Pond area, groundwater flow is to the southeast. The water table map for the October 2021 monitoring event (**Figure 5**) shows flow to the south and southwest toward the river. The groundwater elevations for the CCR monitoring wells and additional wells in the state monitoring program for the closed CCR landfill are provided in **Table 3.** Calculated horizontal gradients and flow velocities for flow to the northeast in April 2021 and to the southeast in October 2021 are provided in **Table 4A**. Vertical gradients are provided in Table 4B.

2.2 CCR MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of one upgradient (background) monitoring well and six downgradient monitoring wells (**Table 1** and **Figure 3**). The background well is B-26. The downgradient wells include B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R. The CCR Rule wells are installed within the surficial alluvium aquifer. Well depths range from approximately 23 to 114 feet, measured from the top of the well casing.

3.0 § 257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has*

been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

3.1 §257.90(E)(1) SITE MAP

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

A map showing the site location is provided as **Figure 1**. A map showing the CCR unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as **Figure 3**. The Slag Pond CCR unit is closed, and the map shows the post-closure conditions.

3.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

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

No new monitoring wells were installed and no wells were decommissioned as part of the groundwater monitoring program for the CCR unit in 2021.

3.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

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

Two groundwater sampling events were completed in 2021 at the NED Slag Pond as part of ongoing detection monitoring.

Groundwater samples collected during the semiannual events, in April and October 2021, were analyzed for the Appendix III constituents. A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring program is included in **Table 2**.

The sampling results for Appendix III parameters in 2021 are summarized in **Table 5**. Field parameter results for the 2021 sampling events are provided in **Table 6**. The analytical laboratory reports for 2021 are provided in **Appendix C**. Historical results for each monitoring well are summarized in **Appendix D**.

3.4 § 257.90(E)(4) MONITORING TRANSITION NARRATIVE

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

There was no monitoring program transition in 2021. The NED Slag Pond remained in the detection monitoring program.

In 2021, the monitoring results for the October 2020 and April 2021 monitoring events were evaluated for statistically significant increases (SSIs) in detection monitoring parameters relative to background. The comparison to background was based on a prediction limit approach, comparing the results to interwell upper prediction limits (UPLs) based on background monitoring results from the upgradient well (B-26). The interwell UPLs were most recently updated in January 2021 using background data collected through October 2020. The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (USEPA, 2009; Section 5.3.1) recommends periodic updating of background for both intrawell and interwell analyses. For semiannual monitoring, an update interval of 2 to 3 years is recommended; therefore, the next UPL update is planned for 2023 or 2024. The UPL calculations are included in Appendix E. The UPLs calculated in January 2021 were applied to the evaluation of the October 2020 and April 2021 monitoring results.

For the October 2020 and April 2021 events, SSIs were identified at one or more wells for boron, calcium, fluoride (April 2021 only), field pH, sulfate, and total dissolved solids (TDS). For the October 2021 event, SSIs have been preliminarily identified for boron, calcium, field pH, sulfate, and TDS (Table 5).

Alternative source demonstrations were completed in 2021 for SSIs identified in the October 2020 and April 2021 events, demonstrating that sources other than the Slag Pond were the likely cause of the observed SSIs. The Alternative Source Demonstration (ASD) reports are provided in Appendix F. A similar evaluation of alternative sources is anticipated to be performed in 2022 for SSIs identified in the October 2021 monitoring results.

3.5 § 257.90(E)(5) OTHER REQUIREMENTS

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

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in italics, followed by applicable information relative to the 2021 Annual Groundwater Monitoring and Corrective Action Report for the NED Slag Pond CCR unit.

3.5.1 § 257.90(e) General Requirements

For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year.

Status of Groundwater Monitoring and Corrective Action Program. The groundwater monitoring and corrective action program was in detection monitoring throughout 2021.

Summary of Key Actions Completed.

- Two semiannual groundwater sampling and analysis events (April and October 2021).
- Statistical evaluation and determination of SSIs for the October 2020 and April 2021 monitoring events.
- ASD reports for the SSIs identified from the October 2020 and April 2021 monitoring events.

Description of Any Problems Encountered. During the October 2021 monitoring event, compliance well B-7R did not have sufficient groundwater for sample collection. B-7R is a shallow well located close to the Mississippi River, and the low water level within the well is attributed to the low river level in the summer and fall of 2021. The groundwater elevation measured at B-7R in October 2021 is the lowest observed since the well was installed in 2009, and this well was able to be sampled during all previous monitoring events.

The April 2021 water table map shows a more easterly flow component in the vicinity of the CCR unit than was observed on previous water table maps. (**Figure 4**).

Discussion of Actions to Resolve the Problems. An additional attempt was made to sample B-7R on October 28, 2021, and again the well did not contain sufficient water for sample collection. This well will be sampled again in April 2022.

The easterly component of groundwater flow will be evaluated further in 2022 with quarterly groundwater level measurements and review of historic data from the state monitoring program. An additional monitoring well or wells will be installed east of the CCR unit if a data gap is confirmed.

Projection of Key Activities for the Upcoming Year (2022):

- Two semiannual groundwater sampling and analysis events (April and October 2022).
- Statistical evaluation and determination of any SSIs for the October 2021 and April 2022 monitoring events.
- If an SSI is determined, then within 90 days either:
  - Complete ASD (if applicable), or
  - Establish an assessment monitoring program.
- Quarterly groundwater level measurements to evaluate a potential easterly flow component. An additional monitoring well or wells will be installed east of the CCR unit if a data gap is confirmed.

3.5.2 § 257.94(d) Alternative Detection Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. No alternative detection monitoring frequency has been proposed.

3.5.3 § 257.94(e)(2) Alternative Source Demonstration for Detection Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

The ASD reports prepared to address the SSIs observed for the October 2020 and April 2021 sampling events are provided in **Appendix F**. The ASD reports are certified by a qualified professional engineer.

3.5.4 § 257.95(c) Alternative Assessment Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. Assessment monitoring has not been initiated.

3.5.5 § 257.95(d)(3) Assessment Monitoring Results and Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. Assessment monitoring has not been initiated.

3.5.6 § 257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. Assessment monitoring has not been initiated.

3.5.7 § 257.96(a) Extension of Time for Corrective Measures Assessment

The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measure due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. Corrective measures assessment has not been initiated.

3.6 257.90(E)(6) OVERVIEW

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit.

The specific requirements for the overview under §257.90(e)(6) are listed and the information is provided at the beginning of this report, before the Table of Contents.

4.0 REFERENCES

U.S. Environmental Protection Agency (USEPA), 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530-R-09-007, March 2009.

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Tables

Table 1. Groundwater Monitoring Well Network
Nelson Dewey Closed Ash Disposal Facility
SCS Engineers Project #25221071.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
B-26	Upgradient / Sidegradient	Background
B-7R	Downgradient	Compliance
B-11R	Downgradient	Compliance
B-11A	Downgradient	Compliance
B-11B	Downgradient	Compliance
B-31R	Downgradient	Compliance
B-31A	Downgradient	Compliance

Created by: RM Date: 12/14/2020
Last revision by: JAO Date: 12/17/2021
Checked by: RM Date: 12/27/2021

Table 2. CCR Rule Groundwater Samples Summary
Nelson Dewey Closed Ash Disposal Facility / SCS Engineers Project #25221071.00

Sample Dates	Downgradient Wells							Upgradient Well
	B-7R[(1)]	B-11R	B-11A	B-11B	B-31R	B-31A	B-39	B-26
4/19-21/2020	D	D	D	D	D	D	D	D
10/7-8/2020	--	D	D	D	D	D	D	D
Total Samples	1	2	2	2	2	2	2	2

Abbreviations:
D = Required by Detection Monitoring Program

Notes:
(1) Insufficient amount of water for sampling at B-7R during October 2021 sampling event.

Created by: ACW Date: 11/12/2019
Last revision by: RM Date: 12/27/2021
Checked by: MDB Date: 1/6/2022

Table 3. Groundwater Elevation Summary
Nelson Dewey Closed Ash Disposal Facility / SCS Engineers Project #25221071.00

Groundwater Elevation in feet above mean sea level (amsl)																								
Well Number	**B-7R**	**B-8R**	**B-11R**	**B-11A**	**B-11B**	**B-21R**	**B-26**	**B-26A**	**B-28**	**B-30R**	**B-30AR**	**B-31R**	**B-31A**	**B-32**	**B-32A**	**B-35**	**B-35A**	**B-36**	**B-36A**	**B-37**	**B-37A**	**B-39**	**MW-301**	**MW-302**	**MW-303**
Top of Casing Elevation (feet amsl)	623.35	627.51	622.62	622.12	621.89	623.31	626.40	626.40	616.81	621.81	622.4	622.42	622.69	614.18	614.4	620.78	621.09	621.11	621.33	614.85	614.85	626.48	619.09	619.21	618.49
Screen Length (ft)	10	10	10	5	5	10	10	5	10	10	5	10	5	10	5	10	5			10	5	10	10	10	10
Total Depth (ft from top of casing)	23.05	27.25	24.15	52.00	113.90	22.78	31.67	45.78	16.70	22.20	46.90	22.82	35.52	14.79	52.00	16.60	47.00			19.95	48.20	26.90	21.11	21.27	20.15
Top of Well Screen Elevation (ft)	610.30	610.26	608.47	575.12	512.99	610.53	604.73	585.62	610.11	609.61	580.50	609.60	592.17	609.39	567.40	614.18	579.20			604.90	571.65	609.58	607.98	607.94	608.34
Measurement Date																		--	--				--	--	--
October 5-6, 2011	604.94	606.29	604.57	604.36	604.32	604.43	604.52	604.55	604.61	604.37	605.21	608.37	604.42	604.88	604.82	604.87	604.81	--	--	604.37	604.39		--	--	--
April 25-26, 2012	606.58	606.30	606.07	606.30	606.28	--	605.89	605.91	--	--	--	608.65	606.31	604.33	--	606.29	621.20	--	--	606.16	606.17	606.17	--	--	--
October 17, 2012	604.39	604.16	604.10	603.98	603.98	604.08	604.12	604.14	604.31	603.97	603.98	607.32	604.07	604.33	604.35	--	621.20	--	--	603.93	603.93	603.93	--	--	--
April 2, 2013	607.04	608.01	606.15	607.20	607.17	606.30	605.60	605.64	605.90	605.91	605.93	607.13	607.13	606.11	606.14	606.13	606.25	--	--	606.99	607.02		--	--	--
October 16-17, 2013	604.51	605.89	604.17	603.90	603.87	604.11	604.31	604.32	604.36	604.08	604.06	604.87	604.00	604.53	604.56	604.46	604.44	--	--	604.05	604.04		--	--	--
April 10, 2014	607.42	608.97	607.45	607.28	607.26	--	607.22	607.23	--	--	--	607.37	607.28	--	--	607.46	607.39	--	--	607.25	607.26		--	--	--
October 14-15, 2014	605.67	606.82	605.17	604.90	604.91	614.92	605.00	605.01	605.13	604.92	604.92	606.36	605.54	605.41	605.45	605.36	605.33	--	--	604.94	604.99		--	--	--
April 16, 2015	607.26	608.50	607.11	607.15	607.05	--	606.40	606.41	--	--	--	607.37	607.09	--	--	606.73	606.78	--	--	606.99	606.88		--	--	--
October 1-2, 2015	605.14	604.66	604.53	604.42	604.38	604.36	604.43	604.50	604.54	604.34	604.32	605.13	604.38	604.76	604.82	604.76	604.75	--	--	604.30	604.39		--	--	--
December 8, 2015	606.69	--	606.71	606.30	606.26	--	606.80	--	--	--	--	607.40	606.39	--	--	--	--	--	--	--	--	607.54	--	--	--
April 12, 2016	609.32	609.36	609.32	608.71	608.68	--	609.81	609.72	--	--	--	609.34	609.01	--	--	609.73	609.65	--	--	608.79	608.79	610.23	--	--	--
July 18-19, 2016	606.54	--	606.14	606.76	606.74	--	606.09	--	--	--	--	606.55	606.73	--	--	--	--	--	--	--	--	606.28	--	--	--
October 19-20, 2016	608.59	608.46	608.35	608.21	608.19	608.37	608.84	608.76	608.63	608.45	608.46	608.51	608.20	608.69	608.73	608.78	608.74	--	--	608.20	608.18	609.09	--	--	--
January 11-12, 2017	608.02		607.96	607.83	607.78		608.56					607.90	607.84					--	--			608.92	--	--	--
April 17, 2017	609.08	608.82	608.34	609.05	608.99	NM	608.59	608.54	609.94	608.57	608.64	607.20	608.98	608.96	608.98	609.00	609.02	--	--	609.02	609.02	610.23	--	--	--
June 8, 2017	610.74	--	610.42	609.81	610.08	--	611.25	--	--	--	--	609.63	610.50	--	--	--	--	--	--	--	--	611.53	--	--	--
August 1-2, 2017	607.02	--	606.73	605.57	605.50	--	607.39	--	--	--	--	606.84	605.69	--	--	--	--	--	--	--	--	608.71	--	--	--
October 9-10, 2017	606.93	606.51	606.25	607.01	606.94	--	606.22	606.13	606.33	606.44	606.45	606.68	606.93	606.57	606.61	606.65	606.71	--	--	--	--	--	--	--	--
October 19, 2017	609.60	--	609.42	609.58	609.65	--	608.84	--	--	--	--	609.47	609.43	--	--	--	--	--	--	609.40	609.40	608.55	--	--	--
November 17, 2017	--	--	--	--	--	606.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
December 19, 2017	--	--	--	--	--	604.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
February 7, 2018	605.37	--	605.33	604.96	604.92	--	--	--	616.81	--	--	605.31	605.01	--	--	--	--	--	--	--	--	606.19	605.08	605.05	605.00
March 16, 2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	604.64	604.6	604.56
April 2-3, 2018 **	604.82	606.61	606.27	606.63	606.55	606.52	606.49	606.37	606.39	606.46	606.43	604.44	606.46	606.58	606.66	606.68	606.70	--	--	606.77	606.83	606.19	--	--	--
May 23, 2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	610.68	610.78	610.61
October 8-10, 2018	610.76	610.68	610.67	610.28	610.24	610.02	610.34	610.28	610.83	610.09	610.05	610.39	610.27	611.05	610.94	610.72	610.54	--	--	--	--	611.44	--	--	--
November 11, 2018	--	--	--	--	609.14	--	--	--	--	--	--	609.11	--	--	--	--	--	--	--	--	--	--	--	--	--
April 22-23, 2019	615.28	615.66	615.28	615.29	615.28	614.98	615.49	615.31	615.40	615.36	615.35	615.01	615.33	--	--	615.87	615.98	--	--	--	--	615.40	--	--	--
October 14-16, 2019	613.43	613.11	613.06	613.29	613.18	612.47	613.10	613.10	612.71	612.83	612.78	612.50	613.20	613.10	613.00	613.10	613.15	--	--	--	--	613.35	--	--	--
April 13-14, 2020	614.12	613.76	614.39	613.88	613.86	613.22	613.76	613.73	613.68	613.60	613.56	613.80	613.79	--	--	614.04	614.00	--	--	--	--	613.71	--	--	--
October 12-13, 2020	605.09	604.88	604.57	604.54	604.44	604.28	604.92	604.83	604.86	604.72	604.72	604.66	604.54	605.07	605.06	605.00	605.08	--	--	--	--	605.06	--	--	--
April 19-21, 2021	608.83	608.66	608.57	608.72	608.67	607.93	608.55	608.49	608.27	608.38	608.35	608.66	608.63	608.68	608.74	608.86	608.85	608.40	608.39	608.74	608.75	608.48	--	--	--
October 6-8, 2021	604.05	604.04	603.85	603.79	603.74	603.56	604.21	604.13	604.11	604.00	603.97	603.98	603.84	604.32	604.38	604.35	604.34	603.93	603.92	--	--	604.23	--	--	--
Bottom of Well Elevation (ft)	600.30	600.26	598.47	570.12	507.99	600.53	594.73	580.62	600.11	599.61	575.50	599.60	587.17	599.39	562.40	604.18	574.20	600.60	--	594.90	566.65	599.58	597.98	597.94	598.34

Notes:
-- = not measured
*The PVC casing at B-35A was cut down on June 28, 2018 to allow the protective cover to close. Groundwater elevations prior to 6/28/18 are calculated using the old top of casing (TOC) elevation of 621.20 ft amsl. Groundwater elevations after 6/28/18 are calculated using the new TOC elevation (621.09 ft amsl).
** The PVC casing at B-21R was extended in 2018 following well rehabilitation. The well was resurveyed on April 22, 2019. The old top of casing elevation was 621.03 ft. The new TOC elevation is 623.31 ft.

Created by: MDB Date: 4/1/2013
Last revision by: JAO Date: 12/20/2021
Checked by: RM Date: 12/27/2021

I:\25221071.00\Deliverables\2021 NED Fed CCR Annual Report\Tables\[Table 3 - 2021 Groundwater Elevation Summary.xls]levels

Table 4A. Horizontal Gradients and Flow Velocity
Nelson Dewey Generating Station
SCS Engineers Project #25221071.00
2021

	Northeast				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
April 19-21, 2021	608.75	608.5	243	0.001	0.01
April 19-21, 2021	608.57	608.5	403	0.0002	

	South				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
October 6-8, 2021	604.23	603.85	578	0.001	0.01
October 6-8, 2021	604.00	603.98	145	0.0001	

Wells	**K Values (cm/sec)**	**K Values (ft/d)**
Geometric Mean	2.9E-03	8.2

Note: K value derived from averaging previous slug tests

Assumed Porosity, n
0.40

Groundwater flow velocity equation: V = [K*(Δh/Δl)] / n

ft = feet
ft/d = feet per day
K = hydraulic conductivity
n = effective porosity
V = groundwater flow velocity

h1, h2 = point interpreted groundwater elevation at locations 1 and 2
Δl = distance between location 1 and 2
Δh/Δl = hydraulic gradient

Created by:	RM	Date:	12/29/2020
Last revision by:	MDB	Date:	1/10/2022
Checked by:	RM	Date:	1/11/2022

Table 4B. Summary of Calculated Vertical Hydraulic Gradients
Nelson Dewey Generating Station
SCS Engineers Project #25221071.00
2021

Date	B-11A/B-11B	B-31R/B-31A
April 19-21, 2021	-0.0005	-0.002
October 6-8, 2021	-0.0005	-0.010

Notes:

A positive vertical gradient indicates upward flow potential, and a negative vertical gradient indicates downward flow potential.

Created by:	MDB	Date: 1/20/2022
Last revision by:	MDB	Date: 1/20/2022
Checked by:	RM	Date: 1/20/2022

I:\25221071.00\Deliverables\2021 NED Fed CCR Annual Report\Tables\[Table 4B - Vertical_Gradients_2021.xlsx]Vertical Gradients

Table 5. Groundwater Analytical Results Summary - 2021
Nelson Dewey Closed Ash Disposal Facility, Cassville, WI / SCS Engineers Project #25221071.00

Parameter Name	UPL	Background Well		Compliance Wells											
		B-26		B-7R		B-11A		B-11B		B-11R		B-31A		B-31R	
		4/21/2021	10/8/2021	4/20/2021	10/7/2021[4]	4/19/2021	10/7/2021	4/19/2021	10/7/2021	4/19/2021	10/7/2021	4/19/2021	10/7/2021	4/19/2021	10/7/2021
Appendix III															
Boron, ug/L	72.3	63.6	48.4	104	--	88.1	85.4	4,440	2,480	3,010	2,940	172	178	621	353
Calcium, ug/L	108,000	78,700	84,900	56,100	--	50,600	51,400	93,400	100,000	115,000	119,000	52,100	53,500	91,400	79,000
Chloride, mg/L	77.6	42.6	39.1	9.5 J, D3	--	59.1	58.8	28.3	39.6	27.2	23.1	64.8	60.3	23.3	36.5
Fluoride, mg/L	0.2	<0.095	<0.095	<0.48 D3	--	0.23 J	0.22 J	0.36	<0.95 D3	<0.48 D3	<0.48 D3	0.14 J	0.15 J	0.19 J	0.22 J
Field pH, Std. Units	7.71	7.34	7.18	6.54	--	7.65	7.57	8.07	7.81	7.11	6.86	7.90	7.44	6.91	6.63
Sulfate, mg/L	44.0	35.3	43.8	<2.2 D3	--	2.9	7.0	379 M0	466	61.2	61.8	15.8	14.9	45.3	24.9
Total Dissolved Solids, mg/L	553	470	440	248	--	366	356	910	884	578	576	330	294	454	372

7.81 Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:
UPL = Upper Prediction Limit
SSI = Statistically Significant Increase
DQ = Double Quantification
LOQ = Limit of Quantitation
LOD = Limit of Detection
ug/L = micrograms per liter
mg/L = milligrams per liter

Lab Notes:
J = Estimated concentration at or above the LOD and below the LOQ.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M0 = Matrix Spike recovery and/or matric spike duplicate recovery was outside laboratory control limits.

Notes:
1. An individual result above the UPL may not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background well B-26. UPLs are based on a 1-of-2 retesting approach.
3. Interwell UPLs were updated in January 2021 with background well results from December 2015 through October 2020.
4. Monitoring well B-7R could not be sampled during the October 2021 sampling event due to low water levels.

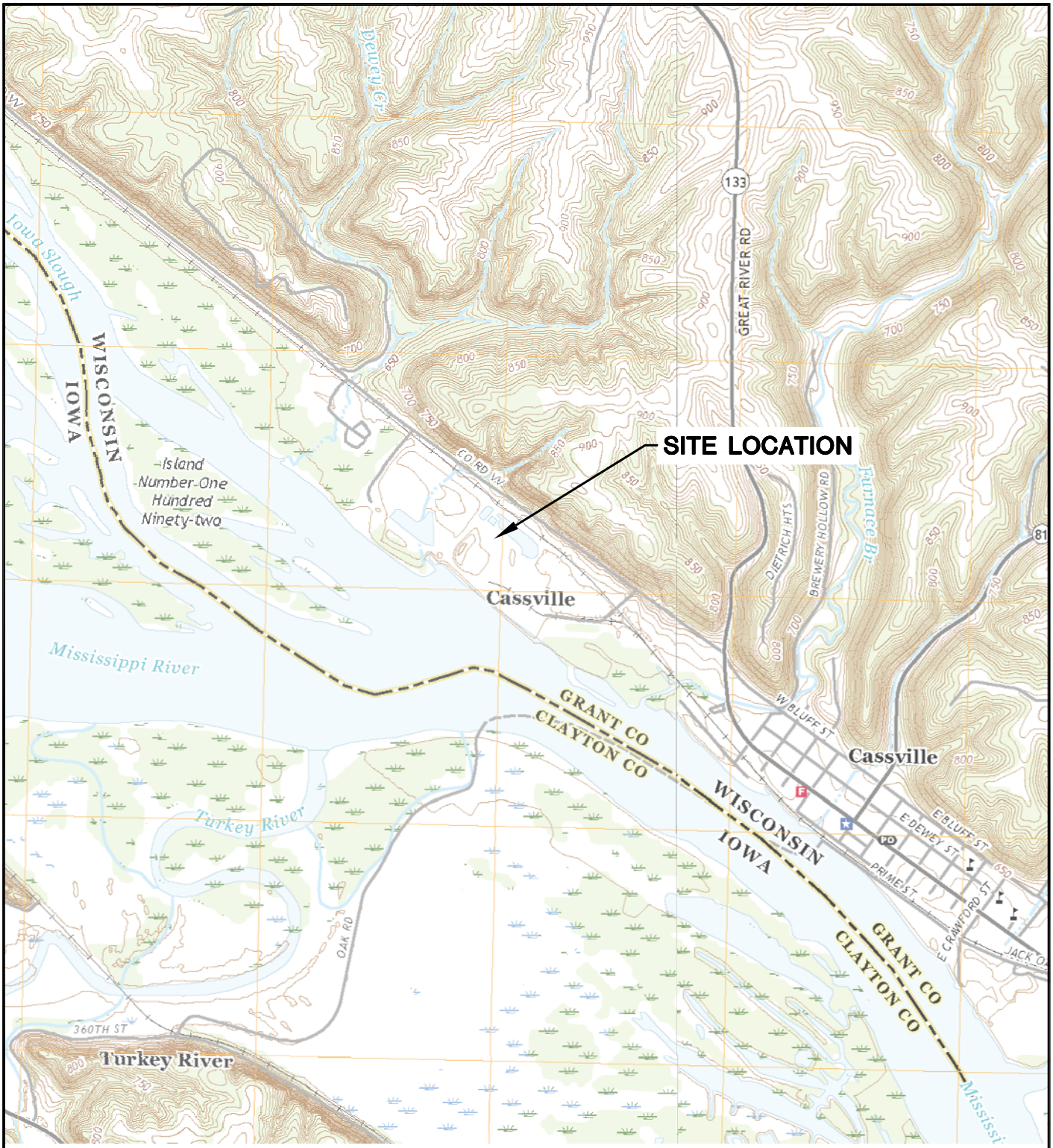
Created by:	LMH	Date:	6/4/2018
Last revision by:	JAO	Date:	12/17/2021
Checked by:	RM	Date:	12/27/2021
Proj Mgr QA/QC:	TK	Date:	1/10/2022

Table 6. 2021 Groundwater Field Data Summary
Nelson Dewey Closed Ash Disposal Facility / SCS Engineers Project #25221071.00
January - December 2021

Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Field Specific Conductance (umhos/cm)	Oxygen, Dissolved (mg/L)	Field Oxidation Potential (mV)	Turbidity (NTU)
B-7R	4/20/2021	608.83	9.3	6.54	535	0.19	-23.4	0.99
	10/7/2021	604.05	--	--	--	--	--	--
B-11A	4/19/2021	608.72	13.4	7.65	638	0.21	135.4	0.00
	10/7/2021	603.79	13.9	7.57	621	1.27	61.4	0.00
B-11B	4/19/2021	608.67	13.4	8.07	1,286	0.13	44.7	0.00
	10/7/2021	603.74	14.0	7.81	1,337	1.29	46.9	0.00
B-11R	4/19/2021	608.57	10.6	7.11	1,003	0.10	-64.5	8.40
	10/7/2021	603.85	14.6	6.86	1,029	1.57	-42.6	10.81
B-26	4/21/2021	608.55	11.0	7.27	778	8.74	105.8	0.00
	10/8/2021	604.21	11.4	7.18	788	9.40	122.1	0.00
B-31A	4/19/2021	608.63	13.5	7.90	563	0.18	79.6	0.00
	10/7/2021	603.84	13.5	7.44	553	1.35	23.5	0.00
B-31R	4/19/2021	608.66	12.1	6.91	747	0.12	16.3	11.39
	10/7/2021	603.98	13.8	6.63	649	1.81	16.7	0.00

Created by: RM Date: 12/22/2020
Last revision by: JAO Date: 12/20/2021
Checked by: RM Date: 12/27/2021

Figures



N

CASSVILLE AND TURKEY RIVER QUADRANGLES
WISCONSIN–IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	ALLIANT ENERGY 4902 N. BILTMORE LANE, #1000 MADISON, WI 53718	SITE	ALLIANT ENERGY NELSON DEWEY GENERATING STATION CASSVILLE, WISCONSIN

SITE LOCATION MAP

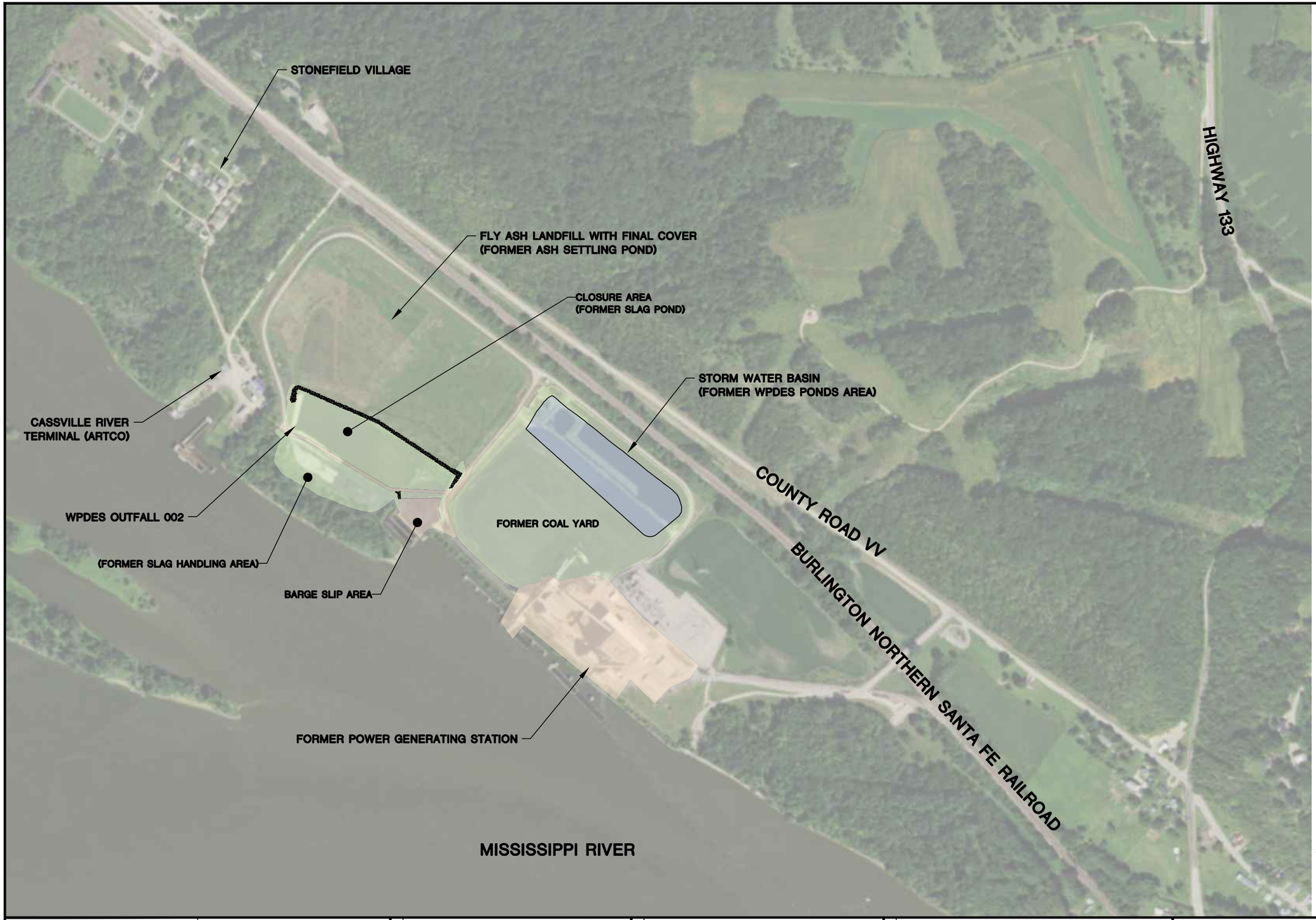
PROJECT NO.	25220071.00	DRAWN BY:	BSS
DRAWN:	11/27/2019	CHECKED BY:	MDB
REVISED:	01/14/2020	APPROVED BY:	TK 04/10/2020

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE
1

I:\25220071.00\Drawings\ASD\Site Location Map.dwg, 4/12/2020 7:11:31 PM



N

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS AUGUST 24, 2015.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25220071.00	DRAWN BY:	BJM
DRAWN:	12/18/13	CHECKED BY:	KAK
REVISED:	01/22/20	APPROVED BY:	TK 04/10/2020

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: WISCONSIN POWER AND LIGHT CO.
NELSON DEWEY GENERATING STATION
11999 COUNTY HIGHWAY VV
CASSVILLE WI, 53806

SITE: WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION
CASSVILLE WISCONSIN

AERIAL VIEW

FIGURE 2

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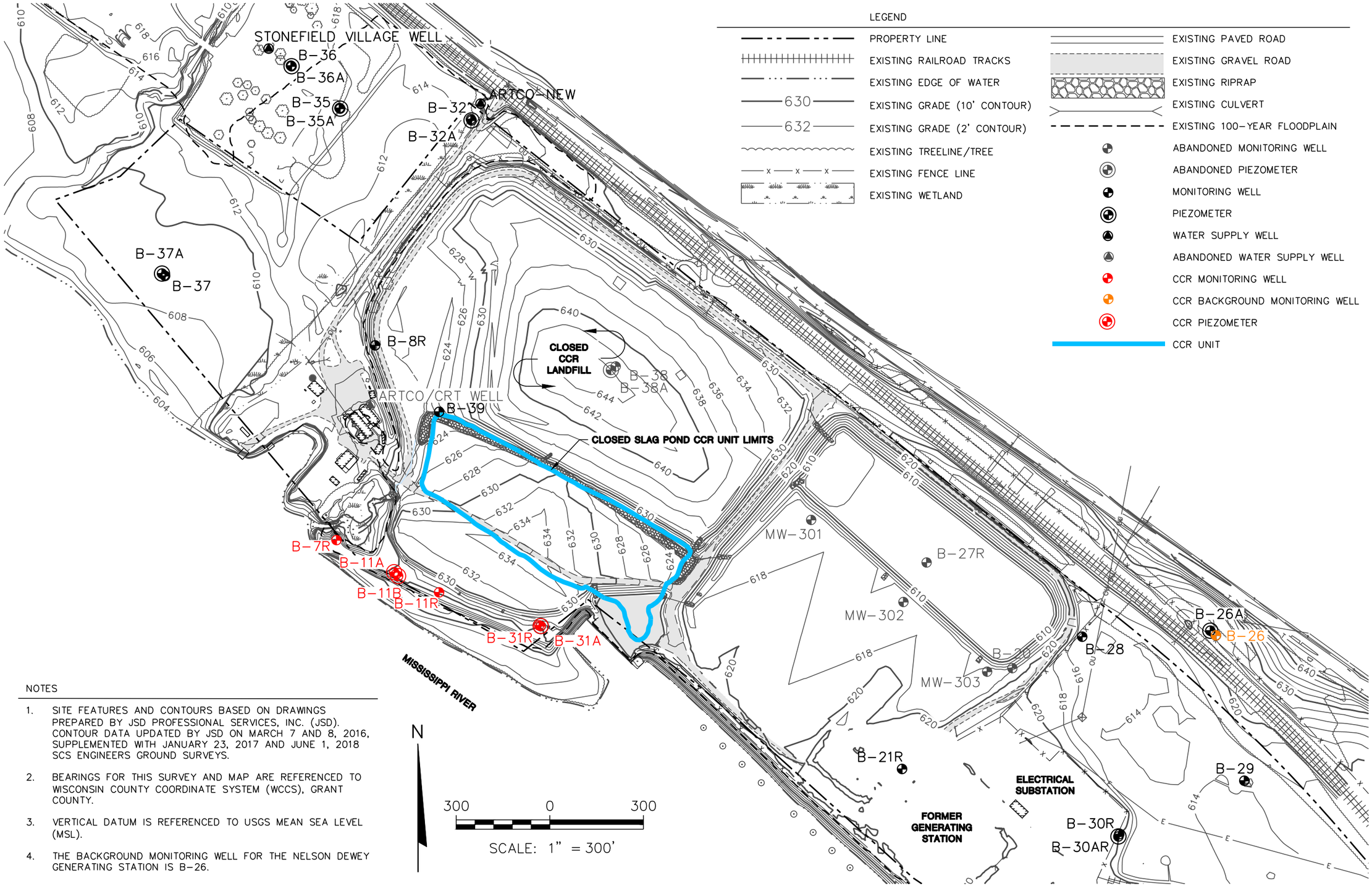

NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016, SUPPLEMENTED WITH JANUARY 23, 2017 AND JUNE 1, 2018 SCS ENGINEERS GROUND SURVEYS.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL).
4. THE BACKGROUND MONITORING WELL FOR THE NELSON DEWEY GENERATING STATION IS B-26.

SITE PLAN AND MONITORING WELL LOCATIONS

ALLIANT ENERGY
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

FIGURE 3

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

ENGINEER

DRAWN BY:	BSS
CHECKED BY:	MDB
APPROVED BY:	MDB 1/11/2022

PROJECT NO.	25221071.00
DRAWN:	11/27/2019
REVISED:	01/11/2022

SITE

CLIENT
ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

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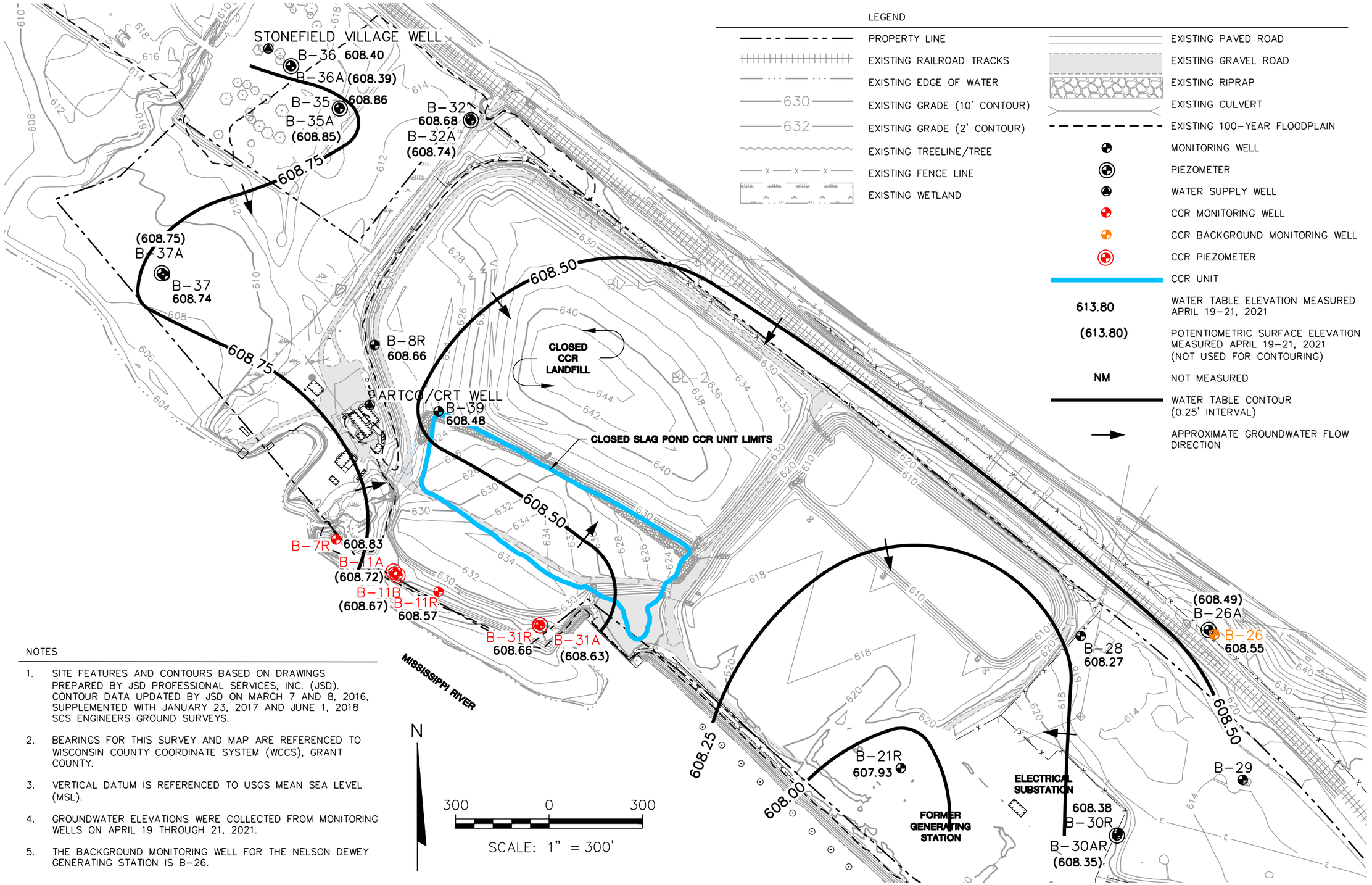

NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016, SUPPLEMENTED WITH JANUARY 23, 2017 AND JUNE 1, 2018 SCS ENGINEERS GROUND SURVEYS.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL).
4. GROUNDWATER ELEVATIONS WERE COLLECTED FROM MONITORING WELLS ON APRIL 19 THROUGH 21, 2021.
5. THE BACKGROUND MONITORING WELL FOR THE NELSON DEWEY GENERATING STATION IS B-26.

WATER TABLE FLOW MAP
APRIL 2021

ALLIANT ENERGY
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

SITE

ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

CLIENT

FIGURE 4

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

ENGINEER

PROJECT NO.	25221071.00	DRAWN BY:	KP
DRAWN:	05/12/2021	CHECKED BY:	RM
REVISED:	09/22/2021	APPROVED BY:	TK 1/10/2022

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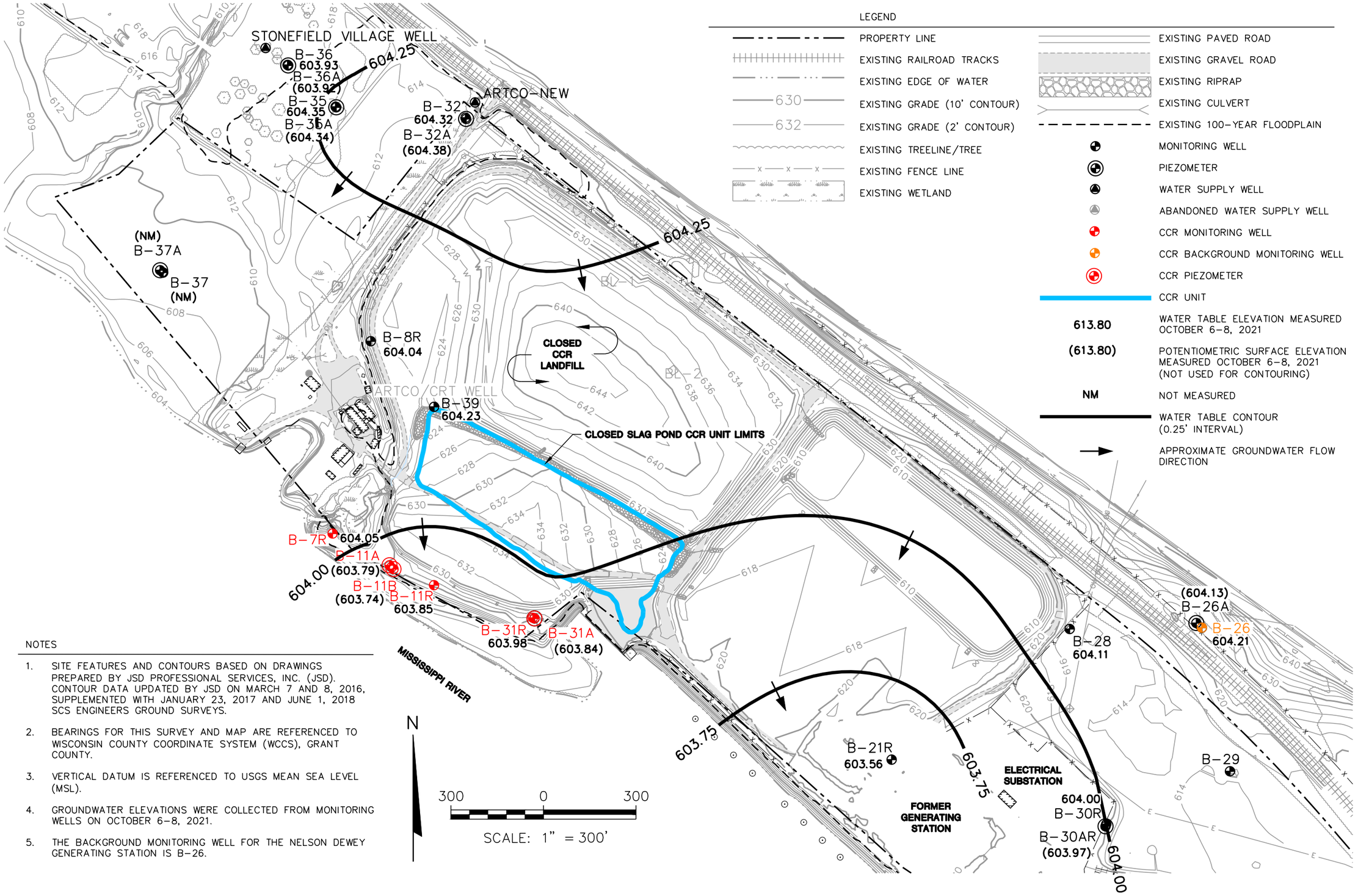

LEGEND

- PROPERTY LINE
- EXISTING RAILROAD TRACKS
- EXISTING EDGE OF WATER
- EXISTING GRADE (10' CONTOUR)
- EXISTING GRADE (2' CONTOUR)
- EXISTING TREELINE/TREE
- EXISTING FENCE LINE
- EXISTING WETLAND
- EXISTING PAVED ROAD
- EXISTING GRAVEL ROAD
- EXISTING RIPRAP
- EXISTING CULVERT
- EXISTING 100-YEAR FLOODPLAIN
- MONITORING WELL
- PIEZOMETER
- WATER SUPPLY WELL
- ABANDONED WATER SUPPLY WELL
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- CCR PIEZOMETER
- CCR UNIT
- 613.80 — WATER TABLE ELEVATION MEASURED OCTOBER 6-8, 2021
- (613.80) — POTENTIOMETRIC SURFACE ELEVATION MEASURED OCTOBER 6-8, 2021 (NOT USED FOR CONTOURING)
- NM — NOT MEASURED
- WATER TABLE CONTOUR (0.25' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016, SUPPLEMENTED WITH JANUARY 23, 2017 AND JUNE 1, 2018 SCS ENGINEERS GROUND SURVEYS.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL).
4. GROUNDWATER ELEVATIONS WERE COLLECTED FROM MONITORING WELLS ON OCTOBER 6-8, 2021.
5. THE BACKGROUND MONITORING WELL FOR THE NELSON DEWEY GENERATING STATION IS B-26.

WATER TABLE FLOW MAP
OCTOBER 2021

SITE
ALLIANT ENERGY
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

CLIENT
ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

FIGURE 5

ENGINEER
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

DRAWN BY:	KP	
PROJECT NO.	25221071.00	
CHECKED BY:	NDK	
DRAWN:	10/14/2021	
APPROVED BY:	TK 1/10/2022	
REVISED:	01/11/2022	

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Appendix A

Summary of Regional Geologic and Hydrogeologic Information

Regional Glacial Geology

Alluvial

al — **Alluvium.** Primarily sand or slightly gravelly sand on modern valley bottoms; most deposited during the last part of the Holocene; overlain by thin peat and thin silty overbank sediment in many places.

ate — **Alluvial sediment of the Elderon-phase terrace.** Sand or gravelly sand, at least a few meters thick up to 15 m thick, deposited by streams carrying meltwater from the margins of the Laurentide Ice Sheet during the Elderon phase of the late Wisconsin glaciation. Occurs as terraces formed during subsequent down-cutting during the latest Wisconsin and Holocene.

ats — **Alluvial sediment of the Savanna terrace.** Sand or gravelly sand, at least a few meters thick up to a15 m thick, deposited by streams carrying meltwater from the margins of the Laurentide Ice Sheet during the late Wisconsin glaciation. Occurs as the Savanna terrace formed during subsequent down-cutting during the latest Wisconsin and Holocene.

atb — **Alluvial sediment of the Bridgeport terrace.** Sand or gravelly sand, at least a few meters thick up to 15 m thick, deposited by streams carrying meltwater from the margins of the Laurentide Ice Sheet during the late Wisconsin glaciation. Occurs as remnants of the Bridgeport terrace; the terrace surface is likely largely underlain by a bedrock strath.

af — **Alluvial fan.** Moderately to well-sorted cobbles, gravel, pebbles, and fine sediment forming fan-shaped deposits on valley floors. Typically forms at the base of steep slopes and particularly at the mouths of steep tributaries.

Colluvial

cc — **Coarse-grained colluvium.** Unsorted slope sediment, derived from erosion of Paleozoic bedrock and windblown silt from upland surfaces moving downslope due to gravity. Typically associated with bedrock incision by major streams, and occurring on relatively steep slopes adjacent to major stream systems and deposits.

ls — **Landslide.** Poorly sorted gravel, boulder, and blocky debris. Forms chaotic, hummocky lobes on valley floors and at bases of slopes; may have associated scarps on adjacent upslope surfaces.

Windblown

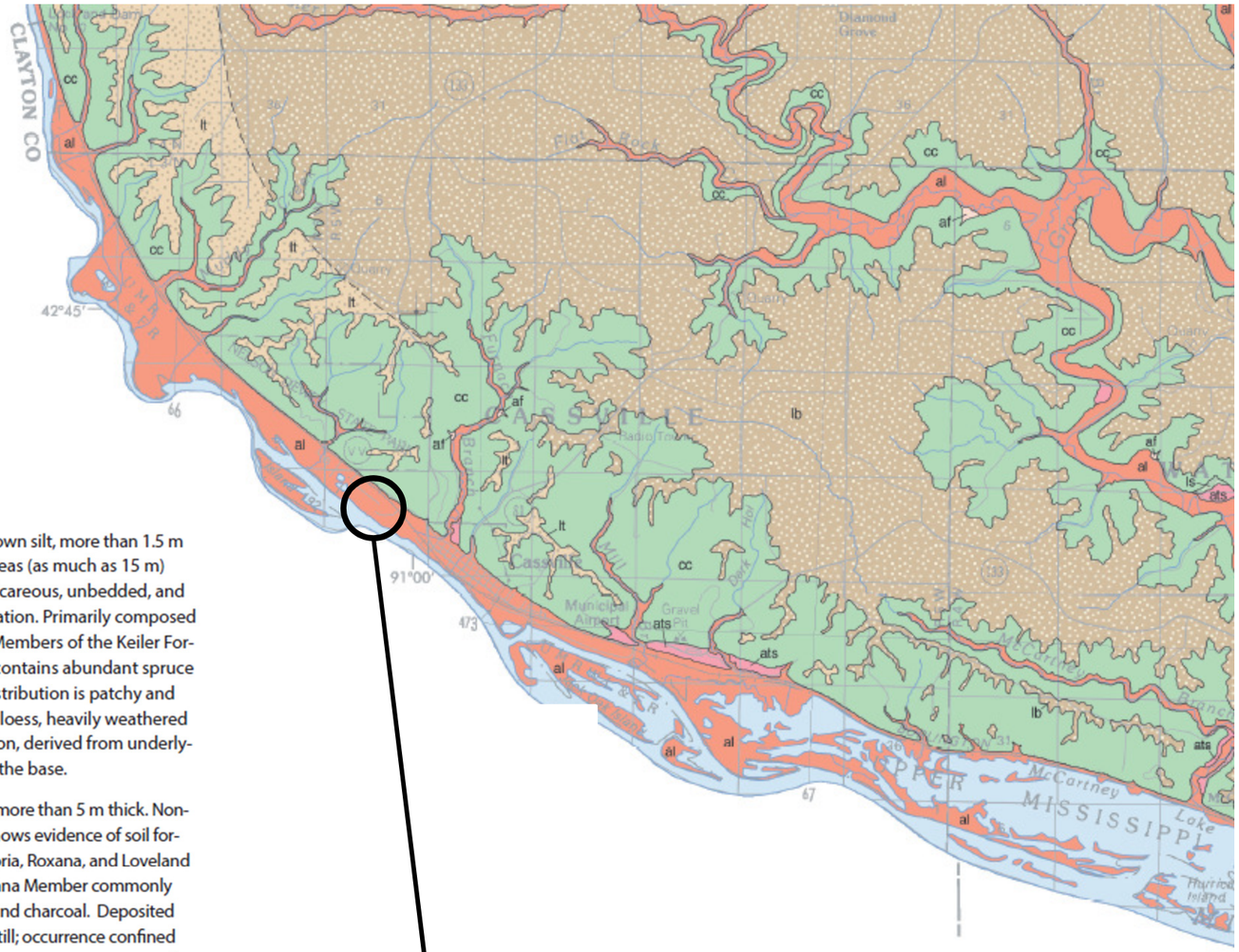
lb — **Loess on Paleozoic bedrock.** Windblown silt, more than 1.5 m thick; generally thickest in western areas (as much as 15 m) and thinning toward the east. Noncalcareous, unbedded, and massive; shows evidence of soil formation. Primarily composed of the Peoria, Roxana, and Loveland Members of the Keiler Formation. Roxana Member commonly contains abundant spruce fragments and charcoal. Although distribution is patchy and uncertain due to the thickness of the loess, heavily weathered residual clay of the Rountree Formation, derived from underlying Paleozoic bedrock, is common at the base.

lt — **Loess on till.** Windblown silt, typically more than 5 m thick. Noncalcareous, unbedded, and massive, shows evidence of soil formation. Primarily composed of the Peoria, Roxana, and Loveland Members of the Keiler Formation. Roxana Member commonly contains abundant spruce fragments and charcoal. Deposited on patchy, discontinuous pre-Illinoian till; occurrence confined to western Grant County, which was the easternmost extent of pre-Illinoian ice flowing from Minnesota and Iowa.

ws — **Windblown sand.** More than about 1.5 m thick; dunes generally no more than a few meters high.

Symbols

Geologic contact. Position shown on map is judged to be generally within 0.2 km of actual position. Dashed where approximate.

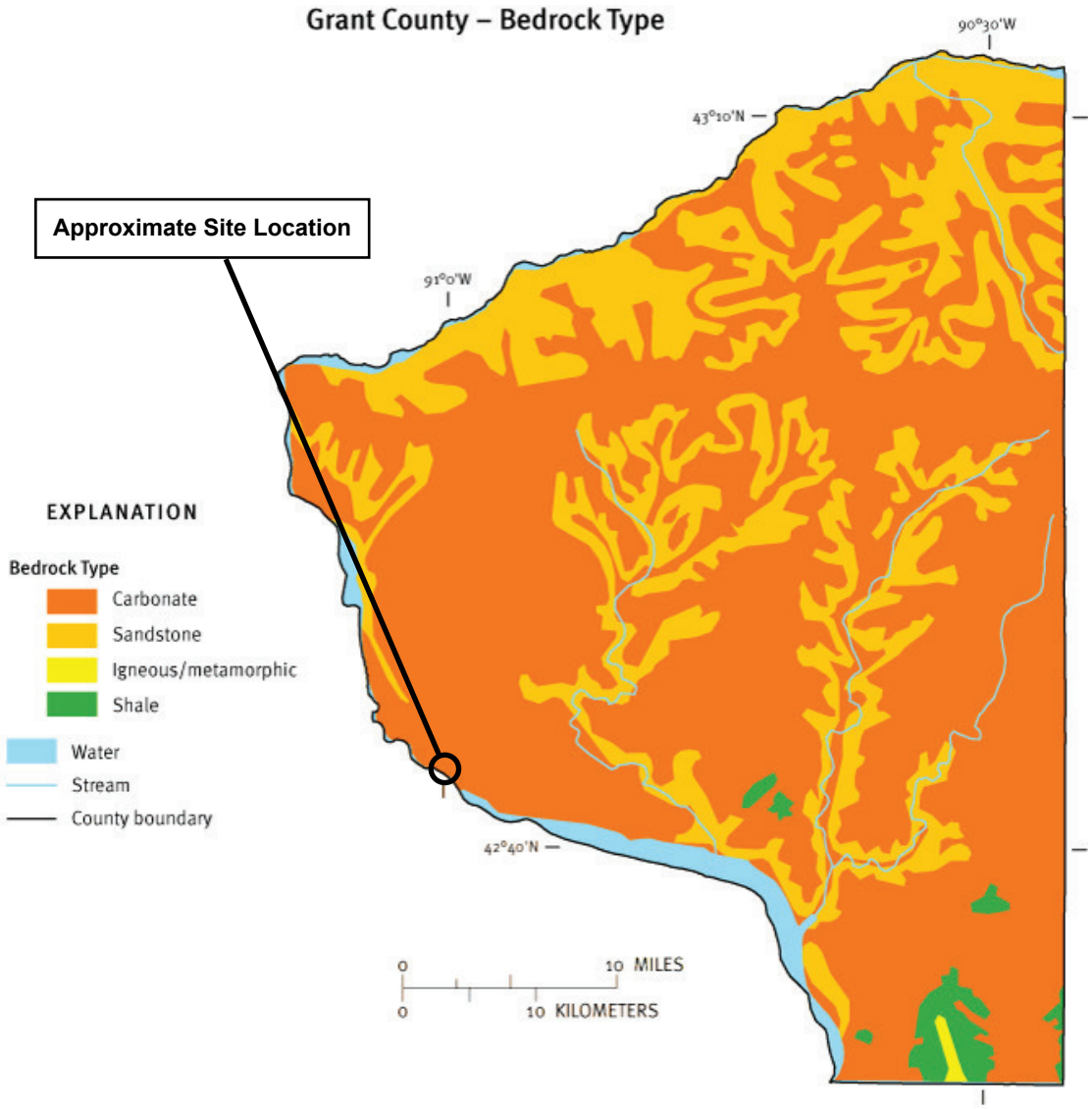


SCALE 1:100,000

1 0 1 2 3 4 5
MILES

1 0 1 2 3 4 5 6 7 8
KILOMETERS

Source: Carson, Eric C., Preliminary Quaternary Geology of Grant County, Wisconsin, Wisconsin Geological and Natural History Survey Open File Report 2012-06.

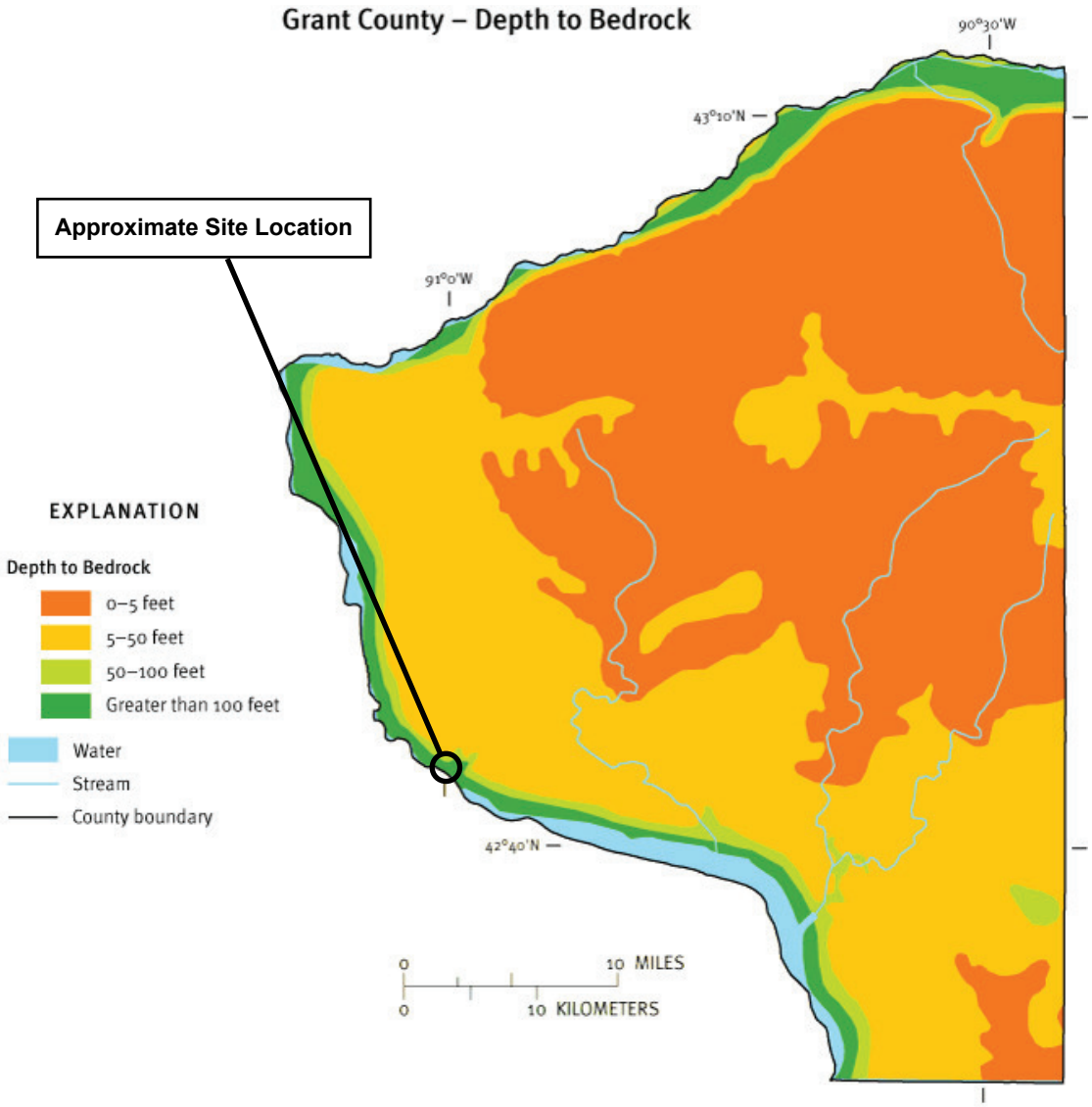


This resource characteristic map was derived from generalized statewide information at small scales, and cannot be used for any site-specific purposes.

Map source: Schmidt, R.R., 1987, Groundwater contamination susceptibility map and evaluation: Wisconsin Department of Natural Resources, Wisconsin's Groundwater Management Plan Report 5, PUBL-WR-177-87, 27 p.

Figure created for the "Protecting Wisconsin's Groundwater Through Comprehensive Planning" web site, 2007, *http://wi.water.usgs.gov/gwcomp/*

When bedrock is less than 50 feet from the land surface and the water table occurs in the bedrock, the type of bedrock is important in determining how easily a contaminant can reach the groundwater. Bedrock types that allow water to pass quickly through them will offer less protection from contaminants. In Wisconsin, these types of bedrock are typically limestone and dolomite which are highly fractured. Igneous and metamorphic rocks (e.g. granite) and sandstone are less fractured and offer some protection from infiltrating water which may contain contaminants. On the other hand, shale bedrock is almost impermeable, and doesn't allow water and accompanying contaminants to pass through it as easily. The bedrock categories used for this project are carbonates, sandstone, igneous/metamorphic/volcanic, and shale.



This resource characteristic map was derived from generalized statewide information at small scales, and cannot be used for any site-specific purposes.

Map source: Schmidt, R.R., 1987, Groundwater contamination susceptibility map and evaluation: Wisconsin Department of Natural Resources, Wisconsin's Groundwater Management Plan Report 5, PUBL-WR-177-87, 27 p.

Figure created for the "Protecting Wisconsin's Groundwater Through Comprehensive Planning" web site, 2007, *http://wi.water.usgs.gov/gwcomp/*

The depth to bedrock indicates the amount of soil and surficial deposits that exist in an area and, therefore how important the type of bedrock is in evaluating pollution potential. Information on the depth to bedrock map is used to determine the relative weight given to the other resource characteristic maps. For example, where the bedrock surface is deep and the water table occurs above the bedrock, the type of bedrock is not considered in determining groundwater contamination susceptibility. Where the depth to bedrock is shallow (less than 50 feet below the land surface), the water table is likely to occur in the bedrock. In that case, the type of bedrock is considered because it could influence a contaminant's ability to reach the groundwater. This map identifies areas where the depth to bedrock is 0-5 feet (in at least 35% of the area), 5-50 feet, 50-100 feet and greater than 100 feet.

Appendix B

Boring Logs, Well Construction, and Well Development Forms

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL - Nelson Dewey Generating Station	02525	B-07R

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Wes Imhoff Layne Christensen, Co.	4/28/2009	4/28/2009	Rotosonic

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VU600	156	B-07R	Feet MSL	620.5 Feet MSL	6.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 265,999 N, 1,695,529 E S/C/N
NW 1/4 of NW 1/4 of Section 19, T 3 N, R 5 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
122014530	Grant	22	Cassville

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 42		1	**WELL GRADED SAND WITH SILT (SW-SM),** non-plastic, 5YR 4/4 reddish brown, no odor, moist, some siltier layers at 4.5 feet.										
			2											
			3											
			4											
2 CS	60 48		5	Same as above.										
			6		SW-SM									
			7											
			8											
			9	Silty organic sand layer from 9 to 9.5 feet.										
3 CS	60 60		10	Same as above, color change to 7.5YR 4/1 dark gray, moist to wet above clay.										
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
Nate Keller /jcs	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-07R Use only as an attachment to Form 4400-122.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13		SW-SM									
			14	**LEAN CLAY WITH SAND (CL),** fine sand, plastic, 7.5YR 3/1 very dark gray, no odor, wet.	CL									
4 CS	60 60		15	**WELL GRADED SAND WITH SILT AND CLAY (SW-SM),** trace gravel, very low plasticity, 5YR 4/3 reddish brown, no odor, wet.										
			16											
			17		SW-SM									
			18											
			19											
			20	**End of boring at 20.0 feet.**										

State of Wisconsin
Department of Natural Resources

Route To: Watershed/Wastewater ☐ Remediation/Redevelopment ☐ Waste Management ☒ Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name: WPL - Nelson Dewey Generating Station	Local Grid Location of Well: ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.	Well Name: B-07R
Facility License, Permit or Monitoring No.: 02525	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or St. Plane 265,999 ft. N, 1,695,529 ft. E. S/C/N	Wis. Unique Well No.: VU600 / DNR Well Number: 156
Facility ID: 122014530		Date Well Installed: 04/28/2009
Type of Well: Well Code 11/mw	Section Location of Waste/Source: NW 1/4 of NW 1/4 of Sec. 19, T. 3 N, R. 5 ☐ E ☒ W	Well Installed By: (Person's Name and Firm) Wes Imhoff, Layne Christensen, Co.
Distance from Waste/Source 350 ft. / Enf. Stds. Apply ☒	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known / Gov. Lot Number	

A. Protective pipe, top elevation 623.50 ft. MSL
B. Well casing, top elevation 623.35 ft. MSL
C. Land surface elevation 620.5 ft. MSL
D. Surface seal, bottom 618.5 ft. MSL or 2.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP ☐
SM ☒ SC ☐ ML ☐ MH ☐ CL ☒ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 5 0; Hollow Stem Auger ☐ 4 1; Rotosonic Other ☒

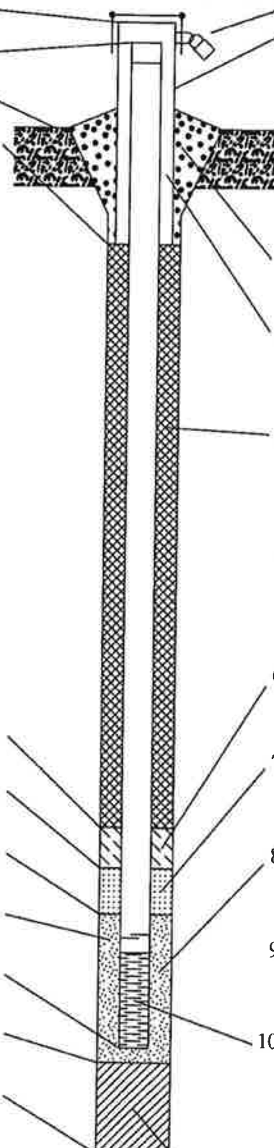
15. Drilling fluid used: Water ☒ 0 2 Air ☐ 0 1 Drilling Mud ☐ 0 3 None ☐ 9 9

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required): on-site hydrant

E. Bentonite seal, top 618.5 ft. MSL or 2.0 ft.
F. Fine sand, top 612.6 ft. MSL or 7.9 ft.
G. Filter pack, top 612.6 ft. MSL or 7.9 ft.
H. Screen joint, top 610.5 ft. MSL or 10.0 ft.
I. Well bottom 600.5 ft. MSL or 20.0 ft.
J. Filter pack, bottom 600.5 ft. MSL or 20.0 ft.
K. Borehole, bottom 600.5 ft. MSL or 20.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.07 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 5.0 ft.
   c. Material: Steel ☒ 0 4; Other ☐
   d. Additional protection? ☐ Yes ☒ No; If yes, describe: ____
3. Surface seal: Bentonite ☒ 3 0; Concrete ☐ 0 1; Other ☐
4. Material between well casing and protective pipe: Bentonite ☒ 3 0; Upper Filter Sand/Lower Bentonite Other ☐
5. Annular space seal: a. Granular/Chipped Bentonite ☒ 3 3
   b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 3 5
   c. ____ Lbs/gal mud weight . . . Bentonite slurry ☐ 3 1
   d. ____ % Bentonite . . . Bentonite-cement grout ☐ 5 0
   e. 1.5 Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ 0 1; Tremie pumped ☐ 0 2; Gravity ☒ 0 8
6. Bentonite seal: a. Bentonite granules ☐ 3 3
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 3 2
   c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
   a. NA
   b. Volume added ____ ft^3
8. Filter pack material: Manufacturer, product name & mesh size
   a. Red Flint Filter Sand
   b. Volume added 2.1 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 2 3; Flush threaded PVC schedule 80 ☐ 2 4; Other ☐
10. Screen material: PVC
    a. Screen Type: Factory cut ☒ 1 1; Continuous slot ☐ 0 1; Other ☐
    b. Manufacturer ____
    c. Slot size: 0.010 in.
    d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☒ 1 4; Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Nate Keller /go   Firm: RMTINC   Tel: Fax:

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☒
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	County	Well Name
WPL - Nelson Dewey Generating Station	Grant	B-07R

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well Number
02525	22	VU600	156

1. Can this well be purged dry? ☐ Yes ☐ No

2. Well development method:

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed, and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
other surged and pumped with Whaler pump	☒	71

3. Time spent developing well 115 min.

4. Depth of well (from top of well casing) 23.0 ft.

5. Inside diameter of well 2.07 in.

6. Volume of water in filter pack and well casing 1.5 gal.

7. Volume of water removed from well 20.0 gal.

8. Volume of water added (if any) 10.0 gal.

9. Source of water added fire suppression system hydrant

10. Analysis performed on water added? ☒ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	15.50 ft.	17.85 ft.
Date b.	4/29/2009	4/29/2009
Time c.	☒ a.m. 07:55 ☐ p.m.	☒ a.m. 09:50 ☐ p.m.
12. Sediment in well bottom	inches	inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) dark reddish brown, no odor	Clear ☒ 20 Turbid ☐ 25 (Describe) light brown, no odor

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	mg/l	96.7 mg/l
15. COD	mg/l	mg/l

16. Well developed by: Person's Name and Firm
Roy Buckenberger
Layne Christensen, Co.

17. Additional comments on development:

Facility Address or Owner/Responsible Party Address

Name: Nathaniel Sievers
Firm: Nelson Dewey Generating Station
Street: 11999 County Rd VV
City/State/Zip: Cassville, WI 53806

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: Nate Keller /go
Print Name: Nathaniel Keller
Firm: RMT, Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

WDNR WELL DEVELOP 1998 03026W.GPJ WI DNR 2003.GDT 8/27/09

State of Wisconsin
Department of Natural Resources

Route To:
☒ Solid Waste
☐ Emergency Response
☐ Wastewater
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-91

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WP&L - Nelson Dewey 4293.02	2525	B-11R

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Environmental & Foundation Drilling; Crew Chief: Kevin Hargis	11/17/97	11/17/97	4 1/4 HSA

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
155			Feet MSL	620.4 Feet MSL	8.0 Inches

Boring Location
State Plane N, E
NW 1/4 of WW 1/4 of Section 19 T 3 N,R 5 W
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
265,843 ☒ N 1,695,868 ☒ E
Feet ☐ S Feet ☐ W

County	DNR County Code	Civil Town/City/ or Village
Grant	22	Cassville

Sample Number	Sample Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	Comments
			1–23	Boring B-11R was blind drilled to a depth of 23 ft. See boring log B-11 for geologic description.	SP/SW									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: John C Oswald

Firm: RMT
744 Heartland Trail, Madison Wisconsin
Tel: 608-831-4444, Fax: 608-831-3334

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

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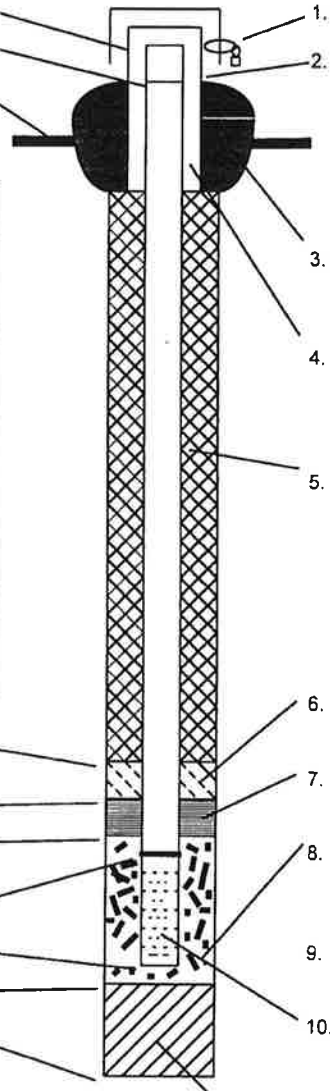
State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☒ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4-90

Facility/Project Name WP&L Nelson Dewey 4293.01	Local Grid Location of Well ☐N. ☐E. ____ ft. ☐S. ____ ft. ☐W.	Well Name B-11R
Facility License, Permit or Monitoring Number 2525	Grid Origin Location Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or St. Plane 265,843 ft. N, 1,695,868 ft. E.	Wis. Unique Well Number / DNR Well Number 155
Distance Well is From Waste/Source Boundary ft.	Section Location of Waste/Source ☐E. NW ¼ of NW ¼ of Sec. 19, T3N, R5 ☒W.	Date Well Installed 11/ 17/ 97 MM DD YY
Type of Well: Water Table Observation Well ☒11 Piezometer ☐12	Location of Well Relative to Waste/Source U ☐Upgradient S ☐Sidegradient D ☒Downgradient N ☐Not Known	Well Installed By: (Person's Name and Firm) Kevin Hargis Environmental and Foundation Drilling Waunakee, Wisconsin
Is Well A Point of Enforcement Std. Application? ☐Yes ☒No		



Protective pipe, top elevation 622.56 ft. MSL
Well casing, top elevation 622.62 ft. MSL
Land surface elevation 620.4 ft. MSL
Surface seal, bottom 619.4 ft. MSL or 1.0 ft.

USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

Sieve analysis attached? Yes ☐ No ☒

Drilling method used: Rotary ☐50
Hollow Stem Auger ☒41
Other ☐

Drilling fluid used: Water ☐02 Air ☐01
Drilling Mud ☐03 None ☒99

Drilling additives used? Yes ☐ No ☒
Describe:

Source of water (attach analysis):

Bentonite seal, top 619.4 ft. MSL or 1.0 ft.
Sand, top 606.4 ft. MSL or 14 ft.
Backfill, top 605.4 ft. MSL or 15 ft.
Filter pack, top 603.4 ft. MSL or 17 ft.
Screen 598.4 ft. MSL or 22 ft.
Backfill, bottom 597.4 ft. MSL or 23 ft.
Filter pack, bottom 597.4 ft. MSL or 23 ft.
Borehole diameter 8.25 in.
Well casing 2.38 in.
Screen 2.00 in.

1. Cap and lock? ☒Yes ☐No
2. Protective cover pipe:
   a. Inside diameter: 4.0 in.
   b. Length: 7.0 ft.
   c. Material: Steel ☒04 Other ☐
   d. Additional protection? ☐Yes ☒No
      If yes, describe: _____
3. Surface seal: Bentonite ☒30 Concrete ☐01 Other ☐
4. Material between well casing and protective pipe: Bentonite ☒30 Annular space seal ☐ Other ☐
5. Annular space seal: a. Granular Bentonite ☒33
   b. Lbs/gal mud weight....Bentonite-sand slurry ☐35
   c. Lbs/gal mud weight..... Bentonite slurry ☐31
   d. % Bentonite.....Bentonite-cement grout ☐50
   e. Ft^3 volume added for any of the above
   f. How installed: Tremie ☐01 Tremie pumped ☐02 Gravity ☒08
6. Bentonite seal: a. Bentonite granules ☐33
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒32
   c. Other ☐
7. Fine sand material: Manufacturer, product name, mesh size
   a. Badger Mining Corp.
   b. Volume added 20 lbs
8. Filter pack material: Manufacturer, product, mesh size
   a. 30 - 50
   b. Volume added 300 lbs
9. Well casing: Flush threaded PVC schedule 40 ☒23 Flush threaded PVC schedule 80 ☐24 Other ☐
10. Screen Material: Sch 40 PVC
    a. Screen type: Factory cut ☒11 Continuous slot ☐01 Other ☐ b.
    Manufacturer Boart Longyear
    c. Slot size: 0.010 in.
    d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☒14 Other ☐

I certify that the information on this form is true and correct to the best of my knowledge.

Firm
RMT, Inc.

Complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 4-90

Route to: Solid Waste ☒ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
WP&L Nelson Dewey	Grant	B-11R

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well Number
2525	22		155

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method
- surged with bailer and bailed ☐ 41
- surged with bailer and pumped ☒ 61
- surged with block and bailed ☐ 42
- surged with block and pumped ☐ 62
- surged with block, bailed and pumped ☐ 70
- compressed air ☐ 20
- bailed only ☐ 10
- pumped only ☐ 51
- pumped slowly ☐ 50
- Other _____ ☐

3. Time spent developing well: 35 min.

4. Depth of well (from top of well casing): 25.5 ft.

5. Inside diameter of well: 2.0 in.

6. Volume of water in filter pack and well casing: 3.0 gal.

7. Volume of water removed from well: 35 gal.

8. Volume of water added (if any): 0 gal.

9. Source of water added:

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 17.5 ft	17.5 ft
Date	b. 11/18/97 mm/dd/yy	11/18/97 mm/dd/yy
Time	c. 13:45 ☐ a.m. ☒ p.m.	14:20 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.5 inches	0.0 Inches
13. Water clarity	Clear ☐10 Turbid ☒15 (Describe)	Clear ☒20 Turbid ☐25 (Describe)
14. Total suspended solids	_____ mg/l	110 mg/L
15. COD	_____ mg/l	_____ mg/L

Fill in if drilling fluids were used and well is at solid waste facility:

16. Additional comments on development:

Well developed by: Person's Name and Firm
Name: Kevin Baker
Firm: RMT, Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature:
Print Initials: K L B
Firm:

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

I:\WPMSN\PJT\00-03026\14\B0003026.14A 03/20/98

6

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WP&L Nelson Dewey 3314.01		B11A

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Environmental & Foundation Drilling, Crew Chief: G. Markgraf	12/1/94	12/1/94	DTRC

DNR Facitity Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	620.2 Feet MSL	7.5 Inches

Boring Location
State Plane 265903.10 N, 1727265.86 E
NE 1/4 of NE — 1/4 of Section 19 T 3 N,R 5W
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
Feet ☐ N ☐ S ☐ E ☐ W

County	DNR County Code	Civil Town/City/ or Village
Grant	22	Cassville

Sample Number	Sample Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	Comments
			1–20	Boring blind drilled to 50' bgs. See log of B-11A for geologic description.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
	RMT 744 Heartland Trail, Madison Wisconsin Tel: 608-831-4444, Fax: 608-831-3334

Boring Number **B11A** Use only as an attachment to Form 4400-122. Page 2 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					Comments
Number	Length (In) Recovered								Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
			21											
			22											
			23											
			24											
			25											
			26											
			27											
			28											
			29											
			30											
			31											
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			43											
			44											
			45											
			46											
			47											
			48											
			49											
			50											
			51											
			52											
			53											

Boring Number **B11A** Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number	Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	Comments
			54 55 56	Drill rod to 53'. End of Boring at 56 Ft.										

of Wisconsin
partment of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ ____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 4-

Facility/Project Name WP&L Nelson Dewey 3314.01	Local Grid Location of Well ____ ft. ☐ N. ____ ft. ☐ E. ☐ S. ☐ W.	Well Name B-11B A MCM 12/30/94
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. ___ ___ ___ Long. ___ ___ ___ or St. Plane ____ ft. N, ____ ft. E. 265,903.10N, 1,727,265.96E	Wis. Unique Well Number / DNR Well Number
Type of Well: Water Table Observation Well ☐ 11 Piezometer ■ 12	Section Location of Waste/Source NE¼ of NE¼ of Sec. 19, T. 3N, R. 5 ☐ E. ■ W.	Date Well Installed 12 / 01 / 94 M M D D Y Y
Distance Well is From Waste/Source Boundary Approx. 300' ft.	Location of Well Relative to Waste/Source U ☐ Upgradient S ☐ Sidegradient D ■ Downgradient N ☐ Not Known	Well Installed By: (Persons' Name and Firm) Greg Markgraf, Environmental & Foundation Drilling
Is Well A Point of Enforcement Std. Application? ■ Yes ☐ No		

A. Protective pipe, top elevation 622.20 ft. MSL

B. Well casing, top elevation 622.12 ft. MSL

C. Land surface elevation 620.2 ft. MSL

D. Surface seal, bottom ____.__ ft. MSL or ___.__ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? Yes ☐ No ■

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
Dual tube reverse circulation Other ■ ▒

15. Drilling fluid used: Water ☐ 02 Air ■ 01
Drilling Mud ☐ 03 None ☐ 99

16. Drilling additives used? Yes ☐ No ■
Describe ____

17. Source of water (attach analysis):
____

E. Bentonite seal, top ____.__ ft. MSL or 0.0 ft.

F. Fine sand, top ____.__ ft. MSL or 41.0 ft.

G. Filter pack, top ____.__ ft. MSL or 43.0 ft.

H. Screen joint, top ____.__ ft. MSL or 45.0 ft.

I. Well bottom ____.__ ft. MSL or 50.0 ft.

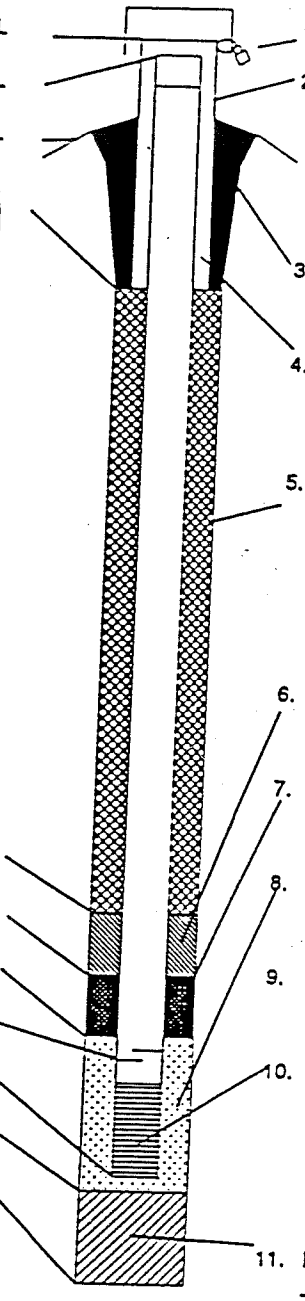
J. Filter pack, bottom ____.__ ft. MSL or 56.0 ft.

K. Borehole, bottom ____.__ ft. MSL or 56.0 ft.

L. Borehole, diameter 7.5 in.

M. O.D. well casing 2.2 in.

N. I.D. well casing 2.0 in.



1. Cap and lock? ■ Yes ☐ N

2. Protective cover pipe:
a. Inside diameter: 3.8 i
b. Length: 7.0
c. Material: Steel ■ 04
Other ☐ ▒
d. Additional protection? ☐ Yes ☐ N
If yes, describe: ____

3. Surface seal: Bentonite ■ 30
Concrete ☐ 01
Other ☐ ▒
____

4. Material between well casing and protective pipe: Bentonite ■ 30
Annular space seal ☐ ▒
Other ☐ ▒
____

5. Annular space seal: a. Granular Bentonite ☐ 33
b. __ Lbs/gal mud weight.... Bentonite-sand slurry ☐ 35
c. __ Lbs/gal mud weight..... Bentonite slurry ☐ 31
d. __ % Bentonite..... Bentonite-cement grout ☐ 50
e. __ lb volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☐ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ■ 3/8 in. ☐ 1/2 in. Bentonite pellets ■ 32
c. ____ Other ☐ ▒

7. Fine sand material: Manufacturer, product name, mesh size
a. Badger Mining 40-60 ▒
b. Volume added 1 bag, 50 lbs

8. Filter pack material: Manufacturer, product, mesh size
a. Badger Mining #30 ▒
b. Volume added 500 lbs, 10 bags

9. Well casing: Flush threaded PVC schedule 40 ■ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐ ▒
____

10. Screen Material: PVC Schedule 40 ▒
a. Screen type: Factory cut ■ 11
Continuous slot ☐ 01
Other ☐ ▒
b. Manufacturer Northern Air
c. Slot size: 0.01 in.
d. Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ■ 14
Other ☐ ▒
____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Madeline Gottlieb 12/21/94 | Firm RMT, Inc

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

3314.01.0000:FTG

Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B

Rev.

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
WP & L Neslon Dewey/Casseville	Grant	B-11B/A MW 12/94
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number** / **DNR Well Number**
_____	_____	_____ / _____

		Before Development	After Development
1. Can this well purged dry?	☐ Yes ■ No		
2. Well development method			
surged with bailer and bailed	☐ 41		
surged with bailer and pumped	■ 61		
surged with block and bailed	☐ 42		
surged with block and pumped	☐ 62		
surged with block, bailed and pumped	☐ 70		
compressed air	☐ 20		
bailed only	☐ 10		
pumped only	☐ 51		
pumped slowly	☐ 50		
Other _____	☐ ▒		
3. Time spent developing well	45 min.		
4. Depth of well (from top of well casing)	52.1 ft.		
5. Inside diameter of well	2.03 in.		
6. Volume of water in filter pack and well casing	2.2 gal./ft		
7. Volume of water removed from well	1000.0 gal.		
8. Volume of water added (if any)	____.__ gal.		
9. Source of water added _____			
10. Analysis performed on water added? (If yes, attach results)	☐ Yes ☐ No		
11. Depth of Water (from top of well casing)		a. 16.4 ft.	16.45 ft.
Date		b. 12/01/94 mm dd yy	12/01/94 mm dd yy
Time		c. 5:05 ■ p.m. ☐ a.m.	5:45 ■ p.m. ☐ a.m.
12. Sediment in well bottom		0.0 inches	0.0 inches
13. Water Clarity		Clear ☐ 10 Turbid ■ 15 (Describe) _____	Clear ■ 20 Turbid ☐ 25 (Describe) _____
Fill in if drilling fluids were used and well is at solid waste facility:			
14. Total suspended solids		____.__ mg/l	____.__ mg/l
15. COD		____.__ mg/l	____.__ mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm

Name: Charles Markgraf

Firm: Environmental & Foundation Drilling, Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Print Initials: G D A

Firm: Environmental & Foundation Drilling, Inc.

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

of Wisconsin
partment of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Informatic
Form 4400-122 7-91

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WP&L Nelson Dewey 3314.01		B11B

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
Environmental & Foundation Drilling, Crew Chief: G. Markgraf	11/29/94	11/30/94	DTRC

DNR Facitity Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	619.7 Feet MSL	7.5 Inches

Boring Location
State Plane 265907.89 N, 1727255.90 E
NE 1/4 of NE 1/4 of Section 19 T 3 N,R 5W
Lat ° ' "
Long ° ' "
Local Grid Location (If applicable)
☐ N ☐ E
Feet ☐ S Feet ☐ W

County	DNR County Code	Civil Town/City/ or Village
Grant	22	Cassville

Sample Number	Sample Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	Comments
A			1–5	POORLY GRADED SAND (SP), sand fine grained, yellowish brown 10YR 5/6.	SP					D				
B			10–11	As above, brown 10YR 4/3.						M				
C			15–16	As above, yellowish brown 10YR 5/6.						M				

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm RMT
744 Heartland Trail, Madison Wisconsin
Tel: 608-831-4444, Fax: 608-831-3334

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Boring Number **B11B** Use only as an attachment to Form 4400-122.

Sample Number	Sample Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	Comments
D			21	As above.						W				
			22											
			23											
			24											
E			25	As above.						W				
			26											
			27											
			28											
			29											
F			30	As above, sand medium grained, grains are light yellowish brown, yellowish brown and very dark brown.						W				
			31											
			32											
			33											
			34											
G			35	As above, fine grained, light yellowish brown 10YR 6/4.						W				
			36											
			37											
			38											
			39											
H			40	As above, slightly coarser grained sand than at 35', fine to medium grained.						W				
			41											
			42											
			43											
			44											
I			45	As above.						W				
			46											
			47											
			48											
			49											
J			50	As above.						W				
			51											
			52											
			53											

Boring Number **B11B** Use only as an attachment to Form 4400-122.

Sample Number	Sample Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	Comments
K			54–55	As above, sand finer grained than at 50', yellowish brown 10YR 5/4.						W				
			56–59											
L			60–64	As above, sand medium grained.						W				
M			65–69	As above.						W				
N			70–74	As above.						W				
O			75–78	As above, 75% medium and 25% coarse grained sand.						W				
P			80–84	As above, sand fine grained.						W				
Q			85–86	As above, 75% fine grained and 25% medium grained sand.						W				

Boring Number **B11B** Use only as an attachment to Form 4400-122. Page 4 of 4

Sample Number	Sample Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plastic Limit	Soil Properties: P 200	Comments
			87											
			88											
			89							W				
R			90	As above.						W				
			91											
			92											
			93											
			94											
S			95	As above, 75% medium and 25% coarse grained sand.						W				
			96											
			97											
			98											
			99											
T			100	As above, 50% medium and 50% coarse sand.						W				
			101											
			102											
			103											
			104											
U			105	As above, 90% medium and 10% coarse sand.						W				
			106											
			107											
			108											
			109											
V			110	As above, 50% medium and 50% coarse sand.						W				
			111											
			112											
			113											
			114											
			115	As above.						W				
			116											
			117	End of Boring at 117 Ft.										

e of Wisconsin
epartment of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev.

Facility/Project Name WP&L Nelson Dewey 3314.01	Local Grid Location of Well ☐ N. ____ ft. ☐ S. ☐ E. ____ ft. ☐ W.	Well Name B-11R B Mcm 12/30/94
Facility License, Permit or Monitoring Number	Grid Origin Location Lat ___ ___ ___ Long. ___ ___ ___ or St. Plane ____ ft. N, ____ ft. E. 265907.89N, 1,727,255.90E	Wis. Unique Well Number / DNR Well Numbe
Type of Well: Water Table Observation Well ☐ 11 Piezometer ■ 12	Section Location of Waste/Source NE¼ of NE¼ of Sec. 19, T 3N, R 5 ☐ E. ■ W.	Date Well Installed 11 / 30 / 94 M M D D Y Y
Distance Well is From Waste/Source Boundary Approx. 300' ft.	Location of Well Relative to Waste/Source U ☐ Upgradient S ☐ Sidegradient D ■ Downgradient N ☐ Not Known	Well Installed By: (Persons' Name and Firm) Greg Markoraf, Environmental & Foundation Drilling
Is Well A Point of Enforcement Std. Application? ■ Yes ☐ No		

A. Protective pipe, top elevation 622.02 ft. MSL

B. Well casing, top elevation 621.89 ft. MSL

C. Land surface elevation 619.7 ft. MSL

D. Surface seal, bottom ____ ft. MSL or 15.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? Yes ☐ No ■

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
Dual-tube reverse circulation Other ■ ▒

15. Drilling fluid used: Water ☐ 02 Air ■ 01
Drilling Mud ☐ 03 None ☐ 99

16. Drilling additives used? Yes ☐ No ■

Describe ____

17. Source of water (attach analysis):

E. Bentonite seal, top ____ ft. MSL or 95.0 ft.

F. Fine sand, top ____ ft. MSL or 101.5 ft.

G. Filter pack, top ____ ft. MSL or 103.5 ft.

H. Screen joint, top ____ ft. MSL or 106.3 ft.

I. Well bottom ____ ft. MSL or 111.3 ft.

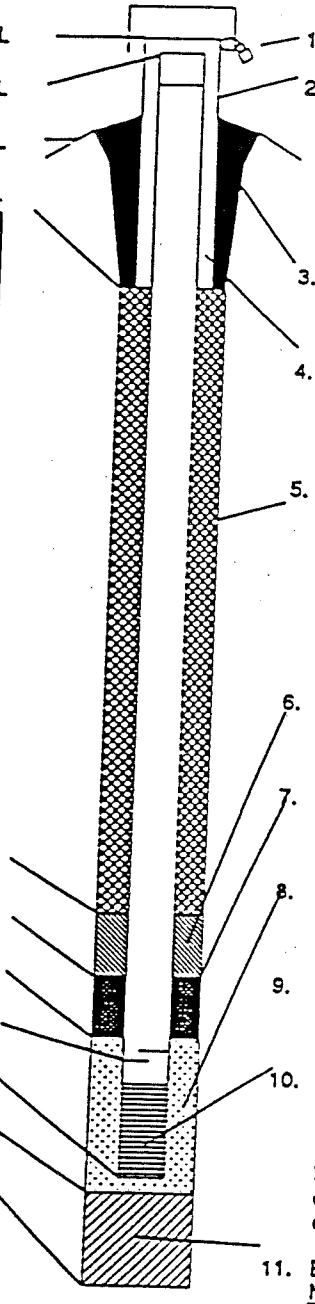
J. Filter pack, bottom ____ ft. MSL or 111.3 ft.

K. Borehole, bottom ____ ft. MSL or 117.0 ft.

L. Borehole, diameter 7.5 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 1.89 in.



1. Cap and lock? ■ Yes ☐ N

2. Protective cover pipe:
a. Inside diameter: 3.8
b. Length: 7.0
c. Material: Flush Mount Steel ■ Other ☐
d. Additional protection? ☐ Yes ☐ N
If yes, describe: ____

3. Surface seal: Bentonite ■ 3
Concrete ☐ 0
Other ☐
13 bags bentonite chips

4. Material between well casing and protective pipe:
Bentonite ■ 3
Annular space seal ☐
Other ☐

5. Annular space seal: a. Granular Bentonite ☐ 3
b. ___ Lbs/gal mud weight... Bentonite-sand slurry ☐ 3
c. 1.9 Lbs/gal mud weight..... Bentonite slurry ■ 3
d. ___ % Bentonite..... Bentonite-cement grout ☐ 5
e. 24 lb volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ■ 02
Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ■ 3/8 in. ☐ 1/2 in. Bentonite pellets ■ 32
c. ____ Other ☐

7. Fine sand material: Manufacturer, product name, mesh siz
a. Unimin silica sand
b. Volume added 50 lbs, 1 bag

8. Filter pack material: Manufacturer, product, mesh size
a. Badger Mining #30
b. Volume added 4 bags, 200 lbs

9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ■ 24
Other ☐
____

10. Screen Material: PVC Schedule 80
a. Screen type: Factory cut ■ 11
Continuous slot ☐ 01
Other ☐
b. Manufacturer Northern Air
c. Slot size: 0.01 in.
d. Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ☐ 14
Natural material (medium sand) Other ■

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Michelle Gottwald 12/21/94 Firm RMT, Inc.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

3314.01 0000 RTG

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPM

Form 4400-113B Rev

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
WP & L Neslon Dewey/Casseville	Grant	B-11XB MCM 12/3
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number**	**DNR Well Number**
_ _ _ _ _ _ _	_ _	_ _ _ _ _ _ _	_ _ _ _

		Before Development	After Development
1. Can this well purged dry?	☐ Yes ■ No		
2. Well development method			
surged with bailer and bailed	☐ 41		
surged with bailer and pumped	■ 61		
surged with block and bailed	☐ 42		
surged with block and pumped	☐ 62		
surged with block, bailed and pumped	☐ 70		
compressed air	☐ 20		
bailed only	☐ 10		
pumped only	☐ 51		
pumped slowly	☐ 50		
Other _____	☐ ▒▒		
3. Time spent developing well	_ _45_ min.		
4. Depth of well (from top of well casing)	113.5 ft.		
5. Inside diameter of well	_2.03 in.		
6. Volume of water in filter pack and well casing	_ _2.2 gal./ft		
7. Volume of water removed from well	1350.0 gal.		
8. Volume of water added (if any)	_ _ _ _._ gal.		
9. Source of water added _____			
10. Analysis performed on water added? (If yes, attach results)	☐ Yes ☐ No		
11. Depth of Water (from top of well casing)		a. 16.4 ft.	15.8 ft.
Date		b. 12/01/94 mm dd yy	12/01/94 mm dd yy
Time		c. 10:00 ■ a.m. ☐ p.m.	10:45 ■ a.m. ☐ p.m.
12. Sediment in well bottom		0.0 inches	0.0 inches
13. Water Clarity		Clear ☐ 10 Turbid ■ 15 (Describe)	Clear ■ 20 Turbid ☐ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:			
14. Total suspended solids		_ _ _ _ _._ mg/l	_ _ _ _ _._ mg/l
15. COD		_ _ _ _ _._ mg/l	_ _ _ _ _._ mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm

Name: Charles Markgraf

Firm: Environmental & Foundation Drilling, Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Print Initials: G D A

Firm: Environmental & Foundation Drilling, Inc.

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

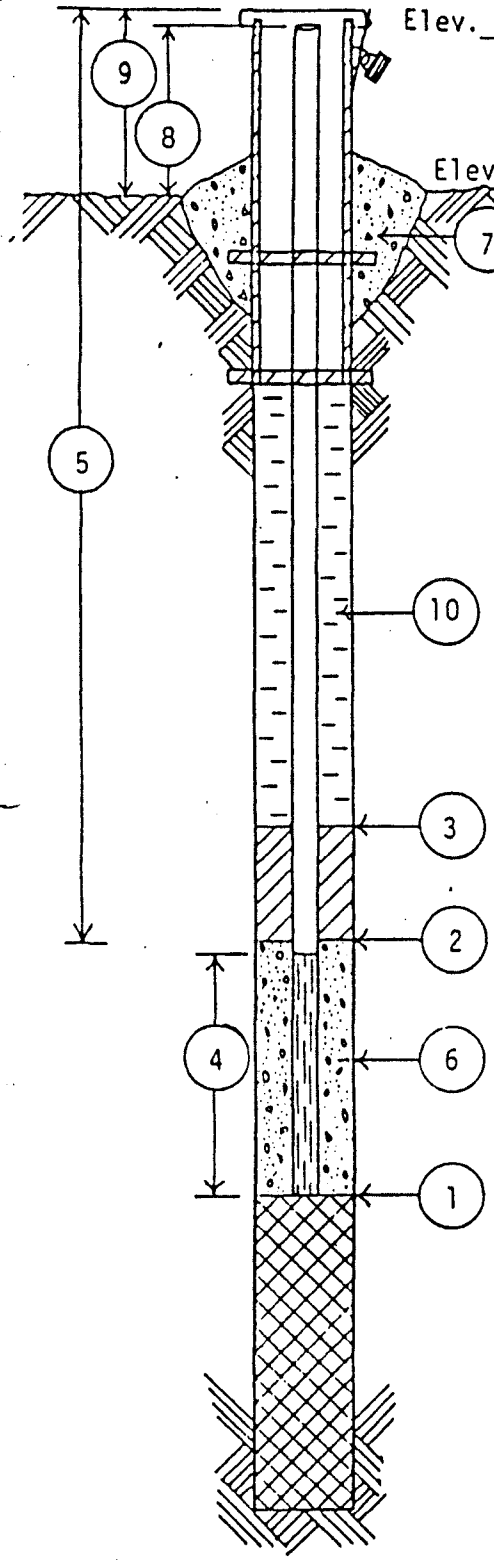
JOB NO. C 9065

BORING NO. B 31A

DATE 2/28/80

CHIEF D. Braun

LOCATION Cassville, Wisconsin



All depth measurements of well detail assumed to be from ground surface unless otherwise indicated.

1. DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 34' FEET.
2. DEPTH OF BOTTOM OF SEAL (if installed) 28 FEET.
3. DEPTH TO TOP OF SEAL (if installed) 25 FEET.
4. LENGTH OF WELL POINT, (PVC WELL SCREEN) OR SLOTTED PIPE 5 FEET. (Circle One)
5. TOTAL LENGTH OF PIPE 33 FEET @ 2 IN. DIAMETER.
6. TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Sand.
7. CONCRETE CAP, YES (NO) (Circle One)
8. HEIGHT OF WELL CASING ABOVE GROUND 4 FEET.
9. PROTECTIVE CASING? YES (NO) (Circle One)
   HEIGHT ABOVE GROUND -.
   LOCKING CAP? YES (NO) (Circle One)
10. TYPE OF BACKFILL: Soil & Bentonite Mix

WATER LEVEL CHECKS

*From top of casing, if protective casing higher, take measurement from top of protective casing.

BORING #	DATE	TIME	DEPTH TO WATER	REMARKS
31A	2/28/80		10.5'	¼ hour

WARZYN ENGINEERING INC

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project: Monitoring Well

Location: Cassville, Wisconsin

Boring No. 31
Surface Elevation
Job No. C 9065
Sheet 1 of 1

1409 EMIL STREET • P.O. BOX 9638, MADISON, WIS. 53715 • TEL. (608) 257-4848

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		qu	W	LL	PL	D
					5	For Soil Classification See Boring Log 31A					
					10						
					15						
					20	End Boring at 20'					
						Install 19.5' Observation Well					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling
Depth to Water
Depth to Cave In

GENERAL NOTES

Start 2/28/80 Complete 2/28/80
Crew Chief DB Rig Bomb
Drilling Method

w-1

WARZYN

LOG OF TEST BORING

Project WP&L
Nelson Dewey Generating Station
Location Cassville, Wisconsin

Boring No. B-31R
Surface Elevation
Job No. 13758
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	SAMPLE TYPE	SAMPLE Rec (in.)	SAMPLE Moist	SAMPLE N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						TOPSOIL - Brown Silty Sand					
					5	FILL					
					10	Loose, Tan Fine to Medium SAND (SW)					
1		18	W	8	15						
						Medium Dense, Tan Medium to Coarse SAND (SW)					
2		18	W	12	20						
						End Boring at 22.0'					
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ Upon Completion of Drilling
Time After Drilling
Depth to Water 14.0' ▽
Depth to Cave in

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 4/25/89 End 4/25/89
Driller E&F Chief GA Rig CME 65
Logger WB Editor AJS
Drill Method HSA 0-22'

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project: Nelson Dewey Generating Station

Location: Cassville, Wisconsin

Boring No.: B 31A
Surface Elevation: 6200
Job No.: C 9065
Sheet: 1 of 1

1409 EMIL STREET • P.O. BOX 9538, MADISON, WIS. 53715 • TEL. (608) 257-4848

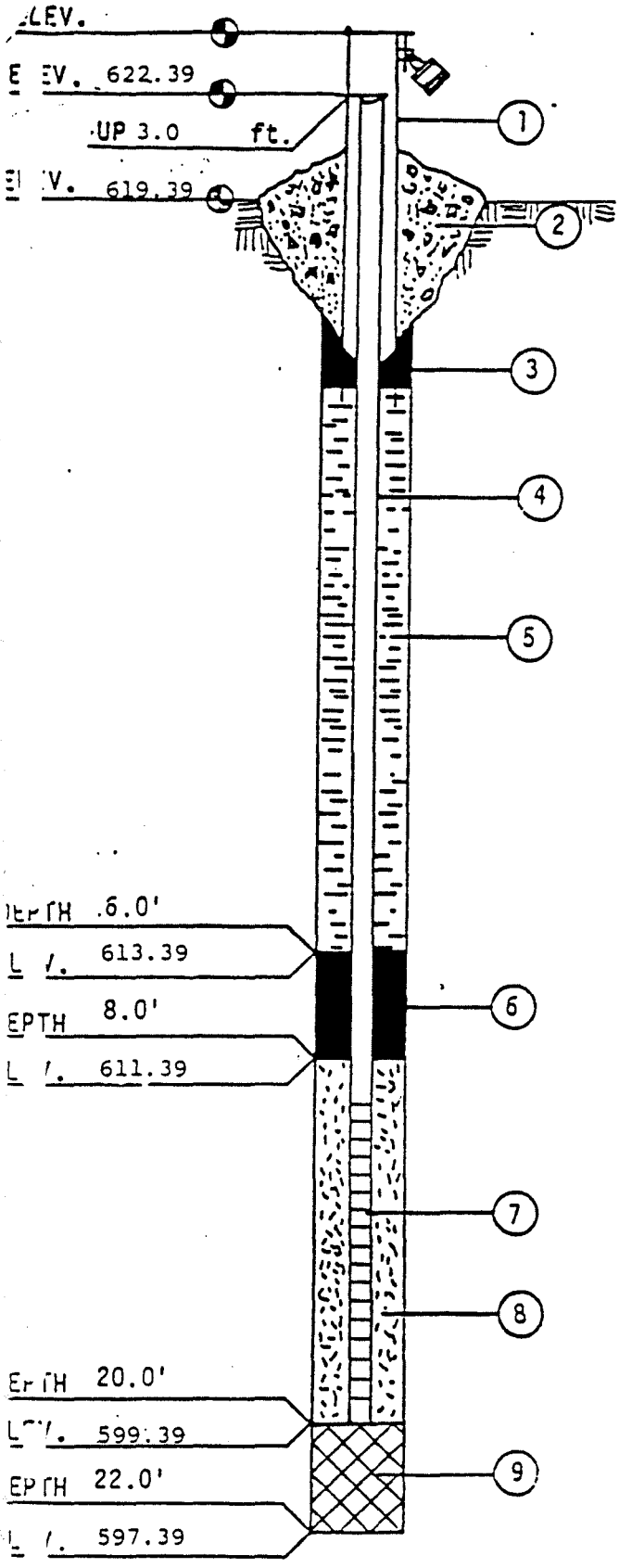
SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
		Recovery	Moisture								
No.	Type	↓	↓	N	Depth		q_u	W	LL	PL	D
						TOPSOIL-Brown Silty SAND					
1	SS	X	M	33							
2	SS	X	M	11	5	FILL					
3	SS	X	W	6							
4	SS	X	W	3	10						
						Tan Fine to Medium SAND					
5	SS	X	W	8	15						
6	SS	X	W	18	20	Tan Medium to Coarse SAND, Trace Gravel					
7	SS	X	W	11	25						
8	SS	NR	W	15	30						
						Very Fine Tan SAND, Little Silt					
9	SS	X	W	27	35	End Boring at 35'					
					40						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling: ½ hour
Depth to Water: 10.5'
Depth to Cave In

GENERAL NOTES

Start: 2/28/80 Complete: 2/28/80
Crew Chief: DB Rig: Bomb
Drilling Method: 0-10' Auger
10-35' Wash Bore



MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. 13758

BORING/WELL NO. B-31R

DATE 4/25/89

CHIEF/UNIT Greg Anderson/CME 65

1. PROTECTIVE CASING (YES) NO

   LOCKING (YES) NO

2. CONCRETE SEAL (YES) NO

3. TYPE OF SURFACE SEAL (IF INSTALLED)

   Granular Bentonite

4. SOLID PIPE TYPE PVC

   SOLID PIPE LENGTH 13.0 ft.

   JOINT TYPE SLIP/GLUED (THREADED)

5. TYPE OF BACKFILL Granular Bentonite

   HOW INSTALLED - TREMIE (FROM SURFACE)

6. TYPE OF LOWER SEAL (IF INSTALLED)

   Bentonite Pellets

7. SCREEN TYPE PVC

   SCREEN LENGTH 10.0 ft

   SLOT-SIZE 0.010" LENGTH 10 ft.

   SCREEN DIAMETER 2.0 in.

8. TYPE OF BACKFILL AROUND SCREEN

   #20 Flint Sand

9. TYPE OF BACKFILL Natural Cave-in

10. DRILLING METHOD HSA

11. ADDITIVES USED (IF ANY)

    -

WATER LEVEL 14.0' DATE 4/25/89

*ALL DEPTHS MEASURED FROM GROUND SURFACE.

/ARZYN

ENGINEERING INC

WELL DETAIL INFORMATION SHEET

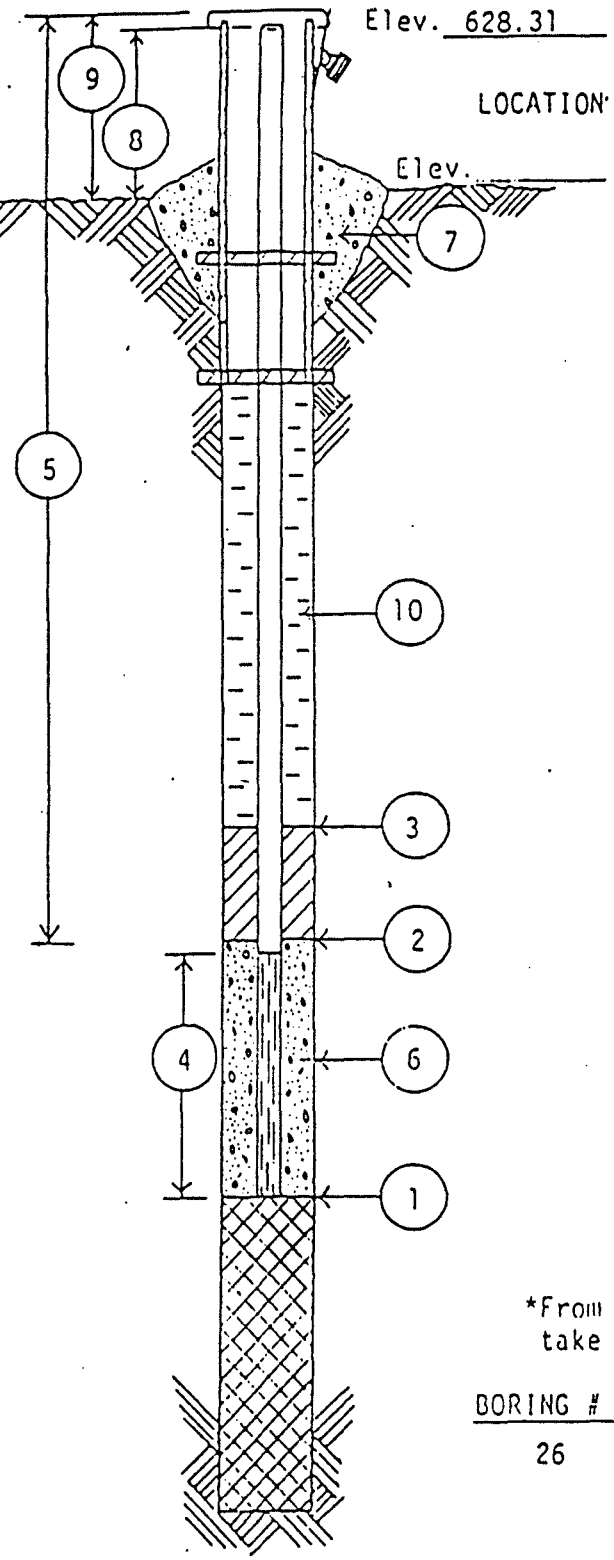
JOB NO. C 9036

BORING NO. 26

DATE 2/28/80

CHIEF D. Braun

LOCATION Nelson Dewey G.S.; Cassville, Wisconsin



* All depth measurements of well detail assumed to be from ground surface unless otherwise indicated.

(1) DEPTH TO BOTTOM OF WELL POINT OR SLOTTED PIPE 29.5 FEET.

(2) DEPTH OF BOTTOM OF SEAL (if installed) 3 FEET.

(3) DEPTH TO TOP OF SEAL (if installed) 0 FEET.

(4) LENGTH OF WELL POINT, (PVC WELL SCREEN) OR SLOTTED PIPE 10 FEET. (Circle One)

(5) TOTAL LENGTH OF PIPE 23.5 FEET @ 2 IN. DIAMETER.

(6) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Sand.

(7) CONCRETE CAP, YES (NO) (Circle One)

(8) HEIGHT OF WELL CASING ABOVE GROUND 4 FEET.

(9) PROTECTIVE CASING? YES (NO) (Circle One)
HEIGHT ABOVE GROUND -.
LOCKING CAP? YES (NO) (Circle One)

(10) TYPE OF BACKFILL: Soil & Bentonite Mix

WATER LEVEL CHECKS

*From top of casing, if protective casing higher, take measurement from top of protective casing.

BORING #	DATE	TIME	DEPTH TO WATER	REMARKS
26	2/28/80		17'8"	½ hour

WARZYN ENGINEERING INC

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project: Nelson Dewey Generating Station
Proposed Slag Disposal Area
Location: Cassville, Wisconsin

Boring No. B 26A
Surface Elevation 624.6
Job No. C 9036
Sheet 1 of 2

1409 EMIL STREET • P.O. BOX 9538, MADISON, WIS. 53715 • TEL. (608) 257-4848

SAMPLE No.	Type	Recovery ↓	Moisture ↓	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu	W	LL	PL	D
						TOPSOIL					
1	SS	X	M	11			4.5				
2	SS	X	M	4	5	Brown SILT, Some Clay, Some Sand (CL-ML) Occasional Sand Lenses					
	SS	X	M	-							
3	SS	X	M	5							
	SS	X	M	-							
4	SS	X	M	6	10				25.4	19.9	
5	SS	X	M	9	15	Tan Coarse to Medium SAND, Some to Trace Gravel, Trace Silt and Clay (SP)					
6	SS	X	W	28	20						
7	SS	X	W	20	25	Tan Medium to Fine SAND, Trace Gravel, Little to Trace Silt and Clay (SP)					
8	SS	X	W	11	30						
9	SS	X	W	19	35						
1	SS	X	W	27	40	Tan Coarse to Medium SAND, Some to Trace Gravel, Trace Silt and Clay (SP)					
	SS	X	W	26	45						
						End Boring at 45'					

(Continued)

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project: Nelson Dewey Generating Station
Proposed Slag Disposal Area
Location: Cassville, Wisconsin

Boring No. B 26A
Surface Elevation 624.6
Job No. C 9036
Sheet 2 of 2

1409 EMIL STREET • P.O. BOX 9538, MADISON, WIS. 53715 • TEL. (608) 257-4848

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		q_u	W	LL	PL	D
					50						
					55						
					60						
					65						
					70						
					75						
					80						
					85						

WATER LEVEL OBSERVATIONS

While Drilling 19.5'
Upon Completion of Drilling
Time After Drilling 3/10/80
Depth to Water 23.14
Depth to Cave In

GENERAL NOTES

Start 2/27/80 Complete 2/27/80
Crew Chief DB Rig Bomb
Drilling Method
Auger to 20'
Wash Bore to 45'

W-5

SCS # 25215135.30

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Managemen ☐
Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name: WPL- Nelson Dewey Generating St.	Local Grid Location of Well: 479422.6 ft. ☒ N. ☐ S. 737324.8 ft. ☒ E. ☐ W.	Well Name: B-39
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.	DNR Well ID No.
Facility ID	St. Plane ft. N, ft. E. S/C/N	Date Well Installed: 10 / 20 / 2015 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 19, T. 3 N, R. 5 ☐ E ☒ W	Well Installed By: Name (first, last) and Firm: Dave Cruise- Badger State Drilling; Kyle Kramer- SCS Engineers
Distance from Waste/Source ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number

A. Protective pipe, top elevation 626.65 ft. MSL
B. Well casing, top elevation 626.48 ft. MSL
C. Land surface elevation 623.58 ft. MSL
D. Surface seal, bottom 623.08 ft. MSL or 0.5 ft.

12. USCS classification of soil near screen:
GP ☒ GM ☐ GC ☐ GW ☐ SW ☐ SP ☒
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ ___

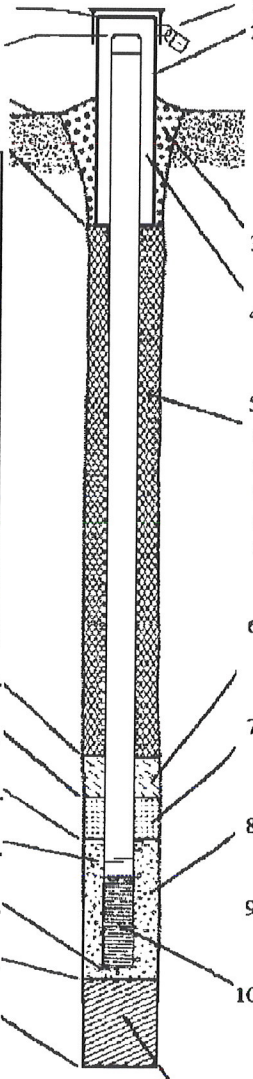
15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe ___

17. Source of water (attach analysis, if required):

E. Bentonite seal, top 623.08 ft. MSL or 0.5 ft.
F. Fine sand, top 613.58 ft. MSL or 10 ft.
G. Filter pack, top 611.58 ft. MSL or 12 ft.
H. Screen joint, top 609.58 ft. MSL or 14 ft.
I. Well bottom 599.58 ft. MSL or 24 ft.
J. Filter pack, bottom 596.58 ft. MSL or 27 ft.
K. Borehole, bottom 596.58 ft. MSL or 27 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.4 in.
N. I.D. well casing 2.04 in.



1. Cap and lock? ☒ Yes ☒ No
2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 4 ft.
c. Material: Steel ☒ 04; Other ☐ ___
d. Additional protection? ☐ Yes ☐ No
If yes, describe: Bollards
3. Surface seal: Bentonite ☒ 30; Concrete ☐ 01; Other ☐ ___
Bentonite
4. Material between well casing and protective pipe: Bentonite ☐ 30; Other ☐ ___
#5 Filter Sand - Ohio
5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33
b. ___ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ___ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ___ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ___ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☑ 32
c. ___ Other ☐ ___
7. Fine sand material: Manufacturer, product name & mesh size
a. #7 Fine Sand - Ohio ☐
b. Volume added ___ ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. #5 Filter Sand - Ohio ☐
b. Volume added ___ ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ___
10. Screen material: 40 PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ___
b. Manufacturer Monoflex
c. Slot size: 0.10 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): None ☐ 14; Other ☐ ___
#5 Coarse - Ohio

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [signature] Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL- Nelson Dewey Generating Station SCS#: 25215135.30		B-39

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dave Cruise Badger State Drilling	10/20/2015	10/20/2015	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet	623.58 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane 479,423 N, 737,325 E S/C/N
NW 1/4 of NW 1/4 of Section 19, T 3 N, R 5 W
Lat ___° ___' ___"
Long ___° ___' ___"
Local Grid Location: Feet ☐ N ☐ S; Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Grant	22	Cassville

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0	TOPSOIL, with medium grained sand, light brown.	TOPSOIL									
			0.5–11	POORLY GRADED SLAG, coarse grained, very dark brown (10YR 2/2), fly ash.	FILL									
S1	20	20 25 29 33	3							M				
S2	21	14 32 44 31	7							M				
S3	10	12 10 15 8	11	POORLY GRADED SAND, fine grained, dark gray (10YR4/1).	SP					M				
S4	18	3 4 4 4	13							M				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
[signature]	SCS Engineers 2830 Dairy Drive Madison, WI 53711	Tel: (608) 224-2830 Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-39 Use only as an attachment to Form 4400-122.

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S5	15	4 5 5 6	16	POORLY GRADED SAND, fine grained, dark gray (10YR 4/1).						M				
S6	16	3 4 4 6	17 18 19		SP					S				Saturation @ 16.5ft bgs
S7	22	4 6 8 11	20	POORLY GRADED GRAVEL WITH SAND, pebble size gravel, dark gray (10YR 4/1).	GP					S				
S8	14	7 4 4 5	21 22	POORLY GRADED SAND, coarse grained, dark gray (10YR 4/1).						S				
S9	6	4 7 8 10	23 24 25		SP					S				
S10	14	4 3 4 21	26	Trace pebbles						S				
			27	EOB @ 27' bgs.										

Appendix C

Analytical Laboratory Reports

C1 April 2021 Detection Monitoring

C2 October 2021 Detection Monitoring

C1 April 2021 Detection Monitoring

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

May 07, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 23, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:
- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40225648001	**FIELD BLANK**	Water	04/21/21 12:35	04/23/21 07:50
40225648002	**B-7R**	Water	04/20/21 17:30	04/23/21 07:50
40225648003	**B-11R**	Water	04/19/21 16:35	04/23/21 07:50
40225648004	**B-11A**	Water	04/19/21 15:30	04/23/21 07:50
40225648005	**B11-B**	Water	04/19/21 17:25	04/23/21 07:50
40225648006	**B-26**	Water	04/21/21 12:50	04/23/21 07:50
40225648007	**B-31R**	Water	04/19/21 19:10	04/23/21 07:50
40225648008	**B-31A**	Water	04/19/21 18:30	04/23/21 07:50
40225648009	**B-39**	Water	04/20/21 16:50	04/23/21 07:50

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40225648001	**FIELD BLANK**	EPA 6020	KXS	2
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225648002	**B-7R**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225648003	**B-11R**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225648004	**B-11A**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225648005	**B11-B**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225648006	**B-26**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225648007	**B-31R**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225648008	**B-31A**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	HNT	1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40225648009	**B-39**	EPA 6020	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Sample: FIELD BLANK **Lab ID: 40225648001** Collected: 04/21/21 12:35 Received: 04/23/21 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**<3.0**	ug/L	10.0	3.0	1	04/26/21 06:33	04/27/21 18:08	7440-42-8	
Calcium	**<76.2**	ug/L	254	76.2	1	04/26/21 06:33	04/27/21 18:08	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**10.0J**	mg/L	20.0	8.7	1		04/26/21 12:46		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.4**	Std. Units	0.10	0.010	1		04/27/21 09:59		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.43**	mg/L	2.0	0.43	1		05/05/21 02:54	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/05/21 02:54	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		05/05/21 02:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Sample: B-7R **Lab ID: 40225648002** Collected: 04/20/21 17:30 Received: 04/23/21 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**104**	ug/L	10.0	3.0	1	04/26/21 06:33	04/27/21 21:54	7440-42-8	
Calcium	**56100**	ug/L	254	76.2	1	04/26/21 06:33	04/27/21 21:54	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.54**	Std. Units			1		04/20/21 17:30		
Field Specific Conductance	**535**	umhos/cm			1		04/20/21 17:30		
Oxygen, Dissolved	**0.19**	mg/L			1		04/20/21 17:30	7782-44-7	
REDOX	**-23.4**	mV			1		04/20/21 17:30		
Turbidity	**0.99**	NTU			1		04/20/21 17:30		
Static Water Level	**608.83**	feet			1		04/20/21 17:30		
Temperature, Water (C)	**9.3**	deg C			1		04/20/21 17:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**248**	mg/L	20.0	8.7	1		04/26/21 12:46		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.6**	Std. Units	0.10	0.010	1		04/27/21 10:01		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**9.5J**	mg/L	10.0	2.2	5		05/05/21 03:08	16887-00-6	D3
Fluoride	**<0.48**	mg/L	1.6	0.48	5		05/05/21 03:08	16984-48-8	D3
Sulfate	**<2.2**	mg/L	10.0	2.2	5		05/05/21 03:08	14808-79-8	D3

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Sample: B-11R **Lab ID: 40225648003** Collected: 04/19/21 16:35 Received: 04/23/21 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**3010**	ug/L	10.0	3.0	1	04/26/21 06:33	04/27/21 22:01	7440-42-8	
Calcium	**115000**	ug/L	254	76.2	1	04/26/21 06:33	04/27/21 22:01	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.11**	Std. Units			1		04/19/21 16:35		
Field Specific Conductance	**1003**	umhos/cm			1		04/19/21 16:35		
Oxygen, Dissolved	**0.10**	mg/L			1		04/19/21 16:35	7782-44-7	
REDOX	**-64.5**	mV			1		04/19/21 16:35		
Turbidity	**8.40**	NTU			1		04/19/21 16:35		
Static Water Level	**608.57**	feet			1		04/19/21 16:35		
Temperature, Water (C)	**10.6**	deg C			1		04/19/21 16:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**578**	mg/L	20.0	8.7	1		04/26/21 12:47		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		04/27/21 10:03		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**27.2**	mg/L	10.0	2.2	5		05/05/21 03:23	16887-00-6	
Fluoride	**<0.48**	mg/L	1.6	0.48	5		05/05/21 03:23	16984-48-8	D3
Sulfate	**61.2**	mg/L	10.0	2.2	5		05/05/21 03:23	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Sample: B-11A **Lab ID: 40225648004** Collected: 04/19/21 15:30 Received: 04/23/21 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**88.1**	ug/L	10.0	3.0	1	04/26/21 06:33	04/27/21 22:08	7440-42-8	
Calcium	**50600**	ug/L	254	76.2	1	04/26/21 06:33	04/27/21 22:08	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.65**	Std. Units			1		04/19/21 15:30		
Field Specific Conductance	**638**	umhos/cm			1		04/19/21 15:30		
Oxygen, Dissolved	**0.21**	mg/L			1		04/19/21 15:30	7782-44-7	
REDOX	**135.4**	mV			1		04/19/21 15:30		
Turbidity	**0.00**	NTU			1		04/19/21 15:30		
Static Water Level	**608.72**	feet			1		04/19/21 15:30		
Temperature, Water (C)	**13.4**	deg C			1		04/19/21 15:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**366**	mg/L	20.0	8.7	1		04/26/21 12:47		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		04/27/21 10:04		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**59.1**	mg/L	2.0	0.43	1		05/05/21 03:37	16887-00-6	
Fluoride	**0.23J**	mg/L	0.32	0.095	1		05/05/21 03:37	16984-48-8	
Sulfate	**2.9**	mg/L	2.0	0.44	1		05/05/21 03:37	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Sample: B11-B **Lab ID: 40225648005** Collected: 04/19/21 17:25 Received: 04/23/21 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**4440**	ug/L	10.0	3.0	1	04/26/21 06:33	04/27/21 22:15	7440-42-8	
Calcium	**93400**	ug/L	254	76.2	1	04/26/21 06:33	04/27/21 22:15	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**8.07**	Std. Units			1		04/19/21 17:25		
Field Specific Conductance	**1286**	umhos/cm			1		04/19/21 17:25		
Oxygen, Dissolved	**0.13**	mg/L			1		04/19/21 17:25	7782-44-7	
REDOX	**44.7**	mV			1		04/19/21 17:25		
Turbidity	**0.00**	NTU			1		04/19/21 17:25		
Static Water Level	**608.67**	feet			1		04/19/21 17:25		
Temperature, Water (C)	**13.4**	deg C			1		04/19/21 17:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**910**	mg/L	20.0	8.7	1		04/26/21 12:47		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.0**	Std. Units	0.10	0.010	1		04/27/21 10:06		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**28.3**	mg/L	2.0	0.43	1		05/06/21 11:25	16887-00-6	
Fluoride	**0.36**	mg/L	0.32	0.095	1		05/06/21 11:25	16984-48-8	
Sulfate	**379**	mg/L	20.0	4.4	10		05/07/21 11:19	14808-79-8	M0

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Sample: B-26 **Lab ID: 40225648006** Collected: 04/21/21 12:50 Received: 04/23/21 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**63.6**	ug/L	10.0	3.0	1	04/26/21 06:33	04/27/21 22:21	7440-42-8	
Calcium	**78700**	ug/L	254	76.2	1	04/26/21 06:33	04/27/21 22:21	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.27**	Std. Units			1		04/21/21 12:50		
Field Specific Conductance	**778**	umhos/cm			1		04/21/21 12:50		
Oxygen, Dissolved	**8.74**	mg/L			1		04/21/21 12:50	7782-44-7	
REDOX	**105.8**	mV			1		04/21/21 12:50		
Turbidity	**0.00**	NTU			1		04/21/21 12:50		
Static Water Level	**608.55**	feet			1		04/21/21 12:50		
Temperature, Water (C)	**11.0**	deg C			1		04/21/21 12:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**470**	mg/L	20.0	8.7	1		04/26/21 15:14		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		04/27/21 10:08		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**42.6**	mg/L	2.0	0.43	1		05/06/21 12:51	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/06/21 12:51	16984-48-8	
Sulfate	**35.3**	mg/L	2.0	0.44	1		05/06/21 12:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Sample: B-31R **Lab ID: 40225648007** Collected: 04/19/21 19:10 Received: 04/23/21 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**621**	ug/L	10.0	3.0	1	04/26/21 06:33	04/27/21 22:28	7440-42-8	
Calcium	**91400**	ug/L	254	76.2	1	04/26/21 06:33	04/27/21 22:28	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.91**	Std. Units			1		04/19/21 19:10		
Field Specific Conductance	**747**	umhos/cm			1		04/19/21 19:10		
Oxygen, Dissolved	**0.12**	mg/L			1		04/19/21 19:10	7782-44-7	
REDOX	**16.3**	mV			1		04/19/21 19:10		
Turbidity	**11.39**	NTU			1		04/19/21 19:10		
Static Water Level	**608.66**	feet			1		04/19/21 19:10		
Temperature, Water (C)	**12.1**	deg C			1		04/19/21 19:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**454**	mg/L	20.0	8.7	1		04/26/21 15:14		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.9**	Std. Units	0.10	0.010	1		04/27/21 10:09		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**23.3**	mg/L	2.0	0.43	1		05/06/21 13:05	16887-00-6	
Fluoride	**0.19J**	mg/L	0.32	0.095	1		05/06/21 13:05	16984-48-8	
Sulfate	**45.3**	mg/L	2.0	0.44	1		05/06/21 13:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Sample: B-31A **Lab ID: 40225648008** Collected: 04/19/21 18:30 Received: 04/23/21 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**172**	ug/L	10.0	3.0	1	04/26/21 06:33	04/27/21 22:35	7440-42-8	
Calcium	**52100**	ug/L	254	76.2	1	04/26/21 06:33	04/27/21 22:35	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.90**	Std. Units			1		04/19/21 18:30		
Field Specific Conductance	**563**	umhos/cm			1		04/19/21 18:30		
Oxygen, Dissolved	**0.18**	mg/L			1		04/19/21 18:30	7782-44-7	
REDOX	**79.6**	mV			1		04/19/21 18:30		
Turbidity	**0.00**	NTU			1		04/19/21 18:30		
Static Water Level	**608.63**	feet			1		04/19/21 18:30		
Temperature, Water (C)	**13.5**	deg C			1		04/19/21 18:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**330**	mg/L	20.0	8.7	1		04/26/21 15:15		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.8**	Std. Units	0.10	0.010	1		04/27/21 10:11		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**64.8**	mg/L	10.0	2.2	5		05/07/21 12:02	16887-00-6	
Fluoride	**0.14J**	mg/L	0.32	0.095	1		05/06/21 13:20	16984-48-8	
Sulfate	**15.8**	mg/L	2.0	0.44	1		05/06/21 13:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Sample: B-39 **Lab ID: 40225648009** Collected: 04/20/21 16:50 Received: 04/23/21 07:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay								
Boron	**191**	ug/L	10.0	3.0	1	04/26/21 06:33	04/27/21 22:42	7440-42-8	
Calcium	**71300**	ug/L	254	76.2	1	04/26/21 06:33	04/27/21 22:42	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.84**	Std. Units			1		04/20/21 16:50		
Field Specific Conductance	**519**	umhos/cm			1		04/20/21 16:50		
Oxygen, Dissolved	**0.05**	mg/L			1		04/20/21 16:50	7782-44-7	
REDOX	**49.2**	mV			1		04/20/21 16:50		
Turbidity	**0.00**	NTU			1		04/20/21 16:50		
Static Water Level	**608.48**	feet			1		04/20/21 16:50		
Temperature, Water (C)	**12.1**	deg C			1		04/20/21 16:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**302**	mg/L	20.0	8.7	1		04/26/21 15:15		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.3**	Std. Units	0.10	0.010	1		04/29/21 10:44		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**0.58J**	mg/L	2.0	0.43	1		05/06/21 13:34	16887-00-6	
Fluoride	**0.21J**	mg/L	0.32	0.095	1		05/06/21 13:34	16984-48-8	
Sulfate	**4.3**	mg/L	2.0	0.44	1		05/06/21 13:34	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

QC Batch: 383380
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225648001, 40225648002, 40225648003, 40225648004, 40225648005, 40225648006, 40225648007, 40225648008, 40225648009

METHOD BLANK: 2211892 Matrix: Water
Associated Lab Samples: 40225648001, 40225648002, 40225648003, 40225648004, 40225648005, 40225648006, 40225648007, 40225648008, 40225648009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	04/27/21 18:01	
Calcium	ug/L	<76.2	254	04/27/21 18:01	

LABORATORY CONTROL SAMPLE: 2211893

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	472	94	80-120	
Calcium	ug/L	5000	4830	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2211894 2211895

Parameter	Units	40225677021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	8.4J	500	500	499	468	98	92	75-125	6	20	
Calcium	ug/L	73800	5000	5000	80400	75600	131	37	75-125	6	20	P6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

QC Batch: 383436 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225648001, 40225648002, 40225648003, 40225648004, 40225648005

METHOD BLANK: 2212134 Matrix: Water
Associated Lab Samples: 40225648001, 40225648002, 40225648003, 40225648004, 40225648005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/26/21 12:37	

LABORATORY CONTROL SAMPLE: 2212135

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	564	566	100	80-120	

SAMPLE DUPLICATE: 2212136

Parameter	Units	40225609004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	30.0	28.0	7	10	

SAMPLE DUPLICATE: 2212137

Parameter	Units	40225638006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	428	426	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

QC Batch: 383437
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225648006, 40225648007, 40225648008, 40225648009

METHOD BLANK: 2212138 Matrix: Water
Associated Lab Samples: 40225648006, 40225648007, 40225648008, 40225648009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/26/21 15:09	

LABORATORY CONTROL SAMPLE: 2212139

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	564	564	100	80-120	

SAMPLE DUPLICATE: 2212140

Parameter	Units	40225648006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	470	466	1	10	

SAMPLE DUPLICATE: 2212141

Parameter	Units	40225654013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

QC Batch: 383518
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225648001, 40225648002, 40225648003, 40225648004, 40225648005, 40225648006, 40225648007, 40225648008

SAMPLE DUPLICATE: 2212516

Parameter	Units	40225320001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.4	8.4	1	20	H6

SAMPLE DUPLICATE: 2212517

Parameter	Units	40225579001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.9	1	20	H6

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QUALITY CONTROL DATA

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

QC Batch: 383801
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40225648009

SAMPLE DUPLICATE: 2213863

Parameter	Units	40225648009 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.4	1	20	H6

SAMPLE DUPLICATE: 2213864

Parameter	Units	40225748009 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.8	8.7	1	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

QC Batch: 384211
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225648001, 40225648002, 40225648003, 40225648004

METHOD BLANK: 2216349 Matrix: Water
Associated Lab Samples: 40225648001, 40225648002, 40225648003, 40225648004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/04/21 23:47	
Fluoride	mg/L	<0.095	0.32	05/04/21 23:47	
Sulfate	mg/L	<0.44	2.0	05/04/21 23:47	

LABORATORY CONTROL SAMPLE: 2216350

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.0	105	90-110	
Fluoride	mg/L	2	2.1	104	90-110	
Sulfate	mg/L	20	21.1	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2216351 2216352

Parameter	Units	40225609002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	0.57J	20	20	22.3	22.3	109	109	90-110	0	15	
Fluoride	mg/L	<0.095	2	2	2.2	2.2	110	111	90-110	0	15	M0
Sulfate	mg/L	2.3	20	20	24.4	24.4	110	111	90-110	0	15	M0

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

QC Batch: 384399
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40225648005, 40225648006, 40225648007, 40225648008, 40225648009

METHOD BLANK: 2217395 Matrix: Water
Associated Lab Samples: 40225648005, 40225648006, 40225648007, 40225648008, 40225648009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/06/21 09:15	
Fluoride	mg/L	<0.095	0.32	05/06/21 09:15	
Sulfate	mg/L	<0.44	2.0	05/06/21 09:15	

LABORATORY CONTROL SAMPLE: 2217396

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.3	101	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	20.4	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2217397 2217398

Parameter	Units	40225648005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	28.3	20	20	48.0	48.1	98	99	90-110	0	15	
Fluoride	mg/L	0.36	2	2	2.5	2.5	106	107	90-110	1	15	
Sulfate	mg/L	379	200	200	554	538	87	79	90-110	3	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2217399 2217400

Parameter	Units	40225950002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	296	200	200	483	477	93	91	90-110	1	15	
Fluoride	mg/L	<0.95	20	20	21.7	21.6	107	106	90-110	1	15	
Sulfate	mg/L	149	200	200	352	353	101	102	90-110	0	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219071 CCR NELSON DEWEY
Pace Project No.: 40225648

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40225648001	**FIELD BLANK**	EPA 3010	383380	EPA 6020	383475
40225648002	**B-7R**	EPA 3010	383380	EPA 6020	383475
40225648003	**B-11R**	EPA 3010	383380	EPA 6020	383475
40225648004	**B-11A**	EPA 3010	383380	EPA 6020	383475
40225648005	**B11-B**	EPA 3010	383380	EPA 6020	383475
40225648006	**B-26**	EPA 3010	383380	EPA 6020	383475
40225648007	**B-31R**	EPA 3010	383380	EPA 6020	383475
40225648008	**B-31A**	EPA 3010	383380	EPA 6020	383475
40225648009	**B-39**	EPA 3010	383380	EPA 6020	383475
40225648002	**B-7R**				
40225648003	**B-11R**				
40225648004	**B-11A**				
40225648005	**B11-B**				
40225648006	**B-26**				
40225648007	**B-31R**				
40225648008	**B-31A**				
40225648009	**B-39**				
40225648001	**FIELD BLANK**	SM 2540C	383436		
40225648002	**B-7R**	SM 2540C	383436		
40225648003	**B-11R**	SM 2540C	383436		
40225648004	**B-11A**	SM 2540C	383436		
40225648005	**B11-B**	SM 2540C	383436		
40225648006	**B-26**	SM 2540C	383437		
40225648007	**B-31R**	SM 2540C	383437		
40225648008	**B-31A**	SM 2540C	383437		
40225648009	**B-39**	SM 2540C	383437		
40225648001	**FIELD BLANK**	EPA 9040	383518		
40225648002	**B-7R**	EPA 9040	383518		
40225648003	**B-11R**	EPA 9040	383518		
40225648004	**B-11A**	EPA 9040	383518		
40225648005	**B11-B**	EPA 9040	383518		
40225648006	**B-26**	EPA 9040	383518		
40225648007	**B-31R**	EPA 9040	383518		
40225648008	**B-31A**	EPA 9040	383518		
40225648009	**B-39**	EPA 9040	383801		
40225648001	**FIELD BLANK**	EPA 300.0	384211		
40225648002	**B-7R**	EPA 300.0	384211		
40225648003	**B-11R**	EPA 300.0	384211		
40225648004	**B-11A**	EPA 300.0	384211		
40225648005	**B11-B**	EPA 300.0	384399		
40225648006	**B-26**	EPA 300.0	384399		
40225648007	**B-31R**	EPA 300.0	384399		
40225648008	**B-31A**	EPA 300.0	384399		
40225648009	**B-39**	EPA 300.0	384399		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

40225648

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	SCS ENGINEERS	Report To:	Meghan Blodgett	Attention:	
Address:	2830 Dairy Drive	Copy To:		Company Name:	
Madison, WI 53718				Address:	
Email:	mblodgett@scsengineers.com	Purchase Order #:		Pace Quote:	
Phone:	608-216-7362 Fax:	Project Name:	CCR Rule Alliant Nelson Dewey (25219071)	Pace Project Manager:	dan.milewsky@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	3946-13

Regulatory Agency

State / Location

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: Boron/Calcium	TDS, Cl, F, SO4	pH	Residual Chlorine (Y/N)	
	MATRIX CODES: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS																	N	N	N			
1	FIELD BLANK	WT				4-21	12:35		3	2		1						X	X	X			001
2	B-7R	WT				4-20	17:30											X	X	X			002
3	B-11R	WT				4-19	16:35											X	X	X			003
4	B-11A	WT					15:30											X	X	X			004
5	B11-B	WT					17:25											X	X	X			005
6	B-26	WT				4-21	12:50											X	X	X			006
7	B-31R	WT				4-19	19:10											X	X	X			007
8	B-31A	WT				4-19	18:30											X	X	X			008
9	B-39	WT				4-20	16:50											X	X	X			009
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Paul A. Grom SCS	4-22-14	12:00							
	C.S Logistics	4/23/14	0750		4/23/14	0750	.5	4	4	4

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed:

TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

Sample Preservation Receipt Form

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Client Name: SCS Engineers Project # 40225648

All containers needing preservation have been checked and noted below: ☒Yes ☐No ☐N/A

Lab Lot# of pH paper: 10D2601 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: LP Date/ Time:

Pace Lab #	Glass								Plastic					Vials						Jars				General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN							
001										2		1																		X		2.5 / 5 / 10
002										2		1																		X		2.5 / 5 / 10
003										2		1																		X		2.5 / 5 / 10
004										2		1																		X		2.5 / 5 / 10
005										2		1																		X		2.5 / 5 / 10
006										2		1																		X		2.5 / 5 / 10
007										2		1																		X		2.5 / 5 / 10
008										2		1																		X		2.5 / 5 / 10
009										2		1																		X		2.5 / 5 / 10
010																																2.5 / 5 / 10
011																																2.5 / 5 / 10
012																																2.5 / 5 / 10
013																																2.5 / 5 / 10
014																																2.5 / 5 / 10
015																																2.5 / 5 / 10
016																																2.5 / 5 / 10
017																													1/23/21			2.5 / 5 / 10
018																																2.5 / 5 / 10
019																																2.5 / 5 / 10
020																																2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other:_____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☒N/A ***If yes look in headspace column**

AG1U	1 liter amber glass
BG1U	1 liter clear glass
AG1H	1 liter amber glass HCL
AG4S	125 mL amber glass H2SO4
AG4U	120 mL amber glass unpres
AG5U	100 mL amber glass unpres
AG2S	500 mL amber glass H2SO4
BG3U	250 mL clear glass unpres

BP1U	1 liter plastic unpres
BP3U	250 mL plastic unpres
BP3B	250 mL plastic NaOH
BP3N	250 mL plastic HNO3
BP3S	250 mL plastic H2SO4

VG9A	40 mL clear ascorbic
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN	

Pace Analytical® 1241 Bellevue Street, Green Bay, WI 54302	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: 26Mar2020
	Document No.: **ENV-FRM-GBAY-0014-Rev.00**	Author: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40225648

40225648

Client Name: SCS Engineers

Courier: ☒ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other:

Tracking #: —

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☐ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other

Thermometer Used SR - 90 **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 1 /Corr: .5

Temp Blank Present: ☐ yes ☒ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Person examining contents: Date: 4/23/21 /Initials: JP

Labeled By Initials:

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2. PM 4/23/21 JP
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☒No	6.
Rush Turn Around Time Requested:	☐Yes ☒No	7.
Sufficient Volume: For Analysis: ☒Yes ☐No MS/MSD:	☐Yes ☒No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No	9.
-Pace Containers Used:	☒Yes ☒No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☒N/A	
Containers Intact:	☒Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: W	☒Yes ☐No ☐N/A	12.
Trip Blank Present:	☐Yes ☐No ☒N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution:

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logir

Page 2 of 2

C2 October 2021 Detection Monitoring

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

October 28, 2021

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory between October 09, 2021 and October 11, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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(920)469-2436

CERTIFICATIONS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40234851001	**B-11R**	Water	10/07/21 11:00	10/09/21 08:45
40234851002	**B-11A**	Water	10/07/21 10:00	10/09/21 08:45
40234851003	**B-11B**	Water	10/07/21 09:40	10/09/21 08:45
40234851004	**B-26**	Water	10/08/21 10:25	10/09/21 08:45
40234851005	**B-31R**	Water	10/07/21 08:05	10/09/21 08:45
40234851006	**B-31A**	Water	10/07/21 08:35	10/09/21 08:45
40234851007	**B-39**	Water	10/08/21 08:10	10/09/21 08:45
40234851008	**FIELD BLANK**	Water	10/07/21 10:05	10/09/21 08:45
40234851009	**B-7R**	Water	10/07/21 11:55	10/11/21 00:00

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40234851001	**B-11R**	EPA 6020B	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40234851002	**B-11A**	EPA 6020B	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40234851003	**B-11B**	EPA 6020B	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40234851004	**B-26**	EPA 6020B	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40234851005	**B-31R**	EPA 6020B	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40234851006	**B-31A**	EPA 6020B	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40234851007	**B-39**	EPA 6020B	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40234851008	**FIELD BLANK**	EPA 6020B	KXS	2
		SM 2540C	HNT	1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40234851009	**B-7R**		VGC	1

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Sample: B-11R **Lab ID: 40234851001** Collected: 10/07/21 11:00 Received: 10/09/21 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**2940**	ug/L	100	30.3	10	10/13/21 06:36	10/16/21 07:51	7440-42-8	
Calcium	**119000**	ug/L	2540	762	10	10/13/21 06:36	10/16/21 07:51	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.86**	Std. Units			1		10/07/21 11:00		
Field Specific Conductance	**1029**	umhos/cm			1		10/07/21 11:00		
Oxygen, Dissolved	**1.57**	mg/L			1		10/07/21 11:00	7782-44-7	
REDOX	**-42.6**	mV			1		10/07/21 11:00		
Turbidity	**10.81**	NTU			1		10/07/21 11:00		
Static Water Level	**603.85**	feet			1		10/07/21 11:00		
Temperature, Water (C)	**14.6**	deg C			1		10/07/21 11:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**576**	mg/L	20.0	8.7	1		10/13/21 11:56		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.3**	Std. Units	0.10	0.010	1		10/18/21 11:01		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**23.1**	mg/L	10.0	2.2	5		10/24/21 21:20	16887-00-6	
Fluoride	**<0.48**	mg/L	1.6	0.48	5		10/24/21 21:20	16984-48-8	D3
Sulfate	**61.8**	mg/L	10.0	2.2	5		10/24/21 21:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Sample: B-11A **Lab ID: 40234851002** Collected: 10/07/21 10:00 Received: 10/09/21 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**85.4**	ug/L	10.0	3.0	1	10/13/21 06:36	10/16/21 07:58	7440-42-8	
Calcium	**51400**	ug/L	254	76.2	1	10/13/21 06:36	10/16/21 07:58	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.57**	Std. Units			1		10/07/21 10:00		
Field Specific Conductance	**621**	umhos/cm			1		10/07/21 10:00		
Oxygen, Dissolved	**1.27**	mg/L			1		10/07/21 10:00	7782-44-7	
REDOX	**61.4**	mV			1		10/07/21 10:00		
Turbidity	**0.00**	NTU			1		10/07/21 10:00		
Static Water Level	**603.79**	feet			1		10/07/21 10:00		
Temperature, Water (C)	**13.9**	deg C			1		10/07/21 10:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**356**	mg/L	20.0	8.7	1		10/13/21 11:57		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.0**	Std. Units	0.10	0.010	1		10/18/21 11:03		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**58.8**	mg/L	2.0	0.43	1		10/24/21 22:03	16887-00-6	
Fluoride	**0.22J**	mg/L	0.32	0.095	1		10/24/21 22:03	16984-48-8	
Sulfate	**7.0**	mg/L	2.0	0.44	1		10/24/21 22:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Sample: B-11B **Lab ID: 40234851003** Collected: 10/07/21 09:40 Received: 10/09/21 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**2480**	ug/L	100	30.3	10	10/13/21 06:36	10/16/21 08:20	7440-42-8	
Calcium	**100000**	ug/L	2540	762	10	10/13/21 06:36	10/16/21 08:20	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.81**	Std. Units			1		10/07/21 09:40		
Field Specific Conductance	**1337**	umhos/cm			1		10/07/21 09:40		
Oxygen, Dissolved	**1.29**	mg/L			1		10/07/21 09:40	7782-44-7	
REDOX	**46.9**	mV			1		10/07/21 09:40		
Turbidity	**0.00**	NTU			1		10/07/21 09:40		
Static Water Level	**603.74**	feet			1		10/07/21 09:40		
Temperature, Water (C)	**14.0**	deg C			1		10/07/21 09:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**884**	mg/L	20.0	8.7	1		10/13/21 11:57		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.0**	Std. Units	0.10	0.010	1		10/18/21 11:05		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**39.6**	mg/L	20.0	4.3	10		10/25/21 01:10	16887-00-6	
Fluoride	**<0.95**	mg/L	3.2	0.95	10		10/25/21 01:10	16984-48-8	D3
Sulfate	**466**	mg/L	20.0	4.4	10		10/25/21 01:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Sample: B-26 **Lab ID: 40234851004** Collected: 10/08/21 10:25 Received: 10/09/21 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**48.4**	ug/L	10.0	3.0	1	10/13/21 06:36	10/16/21 08:28	7440-42-8	
Calcium	**84900**	ug/L	254	76.2	1	10/13/21 06:36	10/16/21 08:28	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.18**	Std. Units			1		10/08/21 10:25		
Field Specific Conductance	**788**	umhos/cm			1		10/08/21 10:25		
Oxygen, Dissolved	**9.40**	mg/L			1		10/08/21 10:25	7782-44-7	
REDOX	**122.1**	mV			1		10/08/21 10:25		
Turbidity	**0.00**	NTU			1		10/08/21 10:25		
Static Water Level	**604.21**	feet			1		10/08/21 10:25		
Temperature, Water (C)	**11.4**	deg C			1		10/08/21 10:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**440**	mg/L	20.0	8.7	1		10/13/21 11:57		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		10/18/21 11:07		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**39.1**	mg/L	2.0	0.43	1		10/24/21 22:32	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/24/21 22:32	16984-48-8	
Sulfate	**43.8**	mg/L	2.0	0.44	1		10/24/21 22:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Sample: B-31R **Lab ID: 40234851005** Collected: 10/07/21 08:05 Received: 10/09/21 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**353**	ug/L	10.0	3.0	1	10/13/21 06:36	10/16/21 08:35	7440-42-8	
Calcium	**79000**	ug/L	254	76.2	1	10/13/21 06:36	10/16/21 08:35	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.63**	Std. Units			1		10/07/21 08:05		
Field Specific Conductance	**649**	umhos/cm			1		10/07/21 08:05		
Oxygen, Dissolved	**1.81**	mg/L			1		10/07/21 08:05	7782-44-7	
REDOX	**16.7**	mV			1		10/07/21 08:05		
Turbidity	**0.00**	NTU			1		10/07/21 08:05		
Static Water Level	**603.98**	feet			1		10/07/21 08:05		
Temperature, Water (C)	**13.8**	deg C			1		10/07/21 08:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**372**	mg/L	20.0	8.7	1		10/13/21 11:57		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.3**	Std. Units	0.10	0.010	1		10/18/21 11:09		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**36.5**	mg/L	2.0	0.43	1		10/24/21 22:46	16887-00-6	
Fluoride	**0.22J**	mg/L	0.32	0.095	1		10/24/21 22:46	16984-48-8	
Sulfate	**24.9**	mg/L	2.0	0.44	1		10/24/21 22:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Sample: B-31A **Lab ID: 40234851006** Collected: 10/07/21 08:35 Received: 10/09/21 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**178**	ug/L	10.0	3.0	1	10/13/21 06:36	10/16/21 08:42	7440-42-8	
Calcium	**53500**	ug/L	254	76.2	1	10/13/21 06:36	10/16/21 08:42	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.44**	Std. Units			1		10/07/21 08:35		
Field Specific Conductance	**553**	umhos/cm			1		10/07/21 08:35		
Oxygen, Dissolved	**1.35**	mg/L			1		10/07/21 08:35	7782-44-7	
REDOX	**23.5**	mV			1		10/07/21 08:35		
Turbidity	**0.00**	NTU			1		10/07/21 08:35		
Static Water Level	**603.84**	feet			1		10/07/21 08:35		
Temperature, Water (C)	**13.5**	deg C			1		10/07/21 08:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**294**	mg/L	20.0	8.7	1		10/13/21 11:58		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.9**	Std. Units	0.10	0.010	1		10/18/21 11:11		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**60.3**	mg/L	10.0	2.2	5		10/25/21 01:39	16887-00-6	
Fluoride	**0.15J**	mg/L	0.32	0.095	1		10/24/21 23:44	16984-48-8	
Sulfate	**14.9**	mg/L	2.0	0.44	1		10/24/21 23:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Sample: B-39 **Lab ID: 40234851007** Collected: 10/08/21 08:10 Received: 10/09/21 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**130**	ug/L	10.0	3.0	1	10/13/21 06:36	10/16/21 08:50	7440-42-8	
Calcium	**69600**	ug/L	254	76.2	1	10/13/21 06:36	10/16/21 08:50	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.30**	Std. Units			1		10/08/21 08:10		
Field Specific Conductance	**473.2**	umhos/cm			1		10/08/21 08:10		
Oxygen, Dissolved	**1.45**	mg/L			1		10/08/21 08:10	7782-44-7	
REDOX	**135.4**	mV			1		10/08/21 08:10		
Turbidity	**0.00**	NTU			1		10/08/21 08:10		
Static Water Level	**604.23**	feet			1		10/08/21 08:10		
Temperature, Water (C)	**14.0**	deg C			1		10/08/21 08:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**252**	mg/L	20.0	8.7	1		10/13/21 11:58		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		10/18/21 11:14		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**0.84J**	mg/L	2.0	0.43	1		10/24/21 23:58	16887-00-6	
Fluoride	**0.13J**	mg/L	0.32	0.095	1		10/24/21 23:58	16984-48-8	
Sulfate	**1.9J**	mg/L	2.0	0.44	1		10/24/21 23:58	14808-79-8	

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ANALYTICAL RESULTS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Sample: FIELD BLANK **Lab ID: 40234851008** Collected: 10/07/21 10:05 Received: 10/09/21 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**<3.0**	ug/L	10.0	3.0	1	10/13/21 06:36	10/16/21 07:00	7440-42-8	
Calcium	**<76.2**	ug/L	254	76.2	1	10/13/21 06:36	10/16/21 07:00	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		10/13/21 11:58		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.1**	Std. Units	0.10	0.010	1		10/18/21 11:15		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**0.56J**	mg/L	2.0	0.43	1		10/25/21 00:12	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/25/21 00:12	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		10/25/21 00:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Sample: B-7R **Lab ID: 40234851009** Collected: 10/07/21 11:55 Received: 10/11/21 00:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Static Water Level	**604.05**	feet			1		10/07/21 11:55		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

QC Batch: 398294
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40234851001, 40234851002, 40234851003, 40234851004, 40234851005, 40234851006, 40234851007, 40234851008

METHOD BLANK: 2299252 Matrix: Water
Associated Lab Samples: 40234851001, 40234851002, 40234851003, 40234851004, 40234851005, 40234851006, 40234851007, 40234851008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	10/15/21 15:49	
Calcium	ug/L	<76.2	254	10/15/21 15:49	

LABORATORY CONTROL SAMPLE: 2299253

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	248	99	80-120	
Calcium	ug/L	10000	9760	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2299254 2299255

Parameter	Units	40234537001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	2560	250	250	2870	2870	125	124	75-125	0	20	
Calcium	ug/L	26000	10000	10000	34200	35300	81	93	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

QC Batch: 398340 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40234851001, 40234851002, 40234851003, 40234851004, 40234851005, 40234851006, 40234851007, 40234851008

METHOD BLANK: 2299475 Matrix: Water
Associated Lab Samples: 40234851001, 40234851002, 40234851003, 40234851004, 40234851005, 40234851006, 40234851007, 40234851008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/13/21 11:54	

LABORATORY CONTROL SAMPLE: 2299476

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	575	576	100	80-120	

SAMPLE DUPLICATE: 2299480

Parameter	Units	40234851001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	576	592	3	10	

SAMPLE DUPLICATE: 2299481

Parameter	Units	40234931001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	264	250	5	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

QC Batch: 398799
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40234851001, 40234851002, 40234851003, 40234851004, 40234851005, 40234851006, 40234851007, 40234851008

SAMPLE DUPLICATE: 2302605

Parameter	Units	40234771001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.7	7.7	0	20	H6

SAMPLE DUPLICATE: 2302606

Parameter	Units	40234855019 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

QC Batch: 399320
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40234851001, 40234851002, 40234851003, 40234851004, 40234851005, 40234851006, 40234851007, 40234851008

METHOD BLANK: 2305515 Matrix: Water
Associated Lab Samples: 40234851001, 40234851002, 40234851003, 40234851004, 40234851005, 40234851006, 40234851007, 40234851008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	10/24/21 20:52	
Fluoride	mg/L	<0.095	0.32	10/24/21 20:52	
Sulfate	mg/L	<0.44	2.0	10/24/21 20:52	

LABORATORY CONTROL SAMPLE: 2305516

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.5	102	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	20.4	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2305517 2305518

Parameter	Units	40234851001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	23.1	100	100	121	123	98	100	90-110	1	15	
Fluoride	mg/L	<0.48	10	10	9.8	9.9	96	97	90-110	1	15	
Sulfate	mg/L	61.8	100	100	161	163	99	101	90-110	1	15	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALIFIERS

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

WORKORDER QUALIFIERS

WO: 40234851

[1] Revised Report: Field conductivity has been corrected for B-31A.

ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25221071.00 NELSON DEWEY CCR
Pace Project No.: 40234851

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40234851001	**B-11R**	EPA 3010A	398294	EPA 6020B	398403
40234851002	**B-11A**	EPA 3010A	398294	EPA 6020B	398403
40234851003	**B-11B**	EPA 3010A	398294	EPA 6020B	398403
40234851004	**B-26**	EPA 3010A	398294	EPA 6020B	398403
40234851005	**B-31R**	EPA 3010A	398294	EPA 6020B	398403
40234851006	**B-31A**	EPA 3010A	398294	EPA 6020B	398403
40234851007	**B-39**	EPA 3010A	398294	EPA 6020B	398403
40234851008	**FIELD BLANK**	EPA 3010A	398294	EPA 6020B	398403
40234851001	**B-11R**				
40234851002	**B-11A**				
40234851003	**B-11B**				
40234851004	**B-26**				
40234851005	**B-31R**				
40234851006	**B-31A**				
40234851007	**B-39**				
40234851009	**B-7R**				
40234851001	**B-11R**	SM 2540C	398340		
40234851002	**B-11A**	SM 2540C	398340		
40234851003	**B-11B**	SM 2540C	398340		
40234851004	**B-26**	SM 2540C	398340		
40234851005	**B-31R**	SM 2540C	398340		
40234851006	**B-31A**	SM 2540C	398340		
40234851007	**B-39**	SM 2540C	398340		
40234851008	**FIELD BLANK**	SM 2540C	398340		
40234851001	**B-11R**	EPA 9040	398799		
40234851002	**B-11A**	EPA 9040	398799		
40234851003	**B-11B**	EPA 9040	398799		
40234851004	**B-26**	EPA 9040	398799		
40234851005	**B-31R**	EPA 9040	398799		
40234851006	**B-31A**	EPA 9040	398799		
40234851007	**B-39**	EPA 9040	398799		
40234851008	**FIELD BLANK**	EPA 9040	398799		
40234851001	**B-11R**	EPA 300.0	399320		
40234851002	**B-11A**	EPA 300.0	399320		
40234851003	**B-11B**	EPA 300.0	399320		
40234851004	**B-26**	EPA 300.0	399320		
40234851005	**B-31R**	EPA 300.0	399320		
40234851006	**B-31A**	EPA 300.0	399320		
40234851007	**B-39**	EPA 300.0	399320		
40234851008	**FIELD BLANK**	EPA 300.0	399320		

REPORT OF LABORATORY ANALYSIS

(Please Print Clearly)	
Company Name:	SCS Engineers
Branch/Location:	25 - Madison
Project Contact:	Tom Karwoski
Phone:	608-957-9332
Project Number:	25221071.00
Project Name:	Nelson Dewey Gen. Station
Project State:	WI
Sampled By (Print):	Ryan Matzuk
Sampled By (Sign):	[signature]
PO #:	Regulatory Program:

Pace Analytical®
www.pacelabs.com

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

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40234851

CHAIN OF CUSTODY

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

Quote #:	
Mail To Contact:	Tom Karwoski
Mail To Company:	SCS Engineers
Mail To Address:	2830 Dairy Dr. Madison WI 53718
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	same as above
Invoice To Phone:	608-957-9332

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air, B = Biota, C = Charcoal, O = Oil, S = Soil, Sl = Sludge
W = Water, DW = Drinking Water, GW = Ground Water, SW = Surface Water, WW = Waste Water, WP = Wipe

FILTERED? (YES/NO) — Y/N: N, N
PRESERVATION (CODE)* — Pick Letter: D, A

Analyses Requested: Boron, Calcium | pH, TDS, Cl, F, SO4

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Boron, Calcium	pH, TDS, Cl, F, SO4	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
001	B-11R	10/7	1100	GW	X	X			
002	B-11A	10/7	1000	↓	X	X			
003	B-11B	10/7	940	↓	X	X			
004	B-26	10/8	1025	↓	X	X			
005	B-31R	10/7	805	↓	X	X			
006	B-31A	10/7	835	↓	X	X			
007	B-39	10/8	810	↓	X	X			
008	Field Blank	10/7	1005	W	X	X			

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):

Email #1:	
Email #2:	
Telephone:	
Fax:	

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
[signature]	10/8/21 1600		
CS Logistics	10/9/21 0845	Will Comeau Pace	10/9/21 0845

PACE Project No. 40234851

Receipt Temp = 3 °C

Sample Receipt pH
OK / Adjusted

Cooler Custody Seal
Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

Sample Preservation Receipt Form

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Client Name: SCS Engineers Project #

All containers needing preservation have been checked and noted below: ☐Yes ☐No ☐N/A

Lab Lot# of pH paper: 10D3604 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: WC Date/ Time:

Pace Lab #	Glass: AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	Plastic: BP1U	BP3U	BP3B	BP3N	BP3S	Vials: VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	Jars: JGFU	JG9U	WGFU	WPFU	General: SP5T	ZPLC	GN	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001										2		1																			✓		2.5 / 5 / 10
002										2		1																			✓		2.5 / 5 / 10
003										2		1																			✓		2.5 / 5 / 10
004										2		1																			✓		2.5 / 5 / 10
005										2		1																			✓		2.5 / 5 / 10
006										2		1																			✓		2.5 / 5 / 10
007										2		1																			✓		2.5 / 5 / 10
008										2		1																			✓		2.5 / 5 / 10
009																																	2.5 / 5 / 10
010																																	2.5 / 5 / 10
011																																	2.5 / 5 / 10
012														WC																			2.5 / 5 / 10
013																																	2.5 / 5 / 10
014																																	2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																																	2.5 / 5 / 10
020																																	2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other:_____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☐N/A ***If yes look in headspace column**

AG1U	1 liter amber glass
BG1U	1 liter clear glass
AG1H	1 liter amber glass HCL
AG4S	125 mL amber glass H2SO4
AG4U	120 mL amber glass unpres
AG5U	100 mL amber glass unpres
AG2S	500 mL amber glass H2SO4
BG3U	250 mL clear glass unpres

BP1U	1 liter plastic unpres
BP3U	250 mL plastic unpres
BP3B	250 mL plastic NaOH
BP3N	250 mL plastic HNO3
BP3S	250 mL plastic H2SO4

VG9A	40 mL clear ascorbic
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN	

Pace Analytical® 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 26Mar2020
	Document No.: ENV-FRM-GBAY-0014-Rev.00	Author: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40234851

40234851

Client Name: SCS Engineers

Courier: ☑ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other:

Tracking #: —

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other

Thermometer Used SR - 111 **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 3 /Corr: 3

Temp Blank Present: ☐ yes ☑ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Person examining contents: Date: 10/9/21 /Initials: LC

Labeled By Initials: AJ

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	10/9/21 AJ ☑Yes ☐No ☐N/A	2. no pg # 10/9/21 AJ
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☑No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: ☐Yes ☑No ☐N/A		8.
Correct Containers Used:	☑Yes ☐No	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☑N/A	
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11. 10/9/21 AJ
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: GW		
Trip Blank Present:	☐Yes ☐No ☑N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution:

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logi

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Appendix D

Historical Monitoring Results

Single Location

Name: WPL - Nelson Dewey

Location ID: B-7R
Number of Sampling Dates: 17

Parameter Name	Units	12/9/2015	4/13/2016	7/18/2016	10/19/2016	1/12/2017	4/17/2017	6/7/2017	8/1/2017	10/19/2017	4/2/2018	10/9/2018	4/22/2019	10/14/2019	4/13/2020	10/13/2020	4/20/2021	10/7/2021
Boron	ug/L	110	115	164	154	159	129	110	129	159	121	73	93.5	139	96	145	104	--
Calcium	ug/L	31700	42300	44400	56600	56700	61400	51600	50400	56200	49200	38500	59400	57700	58700	41900	56100	--
Chloride	mg/L	45.2	4.6	7.1	22	19.7	13.1	12.8	8.1	12	10.1	1.9	10.9	11.5	14.3	6.7	9.5	--
Fluoride	mg/L	<1	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.1	<0.5	<0.5	<0.48	<0.48	<0.48	--
Field pH	Std. Units	6.74	6.8	6.29	6.55	7.43	6.6	6.65	6.28	6.88	6.57	6.23	6.63	6.62	6.6	6.35	6.54	--
Sulfate	mg/L	17	2.5	2.4	<5	<5	<5	<5	3.7	<5	<5	3.2	<5	<5	7.5	<2.2	<2.2	--
Total Dissolved Solids	mg/L	198	218	220	288	240	278	240	220	242	220	186	254	208	306	208	248	--
Antimony	ug/L	0.28	<0.073	0.25	0.086	0.2	0.18	<0.15	0.33	--	<0.15	--	--	--	--	--	--	--
Arsenic	ug/L	5	2	1.8	5.7	6.6	3.5	2.6	2	--	2.6	--	--	--	--	--	--	--
Barium	ug/L	77.8	67.8	54.5	78.8	98.4	83.3	65.8	54.2	--	89.3	--	--	--	--	--	--	--
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	0.16	<0.13	<0.18	<0.18	--	<0.18	--	--	--	--	--	--	--
Cadmium	ug/L	0.17	<0.089	<0.089	0.13	0.16	0.11	<0.081	0.23	--	<0.081	--	--	--	--	--	--	--
Chromium	ug/L	0.5	<0.39	<0.39	<0.39	0.62	0.41	<1	<1	--	<1	--	--	--	--	--	--	--
Cobalt	ug/L	1.3	0.88	0.69	1.8	1.5	1.4	1.1	1.3	--	0.42	--	--	--	--	--	--	--
Lead	ug/L	0.21	0.16	0.078	0.14	0.42	0.26	<0.2	0.29	--	<0.2	--	--	--	--	--	--	--
Lithium	ug/L	0.45	0.14	0.18	0.23	0.35	0.26	<0.14	0.41	--	0.22	--	--	--	--	--	--	--
Mercury	ug/L	<0.1	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	--	--	--	--	--	--
Molybdenum	ug/L	9.6	1.4	1.4	4.3	3.3	2.1	2.8	1.9	--	0.84	--	--	--	--	--	--	--
Selenium	ug/L	0.44	0.24	0.26	0.23	0.47	0.39	<0.32	0.56	--	<0.32	--	--	--	--	--	--	--
Thallium	ug/L	0.2	<0.14	<0.14	<0.14	<0.14	0.22	<0.14	0.36	--	<0.14	--	--	--	--	--	--	--
Total Radium	pCi/L	0.933	1.18	0.598	0.118	0.828	0.747	0.181	0.967	--	0.339	--	--	--	--	--	--	--
Radium-226	pCi/L	0.341	0.436	-0.089	-0.243	-0.253	0.345	0.181	0.379	--	0.339	--	--	--	--	--	--	--
Radium-228	pCi/L	0.592	0.746	0.598	0.118	0.828	0.402	-0.057	0.588	--	-0.032	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	367.8	410.9	422.3	583.4	1054	532	303	411.8	480.9	342.5	336	603.7	576.6	623.8	414.4	535	--
Oxygen, Dissolved	mg/L	4.88	1.29	0.55	0.37	0.1	0.1	0.22	0.47	0.31	0.3	1.24	0.17	0.11	2.18	1.68	0.19	--
Field Oxidation Potential	mV	-48.2	-46.1	-26.6	137.3	-122.2	-83.3	-12.6	-3	112.8	-74.1	54.5	-100.9	-132.2	-124	142.1	-23.4	--
Groundwater Elevation	feet	606.69	609.32	606.54	608.59	604.94	609.08	610.74	607.02	609.6	604.82	610.76	615.28	613.43	614.12	605.09	608.83	604.05
Temperature	deg C	13.9	11.7	15.1	16	11.7	10.9	13.5	16.5	16	9.2	16.3	10.5	15.2	8.2	13.7	9.3	--
Turbidity	NTU	--	4.8	4.3	2.22	2.69	3.53	3.28	1.31	3	4.17	29.56	17.05	4.25	8.2	54.78	0.99	--
pH at 25 Degrees C	Std. Units	6.3	6.5	6.4	7.1	6.6	6.8	7.7	6.6	6.6	6.8	6.6	6.6	6.9	6.6	6.4	6.6	--

Single Location

Name: WPL - Nelson Dewey

Location ID: B-11A
Number of Sampling Dates: 17

Parameter Name	Units	12/9/2015	4/13/2016	7/19/2016	10/19/2016	1/12/2017	4/17/2017	6/8/2017	8/1/2017	10/19/2017	4/2/2018	10/9/2018	4/22/2019	10/14/2019	4/13/2020	10/12/2020	4/19/2021	10/7/2021
Boron	ug/L	124	116	104	112	106	100	102	105	116	91	94.2	93.9	80.7	86.3	99.3	88.1	85.4
Calcium	ug/L	58800	60100	54000	54600	54500	54800	57800	54500	55000	53300	48600	60400	56600	57500	55600	50600	51400
Chloride	mg/L	40.4	43	46.6	46.5	46.6	45.4	46.9	46.7	49.9	54.7	57.8	83.6	96.6	93.7	65.3	59.1	58.8
Fluoride	mg/L	0.3	0.38	0.35	0.36	0.43	0.36	0.37	0.37	0.32	0.24	0.29	0.29	0.26	0.27	0.28	0.23	0.22
Field pH	Std. Units	7.7	7.75	7.42	7.47	7.89	7.38	7.78	7.67	7.96	8.04	7.43	7.62	7.66	7.75	7.74	7.65	7.57
Sulfate	mg/L	3.2	3.8	2.7	3	2.3	<1	1.4	2.4	5.1	12.3	6	1.9	<1	1.4	1	2.9	7
Total Dissolved Solids	mg/L	338	362	336	340	322	326	338	326	322	336	332	386	348	394	364	366	356
Antimony	ug/L	0.42	0.14	0.17	0.44	0.22	0.51	<0.15	0.27	--	<0.15	--	--	--	--	--	--	--
Arsenic	ug/L	0.27	0.19	0.18	0.51	0.19	0.4	<0.28	<0.28	--	<0.28	--	--	--	--	--	--	--
Barium	ug/L	202	206	171	181	187	192	194	184	--	170	--	--	--	--	--	--	--
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	--	--	--	--	--	--	--
Cadmium	ug/L	<0.089	<0.089	<0.089	0.26	<0.089	0.24	<0.081	<0.081	--	<0.081	--	--	--	--	--	--	--
Chromium	ug/L	<0.39	<0.39	<0.39	<0.39	0.46	0.52	<1	<1	--	<1	--	--	--	--	--	--	--
Cobalt	ug/L	1.3	1.4	0.97	1.3	1.2	1.4	1.1	1.3	--	1.1	--	--	--	--	--	--	--
Lead	ug/L	0.083	<0.04	<0.04	0.34	<0.04	0.33	<0.2	<0.2	--	<0.2	--	--	--	--	--	--	--
Lithium	ug/L	5.9	6.1	5.8	5.9	5.9	5.9	6.1	4.9	--	5.1	--	--	--	--	--	--	--
Mercury	ug/L	<0.1	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	--	--	--	--	--	--
Molybdenum	ug/L	22.7	24.1	22.5	21.8	21.8	22.4	22.2	20	--	18.2	--	--	--	--	--	--	--
Selenium	ug/L	<0.21	<0.21	<0.21	0.27	<0.21	0.36	<0.32	<0.32	--	<0.32	--	--	--	--	--	--	--
Thallium	ug/L	0.14	<0.14	<0.14	0.5	<0.14	0.46	<0.14	0.15	--	<0.14	--	--	--	--	--	--	--
Total Radium	pCi/L	1.08	1.48	0.937	0.95	0.845	1.4	1.88	0.917	--	0.848	--	--	--	--	--	--	--
Radium-226	pCi/L	0.579	0.148	0.179	0.172	0	0.948	0.454	0.0728	--	0.405	--	--	--	--	--	--	--
Radium-228	pCi/L	0.503	1.33	0.758	0.778	0.845	0.447	1.43	0.844	--	0.443	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	660	658	598.1	631	1049	583.3	407.9	588.8	519.1	481.9	654	721	708	720	674	638	621
Oxygen, Dissolved	mg/L	0.49	0.03	0.08	0.37	0.19	0.11	0.23	0.1	0.51	0.12	0.08	0.07	0.14	0.19	0.09	0.21	1.27
Field Oxidation Potential	mV	9.8	-31.2	84.2	-76.8	-88.3	-103.6	31.4	-44.1	112.1	-42.1	-47.9	218.3	-59	-31	55.1	135.4	--
Groundwater Elevation	feet	606.3	608.71	606.76	608.21	604.36	609.05	609.81	605.57	609.58	606.63	610.28	615.29	613.29	613.88	604.54	608.72	603.79
Temperature	deg C	14.8	14.8	14.8	14.9	14.2	14.4	14.3	14.7	14.9	13.9	15	13.8	14.3	13.4	14.2	13.4	13.9
Turbidity	NTU	--	0.23	0.01	0.15	0.21	0.51	0.39	0.12	0.78	0.5	3.15	0	2.58	0	0	0	0
pH at 25 Degrees C	Std. Units	7.4	7.5	7.5	7.9	7.7	7.7	7.7	7.7	7.6	7.8	7.7	7.7	7.8	7.6	7.7	7.7	8
REDOX	mV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	61.4

Single Location

Name: WPL - Nelson Dewey

Location ID: B-11B

Number of Sampling Dates: 18

Parameter Name	Units	12/9/2015	4/13/2016	7/19/2016	10/20/2016	1/12/2017	4/17/2017	6/8/2017	8/1/2017	10/19/2017	4/2/2018	10/9/2018	11/12/2018	4/22/2019	10/14/2019	4/13/2020	10/12/2020	4/19/2021	10/7/2021
Boron	ug/L	1140	1360	1210	1460	1540	1760	1880	1800	1500	2020	3620	--	6830	4630	5380	3350	4440	2480
Calcium	ug/L	64100	65400	59000	59100	63900	67400	68200	61400	52400	59000	66300	--	83300	91400	115000	91200	93400	100000
Chloride	mg/L	31.2	32.7	33.6	34.3	36.1	36.3	33.9	35.9	36.1	31.3	21.9	--	28.4	32.3	30.9	33.4	28.3	39.6
Fluoride	mg/L	0.44	0.49	0.45	0.53	0.52	0.58	0.59	0.6	0.59	0.65	0.61	--	0.64	0.62	<0.95	<0.095	0.36	<0.95
Field pH	Std. Units	8.06	8.14	7.77	7.91	8.18	7.83	8.07	7.77	7.77	8.42	7.74	8.05	7.91	7.92	7.89	7.8	8.07	7.81
Sulfate	mg/L	134	148	165	178	182	181	191	179	175	200	197	--	303	339	378	388	379	466
Total Dissolved Solids	mg/L	494	512	520	496	488	502	516	498	510	550	602	594	742	728	872	906	910	884
Antimony	ug/L	0.32	<0.073	0.097	0.21	0.12	0.098	<0.15	<0.15	--	<0.15	--	--	--	--	--	--	--	--
Arsenic	ug/L	0.67	0.38	0.36	0.52	0.4	0.47	<0.28	<0.28	--	0.29	--	--	--	--	--	--	--	--
Barium	ug/L	147	153	128	130	145	151	151	132	--	128	--	--	--	--	--	--	--	--
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.25	<0.13	<0.13	<0.18	<0.18	--	<0.18	--	--	--	--	--	--	--	--
Cadmium	ug/L	0.23	<0.089	<0.089	0.18	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	--	--	--	--	--	--	--
Chromium	ug/L	0.7	0.74	<0.39	<0.39	<0.39	0.45	<1	<1	--	<1	--	--	--	--	--	--	--	--
Cobalt	ug/L	0.44	0.23	0.21	0.38	0.3	0.29	0.26	0.2	--	0.17	--	--	--	--	--	--	--	--
Lead	ug/L	0.45	<0.04	<0.04	0.36	0.083	0.061	<0.2	<0.2	--	<0.2	--	--	--	--	--	--	--	--
Lithium	ug/L	21.7	21.3	18.4	19.8	20	19.5	19.4	17	--	15.4	--	--	--	--	--	--	--	--
Mercury	ug/L	<0.1	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	--	--	--	--	--	--	--
Molybdenum	ug/L	46.2	51.7	48.7	48.1	52.6	53.8	55.1	55.9	--	77.7	--	--	--	--	--	--	--	--
Selenium	ug/L	0.46	<0.21	<0.21	0.28	<0.21	<0.21	<0.32	<0.32	--	<0.32	--	--	--	--	--	--	--	--
Thallium	ug/L	0.35	<0.14	<0.14	0.32	<0.14	<0.14	0.16	<0.14	--	0.16	--	--	--	--	--	--	--	--
Total Radium	pCi/L	0.862	1.69	0.977	0.534	0.787	0.643	1.05	2.21	--	1.02	--	--	--	--	--	--	--	--
Radium-226	pCi/L	0.733	0.0581	0.284	-0.487	-0.434	0.193	0.389	0.766	--	0.518	--	--	--	--	--	--	--	--
Radium-228	pCi/L	0.129	1.63	0.693	0.534	0.787	0.45	0.661	1.44	--	0.505	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	631	808	785	807	1342	799	534.3	776	709	671	954	863	1129	1132	1280	1348	1286	1337
Oxygen, Dissolved	mg/L	0.84	0.04	0.08	0.3	0.16	0.09	0.28	0.13	0.22	0.59	0.13	0.16	0.09	0.19	0.24	0.22	0.13	1.29
Field Oxidation Potential	mV	-50.9	-66.9	-69	-114.5	-135.7	-121.3	36.2	-81.1	93.7	116.3	13.2	45.8	207.8	-48.9	-57.9	225	44.7	--
Groundwater Elevation	feet	606.26	608.68	606.74	608.19	604.32	608.99	610.08	605.5	609.65	606.55	610.24	609.14	615.28	613.18	613.86	604.44	608.67	603.74
Temperature	deg C	14.4	14.3	14.6	14.6	14.1	14.2	14.1	14.5	14.8	13.5	14.8	14.1	13.6	14.3	13.5	14.3	13.4	14
Turbidity	NTU	--	0.21	0.01	0.33	0.38	0.36	0.7	0.07	1.01	0.78	2.98	2.65	0	1.5	0	0	0	0
pH at 25 Degrees C	Std. Units	7.7	7.8	7.8	8	7.9	7.9	8.1	7.9	7.7	8.1	7.9	--	7.9	7.8	7.8	7.9	8	8
REDOX	mV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	46.9

Single Location

Name: WPL - Nelson Dewey

Location ID: B-11R
Number of Sampling Dates: 17

Parameter Name	Units	12/9/2015	4/13/2016	7/19/2016	10/20/2016	1/12/2017	4/17/2017	6/7/2017	8/1/2017	10/19/2017	4/2/2018	10/9/2018	4/22/2019	10/14/2019	4/13/2020	10/12/2020	4/19/2021	10/7/2021
Boron	ug/L	4170	3410	3530	4120	3530	3520	3420	2040	3120	3180	576	1360	1440	2140	2870	3010	2940
Calcium	ug/L	126000	141000	130000	128000	126000	123000	128000	139000	117000	124000	49900	82400	66000	117000	120000	115000	119000
Chloride	mg/L	39.2	7	38.9	39.1	42.3	40.2	42	24.7	38.8	36.8	5.9	12.6	13.1	22.5	20.7	27.2	23.1
Fluoride	mg/L	<1	<0.2	0.22	<0.5	<0.5	<0.5	<0.5	0.25	<0.5	<0.5	0.15	0.2	0.26	<0.48	<0.48	<0.48	<0.48
Field pH	Std. Units	7.07	6.78	6.69	6.77	6.98	7.11	6.8	6.7	7.22	7.14	6.55	6.82	6.83	6.8	6.83	7.11	6.86
Sulfate	mg/L	75.4	18.4	115	118	108	108	98.2	126	97.7	88.1	15.1	34.6	40.7	41.9	22.8	61.2	61.8
Total Dissolved Solids	mg/L	616	682	698	660	616	620	630	738	586	638	266	406	310	570	600	578	576
Antimony	ug/L	<0.073	<0.073	<0.073	0.22	<0.073	<0.073	<0.15	0.42	--	<0.15	--	--	--	--	--	--	--
Arsenic	ug/L	14.8	7	10.6	7.4	7.1	6.9	6.1	7.5	--	9.3	--	--	--	--	--	--	--
Barium	ug/L	204	169	187	159	144	149	152	168	--	144	--	--	--	--	--	--	--
Beryllium	ug/L	<0.13	<0.13	<0.13	0.36	<0.13	<0.13	<0.18	<0.18	--	<0.18	--	--	--	--	--	--	--
Cadmium	ug/L	<0.089	<0.089	<0.089	0.15	<0.089	<0.089	<0.081	0.32	--	<0.081	--	--	--	--	--	--	--
Chromium	ug/L	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<1	<1	--	<1	--	--	--	--	--	--	--
Cobalt	ug/L	0.36	0.54	0.68	1	1.2	1.3	1.5	1.4	--	0.94	--	--	--	--	--	--	--
Lead	ug/L	0.21	<0.04	0.13	0.19	<0.04	0.12	<0.2	0.39	--	<0.2	--	--	--	--	--	--	--
Lithium	ug/L	2.3	1.5	1.6	2	1.4	1.4	1.3	2	--	1.6	--	--	--	--	--	--	--
Mercury	ug/L	<0.1	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	--	--	--	--	--	--
Molybdenum	ug/L	15.1	23.2	34.9	43.8	42.8	57.2	53.8	22.7	--	35.6	--	--	--	--	--	--	--
Selenium	ug/L	1.2	5	<0.21	0.3	<0.21	<0.21	<0.32	0.78	--	<0.32	--	--	--	--	--	--	--
Thallium	ug/L	<0.14	<0.14	<0.14	0.5	<0.14	<0.14	<0.14	0.47	--	<0.14	--	--	--	--	--	--	--
Total Radium	pCi/L	1.45	1.62	0.953	1.51	0.345	1.45	2.1	1.43	--	0.749	--	--	--	--	--	--	--
Radium-226	pCi/L	0.797	0.863	0.19	0.516	0	0.719	0.272	0.602	--	0.254	--	--	--	--	--	--	--
Radium-228	pCi/L	0.653	0.757	0.763	0.997	0.345	0.732	1.83	0.826	--	0.495	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	931	1172	1160	1139	1876	1020	721	1192	870	839	463.2	737	612	993	1125	1003	1029
Oxygen, Dissolved	mg/L	2.47	0.03	0.08	0.34	0.14	0.11	0.21	0.1	0.19	0.09	0.34	0.37	0.1	0.22	0.14	0.1	1.57
Field Oxidation Potential	mV	-114.2	-91	-94.7	-113.2	-72.9	-53.3	-26.8	-41.3	133.4	-128.6	-49.5	-20.9	-4.7	-75.8	-139.8	-64.5	--
Groundwater Elevation	feet	606.71	609.32	606.14	608.35	604.57	608.34	610.42	606.73	609.42	606.27	610.67	615.28	613.06	614.39	604.57	608.57	603.85
Temperature	deg C	14.5	10.9	14	15.5	12.7	11.7	11.9	14.4	15.1	11.1	16.2	10	14.5	10.1	14.3	10.6	14.6
Turbidity	NTU	--	3.18	2.11	1.66	2.51	3.85	1.72	1.04	2.5	3.58	10.05	8.88	7.5	8.97	6.58	8.4	10.81
pH at 25 Degrees C	Std. Units	6.9	6.8	6.8	7.3	6.9	7.2	7.1	6.9	6.8	7	6.9	6.9	7	6.8	7	7	7.3
REDOX	mV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-42.6

Single Location

Name: WPL - Nelson Dewey

Location ID: B-26
Number of Sampling Dates: 17

Parameter Name	Units	12/9/2015	4/12/2016	7/19/2016	10/20/2016	1/12/2017	4/17/2017	6/7/2017	8/2/2017	10/19/2017	4/3/2018	10/8/2018	4/23/2019	10/15/2019	4/14/2020	10/13/2020	4/21/2021	10/8/2021
Boron	ug/L	29.6	33.7	28.6	33	35.2	50.1	45.8	54.6	47.4	48	53.4	41.6	<3	66.1	63.6	63.6	48.4
Calcium	ug/L	81300	86200	82400	82700	89400	89000	105000	98100	102000	88100	78700	75300	<76.2	88500	76500	78700	84900
Chloride	mg/L	45.5	51.3	55.6	52.8	54.5	56	59.6	52.6	79.3	54.4	33.2	40.8	30.5	54.9	35.3	42.6	39.1
Fluoride	mg/L	<0.2	<0.2	<0.2	0.13	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.095	<0.095	<0.095
Field pH	Std. Units	7.35	7.43	7.14	7.19	7.57	7.54	7.22	7.21	7.5	7.64	7.2	7.1	7.24	7.27	7.34	7.27	7.18
Sulfate	mg/L	37.1	38	36.2	35	35	32.4	31	28.5	25.3	19.1	25.1	26.7	36	30.2	37	35.3	43.8
Total Dissolved Solids	mg/L	424	456	504	466	446	468	538	496	542	464	450	458	404	464	448	470	440
Antimony	ug/L	0.075	<0.073	0.16	0.2	0.24	0.087	<0.15	<0.15	--	<0.15	--	--	--	--	--	--	--
Arsenic	ug/L	0.49	0.54	0.49	0.59	0.6	0.5	0.39	0.5	--	0.36	--	--	--	--	--	--	--
Barium	ug/L	73.7	81.8	77.8	81.2	89.2	91	107	100	--	91.5	--	--	--	--	--	--	--
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	0.13	<0.13	<0.18	<0.18	--	<0.18	--	--	--	--	--	--	--
Cadmium	ug/L	<0.089	<0.089	<0.089	0.13	0.15	<0.089	<0.081	<0.081	--	0.085	--	--	--	--	--	--	--
Chromium	ug/L	0.94	4.1	1.1	0.83	1	1.1	<1	<1	--	<1	--	--	--	--	--	--	--
Cobalt	ug/L	0.17	0.13	0.086	0.21	0.25	0.13	<0.085	0.13	--	<0.085	--	--	--	--	--	--	--
Lead	ug/L	0.057	<0.04	<0.04	0.15	0.2	0.079	<0.2	<0.2	--	0.3	--	--	--	--	--	--	--
Lithium	ug/L	2.1	2.1	1.9	2.2	2.5	2.1	2.2	2	--	2.1	--	--	--	--	--	--	--
Mercury	ug/L	<0.1	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	--	--	--	--	--	--
Molybdenum	ug/L	0.19	0.5	0.15	0.39	0.34	0.2	<0.44	<0.44	--	<0.44	--	--	--	--	--	--	--
Selenium	ug/L	0.69	0.67	0.98	1.1	0.99	1.5	1.5	1.4	--	1.4	--	--	--	--	--	--	--
Thallium	ug/L	<0.14	<0.14	<0.14	0.27	0.16	<0.14	<0.14	<0.14	--	<0.14	--	--	--	--	--	--	--
Total Radium	pCi/L	1.22	0.773	0.416	0.713	0.672	0.867	0.646	0.681	--	0.449	--	--	--	--	--	--	--
Radium-226	pCi/L	0.404	-0.058	-0.089	0.353	0	0.398	0.124	0.224	--	0.261	--	--	--	--	--	--	--
Radium-228	pCi/L	0.82	0.773	0.416	0.36	0.672	0.469	0.522	0.457	--	0.188	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	567	783	788	823	1394	800	575.9	836	786	655.2	661.9	815	753	852	782	778	788
Oxygen, Dissolved	mg/L	5.88	5.3	4.41	6.25	5.58	7.79	2.92	6.8	8.49	2.68	5.98	8.73	12.17	8.43	7.2	8.74	9.4
Field Oxidation Potential	mV	14.3	130.2	63.2	68.9	59.1	148.4	53.4	155.9	215.6	69.7	109.2	259.9	175.8	160.4	242.6	105.8	--
Groundwater Elevation	feet	606.8	609.81	606.09	608.84	604.52	608.59	611.25	607.39	608.84	606.49	610.34	615.49	613.1	613.76	604.92	608.55	604.21
Temperature	deg C	11.1	10.9	10.7	11.3	11.5	11.1	10.9	11.3	11.7	11.3	12	11.4	11.6	11.3	11.9	11	11.4
Turbidity	NTU	--	0.27	0.27	0.37	0.14	0.56	0.44	0.15	0.89	0.99	3.44	0	1.5	0	0	0	0
pH at 25 Degrees C	Std. Units	7.2	7.4	7.2	7.7	7.6	7.5	7.5	7.3	7.4	7.3	7.3	7.4	7.4	7.2	7.4	7.4	7.7
REDOX	mV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	122.1

Single Location

Name: WPL - Nelson Dewey

Location ID: B-31A
Number of Sampling Dates: 17

Parameter Name	Units	12/9/2015	4/13/2016	7/19/2016	10/20/2016	1/12/2017	4/17/2017	6/8/2017	8/1/2017	10/19/2017	4/2/2018	10/9/2018	4/22/2019	10/14/2019	4/13/2020	10/12/2020	4/19/2021	10/7/2021
Boron	ug/L	59	79.2	67.2	63.7	76.4	69.9	58.5	56.3	63.9	74.8	71.8	86.2	98.5	132	127	172	178
Calcium	ug/L	48400	51900	48900	45800	46600	46900	49400	46000	49600	49300	46600	48200	52200	50900	47700	52100	53500
Chloride	mg/L	35.3	35.8	36.4	39	39.9	40.3	40.9	40.8	40.8	42.7	40.2	40.8	47.1	51	57.9	64.8	60.3
Fluoride	mg/L	<0.2	0.22	<0.2	0.18	0.22	0.19	0.18	0.2	0.16	0.13	0.17	0.22	0.22	0.19	0.18	0.14	0.15
Field pH	Std. Units	7.65	7.63	7.25	7.54	7.82	7.83	7.74	7.56	7.92	8	7.48	7.61	7.69	7.71	7.78	7.9	7.44
Sulfate	mg/L	26.2	22.6	24.2	27.2	29.8	31	31.2	26.6	26.1	27.4	24.8	21.6	22.3	16.6	16.8	15.8	14.9
Total Dissolved Solids	mg/L	274	302	280	292	284	318	296	284	290	282	278	284	272	298	300	330	294
Antimony	ug/L	<0.073	<0.073	0.14	0.084	<0.073	<0.073	<0.15	<0.15	--	<0.15	--	--	--	--	--	--	--
Arsenic	ug/L	1.6	1.6	1.4	1.5	1.5	1.3	1.3	1.2	--	1.3	--	--	--	--	--	--	--
Barium	ug/L	132	147	130	128	146	146	150	133	--	139	--	--	--	--	--	--	--
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	--	--	--	--	--	--	--
Cadmium	ug/L	<0.089	<0.089	<0.089	<0.089	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	--	--	--	--	--	--
Chromium	ug/L	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	9.4	<1	--	<1	--	--	--	--	--	--	--
Cobalt	ug/L	2.2	2.3	1.8	1.8	2	1.9	2.2	1.8	--	1.8	--	--	--	--	--	--	--
Lead	ug/L	0.08	<0.04	<0.04	0.05	<0.04	0.36	<0.2	<0.2	--	<0.2	--	--	--	--	--	--	--
Lithium	ug/L	0.83	0.91	0.77	0.97	0.98	0.97	0.94	0.93	--	0.86	--	--	--	--	--	--	--
Mercury	ug/L	<0.1	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	--	--	--	--	--	--
Molybdenum	ug/L	25.3	29.8	23.4	22.6	23.9	23.8	22.9	22.9	--	24.8	--	--	--	--	--	--	--
Selenium	ug/L	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.32	<0.32	--	<0.32	--	--	--	--	--	--	--
Thallium	ug/L	<0.14	<0.14	<0.14	0.2	<0.14	<0.14	<0.14	<0.14	--	<0.14	--	--	--	--	--	--	--
Total Radium	pCi/L	1.47	0.387	0.492	0.331	0.407	1.18	1.34	1.15	--	0.289	--	--	--	--	--	--	--
Radium-226	pCi/L	0.484	-0.152	-0.097	0	0	0.482	0.594	0.163	--	0.132	--	--	--	--	--	--	--
Radium-228	pCi/L	0.985	0.387	0.492	0.331	0.407	0.696	0.746	0.982	--	0.157	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	405	505.8	487.2	509.7	858	486	334.2	479.5	433.5	398.9	503.8	517	514	556	557.3	563	553
Oxygen, Dissolved	mg/L	0.88	0.04	0.18	0.34	0.13	0.14	0.25	0.12	0.23	0.14	0.1	0.13	0.12	0.24	0.19	0.18	1.35
Field Oxidation Potential	mV	-84.7	-106.2	-71.1	-113	-98.4	-55.2	-19.8	-77.3	97.1	-111.6	-75.8	-4.5	-60.5	-68.2	-55.9	79.6	--
Groundwater Elevation	feet	606.39	609.01	606.73	608.2	607.84	608.98	609.63	605.69	609.43	606.46	610.27	615.33	613.2	613.79	604.54	608.63	603.84
Temperature	deg C	15.1	15.4	15.3	15	14.6	14.8	14.7	14.9	14.9	14.4	15	13.9	14.2	13.6	13.9	13.5	13.5
Turbidity	NTU	--	0.36	0.63	0.38	0.21	0.37	0.66	0.17	1.25	0.42	2.83	0	2.66	0.75	1.11	0	0
pH at 25 Degrees C	Std. Units	7.4	7.3	7.6	7.8	7.3	7.7	7.8	7.6	7.5	7.7	7.7	7.6	7.7	7.7	7.7	7.8	7.9
REDOX	mV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23.5

Single Location

Name: WPL - Nelson Dewey

Location ID: B-31R

Number of Sampling Dates: 18

Parameter Name	Units	12/9/2015	4/13/2016	7/19/2016	10/20/2016	1/12/2017	4/17/2017	6/8/2017	8/1/2017	10/19/2017	4/2/2018	10/9/2018	11/12/2018	4/22/2019	10/14/2019	4/13/2020	10/12/2020	4/19/2021	10/7/2021
Boron	ug/L	851	838	641	1020	749	929	895	1550	645	540	1430	--	906	915	730	702	621	353
Calcium	ug/L	77400	84900	76100	84200	73900	85600	90700	93400	75700	72900	125000	--	105000	110000	93800	95700	91400	79000
Chloride	mg/L	29.9	17.6	30.3	16.4	26	20.4	20.7	3.6	29	32.6	19.7	--	17.8	26	29.9	24.4	23.3	36.5
Fluoride	mg/L	<0.2	<0.2	<0.2	0.17	0.26	0.12	0.13	0.16	0.14	<0.1	<0.1	--	0.16	0.25	0.28	<0.48	0.19	0.22
Field pH	Std. Units	6.79	6.76	6.44	6.53	6.8	6.8	6.67	6.56	7.19	6.76	6.41	6.59	6.62	6.72	6.79	6.89	6.91	6.63
Sulfate	mg/L	28.8	34.1	38.5	49.7	34.9	43	41.1	55.6	19.2	22	186	162	121	146	89.4	49.4	45.3	24.9
Total Dissolved Solids	mg/L	374	404	406	452	380	416	426	432	358	374	668	596	516	480	464	462	454	372
Antimony	ug/L	0.47	0.15	0.21	0.24	0.18	0.22	<0.15	0.18	--	0.15	--	--	--	--	--	--	--	--
Arsenic	ug/L	0.47	0.24	0.37	0.37	0.22	0.29	<0.28	<0.28	--	<0.28	--	--	--	--	--	--	--	--
Barium	ug/L	86.2	93.5	85.3	92.6	86.7	91.1	93.9	97.4	--	72.1	--	--	--	--	--	--	--	--
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.25	<0.13	<0.13	<0.18	<0.18	--	<0.18	--	--	--	--	--	--	--	--
Cadmium	ug/L	2.5	2.5	2	3	2.2	3	2.9	3.1	--	2	--	--	--	--	--	--	--	--
Chromium	ug/L	0.43	0.4	<0.39	<0.39	0.41	<0.39	<1	<1	--	<1	--	--	--	--	--	--	--	--
Cobalt	ug/L	3	3.5	5.4	5.2	6.6	3.1	2.3	4.4	--	3.3	--	--	--	--	--	--	--	--
Lead	ug/L	1.8	0.53	0.14	0.37	0.047	0.57	<0.2	<0.2	--	<0.2	--	--	--	--	--	--	--	--
Lithium	ug/L	18.6	18	18.1	22.3	21.4	21.7	21.4	22	--	16.2	--	--	--	--	--	--	--	--
Mercury	ug/L	<0.1	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	--	--	--	--	--	--	--
Molybdenum	ug/L	31.4	27.2	23.9	24.4	27.1	26.8	25.4	21.6	--	31.9	--	--	--	--	--	--	--	--
Selenium	ug/L	0.69	0.48	<0.21	0.29	0.63	0.96	<0.32	1.4	--	0.93	--	--	--	--	--	--	--	--
Thallium	ug/L	2.2	1.9	2	2.3	2.1	2.2	2.2	2	--	1.8	--	--	--	--	--	--	--	--
Total Radium	pCi/L	1.34	1.22	1.16	1.3	1.23	0.613	1.36	1.31	--	0.676	--	--	--	--	--	--	--	--
Radium-226	pCi/L	0.575	0.661	0.513	0.583	0.92	0.38	0.534	0.612	--	0.132	--	--	--	--	--	--	--	--
Radium-228	pCi/L	0.769	0.559	0.649	0.717	0.31	0.233	0.827	0.698	--	0.544	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	543	674	660	742	1100	637	465.4	697	519.6	476.8	1016	858	827	837	763	826	747	649
Oxygen, Dissolved	mg/L	2.36	0.07	0.09	0.33	0.21	0.16	0.21	0.27	0.21	0.45	0.12	0.19	0.1	0.1	0.14	0.22	0.12	1.81
Field Oxidation Potential	mV	77.6	36.2	-11	5.8	12.3	676	64.7	2.9	153	28	-0.5	1	94.2	20.7	7.3	-60.7	16.3	--
Groundwater Elevation	feet	607.4	609.34	606.55	608.51	608.37	607.2	610.5	606.84	609.47	604.44	610.39	609.11	615.01	612.5	613.8	604.66	608.66	603.98
Temperature	deg C	15.8	15	15.1	15.2	14.5	13.8	13.6	14.8	15	13.8	15.9	15	11.8	14.2	12	14	12.1	13.8
Turbidity	NTU	--	1.01	1.5	0.7	0.72	0.62	0.92	1.18	1.53	1.29	3.94	3.83	0	2.81	0.01	0	11.39	0
pH at 25 Degrees C	Std. Units	6.7	6.8	6.6	7.1	6.8	6.8	6.8	6.8	6.8	6.8	6.8	--	6.8	7	6.8	7.1	6.9	7.3
REDOX	mV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.7

Appendix E

Statistical Evaluation

January 14, 2021
File No. 25220071.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results – Prediction Limit Update Nelson Dewey Generating Station

PREPARED BY: Nicole Kron

CHECKED BY: Sherren Clark

STATISTICAL METHOD

Groundwater monitoring data for the Nelson Dewey Generating Station (NED) Slag Pond, is evaluated in accordance with 40 CFR 257.93(f)(3), using a prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit.

Statistical evaluation is performed using commercially available software (*Sanitas for Groundwater*© or similar) in general accordance with the USEPA's *Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* dated March 2009 (Unified Guidance) (USEPA, 2009) and generally accepted procedures.

The NED monitoring data includes one background monitoring well, B-26, as well six compliance monitoring wells, B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R. The statistical analysis includes Interwell evaluation for the Appendix III parameters.

The initial UPLs were calculated based on nine rounds of background monitoring performed up to the initiation of compliance monitoring for the existing CCR unit at NED, from December 2015 through October 2017. Since then, additional rounds of monitoring for Appendix III parameters have been performed at the background well. As part of the evaluation of the October 2020 monitoring results, the background data set for the UPL calculations is being updated to include data from the background well collected through October 2020. This memo addresses updated UPLs for Appendix III parameters.

TIME SERIES PLOTS

Time series plots are prepared for the required monitoring parameters to show the concentration variations over time. Time series graphs are included in **Attachment 1**.

OUTLIER ANALYSIS - INTERWELL

For interwell analysis, an outlier evaluation is performed for background monitoring results at the upgradient well. A statistical outlier is a value that is extremely different from the other values in the

data set. The Sanitas outlier tests identify data points that do not appear to fit the distribution of the rest of the data set and determine if they differ significantly from the rest of the data. The outlier analysis performed in Sanitas includes the following steps:

1) Run normality test (Shapiro Wilk/Francia).

2) If normally distributed, run USEPA's 1989 Outlier Test to identify suspected outliers.
   a) If number of background samples is less than or equal to 25, run Dixon's test for suspected outliers.
   b) If number of background samples is more than 25, run Rosner's test for suspected outliers.

3) If not normally distributed, run Tukey's test for outliers.

4) Review data flagged as possible outliers to evaluate whether they should be removed from the background data set. Also review time series plots for possible outliers that were not picked up in the statistical evaluation (e.g., outlier test may not identify outliers when two values are similar to each other, but very different from all other data).

Results identified as statistical outliers are checked for possible lab instrument failure, field collection problems, or data entry errors; however, outliers may exist naturally in the data if there is an extremely wide inherent or temporal variability in the data. The Unified Guidance states that unless a likely error can be identified, the outlier should not be removed.

For the interwell evaluation of the October 2020 sampling event, the following background values were identified as potential outliers and handled as described:

- Boron. One low result from the October 2019 event was flagged as statistical outlier. The low result was removed as an outlier because it was below detection, which appears very unlikely to be a valid result based on other detections. Review of the October 2019 data indicates that this was likely due to a sampling or laboratory error that resulted in the field blank sample and B-26 sample for metals being switched.

- Calcium. One low result from the October 2019 event was flagged as statistical outlier. The low result was removed as an outlier because it was below detection, which appears very unlikely to be a valid result based on other detections, and was likely due to the same sampling or laboratory analysis error noted for the boron result above.

Outlier analyses are included in Attachment 2.

BACKGROUND UPDATE

The background data pool was updated in accordance with the Unified Guidance, which recommends updating background every 2 to 3 years for semiannual sampling. Prior to expanding the data pool, the original background data set (12/2015 through 10/2017) and the data to be added (4/2018 through 10/2020) were compared. The Unified Guidance states that recently collected measurements from the background wells can be added to the existing pool if a Student's t-test or Wilcoxon rank-sum test finds no significant difference between the two groups at the 1% level of significance.

The Sanitas background group comparison for the NED background data sets, included in **Attachment 3**, indicated no signficant difference at the 1% level; therefore, the more recent data can be added to the background pool. The comparison uses Welch's t-test for normally distributed data and the Mann-Whitney test for non-normal data. (Note: The Sanitas output labels the earlier background dataset as "Background" and the later background dataset as "Compliance," but all data from background well B-26 is background data.)

INTERWELL PREDICTION LIMITS

Interwell prediction limits are calculated using background data from the upgradient monitoring well (B-26) for each monitored constituent, with outliers removed as noted above. During this evaluation of compliance monitoring groundwater results from December 2015 through October 2020 were included to calculate the interwell prediction limits. The prediction limit analysis performed in Sanitas includes the following steps:

1) If 100% of the background values are non-detect, the Double Quanitification rule applies and no prediction limit is calculated.

2) If more than 50% of results are non-detect, then a non-parametric prediction limit is calculated.

3) If 50% or fewer of the results are non-detect, run normality test (Shapiro Wilk/Francia) to assess whether the data fit a normal distribution or can be transformed to fit a normal distribution (e.g., lognormal).

4) If normal or transformed normal, calculate parametric prediction limit.

5) If not normal or transformed normal, calculate non-parametric prediction limit.

Consistent with the Unified Guidance, parametric prediction limits are calculated based on a 1-of-2 retesting protocol and a 10 percent site-wide false positive rate. Sanitas establishes the per-test significance level based on user inputs of the number of events per year, number of constituents being evaluated, and number of compliance wells. For the October 2020 event, the following values were used:

Parameter	Value	Comments
Evaluations per year	2	Spring and Fall events
Constituents analyzed	7	Appendix III parameters
Compliance wells	6	

Non-parametric prediction limits are also based on a 1-of-2 retesting protocol. The non-parametric limit is the highest value in the background dataset. Due to the small sample size, the false positive rate for the non-parametric tests is higher than for the parametric tests, but will go down as more background data are obtained.

For results with 100 percent non-detects in the background data, evaluation under the Double Quantification Rule means that a statistically significant increase (SSI) has not occurred for a compliance well unless two sample results from the well exceed the laboratory's reporting limit or

quanitification limit. For the current background dataset, none of the Appendix III parameters had 100 percent non-detects, so the Double Quantification rule was not applied.

For evaluation of parameters with less than 100 percent non-detects in the background sampling, the non-detects were adjusted using the Kaplan-Meier technique, unless the non-detects represent less than 15 percent of the total samples, in which case one-half of the detection limit was used. Interwell prediction limit analysis results are included in **Attachment 4**.

NDK/SCC

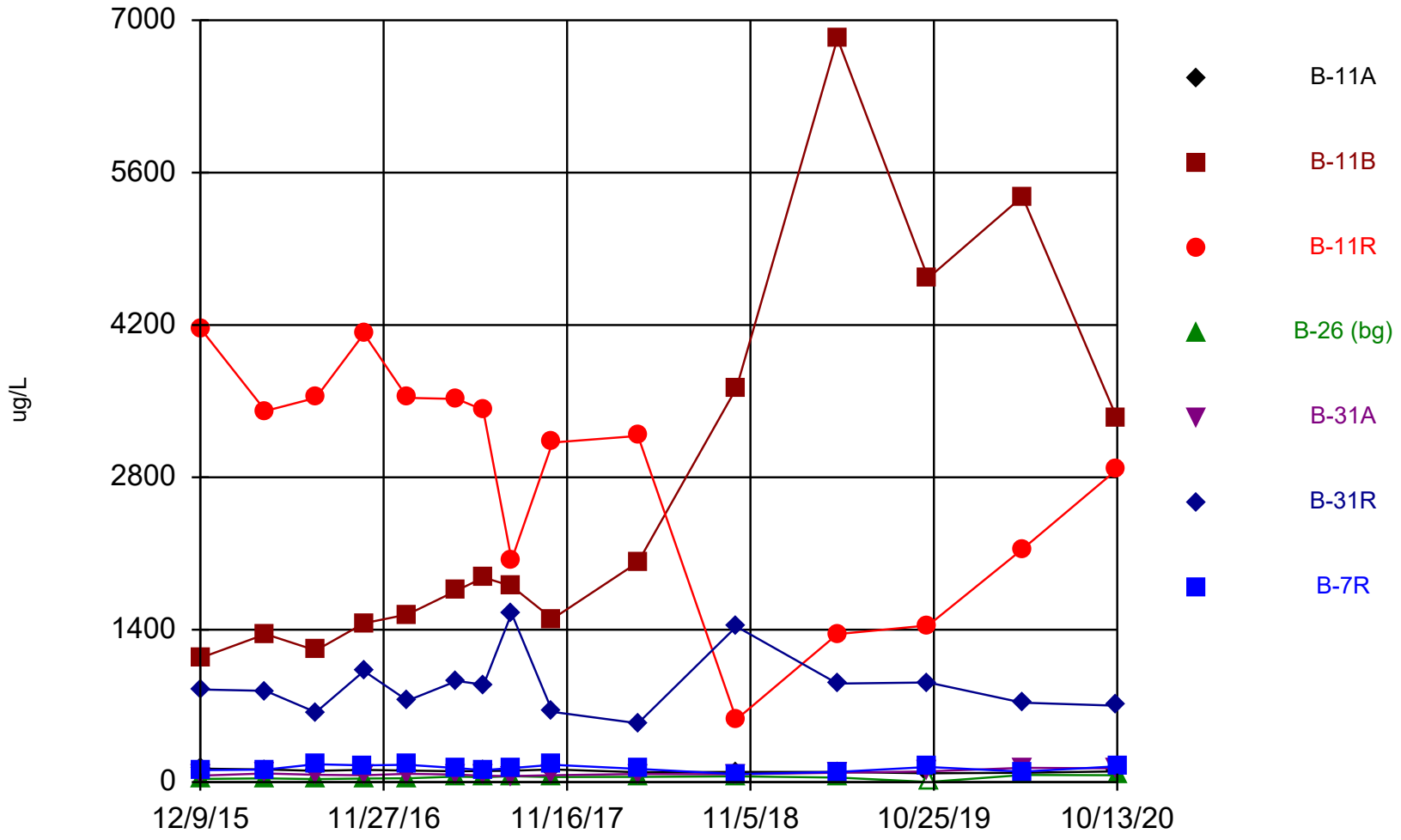
I:\25220071.00\Data and Calculations\Sanitas\NED CCR Stats Memo.docx

Attachment 1

Times Series Graphs

Hollow symbols indicate censored values.

Boron



Time Series Analysis Run 12/21/2020 6:05 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

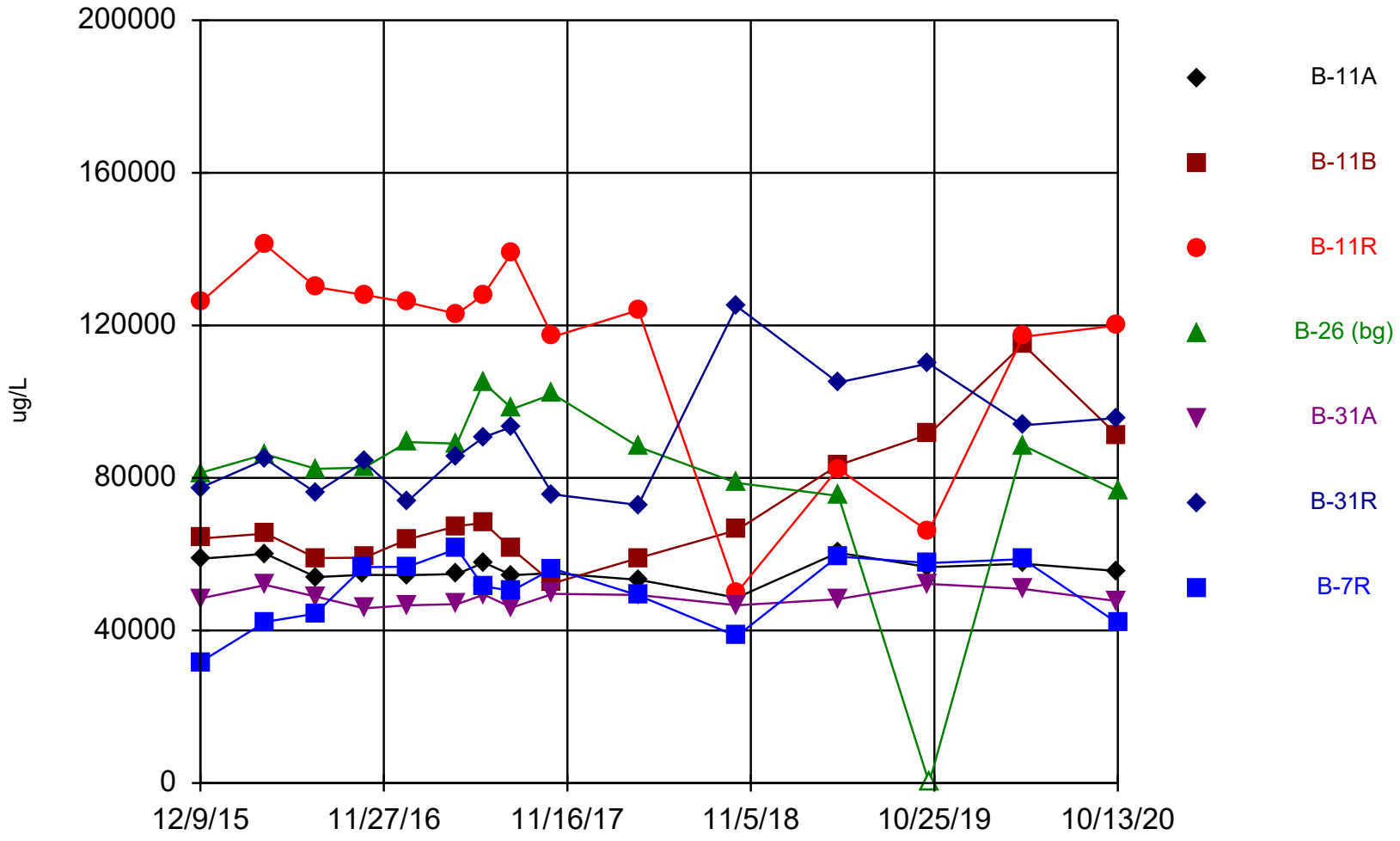
Constituent: Boron (ug/L) Analysis Run 12/21/2020 6:08 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	124	1140	4170	29.6	59	851	110
4/12/2016				33.7			
4/13/2016	116	1360	3410		79.2	838	115
7/18/2016							164
7/19/2016	104	1210	3530	28.6	67.2	641	
10/19/2016	112						154
10/20/2016		1460	4120	33	63.7	1020	
1/12/2017	106	1540	3530	35.2	76.4	749	159
4/17/2017	100	1760	3520	50.1	69.9	929	129
6/7/2017			3420	45.8			110
6/8/2017	102	1880			58.5	895	
8/1/2017	105	1800	2040		56.3	1550	129
8/2/2017				54.6			
10/19/2017	116	1500	3120	47.4	63.9	645	159
4/2/2018	91	2020	3180		74.8	540	121
4/3/2018				48			
10/8/2018				53.4			
10/9/2018	94.2	3620	576		71.8	1430	73
4/22/2019	93.9	6830	1360		86.2	906	93.5
4/23/2019				41.6			
10/14/2019	80.7	4630	1440		98.5	915	139
10/15/2019				<3 (U)			
4/13/2020	86.3	5380	2140		132	730	96
4/14/2020				66.1			
10/12/2020	99.3	3350	2870		127	702	
10/13/2020				63.6			145

Hollow symbols indicate censored values.

Calcium



Time Series Analysis Run 12/21/2020 6:05 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

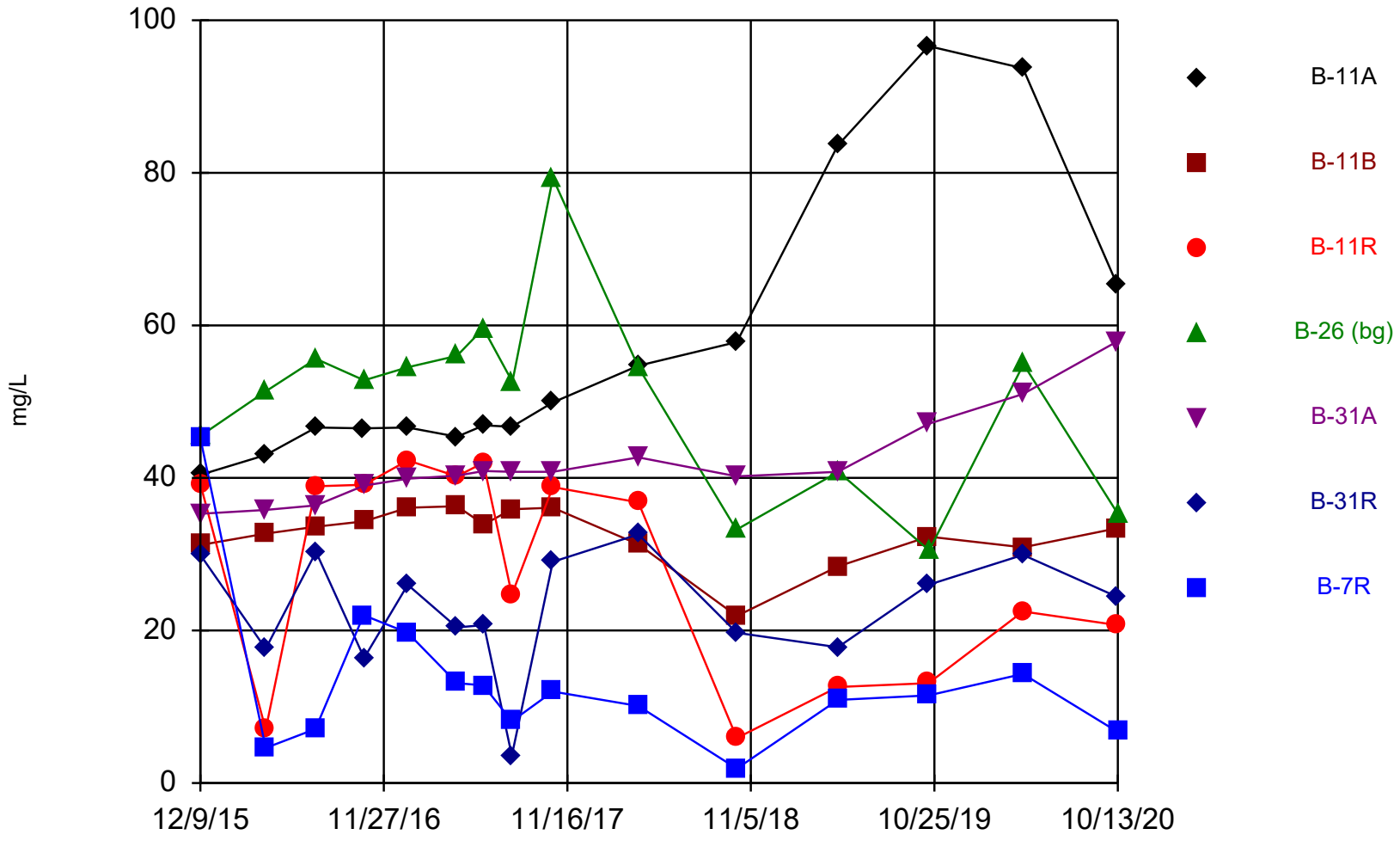
Time Series

Constituent: Calcium (ug/L) Analysis Run 12/21/2020 6:08 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	58800	64100	126000	81300	48400	77400	31700
4/12/2016				86200			
4/13/2016	60100	65400	141000		51900	84900	42300
7/18/2016							44400
7/19/2016	54000	59000	130000	82400	48900	76100	
10/19/2016	54600						56600
10/20/2016		59100	128000	82700	45800	84200	
1/12/2017	54500	63900	126000	89400	46600	73900	56700
4/17/2017	54800	67400	123000	89000	46900	85600	61400
6/7/2017			128000	105000			51600
6/8/2017	57800	68200			49400	90700	
8/1/2017	54500	61400	139000		46000	93400	50400
8/2/2017				98100			
10/19/2017	55000	52400	117000	102000	49600	75700	56200
4/2/2018	53300	59000	124000		49300	72900	49200
4/3/2018				88100			
10/8/2018				78700			
10/9/2018	48600	66300	49900		46600	125000	38500
4/22/2019	60400	83300	82400		48200	105000	59400
4/23/2019				75300			
10/14/2019	56600	91400	66000		52200	110000	57700
10/15/2019				<76.2 (U)			
4/13/2020	57500	115000	117000		50900	93800	58700
4/14/2020				88500			
10/12/2020	55600	91200	120000		47700	95700	
10/13/2020				76500			41900

Chloride



Time Series Analysis Run 12/21/2020 6:05 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

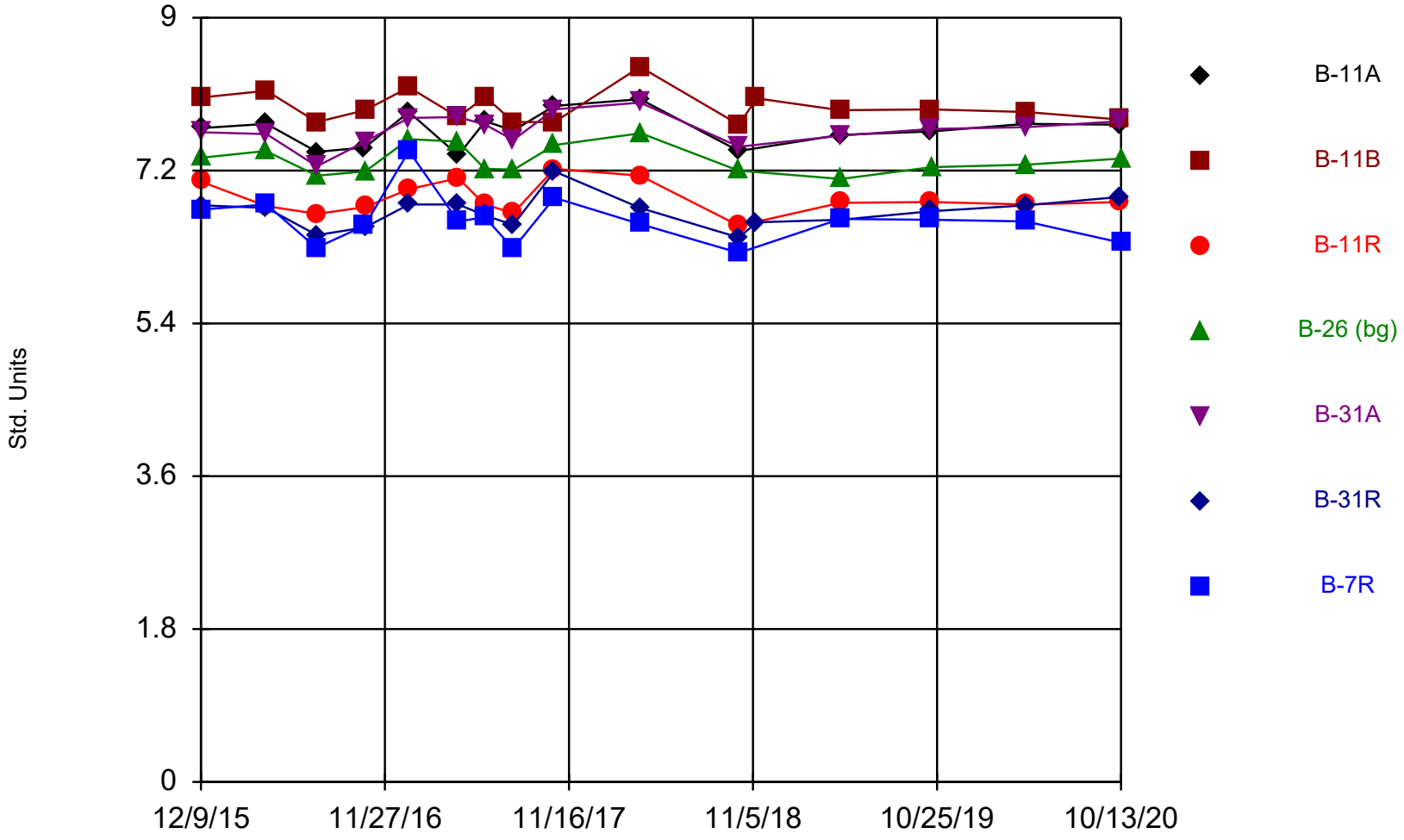
Time Series

Constituent: Chloride (mg/L) Analysis Run 12/21/2020 6:08 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	40.4	31.2	39.2	45.5	35.3	29.9	45.2
4/12/2016				51.3			
4/13/2016	43	32.7	7		35.8	17.6	4.6
7/18/2016							7.1
7/19/2016	46.6	33.6	38.9	55.6	36.4	30.3	
10/19/2016	46.5						22
10/20/2016		34.3	39.1	52.8	39	16.4	
1/12/2017	46.6	36.1	42.3	54.5	39.9	26	19.7
4/17/2017	45.4	36.3	40.2	56	40.3	20.4	13.1
6/7/2017			42	59.6			12.8
6/8/2017	46.9	33.9			40.9	20.7	
8/1/2017	46.7	35.9	24.7		40.8	3.6	8.1
8/2/2017				52.6			
10/19/2017	49.9	36.1	38.8	79.3	40.8	29	12
4/2/2018	54.7	31.3	36.8		42.7	32.6	10.1
4/3/2018				54.4			
10/8/2018				33.2			
10/9/2018	57.8	21.9	5.9		40.2	19.7	1.9 (J)
4/22/2019	83.6	28.4	12.6		40.8	17.8	10.9
4/23/2019				40.8			
10/14/2019	96.6	32.3	13.1		47.1	26	11.5
10/15/2019				30.5			
4/13/2020	93.7	30.9	22.5		51	29.9	14.3
4/14/2020				54.9			
10/12/2020	65.3	33.4	20.7		57.9	24.4	
10/13/2020				35.3			6.7 (J)

Field pH



Time Series Analysis Run 12/21/2020 6:05 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

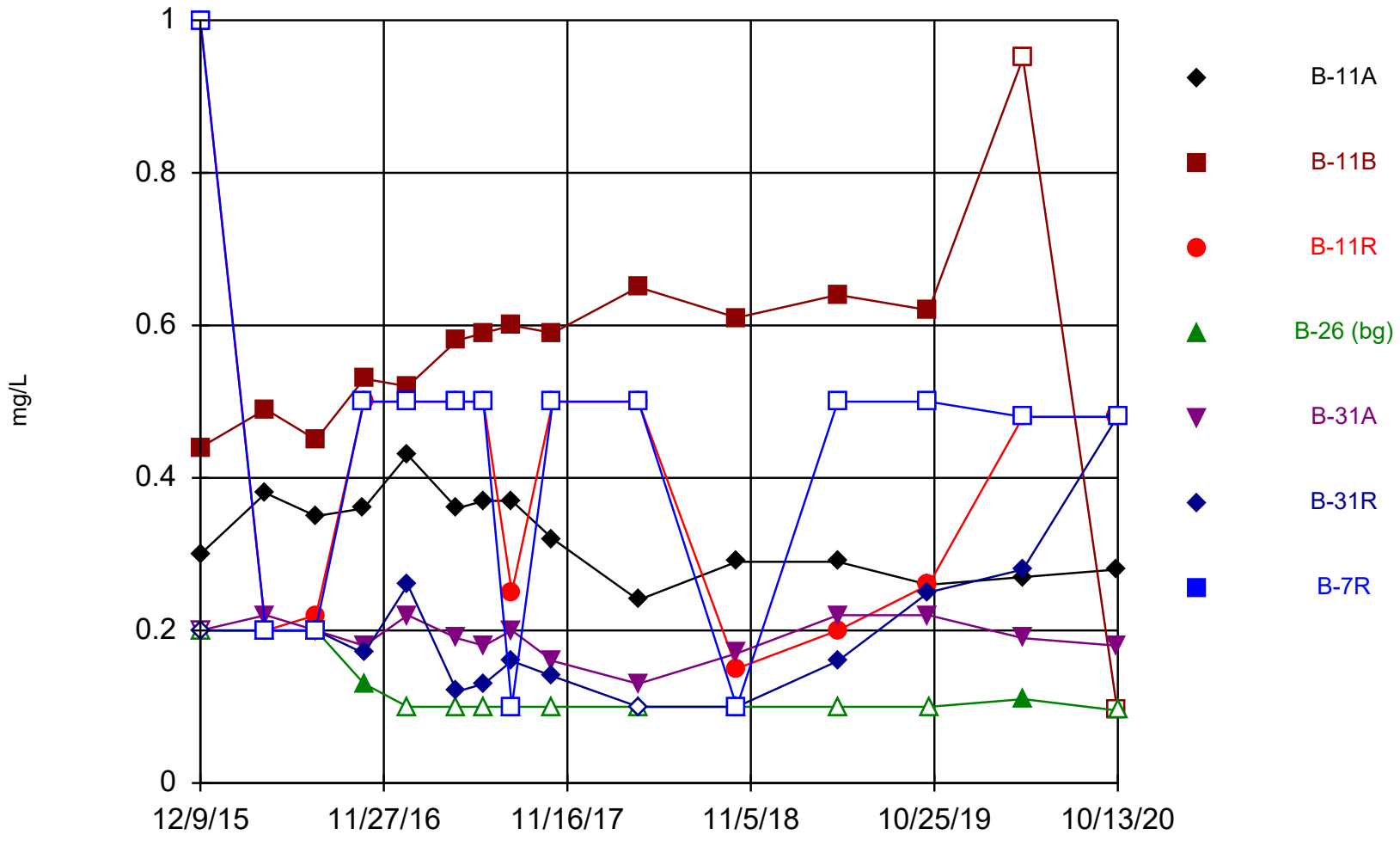
Constituent: Field pH (Std. Units) Analysis Run 12/21/2020 6:08 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	7.7	8.06	7.07	7.35	7.65	6.79	6.74
4/12/2016				7.43			
4/13/2016	7.75	8.14	6.78		7.63	6.76	6.8
7/18/2016							6.29
7/19/2016	7.42	7.77	6.69	7.14	7.25	6.44	
10/19/2016	7.47						6.55
10/20/2016		7.91	6.77	7.19	7.54	6.53	
1/12/2017	7.89	8.18	6.98	7.57	7.82	6.8	7.43
4/17/2017	7.38	7.83	7.11	7.54	7.83	6.8	6.6
6/7/2017			6.8	7.22			6.65
6/8/2017	7.78	8.07			7.74	6.67	
8/1/2017	7.67	7.77	6.7		7.56	6.56	6.28
8/2/2017				7.21			
10/19/2017	7.96	7.77	7.22	7.5	7.92	7.19	6.88
4/2/2018	8.04	8.42	7.14		8	6.76	6.57
4/3/2018				7.64			
10/8/2018				7.2			
10/9/2018	7.43	7.74	6.55		7.48	6.41	6.23
11/12/2018		8.05				6.59	
4/22/2019	7.62	7.91	6.82		7.61	6.62	6.63
4/23/2019				7.1			
10/14/2019	7.66	7.92	6.83		7.69	6.72	6.62
10/15/2019				7.24			
4/13/2020	7.75	7.89	6.8		7.71	6.79	6.6
4/14/2020				7.27			
10/12/2020	7.74	7.8	6.83		7.78	6.89	
10/13/2020				7.34			6.35

Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 12/21/2020 6:05 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

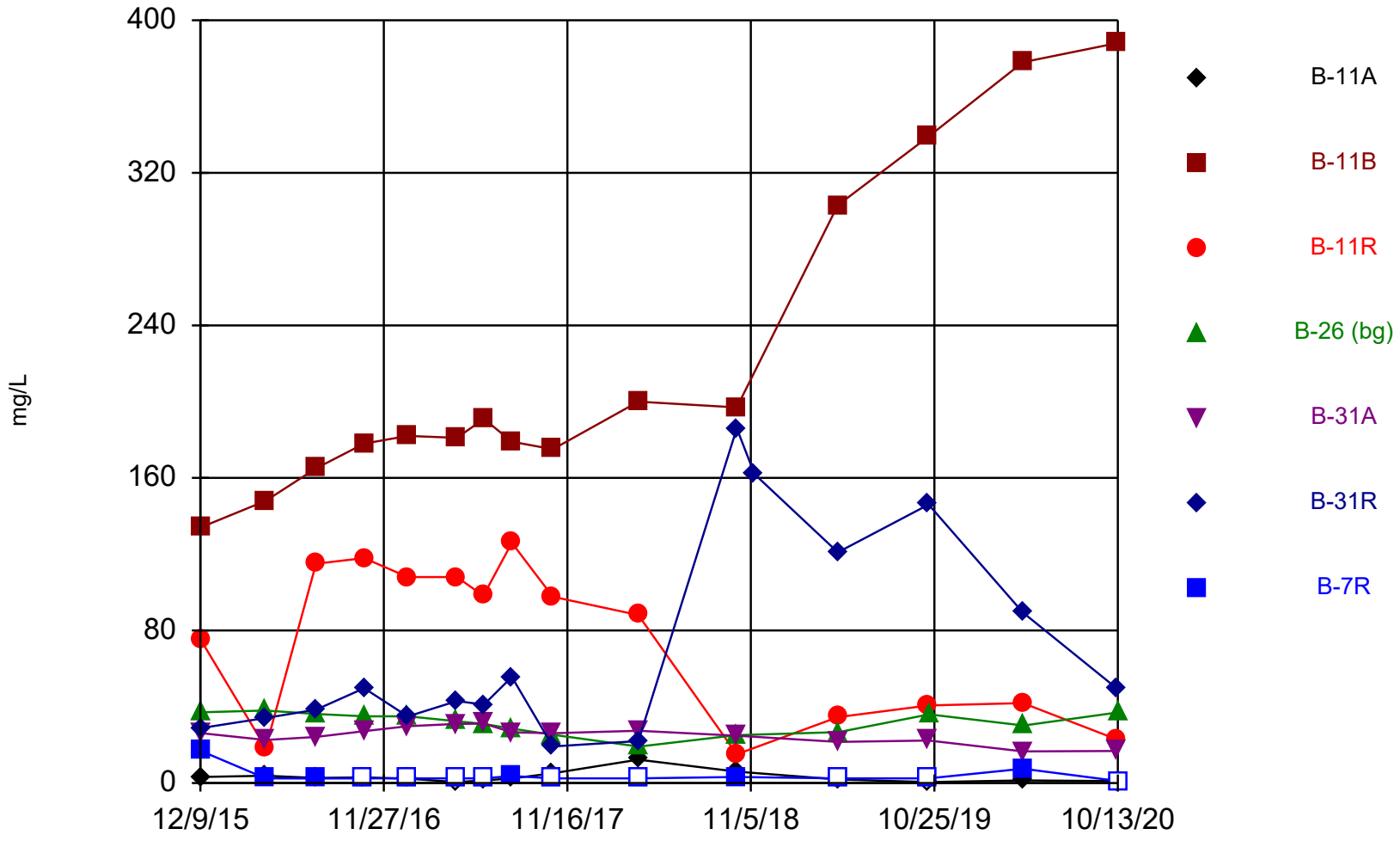
Constituent: Fluoride (mg/L) Analysis Run 12/21/2020 6:08 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	0.3 (J)	0.44	<1 (U)	<0.2 (U)	<0.2 (U)	<0.2 (U)	<1 (U)
4/12/2016				<0.2 (U)			
4/13/2016	0.38 (J)	0.49	<0.2 (U)		0.22 (J)	<0.2 (U)	<0.2 (U)
7/18/2016							<0.2 (U)
7/19/2016	0.35 (J)	0.45	0.22 (J)	<0.2 (U)	<0.2 (U)	<0.2 (U)	
10/19/2016	0.36						<0.5 (U)
10/20/2016		0.53	<0.5 (U)	0.13 (J)	0.18 (J)	0.17 (J)	
1/12/2017	0.43	0.52	<0.5 (U)	<0.1 (U)	0.22 (J)	0.26 (J)	<0.5 (U)
4/17/2017	0.36	0.58	<0.5 (U)	<0.1 (U)	0.19 (J)	0.12 (J)	<0.5 (U)
6/7/2017			<0.5 (U)	<0.1 (U)			<0.5 (U)
6/8/2017	0.37	0.59			0.18 (J)	0.13 (J)	
8/1/2017	0.37	0.6	0.25 (J)		0.2 (J)	0.16 (J)	<0.1 (U)
8/2/2017				<0.1 (U)			
10/19/2017	0.32	0.59	<0.5 (U)	<0.1 (U)	0.16 (J)	0.14 (J)	<0.5 (U)
4/2/2018	0.24 (J)	0.65	<0.5 (U)		0.13 (J)	<0.1 (U)	<0.5 (U)
4/3/2018				<0.1 (U)			
10/8/2018				<0.1 (U)			
10/9/2018	0.29 (J)	0.61	0.15 (J)		0.17 (J)	<0.1 (U)	<0.1 (U)
4/22/2019	0.29 (J)	0.64	0.2 (J)		0.22 (J)	0.16 (J)	<0.5 (U)
4/23/2019				<0.1 (U)			
10/14/2019	0.26 (J)	0.62	0.26 (J)		0.22 (J)	0.25 (J)	<0.5 (U)
10/15/2019				<0.1 (U)			
4/13/2020	0.27 (J)	<0.95 (U)	<0.48 (U)		0.19 (J)	0.28 (J)	<0.48 (U)
4/14/2020				0.11 (J)			
10/12/2020	0.28 (J)	<0.095 (U)	<0.48 (U)		0.18 (J)	<0.48 (U)	
10/13/2020				<0.095 (U)			<0.48 (U)

Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 12/21/2020 6:05 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

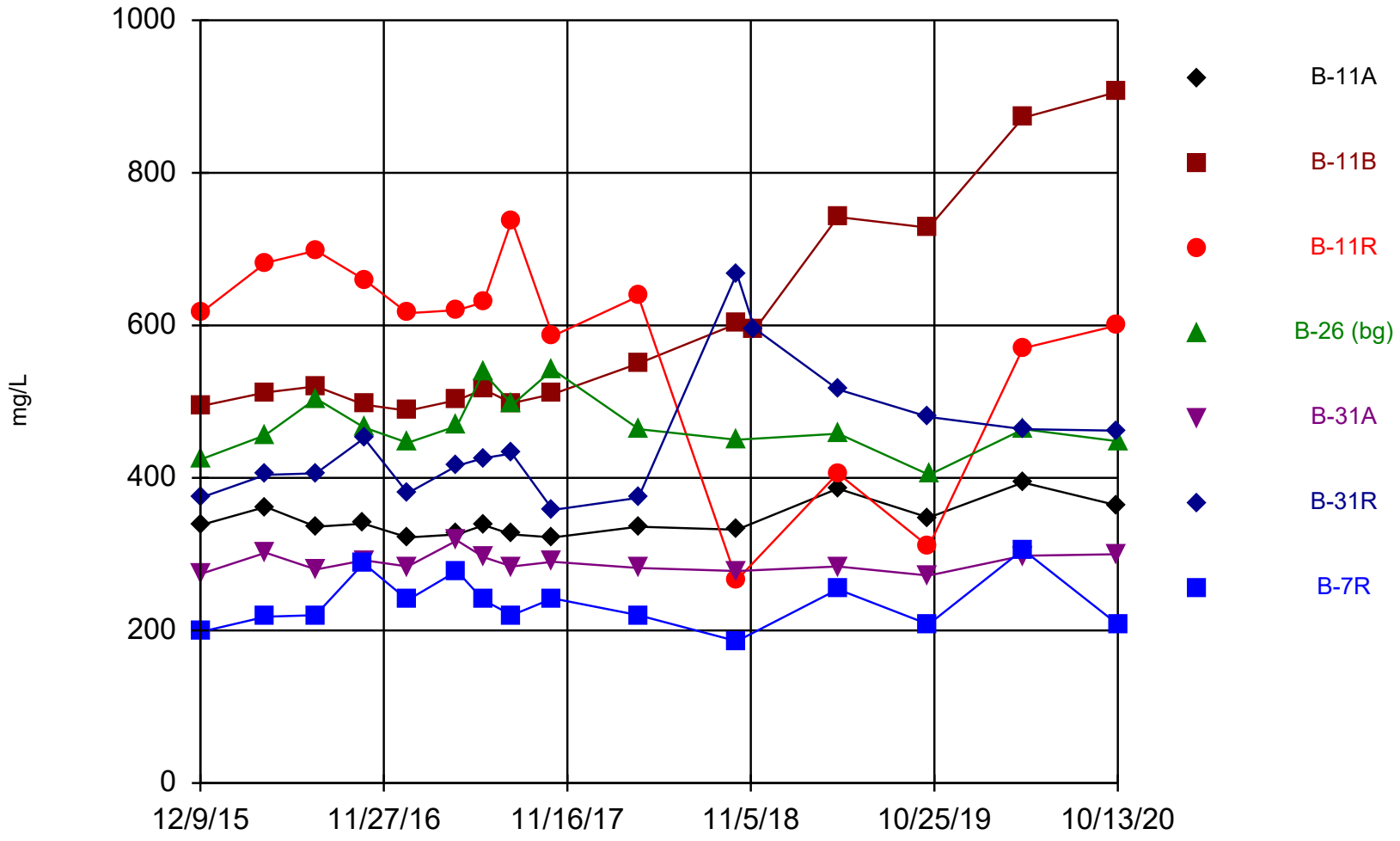
Time Series

Constituent: Sulfate (mg/L) Analysis Run 12/21/2020 6:08 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	3.2 (J)	134	75.4	37.1	26.2	28.8	17 (J)
4/12/2016				38			
4/13/2016	3.8 (J)	148	18.4		22.6	34.1	2.5 (J)
7/18/2016							2.4 (J)
7/19/2016	2.7 (J)	165	115	36.2	24.2	38.5	
10/19/2016	3 (J)						<5 (U)
10/20/2016		178	118	35	27.2	49.7	
1/12/2017	2.3 (J)	182	108	35	29.8	34.9	<5 (U)
4/17/2017	<1 (U)	181	108	32.4	31	43	<5 (U)
6/7/2017			98.2	31			<5 (U)
6/8/2017	1.4 (J)	191			31.2	41.1	
8/1/2017	2.4 (J)	179	126		26.6	55.6	3.7
8/2/2017				28.5			
10/19/2017	5.1	175	97.7	25.3	26.1	19.2	<5 (U)
4/2/2018	12.3	200	88.1		27.4	22	<5 (U)
4/3/2018				19.1			
10/8/2018				25.1			
10/9/2018	6	197	15.1		24.8	186	3.2
11/12/2018						162	
4/22/2019	1.9 (J)	303	34.6		21.6	121	<5 (U)
4/23/2019				26.7			
10/14/2019	<1 (U)	339	40.7		22.3	146	<5 (U)
10/15/2019				36			
4/13/2020	1.4 (J)	378	41.9		16.6	89.4	7.5 (J)
4/14/2020				30.2			
10/12/2020	1 (J)	388	22.8		16.8	49.4	
10/13/2020				37			<2.2 (U)

Total Dissolved Solids



Time Series Analysis Run 12/21/2020 6:05 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/21/2020 6:08 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	338	494	616	424	274	374	198
4/12/2016				456			
4/13/2016	362	512	682		302	404	218
7/18/2016							220
7/19/2016	336	520	698	504	280	406	
10/19/2016	340						288
10/20/2016		496	660	466	292	452	
1/12/2017	322	488	616	446	284	380	240
4/17/2017	326	502	620	468	318	416	278
6/7/2017			630	538			240
6/8/2017	338	516			296	426	
8/1/2017	326	498	738		284	432	220
8/2/2017				496			
10/19/2017	322	510	586	542	290	358	242
4/2/2018	336	550	638		282	374	220
4/3/2018				464			
10/8/2018				450			
10/9/2018	332	602	266		278	668	186
11/12/2018		594				596	
4/22/2019	386	742	406		284	516	254
4/23/2019				458			
10/14/2019	348	728	310		272	480	208
10/15/2019				404			
4/13/2020	394	872	570		298	464	306
4/14/2020				464			
10/12/2020	364	906	600		300	462	
10/13/2020				448			208

Attachment 2

Outlier Analysis

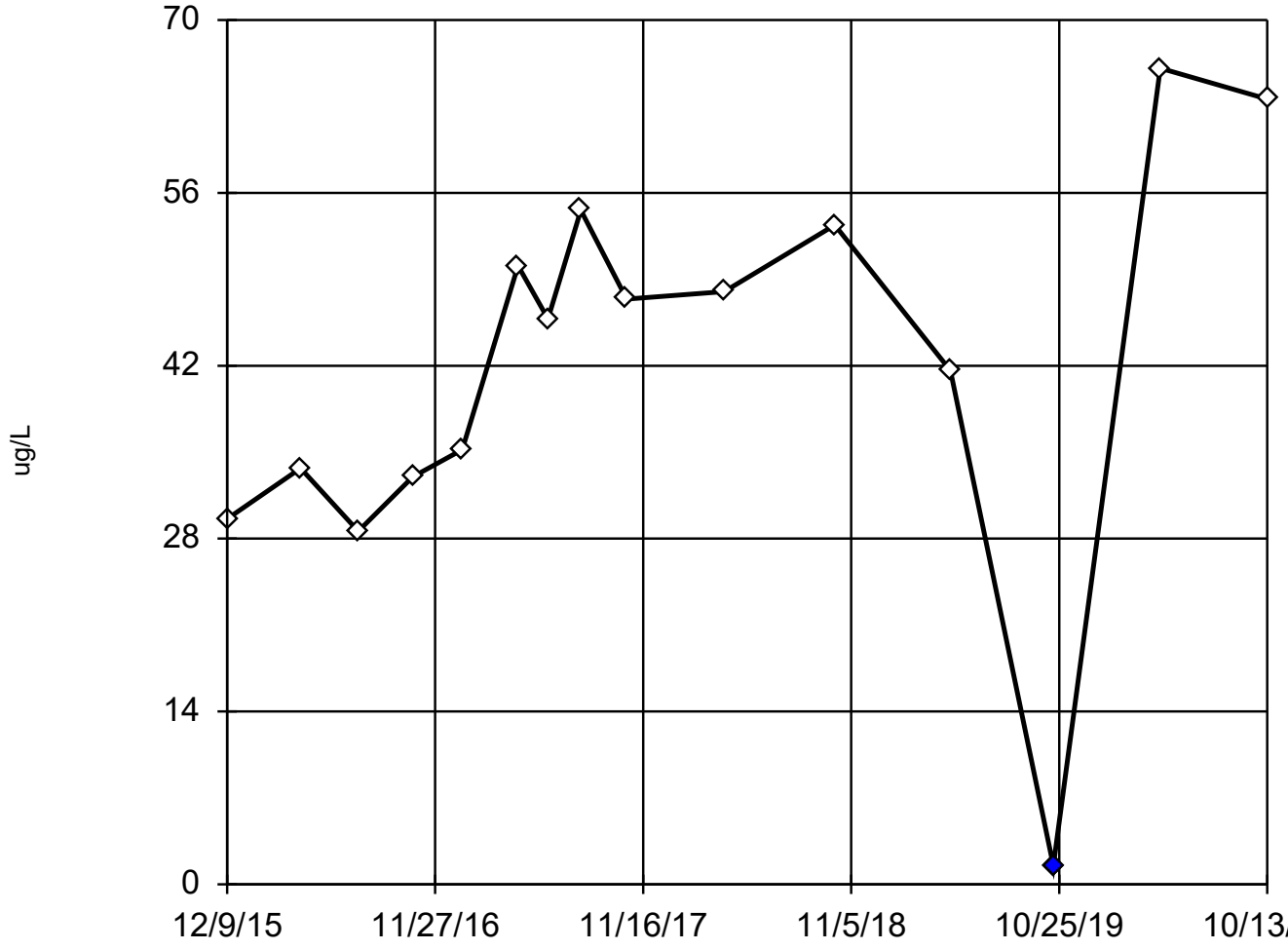
Outlier Analysis

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020 Printed 12/21/2020, 6:11 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron (ug/L)	**B-26 (bg)**	**Yes**	**1.5**	**10/15/2019**	**Dixon`s**	**0.05**	**15**	**42.15**	**16.15**	**normal**	**ShapiroWilk**
Calcium (ug/L)	**B-26 (bg)**	**Yes**	**38.1**	**10/15/2019**	**Dixon`s**	**0.05**	**15**	**81549**	**24188**	**normal**	**ShapiroWilk**
Chloride (mg/L)	B-26 (bg)	No	n/a	n/a	EPA 1989	0.05	15	50.42	12.19	normal	ShapiroWilk
Field pH (Std. Units)	B-26 (bg)	No	n/a	n/a	EPA 1989	0.05	15	7.329	0.1692	normal	ShapiroWilk
Fluoride (mg/L)	B-26 (bg)	No	n/a	n/a	NP (nrm)	NaN	15	0.1223	0.04101	unknown	ShapiroWilk
Sulfate (mg/L)	B-26 (bg)	No	n/a	n/a	Dixon`s	0.05	15	31.51	5.598	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	B-26 (bg)	No	n/a	n/a	EPA 1989	0.05	15	468.5	37.77	normal	ShapiroWilk

Dixon's Outlier Test

B-26 (bg)



n = 15

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 42.15.
Std. Dev. = 16.15.
<3 (U): c = 0.5292
tabl = 0.525.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9463
Critical = 0.895
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Boron Analysis Run 12/21/2020 6:09 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Dixon's Outlier Test

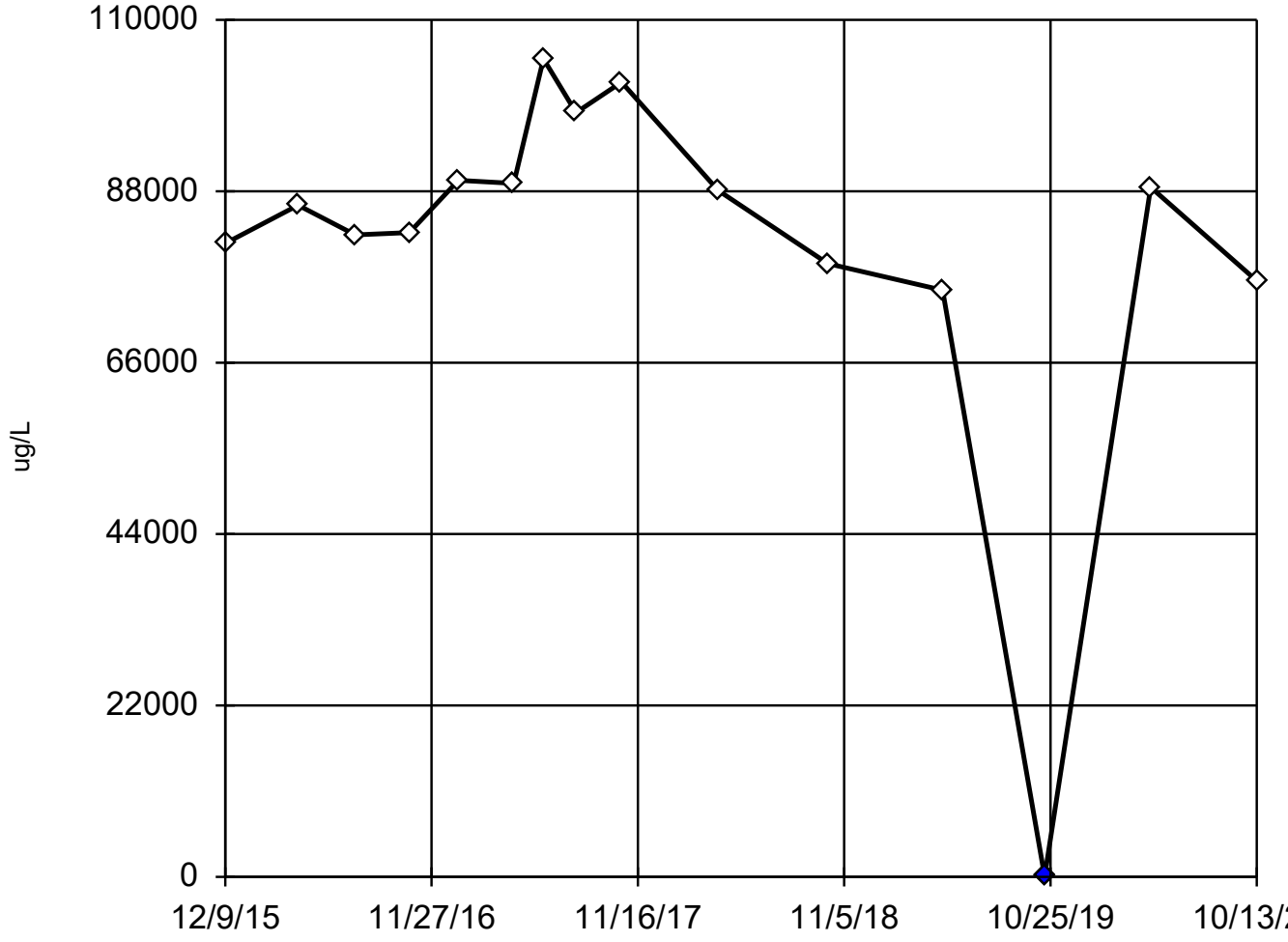
Constituent: Boron (ug/L) Analysis Run 12/21/2020 6:11 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26 (bg)
12/9/2015	29.6
4/12/2016	33.7
7/19/2016	28.6
10/20/2016	33
1/12/2017	35.2
4/17/2017	50.1
6/7/2017	45.8
8/2/2017	54.6
10/19/2017	47.4
4/3/2018	48
10/8/2018	53.4
4/23/2019	41.6
10/15/2019	<3 (UO)
4/14/2020	66.1
10/13/2020	63.6

Dixon's Outlier Test

B-26 (bg)



n = 15

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 81549.
Std. Dev. = 24188.
<76.2 (U): c = 0.7797
tabl = 0.525.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9297
Critical = 0.895
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Calcium Analysis Run 12/21/2020 6:09 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Dixon's Outlier Test

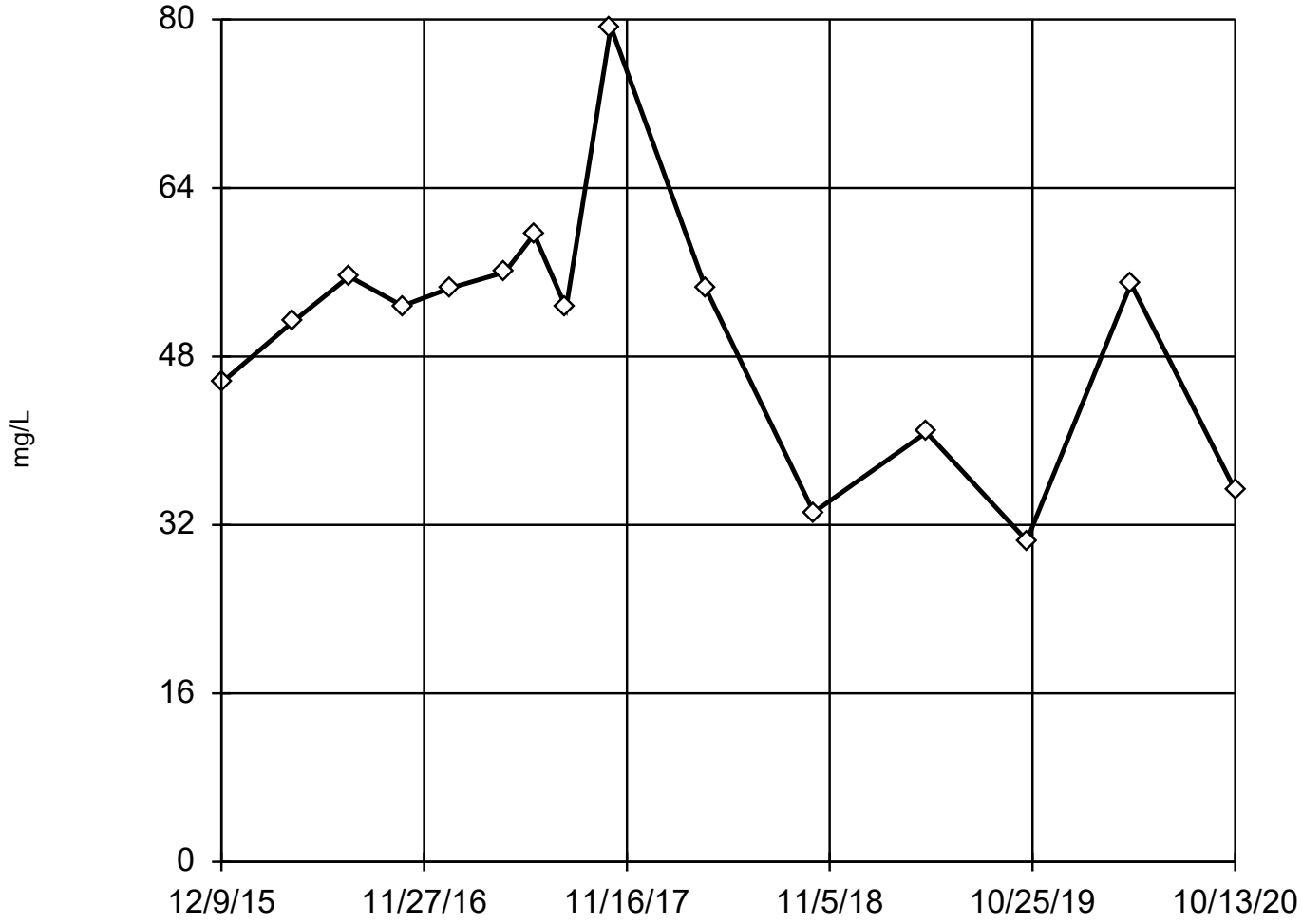
Constituent: Calcium (ug/L) Analysis Run 12/21/2020 6:11 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26 (bg)
12/9/2015	81300
4/12/2016	86200
7/19/2016	82400
10/20/2016	82700
1/12/2017	89400
4/17/2017	89000
6/7/2017	105000
8/2/2017	98100
10/19/2017	102000
4/3/2018	88100
10/8/2018	78700
4/23/2019	75300
10/15/2019	<76.2 (UO)
4/14/2020	88500
10/13/2020	76500

EPA Screening (suspected outliers for Dixon's Test)

B-26 (bg)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 50.42, std. dev. 12.19, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9076
Critical = 0.901
The distribution was found to be normally distrib-uted.

Constituent: Chloride Analysis Run 12/21/2020 6:09 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

EPA 1989 Outlier Screening

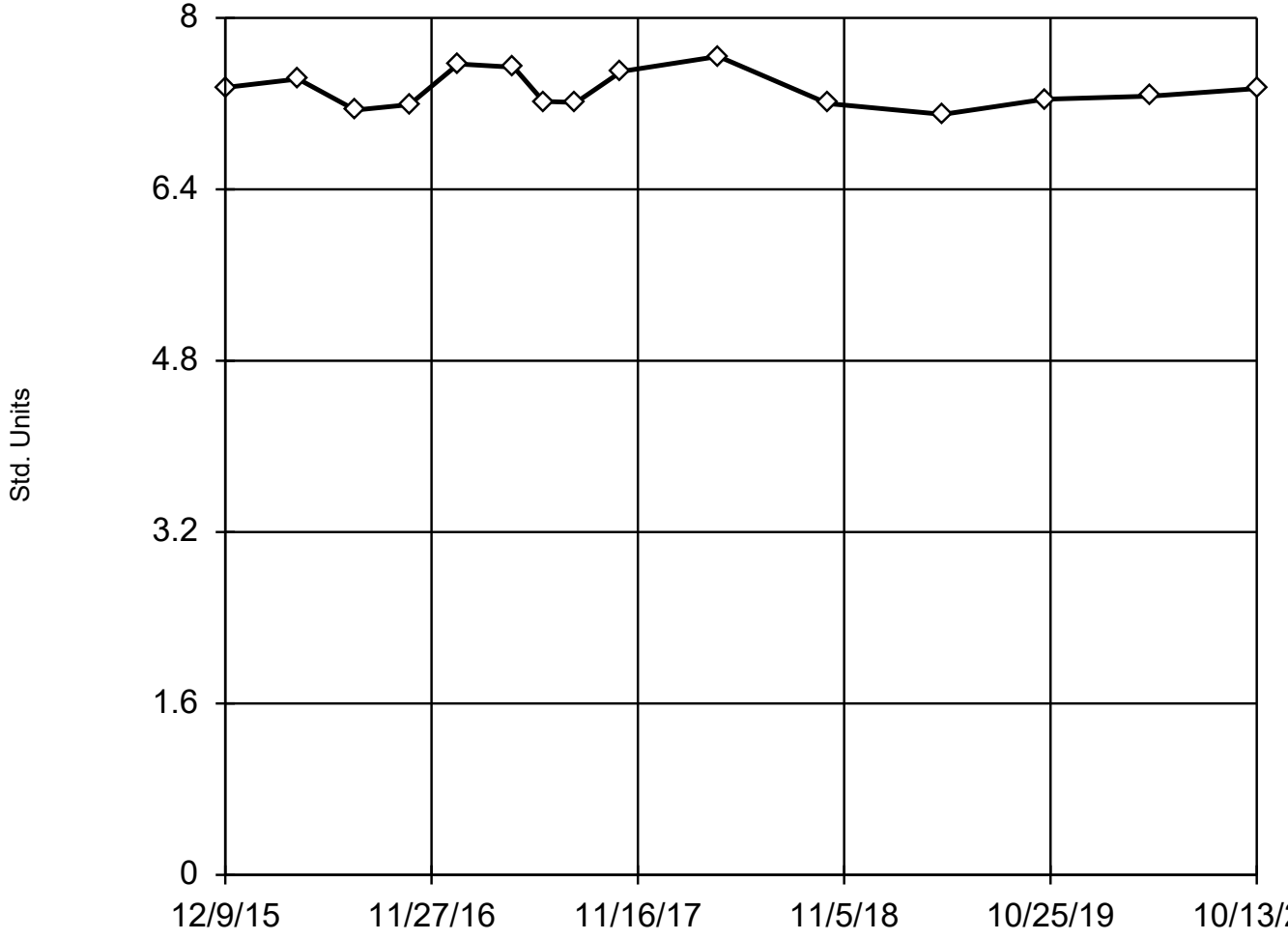
Constituent: Chloride (mg/L) Analysis Run 12/21/2020 6:11 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26 (bg)
12/9/2015	45.5
4/12/2016	51.3
7/19/2016	55.6
10/20/2016	52.8
1/12/2017	54.5
4/17/2017	56
6/7/2017	59.6
8/2/2017	52.6
10/19/2017	79.3
4/3/2018	54.4
10/8/2018	33.2
4/23/2019	40.8
10/15/2019	30.5
4/14/2020	54.9
10/13/2020	35.3

EPA Screening (suspected outliers for Dixon's Test)

B-26 (bg)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 7.329, std. dev. 0.1692, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9265
Critical = 0.901
The distribution was found to be normally distrib-uted.

Constituent: Field pH Analysis Run 12/21/2020 6:09 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

EPA 1989 Outlier Screening

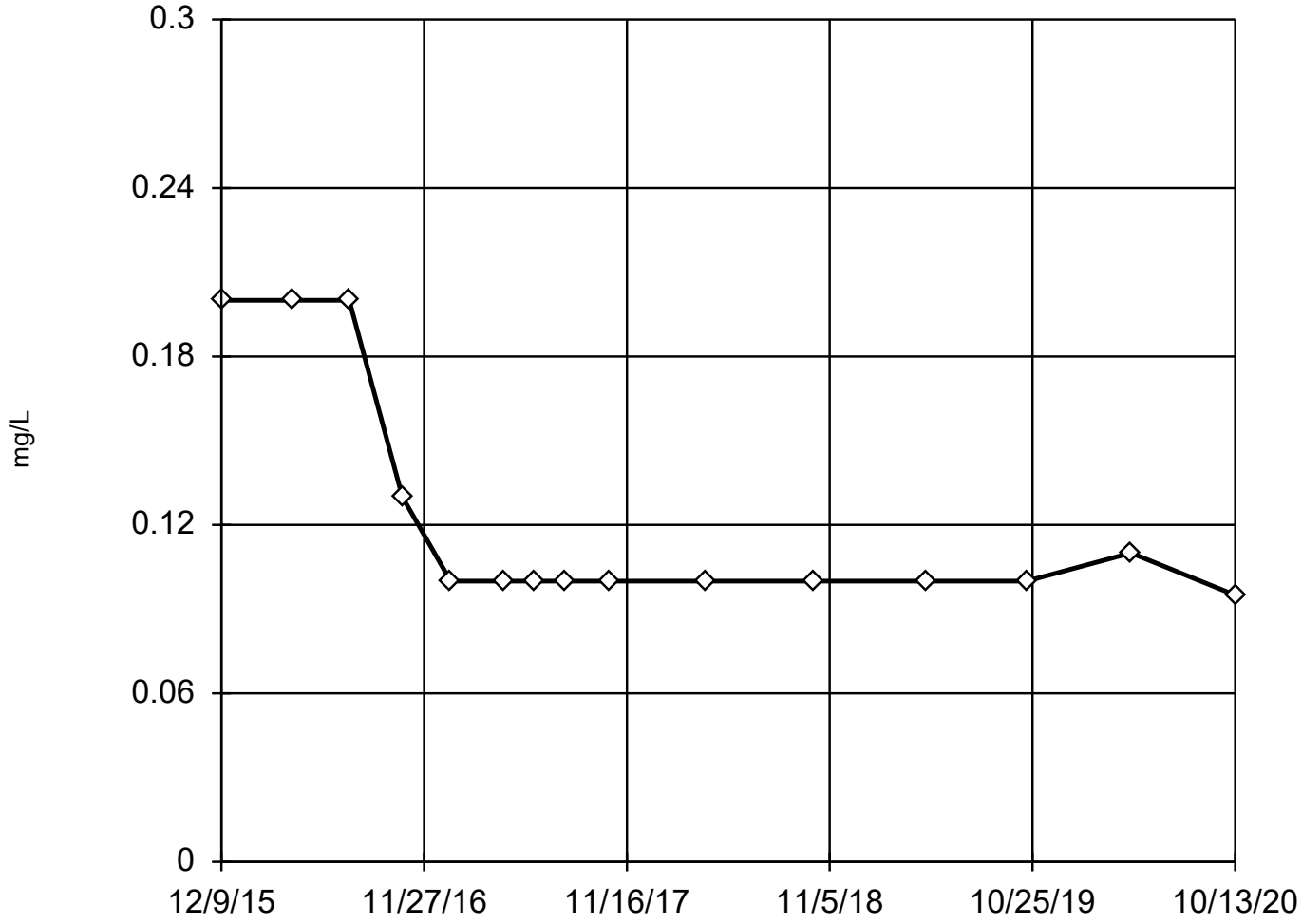
Constituent: Field pH (Std. Units) Analysis Run 12/21/2020 6:11 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26 (bg)
12/9/2015	7.35
4/12/2016	7.43
7/19/2016	7.14
10/20/2016	7.19
1/12/2017	7.57
4/17/2017	7.54
6/7/2017	7.22
8/2/2017	7.21
10/19/2017	7.5
4/3/2018	7.64
10/8/2018	7.2
4/23/2019	7.1
10/15/2019	7.24
4/14/2020	7.27
10/13/2020	7.34

Tukey's Outlier Screening

B-26 (bg)



n = 15

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.2856, low cutoff = 0.04552, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 12/21/2020 6:09 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Tukey's Outlier Screening

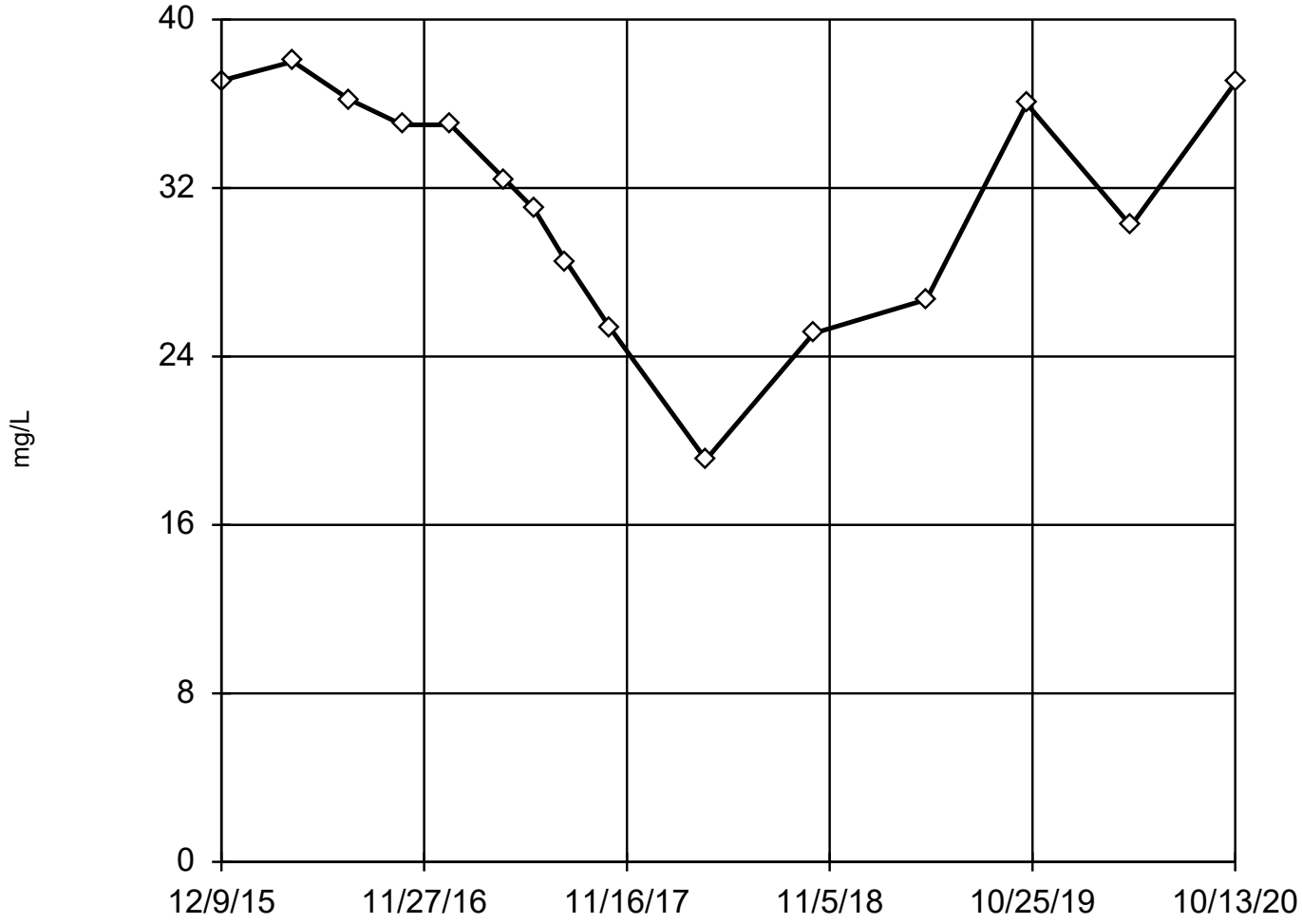
Constituent: Fluoride (mg/L) Analysis Run 12/21/2020 6:11 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26 (bg)
12/9/2015	<0.2 (U)
4/12/2016	<0.2 (U)
7/19/2016	<0.2 (U)
10/20/2016	0.13 (J)
1/12/2017	<0.1 (U)
4/17/2017	<0.1 (U)
6/7/2017	<0.1 (U)
8/2/2017	<0.1 (U)
10/19/2017	<0.1 (U)
4/3/2018	<0.1 (U)
10/8/2018	<0.1 (U)
4/23/2019	<0.1 (U)
10/15/2019	<0.1 (U)
4/14/2020	0.11 (J)
10/13/2020	<0.095 (U)

Dixon's Outlier Test

B-26 (bg)



n = 15

No statistical outliers.
Testing for 1 low outlier.
Mean = 31.51.
Std. Dev. = 5.598.
19.1: c = 0.3464
tabl = 0.525.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.8985
Critical = 0.895
The distribution was found to be normally distrib-uted.

Constituent: Sulfate Analysis Run 12/21/2020 6:09 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Dixon's Outlier Test

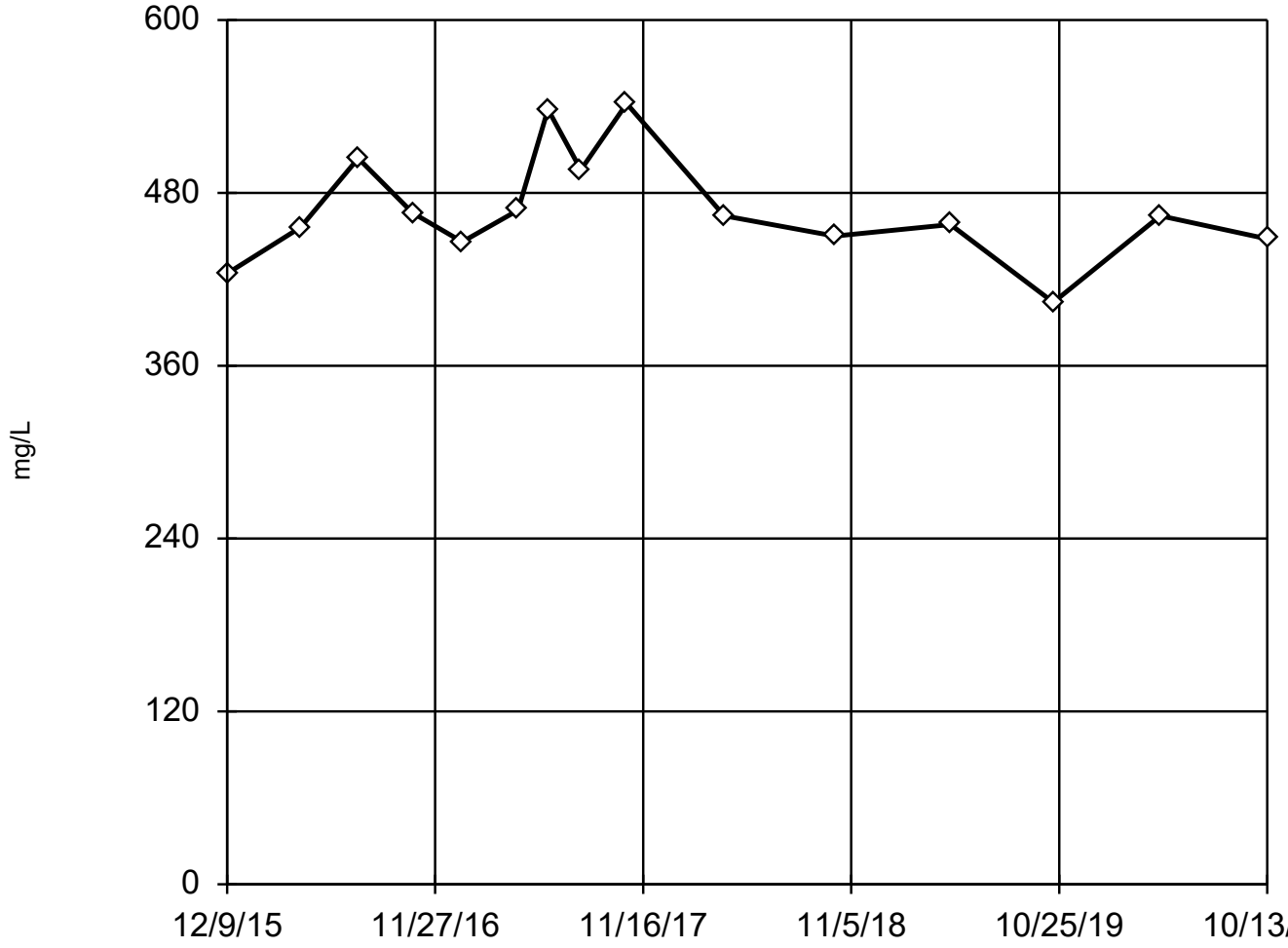
Constituent: Sulfate (mg/L) Analysis Run 12/21/2020 6:11 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26 (bg)
12/9/2015	37.1
4/12/2016	38
7/19/2016	36.2
10/20/2016	35
1/12/2017	35
4/17/2017	32.4
6/7/2017	31
8/2/2017	28.5
10/19/2017	25.3
4/3/2018	19.1
10/8/2018	25.1
4/23/2019	26.7
10/15/2019	36
4/14/2020	30.2
10/13/2020	37

EPA Screening (suspected outliers for Dixon's Test)

B-26 (bg)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 468.5, std. dev. 37.77, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9236
Critical = 0.901
The distribution was found to be normally distrib-uted.

Constituent: Total Dissolved Solids Analysis Run 12/21/2020 6:09 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

EPA 1989 Outlier Screening

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/21/2020 6:11 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

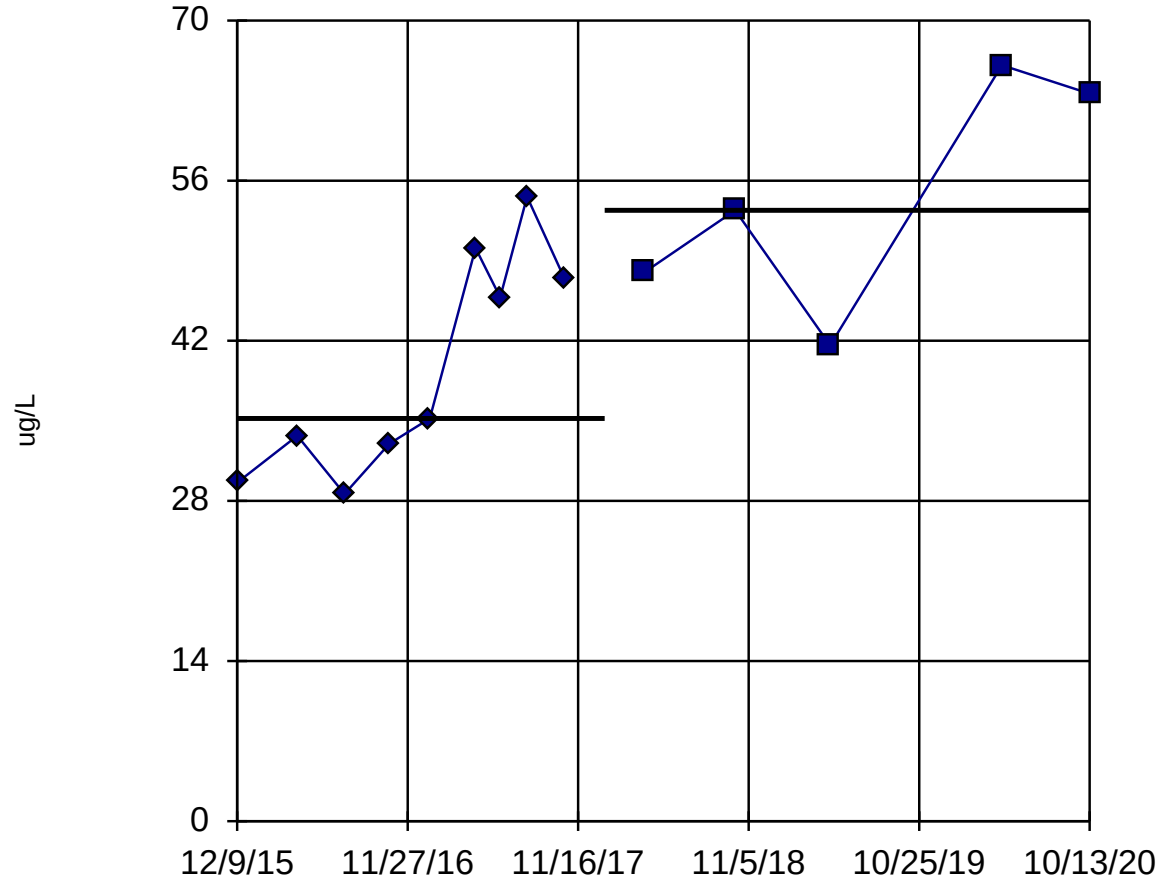
	B-26 (bg)
12/9/2015	424
4/12/2016	456
7/19/2016	504
10/20/2016	466
1/12/2017	446
4/17/2017	468
6/7/2017	538
8/2/2017	496
10/19/2017	542
4/3/2018	464
10/8/2018	450
4/23/2019	458
10/15/2019	404
4/14/2020	464
10/13/2020	448

Attachment 3

Welch's/Mann-Whitney Comparison

Boron

B-26 (bg)



B-26 background

B-26 compliance

background median = 35.2

compliance median = 53.4

t = 2.617

Alpha	Table	Sig.
0.1	1.397	Yes
0.05	1.86	Yes
0.025	2.306	Yes
0.01	2.896	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8943, critical = 0.829.

Welch's t-test Analysis Run 1/11/2021 12:14 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Welch's t-test

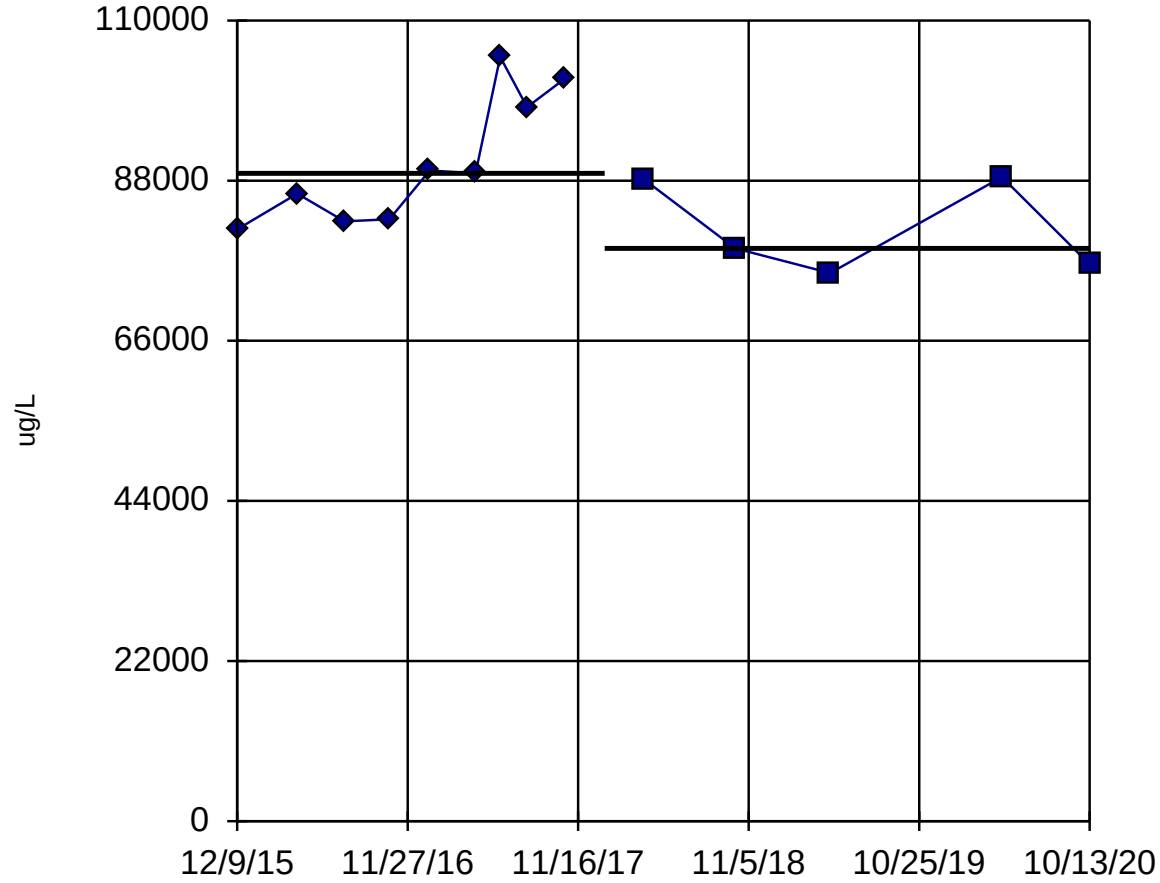
Constituent: Boron (ug/L) Analysis Run 1/11/2021 12:23 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26	B-26
12/9/2015	29.6	
4/12/2016	33.7	
7/19/2016	28.6	
10/20/2016	33	
1/12/2017	35.2	
4/17/2017	50.1	
6/7/2017	45.8	
8/2/2017	54.6	
10/19/2017	47.4	
4/3/2018		48
10/8/2018		53.4
4/23/2019		41.6
10/15/2019	<3 (UX)	
4/14/2020		66.1
10/13/2020		63.6

Calcium

B-26 (bg)



B-26 background

B-26 compliance

background median = 89000

compliance median = 78700

t = -2.247

Alpha	Table	Sig.
0.1	1.363	No
0.05	1.796	No
0.025	2.201	No
0.01	2.718	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8842, critical = 0.829.

Welch's t-test Analysis Run 1/11/2021 12:14 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Welch's t-test

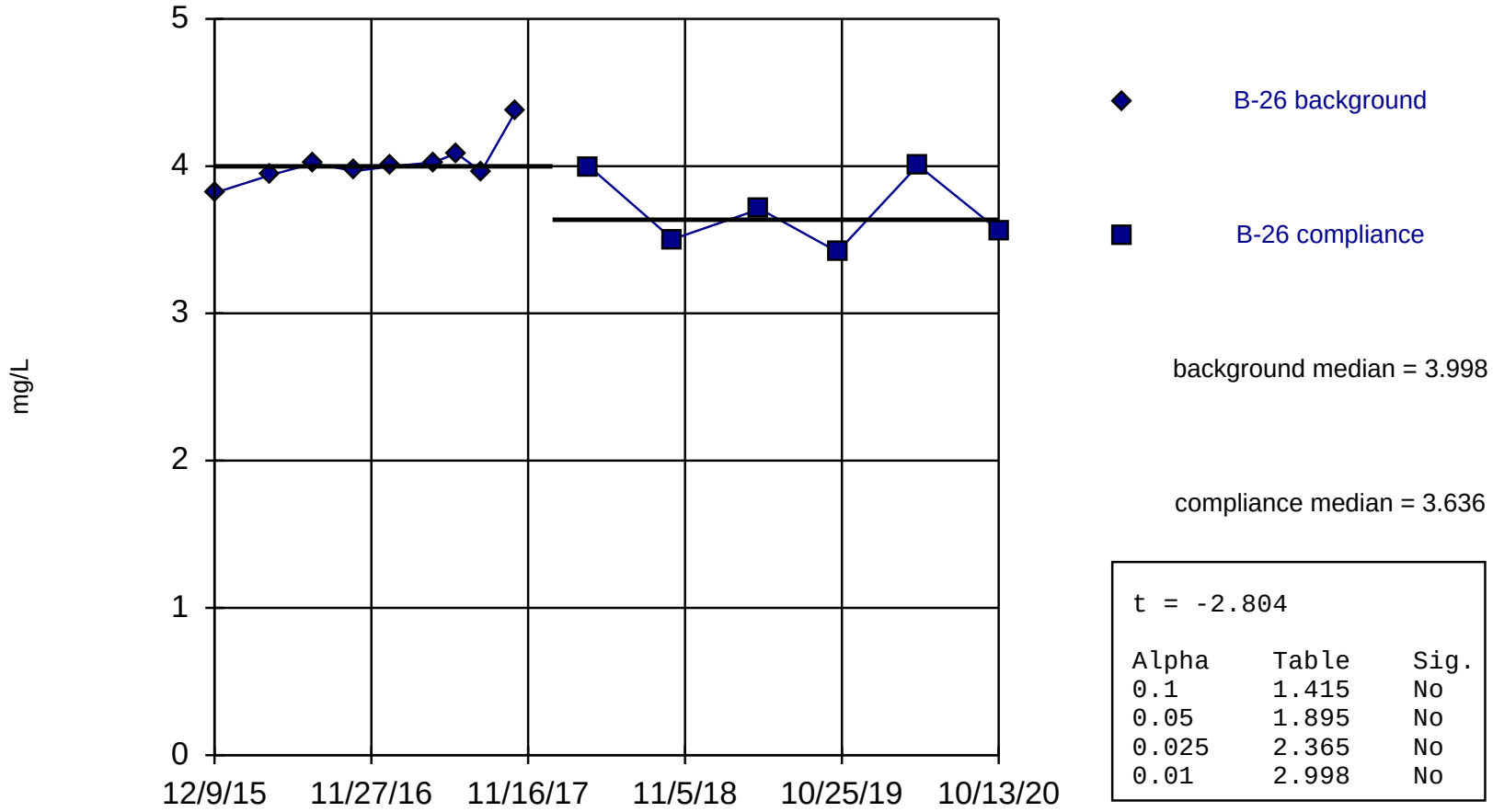
Constituent: Calcium (ug/L) Analysis Run 1/11/2021 12:23 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26	B-26
12/9/2015	81300	
4/12/2016	86200	
7/19/2016	82400	
10/20/2016	82700	
1/12/2017	89400	
4/17/2017	89000	
6/7/2017	105000	
8/2/2017	98100	
10/19/2017	102000	
4/3/2018		88100
10/8/2018		78700
4/23/2019		75300
10/15/2019	<76.2 (UX)	
4/14/2020		88500
10/13/2020		76500

Chloride

B-26 (bg)



background median = 3.998

compliance median = 3.636

t = -2.804

Alpha	Table	Sig.
0.1	1.415	No
0.05	1.895	No
0.025	2.365	No
0.01	2.998	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8409 after natural log transformation, critical = 0.829.

Welch's t-test Analysis Run 1/11/2021 12:14 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Welch's t-test

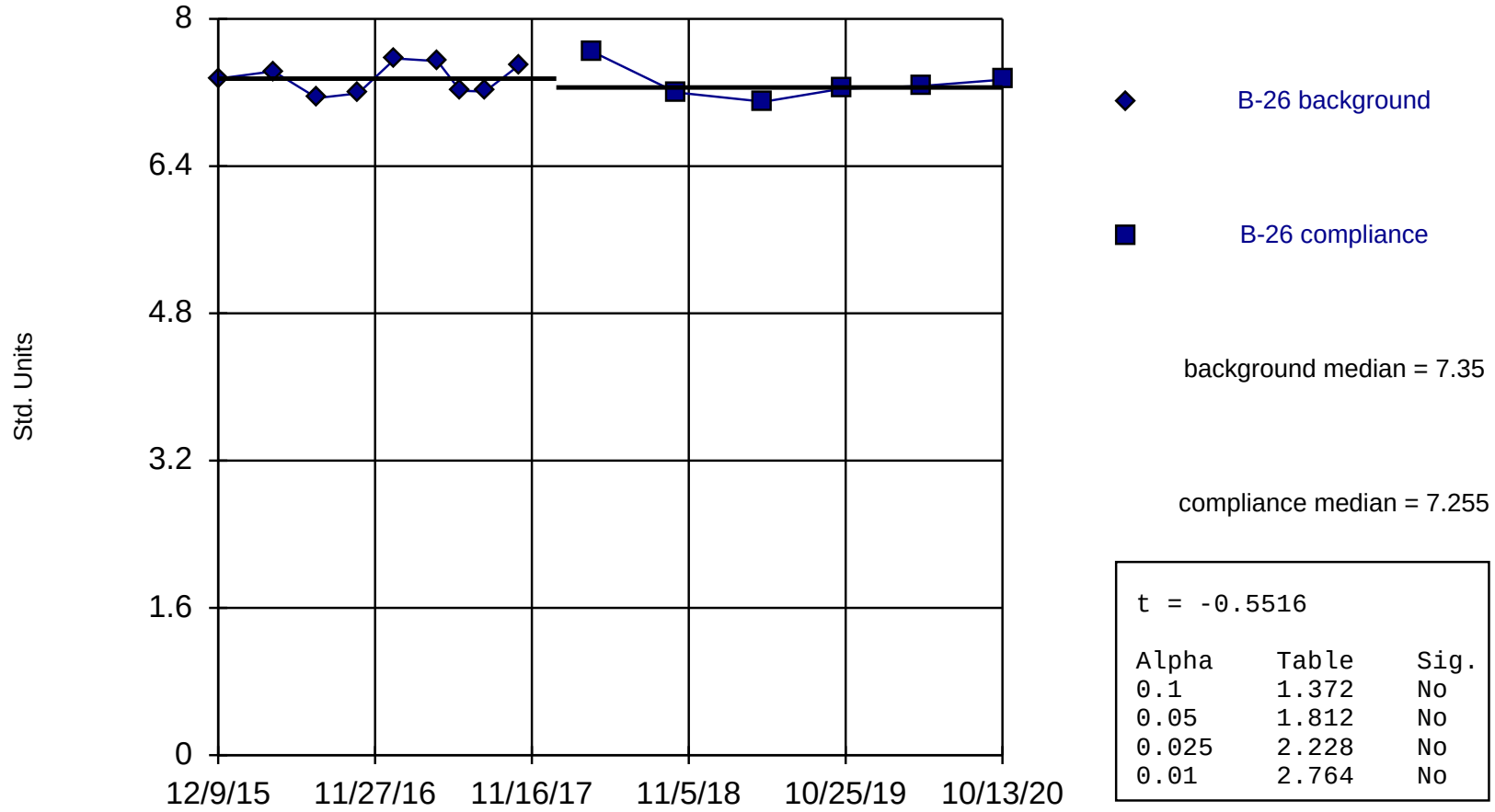
Constituent: Chloride (mg/L) Analysis Run 1/11/2021 12:23 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26	B-26
12/9/2015	45.5	
4/12/2016	51.3	
7/19/2016	55.6	
10/20/2016	52.8	
1/12/2017	54.5	
4/17/2017	56	
6/7/2017	59.6	
8/2/2017	52.6	
10/19/2017	79.3	
4/3/2018		54.4
10/8/2018		33.2
4/23/2019		40.8
10/15/2019		30.5
4/14/2020		54.9
10/13/2020		35.3

Field pH

B-26 (bg)



background median = 7.35

compliance median = 7.255

t = -0.5516

Alpha	Table	Sig.
0.1	1.372	No
0.05	1.812	No
0.025	2.228	No
0.01	2.764	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8974, critical = 0.829.

Welch's t-test Analysis Run 1/11/2021 12:14 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Welch's t-test

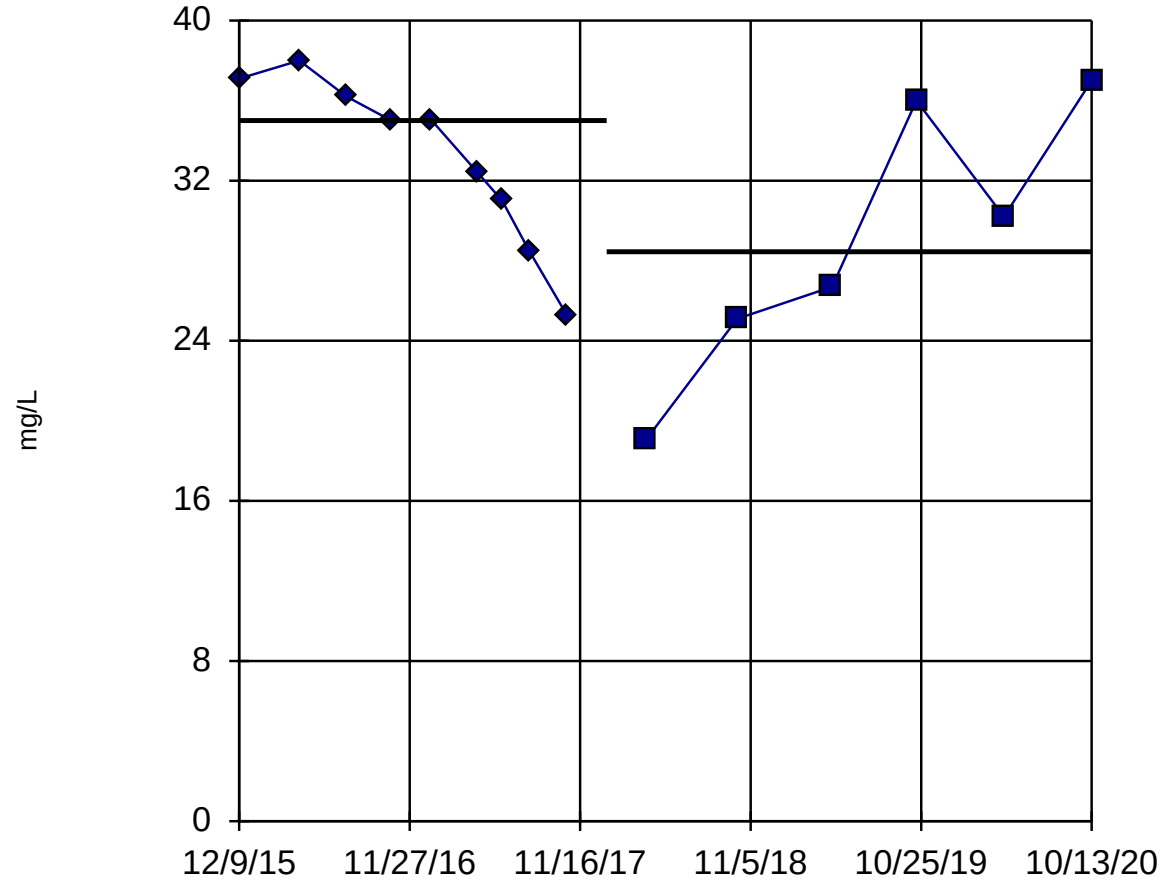
Constituent: Field pH (Std. Units) Analysis Run 1/11/2021 12:23 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26	B-26
12/9/2015	7.35	
4/12/2016	7.43	
7/19/2016	7.14	
10/20/2016	7.19	
1/12/2017	7.57	
4/17/2017	7.54	
6/7/2017	7.22	
8/2/2017	7.21	
10/19/2017	7.5	
4/3/2018		7.64
10/8/2018		7.2
4/23/2019		7.1
10/15/2019		7.24
4/14/2020		7.27
10/13/2020		7.34

Sulfate

B-26 (bg)



B-26 background

B-26 compliance

background median = 35

compliance median = 28.45

t = -1.328

Alpha	Table	Sig.
0.1	1.397	No
0.05	1.86	No
0.025	2.306	No
0.01	2.896	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9269, critical = 0.829.

Welch's t-test Analysis Run 1/11/2021 12:14 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Welch's t-test

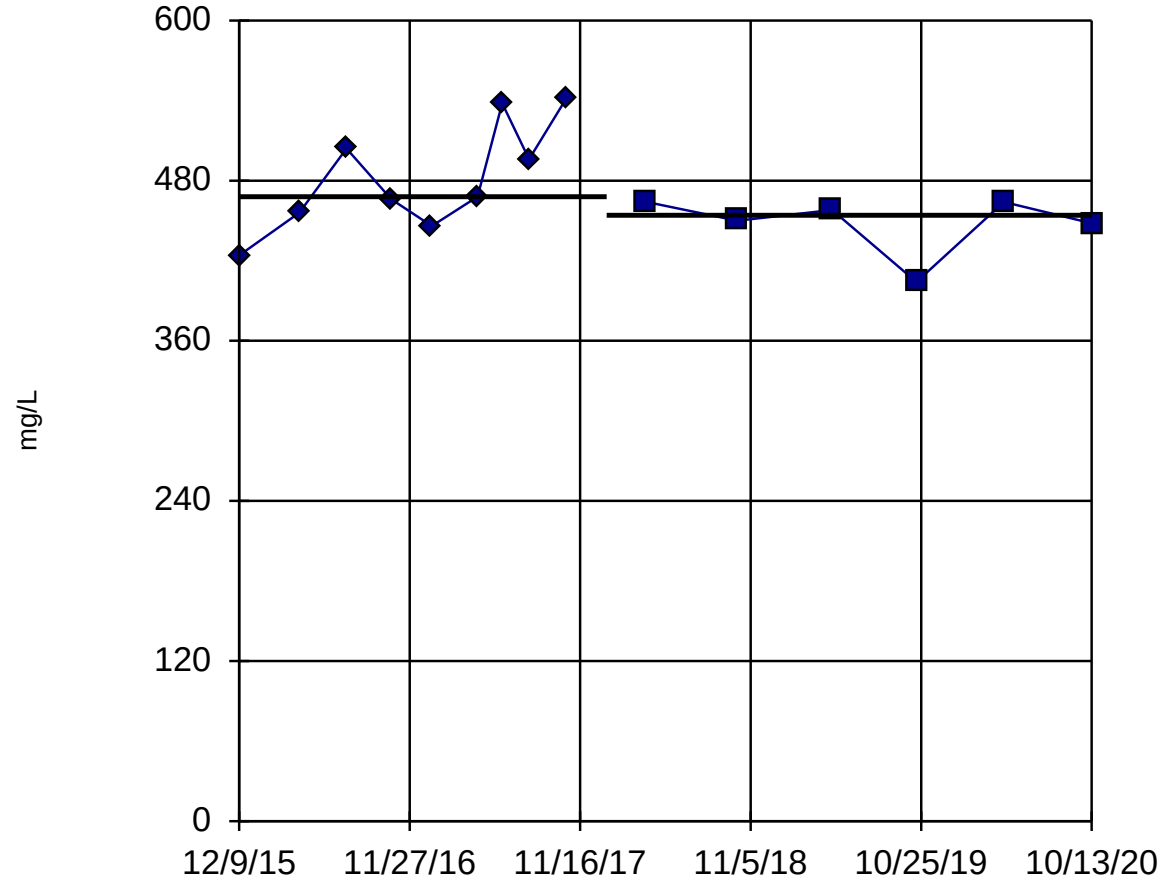
Constituent: Sulfate (mg/L) Analysis Run 1/11/2021 12:23 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26	B-26
12/9/2015	37.1	
4/12/2016	38	
7/19/2016	36.2	
10/20/2016	35	
1/12/2017	35	
4/17/2017	32.4	
6/7/2017	31	
8/2/2017	28.5	
10/19/2017	25.3	
4/3/2018		19.1
10/8/2018		25.1
4/23/2019		26.7
10/15/2019		36
4/14/2020		30.2
10/13/2020		37

Total Dissolved Solids

B-26 (bg)



background median = 468

compliance median = 454

t = -2.089

Alpha	Table	Sig.
0.1	1.35	No
0.05	1.771	No
0.025	2.16	No
0.01	2.65	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9441, critical = 0.829.

Welch's t-test Analysis Run 1/11/2021 12:14 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Welch's t-test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 1/11/2021 12:23 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-26	B-26
12/9/2015	424	
4/12/2016	456	
7/19/2016	504	
10/20/2016	466	
1/12/2017	446	
4/17/2017	468	
6/7/2017	538	
8/2/2017	496	
10/19/2017	542	
4/3/2018		464
10/8/2018		450
4/23/2019		458
10/15/2019		404
4/14/2020		464
10/13/2020		448

Welch's t-test/Mann-Whitney

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020 Printed 1/11/2021, 12:23 PM

Constituent	Well	Calc.	0.1	0.05	0.025	0.01	Alpha	Sig.	Bg. Wells	Method
Boron (ug/L)	B-26 (bg)	2.617	Yes	Yes	Yes	No	0.01	No	(intrawell)	Welch`s
Calcium (ug/L)	B-26 (bg)	-2.247	No	No	No	No	0.01	No	(intrawell)	Welch`s
Chloride (mg/L)	B-26 (bg)	-2.804	No	No	No	No	0.01	No	(intrawell)	Welch`s
Field pH (Std. Units)	B-26 (bg)	-0....	No	No	No	No	0.01	No	(intrawell)	Welch`s
Sulfate (mg/L)	B-26 (bg)	-1.328	No	No	No	No	0.01	No	(intrawell)	Welch`s
Total Dissolved Solids (mg/L)	B-26 (bg)	-2.089	No	No	No	No	0.01	No	(intrawell)	Welch`s

Attachment 4

Interwell Prediction Limit Analysis

Prediction Limit

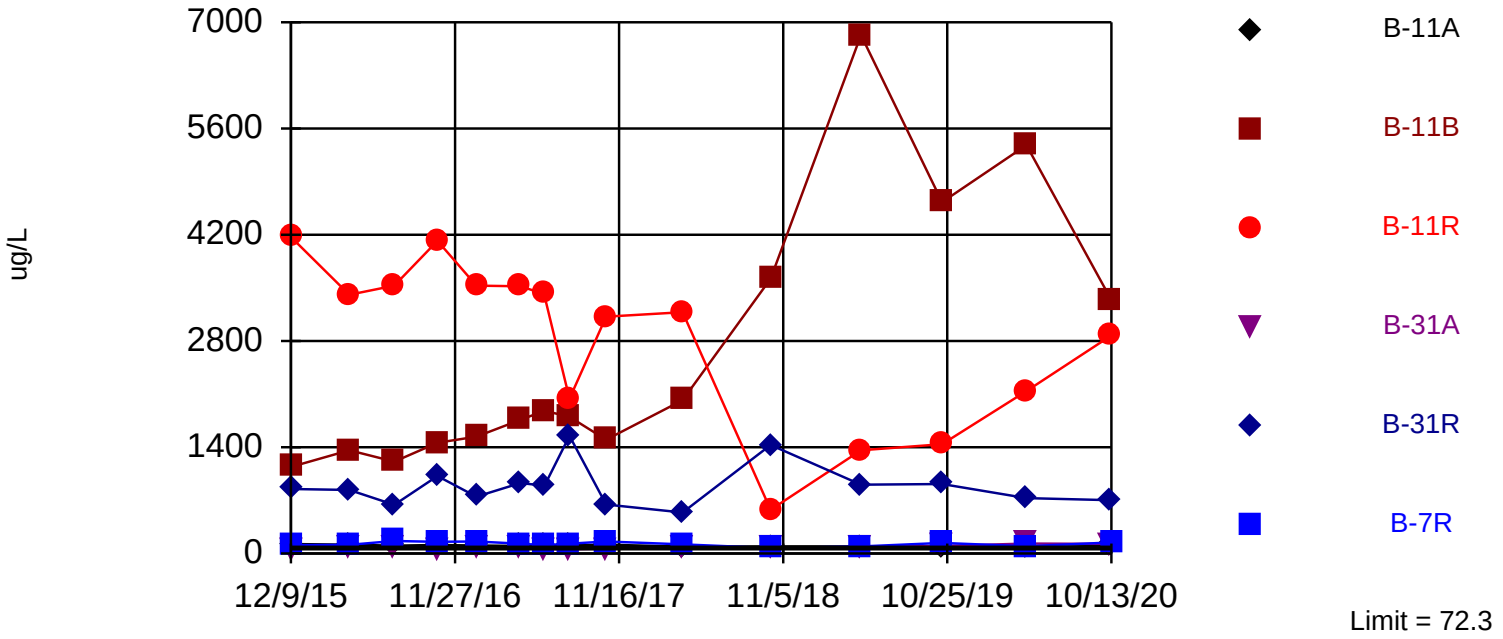
Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020 Printed 1/14/2021, 1:49 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (ug/L)	**B-11A**	**72.3**	**n/a**	**10/12/2020**	**99.3**	**Yes**	**14**	**B-26**	**45.05**	**12.03**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Boron (ug/L)	**B-11B**	**72.3**	**n/a**	**10/12/2020**	**3350**	**Yes**	**14**	**B-26**	**45.05**	**12.03**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Boron (ug/L)	**B-11R**	**72.3**	**n/a**	**10/12/2020**	**2870**	**Yes**	**14**	**B-26**	**45.05**	**12.03**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Boron (ug/L)	**B-31A**	**72.3**	**n/a**	**10/12/2020**	**127**	**Yes**	**14**	**B-26**	**45.05**	**12.03**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Boron (ug/L)	**B-31R**	**72.3**	**n/a**	**10/12/2020**	**702**	**Yes**	**14**	**B-26**	**45.05**	**12.03**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Boron (ug/L)	**B-7R**	**72.3**	**n/a**	**10/13/2020**	**145**	**Yes**	**14**	**B-26**	**45.05**	**12.03**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Calcium (ug/L)	B-11A	108000	n/a	10/12/2020	55600	No	14	B-26	87371	9082	0	None	No	0.001254	Param Inter 1 of 2
Calcium (ug/L)	B-11B	108000	n/a	10/12/2020	91200	No	14	B-26	87371	9082	0	None	No	0.001254	Param Inter 1 of 2
Calcium (ug/L)	**B-11R**	**108000**	**n/a**	**10/12/2020**	**120000**	**Yes**	**14**	**B-26**	**87371**	**9082**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Calcium (ug/L)	B-31A	108000	n/a	10/12/2020	47700	No	14	B-26	87371	9082	0	None	No	0.001254	Param Inter 1 of 2
Calcium (ug/L)	B-31R	108000	n/a	10/12/2020	95700	No	14	B-26	87371	9082	0	None	No	0.001254	Param Inter 1 of 2
Calcium (ug/L)	B-7R	108000	n/a	10/13/2020	41900	No	14	B-26	87371	9082	0	None	No	0.001254	Param Inter 1 of 2
Chloride (mg/L)	B-11A	77.6	n/a	10/12/2020	65.3	No	15	B-26	50.42	12.19	0	None	No	0.001254	Param Inter 1 of 2
Chloride (mg/L)	B-11B	77.6	n/a	10/12/2020	33.4	No	15	B-26	50.42	12.19	0	None	No	0.001254	Param Inter 1 of 2
Chloride (mg/L)	B-11R	77.6	n/a	10/12/2020	20.7	No	15	B-26	50.42	12.19	0	None	No	0.001254	Param Inter 1 of 2
Chloride (mg/L)	B-31A	77.6	n/a	10/12/2020	57.9	No	15	B-26	50.42	12.19	0	None	No	0.001254	Param Inter 1 of 2
Chloride (mg/L)	B-31R	77.6	n/a	10/12/2020	24.4	No	15	B-26	50.42	12.19	0	None	No	0.001254	Param Inter 1 of 2
Chloride (mg/L)	B-7R	77.6	n/a	10/13/2020	6.7J	No	15	B-26	50.42	12.19	0	None	No	0.001254	Param Inter 1 of 2
Field pH (Std. Units)	**B-11A**	**7.71**	**n/a**	**10/12/2020**	**7.74**	**Yes**	**15**	**B-26**	**7.329**	**0.1692**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Field pH (Std. Units)	**B-11B**	**7.71**	**n/a**	**10/12/2020**	**7.8**	**Yes**	**15**	**B-26**	**7.329**	**0.1692**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Field pH (Std. Units)	B-11R	7.71	n/a	10/12/2020	6.83	No	15	B-26	7.329	0.1692	0	None	No	0.001254	Param Inter 1 of 2
Field pH (Std. Units)	**B-31A**	**7.71**	**n/a**	**10/12/2020**	**7.78**	**Yes**	**15**	**B-26**	**7.329**	**0.1692**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Field pH (Std. Units)	B-31R	7.71	n/a	10/12/2020	6.89	No	15	B-26	7.329	0.1692	0	None	No	0.001254	Param Inter 1 of 2
Field pH (Std. Units)	B-7R	7.71	n/a	10/13/2020	6.35	No	15	B-26	7.329	0.1692	0	None	No	0.001254	Param Inter 1 of 2
Fluoride (mg/L)	B-11A	0.200	n/a	10/12/2020	0.28J	No	15	B-26	n/a	n/a	86.67	n/a	n/a	0.006613	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	B-11B	0.200	n/a	10/12/2020	0.095ND	No	15	B-26	n/a	n/a	86.67	n/a	n/a	0.006613	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	B-11R	0.200	n/a	10/12/2020	0.48ND	No	15	B-26	n/a	n/a	86.67	n/a	n/a	0.006613	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	B-31A	0.200	n/a	10/12/2020	0.18J	No	15	B-26	n/a	n/a	86.67	n/a	n/a	0.006613	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	B-31R	0.200	n/a	10/12/2020	0.48ND	No	15	B-26	n/a	n/a	86.67	n/a	n/a	0.006613	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	B-7R	0.200	n/a	10/13/2020	0.48ND	No	15	B-26	n/a	n/a	86.67	n/a	n/a	0.006613	NP Inter (NDs) 1 of 2
Sulfate (mg/L)	B-11A	44	n/a	10/12/2020	1J	No	15	B-26	31.51	5.598	0	None	No	0.001254	Param Inter 1 of 2
Sulfate (mg/L)	**B-11B**	**44**	**n/a**	**10/12/2020**	**388**	**Yes**	**15**	**B-26**	**31.51**	**5.598**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Sulfate (mg/L)	B-11R	44	n/a	10/12/2020	22.8	No	15	B-26	31.51	5.598	0	None	No	0.001254	Param Inter 1 of 2
Sulfate (mg/L)	B-31A	44	n/a	10/12/2020	16.8	No	15	B-26	31.51	5.598	0	None	No	0.001254	Param Inter 1 of 2
Sulfate (mg/L)	**B-31R**	**44**	**n/a**	**10/12/2020**	**49.4**	**Yes**	**15**	**B-26**	**31.51**	**5.598**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Sulfate (mg/L)	B-7R	44	n/a	10/13/2020	1.1ND	No	15	B-26	31.51	5.598	0	None	No	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	B-11A	553	n/a	10/12/2020	364	No	15	B-26	468.5	37.77	0	None	No	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	**B-11B**	**553**	**n/a**	**10/12/2020**	**906**	**Yes**	**15**	**B-26**	**468.5**	**37.77**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Total Dissolved Solids (mg/L)	**B-11R**	**553**	**n/a**	**10/12/2020**	**600**	**Yes**	**15**	**B-26**	**468.5**	**37.77**	**0**	**None**	**No**	**0.001254**	**Param Inter 1 of 2**
Total Dissolved Solids (mg/L)	B-31A	553	n/a	10/12/2020	300	No	15	B-26	468.5	37.77	0	None	No	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	B-31R	553	n/a	10/12/2020	462	No	15	B-26	468.5	37.77	0	None	No	0.001254	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	B-7R	553	n/a	10/13/2020	208	No	15	B-26	468.5	37.77	0	None	No	0.001254	Param Inter 1 of 2

Exceeds Limit: B-11A, B-11B, B-11R, B-31A, B-31R, B-7R

Boron

Interwell Parametric



Background Data Summary: Mean=45.05, Std. Dev.=12.03, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9463, critical = 0.825. Kappa = 2.269 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001254. Comparing 6 points to limit.

Prediction Limit

Constituent: Boron (ug/L) Analysis Run 1/14/2021 1:49 PM

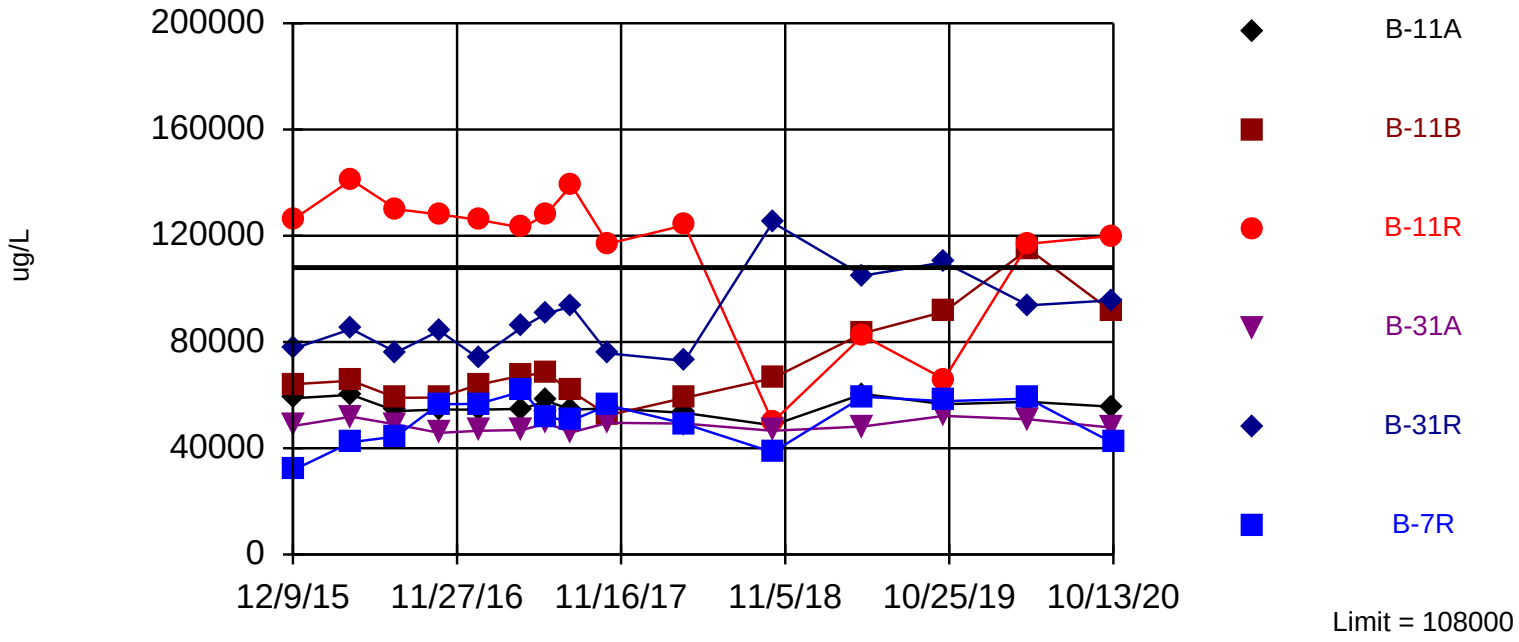
Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-31A	B-11R	B-31R	B-11B	B-7R	B-26 (bg)
12/9/2015	124	59	4170	851	1140	110	29.6
4/12/2016							33.7
4/13/2016	116	79.2	3410	838	1360	115	
7/18/2016						164	
7/19/2016	104	67.2	3530	641	1210		28.6
10/19/2016	112					154	
10/20/2016		63.7	4120	1020	1460		33
1/12/2017	106	76.4	3530	749	1540	159	35.2
4/17/2017	100	69.9	3520	929	1760	129	50.1
6/7/2017			3420			110	45.8
6/8/2017	102	58.5		895	1880		
8/1/2017	105	56.3	2040	1550	1800	129	
8/2/2017							54.6
10/19/2017	116	63.9	3120	645	1500	159	47.4
4/2/2018	91	74.8	3180	540	2020	121	
4/3/2018							48
10/8/2018							53.4
10/9/2018	94.2	71.8	576	1430	3620	73	
4/22/2019	93.9	86.2	1360	906	6830	93.5	
4/23/2019							41.6
10/14/2019	80.7	98.5	1440	915	4630	139	
10/15/2019							<3 (UX)
4/13/2020	86.3	132	2140	730	5380	96	
4/14/2020							66.1
10/12/2020	99.3	127	2870	702	3350		
10/13/2020						145	63.6

Exceeds Limit: B-11R

Calcium

Interwell Parametric



Background Data Summary: Mean=87371, Std. Dev.=9082, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9297, critical = 0.825. Kappa = 2.269 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001254. Comparing 6 points to limit.

Prediction Limit Analysis Run 1/14/2021 1:45 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Prediction Limit

Constituent: Calcium (ug/L) Analysis Run 1/14/2021 1:49 PM

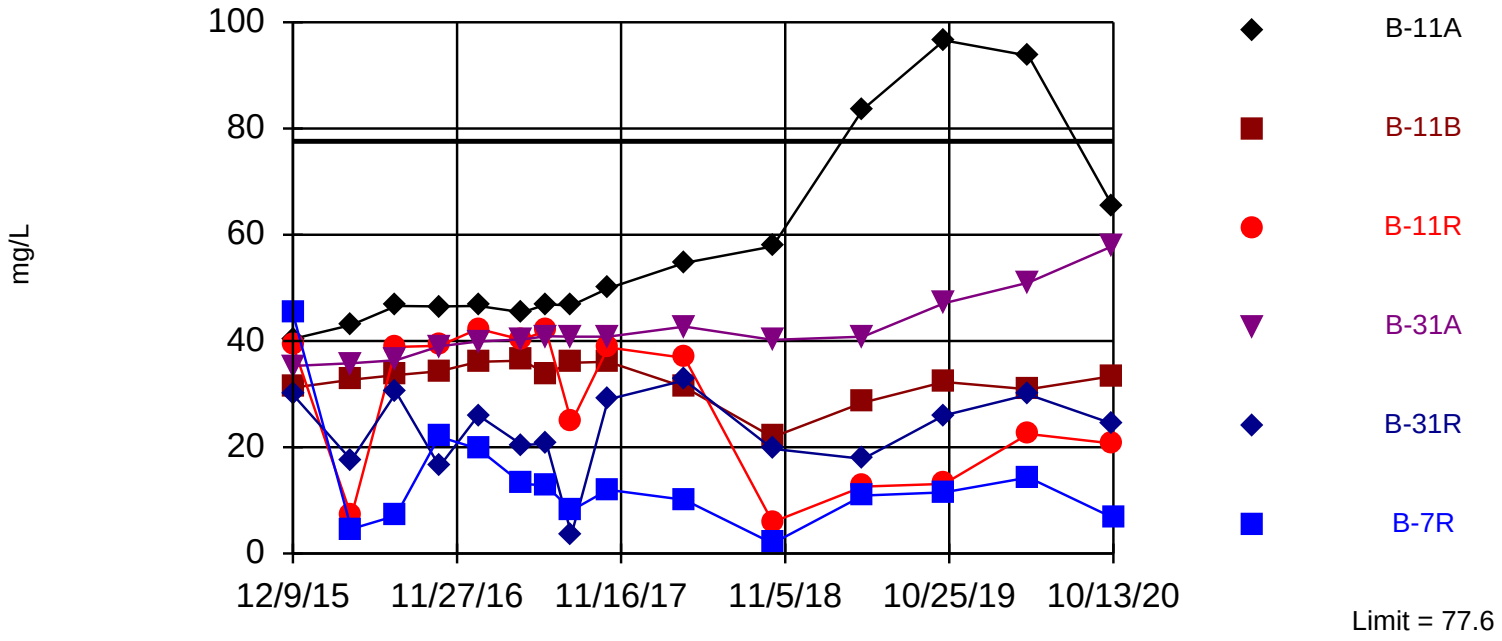
Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-31A	B-11R	B-31R	B-11B	B-7R	B-26 (bg)
12/9/2015	58800	48400	126000	77400	64100	31700	81300
4/12/2016							86200
4/13/2016	60100	51900	141000	84900	65400	42300	
7/18/2016						44400	
7/19/2016	54000	48900	130000	76100	59000		82400
10/19/2016	54600					56600	
10/20/2016		45800	128000	84200	59100		82700
1/12/2017	54500	46600	126000	73900	63900	56700	89400
4/17/2017	54800	46900	123000	85600	67400	61400	89000
6/7/2017			128000			51600	105000
6/8/2017	57800	49400		90700	68200		
8/1/2017	54500	46000	139000	93400	61400	50400	
8/2/2017							98100
10/19/2017	55000	49600	117000	75700	52400	56200	102000
4/2/2018	53300	49300	124000	72900	59000	49200	
4/3/2018							88100
10/8/2018							78700
10/9/2018	48600	46600	49900	125000	66300	38500	
4/22/2019	60400	48200	82400	105000	83300	59400	
4/23/2019							75300
10/14/2019	56600	52200	66000	110000	91400	57700	
10/15/2019							<76.2 (UX)
4/13/2020	57500	50900	117000	93800	115000	58700	
4/14/2020							88500
10/12/2020	55600	47700	120000	95700	91200		
10/13/2020						41900	76500

Within Limit

Chloride

Interwell Parametric



Background Data Summary: Mean=50.42, Std. Dev.=12.19, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9076, critical = 0.835. Kappa = 2.228 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001254. Comparing 6 points to limit.

Prediction Limit Analysis Run 1/14/2021 1:45 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 1/14/2021 1:49 PM

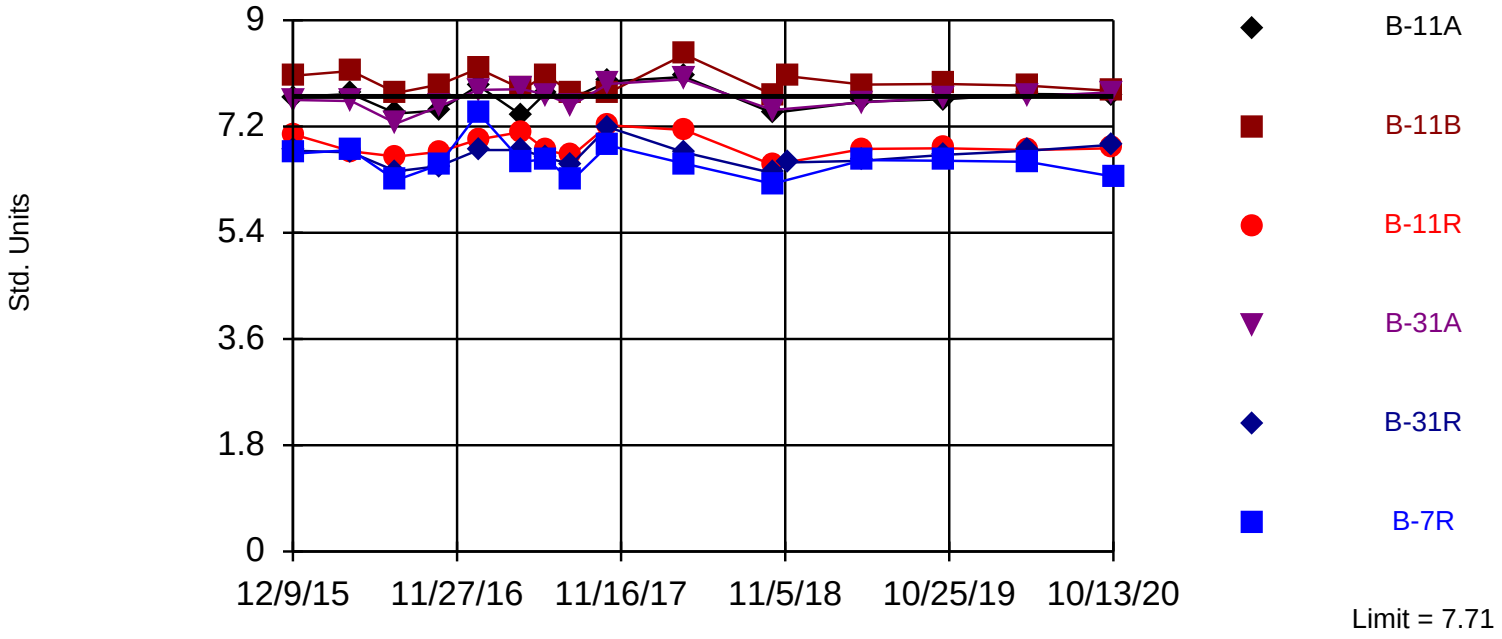
Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-26 (bg)	B-31R	B-11R	B-7R	B-11B	B-31A
12/9/2015	40.4	45.5	29.9	39.2	45.2	31.2	35.3
4/12/2016		51.3					
4/13/2016	43		17.6	7	4.6	32.7	35.8
7/18/2016					7.1		
7/19/2016	46.6	55.6	30.3	38.9		33.6	36.4
10/19/2016	46.5				22		
10/20/2016		52.8	16.4	39.1		34.3	39
1/12/2017	46.6	54.5	26	42.3	19.7	36.1	39.9
4/17/2017	45.4	56	20.4	40.2	13.1	36.3	40.3
6/7/2017		59.6		42	12.8		
6/8/2017	46.9		20.7			33.9	40.9
8/1/2017	46.7		3.6	24.7	8.1	35.9	40.8
8/2/2017		52.6					
10/19/2017	49.9	79.3	29	38.8	12	36.1	40.8
4/2/2018	54.7		32.6	36.8	10.1	31.3	42.7
4/3/2018		54.4					
10/8/2018		33.2					
10/9/2018	57.8		19.7	5.9	1.9 (J)	21.9	40.2
4/22/2019	83.6		17.8	12.6	10.9	28.4	40.8
4/23/2019		40.8					
10/14/2019	96.6		26	13.1	11.5	32.3	47.1
10/15/2019		30.5					
4/13/2020	93.7		29.9	22.5	14.3	30.9	51
4/14/2020		54.9					
10/12/2020	65.3		24.4	20.7		33.4	57.9
10/13/2020		35.3			6.7 (J)		

Exceeds Limit: B-11A, B-11B, B-31A

Field pH

Interwell Parametric



Background Data Summary: Mean=7.329, Std. Dev.=0.1692, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9265, critical = 0.835. Kappa = 2.228 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001254. Comparing 6 points to limit.

Prediction Limit Analysis Run 1/14/2021 1:45 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Prediction Limit

Constituent: Field pH (Std. Units) Analysis Run 1/14/2021 1:49 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

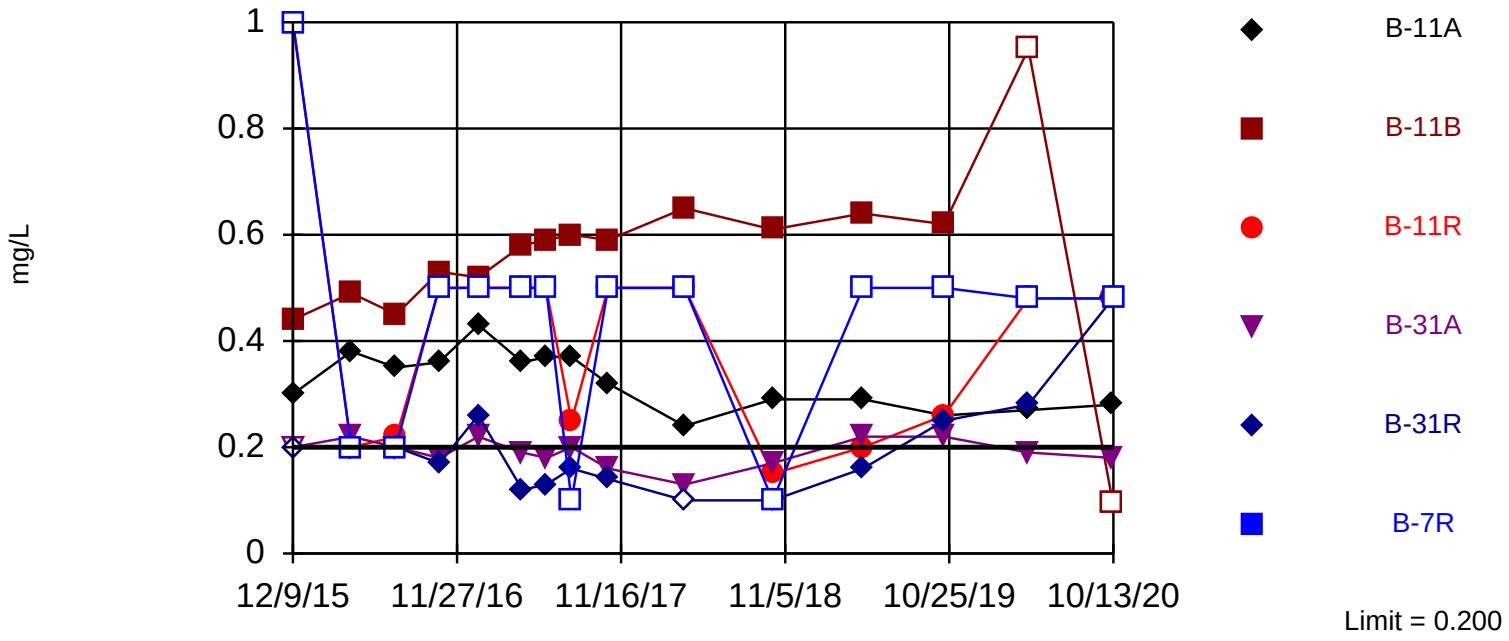
	B-11A	B-26 (bg)	B-31R	B-11R	B-7R	B-11B	B-31A
12/9/2015	7.7	7.35	6.79	7.07	6.74	8.06	7.65
4/12/2016		7.43					
4/13/2016	7.75		6.76	6.78	6.8	8.14	7.63
7/18/2016					6.29		
7/19/2016	7.42	7.14	6.44	6.69		7.77	7.25
10/19/2016	7.47				6.55		
10/20/2016		7.19	6.53	6.77		7.91	7.54
1/12/2017	7.89	7.57	6.8	6.98	7.43	8.18	7.82
4/17/2017	7.38	7.54	6.8	7.11	6.6	7.83	7.83
6/7/2017		7.22		6.8	6.65		
6/8/2017	7.78		6.67			8.07	7.74
8/1/2017	7.67		6.56	6.7	6.28	7.77	7.56
8/2/2017		7.21					
10/19/2017	7.96	7.5	7.19	7.22	6.88	7.77	7.92
4/2/2018	8.04		6.76	7.14	6.57	8.42	8
4/3/2018		7.64					
10/8/2018		7.2					
10/9/2018	7.43		6.41	6.55	6.23	7.74	7.48
11/12/2018			6.59			8.05	
4/22/2019	7.62		6.62	6.82	6.63	7.91	7.61
4/23/2019		7.1					
10/14/2019	7.66		6.72	6.83	6.62	7.92	7.69
10/15/2019		7.24					
4/13/2020	7.75		6.79	6.8	6.6	7.89	7.71
4/14/2020		7.27					
10/12/2020	7.74		6.89	6.83		7.8	7.78
10/13/2020		7.34			6.35		

Hollow symbols indicate censored values.

Within Limit

Fluoride

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 15 background values. 86.67% NDs. Annual per-constituent alpha = 0.07653. Individual comparison alpha = 0.006613 (1 of 2). Comparing 6 points to limit.

Prediction Limit Analysis Run 1/14/2021 1:45 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 1/14/2021 1:49 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

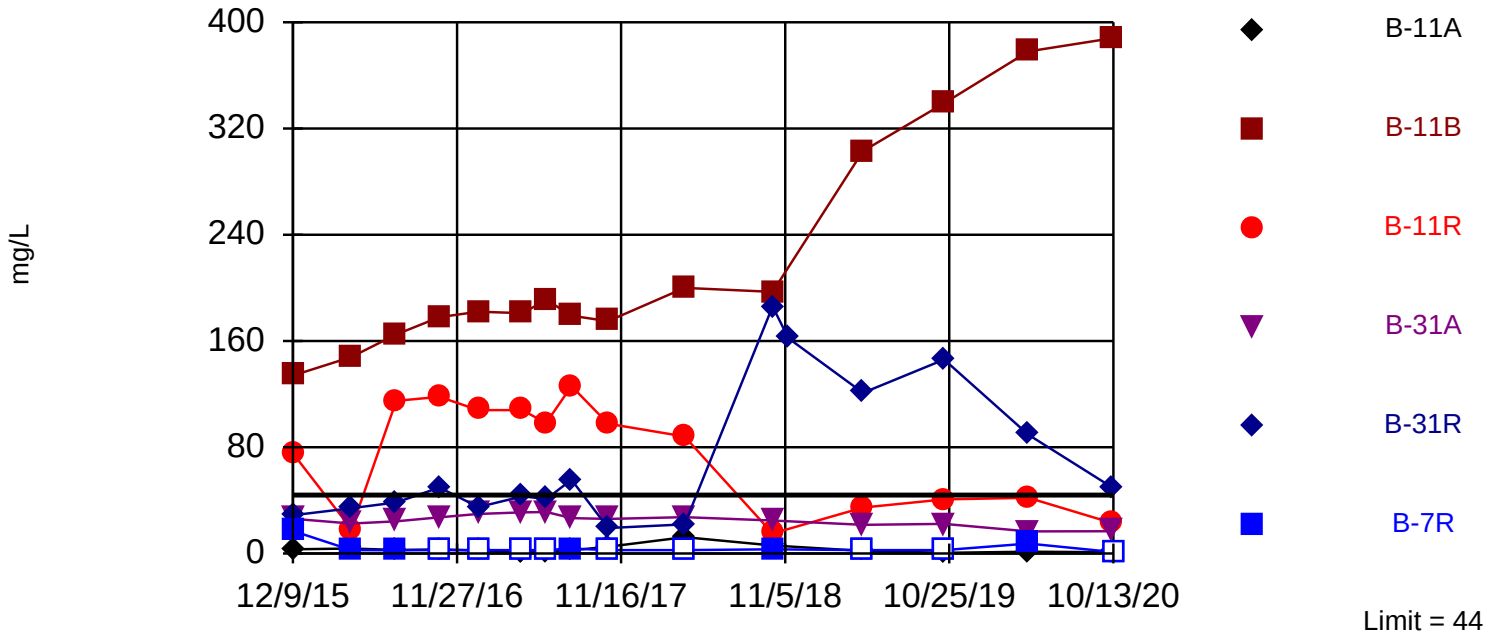
	B-11A	B-26 (bg)	B-31R	B-11R	B-7R	B-11B	B-31A
12/9/2015	0.3 (J)	<0.2 (U)	<0.2 (U)	<1 (U)	<1 (U)	0.44	<0.2 (U)
4/12/2016		<0.2 (U)					
4/13/2016	0.38 (J)		<0.2 (U)	<0.2 (U)	<0.2 (U)	0.49	0.22 (J)
7/18/2016					<0.2 (U)		
7/19/2016	0.35 (J)	<0.2 (U)	<0.2 (U)	0.22 (J)		0.45	<0.2 (U)
10/19/2016	0.36				<0.5 (U)		
10/20/2016		0.13 (J)	0.17 (J)	<0.5 (U)		0.53	0.18 (J)
1/12/2017	0.43	<0.1 (U)	0.26 (J)	<0.5 (U)	<0.5 (U)	0.52	0.22 (J)
4/17/2017	0.36	<0.1 (U)	0.12 (J)	<0.5 (U)	<0.5 (U)	0.58	0.19 (J)
6/7/2017		<0.1 (U)		<0.5 (U)	<0.5 (U)		
6/8/2017	0.37		0.13 (J)			0.59	0.18 (J)
8/1/2017	0.37		0.16 (J)	0.25 (J)	<0.1 (U)	0.6	0.2 (J)
8/2/2017		<0.1 (U)					
10/19/2017	0.32	<0.1 (U)	0.14 (J)	<0.5 (U)	<0.5 (U)	0.59	0.16 (J)
4/2/2018	0.24 (J)		<0.1 (U)	<0.5 (U)	<0.5 (U)	0.65	0.13 (J)
4/3/2018		<0.1 (U)					
10/8/2018		<0.1 (U)					
10/9/2018	0.29 (J)		<0.1 (U)	0.15 (J)	<0.1 (U)	0.61	0.17 (J)
4/22/2019	0.29 (J)		0.16 (J)	0.2 (J)	<0.5 (U)	0.64	0.22 (J)
4/23/2019		<0.1 (U)					
10/14/2019	0.26 (J)		0.25 (J)	0.26 (J)	<0.5 (U)	0.62	0.22 (J)
10/15/2019		<0.1 (U)					
4/13/2020	0.27 (J)		0.28 (J)	<0.48 (U)	<0.48 (U)	<0.95 (U)	0.19 (J)
4/14/2020		0.11 (J)					
10/12/2020	0.28 (J)		<0.48 (U)	<0.48 (U)		<0.095 (U)	0.18 (J)
10/13/2020		<0.095 (U)			<0.48 (U)		

Hollow symbols indicate censored values.

Exceeds Limit: B-11B, B-31R

Sulfate

Interwell Parametric



Background Data Summary: Mean=31.51, Std. Dev.=5.598, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9132, critical = 0.835. Kappa = 2.228 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001254. Comparing 6 points to limit.

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 1/14/2021 1:49 PM

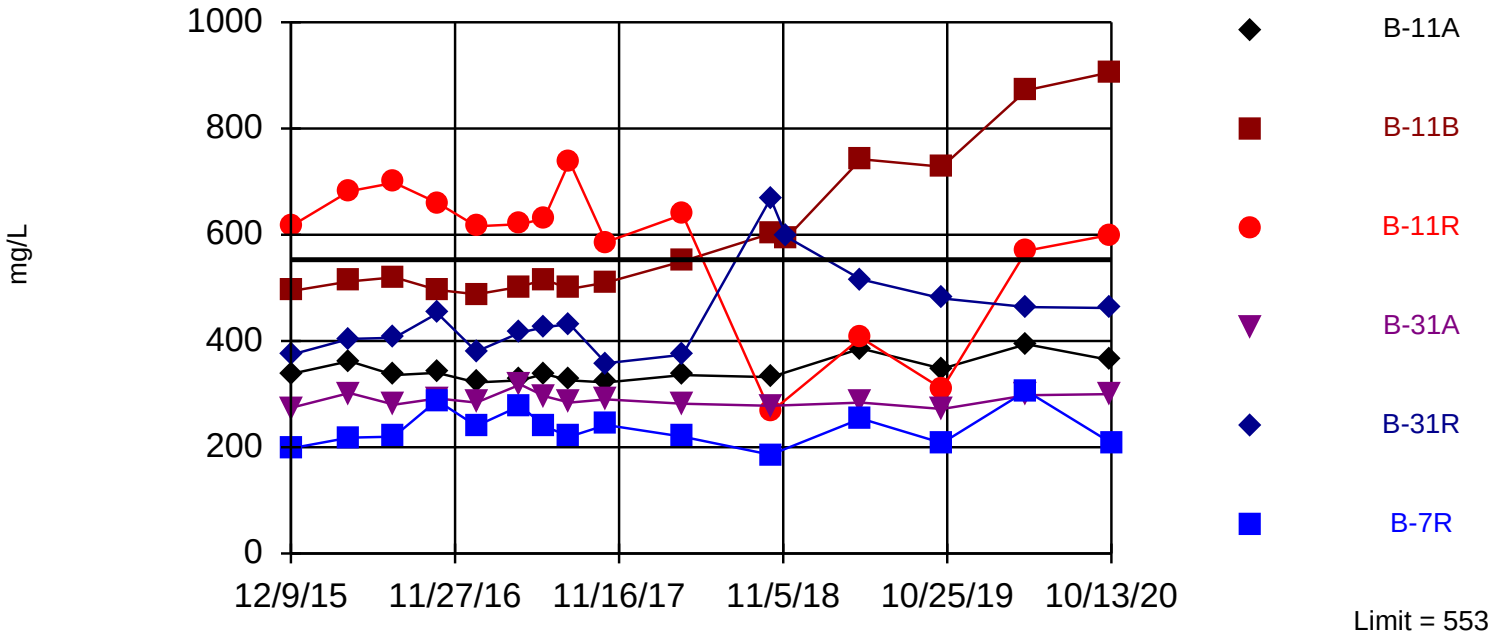
Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-26 (bg)	B-31R	B-11R	B-7R	B-11B	B-31A
12/9/2015	3.2 (J)	37.1	28.8	75.4	17 (J)	134	26.2
4/12/2016		38					
4/13/2016	3.8 (J)		34.1	18.4	2.5 (J)	148	22.6
7/18/2016					2.4 (J)		
7/19/2016	2.7 (J)	36.2	38.5	115		165	24.2
10/19/2016	3 (J)				<5 (U)		
10/20/2016		35	49.7	118		178	27.2
1/12/2017	2.3 (J)	35	34.9	108	<5 (U)	182	29.8
4/17/2017	<1 (U)	32.4	43	108	<5 (U)	181	31
6/7/2017		31		98.2	<5 (U)		
6/8/2017	1.4 (J)		41.1			191	31.2
8/1/2017	2.4 (J)		55.6	126	3.7	179	26.6
8/2/2017		28.5					
10/19/2017	5.1	25.3	19.2	97.7	<5 (U)	175	26.1
4/2/2018	12.3		22	88.1	<5 (U)	200	27.4
4/3/2018		19.1					
10/8/2018		25.1					
10/9/2018	6		186	15.1	3.2	197	24.8
11/12/2018			162				
4/22/2019	1.9 (J)		121	34.6	<5 (U)	303	21.6
4/23/2019		26.7					
10/14/2019	<1 (U)		146	40.7	<5 (U)	339	22.3
10/15/2019		36					
4/13/2020	1.4 (J)		89.4	41.9	7.5 (J)	378	16.6
4/14/2020		30.2					
10/12/2020	1 (J)		49.4	22.8		388	16.8
10/13/2020		37			<2.2 (U)		

Exceeds Limit: B-11B, B-11R

Total Dissolved Solids

Interwell Parametric



Background Data Summary: Mean=468.5, Std. Dev.=37.77, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9236, critical = 0.835. Kappa = 2.228 (c=7, w=6, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001254. Comparing 6 points to limit.

Prediction Limit Analysis Run 1/14/2021 1:45 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 1/14/2021 1:49 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-26 (bg)	B-31R	B-11R	B-7R	B-11B	B-31A
12/9/2015	338	424	374	616	198	494	274
4/12/2016		456					
4/13/2016	362		404	682	218	512	302
7/18/2016					220		
7/19/2016	336	504	406	698		520	280
10/19/2016	340				288		
10/20/2016		466	452	660		496	292
1/12/2017	322	446	380	616	240	488	284
4/17/2017	326	468	416	620	278	502	318
6/7/2017		538		630	240		
6/8/2017	338		426			516	296
8/1/2017	326		432	738	220	498	284
8/2/2017		496					
10/19/2017	322	542	358	586	242	510	290
4/2/2018	336		374	638	220	550	282
4/3/2018		464					
10/8/2018		450					
10/9/2018	332		668	266	186	602	278
11/12/2018			596			594	
4/22/2019	386		516	406	254	742	284
4/23/2019		458					
10/14/2019	348		480	310	208	728	272
10/15/2019		404					
4/13/2020	394		464	570	306	872	298
4/14/2020		464					
10/12/2020	364		462	600		906	300
10/13/2020		448			208		

Appendix F

Alternative Source Demonstration Reports

F1 Alternative Source Demonstration, October 2020 Detection Monitoring

F2 Alternative Source Demonstration, April 2021 Detection Monitoring

F1 Alternative Source Demonstration, October 2020 Detection Monitoring

Alternative Source Demonstration
October 2020 Detection Monitoring

Slag Pond
Nelson Dewey Generating Station
Cassville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25221071.00 | April 15, 2021

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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Tables

Figures

Appendices

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PE CERTIFICATION

I, Sherren Clark, hereby certify that that the information in this alternative source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Nelson Dewey Generating Station Slag Pond facility. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

SC Clark 4-15-2021

(signature) (date)

Sherren Clark

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2022.

Pages or sheets covered by this seal:

Alternative Source Demonstration, October 2020
Detection Monitoring – Slag Pond
Nelson Dewey Generating Station, Cassville
(Entire Document)

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.94(e)(2). The applicable sections of the Rule are provided below in *italics*.

1.1 §257.94(E)(2) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

The owner and operator may demonstrate that a source other than the CCR Unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program. The ASD is completed to determine if any other sources are likely causes of the identified exceedance(s) of established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSIs observed in the statistical evaluation of the October 2020 detection monitoring event at the Nelson Dewey Generating Station (NED). The first ASD was prepared for this facility evaluating the SSIs observed in the statistical evaluation of the October 2017 detection monitoring event (SCS Engineers [SCS], 2018). The October 2017 ASD and subsequent semiannual updates have concluded that several lines of evidence demonstrate that SSIs reported for Appendix III parameters in the downgradient monitoring wells were likely due to man-made sources other than the slag pond CCR unit and/or naturally occurring constituents in the alluvial aquifer. The conclusions of this ASD are consistent with previous ASDs.

1.2 SITE INFORMATION AND MAP

The NED site is located along the east bank of the Mississippi River, north of the Village of Cassville, in Grant County, Wisconsin (**Figure 1**). The facility includes a decommissioned coal fired generating plant, a CCR landfill that was closed in 2001, a closed Slag Pond, and a closed wastewater treatment pond. The layout of the site on an aerial photograph base is shown on **Figure 2**. The closed landfill at NED facility was permitted under Wisconsin Department of Natural Resources (WDNR) License #02525.

The existing CCR unit evaluated for this ASD is:

- Slag Pond (existing surface impoundment – closed January 2018)

A map showing the CCR unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program and the state monitoring program is provided as **Figure 3**.

Operations at the facility began in the late 1950s, and a CCR impoundment that included what is now the Slag Pond closure area was commissioned at that time. The CCR landfill was initially licensed in 1976 and received fly ash from NED until it was closed in phases between 1996 and 2001. The CCR landfill was initially operated as a fly ash sluice basin, then transitioned to dry ash placement prior to closure. The wastewater ponds, now closed, were constructed in 1976 for the purpose of settling CCR from the NED process wastewater streams and sediment from storm water runoff prior to discharge. Both NED generating units were retired on December 31, 2015, and have since been decommissioned. The generating station was demolished in 2017. Closure of the slag pond was completed in January 2018.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

The statistical evaluation was completed in accordance with 40 CFR 257.93(f)(3) using a prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit (UPL). The initial evaluation was based on an interwell comparison. The UPLs were calculated based on a 1-of-2 resampling approach. The UPLs and the analytical results for the October 2020 monitoring event are summarized in the attached **Table 1**.

The initial evaluation indicated that the October 2020 monitoring event results represent a statistically significant increase (SSI) over background for the following parameters and wells:

- Boron: B-7R, B-11A, B-11B, B-11R, B-31A, B-31R
- Calcium: B-11R
- pH: B-11A, B-11B and B-31A
- Sulfate: B-11B, B-31R
- Total Dissolved Solids (TDS): B-11B, B-11R

The SSIs are consistent with SSIs identified in previous detection monitoring results, with the exception of the calcium SSI observed at B-11R. Although the UPLs were calculated based on a 1-of-2 resampling approach, optional retesting for the October 2020 event was not conducted, and the determination of SSIs is based solely on the October results.

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION APPROACH

This ASD report includes:

- Background information (**Section 2.0**)
- Evaluation of potential that SSIs are due to methodology or analysis (**Section 3.0**)
- Evaluation of potential that SSIs are due to natural sources or man-made sources other than the CCR Units (**Section 4.0**)
- ASD conclusions (**Section 5.0**)
- Monitoring recommendations (**Section 6.0**)

Historical monitoring results from background and compliance sampling for the CCR Rule constituents with SSIs are provided in **Table 2**. The laboratory report for the October 2020 event was included in the 2020 Annual Groundwater Monitoring and Corrective Action report completed in January 2021. Complete laboratory reports for the background monitoring events and previous detection monitoring events were included in the previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

To provide context for the ASD evaluation, the following background information is provided in this section of the report, prior to the ASD evaluation sections:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells

A more detailed discussion of the background information for the site is provided in the ASD for the October 2017 event (SCS, 2018).

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Information

The uppermost geologic formation beneath the NED site is the surficial alluvial aquifer. The alluvial aquifer consists of Mississippi River valley sand and gravel deposits, and is the uppermost aquifer as defined in section 257.53 of the CCR Rule. This deposit is prevalent along the edges of the entire Mississippi River valley in southwestern Wisconsin.

The alluvial aquifer is underlain by dolomitic bedrock of the Prairie du Chien Group. The dolomite bedrock is also an aquifer and is likely hydraulically connected to the alluvial aquifer above.

Regionally, groundwater flow is generally to the southwest and discharges to the Mississippi River.

Additional details on the regional geology were provided in the October 2017 ASD (SCS, 2018).

2.1.2 Site Information

The thickness of the alluvium in the immediate vicinity of the site is over 125 feet, as evidenced by local water supply well logs (SCS, 2018). These logs are also evidence that the alluvial aquifer yields useable quantities of groundwater for supply wells in the area. Soil boring logs for monitoring wells installed at the site also generally indicate sand and gravel soils within the monitored depths.

The groundwater flow direction in the vicinity of the plant is generally southwest toward the Mississippi River. Historically, infiltration at the former Slag Pond, former fly ash basin, and the former Wisconsin Pollutant Discharge Elimination System (WPDES) ponds caused groundwater mounding to be present around these features; however, these ponds have now all been closed and are no longer sources of infiltration.

Site water level measurements generally indicate that groundwater flow is to the southwest, discharging to the Mississippi River. However, during periods of high river water levels, the flow temporarily reverses and the river discharges to the shallow sand and gravel aquifer. The groundwater flow direction during the October 2020 detection monitoring event was toward the Mississippi River with flow moving south to southwest (**Figure 4**). The groundwater elevations are provided in **Table 3**.

2.2 COAL COMBUSTION RESIDUALS RULE MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of one upgradient (background) monitoring well and six downgradient monitoring wells. The background

well is B-26. The downgradient wells include B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R. The CCR Rule wells are installed within the surficial alluvium aquifer. Well depths range from approximately 23 to 114 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

There are several additional groundwater monitoring wells at the NED facility that are part of the monitoring system developed for the state monitoring program. All of the wells included in the CCR monitoring well network were already in use for the state monitoring program. The well locations are shown on Figure 3. The state program monitoring wells and two private wells are used to monitor groundwater conditions at the site under WDNR License Number 2525, which includes the closed CCR landfill (former fly ash settling basin) and the closed Slag Pond. Monitoring wells for the state monitoring program are installed in the surficial sand and gravel aquifer which is the uppermost aquifer as defined under 40 CFR 257.53.

3.0 METHODOLOGY AND ANALYSIS REVIEW

To evaluate the potential that an SSI is due to a source other than the regulated CCR unit, SCS used a two-step evaluation process. First, the sample collection, field and laboratory analysis, and statistical evaluation were reviewed to identify any potential error or analysis that led to an exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. Section 4.0 of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS REVIEW

Field notes and sampling results were reviewed to determine if any sampling error may have caused or contributed to the observed SSIs. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross contamination during sampling, or other field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers. Based on the review of the field notes and results, SCS did not identify any indication that the SSIs were due to a sampling error.

For field pH, the readings for which an SSI was indicated (B-11A, B-11B, and B-31A samples) exceeded the UPL by only 0.03 to 0.09 pH units. This is within the accuracy range for the YSI pH meter, which is +/- 0.2 pH units. Therefore, the true field pH may or may not have exceeded the UPL and normal instrument error may have contributed to the reported SSI. Because the field pH exceedance of the UPL was well within the range of the instrument accuracy, it cannot be concluded with a high degree of certainty that the true field pH exceeds the UPL.

SCS did not identify any other issues with the field sampling for field analysis based on review of the data and field notes. Because boron, calcium, TDS, and sulfate are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the October 2020 detection monitoring events were reviewed to evaluate whether any laboratory analysis error or issue may have caused or contributed to the observed SSIs. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results. Laboratory reports for the background monitoring

events were reviewed for the October 2017 ASD. Laboratory reports for subsequent detection monitoring events were reviewed as part of the ASD preparation for each event.

Based on the review of the laboratory reports, SCS did not identify any indication that any SSI was due to a laboratory analysis error. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for detection monitoring.

Time series plots of the SSI constituent analytical data were also reviewed for any anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). The time series plots are provided in Appendix A. None of the time series plots included anomalous results that appeared to indicate a sampling or laboratory error.

3.3 STATISTICAL EVALUATION REVIEW

The review of the statistical results and methods included a quality control check of the following:

- Input analytical data vs. laboratory analytical reports
- Statistical method and process for each SSI

Based on the review of the statistical evaluation, SCS did not identify any errors or issues in the statistical evaluation that caused or contributed to the determination of interwell SSIs for boron, calcium, pH, sulfate, and TDS at the downgradient monitoring wells.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the October 2020 detection monitoring events based on the methodology and analysis review; however, measurement error could have caused or contributed to the field pH SSIs. The field pH results at B-11A, B-11B, and B-31A were found to be above the UPL, but the differences between the UPL and the well results were within the range of the instrument accuracy. No other errors or issues causing or contributing to the reported SSIs were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the SSI constituents at the downgradient wells, identifies the most likely alternative source(s), and presents the lines of evidence indicating that an alternative source is the most likely cause of the observed SSIs.

4.1 POTENTIAL CAUSES OF STATISTICALLY SIGNIFICANT INCREASES

4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the October 2020 detection monitoring results to the upper prediction limits (UPLs) calculated based on sampling of the background well (B-26). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron, sulfate and TDS SSIs. These parameters were detected at higher concentrations than would likely be present naturally.

Natural variation may have caused or contributed to the SSI for calcium at B-11R. . As discussed in Section 2.1.1, the alluvial aquifer is underlain by dolomitic bedrock of the Prairie du Chien Group. The dolomite aquifer is also present in the bluffs northeast of the site and groundwater from the dolomite likely discharges to the alluvial aquifer. Calcium is a typical constituent of groundwater in dolomite aquifers. The calcium concentrations in upgradient well B-26 have exceeded those in at least three of the downgradient wells, suggesting that natural variability may contribute to the calcium concentrations observed in the downgradient monitoring wells.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, calcium, pH, sulfate, and TDS SSIs could include the closed CCR landfill, the coal storage area, or other plant operations. Based the groundwater flow directions and on previous investigations at the site, the closed landfill appears to be the most likely man-made cause of the SSIs for the downgradient wells B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSIs for boron, calcium, pH, sulfate, and TDS in one or more compliance wells relative to the background well are more likely due to the closed landfill and prior fly ash sluicing than to the Slag Pond include:

1. A previous Environmental Contamination Assessment completed for the ash disposal facility indicated that the fly ash sluicing and landfill were the primary source of the groundwater impacts in the area, based on multiple lines of evidence.

2. Sampling performed in preparation for the Slag Pond closure indicated that the slag and the Slag Pond sediment had little potential to cause the SSIs for boron, sulfate, and TDS.

3. Past and current groundwater monitoring performed under the state monitoring program shows that groundwater quality has improved since the 1990s in response to termination of fly ash sluicing and closure, and capping of the ash landfill. Recent concentration increases at some wells in the state monitoring program appear to be attributable to the closed CCR landfill source and to changes in groundwater flow at the site in response to closure of the Slag Pond.

The data supporting these lines of evidence are discussed below. Most of these lines of evidence and the supporting data were discussed in detail in the ASD for the October 2017 detection monitoring event (SCS, 2018), with the exception of the TDS SSI concentrations. For lines of evidence included in previous ASDs, the discussion focuses on any updated information collected since the previous ASD, with references to the previous ASD for additional details.

4.2.1 Previous CCR Pond and Landfill Study

A previous investigation titled *Environmental Contamination Assessment: Nelson Dewey Generating Station Ash Disposal Facility*, completed by RMT in 1994, found that groundwater impacts were associated with disposal of fly ash in the now-closed CCR landfill located immediately north of the Slag Pond (Figure 3). The purpose of the 1994 Environmental Contamination Assessment (ECA) was

to investigate the impacts to groundwater at the NED landfill. The ECA was used to evaluate feasibility of possible remedial alternatives. The remedial alternative that was ultimately selected was to convert the plant to dry fly ash handling.

The primary lines of evidence from the 1994 report that support the current ASD for boron, pH, sulfate, and TDS include:

- Water leaching tests for ash and slag indicated that boron and sulfate concentrations in the slag leachate were orders of magnitude lower than in the ash leachate (**Appendix B**, **Table 5**).

- Surface water samples from the then active ash sluice pond and the Slag Pond indicated that boron and sulfate concentrations in the Slag Pond were one or more orders of magnitude lower than in the ash sluice pond. The surface water pH measurement was also higher in the ash sluice pond. The surface water boron and sulfate concentrations in the Slag Pond were higher than leach test results, which was attributed to infiltration of ash sluice pond water through the berm between the ponds into the Slag Pond (**Appendix B**, **Table 6**).

- Groundwater sampling at monitoring wells B-38 and B-38A (now abandoned), which were installed through and screened below the ash disposal area (now closed landfill), indicated that groundwater affected by ash sluicing was characterized by high pH and elevated concentrations of boron, sulfate, and TDS (**Appendix B**, **Site Map** and **Table 8**).

Although calcium was not included in the historical state groundwater monitoring program or evaluated in the 1994 report, hardness was monitored and provides an indication of relative calcium concentrations. Surface water samples from the then active ash sluice pond and the Slag Pond indicated that hardness in the Slag Pond was lower than in the ash sluice pond (**Appendix B**, **Table 6**). These results suggest that if the calcium SSI is not solely due to natural variation, then the closed CCR landfill is the most likely man-made source of calcium.

The results of the 1994 ECA were reported to WDNR on November 1994. The ECA investigation was then used for a feasibility study to determine appropriate ash disposal operation on site. Following the ECA, the plant converted to a dry ash handling system. Dry ash was placed in the CCR landfill through the 1990s, and the landfill was capped and closed in phases in 1996 through 2001. After that time, fly ash was not disposed of at the facility.

4.2.2 Slag Pond Closure Sampling Results

Results of leaching test analysis performed for slag, ash, soil, and sediment were submitted as part of a Low Hazard Exemption Request to the WDNR in March 2017 (SCS, 2017). The Exemption Request was submitted as part of the Closure Plan for the site and requested WDNR approval to consolidate materials from decommissioning activities in the Slag Pond and Slag Handling Area, which would then be capped with a composite final cover system. The sediment and soil samples were collected to characterize the materials that would remain on site under the Closure Plan. Leaching tests were performed using ASTM water leach test methods. The leaching test analytical results for parameters with SSIs that were included in the leaching test program (boron, sulfate, and TDS) are summarized in **Appendix C**.

The sampling results in the Exemption Request indicated that the materials to be consolidated and capped were not likely to cause groundwater standard exceedances for boron, sulfate, or TDS. The

leach test results for slag, Slag Pond sediment, and soil in the Slag Handling Area were below the state groundwater standards for boron and sulfate. The parameter TDS does not currently have a state standard but the leach test results for slag, Slag Pond sediment, and soil in the Slag Handling Area were all below the calculated TDS UPL for the site (**Table 1** and **Appendix C**). The results were also below the concentrations of boron, sulfate, and TDS in the downgradient CCR wells with SSIs, and well below the historical results for former well B-38, which was located within the CCR landfill area, upgradient from the Slag Pond (**Appendix B, Table 8**).

The Low Hazard Exemption was granted by the WDNR based on the sampling results and other information presented.

4.2.3 State Program Groundwater Monitoring Results

Past and current groundwater monitoring performed under the state monitoring program shows that groundwater quality has improved substantially since the 1990s in response to termination of fly ash sluicing, and closure and capping of the ash landfill (SCS, 2018). The long-term trends show that concentrations of boron and sulfate in groundwater have decreased or stabilized since termination of fly ash sluicing and closure of the landfill, in some cases by an order of magnitude or more. The results suggest that current boron, sulfate, and pH levels likely represent residual contamination from historical ash disposal in the CCR landfill area. Increasing boron and sulfate concentrations at B-11B appear to be attributable to the closed CCR landfill and to changes in groundwater flow at the site, related to a decrease in the volume of water discharged to the Slag Pond and subsequent closure of the Slag Pond. A summary of state analytical groundwater results is provided in **Table 4**.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, calcium, pH, sulfate, and TDS results in downgradient monitoring wells demonstrate that the SSIs are likely primarily due to sources other than the closed Slag Pond. The SSIs for boron, sulfate, and TDS appear to be due to historical ash disposal in the closed CCR landfill, which is not subject to the requirements of 40 CFR 257.50-107. The landfill is regulated by the WDNR under the solid waste program (License 02525). The SSIs for pH may reflect instrument error, given that the results exceed the UPL by less than the stated instrument accuracy range, and/or may also be associated with the closed CCR landfill. The SSI for calcium at B-11R may reflect natural variation in the aquifer at and near the site and/or may also be associated with the closed CCR landfill.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the NED Slag Pond site may continue with detection monitoring based on this ASD. The ASD report will be included in the 2021 Annual Report due January 31, 2022.

7.0 REFERENCES

RMT, 1994, Environmental Contamination Assessment: Nelson Dewey Generating Station Ash Disposal Facility, November 1994.

SCS Engineers, 2017, Low Hazard Exemption Request, Nelson Dewey Generating Station, Cassville, WI, March 2017.

SCS Engineers, 2018, 2017 Alternative Source Demonstration, October 2017 Monitoring Event, Nelson Dewey Generating Station, April 2018.

U.S. Environmental Protection Agency (USEPA), 2015, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, April 2015.

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Tables

Table 1. Groundwater Analytical Results Summary - October 2020 Event
Nelson Dewey Slag Pond, Cassville, WI / SCS Engineers Project #25221071.00

Parameter Name	UPL	Background Well	Compliance Wells					
		B-26	B-7R	B-11A	B-11B	B-11R	B-31A	B-31R
		10/13/2020	10/13/2020	10/12/2020	10/12/2020	10/12/2020	10/12/2020	10/12/2020
Appendix III								
Boron, ug/L	72.3	63.6	145	99.3	3,350	2,870	127	702
Calcium, ug/L	108,000	76,500	41,900	55,600	91,200	120,000	47,700	95,700
Chloride, mg/L	77.6	35.3	6.7 J , D3	65.3	33.4	20.7	57.9	24.4
Fluoride, mg/L	0.2	<0.95 M0	<0.48 D3	0.28 J	<0.095	<0.48 D3	0.18 J	<0.48 D3, M0
Field pH, Std. Units	7.71	7.34	6.35	7.74	7.80	6.83	7.78	6.89
Sulfate, mg/L	44.0	37	<2.2 D3	1.00 J	388	22.8	16.8	49.4
Total Dissolved Solids, mg/L	553	448	208	364	906	600	300	462

7.81 Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:

UPL = Upper Prediction Limit
SSI = Statistically Signficant Increase
LOQ = Limit of Quantitation
LOD = Limit of Detection
ug/L = micrograms per liter
mg/L = milligrams per liter

Lab Notes:

J = Estimated concentration at or above the LOD and below the LOQ.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M0 = Matrix Spike recovery and/or matric spike duplicate recovery was outside laboratory control limits.

Notes:

1. An individual result above the UPL may not constitute an SSI above background. See the accompanying letter text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background well B-26. UPLs are based on a 1-of-2 retesting approach. UPLs updated January 2021 based on background well results from December 2015 through October 2020.

Created by: ZTW Date: 6/4/2020
Last revision by: SCC Date: 1/14/2021
Checked by: NDK Date: 1/14/2021
Proj Mgr QA/QC/Scientist: Tk Date: 4/10/2021

I:\25221071.00\Deliverables\2020 October ASD NED\Tables\[Table 1_CCR GW Screening Summary_NED-Updated.xlsx]Current Event - Updated UPL

Table 2. Historical Analytical Results for Parameters with SSIs
Nelson Dewey Generating Station - Cassville, Wisconsin / SCS Engineers Project #25221071.00

Well Group	Well	Collection Date	Boron (µg/L)	Calcium (mg/L)	Chloride (mg/L)	Field pH (Std. Units)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Background	B-26	12/9/2015	29.6	81,300	45.5	7.35	37.1	424
		4/12/2016	33.7	86,200	51.3	7.43	38.0	456
		7/19/2016	28.6	82,400	55.6	7.14	36.2	504
		10/20/2016	33.0	82,700	52.8	7.19	35.0	466
		1/12/2017	35.2	89,400	54.5	7.57	35.0	446
		4/17/2017	50.1	89,000	56.0	7.54	32.4	468
		6/7/2017	45.8	105,000	59.6	7.22	31.0	538
		8/2/2017	54.6	98,100	52.6	7.21	28.5	496
		10/19/2017	47.4	102,000	79.3	7.50	25.3	542
		4/2/2018	48.0	88,100	54.4	7.64	19.1	464
		10/8/2018	53.4	78,700	33.2	7.20	25.1	450
		4/22/2019	41.6	75,300	40.8	7.10	26.7	458
		10/15/2019	<3.00 U	<76.2	30.5	7.24	36.0	404
		4/14/2020	66.1	88,500	54.9	7.27	30.2	464
		10/12/2020	63.6	76,500	35.3	7.34	37.0	448
Compliance	B-11A	12/9/2015	124	58,800	40.4	7.70	3.20 J	338
		4/13/2016	116	60,100	43.0	7.75	3.80 J	362
		7/19/2016	104	54,000	46.6	7.42	2.70 J	336
		10/19/2016	112	54,600	46.5	7.47	3.00 J	340
		1/12/2017	106	54,500	46.6	7.89	2.30 J	322
		4/17/2017	100	54,800	45.4	7.38	<1.00 U	326
		6/8/2017	102	57,800	46.9	7.78	1.40 J	338
		8/1/2017	105	54,500	46.7	7.67	2.40 J	326
		10/19/2017	116	55,000	49.9	7.96	5.10	322
		4/2/2018	91.0	53,300	54.7 J, M0	8.04	12.3 M0	336
		10/9/2018	94.2	48,600	57.8	7.43	6.00	332
		4/22/2019	93.9	60,400	83.6	7.62	1.90 J	386
		10/14/2019	80.7	56,600	96.6	7.66	<1.00 U	348
		4/13/2020	86.3	57,500	93.7	7.75	1.40 J	394
		10/12/2020	99.3	55,600	65.3	7.74	1.00 J	364
	B-11B	12/9/2015	1,140	64,100	31.2	8.06	134	494
		4/13/2016	1,360	65,400	32.7	8.14	148	512
		7/19/2016	1,210	59,000	33.6	7.77	165	520
		10/20/2016	1,460	59,100	34.3	7.91	178	496
		1/12/2017	1,540	63,900	36.1	8.18	182	488
		4/17/2017	1,760	67,400	36.3	7.83	181	502
		6/8/2017	1,880	68,200	33.9	8.07	191	516
		8/1/2017	1,800	61,400	35.9	7.77	179	498
		10/19/2017	1,500	52,400	36.1	7.77	175	510
		4/2/2018	2,020	59,000	31.3	8.42	200	550
		10/9/2018	3,620	66,300	21.9	7.74	197	602
		11/12/2018	--	--	--	8.05	--	594
		4/22/2019	6,830	83,300	28.4	7.91	303	742
		10/14/2019	4,630	91,400	32.3	7.92	339	728
		4/13/2020	5,380	115,000	30.9	7.89	378	872
		10/12/2020	3,350	91,200	33.4	7.80	388	906
	B-11R	12/9/2015	4,170	126,000	39.2	7.07	75.4	616
		4/13/2016	3,410	141,000	7.00	6.78	18.4	682
		7/19/2016	3,530	130,000	38.9	6.69	115	698
		10/20/2016	4,120	128,000	39.1	6.77	118	660
		1/12/2017	3,530	126,000	42.3	6.98	108	616
		4/17/2017	3,520	123,000	40.2	7.11	108	620
		6/7/2017	3,420	128,000	42.0	6.80	98.2	630
		8/1/2017	2,040	139,000	24.7	6.70	126	738
		10/19/2017	3,120	117,000	38.8	7.22	97.7	586
		4/2/2018	3,180	124,000	36.8	7.14	88.1	638
		10/9/2018	576	49,900	5.90	6.55	15.1	266
		4/22/2019	1,360	82,400	12.6	6.82	34.6	406
		10/14/2019	1,440	66,000	13.1	6.83	40.7	310
		4/13/2020	2,140	117,000	22.5	6.80	41.9	570
		10/12/2020	2,870	120,000	20.7	6.83	22.8	600

Table 2. Historical Analytical Results for Parameters with SSIs
Nelson Dewey Generating Station - Cassville, Wisconsin / SCS Engineers Project #25221071.00

Well Group	Well	Collection Date	Boron (µg/L)	Calcium (mg/L)	Chloride (mg/L)	Field pH (Std. Units)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Compliance	B-31A	12/9/2015	59.0	48,400	35.3	7.65	26.2	274
		4/13/2016	79.2	51,900	35.8	7.63	22.6	302
		7/19/2016	67.2	48,900	36.4	7.25	24.2	280
		10/20/2016	63.7	45,800	39.0	7.54	27.2	292
		1/12/2017	76.4	46,600	39.9	7.82	29.8	284
		4/17/2017	69.9	46,900	40.3	7.83	31.0	318
		6/8/2017	58.5	49,400	40.9	7.74	31.2	296
		8/1/2017	56.3	46,000	40.8	7.56	26.6	284
		10/19/2017	63.9	49,600	40.8	7.92	26.1	290
		4/2/2018	74.8	49,300	42.7	8.00	27.4	282
		10/9/2018	71.8	46,600	40.2	7.48	24.8	278
		4/22/2019	86.2	48,200	40.8	7.61	21.6	284
		10/14/2019	98.5	52,200	47.1	7.69	22.3	272
		4/13/2020	132	50,900	51.0	7.71	16.6	298
		10/13/2020	127	47,700	57.9	7.78	16.8	300
	B-31R	12/9/2015	851	77,400	29.9	6.79	28.8	374
		4/13/2016	838	84,900	17.6	6.76	34.1	404
		7/19/2016	641	76,100	30.3	6.44	38.5	406
		10/20/2016	1,020	84,200	16.4	6.53	49.7	452
		1/12/2017	749	73,900	26.0	6.80	34.9	380
		4/17/2017	929	85,600	20.4	6.80	43.0	416
		6/8/2017	895	90,700	20.7	6.67	41.1	426
		8/1/2017	1,550	93,400	3.60	6.56	55.6	432
		10/19/2017	645	75,700	29.0	7.19	19.2	358
		4/2/2018	540	72,900	32.6	6.76	22.0	374
		10/9/2018	1,430	125,000	19.7	6.41	186	668
		11/12/2018	--	--	--	6.59	162	596
		4/22/2019	906	105,000	17.8	6.62	121	516
		10/14/2019	915	110,000	26.0	6.72	146	480
		4/13/2020	730	93,800	29.9	6.79	89.4	464
		10/12/2020	702	95,700	24.4	6.89	49.4	462
	B-7R	12/9/2015	110	31,700	45.2	6.74	17.0 J	198
		4/13/2016	115	42,300	4.60	6.80	2.50 J	218
		7/18/2016	164	44,400	7.10	6.29	2.40 J	220
		10/19/2016	154	56,600	22.0	6.55	<5.00 U	288
		1/12/2017	159	56,700	19.7	7.43	<5.00 U	240
		4/17/2017	129	61,400	13.1	6.60	<5.00 U	278
		6/7/2017	110	51,600	12.8	6.65	<5.00 U	240
		8/1/2017	129	50,400	8.10	6.28	3.70	220
		10/19/2017	159	56,200	12.0	6.88	<5.00 U, D3	242
		4/2/2018	121	49,200	10.1	6.57	<5.00 U, D3	220
		10/9/2018	73.0	38,500	1.90 J	6.23	3.20	186
		4/22/2019	93.5	59,400	10.9	6.63	<0.50 U, D3	254
		10/14/2019	139	57,700	11.5	6.62	<0.50 U, D3	208
		4/13/2020	96.0	58,700	14.3	6.60	7.50 J, D3	306
		10/13/2020	145.0	41,900	6.7 J, D3	6.35	<2.20 U	208

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
Std. Units = Standard Units

Flags:
U = Not detected.
J = Estimated concentration at or above the LOD and below the LOQ.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
-- = Not applicable.

Created by:	NDK	Date:	3/8/2018
Last revision by:	NDK	Date:	3/16/2021
Checked by:	ZTW	Date:	3/17/2021

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Table 3. Groundwater Elevation Summary
Nelson Dewey Closed Ash Disposal Facility / SCS Engineers Project #25221071.00

	Ground Water Elevation in feet above mean sea level (amsl)																							
Well Number	**B-7R**	**B-8R**	**B-11R**	**B-11A**	**B-11B**	**B-21R**	**B-26**	**B-26A**	**B-28**	**B-30R**	**B-30AR**	**B-31R**	**B-31A**	**B-32**	**B-32A**	**B-35**	**B-35A**	**B-37**	**B-37A**	**B-39**	**MW-301**	**MW-302**	**MW-303**	**Barge Gauge (SG-12)**	**Pond Gauge (SG-13)**
Top of Casing Elevation (feet amsl)	623.35	627.51	622.62	622.12	621.89	623.31	626.40	626.40	616.81	621.81	622.4	622.42	622.69	614.18	614.4	620.78	621.09	614.85	614.85	626.48	619.09	619.21	618.49	616.60	See notes
Screen Length (ft)	10	10	10	5	5	10	10	5	10	10	5	10	5	10	5	10	5	10	5	10	10	10	10		
Total Depth (ft from top of casing)	23.05	27.25	24.15	52.00	113.90	22.78	31.67	45.78	16.70	22.20	46.90	22.82	35.52	14.79	52.00	16.60	47.00	19.95	48.20	26.90	21.11	21.27	20.15		
Top of Well Screen Elevation (ft)	610.30	610.26	608.47	575.12	512.99	610.53	604.73	585.62	610.11	609.61	580.50	609.60	592.17	609.39	567.40	614.18	579.20	604.90	571.65	609.58	607.98	607.94	608.34		
Measurement Date																					--	--	--	--	--
October 5-6, 2011	604.94	606.29	604.57	604.36	604.32	604.43	604.52	604.55	604.61	604.37	605.21	608.37	604.42	604.88	604.82	604.87	604.81	604.37	604.39		--	--	--	--	--
April 25-26, 2012	606.58	606.30	606.07	606.30	606.28	--	605.89	605.91	--	--	--	608.65	606.31	604.33	--	606.29	621.20	606.16	606.17	606.17	--	--	--	--	--
October 17, 2012	604.39	604.16	604.10	603.98	603.98	604.08	604.12	604.14	604.31	603.97	603.98	607.32	604.07	604.33	604.35	--	621.20	603.93	603.93	603.93	--	--	--	--	--
April 2, 2013	607.04	608.01	606.15	607.20	607.17	606.30	605.60	605.64	605.90	605.91	605.93	607.13	607.13	606.11	606.14	606.13	606.25	606.99	607.02		--	--	--	--	--
October 16-17, 2013	604.51	605.89	604.17	603.90	603.87	604.11	604.31	604.32	604.36	604.08	604.06	604.87	604.00	604.53	604.56	604.46	604.44	604.05	604.04		--	--	--	--	--
April 10, 2014	607.42	608.97	607.45	607.28	607.26	--	607.22	607.23	--	--	--	607.37	607.28	--	--	607.46	607.39	607.25	607.26		--	--	--	--	--
October 14-15, 2014	605.67	606.82	605.17	604.90	604.91	614.92	605.00	605.01	605.13	604.92	604.92	606.36	605.54	605.41	605.45	605.36	605.33	604.94	604.99		--	--	--	--	--
April 16, 2015	607.26	608.50	607.11	607.15	607.05	--	606.40	606.41	--	--	--	607.37	607.09	--	--	606.73	606.78	606.99	606.88		--	--	--	--	--
October 1-2, 2015	605.14	604.66	604.53	604.42	604.38	604.36	604.43	604.50	604.54	604.34	604.32	605.13	604.38	604.76	604.82	604.76	604.75	604.30	604.39		--	--	--	--	--
December 8, 2015	606.69	--	606.71	606.30	606.26	--	606.80	--	--	--	--	607.40	606.39	--	--	--	--	--	--	607.54	--	--	--	--	--
April 12, 2016	609.32	609.36	609.32	608.71	608.68	--	609.81	609.72	--	--	--	609.34	609.01	--	--	609.73	609.65	608.79	608.79	610.23	--	--	--	--	--
July 18-19, 2016	606.54	--	606.14	606.76	606.74	--	606.09	--	--	--	--	606.55	606.73	--	--	--	--	--	--	606.28	--	--	--	--	--
October 19-20, 2016	608.59	608.46	608.35	608.21	608.19	608.37	608.84	608.76	608.63	608.45	608.46	608.51	608.20	608.69	608.73	608.78	608.74	608.20	608.18	609.09	--	--	--	--	--
January 11-12, 2017	608.02		607.96	607.83	607.78		608.56					607.90	607.84							608.92	--	--	--	--	--
April 17, 2017	609.08	608.82	608.34	609.05	608.99	NM	608.59	608.54	609.94	608.57	608.64	607.20	608.98	608.96	608.98	609.00	609.02	609.02	609.02	610.23	--	--	--	--	--
June 8, 2017	610.74	--	610.42	609.81	610.08	--	611.25	--	--	--	--	609.63	610.50	--	--	--	--	--	--	611.53	--	--	--	--	--
August 1-2, 2017	607.02	--	606.73	605.57	605.50	--	607.39	--	--	--	--	606.84	605.69	--	--	--	--	--	--	608.71	--	--	--	--	--
October 9-10, 2017	606.93	606.51	606.25	607.01	606.94	--	606.22	606.13	606.33	606.44	606.45	606.68	606.93	606.57	606.61	606.65	606.71	--	--	--	--	--	--	--	--
October 19, 2017	609.60	--	609.42	609.58	609.65	--	608.84	--	--	--	--	609.47	609.43	--	--	--	--	609.40	609.40	608.55	--	--	--	--	--
November 17, 2017	--	--	--	--	--	606.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
December 19, 2017	--	--	--	--	--	604.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
February 7, 2018	605.37	--	605.33	604.96	604.92	--	--	--	616.81	--	--	605.31	605.01	--	--	--	--	--	--	606.19	605.08	605.05	605.00	--	--
March 16, 2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	604.64	604.6	604.56	--	--
April 203, 2018 **	604.82	606.61	606.27	606.63	606.55	606.52	606.49	606.37	606.39	606.46	606.43	604.44	606.46	606.58	606.66	606.68	606.70	606.77	606.83	606.19	--	--	--	--	--
May 23, 2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	610.68	610.78	610.61	--	--
October 8-10, 2018	610.76	610.68	610.67	610.28	610.24	610.02	610.34	610.28	610.83	610.09	610.05	610.39	610.27	611.05	610.94	610.72	610.54	--	--	611.44	--	--	--	--	--
November 11, 2018	--	--	--	--	609.14	--	--	--	--	--	--	609.11	--	--	--	--	--	--	--	--	--	--	--	608.40	
April 22-23, 2019	615.28	615.66	615.28	615.29	615.28	614.98	615.49	615.31	615.40	615.36	615.35	615.01	615.33	--	--	615.87	615.98	--	--	615.40	--	--	--	615.17	<615.06
October 14-16, 2019	613.43	613.11	613.06	613.29	613.18	612.47	613.10	613.10	612.71	612.83	612.78	612.50	613.20	613.10	613.00	613.10	613.15	--	--	613.35	--	--	--	612.33	<615.06
April 13-14, 2020	614.12	613.76	614.39	613.88	613.86	613.22	613.76	613.73	613.68	613.60	613.56	613.80	613.79	--	--	614.04	614.00	--	--	613.71	--	--	--	612.89	613.10
October 12-13, 2020	605.09	604.88	604.57	604.54	604.44	604.28	604.92	604.83	604.86	604.72	604.72	604.66	604.54	605.07	605.06	605.00	605.08	--	--	605.06	--	--	--	603.89	DRY
Bottom of Well Elevation (ft)	600.30	600.26	598.47	570.12	507.99	600.53	594.73	580.62	600.11	599.61	575.50	599.60	587.17	599.39	562.40	604.18	574.20	594.90	566.65	599.58	597.98	597.94	598.34		

Notes:
NM = not measured
*The PVC casing at B-35A was cut down on June 28, 2018 to allow the protective cover to close. Groundwater elevations prior to 6/28/18 are calculated using the old top of casing (TOC) elevation of 621.20 ft amsl. Groundwater elevations after 6/28/18 are calculated using the new TOC elevation (621.09 ft amsl).
** The PVC casing at B-21R was extended in 2018 following well rehabilitation. The well was resurveyed on April 22, 2019. The old top of casing elevation was 621.03 ft. The new TOC elevation is 623.31 ft.
^ One pond staff gauge was installed on April 22, 2019. The base of the gauge (0 reading) is at 615.056 ft amsl. Two additional gauges were installed on March 24, 2020. These gauge bases are at 609' and 612' amsl.

Created by: MDB Date: 4/1/2013
Last revision by: RM Date: 1/8/2021
Checked by: NDK Date: 1/8/2021
Proj Mgr QA/QC: TK Date: 1/18/2021

Table 4. Analytical Results - State Monitoring Program
Nelson Dewey Generating Station
Cassville, Wisconsin / SCS Engineers Project #25221071.00

WELL ID	SAMPLE MONTH	BORON, DISSOLVED (UG/L)	SULFATE, DISSOLVED (MG/L)	PH, FIELD (STANDARD UNITS)
B-7R	2016-Apr	110	7.40	6.80
	2016-Oct	147	<20.0	6.55
	2017-Apr	127	<5.00	6.60
	2017-Oct	159	<5.00	6.61
	2018-Apr	115	<5.00 D3	6.57
	2018-Oct	89.8	3.40	6.23
	2019-Apr	95.7	<5.00 D3	6.63
	2019-Oct	140	<5.00 D3	6.62
	2020-Apr	90.8	5.20 J, D3	6.60
	2020-Oct	144	<2.2 D3	6.35
B-8R	2016-Apr	2,250	30.0	6.64
	2016-Oct	2,130	47.0	6.38
	2017-Apr	1,970	30.5	6.83
	2017-Oct	2,490	32.5	6.87
	2018-Apr	1,700	28.7	7.02
	2018-Oct	1,500	30.6	6.18
	2019-Apr	1,560	39.8	6.65
	2019-Oct	1,110	23.6	6.85
	2020-Apr	1,340	20.9	6.61
	2020-Oct	1,600	63.9	6.60
B-11A	2016-Apr	110	3.80 J	7.75
	2016-Oct	111	2.80 J	7.47
	2017-Apr	106	<1.00	7.38
	2017-Oct	97.7	8.30	7.91
	2018-Apr	89.4	12.70	8.04
	2018-Oct	142	5.30	7.43
	2019-Apr	94.0	1.90 J	7.62
	2019-Oct	82.3	<1.00	7.66
	2020-Apr	83.3	1.50 J	7.75
	2020-Oct	94.3	1.0 J	7.74
B-11B	2016-Apr	1,240	153	8.14
	2016-Oct	1,410	181	7.91
	2017-Apr	1,720	186	7.83
	2017-Oct	1,900	169	7.80
	2018-Apr	2,020	195	8.42
	2018-Oct	3,910	195	7.74
	2019-Apr	6,670	289	7.91
	2019-Oct	4,860	335	7.92
	2020-Apr	5,080	362	7.89
	2020-Oct	3,190	422	7.80
B-11R	2016-Apr	3,290	93.9	6.98
	2016-Oct	4,070	115	6.77
	2017-Apr	3,710	111	7.11
	2017-Oct	3,400	94.0	6.75
	2018-Apr	2,790	78.6	7.14
	2018-Oct	635	15.6	6.55
	2019-Apr	1,310	34.5	6.82
	2019-Oct	1,500	39.2	6.83
	2020-Apr	2,250	39.8	6.80
	2020-Oct	2,690	23.0	6.83
B-26	2016-Apr	37.0	40.1	7.43
	2016-Oct	48.7	34.4	7.19
	2017-Apr	37.3	32.3	7.54
	2017-Oct	44.5	25.0	7.35
	2018-Apr	46.8	19.2	7.64
	2018-Oct	55.2	24.9	7.20
	2019-Apr	41.8	26.4	7.10
	2019-Oct	50.8	37.0	7.24
	2020-Apr	49.2	29.1	7.27
	2020-Oct	61.4	37.1	7.34

Table 4. Analytical Results - State Monitoring Program
Nelson Dewey Generating Station
Cassville, Wisconsin / SCS Engineers Project #25221071.00

WELL ID	SAMPLE MONTH	BORON, DISSOLVED (UG/L)	SULFATE, DISSOLVED (MG/L)	PH, FIELD (STANDARD UNITS)
B-26A (cont.)	2016-Apr	33.1	40.1	7.06
	2016-Oct	30.5	39.9	7.26
	2017-Apr	52.6	42.3	7.96
	2017-Oct	28.4	38.4	7.44
	2018-Apr	27.6	37.0	7.47
	2018-Oct	18.4	33.3	7.38
	2019-Apr	27.6	27.0	7.35
	2019-Oct	47.0	35.6	7.31
	2020-Apr	37.7	39.2 M0	7.38
	2020-Oct	33.5	44.7	7.51
B-31A	2016-Apr	69.4	22.8	7.63
	2016-Oct	81.0	27.9	7.54
	2017-Apr	80.3	30.8	7.83
	2017-Oct	61.5	26.2	7.60
	2018-Apr	69.3	28.1	8.00
	2018-Oct	103	26.2	7.48
	2019-Apr	86.0	21.6	7.61
	2019-Oct	112	22.5	7.69
	2020-Apr	121	17.7	7.71
	2020-Oct	146	16.8	7.78
B-31R	2016-Apr	759	34.3	6.76
	2016-Oct	956	48.5	6.53
	2017-Apr	910	42.9	6.80
	2017-Oct	618	23.2	6.78
	2018-Apr	520	23.3	6.76
	2018-Oct	1,530	179	6.41
	2019-Apr	892	114	6.62
	2019-Oct	1,000	145	6.72
	2020-Apr	765	97.6 M0	6.79
	2020-Oct	696	50.8	6.89
B-35	2016-Apr	38.7	8.10	6.89
	2016-Oct	46.4	6.50	6.86
	2017-Apr	54.4	7.70	6.68
	2017-Oct	40.8	3.80	7.65
	2018-Apr	28.9	4.80 M0	7.01
	2018-Oct	40.0	3.60	6.58
	2019-Apr	33.6	4.90	7.26
	2019-Oct	41.0	5.60	7.07
	2020-Apr	27.0	4.20	6.87
	2020-Oct	28.1	5.6	6.85
B-35A	2016-Apr	21.7	26.2	6.96
	2016-Oct	23.4	27.4	7.17
	2017-Apr	29.9	25.4	7.27
	2017-Oct	51.4	4.00	7.44
	2018-Apr	28.9	23.1	7.45
	2018-Oct	59.8	6.00 J, D3	6.95
	2019-Apr	30.3	16.7	7.30
	2019-Oct	33.7	18.9	7.30
	2020-Apr	32.1	20.2	7.29
	2020-Oct	70.7	17.8	7.39
B-37	2016-Apr	121	17.4	7.6
	2016-Oct	159	45.4	7.59
	2017-Apr	252	75.6	7.55
	2017-Oct	231	59.7	8.61
	2018-Apr	164	49.0	8.10
	2018-Oct	--	--	--
	2019-Apr	--	--	--
	2019-Oct	--	--	--
	2020-Apr	--	--	--
	2020-Oct	--	--	--

Table 4. Analytical Results - State Monitoring Program
Nelson Dewey Generating Station
Cassville, Wisconsin / SCS Engineers Project #25221071.00

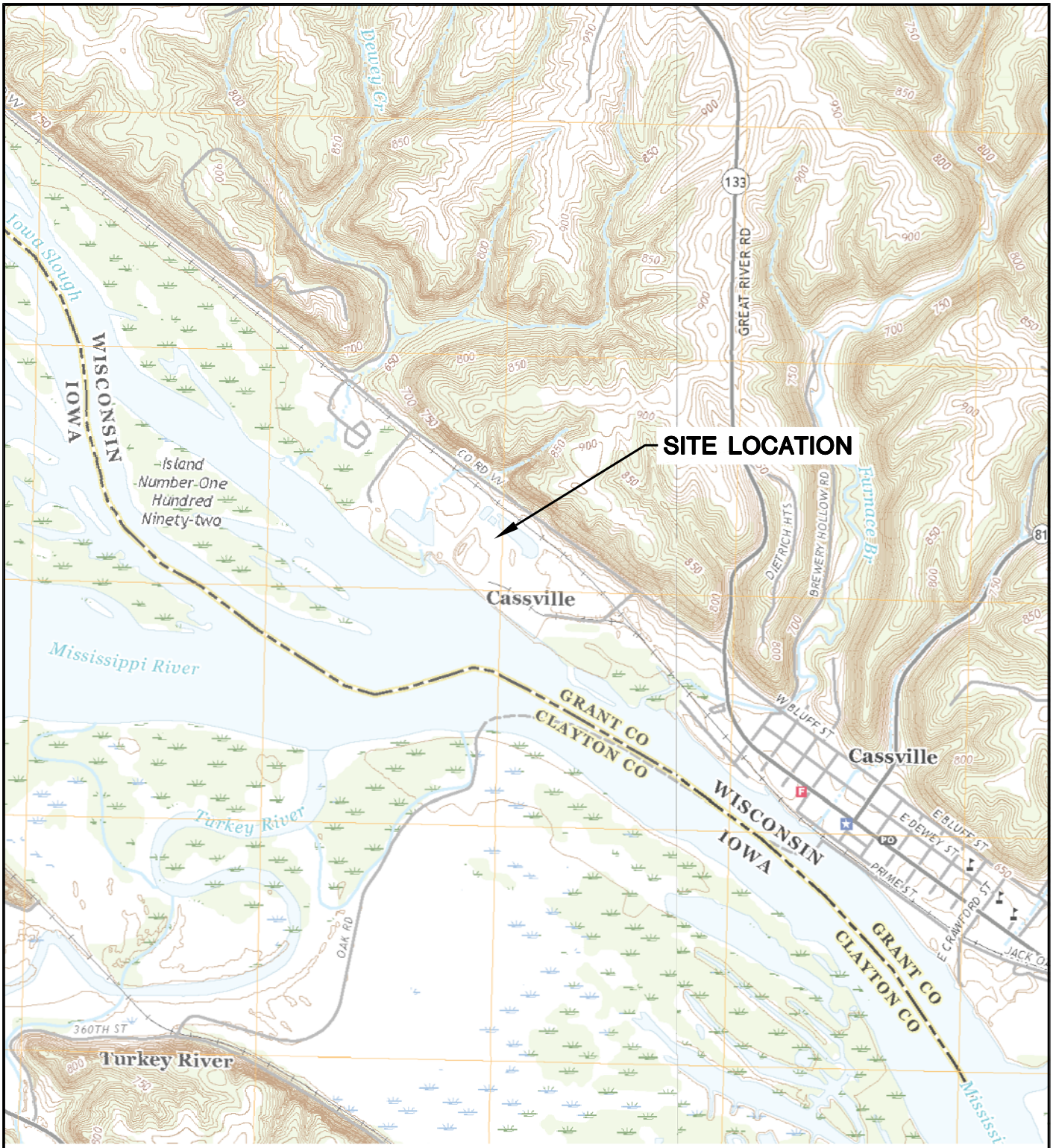
WELL ID	SAMPLE MONTH	BORON, DISSOLVED (UG/L)	SULFATE, DISSOLVED (MG/L)	PH, FIELD (STANDARD UNITS)
B-37A	2016-Apr	326	42.4	7.21
	2016-Oct	279	38.6	7.39
	2017-Apr	269	39.8	7.53
	2017-Oct	320	39.5	8.28
	2018-Apr	204	43.9	8.39
	2018-Oct	--	--	--
	2019-Apr	--	--	--
	2019-Oct	--	--	--
	2020-Apr	--	--	--
	2020-Oct	--	--	--

Note:
J: Estimated concentration above the adjusted method detection limit and below the adjusted
D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix
M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limi

Created by: JSN Date: 12/29/2017
Last revision by: ACW Date: 2/1/2021
Checked by: RM Date: 2/1/2021

I:\25221071.00\Deliverables\2020 October ASD NED\Tables\[Table 4_Analytical Results - State Monitoring - NED.xlsx]4. State Analytical

Figures



N

CASSVILLE AND TURKEY RIVER QUADRANGLES
WISCONSIN–IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	ALLIANT ENERGY 4902 N. BILTMORE LANE, #1000 MADISON, WI 53718	SITE	ALLIANT ENERGY NELSON DEWEY GENERATING STATION CASSVILLE, WISCONSIN

SITE LOCATION MAP

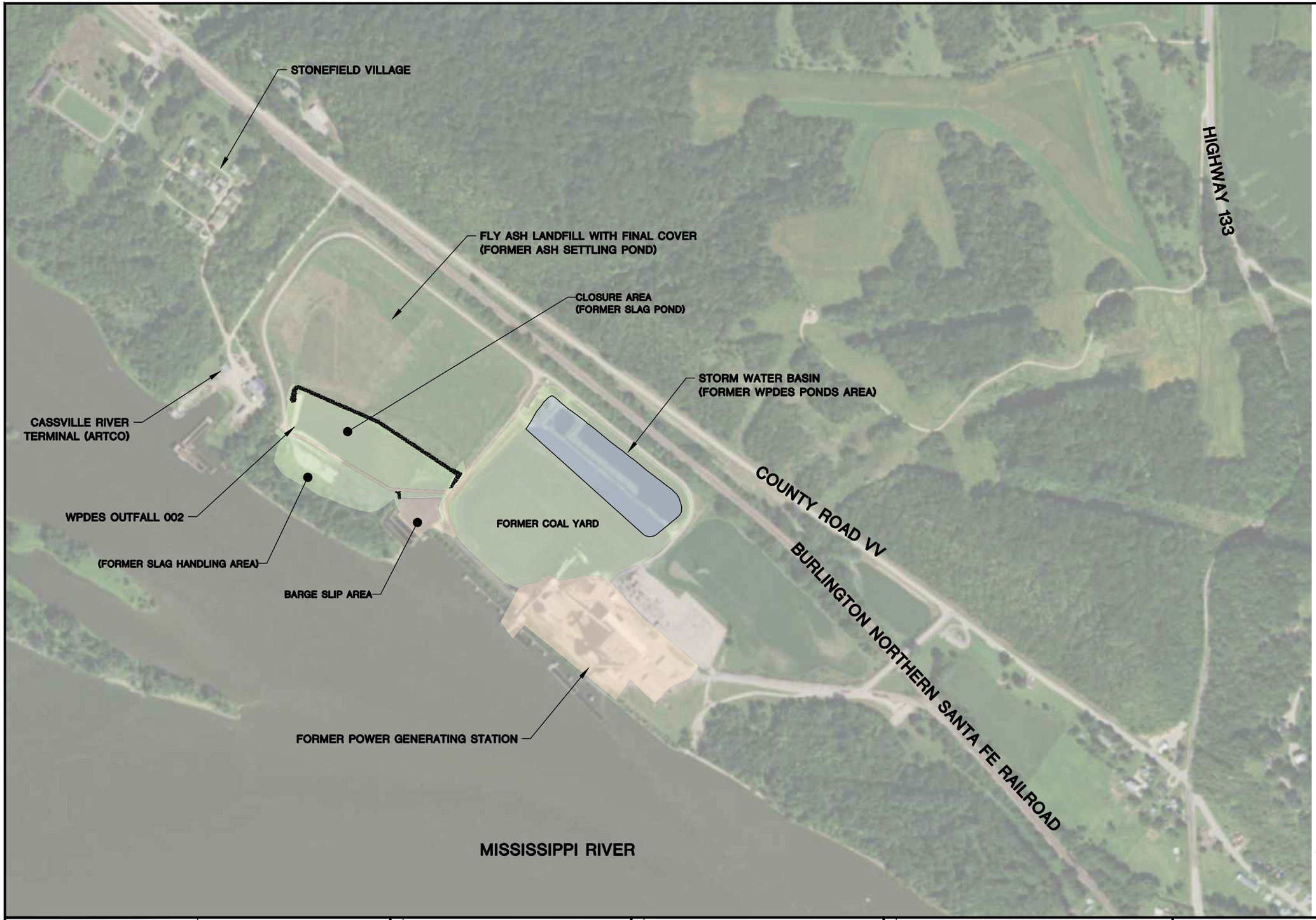
PROJECT NO.	25220071.00	DRAWN BY:	BSS
DRAWN:	11/27/2019	CHECKED BY:	MDB
REVISED:	01/14/2020	APPROVED BY:	TK 04/10/2020

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE
1

I:\25220071.00\Drawings\ASD\Site Location Map.dwg, 4/12/2020 7:11:31 PM



N

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS AUGUST 24, 2015.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25220071.00	DRAWN BY:	BJM
DRAWN:	12/18/13	CHECKED BY:	KAK
REVISED:	01/22/20	APPROVED BY:	TK 04/10/2020

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: WISCONSIN POWER AND LIGHT CO.
NELSON DEWEY GENERATING STATION
11999 COUNTY HIGHWAY VV
CASSVILLE WI, 53806

SITE: WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION
CASSVILLE WISCONSIN

AERIAL VIEW

FIGURE 2

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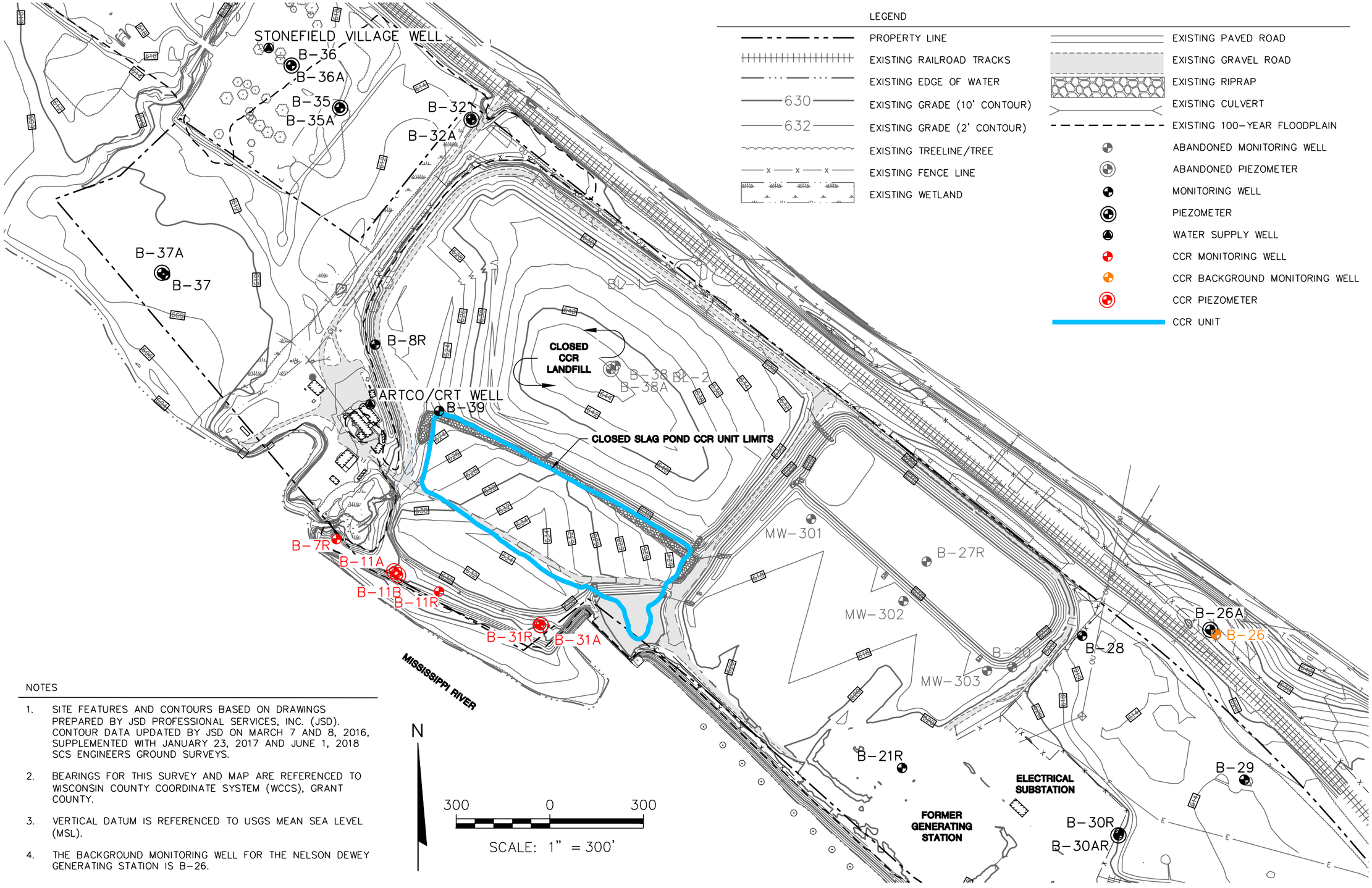


NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016, SUPPLEMENTED WITH JANUARY 23, 2017 AND JUNE 1, 2018 SCS ENGINEERS GROUND SURVEYS.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL).
4. THE BACKGROUND MONITORING WELL FOR THE NELSON DEWEY GENERATING STATION IS B-26.

SITE PLAN AND MONITORING WELL LOCATIONS

ALLIANT ENERGY
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

SITE

CLIENT

ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

FIGURE 3

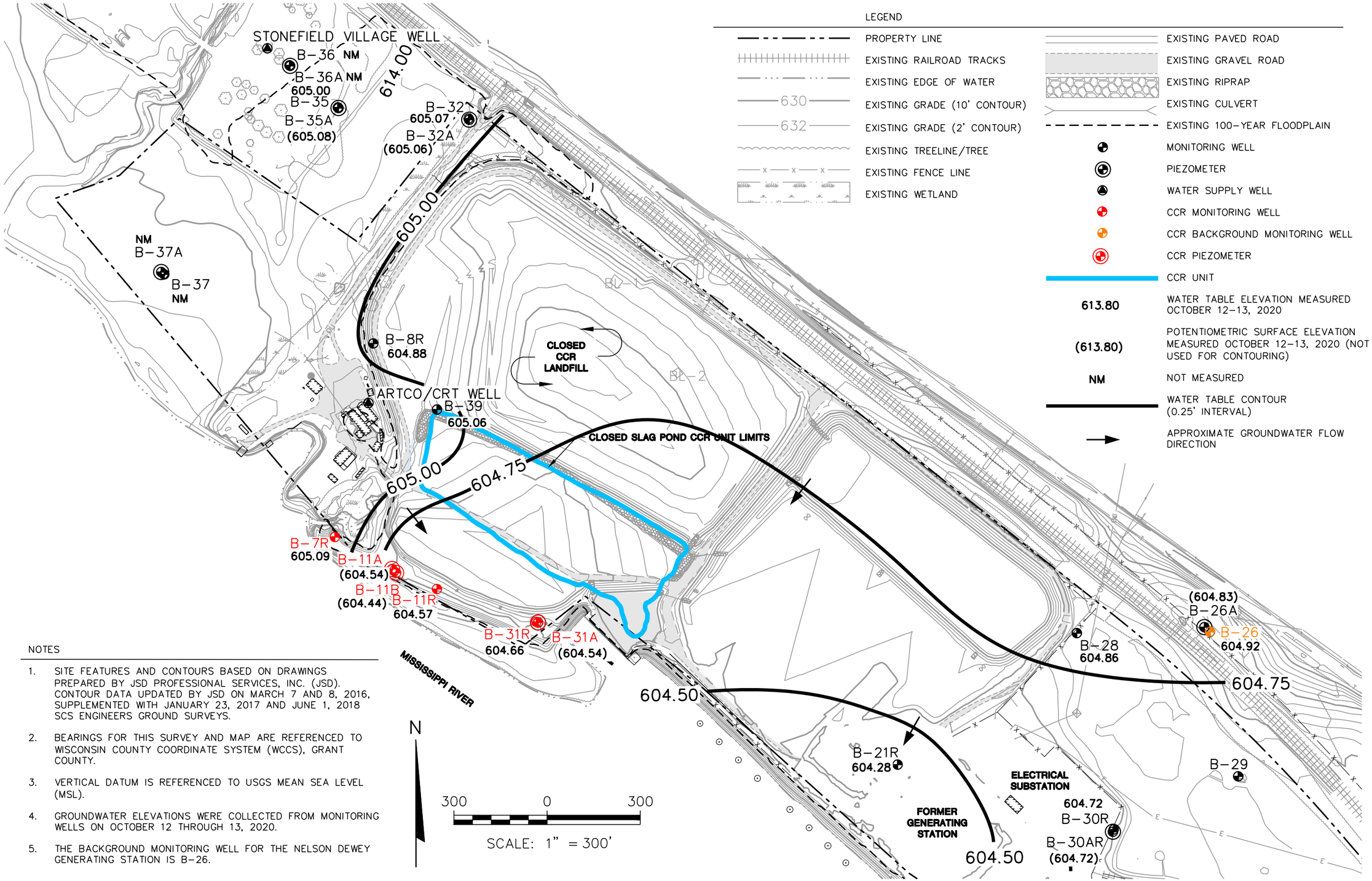
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

ENGINEER

PROJECT NO.	25220071.00
DRAWN:	11/27/2019
REVISED:	01/14/2020

DRAWN BY:	BSS
CHECKED BY:	MDB
APPROVED BY:	TK 01/28/2021

I:\25220071.00\Drawings\ASD\Site Plan and Monitoring Well Locations.dwg, 1/28/2021 9:26:56 AM



NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016, SUPPLEMENTED WITH JANUARY 23, 2017 AND JUNE 1, 2018 SCS ENGINEERS GROUND SURVEYS.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL).
4. GROUNDWATER ELEVATIONS WERE COLLECTED FROM MONITORING WELLS ON OCTOBER 12 THROUGH 13, 2020.
5. THE BACKGROUND MONITORING WELL FOR THE NELSON DEWEY GENERATING STATION IS B-26.

SITE
WATER TABLE FLOW MAP
OCTOBER 2020

CLIENT
ALLIANT ENERGY
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

ENGINEER
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

PROJECT NO.	25220071.00
DRAWN:	11/27/2019
REVISED:	12/08/2020
DRAWN BY:	BSS/ZTW
CHECKED BY:	Tk
APPROVED BY:	Tk 01/28/2021

FIGURE 4

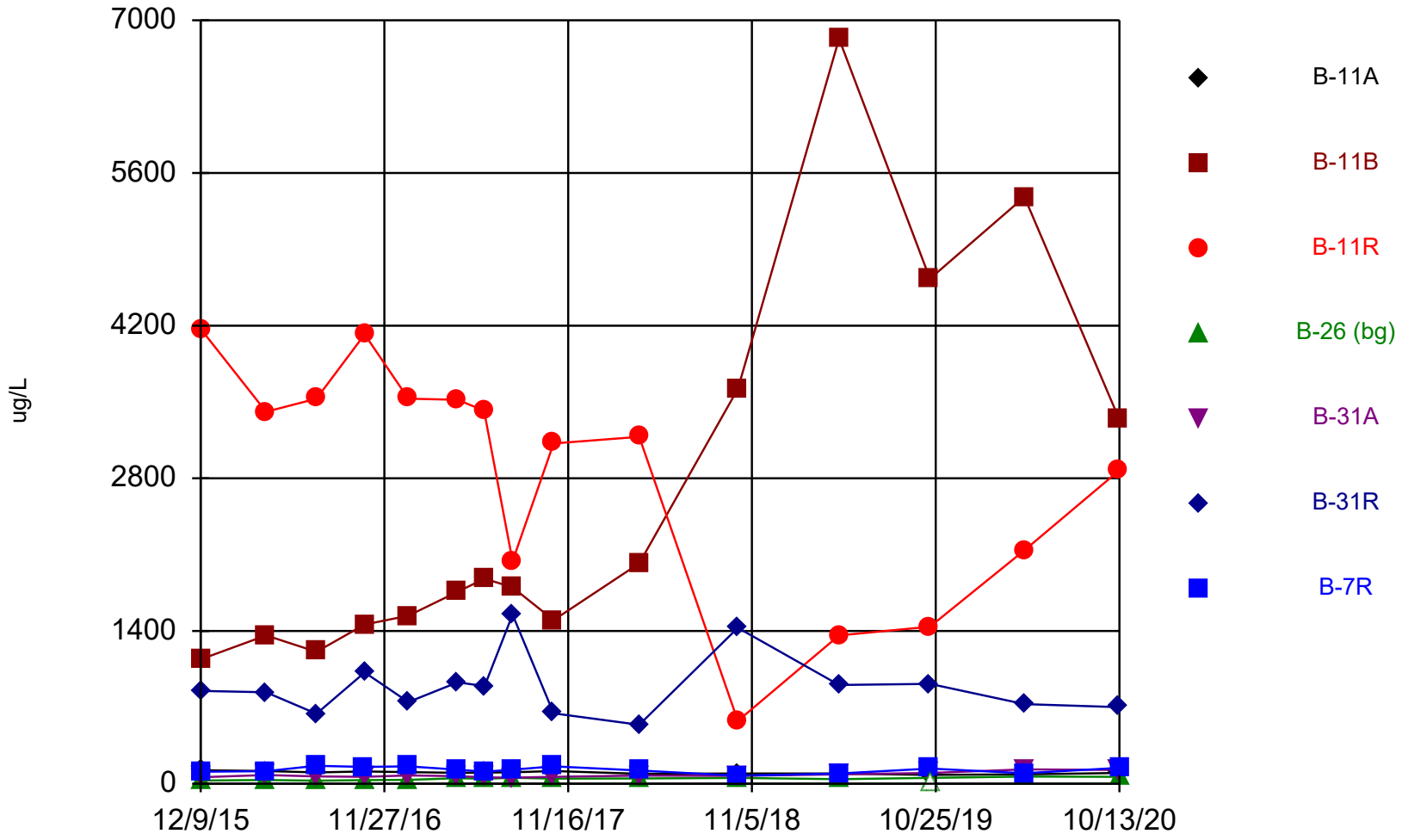
I:\25220071.00\Drawings\ASD\OCTOBER 2020 WTBL.dwg, 1/28/2021 9:23:34 AM

Appendix A

CCR Well Trend Plots

Hollow symbols indicate censored values.

Boron



Time Series Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

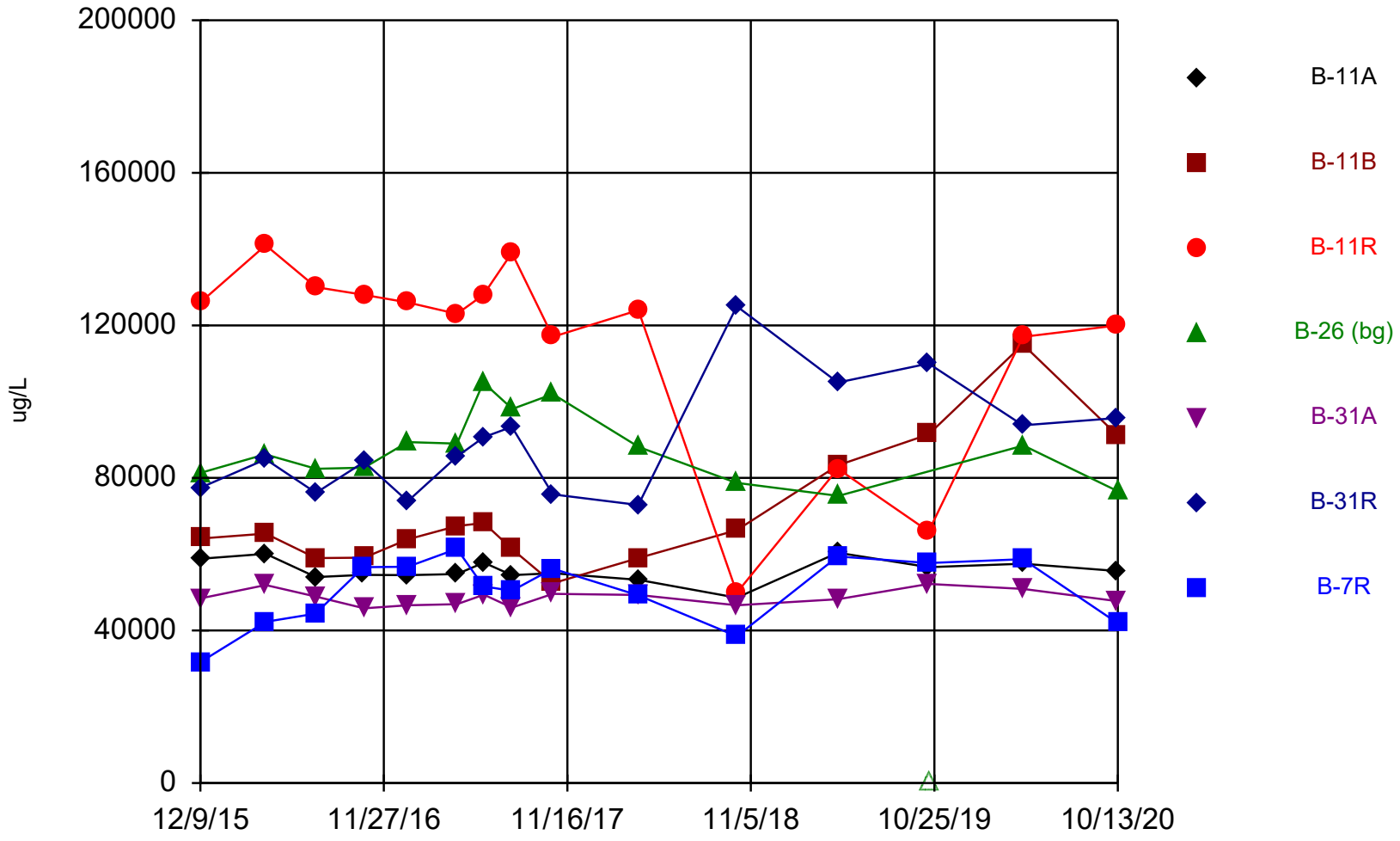
Constituent: Boron (ug/L) Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	124	1140	4170	29.6	59	851	110
4/12/2016				33.7			
4/13/2016	116	1360	3410		79.2	838	115
7/18/2016							164
7/19/2016	104	1210	3530	28.6	67.2	641	
10/19/2016	112						154
10/20/2016		1460	4120	33	63.7	1020	
1/12/2017	106	1540	3530	35.2	76.4	749	159
4/17/2017	100	1760	3520	50.1	69.9	929	129
6/7/2017			3420	45.8			110
6/8/2017	102	1880			58.5	895	
8/1/2017	105	1800	2040		56.3	1550	129
8/2/2017				54.6			
10/19/2017	116	1500	3120	47.4	63.9	645	159
4/2/2018	91	2020	3180		74.8	540	121
4/3/2018				48			
10/8/2018				53.4			
10/9/2018	94.2	3620	576		71.8	1430	73
4/22/2019	93.9	6830	1360		86.2	906	93.5
4/23/2019				41.6			
10/14/2019	80.7	4630	1440		98.5	915	139
10/15/2019				<3 (UX)			
4/13/2020	86.3	5380	2140		132	730	96
4/14/2020				66.1			
10/12/2020	99.3	3350	2870		127	702	
10/13/2020				63.6			145

Hollow symbols indicate censored values.

Calcium



Time Series Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

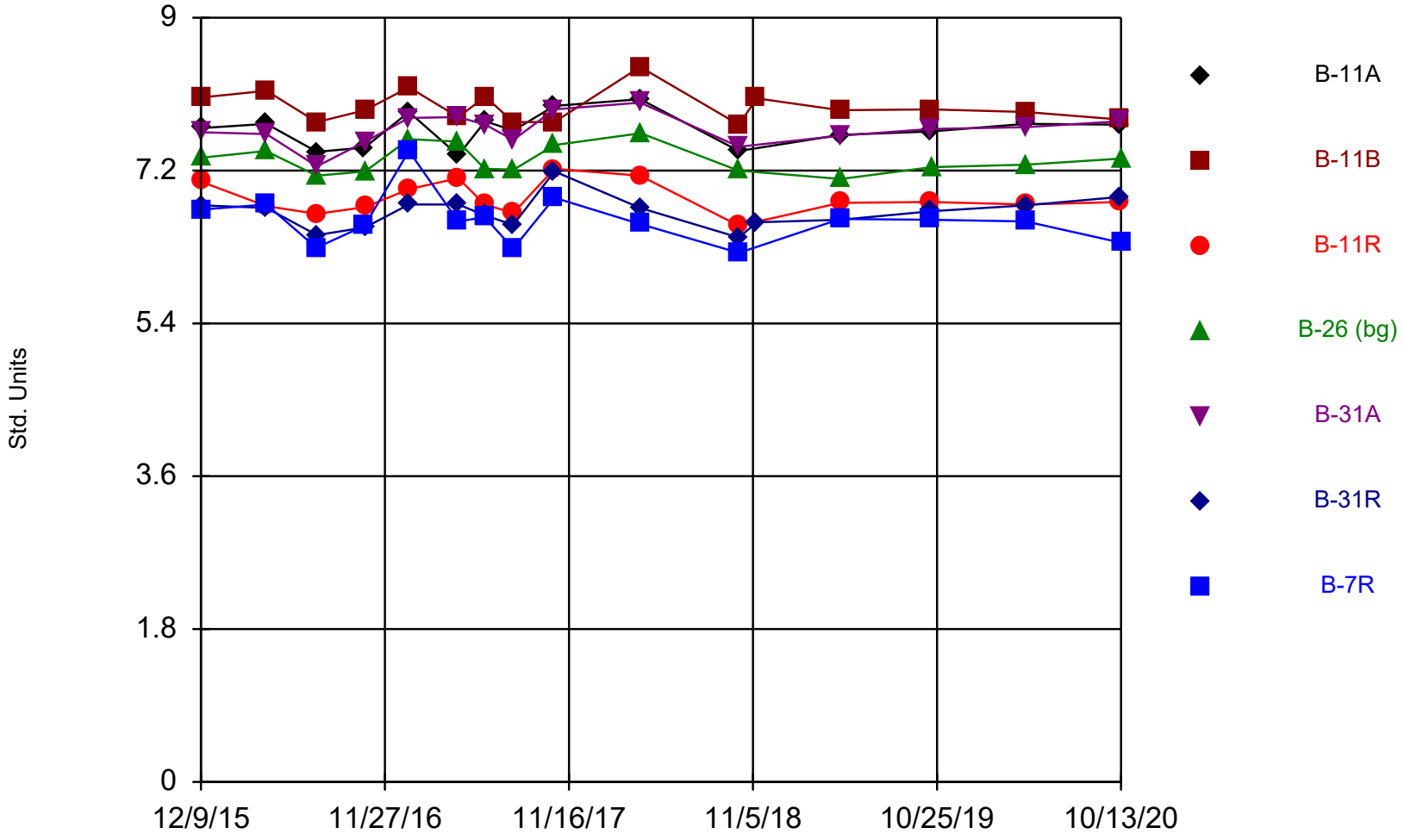
Time Series

Constituent: Calcium (ug/L) Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	58800	64100	126000	81300	48400	77400	31700
4/12/2016				86200			
4/13/2016	60100	65400	141000		51900	84900	42300
7/18/2016							44400
7/19/2016	54000	59000	130000	82400	48900	76100	
10/19/2016	54600						56600
10/20/2016		59100	128000	82700	45800	84200	
1/12/2017	54500	63900	126000	89400	46600	73900	56700
4/17/2017	54800	67400	123000	89000	46900	85600	61400
6/7/2017			128000	105000			51600
6/8/2017	57800	68200			49400	90700	
8/1/2017	54500	61400	139000		46000	93400	50400
8/2/2017				98100			
10/19/2017	55000	52400	117000	102000	49600	75700	56200
4/2/2018	53300	59000	124000		49300	72900	49200
4/3/2018				88100			
10/8/2018				78700			
10/9/2018	48600	66300	49900		46600	125000	38500
4/22/2019	60400	83300	82400		48200	105000	59400
4/23/2019				75300			
10/14/2019	56600	91400	66000		52200	110000	57700
10/15/2019				<76.2 (UX)			
4/13/2020	57500	115000	117000		50900	93800	58700
4/14/2020				88500			
10/12/2020	55600	91200	120000		47700	95700	
10/13/2020				76500			41900

Field pH



Time Series Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

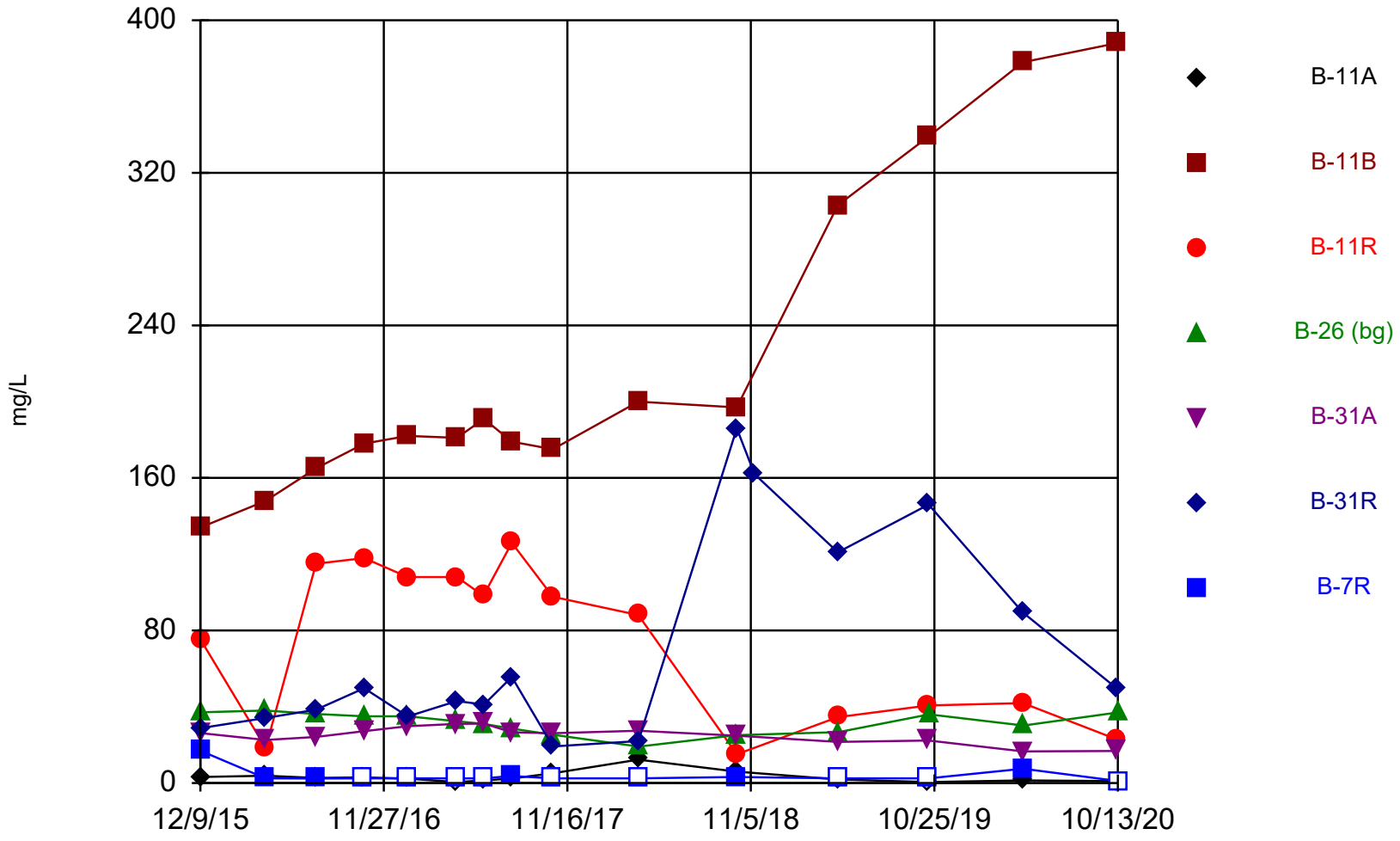
Constituent: Field pH (Std. Units) Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	7.7	8.06	7.07	7.35	7.65	6.79	6.74
4/12/2016				7.43			
4/13/2016	7.75	8.14	6.78		7.63	6.76	6.8
7/18/2016							6.29
7/19/2016	7.42	7.77	6.69	7.14	7.25	6.44	
10/19/2016	7.47						6.55
10/20/2016		7.91	6.77	7.19	7.54	6.53	
1/12/2017	7.89	8.18	6.98	7.57	7.82	6.8	7.43
4/17/2017	7.38	7.83	7.11	7.54	7.83	6.8	6.6
6/7/2017			6.8	7.22			6.65
6/8/2017	7.78	8.07			7.74	6.67	
8/1/2017	7.67	7.77	6.7		7.56	6.56	6.28
8/2/2017				7.21			
10/19/2017	7.96	7.77	7.22	7.5	7.92	7.19	6.88
4/2/2018	8.04	8.42	7.14		8	6.76	6.57
4/3/2018				7.64			
10/8/2018				7.2			
10/9/2018	7.43	7.74	6.55		7.48	6.41	6.23
11/12/2018		8.05				6.59	
4/22/2019	7.62	7.91	6.82		7.61	6.62	6.63
4/23/2019				7.1			
10/14/2019	7.66	7.92	6.83		7.69	6.72	6.62
10/15/2019				7.24			
4/13/2020	7.75	7.89	6.8		7.71	6.79	6.6
4/14/2020				7.27			
10/12/2020	7.74	7.8	6.83		7.78	6.89	
10/13/2020				7.34			6.35

Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

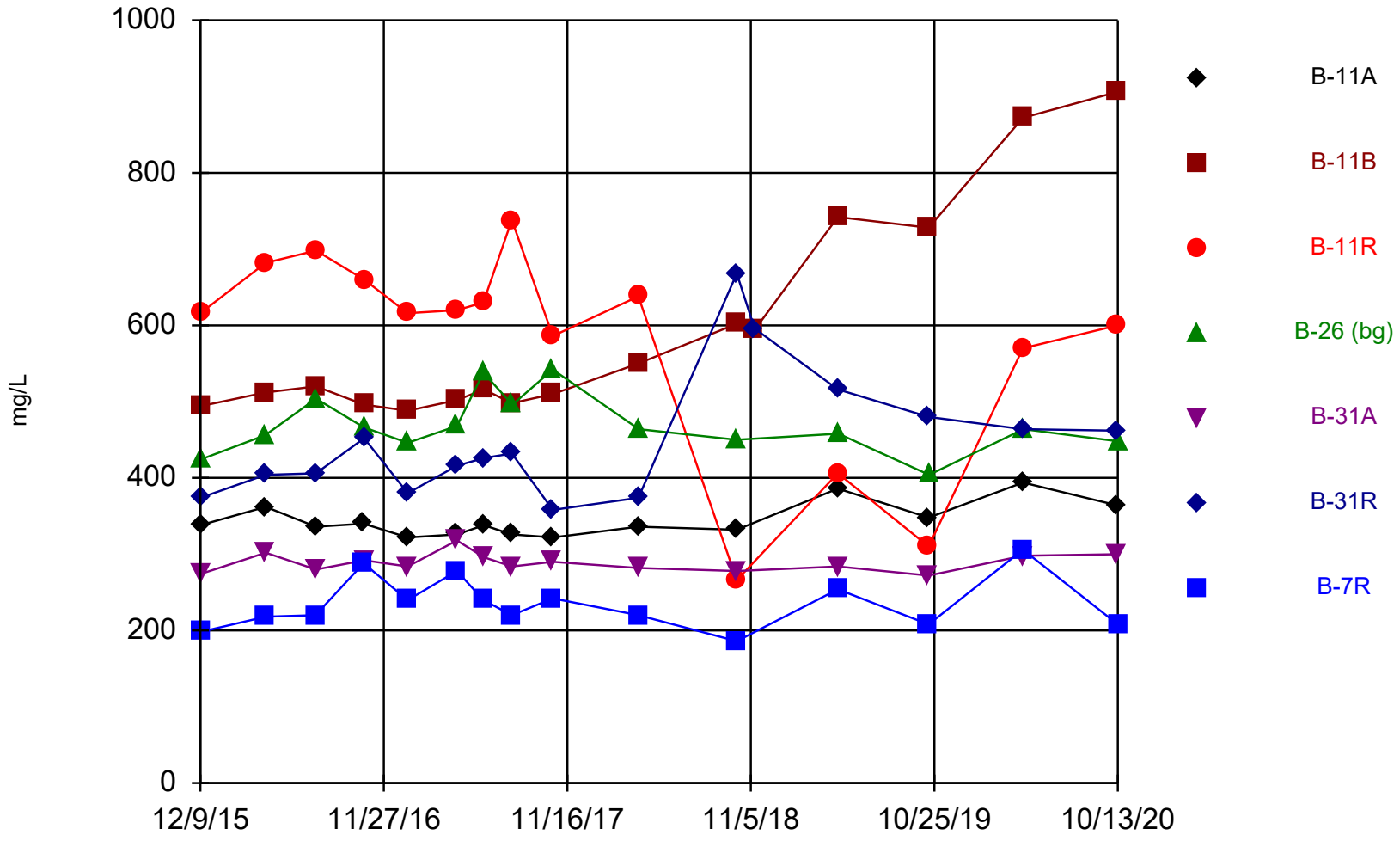
Time Series

Constituent: Sulfate (mg/L) Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	3.2 (J)	134	75.4	37.1	26.2	28.8	17 (J)
4/12/2016				38			
4/13/2016	3.8 (J)	148	18.4		22.6	34.1	2.5 (J)
7/18/2016							2.4 (J)
7/19/2016	2.7 (J)	165	115	36.2	24.2	38.5	
10/19/2016	3 (J)						<5 (U)
10/20/2016		178	118	35	27.2	49.7	
1/12/2017	2.3 (J)	182	108	35	29.8	34.9	<5 (U)
4/17/2017	<1 (U)	181	108	32.4	31	43	<5 (U)
6/7/2017			98.2	31			<5 (U)
6/8/2017	1.4 (J)	191			31.2	41.1	
8/1/2017	2.4 (J)	179	126		26.6	55.6	3.7
8/2/2017				28.5			
10/19/2017	5.1	175	97.7	25.3	26.1	19.2	<5 (U)
4/2/2018	12.3	200	88.1		27.4	22	<5 (U)
4/3/2018				19.1			
10/8/2018				25.1			
10/9/2018	6	197	15.1		24.8	186	3.2
11/12/2018						162	
4/22/2019	1.9 (J)	303	34.6		21.6	121	<5 (U)
4/23/2019				26.7			
10/14/2019	<1 (U)	339	40.7		22.3	146	<5 (U)
10/15/2019				36			
4/13/2020	1.4 (J)	378	41.9		16.6	89.4	7.5 (J)
4/14/2020				30.2			
10/12/2020	1 (J)	388	22.8		16.8	49.4	
10/13/2020				37			<2.2 (U)

Total Dissolved Solids



Time Series Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

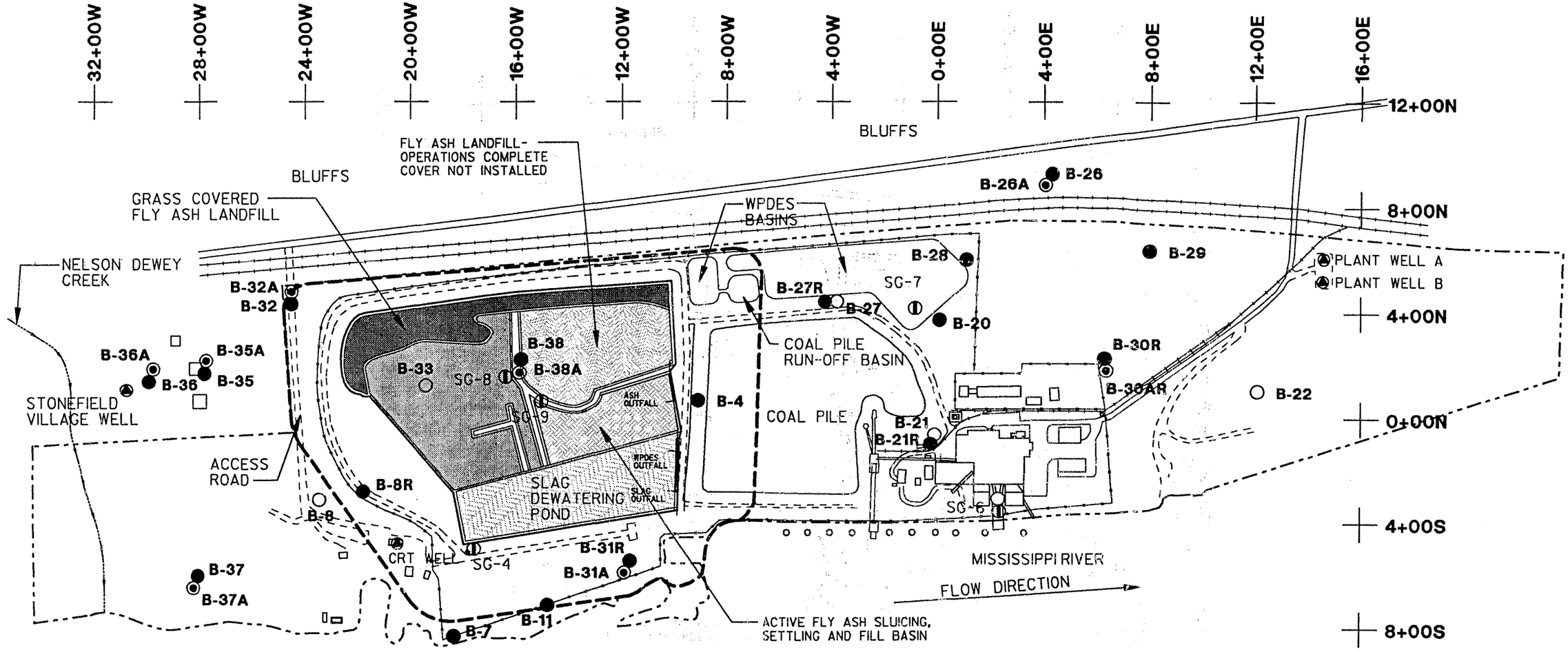
Constituent: Total Dissolved Solids (mg/L) Analysis Run 3/16/2021 5:54 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	338	494	616	424	274	374	198
4/12/2016				456			
4/13/2016	362	512	682		302	404	218
7/18/2016							220
7/19/2016	336	520	698	504	280	406	
10/19/2016	340						288
10/20/2016		496	660	466	292	452	
1/12/2017	322	488	616	446	284	380	240
4/17/2017	326	502	620	468	318	416	278
6/7/2017			630	538			240
6/8/2017	338	516			296	426	
8/1/2017	326	498	738		284	432	220
8/2/2017				496			
10/19/2017	322	510	586	542	290	358	242
4/2/2018	336	550	638		282	374	220
4/3/2018				464			
10/8/2018				450			
10/9/2018	332	602	266		278	668	186
11/12/2018		594				596	
4/22/2019	386	742	406		284	516	254
4/23/2019				458			
10/14/2019	348	728	310		272	480	208
10/15/2019				404			
4/13/2020	394	872	570		298	464	306
4/14/2020				464			
10/12/2020	364	906	600		300	462	
10/13/2020				448			208

Appendix B

1994 RMT Environmental Contamination Assessment Information



LEGEND

● B-28	WATER TABLE OBSERVATION WELL
◉ B-28A	PIEZOMETER
○ B-33	ABANDONED WELL
▲ CRT WELL	WATER SUPPLY WELL
◐ SG-4	STAFF GAUGE
———	APPROXIMATE LIMITS OF LICENSED LANDFILL
——+——+——	RAILROAD TRACK
====	ROAD
— - — - —	PROPERTY LINE
— — — —	DESIGN MANAGEMENT ZONE
+ 0+00S	LOCAL GRID
□	BUILDINGS
o	PILINGS

NOTES

1. BASE MAP WELLHEAD LOCATIONS SURVEYED BY SCHMITT ENGINEERING IN OCTOBER 1993.
2. OTHER SITE INFORMATION PROVIDED BY WP&L.

TRUE

0 400 800

SCALE: 1"=400'

WISCONSIN POWER & LIGHT
NELSON DEWEY GENERATING STATION
EXISTING CONDITIONS
OCTOBER 1993

RMT, INC.

Dwn.By:	CDH
Approved By:	ELM
Date:	OCTOBER 1994
Proj.#:	2767.03
File #:	2767030LDGN

Plot File = P:\MSPC\2767030\DGN\2767030LDGN
Plot Date = Fri Oct 21 08:28:28 1994
Pen Table =DEFAULT.TBL

OCT 31 1994

FIGURE 4

TABLE 5

SUMMARY OF LEACHING TEST RESULTS

	Fly Ash		Slag
Year	1983	1990 to 1992	1987 to 1992
Coal Type	Eastern (and Western)	Western (and Eastern)	Western (and Eastern) [1]
Water:Solid Ratio	2:1	4:1	4:1
Extraction Time	24 hours	48 hours	48 hours
Number of Samples	1	3	6
Arsenic (mg/L)	< 0.001	0.05 to 2.02	< 0.002 to 0.081
Selenium (mg/L)	NA	0.42 to 160	< 0.002 to 0.045
Boron (mg/L)	420	4.63 to 37.34	< 0.010 to 1.05
Iron (mg/L)	NA	NA	< 0.02 to 0.98
Sulfate (mg/L)	13,070	2,000 to 16,700	2.0 to < 5.0
pH (SU)	6.6	10.3 to 12.5	5.6 to 9.9

NOTES:

1. 1983 fly ash leaching data from RMT (1984); remaining leaching data provided by WP&L.
2. NA = Not Analyzed.

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 07-SEP-93

TABLE 6
SLAG AND ASH BASIN CHEMISTRY

PARAMETER	UNITS	FLY ASH BASIN 07-SEP-93 3302-011		SLAG BASIN 07-SEP-93 3302-010	
COLOR, FIELD		CLEAR		CLEAR	
CONDUCTANCE, SPECIFIC	UMHOS/CM	5190		400	
ODOR, FIELD		NONE		NONE	
PH, FIELD	SU	8.1		7.4	
TEMPERATURE	DEG C	17		18	
TURBIDITY, FIELD		SLIGHT		SLIGHT	
ALKALINITY AS CACO3	MG/L	230		160	
HARDNESS AS CACO3	MG/L	930		200	
SOLIDS, TOTAL DISSOLVED	MG/L	410		300	
SULFATE	MG/L	3300		50	
ARSENIC, TOTAL	UG/L	60		8.0	
BARIUM, TOTAL	UG/L	270		150	
BORON, TOTAL	UG/L	2300		210	
CADMIUM, TOTAL	UG/L	5.4		< 0.30	
CHROMIUM, TOTAL	UG/L	11		< 10	
IRON, TOTAL	UG/L	1600		2000	
LEAD, TOTAL	UG/L	< 3.0		< 3.0	
MERCURY, TOTAL	UG/L	< 0.20		< 0.20	
SELENIUM, TOTAL	UG/L	36	I	2.1	L
SILVER, TOTAL	UG/L	< 1.0		< 1.0	

18-OCT-94

wpvalid:SWI.BJC

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-04 01-JUN-93 1670-015	B-04 07-SEP-93 3293-010	B-07 ND 01-JUN-93 1670-020	B-07 ND 07-SEP-93 3302-004	B-08 01-JUN-93 1670-001	B-08R 07-SEP-93 3293-009
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1160	1240	460	550	670	1160
DEPTH TO WATER	FEET	9.90	12.75	12.83	16.12	5.68	20.13
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.3	7.5	7.0	6.9	7.1	6.8
TEMPERATURE	DEG C	15	10	14	12	15	7
TURBIDITY, FIELD		NONE	SLIGHT	NONE	SLIGHT	NONE	MODERATE
WATER ELEVATION	FEET	610.68	607.83	610.97	607.68	610.51	
ALKALINITY AS CACO3	MG/L	72	92	160	190	220	440
CHLORIDE	MG/L	18	23	17	15	9.4	2.8
COD	MG/L						
FLUORIDE	MG/L	0.58	5.5	0.26	0.32	< 0.10	0.12
HARDNESS AS CACO3	MG/L	220	120	210	250	370	620
NITROGEN, NITRATE + NITRITE	MG/L	0.15	0.33	< 0.050	< 0.050	< 0.050	4.2
SOLIDS, TOTAL DISSOLVED	MG/L	900	940	300	360	460	770
SULFATE	MG/L	500	560	74	100	180	180
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	68	< 50	61	73	63	50
BORON, DISSOLVED	UG/L	1900	4200	230	< 200	2200	9400
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	0.38
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	720	890	2800	4100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	1200	720	970	1500	17	3400
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	6.9	3.2	< 1.0 L	< 1.0 L	< 1.0 L	34
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	1000	100	22	< 20	220	< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-11 07-SEP-93 X0001	B-11 29-OCT-93 3485-001	B-20 07-SEP-93 X0002	B-26 01-JUN-93 1670-022	B-26 07-SEP-93 3302-005	B-26A 01-JUN-93 1670-023
COLOR, FIELD					CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1500		310	610	670	660
DEPTH TO WATER	FEET	15.91		10.81	16.22	18.85	16.20
ODOR, FIELD					NONE	NONE	NONE
PH, FIELD	SU				7.1	7.2	7.0
TEMPERATURE	DEG C	13	13	14	14	11	15
TURBIDITY, FIELD					NONE	SLIGHT	NONE
WATER ELEVATION	FEET				610.18	607.55	610.19
ALKALINITY AS CACO3	MG/L		470		320	300	340
CHLORIDE	MG/L				21	43	33
COD	MG/L						
FLUORIDE	MG/L				< 0.10	0.15	< 0.10
HARDNESS AS CACO3	MG/L		810		390	410	400
NITROGEN, NITRATE + NITRITE	MG/L				2.6	4.9	2.0
SOLIDS, TOTAL DISSOLVED	MG/L		520		440	450	450
SULFATE	MG/L		360		34	34	33
ARSENIC, DISSOLVED	UG/L		8.4		< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L		100		62	68	96
BORON, DISSOLVED	UG/L		5100		< 200	< 200	< 200
CADMIUM, DISSOLVED	UG/L		< 0.30		< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L		< 10		< 10	< 10	< 10
COPPER, DISSOLVED	UG/L				< 20	< 20	< 20
IRON, DISSOLVED	UG/L		55000		< 100	< 100	< 100
LEAD, DISSOLVED	UG/L		< 3.0		< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L				< 5.0	< 5.0	< 5.0
MERCURY, DISSOLVED	UG/L		< 0.20		< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L		< 1.0 LNP		< 1.0 L	< 1.0 L	< 1.0 L
SILVER, DISSOLVED	UG/L		< 10		< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L				< 20	< 20	< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-26A 07-SEP-93 3302-006	B-27R 07-SEP-93 X0003	B-28 01-JUN-93 1670-014	B-28 07-SEP-93 3302-003	B-29 07-SEP-93 X0004	B-30AR 01-JUN-93 1670-013
COLOR, FIELD		CLEAR		CLEAR	CLEAR		CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	440	370	190	230	360	220
DEPTH TO WATER	FEET	18.84	14.67	6.40	9.08	9.57	12.33
ODOR, FIELD		NONE		NONE	NONE		NONE
PH, FIELD	SU	7.2		6.1	6.0		7.2
TEMPERATURE	DEG C	11	14	17	15	15	17
TURBIDITY, FIELD		NONE		SLIGHT	MODERATE		NONE
WATER ELEVATION	FEET	607.55		610.46	607.74	607.26	610.11
ALKALINITY AS CACO3	MG/L	340		26	54		200
CHLORIDE	MG/L	25		4.6	11		13
COD	MG/L						7.3
FLUORIDE	MG/L	0.15		< 0.10	< 0.10		0.10
HARDNESS AS CACO3	MG/L	410		82	110		220
NITROGEN, NITRATE + NITRITE	MG/L	1.8		2.7	0.60		< 0.050
SOLIDS, TOTAL DISSOLVED	MG/L	440		140	160		280
SULFATE	MG/L	38		45	42		27
ARSENIC, DISSOLVED	UG/L	< 3.0		< 3.0	< 3.0		< 3.0
BARIUM, DISSOLVED	UG/L	86		< 50	52		< 50
BORON, DISSOLVED	UG/L	< 200		< 200	< 200		< 200
CADMIUM, DISSOLVED	UG/L	< 0.30		< 0.30	< 0.30		< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10		< 10	< 10		< 10
COPPER, DISSOLVED	UG/L	< 20		< 20	< 20		< 20
IRON, DISSOLVED	UG/L	< 100		210	< 100		< 100
LEAD, DISSOLVED	UG/L	< 3.0		< 3.0	< 3.0		< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0		8.6	< 5.0		< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20		< 0.20	< 0.20		< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 LN		< 1.0 L	< 1.0 L		< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0		< 1.0	< 1.0		< 1.0
ZINC, DISSOLVED	UG/L	< 20		< 20	< 20		< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-30AR 07-SEP-93 3302-002	B-30R 01-JUN-93 1670-012	B-30R 07-SEP-93 3302-001	B-31A 01-JUN-93 1670-019	B-31A 07-SEP-93 3293-011	B-31R 01-JUN-93 1670-018
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	410	420	360	700	800	640
DEPTH TO WATER	FEET	15.37	12.25	15.17	12.21	15.93	11.56
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.3	7.0	6.8	6.9	7.3	6.8
TEMPERATURE	DEG C	12	16	14	17	14	17
TURBIDITY, FIELD		NONE	MODERATE	MODERATE	NONE	SLIGHT	SLIGHT
WATER ELEVATION	FEET	607.07	610.10	607.18	610.46	606.74	610.85
ALKALINITY AS CACO3	MG/L	190	160	140	170	160	240
CHLORIDE	MG/L	14	13	6.6	16	17	11
COD	MG/L		9.7				
FLUORIDE	MG/L	0.16	< 0.10	< 0.10	0.39	0.43	< 0.10
HARDNESS AS CACO3	MG/L	230	210	210	120	160	330
NITROGEN, NITRATE + NITRITE	MG/L	< 0.050	8.5	8.8	< 0.050	< 0.050	< 0.050
SOLIDS, TOTAL DISSOLVED	MG/L	280	280	230	510	570	510
SULFATE	MG/L	25	25	26	250	250	150
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	< 50	< 50	< 50	54	66	110
BORON, DISSOLVED	UG/L	< 200	< 200	< 200	2900	2100	2900
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	2.7
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	110
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	210	300	450
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	< 5.0	4600	6000	440
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	1.3 L	3.2	< 1.0 L	< 1.0 L	1.2 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	27

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-31R 07-SEP-93 3293-012	B-32 01-JUN-93 1670-002	B-32 07-SEP-93 3293-016	B-32A 01-JUN-93 1670-003	B-32A 07-SEP-93 3293-017	B-35 01-JUN-93 1670-004
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	L YLW/BN
CONDUCTANCE, SPECIFIC	UMHOS/CM	480	300	330	610	1320	1070
DEPTH TO WATER	FEET	14.44	3.37	6.22	3.59	6.46	10.10
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.0	6.3	5.6	7.0	6.8	6.3
TEMPERATURE	DEG C	15	13	14	13	14	12
TURBIDITY, FIELD		MODERATE	SLIGHT	MODERATE	NONE	SLIGHT	SLIGHT
WATER ELEVATION	FEET	607.97	610.80	607.95	610.81	607.94	610.66
ALKALINITY AS CACO3	MG/L	190	140	140	330	320	190
CHLORIDE	MG/L	11	6.7	6.9	7.0	7.6	110
COD	MG/L						
FLUORIDE	MG/L	0.18	< 0.10	0.12	0.12	0.19	< 0.10
HARDNESS AS CACO3	MG/L	240	160	180	350	390	260
NITROGEN, NITRATE + NITRITE	MG/L	< 0.050	0.68	1.2	1.1	1.3	36
SOLIDS, TOTAL DISSOLVED	MG/L	340	200	240	380	420	800
SULFATE	MG/L	71	11	16	29	30	35
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	7.4
BARIUM, DISSOLVED	UG/L	81	100	120	98	91	100
BORON, DISSOLVED	UG/L	1100	< 200	< 200	< 200	< 200	210
CADMIUM, DISSOLVED	UG/L	1.1	< 0.30	0.38	< 0.30	0.35	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	21
IRON, DISSOLVED	UG/L	210	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	360	< 5.0	280	6.9	33	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-35 07-SEP-93 3293-002	B-35A 01-JUN-93 1670-005	B-35A 07-SEP-93 3293-003	B-36 01-JUN-93 1670-007	B-36 07-SEP-93 3293-004	B-36A 01-JUN-93 1670-006
COLOR, FIELD		YELLOW	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1050	620	680	430	500	620
DEPTH TO WATER	FEET	13.13	10.55	13.57	10.86	13.97	11.11
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	6.8	7.0	7.1	6.3	7.0	7.1
TEMPERATURE	DEG C	14	13	12	12	13	13
TURBIDITY, FIELD		SLIGHT	NONE	NONE	SLIGHT	MODERATE	NONE
WATER ELEVATION	FEET	607.63	610.63	607.61	610.60	607.49	610.35
ALKALINITY AS CACO3	MG/L	210	330	320	230	210	330
CHLORIDE	MG/L	80	26	24	4.4	25	12
COD	MG/L						
FLUORIDE	MG/L	0.19	< 0.10	0.13	< 0.10	0.14	< 0.10
HARDNESS AS CACO3	MG/L	290	380	400	240	280	350
NITROGEN, NITRATE + NITRITE	MG/L	39	1.7	2.0	< 0.050	1.4	0.83
SOLIDS, TOTAL DISSOLVED	MG/L	770	480	460	280	350	400
SULFATE	MG/L	43	33	37	15	18	36
ARSENIC, DISSOLVED	UG/L	3.6	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	120	< 50	54	110	120	68
BORON, DISSOLVED	UG/L	220	< 200	< 200	< 200	< 200	< 200
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	24	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	< 5.0	< 5.0	55	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	1.0 L	2.6 L	< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-36A 07-SEP-93 3293-005	B-37 07-SEP-93 3302-007	B-37A 07-SEP-93 3302-008	B-38 01-JUN-93 1670-016	B-38 07-SEP-93 3293-006	B-38A 01-JUN-93 1670-017
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	620	510	770	3630	2830	2760
DEPTH TO WATER	FEET	14.18	8.13	8.14	18.53	20.19	24.87
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.1	7.3	7.3	8.3	9.9	7.7
TEMPERATURE	DEG C	11	13	11	20	20	15
TURBIDITY, FIELD		NONE	SLIGHT	NONE	NONE	SLIGHT	NONE
WATER ELEVATION	FEET	607.51	606.69	606.69	617.29	615.63	610.96
ALKALINITY AS CACO3	MG/L	330	200	190	100	420	80
CHLORIDE	MG/L	13	6.8	11	26	24	23
COD	MG/L						
FLUORIDE	MG/L	0.14	< 0.10	< 0.10	1.8	2.6	1.1
HARDNESS AS CACO3	MG/L	390	290	410	620	21	500
NITROGEN, NITRATE + NITRITE	MG/L	0.85	1.2	< 0.050	1.7	0.29	1.6
SOLIDS, TOTAL DISSOLVED	MG/L	420	380	590	3000	2200	2300
SULFATE	MG/L	36	100	240	2600	1200	2000
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	180	90	38
BARIUM, DISSOLVED	UG/L	68	< 50	< 50	110	< 50	58
BORON, DISSOLVED	UG/L	< 200	3100	7400	2500	2600	2200
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	68	< 10	52
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	55	< 5.0	< 5.0	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	57	320	22
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS		B-38A 07-SEP-93 3293-007
COLOR, FIELD			CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM		3280
DEPTH TO WATER	FEET		27.59
ODOR, FIELD			NONE
PH, FIELD	SU		9.0
TEMPERATURE	DEG C		16
TURBIDITY, FIELD			NONE
WATER ELEVATION	FEET		608.24
ALKALINITY AS CACO3	MG/L		90
CHLORIDE	MG/L		21
COD	MG/L		
FLUORIDE	MG/L		3.4
HARDNESS AS CACO3	MG/L		390
NITROGEN, NITRATE + NITRITE	MG/L		0.59
SOLIDS, TOTAL DISSOLVED	MG/L		2600
SULFATE	MG/L		1800
ARSENIC, DISSOLVED	UG/L		51
BARIUM, DISSOLVED	UG/L		54
BORON, DISSOLVED	UG/L		3300
CADMIUM, DISSOLVED	UG/L	<	0.30
CHROMIUM, DISSOLVED	UG/L		11
COPPER, DISSOLVED	UG/L	<	20
IRON, DISSOLVED	UG/L	<	100
LEAD, DISSOLVED	UG/L	<	3.0
MANGANESE, DISSOLVED	UG/L	<	5.0
MERCURY, DISSOLVED	UG/L	<	0.20
SELENIUM, DISSOLVED	UG/L		57
SILVER, DISSOLVED	UG/L	<	1.0
ZINC, DISSOLVED	UG/L	<	20

Appendix C

2016 Low-Hazard Waste Exemption Leaching Test Results – Slag and Ash

Sediment and Soil Analytical Results - Water Leach Test Results
WPL Nelson Dewey

Sample	Date	Depth (feet)	Material Type	Lab Notes	Boron (ug/L)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)
WPDES POND								
SED-1	8/3/2016	0-1.3	Fly Ash	--	240	4.3	4.4	54
SED-2	8/3/2016	0-1.0	Fly Ash	--	200	4.3	11.5	60
QC-3 (SED-2)	8/3/2016	0-1	Fly Ash	--	240	3.5 J	6.1	52
SED-3	7/20/2016	0-4.5	Slag	--	130	2.7 J	5	28
	7/20/2016	4.5-5.5	SP	--	<50	2.5 J	<2.0	14 J
SED-4	7/19/2016	0-4.8	ML	--	510	10.5 J	11.9 J	86
	7/19/2016	4.8-5.5		--	74 J	NA	NA	NA
GP-19	8/4/2016	8-12	SM	--	62 J	2.4 J	2 J	16 J
SLAG POND								
SED-5	7/20/2016	0-1.6	ML-OL	--	54 J	3.2 J	33.3	90
SED-6	7/20/2016	0-1.0	ML	--	60 J	3.7 J	59.1	130
SED-7	8/4/2016	0-3.0	Fly Ash	--	88 J	4	10.5	76
SED-8	8/4/2016	1.0-1.5	Fly Ash	--	82 J	3.7 J	12.1	74
COAL YARD								
TP-CY-1	7/19/2016	0-0.5	Coal	--	140	<20.0	<20.0	32
	7/19/2016	3.0-3.5	SM	--	100 J	2.8 J	<2.0	20
TP-CY-3	7/20/2016	1.9-2.1	GM	--	<50	3.9 J	2.8 J	50
	7/20/2016	4.8-5.5	SM	--	NA	NA	NA	NA
TP-CY-4	7/19/2016	0-2.8	Coal	--	190	<20.0	<20.0	38
	7/19/2016	2.8-3.2	GP & SM	--	<50	<10.0	<10.0	34
	7/19/2016	3.6-4.8	Slag	--	<50	<20.0	<20.0	10 J
	7/19/2016	4.8-5.0		--	NA	NA	NA	NA
TP-CY-6	7/19/2016	0-0.5	Coal	--	190	<20.0	<20.0	54
	7/19/2016	0.7-1.0	SP	--	<50	2.5 J	2.3 J	30
TP-CY-10	7/19/2016	0-0.5	Coal	--	120	2.4 J	11.6	48
	7/19/2016	1.0-2.0	SM	--	<50	2.2 J	2.3 J	28
TP-CY-12	7/20/2016	0-0.3	Coal	--	160	<20.0	<20.0	44
	7/20/2016	0.3-2.0	SP	--	<50	2.2 J	2.2 J	24
	7/20/2016	2.0-2.7	SP	--	<50	2.3 J	27.5	50
QC-1 (TP-CY-12)	7/20/2016	0.3-2.0	SP	--	<50	2.6 J	2.5 J	24
SLAG HANDLING AREA								
GP-5	8/3/2016	12.5-15	Fly Ash	--	100	<2.0	3.0 J	22
	8/3/2016	18-24	ML & SM	--	99 J	3.3 J	<2.0	24
GP-7	8/3/2016	7.5-18	Slag	--	<50	2.2 J	<2.0	<8.7
QC-2 (GP-7)	8/3/2016	7.5-18	Slag	--	<50	2.2 J	<2.0	10 J
GP-14	8/4/2016	12.5-15	Fly Ash	--	120	<2.0	13.4	96

Sediment and Soil Analytical Results - Water Leach Test Results
WPL Nelson Dewey

Sample	Date	Depth (feet)	Material Type	Lab Notes	Boron (ug/L)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)
SLAG SAMPLES[1]								
Slag 01 [2]	6/3/2013	--	Slag	--	NA	NA	NA	NA
Slag 01	12/23/2013	--	Slag	--	12.5 AB	0.277 B	0.218	NA
NED Slag Composite 2014	7/1/2014	--	Slag	--	11.7 AB*^	< 0.142	0.457 B	98 H
Slag Sample	4/14/2015	--	Slag	--	< 1020 A	0.751	0.427	NA
FLY ASH SAMPLES[1]								
NED Flyash Composite [2]	2/14/2014	--	Fly Ash	--	NA	NA	6,530 B	NA
Week of 062815 [2]	7/3/2015	--	Fly Ash	--	NA	NA	6,260	NA
Week of 010916	1/4/2016	--	Fly Ash	--	NA	NA	NA	NA
NR 140 Preventative Action Limits (PALs)					200	125	125	NE
NR 140 Enforcement Standards (ESs)					1000	250	250	NE
40 CFR Part 141.62 Maximum Contaminant Levels (MCL)					NE	NE	NE	NE
NR 538 Table 1A Standards					190	125	125	NE
NR 538 Table 2A Standards					1900	1,250	1,250	NE

Abbreviations:
mg/L = micrograms per liter
NE = No Standard Established
NA = Not Analyzed
GM = Silty Gravel
ML = Silt
ML-CL = Silty Clay
SM = Silty Sand
GP = Poorly Graded Gravel
ML-OL = Silty Organic Clay
SP = Poorly Graded Sand
ML-OL = Silty Organic Clay
TDS = Total Dissolved Solids

Notes:
1. Slag and Fly Ash samples were collected by the plant as part of permit requirements.
2. Sample was analyzed using the SPLP Leach Method rather than the ASTM Water Leach Method for tested parameters except for Sulfate.
NR 140 ESs - Wisconsin Administrative Code (WAC), Chapter NR 140.10 Table 1 - Public Health Groundwater Quality Standards from July 2015 and WAC, Chapter NR 140.12 Table 2 - Public Welfare Groundwater Quality Standards from July 2015.
NR 140 PALs - WAC, Chapter NR 140.10 Table 1 - Public Health Groundwater Quality Standards from July 2015 and WAC, Chapter NR 140.12 Table 2 - Public Welfare Groundwater Quality Standards from July 2015.

Laboratory Notes/Qualifiers:
J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
A = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B = Compound was found in the blank and sample.
H = Sample was prepped or analyzed beyond the specified holding time.
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
* = LCS or LCSD is outside acceptance limits.

Created by: RJG Date: 3/14/2016
Last revision by: RJG Date: 10/24/2016
Checked by: BSS Date: 10/24/2016
Original table prepared for Slag Pond Closure Low Hazard Waste Exemption Request (SCS Project #25216054.00).
Reformatted for the Alternative Source Demonstration to include only the parameters with SSIs that were included in the leach testing by NDK, 9/14/2020.

I:\25220071.00\Deliverables\2020 April ASD NED\Appendix C 2017 leachate results slag and ash\[Table 4. Sediment_Soil_Water Leach Results-Updated.xlsx]Leach Test - SSI Parameters

F2 Alternative Source Demonstration, April 2021 Detection Monitoring

Alternative Source Demonstration
April 2021 Detection Monitoring

Slag Pond
Nelson Dewey Generating Station
Cassville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25221071.00 | October 13, 2021

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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PE CERTIFICATION

I, Sherren Clark, hereby certify that that the information in this alternative source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Nelson Dewey Generating Station Slag Pond facility. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

SLClark 10-12-2021

(signature) (date)

Sherren Clark

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2022.

Pages or sheets covered by this seal:

Alternative Source Demonstration, April 2021
Detection Monitoring – Slag Pond
Nelson Dewey Generating Station, Cassville
(Entire Document)

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (U.S. EPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (U.S. EPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.94(e)(2). The applicable sections of the Rule are provided below in *italics*.

1.1 §257.94(E)(2) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

The owner and operator may demonstrate that a source other than the CCR Unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program. The ASD is completed to determine if any other sources are likely causes of the identified exceedance(s) of established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSIs observed in the statistical evaluation of the April 2021 detection monitoring event at the Nelson Dewey Generating Station (NED). The first ASD was prepared for this facility evaluating the SSIs observed in the statistical evaluation of the October 2017 detection monitoring event (SCS Engineers [SCS], 2018). The October 2017 ASD and subsequent semiannual updates have concluded that several lines of evidence demonstrate that SSIs reported for Appendix III parameters in the downgradient monitoring wells were likely due to man-made sources other than the slag pond CCR Unit and/or naturally occurring constituents in the alluvial aquifer. The conclusions of this ASD are consistent with previous ASDs.

1.2 SITE INFORMATION AND MAP

The NED site is located along the east bank of the Mississippi River, north of the Village of Cassville, in Grant County, Wisconsin (**Figure 1**). The facility includes a decommissioned coal-fired generating plant, a CCR landfill that was closed in 2001, a closed Slag Pond, and a closed wastewater treatment pond. The layout of the site on an aerial photograph base is shown on **Figure 2**. The closed landfill at the NED facility was permitted under Wisconsin Department of Natural Resources (WDNR) License #02525.

The existing CCR Unit evaluated for this ASD is:

- Slag Pond (existing surface impoundment – closed January 2018)

A map showing the CCR Unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program and the state monitoring program is provided as **Figure 3**.

Operations at the facility began in the late 1950s, and a CCR impoundment that included what is now the Slag Pond closure area was commissioned at that time. The CCR landfill was initially licensed in 1976 and received fly ash from NED until it was closed in phases between 1996 and 2001. The CCR landfill was initially operated as a fly ash sluice basin, then transitioned to dry ash placement prior to closure. The wastewater ponds, now closed, were constructed in 1976 for the purpose of settling CCR from the NED process wastewater streams and sediment from storm water runoff prior to discharge. Both NED generating units were retired on December 31, 2015, and have since been decommissioned. The generating station was demolished in 2017. Closure of the slag pond was completed in January 2018.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

The statistical evaluation was completed in accordance with 40 CFR 257.93(f)(3) using a prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit (UPL). The initial evaluation was based on an interwell comparison. The UPLs were calculated based on a 1-of-2 resampling approach. The UPLs and the analytical results for the April 2021 monitoring event are summarized in the attached **Table 1**.

The initial evaluation indicated that the April 2021 monitoring event results represent an SSI over background for the following parameters and wells:

- Boron: B-7R, B-11A, B-11B, B-11R, B-31A, B-31R
- Calcium: B-11R
- Fluoride: B-11B
- Field pH: B-11B, B-31A
- Sulfate: B-11B, B-11R, B-31R
- Total Dissolved Solids (TDS): B-11B, B-11R

The SSIs are consistent with SSIs identified in previous detection monitoring results. Although the UPLs were calculated based on a 1-of-2 resampling approach, optional retesting for the April 2021 event was not conducted, and the determination of SSIs is based solely on the April results.

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION APPROACH

This ASD report includes:

- Background information (**Section 2.0**)
- Evaluation of potential that SSIs are due to methodology or analysis (**Section 3.0**)
- Evaluation of potential that SSIs are due to natural sources or man-made sources other than the CCR Units (**Section 4.0**)
- ASD conclusions (**Section 5.0**)
- Monitoring recommendations (**Section 6.0**)

Historical monitoring results from background and compliance sampling for the CCR Rule constituents with SSIs are provided in **Table 2**. The laboratory report for the April 2021 event will be included in the 2021 Annual Groundwater Monitoring and Corrective Action report due in January 2022. Complete laboratory reports for the background monitoring events and previous detection monitoring events were included in the previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

To provide context for the ASD evaluation, the following background information is provided in this section of the report, prior to the ASD evaluation sections:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells

A more detailed discussion of the background information for the site is provided in the ASD for the October 2017 event (SCS, 2018).

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Information

The uppermost geologic formation beneath the NED site is the surficial alluvial aquifer. The alluvial aquifer consists of Mississippi River valley sand and gravel deposits, and is the uppermost aquifer as defined in section 257.53 of the CCR Rule. This deposit is prevalent along the edges of the entire Mississippi River valley in southwestern Wisconsin.

The alluvial aquifer is underlain by dolomitic bedrock of the Prairie du Chien Group. The dolomite bedrock is also an aquifer and is likely hydraulically connected to the alluvial aquifer above.

Regionally, groundwater flow is generally to the southwest and discharges to the Mississippi River.

Additional details on the regional geology were provided in the October 2017 ASD (SCS, 2018).

2.1.2 Site Information

The thickness of the alluvium in the immediate vicinity of the site is over 125 feet, as evidenced by local water supply well logs (SCS, 2018). These logs are also evidence that the alluvial aquifer yields useable quantities of groundwater for supply wells in the area. Soil boring logs for monitoring wells installed at the site also generally indicate sand and gravel soils within the monitored depths.

The groundwater flow direction in the vicinity of the plant is generally southwest toward the Mississippi River. Historically, infiltration at the former Slag Pond, former fly ash basin, and the former Wisconsin Pollutant Discharge Elimination System (WPDES) ponds caused groundwater mounding to be present around these features; however, these ponds have now all been closed and are no longer sources of infiltration.

Site water level measurements generally indicate that groundwater flow is to the southwest, discharging to the Mississippi River. However, during periods of high river water levels, the flow temporarily reverses and the river discharges to the shallow sand and gravel aquifer. The groundwater flow direction during the April 2021 detection monitoring event was toward the Mississippi River with flow generally moving south to southeast (**Figure 4**). The groundwater elevations are provided in **Table 3**.

2.2 COAL COMBUSTION RESIDUALS RULE MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of one upgradient (background) monitoring well and six downgradient monitoring wells. The background well is B-26. The downgradient wells include B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R. The CCR Rule wells are installed within the surficial alluvium aquifer. Well depths range from approximately 23 to 114 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

There are several additional groundwater monitoring wells at the NED facility that are part of the monitoring system developed for the state monitoring program. All of the wells included in the CCR monitoring well network were already in use for the state monitoring program. The well locations are shown on Figure 3. The state program monitoring wells and two private wells are used to monitor groundwater conditions at the site under WDNR License Number 2525, which includes the closed CCR landfill (former fly ash settling basin) and the closed Slag Pond. Monitoring wells for the state monitoring program are installed in the surficial sand and gravel aquifer, which is the uppermost aquifer as defined under 40 CFR 257.53.

3.0 METHODOLOGY AND ANALYSIS REVIEW

To evaluate the potential that an SSI is due to a source other than the regulated CCR Unit, SCS used a two-step evaluation process. First, the sample collection, field and laboratory analysis, and statistical evaluation were reviewed to identify any potential error or analysis that led to an exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR Unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. Section 4.0 of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS REVIEW

Field notes and sampling results were reviewed to determine if any sampling error may have caused or contributed to the observed SSIs. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross contamination during sampling, or other field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers. Based on the review of the field notes and results, SCS did not identify any indication that the SSIs were due to a sampling error.

SCS did not identify any issues with the field sampling for field analysis based on review of the data and field notes. Because boron, calcium, fluoride, total dissolved solids (TDS), and sulfate are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the April 2021 detection monitoring events were reviewed to evaluate whether any laboratory analysis error or issue may have caused or contributed to the observed SSIs. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results. Laboratory reports for the background monitoring events were reviewed for the October 2017 ASD. Laboratory reports for subsequent detection monitoring events were reviewed as part of the ASD preparation for each event.

Based on the review of the laboratory reports, SCS did not identify any indication that any SSI was due to a laboratory analysis error. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for detection monitoring. The sulfate result for the sample from B-11B was flagged by the laboratory for a low matrix spike and matrix spike duplicate recovery, but the laboratory control sample recoveries were within limits so the results are accepted. Since the low spike recoveries would indicate a potential low bias rather than a high bias, this flag does not suggest that laboratory analysis contributed to the SSI for sulfate at B-11B.

Time series plots of the SSI constituent analytical data were also reviewed for any anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). The time series plots are provided in Appendix A. None of the time series plots included anomalous results that appeared to indicate a sampling or laboratory error.

3.3 STATISTICAL EVALUATION REVIEW

The review of the statistical results and methods included a quality control check of the following:

- Input analytical data vs. laboratory analytical reports
- Statistical method and process for each SSI

Based on the review of the statistical evaluation, SCS did not identify any errors or issues in the statistical evaluation that caused or contributed to the determination of interwell SSIs for boron, calcium, fluoride, field pH, sulfate, and TDS at the downgradient monitoring wells.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the April 2021 detection monitoring events based on the methodology and analysis review. No errors or issues causing or contributing to the reported SSIs were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the SSI constituents at the downgradient wells, identifies the most likely alternative source(s), and presents the lines of evidence indicating that an alternative source is the most likely cause of the observed SSIs.

4.1 POTENTIAL CAUSES OF STATISTICALLY SIGNIFICANT INCREASES

4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the April 2021 detection monitoring results to the UPLs calculated based on sampling of the background well (B-26). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron, field pH, sulfate, and TDS SSIs. These parameters were detected at higher concentrations than would likely be present naturally.

Natural variation may have caused or contributed to the SSI for calcium at B-11R. As discussed in Section 2.1.1, the alluvial aquifer is underlain by dolomitic bedrock of the Prairie du Chien Group. The dolomite aquifer is also present in the bluffs northeast of the site and groundwater from the dolomite likely discharges to the alluvial aquifer. Calcium is a typical constituent of groundwater in dolomite aquifers. The calcium concentrations in upgradient well B-26 have exceeded those in at least three of the downgradient wells, suggesting that natural variability may contribute to the calcium concentrations observed in the downgradient monitoring wells.

Based on fluoride data for wells in Grant County, natural variation may also have caused or contributed to the SSI for fluoride at B-11B. Grant County regional fluoride information is attached as Appendix D.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, calcium, fluoride, field pH, sulfate, and TDS SSIs could include the closed CCR landfill, the coal storage area, or other plant operations. Based the groundwater flow directions and on previous investigations at the site, the closed landfill appears to be the most likely man-made cause of the SSIs for the downgradient wells B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that natural variation may have caused or contributed to the fluoride SSI include:

1. Although fluoride was not detected in background well B-26, publicly available data from the WDNR's Groundwater Retrieval Network (GRN) database indicates it is commonly detected in Grant County.

The lines of evidence indicating that the SSIs for boron, calcium, fluoride, field pH, sulfate, and TDS in one or more compliance wells relative to the background well are more likely due to the closed landfill and prior fly ash sluicing than to the Slag Pond include:

1. A previous Environmental Contamination Assessment completed for the ash disposal facility indicated that the fly ash sluicing and landfill were the primary source of the groundwater impacts in the area, based on multiple lines of evidence.

2. Sampling performed in preparation for the Slag Pond closure indicated that the slag and the Slag Pond sediment had little potential to cause the SSIs for boron, fluoride, sulfate, and TDS.

3. Past and current groundwater monitoring performed under the state monitoring program shows that groundwater quality has improved since the 1990s in response to termination of fly ash sluicing and closure, and capping of the ash landfill. Recent concentration increases at some wells in the state monitoring program appear to be attributable to the closed CCR landfill source and to changes in groundwater flow at the site in response to closure of the Slag Pond.

The data supporting these lines of evidence are discussed below. Most of these lines of evidence and the supporting data were discussed in detail in the ASD for the October 2017 detection monitoring event (SCS, 2018), with the exception of the TDS SSI concentrations. For lines of evidence included in previous ASDs, the discussion focuses on any updated information collected since the previous ASD, with references to the previous ASD for additional details.

4.2.1 Grant County Fluoride Data

Natural variation may have caused or contributed to the SSI for fluoride at B-11B. Although fluoride was not detected in background well B-26, publicly available data from the WDNR's GRN database indicates it is commonly detected in Grant County. Out of a total of 403 fluoride analysis results in the GRN database for water supply wells in Grant County, as of June 2021, 88 percent had fluoride detected. The average concentration of fluoride in Grant County well samples with fluoride detections was 0.41 milligrams per liter (mg/L). The fluoride concentration reported for B-11B for April 2021, 0.36 mg/L, is in the range of concentrations in the GRN database for Grant County. A summary of the Grant County fluoride data is included in **Appendix D**. As discussed below, there is also a potential that fluoride concentrations in B-11B are associated with impacts from the closed CCR landfill.

4.2.2 Previous CCR Pond and Landfill Study

A previous investigation titled *Environmental Contamination Assessment: Nelson Dewey Generating Station Ash Disposal Facility*, completed by RMT in 1994, found that groundwater impacts were associated with disposal of fly ash in the now-closed CCR landfill located immediately north of the Slag Pond (**Figure 3**). The purpose of the 1994 Environmental Contamination Assessment (ECA) was to investigate the impacts to groundwater at the NED landfill. The ECA was used to evaluate feasibility of possible remedial alternatives. The remedial alternative that was ultimately selected was to convert the plant to dry fly ash handling.

The primary lines of evidence from the 1994 report that support the current ASD for boron, fluoride, field pH, sulfate, and TDS include:

- Water leaching tests for ash and slag indicated that boron and sulfate concentrations in the slag leachate were orders of magnitude lower than in the fly ash leachate (**Appendix B**, **Table 5**). Higher pH values were also reported for leach samples of Western coal fly ash in 1990 to 1992 than for the slag samples.

- Surface water samples from the then active fly ash sluice pond and the Slag Pond indicated that boron and sulfate concentrations in the Slag Pond were one or more orders of magnitude lower than in the ash sluice pond. The surface water pH measurement was also higher in the ash sluice pond. The surface water boron and sulfate concentrations in the Slag Pond were higher than leach test results, which was attributed to infiltration of ash sluice pond water through the berm between the ponds into the Slag Pond (**Appendix B**, **Table 6**).

- Groundwater sampling at monitoring wells B-38 and B-38A (now abandoned), which were installed through and screened below the ash disposal area (now closed landfill), indicated that groundwater affected by ash sluicing was characterized by high pH and elevated concentrations of boron, fluoride, sulfate, and TDS (**Appendix B**, **Site Map** and **Table 8**).

Although calcium was not included in the historical state groundwater monitoring program or evaluated in the 1994 report, hardness was monitored and provides an indication of relative calcium concentrations. Surface water samples from the then active ash sluice pond and the Slag Pond indicated that hardness in the Slag Pond was lower than in the ash sluice pond (**Appendix B**, **Table 6**). These results suggest that if the calcium SSI is not solely due to natural variation, then the closed CCR landfill is the most likely man-made source of calcium.

The results of the 1994 ECA were reported to WDNR on November 1994. The ECA investigation was then used for a feasibility study to determine appropriate ash disposal operation on site. Following the ECA, the plant converted to a dry ash handling system. Dry ash was placed in the CCR landfill through the 1990s, and the landfill was capped and closed in phases in 1996 through 2001. After that time, fly ash was not disposed of at the facility.

4.2.3 Slag Pond Closure Sampling Results

Results of leaching test analysis performed for slag, ash, soil, and sediment were submitted as part of a Low Hazard Exemption Request to the WDNR in March 2017 (SCS, 2017). The Exemption Request was submitted as part of the Closure Plan for the site and requested WDNR approval to consolidate materials from decommissioning activities in the Slag Pond and Slag Handling Area, which would then be capped with a composite final cover system. The sediment and soil samples were collected to characterize the materials that would remain on site under the Closure Plan. Leaching tests were performed using ASTM water leach test methods. The leaching test analytical results for parameters with SSIs that were included in the leaching test program (boron, fluoride, sulfate, and TDS) are summarized in **Appendix C**.

The sampling results in the Exemption Request indicated that the materials to be consolidated and capped were not likely to cause groundwater standard exceedances for boron, fluoride, sulfate, or TDS. The leach test results for slag, Slag Pond sediment, and soil in the Slag Handling Area were below the state groundwater standards for boron, fluoride, and sulfate. The parameter TDS does not currently have a state standard but the leach test results for slag, Slag Pond sediment, and soil in the Slag Handling Area were all below the calculated TDS UPL for the site (**Table 1** and **Appendix C**). The boron, sulfate, and TDS results were also below the concentrations of in the downgradient CCR wells with SSIs, and well below the historical results for former well B-38, which was located within the CCR landfill area, upgradient from the Slag Pond (**Appendix B, Table 8**). Fluoride was only detected in one leach test sample from the slag pond area and was at a concentration equal to the concentration detected in the downgradient CCR well with an SSI and well below the historical results for former well B-38

The Low Hazard Exemption was granted by the WDNR based on the sampling results and other information presented.

4.2.4 State Program Groundwater Monitoring Results

Past and current groundwater monitoring performed under the state monitoring program shows that groundwater quality has improved substantially since the 1990s in response to termination of fly ash sluicing, and closure and capping of the ash landfill (SCS, 2018). The long-term trends show that concentrations of boron and sulfate in groundwater have decreased or stabilized since termination of fly ash sluicing and closure of the landfill, in some cases by an order of magnitude or more. The results suggest that current pH levels and boron, fluoride, sulfate, and TDS concentrations likely represent residual contamination from historical ash disposal in the CCR landfill area. Increases in boron, fluoride, and sulfate concentrations at B-11B beginning in 2018 appear to be attributable to the closed CCR landfill and to changes in groundwater flow at the site, related to a decrease in the volume of water discharged to the Slag Pond and subsequent closure of the Slag Pond. Concentrations of these three parameters appear be transitioning to a decreasing trend at B-11B as of April 2021. A summary of state analytical groundwater results is provided in **Table 4**.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, calcium, fluoride, field pH, sulfate, and TDS results in downgradient monitoring wells demonstrate that the SSIs are likely primarily due to sources other than the closed Slag Pond. The SSIs for boron, calcium, fluoride, field pH, sulfate, and TDS appear to be due to historical ash disposal in the closed CCR landfill, which is not subject to the requirements of 40 CFR 257.50-107. The landfill is regulated by the WDNR under the solid waste program (License 02525). Natural variation in groundwater quality in the aquifer may also contribute to the SSIs for calcium and fluoride.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the NED Slag Pond site may continue with detection monitoring based on this ASD. The ASD report will be included in the 2021 Annual Report due January 31, 2022.

7.0 REFERENCES

RMT, 1994, Environmental Contamination Assessment: Nelson Dewey Generating Station Ash Disposal Facility, November 1994.

SCS Engineers, 2017, Low Hazard Exemption Request, Nelson Dewey Generating Station, Cassville, WI, March 2017.

SCS Engineers, 2018, 2017 Alternative Source Demonstration, October 2017 Monitoring Event, Nelson Dewey Generating Station, April 2018.

U.S. Environmental Protection Agency (U.S. EPA), 2015, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, April 2015.

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Tables

Table 1. Groundwater Analytical Results Summary - April 2021 Event
Nelson Dewey Slag Pond, Cassville, WI / SCS Engineers Project #25221071.00

		Background Well	Compliance Wells					
Parameter Name	**UPL**	**B-26**	**B-7R**	**B-11A**	**B-11B**	**B-11R**	**B-31A**	**B-31R**
		4/21/2021	4/20/2021	4/19/2021	4/19/2021	4/19/2021	4/19/2021	4/19/2021
Appendix III								
Boron, ug/L	72.3	63.6	104	88.1	4,440	3,010	172	621
Calcium, ug/L	108,000	78,700	56,100	50,600	93,400	115,000	52,100	91,400
Chloride, mg/L	77.6	42.6	9.5 J, D3	59.1	28.3	27.2	64.8	23.3
Fluoride, mg/L	0.2	<0.095	<0.48 D3	0.23 J	0.36	<0.48 D3	0.14 J	0.19 J
Field pH, Std. Units	7.71	7.27	6.54	7.65	8.07	7.11	7.9	6.91
Sulfate, mg/L	44.0	35.3	<2.2 D3	2.90	379 M0	61.2	15.8	45.3
Total Dissolved Solids, mg/L	553	470	248	366	910	578	330	454

7.81 Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:

UPL = Upper Prediction Limit
SSI = Statistically Significant Increase
LOQ = Limit of Quantitation
LOD = Limit of Detection
ug/L = micrograms per liter
mg/L = milligrams per liter

Lab Notes:

J = Estimated concentration at or above the LOD and below the LOQ.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Notes:

1. An individual result above the UPL may not constitute an SSI above background. See the accompanying letter text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background well B-26. UPLs are based on a 1-of-2 retesting approach.
3. Interwell UPLs updated January 2021 based on background well results from December 2015 through October 2020.

Created by: NDK Date: 4/22/2021
Last revision by: NDK Date: 5/27/2021
Checked by: JR Date: 6/2/2021
Proj Mgr QA/QC/Scientist: TK Date: 6/24/2021

I:\25221071.00\Deliverables\2021 April ASD NED\Tables\[Table 1 - CCR GW Screening Summary_NED.xlsx]Current Event - Updated UPL

Table 2. Historical Analytical Results for Parameters with SSIs
Nelson Dewey Generating Station - Cassville, Wisconsin / SCS Engineers Project #25221071.00

Well Group	Well	Collection Date	Boron (µg/L)	Calcium (mg/L)	Field pH (Std. Units)	Fluoride (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Background	B-26	12/9/2015	29.6	81,300	7.35	<0.20	37.1	424
		4/12/2016	33.7	86,200	7.43	<0.20	38.0	456
		7/19/2016	28.6	82,400	7.14	<0.20	36.2	504
		10/20/2016	33.0	82,700	7.19	0.13 J	35.0	466
		1/12/2017	35.2	89,400	7.57	<0.10	35.0	446
		4/17/2017	50.1	89,000	7.54	<0.10	32.4	468
		6/7/2017	45.8	105,000	7.22	<0.10	31.0	538
		8/2/2017	54.6	98,100	7.21	<0.10	28.5	496
		10/19/2017	47.4	102,000	7.50	<0.10	25.3	542
		4/2/2018	48.0	88,100	7.64	<0.10	19.1	464
		10/8/2018	53.4	78,700	7.20	<0.10	25.1	450
		4/22/2019	41.6	75,300	7.10	<0.10	26.7	458
		10/15/2019	<3.00 U	<76.2	7.24	<0.10	36.0	404
		4/14/2020	66.1	88,500	7.27	0.11 J	30.2	464
		10/13/2020	63.6	76,500	7.34	<0.95 , M0	37.0	448
		4/21/2021	63.6	78,700	7.27	<0.095	35.3	470
Compliance	B-11A	12/9/2015	124	58,800	7.70	0.30 J	3.20 J	338
		4/13/2016	116	60,100	7.75	0.38 J	3.80 J	362
		7/19/2016	104	54,000	7.42	0.35 J	2.70 J	336
		10/19/2016	112	54,600	7.47	0.36	3.00 J	340
		1/12/2017	106	54,500	7.89	0.43	2.30 J	322
		4/17/2017	100	54,800	7.38	0.36	<1.00	326
		6/8/2017	102	57,800	7.78	0.37	1.40 J	338
		8/1/2017	105	54,500	7.67	0.37	2.40 J	326
		10/19/2017	116	55,000	7.96	0.32	5.10	322
		4/2/2018	91.0	53,300	8.04	0.24 J, M0	12.3 M0	336
		10/9/2018	94.2	48,600	7.43	0.29 J	6.00	332
		4/22/2019	93.9	60,400	7.62	0.29 J	1.90 J	386
		10/14/2019	80.7	56,600	7.66	0.26 J	<1.00	348
		4/13/2020	86.3	57,500	7.75	0.27 J	1.40 J	394
		10/12/2020	99.3	55,600	7.74	0.28 J	1.00 J	364
		4/19/2021	88.1	50,600	7.65	0.23 J	2.9	366
	B-11B	12/9/2015	1,140	64,100	8.06	0.44	134	494
		4/13/2016	1,360	65,400	8.14	0.49	148	512
		7/19/2016	1,210	59,000	7.77	0.45	165	520
		10/20/2016	1,460	59,100	7.91	0.53	178	496
		1/12/2017	1,540	63,900	8.18	0.52	182	488
		4/17/2017	1,760	67,400	7.83	0.58	181	502
		6/8/2017	1,880	68,200	8.07	0.59	191	516
		8/1/2017	1,800	61,400	7.77	0.60	179	498
		10/19/2017	1,500	52,400	7.77	0.59	175	510
		4/2/2018	2,020	59,000	8.42	0.65	200	550
		10/9/2018	3,620	66,300	7.74	0.61	197	602
		11/12/2018	--	--	8.05	--	--	594
		4/22/2019	6,830	83,300	7.91	0.64	303	742
		10/14/2019	4,630	91,400	7.92	0.62	339	728
		4/13/2020	5,380	115,000	7.89	<0.95	378	872
		10/12/2020	3,350	91,200	7.80	<0.095	388	906
		4/19/2021	4,440	93,400	8.07	0.36	379 M0	910
	B-11R	12/9/2015	4,170	126,000	7.07	<10	75.4	616
		4/13/2016	3,410	141,000	6.78	<0.20	18.4	682
		7/19/2016	3,530	130,000	6.69	0.22 J	115	698
		10/20/2016	4,120	128,000	6.77	<0.50	118	660
		1/12/2017	3,530	126,000	6.98	<0.50	108	616
		4/17/2017	3,520	123,000	7.11	<0.50	108	620
		6/7/2017	3,420	128,000	6.80	<0.50	98.2	630
		8/1/2017	2,040	139,000	6.70	0.25 J	126	738
		10/19/2017	3,120	117,000	7.22	<0.50 , D3	97.7	586
		4/2/2018	3,180	124,000	7.14	<0.50 , D3, M0	88.1	638
		10/9/2018	576	49,900	6.55	0.15 J	15.1	266
		4/22/2019	1,360	82,400	6.82	0.20 J	34.6	406
		10/14/2019	1,440	66,000	6.83	0.26 J	40.7	310
		4/13/2020	2,140	117,000	6.80	<0.48	41.9	570
		10/12/2020	2,870	120,000	6.83	<0.48 D3	22.8	600
		4/19/2021	3,010	115,000	7.11	<0.48 D3	61.2	578

Table 2. Historical Analytical Results for Parameters with SSIs
Nelson Dewey Generating Station - Cassville, Wisconsin / SCS Engineers Project #25221071.00

Well Group	Well	Collection Date	Boron (µg/L)	Calcium (mg/L)	Field pH (Std. Units)	Fluoride (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Compliance	B-31A	12/9/2015	59.0	48,400	7.65	<0.20	26.2	274
		4/13/2016	79.2	51,900	7.63	0.22 J	22.6	302
		7/19/2016	67.2	48,900	7.25	<0.20	24.2	280
		10/20/2016	63.7	45,800	7.54	0.18 J	27.2	292
		1/12/2017	76.4	46,600	7.82	0.22 J	29.8	284
		4/17/2017	69.9	46,900	7.83	0.19 J	31.0	318
		6/8/2017	58.5	49,400	7.74	0.18 J	31.2	296
		8/1/2017	56.3	46,000	7.56	0.20 J	26.6	284
		10/19/2017	63.9	49,600	7.92	0.16 J	26.1	290
		4/2/2018	74.8	49,300	8.00	0.13 J	27.4	282
		10/9/2018	71.8	46,600	7.48	0.17 J	24.8	278
		4/22/2019	86.2	48,200	7.61	0.22 J	21.6	284
		10/14/2019	98.5	52,200	7.69	0.22 J	22.3	272
		4/13/2020	132	50,900	7.71	0.19 J	16.6	298
		10/13/2020	127	47,700	7.78	0.18 J	16.8	300
		4/19/2021	172	52,100	7.90	0.14 J	15.8	330
	B-31R	12/9/2015	851	77,400	6.79	<0.20	28.8	374
		4/13/2016	838	84,900	6.76	<0.20	34.1	404
		7/19/2016	641	76,100	6.44	<0.20	38.5	406
		10/20/2016	1,020	84,200	6.53	0.17 J	49.7	452
		1/12/2017	749	73,900	6.80	0.26 J	34.9	380
		4/17/2017	929	85,600	6.80	0.12 J	43.0	416
		6/8/2017	895	90,700	6.67	0.13 J	41.1	426
		8/1/2017	1,550	93,400	6.56	0.16 J	55.6	432
		10/19/2017	645	75,700	7.19	0.14 J	19.2	358
		4/2/2018	540	72,900	6.76	<0.10	22.0	374
		10/9/2018	1,430	125,000	6.41	<0.10	186	668
		11/12/2018	--	--	6.59	--	162	596
		4/22/2019	906	105,000	6.62	0.16 J	121	516
		10/14/2019	915	110,000	6.72	0.25 J	146	480
		4/13/2020	730	93,800	6.79	0.28 J	89.4	464
		10/12/2020	702	95,700	6.89	<0.48 D3, M0	49.4	462
		4/19/2021	621	91,400	6.91	0.19 J	45.3	454
	B-7R	12/9/2015	110	31,700	6.74	<1.0	17.0 J	198
		4/13/2016	115	42,300	6.80	<0.20	2.50 J	218
		7/18/2016	164	44,400	6.29	<0.20	2.40 J	220
		10/19/2016	154	56,600	6.55	<0.50	<5.00	288
		1/12/2017	159	56,700	7.43	<0.50	<5.00	240
		4/17/2017	129	61,400	6.60	<0.50	<5.00	278
		6/7/2017	110	51,600	6.65	<0.50	<5.00	240
		8/1/2017	129	50,400	6.28	<0.10	3.70	220
		10/19/2017	159	56,200	6.88	<0.50 , D3	<5.00 , D3	242
		4/2/2018	121	49,200	6.57	<0.50 , D3	<5.00 , D3	220
		10/9/2018	73.0	38,500	6.23	<0.10	3.20	186
		4/22/2019	93.5	59,400	6.63	<0.50 , D3	<0.50 , D3	254
		10/14/2019	139	57,700	6.62	<0.50 , D3	<0.50 , D3	208
		4/13/2020	96.0	58,700	6.60	<0.48 , D3	7.50 J, D3	306
		10/13/2020	145.0	41,900	6.35	<0.48 , D3	<2.20	208
		4/20/2021	104.0	56,100	6.54	<0.48 , D3	<2.2 D3	248

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
Std. Units = Standard Units

Flags:
J = Estimated concentration at or above the LOD and below the LOQ.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
-- = Not applicable.

Created by:	NDK	Date:	3/8/2018
Last revision by:	RM	Date:	6/25/2021
Checked by:	JR	Date:	6/29/2021

I:\25221071.00\Deliverables\2021 April ASD NED\Tables\[Table 2 - Analytical Results - App III.xlsx]2. Analytical Results

Table 3. Groundwater Elevation Summary – State and CCR Monitoring Wells
Nelson Dewey Closed Ash Disposal Facility / SCS Engineers Project #25221071.00

	Ground Water Elevation in feet above mean sea level (amsl)																									
Well Number	**B-7R**	**B-8R**	**B-11R**	**B-11A**	**B-11B**	**B-21R**	**B-26**	**B-26A**	**B-28**	**B-30R**	**B-30AR**	**B-31R**	**B-31A**	**B-32**	**B-32A**	**B-35**	**B-35A**	**B-36**	**B-36A**	**B-37**	**B-37A**	**B-39**	**MW-301**	**MW-302**	**MW-303**	**Barge Gauge (SG-12)**	**Pond Gauge (SG-13)**
Top of Casing Elevation (feet amsl)	623.35	627.51	622.62	622.12	621.89	623.31	626.40	626.40	616.81	621.81	622.4	622.42	622.69	614.18	614.4	620.78	621.09	621.11	621.33	614.85	614.85	626.48	619.09	619.21	618.49	616.60	See notes
Screen Length (ft)	10	10	10	5	5	10	10	5	10	10	5	10	5	10	5	10	5			10	5	10	10	10	10		
Total Depth (ft from top of casing)	23.05	27.25	24.15	52.00	113.90	22.78	31.67	45.78	16.70	22.20	46.90	22.82	35.52	14.79	52.00	16.60	47.00			19.95	48.20	26.90	21.11	21.27	20.15		
Top of Well Screen Elevation (ft)	610.30	610.26	608.47	575.12	512.99	610.53	604.73	585.62	610.11	609.61	580.50	609.60	592.17	609.39	567.40	614.18	579.20			604.90	571.65	609.58	607.98	607.94	608.34		
Measurement Date																		--	--				--	--	--	--	--
October 5-6, 2011	604.94	606.29	604.57	604.36	604.32	604.43	604.52	604.55	604.61	604.37	605.21	608.37	604.42	604.88	604.82	604.87	604.81	--	--	604.37	604.39		--	--	--	--	--
April 25-26, 2012	606.58	606.30	606.07	606.30	606.28	--	605.89	605.91	--	--	--	608.65	606.31	604.33	--	606.29	621.20	--	--	606.16	606.17	606.17	--	--	--	--	--
October 17, 2012	604.39	604.16	604.10	603.98	603.98	604.08	604.12	604.14	604.31	603.97	603.98	607.32	604.07	604.33	604.35	--	621.20	--	--	603.93	603.93	603.93	--	--	--	--	--
April 2, 2013	607.04	608.01	606.15	607.20	607.17	606.30	605.60	605.64	605.90	605.91	605.93	607.13	607.13	606.11	606.14	606.13	606.25	--	--	606.99	607.02		--	--	--	--	--
October 16-17, 2013	604.51	605.89	604.17	603.90	603.87	604.11	604.31	604.32	604.36	604.08	604.06	604.87	604.00	604.53	604.56	604.46	604.44	--	--	604.05	604.04		--	--	--	--	--
April 10, 2014	607.42	608.97	607.45	607.28	607.26	--	607.22	607.23	--	--	--	607.37	607.28	--	--	607.46	607.39	--	--	607.25	607.26		--	--	--	--	--
October 14-15, 2014	605.67	606.82	605.17	604.90	604.91	614.92	605.00	605.01	605.13	604.92	604.92	606.36	605.54	605.41	605.45	605.36	605.33	--	--	604.94	604.99		--	--	--	--	--
April 16, 2015	607.26	608.50	607.11	607.15	607.05	--	606.40	606.41	--	--	--	607.37	607.09	--	--	606.73	606.78	--	--	606.99	606.88		--	--	--	--	--
October 1-2, 2015	605.14	604.66	604.53	604.42	604.38	604.36	604.43	604.50	604.54	604.34	604.32	605.13	604.38	604.76	604.82	604.76	604.75	--	--	604.30	604.39		--	--	--	--	--
December 8, 2015	606.69	--	606.71	606.30	606.26	--	606.80	--	--	--	--	607.40	606.39	--	--	--	--	--	--	--	--	607.54	--	--	--	--	--
April 12, 2016	609.32	609.36	609.32	608.71	608.68	--	609.81	609.72	--	--	--	609.34	609.01	--	--	609.73	609.65	--	--	608.79	608.79	610.23	--	--	--	--	--
July 18-19, 2016	606.54	--	606.14	606.76	606.74	--	606.09	--	--	--	--	606.55	606.73	--	--	--	--	--	--	--	--	606.28	--	--	--	--	--
October 19-20, 2016	608.59	608.46	608.35	608.21	608.19	608.37	608.84	608.76	608.63	608.45	608.46	608.51	608.20	608.69	608.73	608.78	608.74	--	--	608.20	608.18	609.09	--	--	--	--	--
January 11-12, 2017	608.02		607.96	607.83	607.78		608.56					607.90	607.84					--	--			608.92	--	--	--	--	--
April 17, 2017	609.08	608.82	608.34	609.05	608.99	NM	608.59	608.54	609.94	608.57	608.64	607.20	608.98	608.96	608.98	609.00	609.02	--	--	609.02	609.02	610.23	--	--	--	--	--
June 8, 2017	610.74	--	610.42	609.81	610.08	--	611.25	--	--	--	--	609.63	610.50	--	--	--	--	--	--	--	--	611.53	--	--	--	--	--
August 1-2, 2017	607.02	--	606.73	605.57	605.50	--	607.39	--	--	--	--	606.84	605.69	--	--	--	--	--	--	--	--	608.71	--	--	--	--	--
October 9-10, 2017	606.93	606.51	606.25	607.01	606.94	--	606.22	606.13	606.33	606.44	606.45	606.68	606.93	606.57	606.61	606.65	606.71	--	--	--	--	--	--	--	--	--	--
October 19, 2017	609.60	--	609.42	609.58	609.65	--	608.84	--	--	--	--	609.47	609.43	--	--	--	--	--	--	609.40	609.40	608.55	--	--	--	--	--
November 17, 2017	--	--	--	--	--	606.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
December 19, 2017	--	--	--	--	--	604.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
February 7, 2018	605.37	--	605.33	604.96	604.92	--	--	--	616.81	--	--	605.31	605.01	--	--	--	--	--	--	--	--	606.19	605.08	605.05	605.00	--	--
March 16, 2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	604.64	604.6	604.56	--	--
April 203, 2018 **	604.82	606.61	606.27	606.63	606.55	606.52	606.49	606.37	606.39	606.46	606.43	604.44	606.46	606.58	606.66	606.68	606.70	--	--	606.77	606.83	606.19	--	--	--	--	--
May 23, 2018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	610.68	610.78	610.61	--	--
October 8-10, 2018	610.76	610.68	610.67	610.28	610.24	610.02	610.34	610.28	610.83	610.09	610.05	610.39	610.27	611.05	610.94	610.72	610.54	--	--	--	--	611.44	--	--	--	--	--
November 11, 2018	--	--	--	--	609.14	--	--	--	--	--	--	609.11	--	--	--	--	--	--	--	--	--	--	--	--	--	608.40	
April 22-23, 2019	615.28	615.66	615.28	615.29	615.28	614.98	615.49	615.31	615.40	615.36	615.35	615.01	615.33	--	--	615.87	615.98	--	--	--	--	615.40	--	--	--	615.17	<615.06
October 14-16, 2019	613.43	613.11	613.06	613.29	613.18	612.47	613.10	613.10	612.71	612.83	612.78	612.50	613.20	613.10	613.00	613.10	613.15	--	--	--	--	613.35	--	--	--	612.33	<615.06
April 13-14, 2020	614.12	613.76	614.39	613.88	613.86	613.22	613.76	613.73	613.68	613.60	613.56	613.80	613.79	--	--	614.04	614.00	--	--	--	--	613.71	--	--	--	612.89	613.10
October 12-13, 2020	605.09	604.88	604.57	604.54	604.44	604.28	604.92	604.83	604.86	604.72	604.72	604.66	604.54	605.07	605.06	605.00	605.08	--	--	--	--	605.06	--	--	--	603.89	DRY
April 19-21, 2021	608.83	608.66	608.57	608.72	608.67	607.93	608.55	608.49	608.27	608.38	608.35	608.66	608.63	608.68	608.74	608.86	608.85	608.40	608.39	608.74	608.75	608.48	--	--	--	608.15	<609.00
Bottom of Well Elevation (ft)	600.30	600.26	598.47	570.12	507.99	600.53	594.73	580.62	600.11	599.61	575.50	599.60	587.17	599.39	562.40	604.18	574.20	--	--	594.90	566.65	599.58	597.98	597.94	598.34		

Notes:
-- = not measured
*The PVC casing at B-35A was cut down on June 28, 2018 to allow the protective cover to close. Groundwater elevations prior to 6/28/18 are calculated using the old top of casing (TOC) elevation of 621.20 ft amsl. Groundwater elevations after 6/28/18 are calculated using the new TOC elevation (621.09 ft amsl).
** The PVC casing at B-21R was extended in 2018 following well rehabilitation. The well was resurveyed on April 22, 2019. The old top of casing elevation was 621.03 ft. The new TOC elevation is 623.31 ft.
^ One pond staff gauge was installed on April 22, 2019. The base of the gauge (0 reading) is at 615.056 ft amsl. Two additional gauges were installed on March 24, 2020. These gauge bases are at 609' and 612' amsl.

Created by: MDB Date: 4/1/2013
Last revision by: NDK Date: 4/26/2021
Checked by: MDB Date: 4/27/2021

I:\25221071.00\Deliverables\2021 April ASD NED\Tables\[Table 3 - Groundwater Elevation Summary.xls]levels

Table 4. Analytical Results - State Monitoring Program
Nelson Dewey Generating Station
Cassville, Wisconsin / SCS Engineers Project #25221071.00

WELL ID	SAMPLE MONTH	BORON, DISSOLVED (UG/L)	FLUORIDE, DISSOLVED (MG/L)	SULFATE, DISSOLVED (MG/L)	PH, FIELD (STANDARD UNITS)
B-7R	2016-Apr	110	<0.20	7.40	6.80
	2016-Oct	147	<2.00	<20.0	6.55
	2017-Apr	127	<0.50	<5.00	6.60
	2017-Oct	159	<0.50	<5.00	6.61
	2018-Apr	115	<0.50 D3	<5.00 D3	6.57
	2018-Oct	89.8	<0.10	3.40	6.23
	2019-Apr	95.7	<0.50 D3	<5.00 D3	6.63
	2019-Oct	140	<0.50 D3, M0	<5.00 D3	6.62
	2020-Apr	90.8	<0.48 D3	5.20 J, D3	6.60
	2020-Oct	145	<0.48	<2.2 D3	6.35
	2021-Apr	121	<0.48 D3	<2.2 D3	6.54
B-8R	2016-Apr	2,250	0.26 J	30.0	6.64
	2016-Oct	2,130	0.21 J	47.0	6.38
	2017-Apr	1,970	0.16 J	30.5	6.83
	2017-Oct	2,490	0.30 J	32.5	6.87
	2018-Apr	1,700	0.14 J	28.7	7.02
	2018-Oct	1,500	0.25 J	30.6	6.18
	2019-Apr	1,560	0.24 J	39.8	6.65
	2019-Oct	1,110	0.49	23.6	6.85
	2020-Apr	1,340	0.27 J	20.9	6.61
	2020-Oct	1,600	0.36	63.9	6.60
	2021-Apr	1,310	0.28 J	25.0	6.54
B-11A	2016-Apr	110	0.37 J	3.80 J	7.75
	2016-Oct	111	0.28 J	2.80 J	7.47
	2017-Apr	106	0.35	<1.00	7.38
	2017-Oct	97.7	0.34	8.30	7.91
	2018-Apr	89.4	0.30 J	12.70	8.04
	2018-Oct	142	0.16 J	5.30	7.43
	2019-Apr	94.0	0.29 J	1.90 J	7.62
	2019-Oct	82.3	0.27 J	<1.00	7.66
	2020-Apr	83.3	0.17 J	1.50 J	7.75
	2020-Oct	94.3	0.30 J	1.0 J	7.74
	2021-Apr	92.9	0.23 J	3.5	7.65
B-11B	2016-Apr	1,240	0.53	153	8.14
	2016-Oct	1,410	0.54	181	7.91
	2017-Apr	1,720	0.56	186	7.83
	2017-Oct	1,900	0.65	169	7.80
	2018-Apr	2,020	0.68	195	8.42
	2018-Oct	3,910	0.41	195	7.74
	2019-Apr	6,670	0.60	289	7.91
	2019-Oct	4,860	0.64	335	7.92
	2020-Apr	5,080	<0.095	362	7.89
	2020-Oct	3,190	<0.095	422	7.80
	2021-Apr	4,590	<0.095	389	8.07
B-11R	2016-Apr	3,290	<1.00	93.9	6.98
	2016-Oct	4,070	<0.50	115	6.77
	2017-Apr	3,710	<0.50	111	7.11
	2017-Oct	3,400	<0.50	94.0	6.75
	2018-Apr	2,790	<0.50 D3	78.6	7.14
	2018-Oct	635	0.14 J	15.6	6.55
	2019-Apr	1,310	0.19 J	34.5	6.82
	2019-Oct	1,500	0.28 J	39.2	6.83
	2020-Apr	2,250	<0.48 D3	39.8	6.80
	2020-Oct	2,690	<0.48	23.0	6.83
	2021-Apr	2,890	<0.48 D3	59.9	7.11
B-26	2016-Apr	37.0	<0.20	40.1	7.43
	2016-Oct	48.7	0.12 J	34.4	7.19
	2017-Apr	37.3	<0.10	32.3	7.54
	2017-Oct	44.5	<0.10	25.0	7.35
	2018-Apr	46.8	<0.10	19.2	7.64
	2018-Oct	55.2	<0.10	24.9	7.20
	2019-Apr	41.8	<0.10	26.4	7.10
	2019-Oct	50.8	0.11 J	37.0	7.24
	2020-Apr	49.2	<0.095	29.1	7.27
	2020-Oct	61.4	<0.095	37.1	7.34
	2021-Apr	67.1	<0.095	35.5	7.27

Table 4. Analytical Results - State Monitoring Program
Nelson Dewey Generating Station
Cassville, Wisconsin / SCS Engineers Project #25221071.00

WELL ID	SAMPLE MONTH	BORON, DISSOLVED (UG/L)	FLUORIDE, DISSOLVED (MG/L)	SULFATE, DISSOLVED (MG/L)	PH, FIELD (STANDARD UNITS)
B-26A	2016-Apr	33.1	<0.20	40.1	7.06
	2016-Oct	30.5	0.14 J	39.9	7.26
	2017-Apr	52.6	0.47	42.3	7.96
	2017-Oct	28.4	<0.10	38.4	7.44
	2018-Apr	27.6	<0.10	37.0	7.47
	2018-Oct	18.4	<0.10	33.3	7.38
	2019-Apr	27.6	0.11 J	27.0	7.35
	2019-Oct	47.0	0.14 J	35.6	7.31
	2020-Apr	37.7	<0.095	39.2 M0	7.38
	2020-Oct	33.5	<0.095	44.7	7.51
	2021-Apr	42.7	<0.095	45.5	7.26
B-31A	2016-Apr	69.4	0.22 J	22.8	7.63
	2016-Oct	81.0	0.18 J	27.9	7.54
	2017-Apr	80.3	0.19 J	30.8	7.83
	2017-Oct	61.5	0.21 J	26.2	7.60
	2018-Apr	69.3	0.17 J	28.1	8.00
	2018-Oct	103	0.14 J	26.2	7.48
	2019-Apr	86.0	0.22 J	21.6	7.61
	2019-Oct	112	0.23 J	22.5	7.69
	2020-Apr	121	0.15 J	17.7	7.71
	2020-Oct	146	0.18 J	16.8	7.78
	2021-Apr	168	0.14 J	17.1	7.90
B-31R	2016-Apr	759	<0.20	34.3	6.76
	2016-Oct	956	0.16 J	48.5	6.53
	2017-Apr	910	0.12 J	42.9	6.80
	2017-Oct	618	0.20 J	23.2	6.78
	2018-Apr	520	0.11 J	23.3	6.76
	2018-Oct	1,530	<1.00 D3	179	6.41
	2019-Apr	892	0.17 J, D3	114	6.62
	2019-Oct	1,000	0.26 J	145	6.72
	2020-Apr	765	0.28 J, M0	97.6 M0	6.79
	2020-Oct	696	0.28 J	50.8	6.89
	2021-Apr	597	0.19 J	44.9	6.91
B-35	2016-Apr	38.7	<0.20	8.10	6.89
	2016-Oct	46.4	0.10 J	6.50	6.86
	2017-Apr	54.4	0.15 J	7.70	6.68
	2017-Oct	40.8	0.18 J	3.80	7.65
	2018-Apr	28.9	<0.10 M0	4.80 M0	7.01
	2018-Oct	40.0	0.13 J	3.60	6.58
	2019-Apr	33.6	<0.10	4.90	7.26
	2019-Oct	41.0	0.12 J	5.60	7.07
	2020-Apr	27.0	<0.095	4.20	6.87
	2020-Oct	28.1	0.097 J	5.6	6.85
	2021-Apr	23.8	0.12 J	5.9	6.89
B-35A	2016-Apr	21.7	<0.20	26.2	6.96
	2016-Oct	23.4	0.16 J	27.4	7.17
	2017-Apr	29.9	<0.10	25.4	7.27
	2017-Oct	51.4	0.26 J	4.00	7.44
	2018-Apr	28.9	<0.10 M0	23.1	7.45
	2018-Oct	59.8	<0.50 D3	6.00 J, D3	6.95
	2019-Apr	30.3	0.12 J	16.7	7.30
	2019-Oct	33.7	0.13 J	18.9	7.30
	2020-Apr	32.1	0.12 J	20.2	7.29
	2020-Oct	70.7	<0.095	17.8	7.39
	2021-Apr	46.8	<0.095	18.9	7.26
B-37	2016-Apr	121	<0.20	17.4	7.6
	2016-Oct	159	<0.10	45.4	7.59
	2017-Apr	252	<0.10	75.6	7.55
	2017-Oct	231	<0.10	59.7	8.61
	2018-Apr	164	<0.10	49.0	8.10
	2018-Oct	--	--	--	--
	2019-Apr	--	--	--	--
	2019-Oct	--	--	--	--
	2020-Apr	--	--	--	--
	2020-Oct	--	--	--	--
	2021-Apr	161	<0.095	40.2	7.64

Table 4. Analytical Results - State Monitoring Program
Nelson Dewey Generating Station
Cassville, Wisconsin / SCS Engineers Project #25221071.00

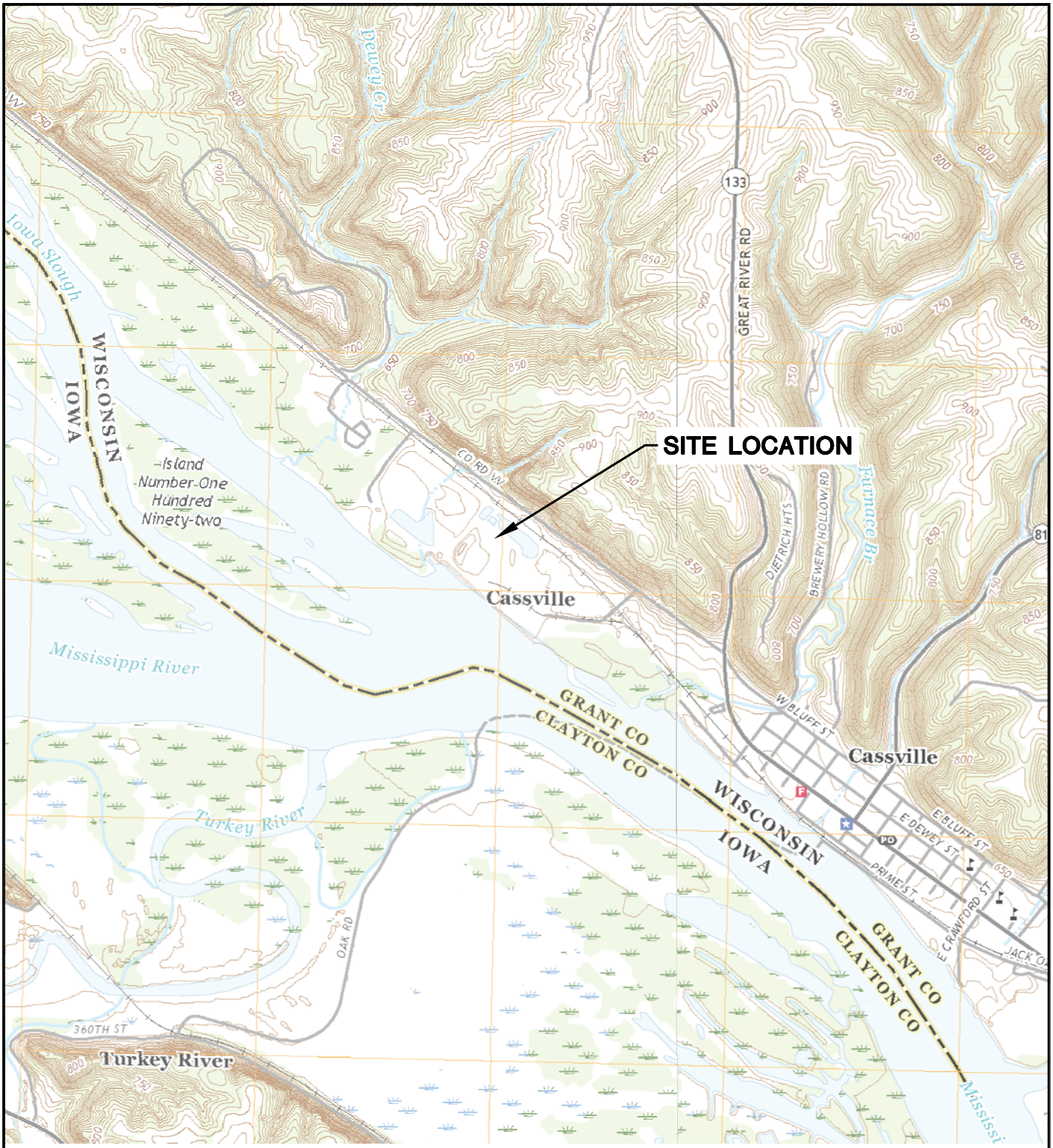
WELL ID	SAMPLE MONTH	BORON, DISSOLVED (UG/L)	FLUORIDE, DISSOLVED (MG/L)	SULFATE, DISSOLVED (MG/L)	PH, FIELD (STANDARD UNITS)
B-37A	2016-Apr	326	<0.20	42.4	7.21
	2016-Oct	279	<0.10	38.6	7.39
	2017-Apr	269	<0.10	39.8	7.53
	2017-Oct	320	<0.10	39.5	8.28
	2018-Apr	204	<0.10	43.9	8.39
	2018-Oct	--	--	--	--
	2019-Apr	--	--	--	--
	2019-Oct	--	--	--	--
	2020-Apr	--	--	--	--
	2020-Oct	--	--	--	--
	2021-Apr	148	<0.095	38.2	7.45

Note:
J: Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Created by: JSN Date: 12/29/2017
Last revision by: RM Date: 6/25/2021
Checked by: JR Date: 6/29/2021

I:\25221071.00\Deliverables\2021 April ASD NED\Tables\[Table 4 - Analytical Results - State Monitoring NED.xlsx]4. State Analytical

Figures



N

CASSVILLE AND TURKEY RIVER QUADRANGLES
WISCONSIN–IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	ALLIANT ENERGY 4902 N. BILTMORE LANE, #1000 MADISON, WI 53718	SITE	ALLIANT ENERGY NELSON DEWEY GENERATING STATION CASSVILLE, WISCONSIN

SITE LOCATION MAP

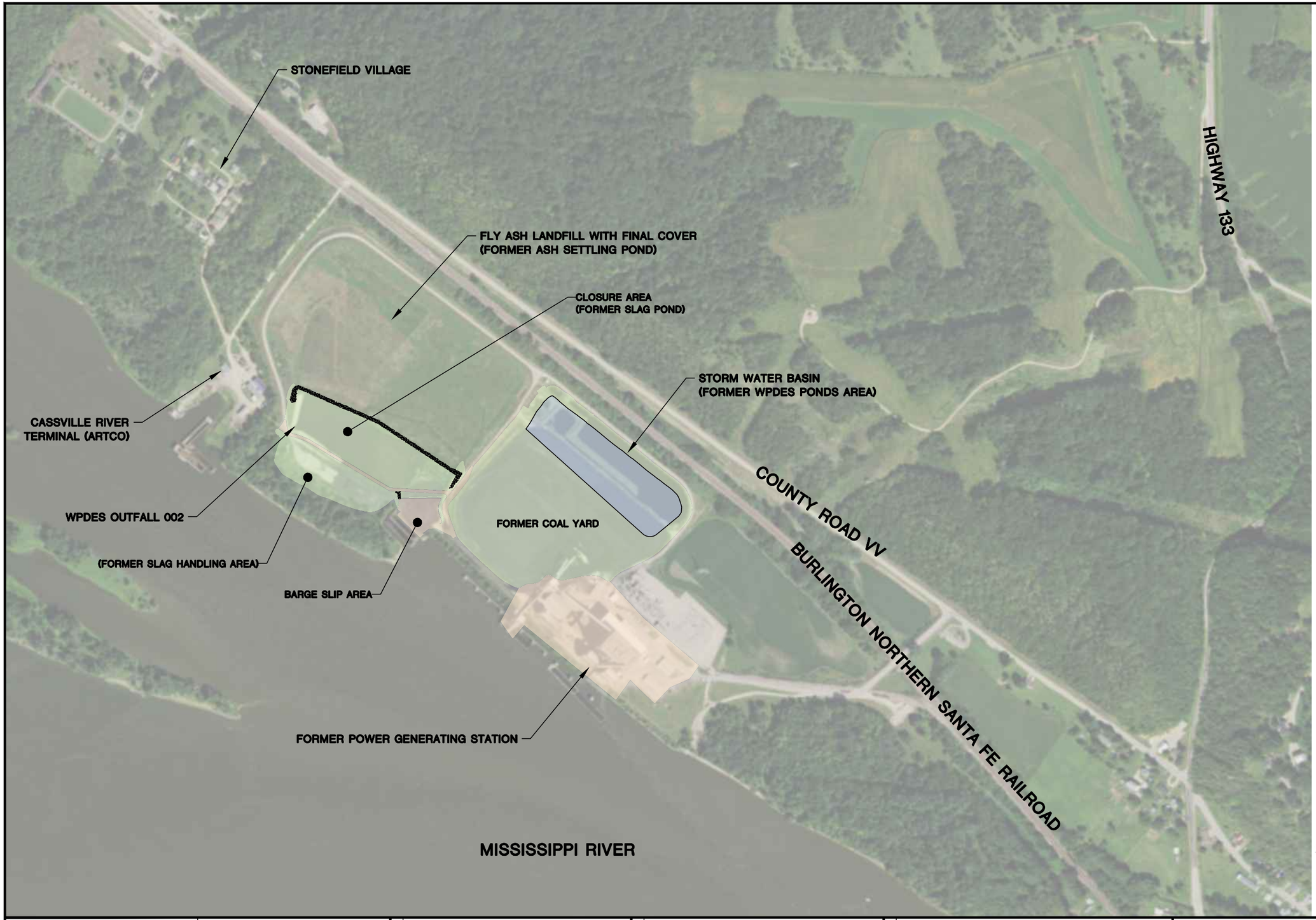
PROJECT NO.	25220071.00	DRAWN BY:	BSS
DRAWN:	11/27/2019	CHECKED BY:	MDB
REVISED:	01/14/2020	APPROVED BY:	TK 04/10/2020

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE
1

I:\25220071.00\Drawings\ASD\Site Location Map.dwg, 4/12/2020 7:11:31 PM



N

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS AUGUST 24, 2015.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25220071.00	DRAWN BY:	BJM
DRAWN:	12/18/13	CHECKED BY:	KAK
REVISED:	01/22/20	APPROVED BY:	TK 04/10/2020

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: WISCONSIN POWER AND LIGHT CO.
NELSON DEWEY GENERATING STATION
11999 COUNTY HIGHWAY VV
CASSVILLE WI, 53806

SITE: WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION
CASSVILLE WISCONSIN

AERIAL VIEW

FIGURE 2

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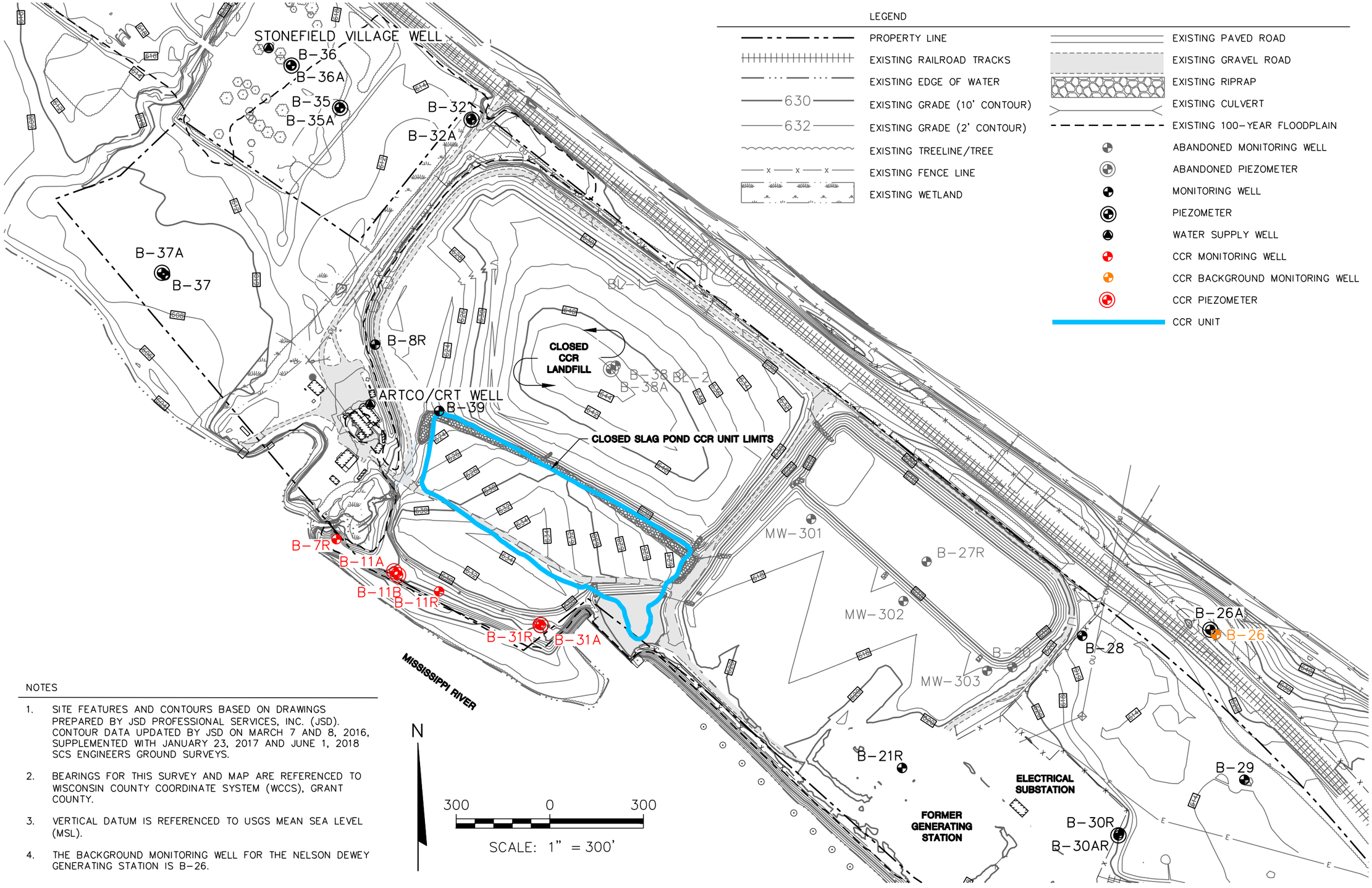

NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016, SUPPLEMENTED WITH JANUARY 23, 2017 AND JUNE 1, 2018 SCS ENGINEERS GROUND SURVEYS.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL).
4. THE BACKGROUND MONITORING WELL FOR THE NELSON DEWEY GENERATING STATION IS B-26.

SITE PLAN AND MONITORING WELL LOCATIONS

ALLIANT ENERGY
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

SITE

CLIENT

ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

FIGURE 3

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

ENGINEER

PROJECT NO.	25220071.00
DRAWN:	11/27/2019
REVISED:	01/14/2020

DRAWN BY:	BSS
CHECKED BY:	MDB
APPROVED BY:	TK 01/28/2021

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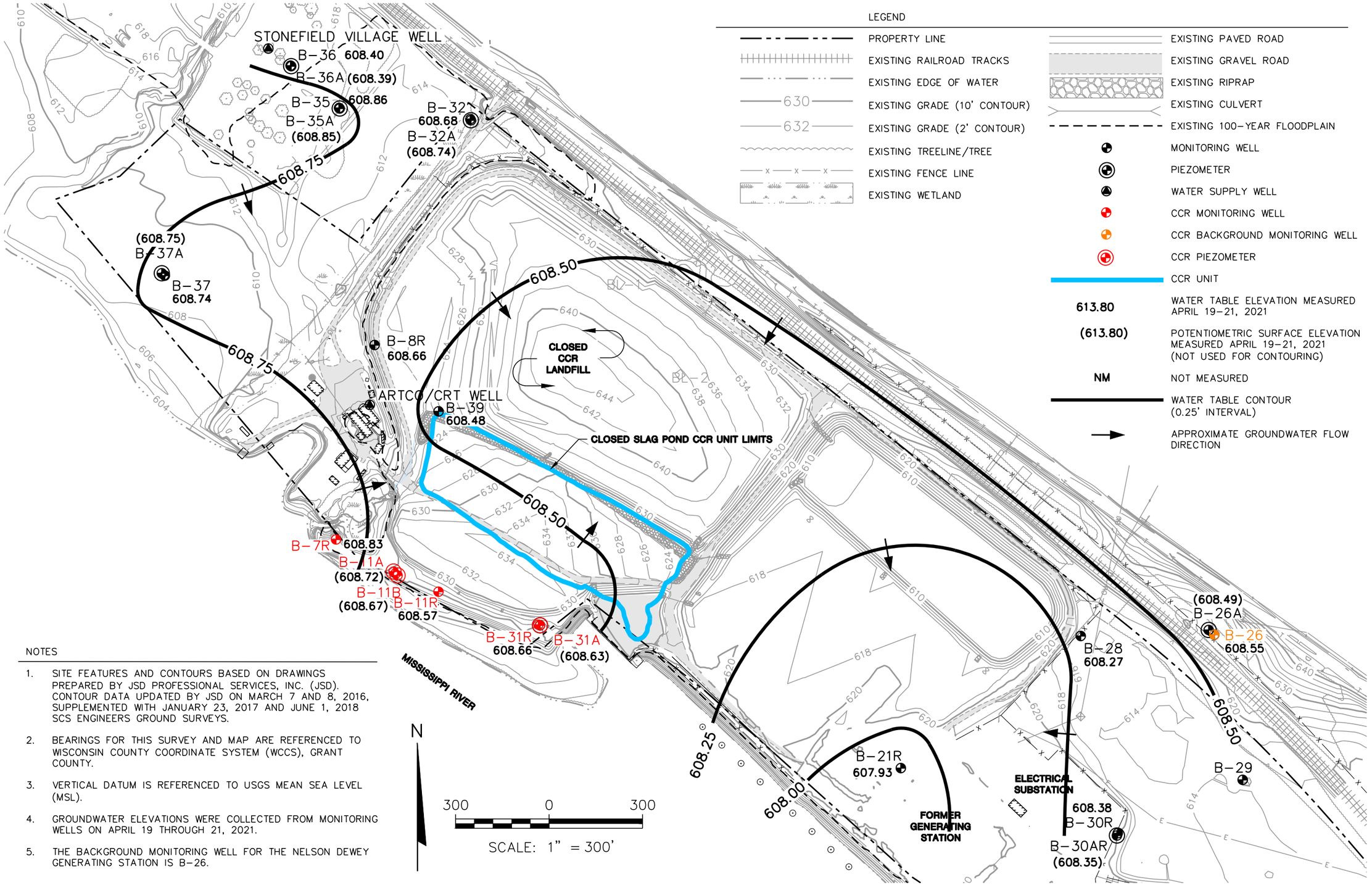

NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016, SUPPLEMENTED WITH JANUARY 23, 2017 AND JUNE 1, 2018 SCS ENGINEERS GROUND SURVEYS.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL).
4. GROUNDWATER ELEVATIONS WERE COLLECTED FROM MONITORING WELLS ON APRIL 19 THROUGH 21, 2021.
5. THE BACKGROUND MONITORING WELL FOR THE NELSON DEWEY GENERATING STATION IS B-26.

WATER TABLE FLOW MAP
APRIL 2021

ALLIANT ENERGY
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

SITE

ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

CLIENT

FIGURE 4

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

ENGINEER

PROJECT NO.	25221071.00
DRAWN:	05/12/2021
REVISED:	09/22/2021
DRAWN BY:	KP
CHECKED BY:	RM
APPROVED BY:	

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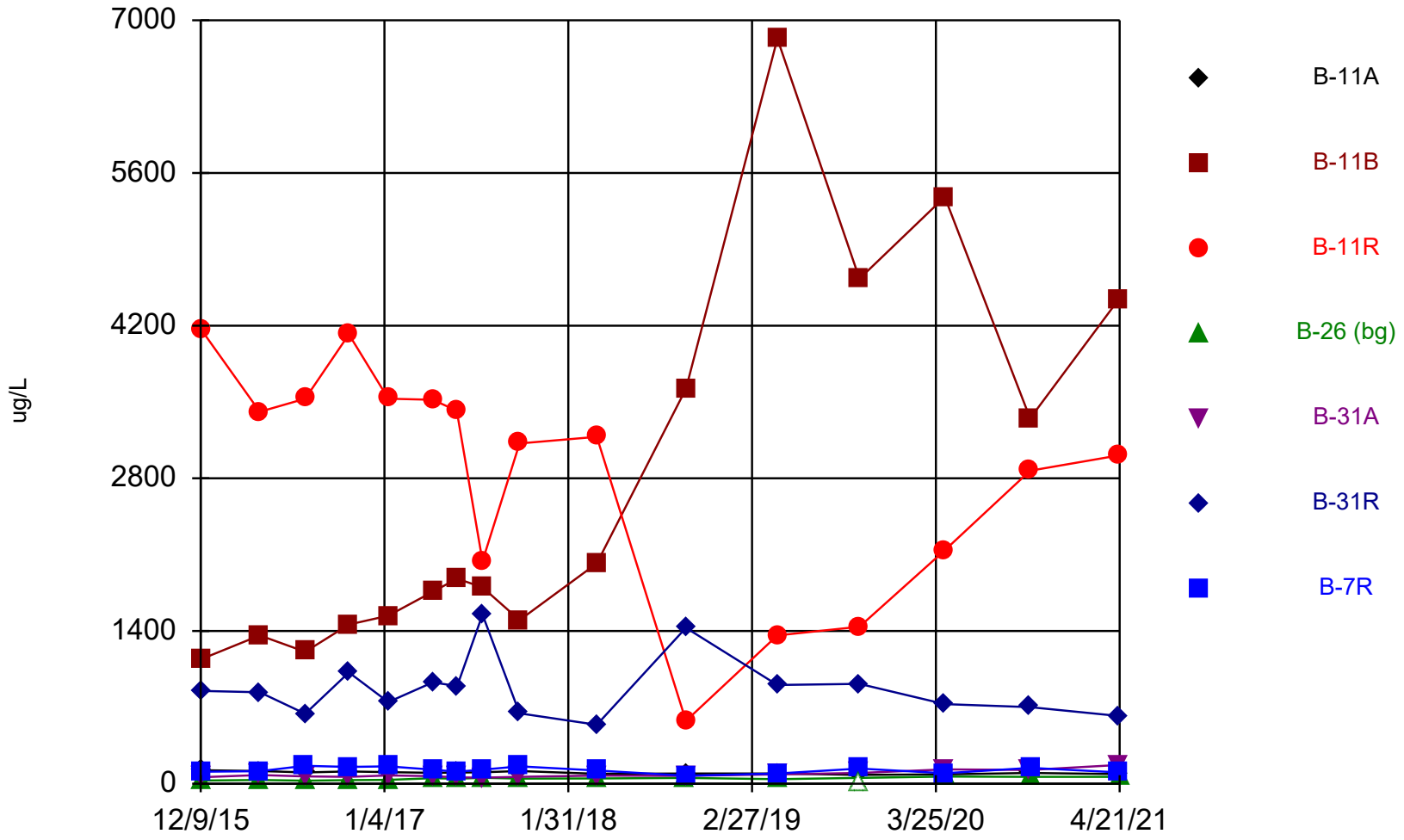
Appendix A

CCR Well Trend Plots

Hollow symbols indicate censored values.

Boron



Time Series Analysis Run 6/24/2021 2:01 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

Constituent: Boron (ug/L) Analysis Run 6/24/2021 2:02 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	124	1140	4170	29.6	59	851	110
4/12/2016				33.7			
4/13/2016	116	1360	3410		79.2	838	115
7/18/2016							164
7/19/2016	104	1210	3530	28.6	67.2	641	
10/19/2016	112						154
10/20/2016		1460	4120	33	63.7	1020	
1/12/2017	106	1540	3530	35.2	76.4	749	159
4/17/2017	100	1760	3520	50.1	69.9	929	129
6/7/2017			3420	45.8			110
6/8/2017	102	1880			58.5	895	
8/1/2017	105	1800	2040		56.3	1550	129
8/2/2017				54.6			
10/19/2017	116	1500	3120	47.4	63.9	645	159
4/2/2018	91	2020	3180		74.8	540	121
4/3/2018				48			
10/8/2018				53.4			
10/9/2018	94.2	3620	576		71.8	1430	73
4/22/2019	93.9	6830	1360		86.2	906	93.5
4/23/2019				41.6			
10/14/2019	80.7	4630	1440		98.5	915	139
10/15/2019				<3 (UX)			
4/13/2020	86.3	5380	2140		132	730	96
4/14/2020				66.1			
10/12/2020	99.3	3350	2870		127	702	
10/13/2020				63.6			145
4/19/2021	88.1	4440	3010		172	621	
4/20/2021							104
4/21/2021				63.6			

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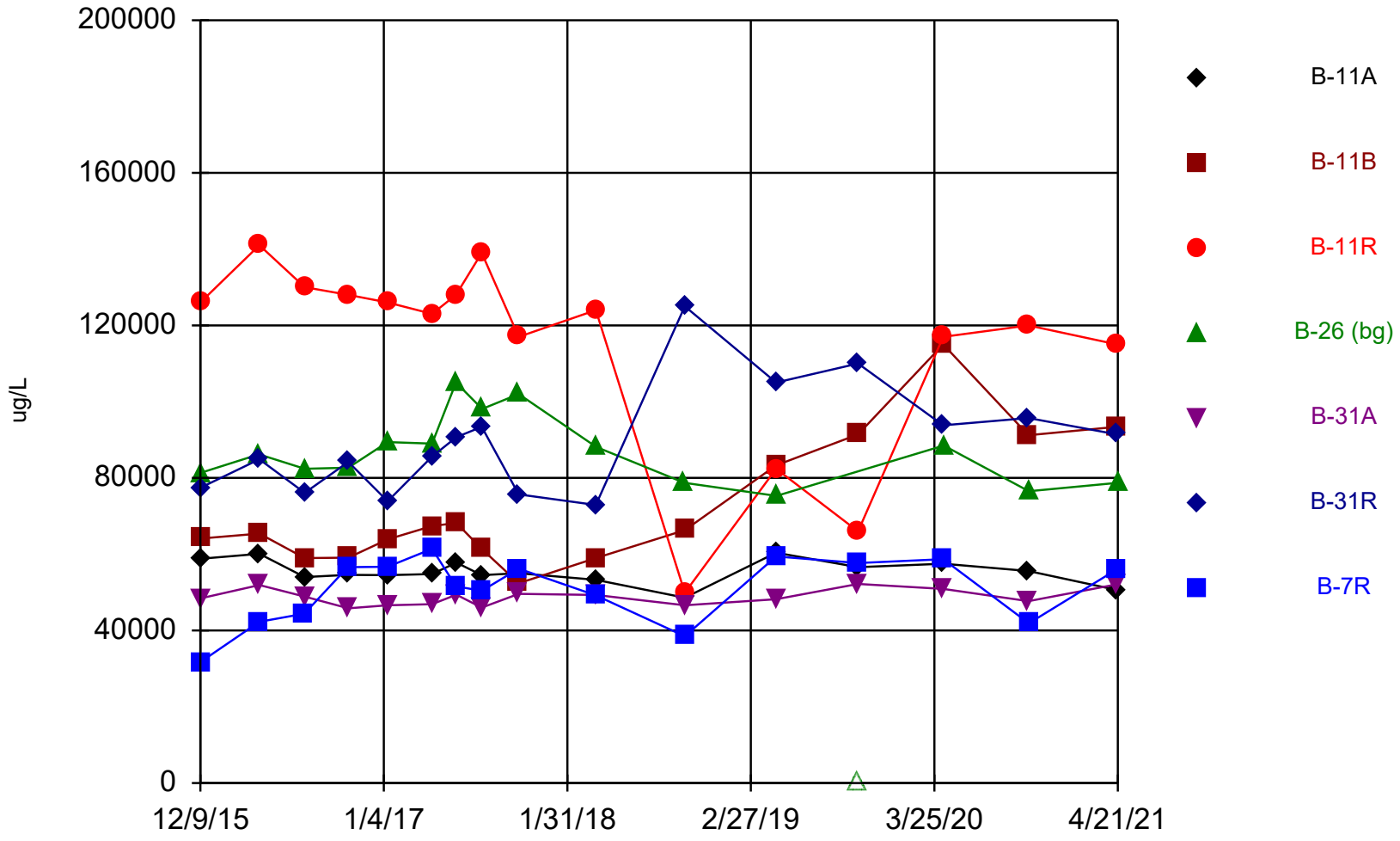
Hollow symbols indicate censored values.

Calcium



Time Series Analysis Run 6/24/2021 2:01 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

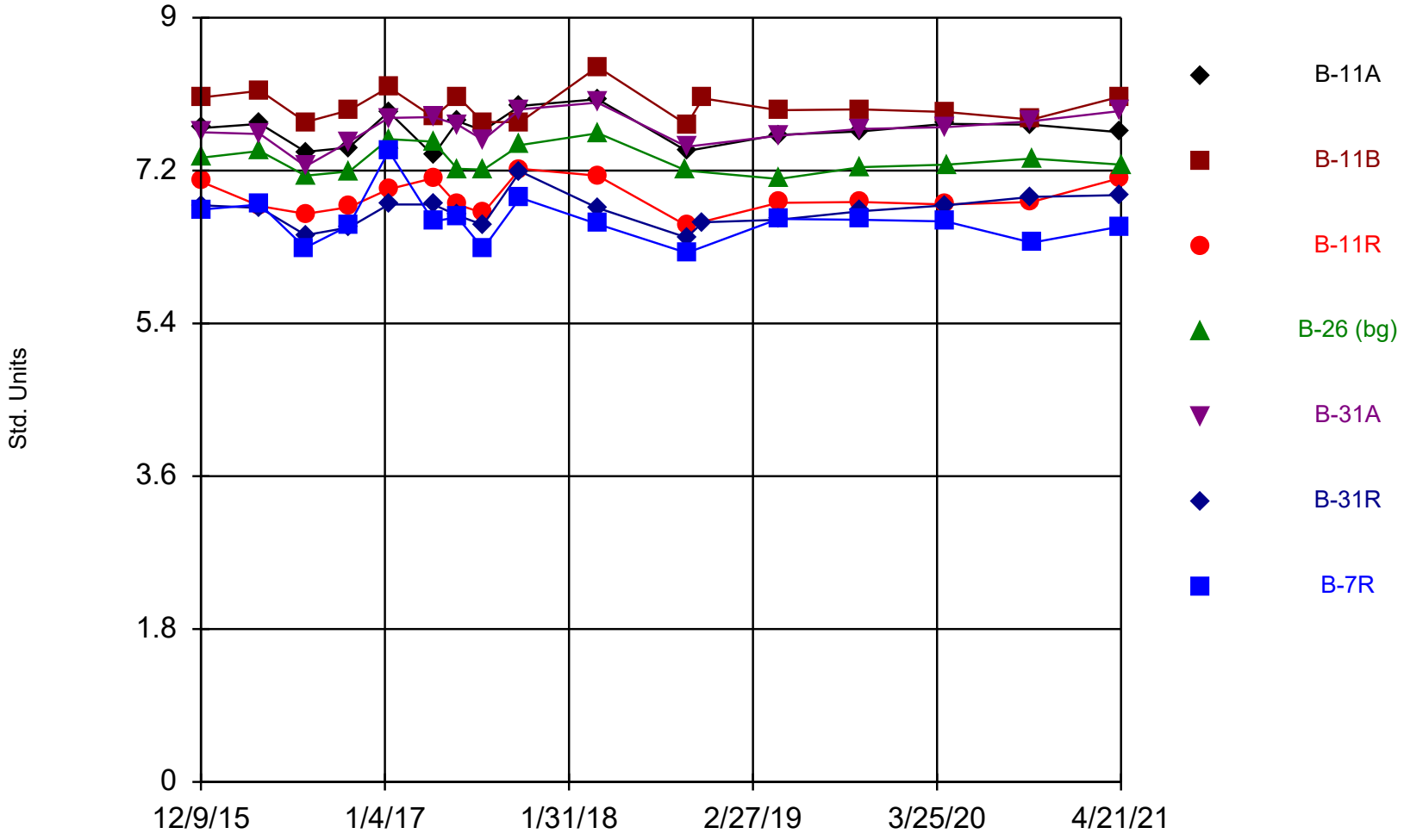
Time Series

Constituent: Calcium (ug/L) Analysis Run 6/24/2021 2:02 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	58800	64100	126000	81300	48400	77400	31700
4/12/2016				86200			
4/13/2016	60100	65400	141000		51900	84900	42300
7/18/2016							44400
7/19/2016	54000	59000	130000	82400	48900	76100	
10/19/2016	54600						56600
10/20/2016		59100	128000	82700	45800	84200	
1/12/2017	54500	63900	126000	89400	46600	73900	56700
4/17/2017	54800	67400	123000	89000	46900	85600	61400
6/7/2017			128000	105000			51600
6/8/2017	57800	68200			49400	90700	
8/1/2017	54500	61400	139000		46000	93400	50400
8/2/2017				98100			
10/19/2017	55000	52400	117000	102000	49600	75700	56200
4/2/2018	53300	59000	124000		49300	72900	49200
4/3/2018				88100			
10/8/2018				78700			
10/9/2018	48600	66300	49900		46600	125000	38500
4/22/2019	60400	83300	82400		48200	105000	59400
4/23/2019				75300			
10/14/2019	56600	91400	66000		52200	110000	57700
10/15/2019				<76.2 (UX)			
4/13/2020	57500	115000	117000		50900	93800	58700
4/14/2020				88500			
10/12/2020	55600	91200	120000		47700	95700	
10/13/2020				76500			41900
4/19/2021	50600	93400	115000		52100	91400	
4/20/2021							56100
4/21/2021				78700			

Field pH



Time Series Analysis Run 6/24/2021 2:01 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

Constituent: Field pH (Std. Units) Analysis Run 6/24/2021 2:02 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	7.7	8.06	7.07	7.35	7.65	6.79	6.74
4/12/2016				7.43			
4/13/2016	7.75	8.14	6.78		7.63	6.76	6.8
7/18/2016							6.29
7/19/2016	7.42	7.77	6.69	7.14	7.25	6.44	
10/19/2016	7.47						6.55
10/20/2016		7.91	6.77	7.19	7.54	6.53	
1/12/2017	7.89	8.18	6.98	7.57	7.82	6.8	7.43
4/17/2017	7.38	7.83	7.11	7.54	7.83	6.8	6.6
6/7/2017			6.8	7.22			6.65
6/8/2017	7.78	8.07			7.74	6.67	
8/1/2017	7.67	7.77	6.7		7.56	6.56	6.28
8/2/2017				7.21			
10/19/2017	7.96	7.77	7.22	7.5	7.92	7.19	6.88
4/2/2018	8.04	8.42	7.14		8	6.76	6.57
4/3/2018				7.64			
10/8/2018				7.2			
10/9/2018	7.43	7.74	6.55		7.48	6.41	6.23
11/12/2018		8.05				6.59	
4/22/2019	7.62	7.91	6.82		7.61	6.62	6.63
4/23/2019				7.1			
10/14/2019	7.66	7.92	6.83		7.69	6.72	6.62
10/15/2019				7.24			
4/13/2020	7.75	7.89	6.8		7.71	6.79	6.6
4/14/2020				7.27			
10/12/2020	7.74	7.8	6.83		7.78	6.89	
10/13/2020				7.34			6.35
4/19/2021	7.65	8.07	7.11		7.9	6.91	
4/20/2021							6.54
4/21/2021				7.27			

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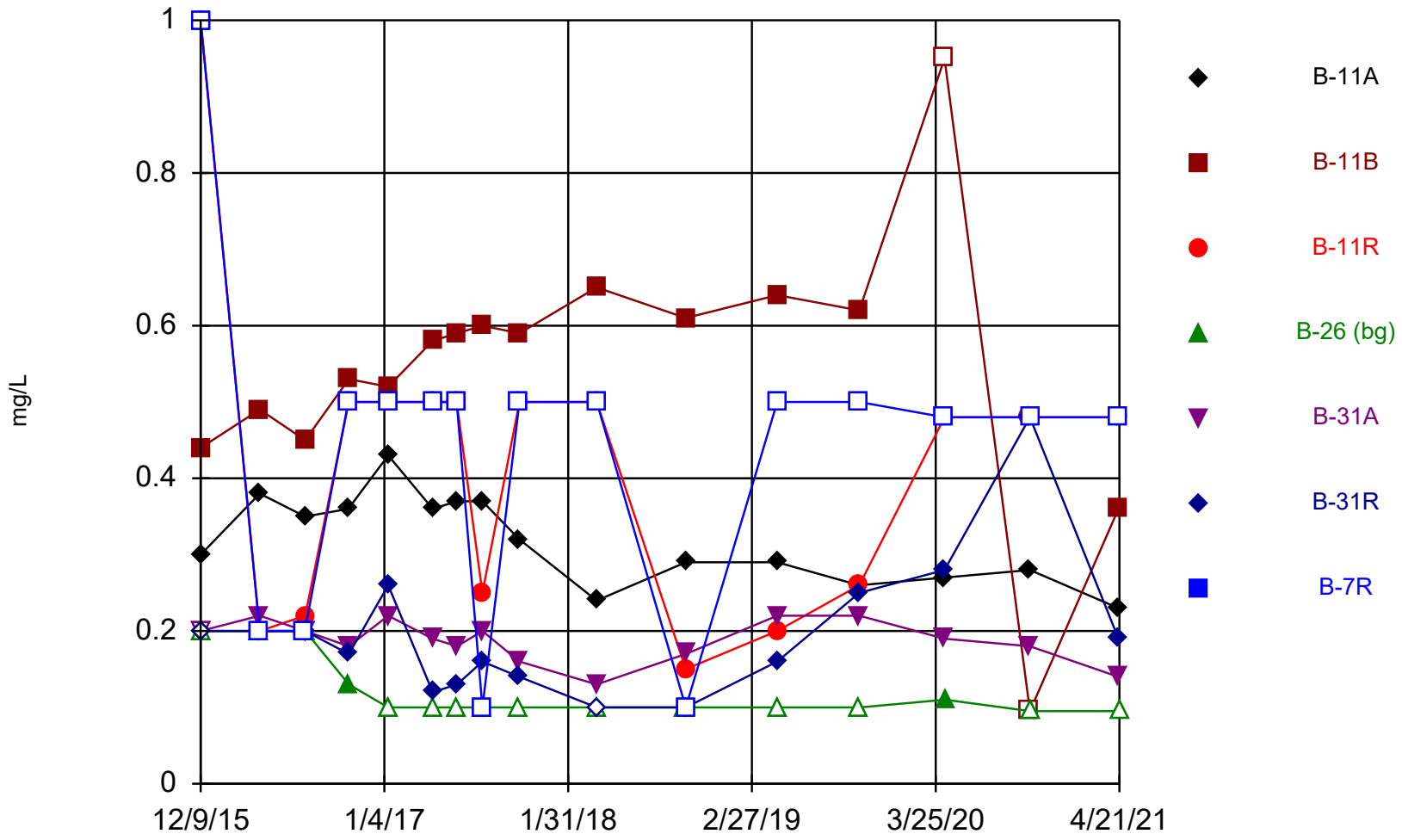
Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 6/24/2021 2:01 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

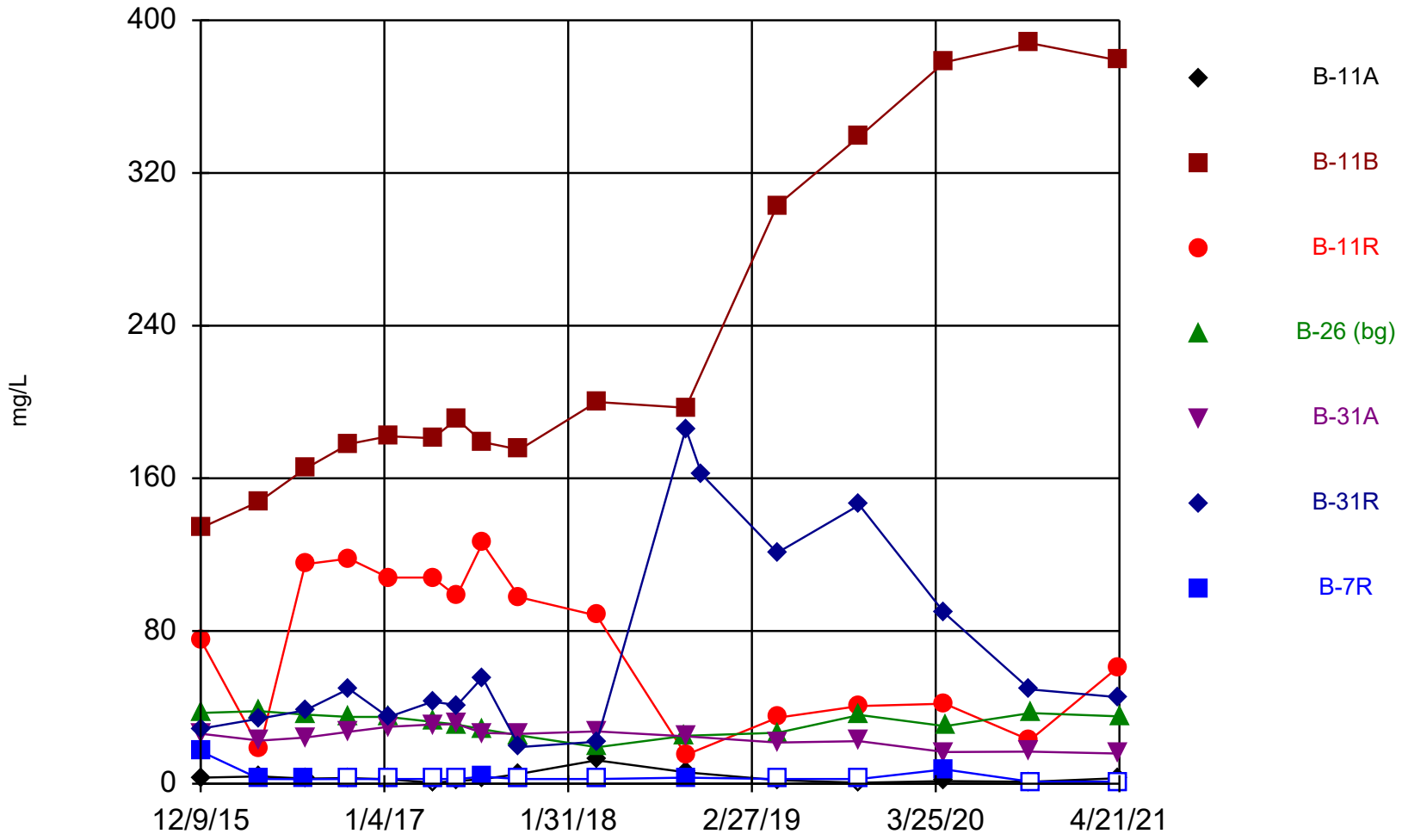
Constituent: Fluoride (mg/L) Analysis Run 6/24/2021 2:02 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	0.3 (J)	0.44	<1 (U)	<0.2 (U)	<0.2 (U)	<0.2 (U)	<1 (U)
4/12/2016				<0.2 (U)			
4/13/2016	0.38 (J)	0.49	<0.2 (U)		0.22 (J)	<0.2 (U)	<0.2 (U)
7/18/2016							<0.2 (U)
7/19/2016	0.35 (J)	0.45	0.22 (J)	<0.2 (U)	<0.2 (U)	<0.2 (U)	
10/19/2016	0.36						<0.5 (U)
10/20/2016		0.53	<0.5 (U)	0.13 (J)	0.18 (J)	0.17 (J)	
1/12/2017	0.43	0.52	<0.5 (U)	<0.1 (U)	0.22 (J)	0.26 (J)	<0.5 (U)
4/17/2017	0.36	0.58	<0.5 (U)	<0.1 (U)	0.19 (J)	0.12 (J)	<0.5 (U)
6/7/2017			<0.5 (U)	<0.1 (U)			<0.5 (U)
6/8/2017	0.37	0.59			0.18 (J)	0.13 (J)	
8/1/2017	0.37	0.6	0.25 (J)		0.2 (J)	0.16 (J)	<0.1 (U)
8/2/2017				<0.1 (U)			
10/19/2017	0.32	0.59	<0.5 (U)	<0.1 (U)	0.16 (J)	0.14 (J)	<0.5 (U)
4/2/2018	0.24 (J)	0.65	<0.5 (U)		0.13 (J)	<0.1 (U)	<0.5 (U)
4/3/2018				<0.1 (U)			
10/8/2018				<0.1 (U)			
10/9/2018	0.29 (J)	0.61	0.15 (J)		0.17 (J)	<0.1 (U)	<0.1 (U)
4/22/2019	0.29 (J)	0.64	0.2 (J)		0.22 (J)	0.16 (J)	<0.5 (U)
4/23/2019				<0.1 (U)			
10/14/2019	0.26 (J)	0.62	0.26 (J)		0.22 (J)	0.25 (J)	<0.5 (U)
10/15/2019				<0.1 (U)			
4/13/2020	0.27 (J)	<0.95 (U)	<0.48 (U)		0.19 (J)	0.28 (J)	<0.48 (U)
4/14/2020				0.11 (J)			
10/12/2020	0.28 (J)	<0.095 (U)	<0.48 (U)		0.18 (J)	<0.48 (U)	
10/13/2020				<0.095 (U)			<0.48 (U)
4/19/2021	0.23 (J)	0.36	<0.48		0.14 (J)	0.19 (J)	
4/20/2021							<0.48
4/21/2021				<0.095			

Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 6/24/2021 2:01 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

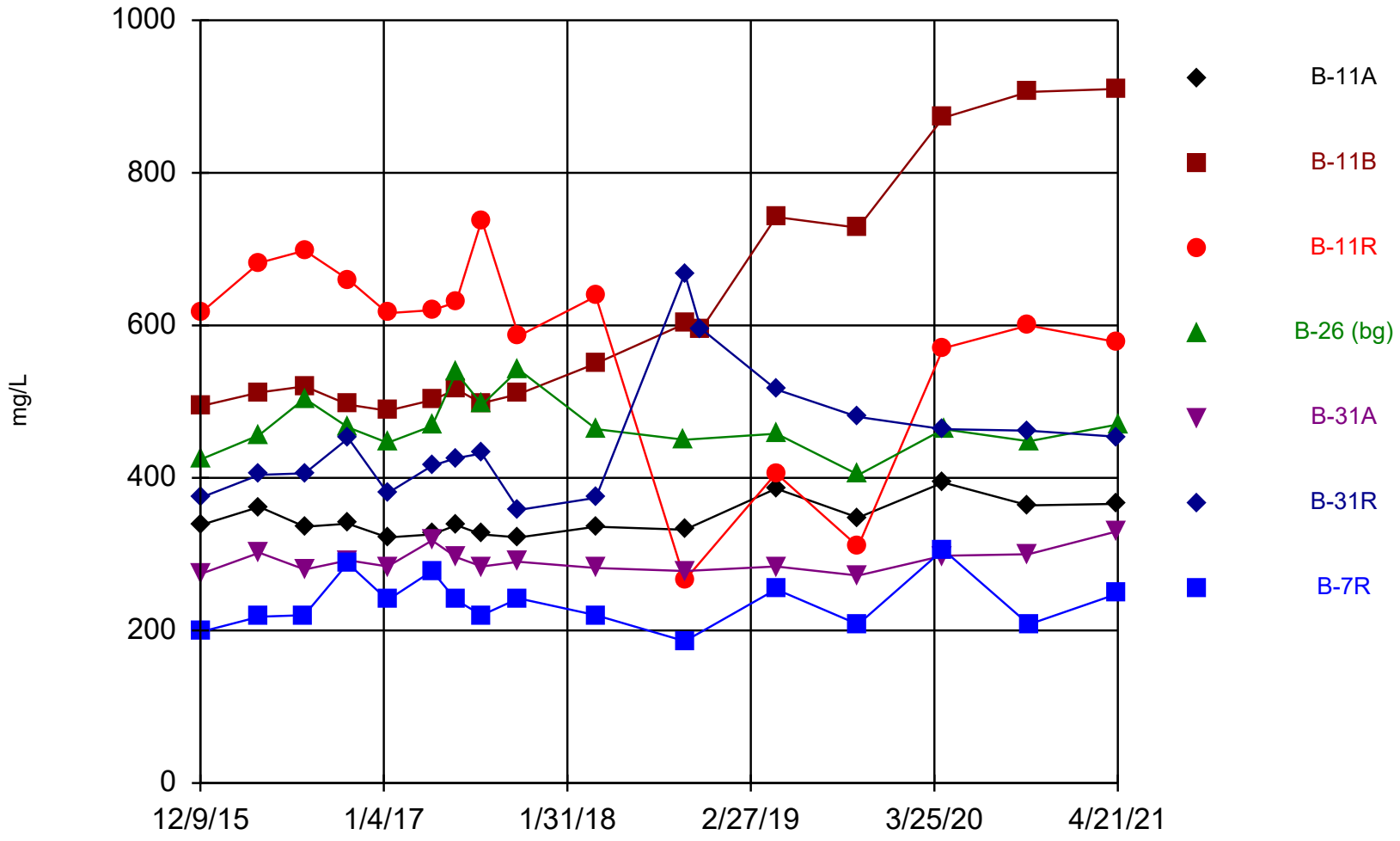
Time Series

Constituent: Sulfate (mg/L) Analysis Run 6/24/2021 2:02 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	3.2 (J)	134	75.4	37.1	26.2	28.8	17 (J)
4/12/2016				38			
4/13/2016	3.8 (J)	148	18.4		22.6	34.1	2.5 (J)
7/18/2016							2.4 (J)
7/19/2016	2.7 (J)	165	115	36.2	24.2	38.5	
10/19/2016	3 (J)						<5 (U)
10/20/2016		178	118	35	27.2	49.7	
1/12/2017	2.3 (J)	182	108	35	29.8	34.9	<5 (U)
4/17/2017	<1 (U)	181	108	32.4	31	43	<5 (U)
6/7/2017			98.2	31			<5 (U)
6/8/2017	1.4 (J)	191			31.2	41.1	
8/1/2017	2.4 (J)	179	126		26.6	55.6	3.7
8/2/2017				28.5			
10/19/2017	5.1	175	97.7	25.3	26.1	19.2	<5 (U)
4/2/2018	12.3	200	88.1		27.4	22	<5 (U)
4/3/2018				19.1			
10/8/2018				25.1			
10/9/2018	6	197	15.1		24.8	186	3.2
11/12/2018						162	
4/22/2019	1.9 (J)	303	34.6		21.6	121	<5 (U)
4/23/2019				26.7			
10/14/2019	<1 (U)	339	40.7		22.3	146	<5 (U)
10/15/2019				36			
4/13/2020	1.4 (J)	378	41.9		16.6	89.4	7.5 (J)
4/14/2020				30.2			
10/12/2020	1 (J)	388	22.8		16.8	49.4	
10/13/2020				37			<2.2 (U)
4/19/2021	2.9	379	61.2		15.8	45.3	
4/20/2021							<2.2
4/21/2021				35.3			

Total Dissolved Solids



Time Series Analysis Run 6/24/2021 2:01 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

Time Series

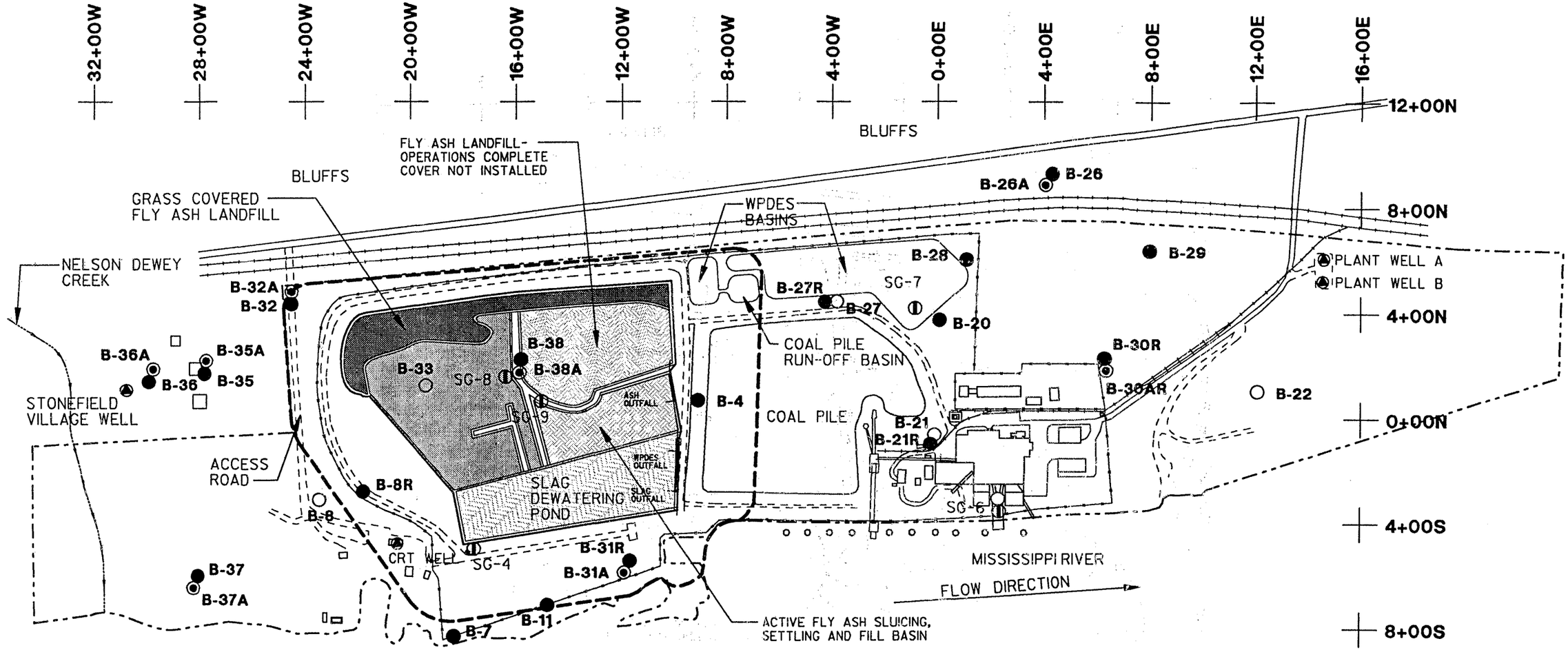
Constituent: Total Dissolved Solids (mg/L) Analysis Run 6/24/2021 2:02 PM

Nelson Dewey Generating Station Client: SCS Engineers Data: NED - Chempoint- export-Dec2020

	B-11A	B-11B	B-11R	B-26 (bg)	B-31A	B-31R	B-7R
12/9/2015	338	494	616	424	274	374	198
4/12/2016				456			
4/13/2016	362	512	682		302	404	218
7/18/2016							220
7/19/2016	336	520	698	504	280	406	
10/19/2016	340						288
10/20/2016		496	660	466	292	452	
1/12/2017	322	488	616	446	284	380	240
4/17/2017	326	502	620	468	318	416	278
6/7/2017			630	538			240
6/8/2017	338	516			296	426	
8/1/2017	326	498	738		284	432	220
8/2/2017				496			
10/19/2017	322	510	586	542	290	358	242
4/2/2018	336	550	638		282	374	220
4/3/2018				464			
10/8/2018				450			
10/9/2018	332	602	266		278	668	186
11/12/2018		594				596	
4/22/2019	386	742	406		284	516	254
4/23/2019				458			
10/14/2019	348	728	310		272	480	208
10/15/2019				404			
4/13/2020	394	872	570		298	464	306
4/14/2020				464			
10/12/2020	364	906	600		300	462	
10/13/2020				448			208
4/19/2021	366	910	578		330	454	
4/20/2021							248
4/21/2021				470			

Appendix B

1994 RMT Environmental Contamination Assessment Information



LEGEND

● B-28	WATER TABLE OBSERVATION WELL
◉ B-28A	PIEZOMETER
○ B-33	ABANDONED WELL
▲ CRT WELL	WATER SUPPLY WELL
◐ SG-4	STAFF GAUGE
———	APPROXIMATE LIMITS OF LICENSED LANDFILL
——+——+——	RAILROAD TRACK
====	ROAD
— - — - —	PROPERTY LINE
— — — —	DESIGN MANAGEMENT ZONE
+ 0+00S	LOCAL GRID
□	BUILDINGS
o	PILINGS

NOTES

1. BASE MAP WELLHEAD LOCATIONS SURVEYED BY SCHMITT ENGINEERING IN OCTOBER 1993.
2. OTHER SITE INFORMATION PROVIDED BY WP&L.

TRUE

0 400 800

SCALE: 1"=400'

WISCONSIN POWER & LIGHT
NELSON DEWEY GENERATING STATION
EXISTING CONDITIONS
OCTOBER 1993

RMT, INC.

Dwn.By:	CDH
Approved By:	ELM
Date:	OCTOBER 1994
Proj.#:	2767.03
File #:	2767030LDGN

Plot File = P:\MSPC\2767030\DGN\2767030LDGN
Plot Date = Fri Oct 21 08:28:28 1994
Pen Table =DEFAULT.TBL

OCT 31 1994

FIGURE 4

TABLE 5

SUMMARY OF LEACHING TEST RESULTS

	Fly Ash		Slag
Year	1983	1990 to 1992	1987 to 1992
Coal Type	Eastern (and Western)	Western (and Eastern)	Western (and Eastern) [1]
Water:Solid Ratio	2:1	4:1	4:1
Extraction Time	24 hours	48 hours	48 hours
Number of Samples	1	3	6
Arsenic (mg/L)	< 0.001	0.05 to 2.02	< 0.002 to 0.081
Selenium (mg/L)	NA	0.42 to 160	< 0.002 to 0.045
Boron (mg/L)	420	4.63 to 37.34	< 0.010 to 1.05
Iron (mg/L)	NA	NA	< 0.02 to 0.98
Sulfate (mg/L)	13,070	2,000 to 16,700	2.0 to < 5.0
pH (SU)	6.6	10.3 to 12.5	5.6 to 9.9

NOTES:

1. 1983 fly ash leaching data from RMT (1984); remaining leaching data provided by WP&L.
2. NA = Not Analyzed.

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 07-SEP-93

TABLE 6
SLAG AND ASH BASIN CHEMISTRY

PARAMETER	UNITS	FLY ASH BASIN 07-SEP-93 3302-011		SLAG BASIN 07-SEP-93 3302-010	
COLOR, FIELD		CLEAR		CLEAR	
CONDUCTANCE, SPECIFIC	UMHOS/CM	5190		400	
ODOR, FIELD		NONE		NONE	
PH, FIELD	SU	8.1		7.4	
TEMPERATURE	DEG C	17		18	
TURBIDITY, FIELD		SLIGHT		SLIGHT	
ALKALINITY AS CACO3	MG/L	230		160	
HARDNESS AS CACO3	MG/L	930		200	
SOLIDS, TOTAL DISSOLVED	MG/L	410		300	
SULFATE	MG/L	3300		50	
ARSENIC, TOTAL	UG/L	60		8.0	
BARIUM, TOTAL	UG/L	270		150	
BORON, TOTAL	UG/L	2300		210	
CADMIUM, TOTAL	UG/L	5.4		< 0.30	
CHROMIUM, TOTAL	UG/L	11		< 10	
IRON, TOTAL	UG/L	1600		2000	
LEAD, TOTAL	UG/L	< 3.0		< 3.0	
MERCURY, TOTAL	UG/L	< 0.20		< 0.20	
SELENIUM, TOTAL	UG/L	36	I	2.1	L
SILVER, TOTAL	UG/L	< 1.0		< 1.0	

18-OCT-94

wpvalid:SWI.BJC

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-04 01-JUN-93 1670-015	B-04 07-SEP-93 3293-010	B-07 ND 01-JUN-93 1670-020	B-07 ND 07-SEP-93 3302-004	B-08 01-JUN-93 1670-001	B-08R 07-SEP-93 3293-009
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1160	1240	460	550	670	1160
DEPTH TO WATER	FEET	9.90	12.75	12.83	16.12	5.68	20.13
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.3	7.5	7.0	6.9	7.1	6.8
TEMPERATURE	DEG C	15	10	14	12	15	7
TURBIDITY, FIELD		NONE	SLIGHT	NONE	SLIGHT	NONE	MODERATE
WATER ELEVATION	FEET	610.68	607.83	610.97	607.68	610.51	
ALKALINITY AS CACO3	MG/L	72	92	160	190	220	440
CHLORIDE	MG/L	18	23	17	15	9.4	2.8
COD	MG/L						
FLUORIDE	MG/L	0.58	5.5	0.26	0.32	< 0.10	0.12
HARDNESS AS CACO3	MG/L	220	120	210	250	370	620
NITROGEN, NITRATE + NITRITE	MG/L	0.15	0.33	< 0.050	< 0.050	< 0.050	4.2
SOLIDS, TOTAL DISSOLVED	MG/L	900	940	300	360	460	770
SULFATE	MG/L	500	560	74	100	180	180
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	68	< 50	61	73	63	50
BORON, DISSOLVED	UG/L	1900	4200	230	< 200	2200	9400
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	0.38
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	720	890	2800	4100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	1200	720	970	1500	17	3400
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	6.9	3.2	< 1.0 L	< 1.0 L	< 1.0 L	34
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	1000	100	22	< 20	220	< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-11 07-SEP-93 X0001	B-11 29-OCT-93 3485-001	B-20 07-SEP-93 X0002	B-26 01-JUN-93 1670-022	B-26 07-SEP-93 3302-005	B-26A 01-JUN-93 1670-023
COLOR, FIELD					CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1500		310	610	670	660
DEPTH TO WATER	FEET	15.91		10.81	16.22	18.85	16.20
ODOR, FIELD					NONE	NONE	NONE
PH, FIELD	SU				7.1	7.2	7.0
TEMPERATURE	DEG C	13	13	14	14	11	15
TURBIDITY, FIELD					NONE	SLIGHT	NONE
WATER ELEVATION	FEET				610.18	607.55	610.19
ALKALINITY AS CACO3	MG/L		470		320	300	340
CHLORIDE	MG/L				21	43	33
COD	MG/L						
FLUORIDE	MG/L				< 0.10	0.15	< 0.10
HARDNESS AS CACO3	MG/L		810		390	410	400
NITROGEN, NITRATE + NITRITE	MG/L				2.6	4.9	2.0
SOLIDS, TOTAL DISSOLVED	MG/L		520		440	450	450
SULFATE	MG/L		360		34	34	33
ARSENIC, DISSOLVED	UG/L		8.4		< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L		100		62	68	96
BORON, DISSOLVED	UG/L		5100		< 200	< 200	< 200
CADMIUM, DISSOLVED	UG/L		< 0.30		< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L		< 10		< 10	< 10	< 10
COPPER, DISSOLVED	UG/L				< 20	< 20	< 20
IRON, DISSOLVED	UG/L		55000		< 100	< 100	< 100
LEAD, DISSOLVED	UG/L		< 3.0		< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L				< 5.0	< 5.0	< 5.0
MERCURY, DISSOLVED	UG/L		< 0.20		< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L		< 1.0 LNP		< 1.0 L	< 1.0 L	< 1.0 L
SILVER, DISSOLVED	UG/L		< 10		< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L				< 20	< 20	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-26A 07-SEP-93 3302-006	B-27R 07-SEP-93 X0003	B-28 01-JUN-93 1670-014	B-28 07-SEP-93 3302-003	B-29 07-SEP-93 X0004	B-30AR 01-JUN-93 1670-013
COLOR, FIELD		CLEAR		CLEAR	CLEAR		CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	440	370	190	230	360	220
DEPTH TO WATER	FEET	18.84	14.67	6.40	9.08	9.57	12.33
ODOR, FIELD		NONE		NONE	NONE		NONE
PH, FIELD	SU	7.2		6.1	6.0		7.2
TEMPERATURE	DEG C	11	14	17	15	15	17
TURBIDITY, FIELD		NONE		SLIGHT	MODERATE		NONE
WATER ELEVATION	FEET	607.55		610.46	607.74	607.26	610.11
ALKALINITY AS CACO3	MG/L	340		26	54		200
CHLORIDE	MG/L	25		4.6	11		13
COD	MG/L						7.3
FLUORIDE	MG/L	0.15		< 0.10	< 0.10		0.10
HARDNESS AS CACO3	MG/L	410		82	110		220
NITROGEN, NITRATE + NITRITE	MG/L	1.8		2.7	0.60		< 0.050
SOLIDS, TOTAL DISSOLVED	MG/L	440		140	160		280
SULFATE	MG/L	38		45	42		27
ARSENIC, DISSOLVED	UG/L	< 3.0		< 3.0	< 3.0		< 3.0
BARIUM, DISSOLVED	UG/L	86		< 50	52		< 50
BORON, DISSOLVED	UG/L	< 200		< 200	< 200		< 200
CADMIUM, DISSOLVED	UG/L	< 0.30		< 0.30	< 0.30		< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10		< 10	< 10		< 10
COPPER, DISSOLVED	UG/L	< 20		< 20	< 20		< 20
IRON, DISSOLVED	UG/L	< 100		210	< 100		< 100
LEAD, DISSOLVED	UG/L	< 3.0		< 3.0	< 3.0		< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0		8.6	< 5.0		< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20		< 0.20	< 0.20		< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 LN		< 1.0 L	< 1.0 L		< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0		< 1.0	< 1.0		< 1.0
ZINC, DISSOLVED	UG/L	< 20		< 20	< 20		< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-30AR 07-SEP-93 3302-002	B-30R 01-JUN-93 1670-012	B-30R 07-SEP-93 3302-001	B-31A 01-JUN-93 1670-019	B-31A 07-SEP-93 3293-011	B-31R 01-JUN-93 1670-018
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	410	420	360	700	800	640
DEPTH TO WATER	FEET	15.37	12.25	15.17	12.21	15.93	11.56
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.3	7.0	6.8	6.9	7.3	6.8
TEMPERATURE	DEG C	12	16	14	17	14	17
TURBIDITY, FIELD		NONE	MODERATE	MODERATE	NONE	SLIGHT	SLIGHT
WATER ELEVATION	FEET	607.07	610.10	607.18	610.46	606.74	610.85
ALKALINITY AS CACO3	MG/L	190	160	140	170	160	240
CHLORIDE	MG/L	14	13	6.6	16	17	11
COD	MG/L		9.7				
FLUORIDE	MG/L	0.16	< 0.10	< 0.10	0.39	0.43	< 0.10
HARDNESS AS CACO3	MG/L	230	210	210	120	160	330
NITROGEN, NITRATE + NITRITE	MG/L	< 0.050	8.5	8.8	< 0.050	< 0.050	< 0.050
SOLIDS, TOTAL DISSOLVED	MG/L	280	280	230	510	570	510
SULFATE	MG/L	25	25	26	250	250	150
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	< 50	< 50	< 50	54	66	110
BORON, DISSOLVED	UG/L	< 200	< 200	< 200	2900	2100	2900
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	2.7
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	110
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	210	300	450
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	< 5.0	4600	6000	440
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	1.3 L	3.2	< 1.0 L	< 1.0 L	1.2 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	27

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-31R 07-SEP-93 3293-012	B-32 01-JUN-93 1670-002	B-32 07-SEP-93 3293-016	B-32A 01-JUN-93 1670-003	B-32A 07-SEP-93 3293-017	B-35 01-JUN-93 1670-004
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	L YLW/BN
CONDUCTANCE, SPECIFIC	UMHOS/CM	480	300	330	610	1320	1070
DEPTH TO WATER	FEET	14.44	3.37	6.22	3.59	6.46	10.10
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.0	6.3	5.6	7.0	6.8	6.3
TEMPERATURE	DEG C	15	13	14	13	14	12
TURBIDITY, FIELD		MODERATE	SLIGHT	MODERATE	NONE	SLIGHT	SLIGHT
WATER ELEVATION	FEET	607.97	610.80	607.95	610.81	607.94	610.66
ALKALINITY AS CACO3	MG/L	190	140	140	330	320	190
CHLORIDE	MG/L	11	6.7	6.9	7.0	7.6	110
COD	MG/L						
FLUORIDE	MG/L	0.18	< 0.10	0.12	0.12	0.19	< 0.10
HARDNESS AS CACO3	MG/L	240	160	180	350	390	260
NITROGEN, NITRATE + NITRITE	MG/L	< 0.050	0.68	1.2	1.1	1.3	36
SOLIDS, TOTAL DISSOLVED	MG/L	340	200	240	380	420	800
SULFATE	MG/L	71	11	16	29	30	35
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	7.4
BARIUM, DISSOLVED	UG/L	81	100	120	98	91	100
BORON, DISSOLVED	UG/L	1100	< 200	< 200	< 200	< 200	210
CADMIUM, DISSOLVED	UG/L	1.1	< 0.30	0.38	< 0.30	0.35	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	21
IRON, DISSOLVED	UG/L	210	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	360	< 5.0	280	6.9	33	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-35 07-SEP-93 3293-002	B-35A 01-JUN-93 1670-005	B-35A 07-SEP-93 3293-003	B-36 01-JUN-93 1670-007	B-36 07-SEP-93 3293-004	B-36A 01-JUN-93 1670-006
COLOR, FIELD		YELLOW	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1050	620	680	430	500	620
DEPTH TO WATER	FEET	13.13	10.55	13.57	10.86	13.97	11.11
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	6.8	7.0	7.1	6.3	7.0	7.1
TEMPERATURE	DEG C	14	13	12	12	13	13
TURBIDITY, FIELD		SLIGHT	NONE	NONE	SLIGHT	MODERATE	NONE
WATER ELEVATION	FEET	607.63	610.63	607.61	610.60	607.49	610.35
ALKALINITY AS CACO3	MG/L	210	330	320	230	210	330
CHLORIDE	MG/L	80	26	24	4.4	25	12
COD	MG/L						
FLUORIDE	MG/L	0.19	< 0.10	0.13	< 0.10	0.14	< 0.10
HARDNESS AS CACO3	MG/L	290	380	400	240	280	350
NITROGEN, NITRATE + NITRITE	MG/L	39	1.7	2.0	< 0.050	1.4	0.83
SOLIDS, TOTAL DISSOLVED	MG/L	770	480	460	280	350	400
SULFATE	MG/L	43	33	37	15	18	36
ARSENIC, DISSOLVED	UG/L	3.6	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	120	< 50	54	110	120	68
BORON, DISSOLVED	UG/L	220	< 200	< 200	< 200	< 200	< 200
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	24	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	< 5.0	< 5.0	55	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	1.0 L	2.6 L	< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-36A 07-SEP-93 3293-005	B-37 07-SEP-93 3302-007	B-37A 07-SEP-93 3302-008	B-38 01-JUN-93 1670-016	B-38 07-SEP-93 3293-006	B-38A 01-JUN-93 1670-017
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	620	510	770	3630	2830	2760
DEPTH TO WATER	FEET	14.18	8.13	8.14	18.53	20.19	24.87
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.1	7.3	7.3	8.3	9.9	7.7
TEMPERATURE	DEG C	11	13	11	20	20	15
TURBIDITY, FIELD		NONE	SLIGHT	NONE	NONE	SLIGHT	NONE
WATER ELEVATION	FEET	607.51	606.69	606.69	617.29	615.63	610.96
ALKALINITY AS CACO3	MG/L	330	200	190	100	420	80
CHLORIDE	MG/L	13	6.8	11	26	24	23
COD	MG/L						
FLUORIDE	MG/L	0.14	< 0.10	< 0.10	1.8	2.6	1.1
HARDNESS AS CACO3	MG/L	390	290	410	620	21	500
NITROGEN, NITRATE + NITRITE	MG/L	0.85	1.2	< 0.050	1.7	0.29	1.6
SOLIDS, TOTAL DISSOLVED	MG/L	420	380	590	3000	2200	2300
SULFATE	MG/L	36	100	240	2600	1200	2000
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	180	90	38
BARIUM, DISSOLVED	UG/L	68	< 50	< 50	110	< 50	58
BORON, DISSOLVED	UG/L	< 200	3100	7400	2500	2600	2200
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	68	< 10	52
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	55	< 5.0	< 5.0	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	57	320	22
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS		B-38A 07-SEP-93 3293-007
COLOR, FIELD			CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM		3280
DEPTH TO WATER	FEET		27.59
ODOR, FIELD			NONE
PH, FIELD	SU		9.0
TEMPERATURE	DEG C		16
TURBIDITY, FIELD			NONE
WATER ELEVATION	FEET		608.24
ALKALINITY AS CACO3	MG/L		90
CHLORIDE	MG/L		21
COD	MG/L		
FLUORIDE	MG/L		3.4
HARDNESS AS CACO3	MG/L		390
NITROGEN, NITRATE + NITRITE	MG/L		0.59
SOLIDS, TOTAL DISSOLVED	MG/L		2600
SULFATE	MG/L		1800
ARSENIC, DISSOLVED	UG/L		51
BARIUM, DISSOLVED	UG/L		54
BORON, DISSOLVED	UG/L		3300
CADMIUM, DISSOLVED	UG/L	<	0.30
CHROMIUM, DISSOLVED	UG/L		11
COPPER, DISSOLVED	UG/L	<	20
IRON, DISSOLVED	UG/L	<	100
LEAD, DISSOLVED	UG/L	<	3.0
MANGANESE, DISSOLVED	UG/L	<	5.0
MERCURY, DISSOLVED	UG/L	<	0.20
SELENIUM, DISSOLVED	UG/L		57
SILVER, DISSOLVED	UG/L	<	1.0
ZINC, DISSOLVED	UG/L	<	20

Appendix C

2016 Low-Hazard Waste Exemption Leaching Test Results – Slag and Ash

Sediment and Soil Analytical Results - Water Leach Test Results
WPL Nelson Dewey

Sample	Date	Depth (feet)	Material Type	Lab Notes	Boron (ug/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	TDS (mg/L)
WPDES POND									
SED-1	8/3/2016	0-1.3	Fly Ash	--	240	4.3	<1.0	4.4	54
SED-2	8/3/2016	0-1.0	Fly Ash	--	200	4.3	<1.0	11.5	60
QC-3 (SED-2)	8/3/2016	0-1	Fly Ash	--	240	3.5 J	<1.0	6.1	52
SED-3	7/20/2016	0-4.5	Slag	--	130	2.7 J	<1.0	5	28
	7/20/2016	4.5-5.5	SP	--	<50	2.5 J	<0.20	<2.0	14 J
SED-4	7/19/2016	0-4.8	ML	--	510	10.5 J	<10.0	11.9 J	86
	7/19/2016	4.8-5.5		--	74 J	NA	NA	NA	NA
GP-19	8/4/2016	8-12	SM	--	62 J	2.4 J	<1.0	2 J	16 J
SLAG POND									
SED-5	7/20/2016	0-1.6	ML-OL	--	54 J	3.2 J	<1.0	33.3	90
SED-6	7/20/2016	0-1.0	ML	--	60 J	3.7 J	0.36 J	59.1	130
SED-7	8/4/2016	0-3.0	Fly Ash	--	88 J	4	<1.0	10.5	76
SED-8	8/4/2016	1.0-1.5	Fly Ash	--	82 J	3.7 J	<1.0	12.1	74
COAL YARD									
TP-CY-1	7/19/2016	0-0.5	Coal	--	140	<20.0	<2.0	<20.0	32
	7/19/2016	3.0-3.5	SM	--	100 J	2.8 J	<1.0	<2.0	20
TP-CY-3	7/20/2016	1.9-2.1	GM	--	<50	3.9 J	<0.20	2.8 J	50
	7/20/2016	4.8-5.5	SM	--	NA	NA	NA	NA	NA
TP-CY-4	7/19/2016	0-2.8	Coal	--	190	<20.0	<2.0	<20.0	38
	7/19/2016	2.8-3.2	GP & SM	--	<50	<10.0	<1.0	<10.0	34
	7/19/2016	3.6-4.8	Slag	--	<50	<20.0	<2.0	<20.0	10 J
	7/19/2016	4.8-5.0		--	NA	NA	NA	NA	NA
TP-CY-6	7/19/2016	0-0.5	Coal	--	190	<20.0	<2.0	<20.0	54
	7/19/2016	0.7-1.0	SP	--	<50	2.5 J	<0.20	2.3 J	30
TP-CY-10	7/19/2016	0-0.5	Coal	--	120	2.4 J	<1.0	11.6	48
	7/19/2016	1.0-2.0	SM	--	<50	2.2 J	<1.0	2.3 J	28
TP-CY-12	7/20/2016	0-0.3	Coal	--	160	<20.0	<2.0	<20.0	44
	7/20/2016	0.3-2.0	SP	--	<50	2.2 J	<0.20	2.2 J	24
	7/20/2016	2.0-2.7	SP	--	<50	2.3 J	<0.20	27.5	50
QC-1 (TP-CY-12)	7/20/2016	0.3-2.0	SP	--	<50	2.6 J	<0.20	2.5 J	24
SLAG HANDLING AREA									
GP-5	8/3/2016	12.5-15	Fly Ash	--	100	<2.0	<1.0	3.0 J	22
	8/3/2016	18-24	ML & SM	--	99 J	3.3 J	<1.0	<2.0	24
GP-7	8/3/2016	7.5-18	Slag	--	<50	2.2 J	<1.0	<2.0	<8.7
QC-2 (GP-7)	8/3/2016	7.5-18	Slag	--	<50	2.2 J	<1.0	<2.0	10 J
GP-14	8/4/2016	12.5-15	Fly Ash	--	120	<2.0	<1.0	13.4	96
SLAG SAMPLES[1]									
Slag 01 [2]	6/3/2013	--	Slag	--	NA	NA	NA	NA	NA
Slag 01	12/23/2013	--	Slag	--	12.5 AB	0.277 B	NA	0.218	NA
NED Slag Composite 2014	7/1/2014	--	Slag	--	11.7 AB*^	< 0.142	NA	0.457 B	98 H
Slag Sample	4/14/2015	--	Slag	--	< 1020 A	0.751	NA	0.427	NA

Sediment and Soil Analytical Results - Water Leach Test Results
WPL Nelson Dewey

Sample	Date	Depth (feet)	Material Type	Lab Notes	Boron (ug/L)	Chloride (mg/L)	Fluoride (mg/L)	Sulfate (mg/L)	TDS (mg/L)
FLY ASH SAMPLES[1]									
NED Flyash Composite [2]	2/14/2014	--	Fly Ash	--	NA	NA	NA	6,530 B	NA
Week of 062815 [2]	7/3/2015	--	Fly Ash	--	NA	NA	NA	6,260	NA
Week of 010916	1/4/2016	--	Fly Ash	--	NA	NA	NA	NA	NA
NR 140 Preventative Action Limits (PALs)					200	125	0.8	125	NE
NR 140 Enforcement Standards (ESs)					1000	250	4	250	NE
40 CFR Part 141.62 Maximum Contaminant Levels (MCL)					NE	NE	4	NE	NE
NR 538 Table 1A Standards					190	125	0.8	125	NE
NR 538 Table 2A Standards					1900	1,250	8	1,250	NE

Abbreviations:
mg/L = micrograms per liter
NE = No Standard Established
NA = Not Analyzed
GM = Silty Gravel
ML = Silt
ML-CL = Silty Clay
SM = Silty Sand
GP = Poorly Graded Gravel
ML-OL = Silty Organic Clay
SP = Poorly Graded Sand
ML-OL = Silty Organic Clay
TDS = Total Dissolved Solids

Notes:
1. Slag and Fly Ash samples were collected by the plant as part of permit requirements.
2. Sample was analyzed using the SPLP Leach Method rather than the ASTM Water Leach Method for tested parameters except for Sulfate.
NR 140 ESs - Wisconsin Administrative Code (WAC), Chapter NR 140.10 Table 1 - Public Health Groundwater Quality Standards from July 2015 and WAC, Chapter NR 140.12 Table 2 - Public Welfare Groundwater Quality Standards from July 2015.
NR 140 PALs - WAC, Chapter NR 140.10 Table 1 - Public Health Groundwater Quality Standards from July 2015 and WAC, Chapter NR 140.12 Table 2 - Public Welfare Groundwater Quality Standards from July 2015.

Laboratory Notes/Qualifiers:
J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
A = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B = Compound was found in the blank and sample.
F1 = MS and/or MSD Recovery is outside acceptance limits.
H = Sample was prepped or analyzed beyond the specified holding time.
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
* = LCS or LCSD is outside acceptance limits.

Created by: RJG Date: 3/14/2016
Last revision by: RJG Date: 10/24/2016
Checked by: BSS Date: 10/24/2016
Original table prepared for Slag Pond Closure Low Hazard Waste Exemption Request (SCS Project #25216054.00).
Reformatted for the Alternative Source Demonstration to include only the parameters with SSIs that were included in the leach testing by NDK, 9/14/2020; SCC 10/1/2021.

I:\25221071.00\Deliverables\2021 April ASD NED\Appendix C 2016 leachate results slag and ash\[Table 4. Sediment_Soil_Water Leach Results-Updated.xlsx]Leach Test - SSI Parameters

Appendix D

Grant County Fluoride Concentrations

Fluoride Data in WDNR's Groundwater Retrieval Network (GRN) Database
for Water Supply Wells
Grant County, Wisconsin
Summary of Fluoride Detections

Row Labels	Count of Analytical Result
FLUORIDE TOTAL	**403**
DETECT BETWEEN LOD & LOQ	84
NON-DETECT	48
NORMAL QUANTIFIED RESULT	271
Grand Total	**403**

Percent with Fluoride Detected 88%

Average Detected Concentration of Fluoride

Sample Analytical Qualifier (Multiple Items)

Count of Sample Analytical Result	Average of Sample Analytical Result	Max of Sample Analytical Result2	Median of Sample Analytical Result
355	0.41	21.1	0.14

Data downloaded by SCS on 6/25/2021

I:\25221071.00\Deliverables\2021 April ASD NED\Appendix D Grant Co fluoride concentrations\[WDNR_GRN_Fluoride_GrantCo_210625.xlsx]Detects