Selection of Remedy
Burlington Generating Station

Burlington Generating Station
Burlington, Iowa

Prepared for:

Alliant Energy

SCS ENGINEERS

25220081.00 | December 31, 2023

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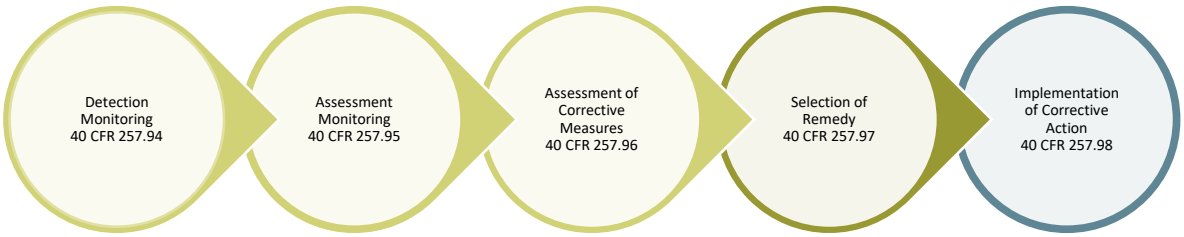
EXECUTIVE SUMMARY

Interstate Power and Light Company (IPL), an Alliant Energy company, operated four ash ponds at the Burlington Generating Station (BGS). The ponds were used to manage coal combustion residuals (CCR) and wastewater from the power plant, which burned coal to generate electricity until December 31, 2021. BGS is currently operating using natural gas to generate electricity and is no longer using the ash ponds to manage plant wastewater.

IPL samples and tests the groundwater in the area of the ash ponds to comply with U.S. Environmental Protection Agency (U.S. EPA) standards for the Disposal of CCR from Electric Utilities, or the "CCR Rule" (Rule).

Groundwater samples from five of the compliance wells installed to monitor the four ponds contain molybdenum and/or lithium at levels higher than the Groundwater Protection Standards (GPS) defined in the Rule. Molybdenum and/or lithium occur naturally within the environment and can also be present in coal and CCR.

IPL has prepared this Selection of Remedy Report in accordance with the requirements of the CCR Rule. The information in this report builds on the Assessment of Corrective Measures (ACM) Report issued in September 2019 and the ACM Addendum issued in November 2020. The ACM and ACM Addendum were prepared in response to the groundwater sampling results at the BGS facility. The Selection of Remedy process is the next step in a series of steps defined in the Rule and shown below.



The Selection of Remedy Report provides an update to the nature and extent of groundwater impacts discussed in the ACM and ACM Addendum. Since the ACM and ACM Addendum were issued, IPL has continued to develop an understanding of the following:

- Types of soil and rock deposits in the area of the BGS facility.
- Depth of groundwater.
- Direction that groundwater is moving.
- Potential sources of the molybdenum and lithium in groundwater.
- The area where molybdenum and lithium levels are higher than the U.S. EPA standards.
- The people, plants, and animals that may be affected by levels of molybdenum and lithium in groundwater that are above the GPS.

IPL has installed new wells to evaluate groundwater concentrations beyond the location of the wells with GPS exceedances. Groundwater monitoring data continue to show molybdenum and lithium are present in groundwater near the BGS ash ponds.

The Selection of Remedy Report also presents the following:

- A comparison to the minimum criteria set forth in 40 CFR 257.97(b).
- A discussion of the evaluating criteria in 40 CFR 257.97(c) and the remedy selection scoring methodology used to help select an appropriate corrective measure.
- A summary of the selected remedy.

IPL has identified capping and consolidating CCR in place with pump and treat as the selected remedy for molybdenum and lithium impacts to groundwater. The selected remedy meets the minimum criteria established in the Rule, and includes:

- Stopping all CCR and wastewater discharges to the BGS ash ponds.
- Closing the pond with CCR in place according to 40 CFR 257.102(d).
- Implementing groundwater extraction with treatment for molybdenum and lithium.

In accordance with 40 CFR 257.96(e), IPL held a public meeting with interested and affected parties to discuss the ACM as required by the Rule on October 14, 2020. However, the ACM was updated with ACM Addendum No. 1 in November 2021, so IPL held an additional public meeting on June 26, 2023. Within 90 days of this Selection of Remedy Report, IPL will implement the selected remedy as required in 40 CFR 257.98(a). This report describes the status of remedy design and an anticipated construction schedule. BGS ash pond closure construction was completed on October 4, 2023. An estimated schedule for the implementation and completion of the selected remedy has been developed and the design of a groundwater collection system has begun now that groundwater dewatering efforts supporting ash pond closure construction are completed.

For more information on Alliant Energy, view the 2023 Corporate Responsibility Report at http://www.alliantenergy.com/responsibility.

PE CERTIFICATION

I, Eric J. Nelson, hereby certify that the selected groundwater remedy described herein meets the requirements of 40 CFR 257.97. This Selection of Remedy Report was prepared by me or under my direct supervision, and I am a duly licensed Professional Engineer under the laws of the State of Iowa.

(signature) 12/31/2023 (date)

Eric J. Nelson

(printed or typed name)

License number 23136

My license renewal date is December 31, 2024.

Pages or sheets covered by this seal:

Selection of Remedy – Burlington Generating Station

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1.0 INTRODUCTION AND PURPOSE

This Selection of Remedy Report 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 a final report identified in 40 CFR 257.97(a) and identify the remedy selected to address the Groundwater Protection Standard (GPS) exceedances observed in the May, August, and October 2018, and a resampling event for selected wells in March 2019. This was identified in the Notification of GPS Exceedance dated February 13, 2019. The evaluation of statistically significant levels exceeding the GPSs was summarized in an Alternative Source Demonstration (ASD) completed in April 2019. The ASD identified a reduced list of well parameters exceeding the GPS and recommended that Interstate Power and Light Company (IPL) initiate the Assessment of Corrective Measures (ACM). This Selection of Remedy Report includes a description of the selected remedy and how it meets the requirements of 40 CFR 257.97(b), which are described in **Section 3.1**.

This report also provides a brief summary of the activities completed to further define the nature and extent of the groundwater impacts attributed to Burlington Generating Station (BGS) impoundments since the ACM Addendum No. 1 report was issued in November 2020.

2.0 BACKGROUND

2.1 SITE INFORMATION AND MAP

BGS is located along the west bank of the Mississippi River, about 5 miles south of the city of Burlington, in Des Moines County, Iowa (**Figure 1**). The address of the plant is 4282 Sullivan Slough Road, Burlington, Iowa. In addition to the generating station, which after December 31, 2021, uses natural gas instead of coal to fuel electrical generating operations, the property also contains a former coal yard, natural gas-fired combustion turbines, four CCR surface impoundments (Upper Ash Pond, Economizer Pond, Main Ash Pond, and Ash Seal Pond), and one non-CCR surface impoundment (Lower Pond). Coal and the coal-handling equipment in the former coal yard have been removed.

The groundwater monitoring system at BGS is a multi-unit system. BGS includes four CCR Units:

- BGS Ash Seal Pond (existing CCR surface impoundment)
- BGS Main Ash Pond (existing CCR surface impoundment)
- BGS Economizer Ash Pond (existing CCR surface impoundment)
- BGS Upper Ash Pond (existing CCR surface impoundment)

The closure of the BGS impoundments was discussed in the most recent amendment to the written closure plan (SCS Engineers [SCS], 2023b). A map showing the CCR Units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program is provided as **Figure 2**. A list of the site monitoring wells is provided in **Table 1**.

In accordance with 40 CFR 257.96(a), IPL prepared an ACM in response to the molybdenum and lithium detected in groundwater samples above the GPS, which was issued in September 2019 (SCS, 2019). An ACM addendum was also issued in November 2020 (SCS, 2020).

In accordance with 40 CFR 257.96(e), IPL held a public meeting to discuss the ACM on October 14, 2020. The meeting was open to interested and affected parties, and, due to the COVID-19 pandemic, was held virtually using an interactive online meeting platform. Because the ACM was amended, an additional public meeting was held on June 26, 2023, to discuss ACM Addendum No. 1.

2.2 UPDATED NATURE AND EXTENT OF GROUNDWATER IMPACTS

This section provides an update of the nature and extent of groundwater impacts since the ACM Addendum No. 1 was completed. The additional work further defined the nature and extent of groundwater impacts and includes:

- April 2021 to October 2023 – Conducted assessment monitoring events. Also conducted additional groundwater sampling events for select parameters used to evaluate the nature and extent of impacts as well as the evaluation of groundwater treatment alternatives. A summary of the monitoring events is provided in Table 2.

- March 2021 – Conducted surface water sampling at two locations on the Mississippi River. One sample was obtained upriver from the plant and the other was obtained from a downriver location.

- May 2021 – Installed new piezometers MW-307B and MW-313B. Drilled boring B-302B.

- July 2021 – Conducted assessment monitoring events for new wells MW-307B and MW-313B.

- September 2021 – Collected and analyzed ash samples from the Main Ash Pond and groundwater sampling at MW-304 and MW-310 to further define source material concentrations and in support of the groundwater treatability study (TS).

- September 2021 – February 2022 – Performed monitoring well design, permitting, and installation of supplemental background well MW-314 to evaluate background groundwater quality conditions within the alluvial aquifer close to the Mississippi River.

- October 2021 – Collected and analyzed ash samples from the Economizer Pond and Main Ash Pond to further define source material concentrations and in support of the groundwater TS.

- December 2021 – Cessation of coal-fired electrical generating operations at BGS.

- February 2022 – Evaluated groundwater dewatering pump test discharge data to provide additional information on the hydraulic properties of the uppermost aquifer.

- March 2022 to August 2023 – Constructed alternative stormwater and wastewater management infrastructure. Completed CCR and non-CCR waste consolidation to the Main Ash Pond and Economizer Pond closure areas.

- July 2022 to October 2022 – Installed Upper Ash Pond and Ash Seal Pond dewatering wells and established dewatering systems.

- **September 2022 to July 2023 –** Operated Upper Ash Pond dewatering system.
- **October 2022 to April 2023 –** Operated Ash Seal Pond dewatering system.
- **May 2023 to October 2023 –** Constructed final cover system and stormwater management features for Main Ash Pond and Economizer Pond closure areas.
- **July 2023** – Re-developed monitoring wells that had gone dry during pond closure construction dewatering system operations, and collected groundwater levels.
- **August 2023** – Measured groundwater elevations to evaluated aquifer recovery from dewatering events.
- **August 2023** – Issued updated Notice of Intent to Close the CCR surface impoundments.

These activities were discussed in semiannual progress reports prepared in accordance with 40 CFR 257.97(a). A summary of groundwater sampling events is provided in **Table 2**.

The nature and extent of work discussed above built a foundation for the groundwater remedy design activities that occurred in 2022 and 2023 as IPL also prepared for and conducted the pond closure work. A summary of the 2022 and 2023 groundwater remedy design and closure activities can be found in Tables 1A and 1B of the 2022 Semiannual Progress Report for the Selection of Remedy, dated September 13, 2023.

2.2.1 Potential Sources

The source of molybdenum and lithium in monitoring wells exceeding GPSs is believed to be the monitored CCR units that include the following:

- Ash Seal Pond
- Main Ash Pond
- Economizer Pond
- Upper Ash Pond

As described in the ACM and subsequent addendums, potential sources of molybdenum and lithium or factors that may be contributing to the groundwater impacts observed include:

- CCR and sluice water discharged to and stored in the ash ponds.
- Precipitation and storm water managed within the ash ponds.
- Low-volume plant wastewater managed via the Ash Seal, Main Ash, Economizer, and Upper Ash Ponds.

No additional sources have been identified since the ACM.

The plant is no longer generating CCR or sluice water following the end of coal combustion activities in December 2021. All of the low-volume plant wastewater previously managed in the CCR units at BGS has been rerouted away from CCR units. BGS is no longer contributing wastewater to the ash pond system. The CCR surface impoundments ceased receiving waste on August 16, 2023, and closure construction was completed on October 4, 2023.

2.2.2 Updated Groundwater Assessment

The ACM process was triggered by the detection of lithium and molybdenum at statistically significant levels exceeding the GPSs in samples from the following compliance wells:

- Lithium: MW-302, MW-307, MW-308
- Molybdenum: MW-302, MW-307, MW-308

Following the completion of ACM Addendum No. 1 in November 2020, boring MW-302B and monitoring wells MW-307B and MW-313B were installed in May 2021 to evaluate the total thickness of the uppermost aquifer and the vertical extent of molybdenum and lithium within the uppermost aquifer. Based on information obtained from the boring and well installations, the depth to the base of the uppermost aquifer is approximately 65 feet below ground surface (bgs). Groundwater quality results from the two new base of aquifer wells, MW-307B and MW-313B, indicated that the molybdenum exceeded the GPS at the base of the aquifer at MW-313B, but not at MW-307B. Neither of the wells indicated lithium GPS exceedances at the base of the aquifer. Sampling results for wells MW-307B and MW-313B are located in **Tables 4** and **5**. There are GPS exceedances in **Table 4** for arsenic at wells MW-301 and MW-302 and cobalt in well MW-305 that are not SSLs.

Concentrations of molybdenum and lithium above the GPS in groundwater samples collected in 2021 and 2022 (**Attachment A**) are similar to the concentrations reported in the ACM Addendum (around 100 to 190 micrograms per liter [µg/L] for molybdenum and 41 to 92 µg/L for lithium). The exception is the molybdenum concentrations in delineation well MW-312, where groundwater samples collected in 2021 - 2022 contained molybdenum concentrations up to 310 µg/L. Many of the monitoring wells installed as shallow piezometers could not be sampled in October 2022 because they were dry due to active groundwater dewatering being performed to facilitate the consolidation of CCR within the ash ponds.

During the April 2023 sampling event, molybdenum remained above the GPS in some compliance wells at concentrations of up to 480 µg/L. Lithium concentrations in select compliance wells remained elevated during the April 2023 sampling event but were within the range of concentrations reported in ACM Addendum No. 1. Pond closure construction dewatering system installed around the Upper Ash Pond was active from September 2022 to July 2023 and the dewatering system installed around the Ash Seal Pond was active from October 2022 to April 2023. The Upper Ash Pond construction dewatering system was operating during the April 2023 sampling event. The pond closure construction dewatering system caused changes to the groundwater flow patterns and water levels across the site, as well as depletion and recharge to the groundwater wells, which resulted in high variability in groundwater chemistry and elevated metals concentrations. Many wells on-site were re-developed once the pond closure construction dewatering system was shut down in an effort to gather more representative data on long-term groundwater chemical conditions during future sampling events.

Monitoring well MW-314 was also installed since the ACM Addendum as a supplemental background well. The well was installed in February 2022 to provide supplemental background groundwater quality information within the alluvial sand uppermost aquifer. Sampling results for well MW-314 are located in **Tables 4** and **5**. There were no GPS exceedances identified in groundwater samples from well MW-314.

The monitoring wells at the site are screened within the alluvial sands that are in contact with overlying silt and clay (**Figures 11** and **12**). The silt and clay are the result of weathering of the underlying mudstone bedrock and Mississippi flood deposits. The groundwater elevations from these

wells represent the potentiometric head within both the bedrock aquifer and alluvial sands in contact with the bedrock, which are overlain by silt and clay. The alluvial aquifer is comprised of Mississippi River valley clay, silt, sand, and sand and gravel deposits. This deposit is present along the edges of the entire Mississippi River valley in southeastern Iowa.

Regionally, the uppermost bedrock is Mississippian Limestone. The limestone bedrock is also an aquifer and is likely hydraulically connected to the alluvial aquifer above. Locally, the Mississippian Limestone is absent in some areas due to erosion, and where it is absent the uppermost bedrock is the Devonian-Mississippian Aquaclude (shale, siltstone, and mudstone).

The water table in the vicinity of the CCR units lies within the silt and clay unit located immediately above the alluvial sand. There are no monitoring wells screened within the silt and clay unit since it is not part of the uppermost aquifer.

Depth to groundwater as measured in the site monitoring wells varies from 1 to 23 feet bgs due to topographic variations across the facility, seasonal variations in groundwater, and Mississippi River levels (**Table 3**). Horizontal gradients and flow velocities vary seasonally (**Table 6**). Vertical gradients are generally flat (**Table 7**). Groundwater flow at the site is generally to the east-southeast, and the groundwater flow direction and water levels fluctuate seasonally due to the proximity to the river. Groundwater elevations and flow directions are shown on the April 2022 shallow and deep potentiometric surface maps, the October 2022 deep potentiometric surface map, and the April and July 2023 shallow and deep potentiometric surface maps (**Figures 3** through **9.**). A shallow potentiometric surface map could not be created from the October 2022 groundwater elevations because many of the shallow piezometers were dry due to active groundwater dewatering being performed to facilitate the consolidation of CCR within the ash ponds.

Groundwater elevations shown on the October 2022 deep potentiometric surface map were affected by the dewatering activities, causing west to southwest groundwater flow directions. Groundwater elevations shown on the April 2023 shallow and deep potentiometric surface maps were affected by the dewatering activities. Prior to the April 2023 sampling event the Ash Seal Pond dewatering system was shut off and the Upper Ash Pond dewatering system remained active, causing a north and northwest flow pattern. The water level conditions observed in October 2022 and April 2023 are transient and not expected to represent the long-term flow conditions in the uppermost aquifer. The Upper Ash Pond dewatering system was turned off on July 10, 2023. As shown on the July 31, 2023 shallow and deep potentiometric surface maps (**Figures 8** and **9**), groundwater elevations and groundwater flow directions have returned to static, or non-pumping conditions, now that the dewatering is complete. The return of the groundwater elevations to static conditions are further evidenced by a preliminary review of the October 3 through 5, 2023 groundwater elevations, which are similar to the July 31, 2023 groundwater elevations. The October 3 through 5, 2023 groundwater elevations will be included in the 2023 Annual Groundwater Monitoring and Corrective Action Report.

The cross section location map on **Figure 10** shows an A-A' cross section running east-west (**Figure 11**) and a B-B' cross section running north-south (**Figure 12**). Water levels measured on July 31, 2023, are posted on the cross sections. This was the first water level measurement event following the completing of construction dewatering. The water table is not in contact with ash in either cross section.

2.2.3 Updated Conceptual Site Model

Based on the additional investigations performed since the September 2019 ACM and the November 2020 ACM Addendum No. 1, the BGS ash ponds continue to be the likely source of the statistically significant exceedances above the GPS for molybdenum and lithium. These constituents remain the only statistically significant exceedances of the GPS.

Groundwater samples collected from the piezometer nests installed downgradient of the BGS ash ponds and adjacent to the Mississippi River contain molybdenum and/or lithium at concentrations above the GPS. Because of this, the ACM and Addendum No. 1 listed the surface water/sediment, biota/food, and ecological exposure assessment as ongoing because the extent of groundwater impacts were still being evaluated.

Additional exposure pathway assessment of molybdenum and lithium in groundwater has been conducted by:

- Updating the water supply well evaluation.
- Sampling of Mississippi River from upstream and downstream locations.

The previous water supply well search was revisited to identify new wells located downgradient or wells within ½ mile of the CCR surface impoundment limits and west of the Mississippi River using the Iowa Geospatial Data database (Iowa Geospatial Data, 2023) of all registered wells in Iowa. No new downgradient water supply wells were identified in the search. In addition to the BGS water supply well, which is not used as a source of potable water, this review revealed a total of 25 wells in the updated database search conducted on December 28, 2023. The wells identified include:

- Six registered testing wells.
- Two wells associated with Koch Fertilizer, which all appear to represent the same single well that is recorded as plugged. Two of the three entries for this well are errantly located and are mapped within the BGS Lower Pond. The location of this abandoned well is at a former Koch Fertilizer facility located approximately 0.15 mile north of the BGS Upper Ash Pond.
- One well owned and operated by Alliant (not used to supply potable water as indicated above).
- Twelve wells registered by Alliant and used for construction dewatering.
- The remaining four wells located upgradient of the impoundments are identified as follows:

Owner (Well ID)	Well Type	Depth (ft)	Approximate Location Relative to Site Based on Database Entries	Date Installed	Comments
Carmen Hand (2102860)	Private	700	380' NW / Upgradient	1/1/1960	Well is separated from the uppermost aquifer by the Devonian Aquiclude
Rudy Mattson (10174)	Private	88	606' NW / Upgradient	3/15/1957	Well is not in use

Owner (Well ID)	Well Type	Depth (ft)	Approximate Location Relative to Site Based on Database Entries	Date Installed	Comments
Raid Quarries (27546)	Exploration	378	964' WNW / Upgradient	4/7/1967	Well is listed as not in use
Jim Smith (2102010)	Private	20	2,485' NNW / Upgradient	1/1/1901	Elevation of well bottom is above water table elevation at the impoundments

According to database records, three active private wells are within the evaluation distance.

- No well log information is available from Well ID 2102860, and based on the depth of installation, this is assumed to be screened in bedrock and separated from the uppermost aquifer by the Devonian Aquaclude.

- Based on the available well log for Well ID 10174, it appears to be screened in bedrock and is located approximately 600 feet upgradient of the site. The well is not in use. Rathbun Water supplies water to the property.

- The Raid Quarries well, ID 27456, is listed as inactive in the Iowa Geospatial Data database.

- The sidegradient well, ID 2102010, is noted as hand-dug to the depth of 20 feet, and is assumed to be placed within sand and gravel approximately one-half mile from the site. The elevation of the base of the well is above the water table of the impoundments.

Groundwater impacts are not expected to reach these wells based on their upgradient position relative to the site. Regional groundwater flow in the bedrock aquifer (Appendix A, SCS, 2023) and localized groundwater flow in the alluvial aquifer (Figures 3 through 5) indicate that these off-site wells are not downgradient of the site.

Surface water sampling from the Mississippi River was performed upstream and downstream of BGS in March 2021 in follow up to the discussion of potential ecological exposure pathways in Section 3.3.2 of ACM Addendum No. 1 (SCS 2020), which preliminarily concluded the molybdenum and lithium impacts to groundwater at BGS are unlikely to impact the river based on the following:

- Neither the U.S. EPA nor the State of Iowa have established surface water standards for these metals. Surface water standards identified in our review are higher than the GPS for these metals and generally higher than the concentrations observed in groundwater at BGS (see standards established in New Mexico, Nevada, and California).

- Neither metal is highly toxic to aquatic organisms, and toxicity testing for these metals found in literature identify "Effective Concentrations" and "No Observable Effect Concentrations" that are higher than the GPS and concentrations observed in groundwater at BGS.

- No population shifts in the mussel communities upstream and downstream of BGS in the Mississippi River were observed in mussel surveys completed to support the National Pollutant Discharge Elimination System (NPDES) Permit renewal for BGS. Mussels, one of the most sensitive animal groups, present at the likely point of groundwater-to-surface water interaction, showed no population shifts that would be indicative of chronic or acute impacts.

Lithium was detected in both the upstream and downstream surface water samples collected from the Mississippi River at similar concentrations (10 and 11 µg/L respectively) below the GPS. Molybdenum was not detected. Based on this sampling, the molybdenum and lithium present in groundwater at BGS are not believed to be contributing to detectable increases in surface water concentrations of the target constituents.

Based on the results of this additional work, there does not appear to be a complete exposure pathway for potential human or ecological exposure.

In summary, molybdenum and lithium are present in groundwater near the BGS ash ponds, and there are no current or expected adverse impacts to human health or ecological receptors due to a lack of exposure.

3.0 CORRECTIVE MEASURES AND REMEDY SELECTION

Several corrective measure options were presented in detail in ACM Addendum No. 1, Existing Surface Impoundments, BGS report, dated November 2020.

This report identified the following corrective measure alternatives for the molybdenum and lithium impacts to groundwater associated with BGS ash ponds:

- Alternative 1 (A1) – No Action
- Alternative 2 (A2) – Close and Cap in Place with MNA
- Alternative 3 (A3) – Consolidate and Cap with MNA
- Alternative 4 (A4) – Excavate and Dispose On-site with MNA
- Alternative 5 (A5) – Excavate and Dispose in Off-site Landfill
- Alternative 6 (A6) – Consolidate and Cap with Chemical Amendment
- Alternative 7 (A7) – Consolidate and Cap with Groundwater Collection
- Alternative 8 (A8) – Consolidate and Cap with Barrier Wall

The following sections present:

- A comparison to the minimum criteria set forth in 40 CFR 257.97(b).
- A discussion of the evaluating criteria in 40 CFR 257.97(c).
- A summary of the selected remedy.

3.1 APPLICABILITY OF CORRECTIVE MEASURES

A1 through A4

In accordance with 40 CFR 257.97(b)(2), a groundwater remedy must attain the GPS and, per 40 CFR 257.98(c)(1), cannot be deemed complete until the GPS has been achieved within the contaminant plume area beyond the groundwater monitoring system established under 40 CFR

257.91. According to U.S. EPA, meeting this standard is required regardless of the present risk to human or ecologic health discussed in the ACM, ACM Addendum No. 1, and Section 2.2. The inclusion of A1 through 4 considered whether a "receptor" or "exposure" to the affected groundwater was possible. Additionally, A1 through A4 considered monitored natural attenuation (MNA) for mitigating CCR -impacted groundwater. MNA mechanisms at this location were evaluated and determined to be insignificant.

With the revised understanding and updated assessment of MNA mechanisms, A1 through 4 do not meet the minimum requirements and were eliminated from further consideration.

A6 and A8

Solidifying agents, such as cement, can be used to immobilize CCR constituents *"in-situ"* or in place. This is often referred to as in-situ solidification. Chemical amendments can also be directly injected *in-situ* to stabilize potential contaminants in place. This is referred to as in-situ stabilization and involves the use of stabilizing agents. Stabilizing agents can also be used as part of a barrier system, where they interact with groundwater passing through reactive media to immobilize potential contaminants.

IPL conducted treatment studies (TS) to assess different chemical amendment reagents for the potential for in-situ solidification/stabilization (ISS) of the CCR and the use of a permeable reactive barrier (PRB) to treat impacted groundwater. ISS is an integral component of the chemical assessment associated with A6 and PRB is an integral component to assess Barrier Walls as part of A8. The focus of the TS was on lithium and molybdenum. The solidifying agents of the ISS trials included: Portland Cement (at treatment levels of 2, 5, 8, and 12 percent by weight), and TerraBond-FC® by Terra Materials, LLC. Samples treated with Portland Cement met strength criteria at 2 percent; however, the treatment resulted in increased concentrations of lithium in leachate from the samples. TerraBond-FC® required a 25 percent addition by weight to meet strength criteria.

A literature review of Alum, BOF Slag, Ferrous Sulfate, Manganese Oxide, PeroxyChem MetaFix, Phosphate, FerroBlack by Redox Solutions, and Zero Valent Iron (ZVI) evaluated these reagents for potential use as part of ISS and a PRB. Based on this literature review, screening-level batch trials were completed to assess the effectiveness of Portland Cement, TerraBond, Aluminum Sulfate, Ferrous Sulfate, PeroxyChem, FerroBlack, and ZVI to treat lithium and molybdenum.

With respect to use as a stabilizing agent as part of ISS, the screening-level batch trials showed that Ferrous Sulfate and FerroBlack had initial beneficial results and these reagents were used in additional batch trials. Upon further assessment after the additional batch trials, the following conclusions were developed:

- FerroBlack Fe+ decreased the leachability of molybdenum, but appears to have increased the leachability of lithium in the batch trials.
- Ferrous sulfate decreased the leachability of molybdenum, but appears to have increased the leachability of lithium in the batch trials. No pH buffer was included with the ferrous sulfate and the buffering capacity of the CCR appears to be limited.

- Multiple extractions of FerroBlack Fe+ amended CCR found neither element to leach above leachate concentrations at a liquid-to-solids ratio of 200 to 1.

Both reagents removed lithium from the solution with increasing reagent doses during the initial screening-level trials. However, both reagents appeared to have increased the leachability of lithium in the additional batch trials. While ferrous sulfate produced a smaller lithium increase than the FerroBlack Fe+, it will increase the leaching of cadmium, cobalt, lead, and selenium unless a pH buffer is added with the ferrous sulfate. Uncertainty remains with the ability to treat lithium and molybdenum without other Appendix IV constituents released from the CCR.

PRB evaluation consisted of a series of batch trials to assess the longevity of the reactants by increasing the liquid-to-solids ratio. ZVI provided an initial reduction in lithium concentration from 94 to 64 µg/L (still above the GPS) in the initial batch test at a liquid-to-solid ratio of 1.9:1, but the lithium concentration increased as the liquid-to-solid ratio was increased (over 71 µg/L at ratios of 10:1 and 20:1). FerroBlack Fe+ initially produced an approximate 40 percent lithium concentration decrease to below the GPS, but the concentration increased with additional exposure to groundwater.

ZVI produced an approximate 50 percent reduction in molybdenum concentrations. These reductions met the molybdenum GPS. FerroBlack Fe+ again raised the molybdenum concentrations. Despite an initial rise in molybdenum concentrations with the addition of FerroBlack Fe+, the molybdenum concentrations eventually decreased with prolonged groundwater exposure as shown in the batch testing completed using a liquid-to-solid ratio of 20:1.

The batch trials found that the ZVI provided more consistent and complete sequestration of lithium and molybdenum than FerroBlack Fe+. Further assessment of ZVI revealed that 15 percent by weight would serve to reduce lithium concentrations as long as residence times are on the order of 2 days. However, the reductions are not enough to meet the GPS for lithium.

These results revealed that molybdenum is treatable through ISS or a PRB with ZVI; however, it does not serve to treat lithium suitably. The extensive ISS and PRB assessment has not demonstrated reliable results for the use of these as part of a remedy.

A6 has been eliminated from further consideration because extensive chemical amendment evaluation did not reveal consistent outcomes for treating molybdenum and lithium. For this same reason, A8 no longer contemplates a PRB wall, and is limited to consideration of an impermeable barrier wall.

3.2 MINIMUM CRITERIA

The selected remedy must meet the minimum criteria set forth in 40 CFR 257.97(b). These criteria and the ability of the alternatives evaluated to satisfy the criteria is summarized in **Table 8**.

It is our opinion that Alternatives 5, 7, and 8 can meet the requirements in 40 CFR 257.97(b)(1) through (5) based on the information currently available.

3.3 EVALUATION FACTORS

Each alternative remedy was evaluated based on the criteria set forth in 257.97(c). The retained remedies were compared with each other to assess the remedy that best satisfies the collective criteria. The comparison is presented in **Table 8** based on the following evaluation criteria:

- Long- and Short-Term Effectiveness [257.97(c)(1)]
  - Magnitude of reduction of existing risks.
  - Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy.
  - The type and degree of long-term management required, including monitoring, operation, and maintenance.
  - Short-term risks to human health and the environment associated with:
    - Excavation
    - Transportation
    - Re-disposal
  - Time until full protection is achieved.
  - Potential for exposure for humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment.
  - Long-term reliability of the engineering and institutional controls.
  - Potential need for replacement of the remedy.

- Source Control to Reduce Future Releases [257.97(c)(2)]
  - The extent to which containment practices will reduce further releases.
  - The extent to which treatment technologies may be used.

- Ease or Difficulty of Implementation [257.97(c)(3)]
  - Degree of difficulty associated with constructing the technology.
  - Expected operation reliability of the technologies.
  - Need to coordinate with and obtain necessary approvals and permits from other agencies.
  - Availability of necessary equipment and specialists.
  - Available capacity and location of needed treatment, storage, and disposal.

- Community Acceptance [257.97(c)(4)]
  - The degree to which community concerns are addressed by a potential remedy.

3.3.1 Long- and Short-Term Effectiveness [257.97(c)(1)]

Long-Term Risks and Management

Each of the retained alternatives serve to reduce the magnitude of existing risks similarly since the existing risk is already minimal based on the discussion in **Section 2.2.3**.

A5 eliminates the potential for future releases of CCR because the material would no longer remain at the facility. The likelihood of a potential release of CCR in the form of materials leaching to groundwater is slightly elevated for A7 in the event of a long-term system shutdown of the

groundwater pumping system. The likelihood of a potential release is also slightly elevated for A8 due to the potential for discontinuities or breaches in the barrier wall component.

Ultimately, A5, A7, and A8 all rely upon an engineered cover system to minimize or eliminate infiltration through the CCR material. Additionally, each alternative relies upon a groundwater-monitoring program to assess for a potential release. A5 employs these elements at a separate landfill location.

The solution for A5 relies on a separate landfill location, and there is no remaining responsibility by IPL for operation, maintenance, and monitoring (OM&M). IPL's additional OM&M responsibility for A7 includes groundwater pump operations and maintenance and treatment system monitoring and reporting through NPDES permit requirements. A8 requires OM&M including ongoing monitoring of barrier wall performance with complex and extensive implementation of repairs, if required.

Short-Term Risks

Short-term risk applies to the implementation of the remedy based on the excavation, transportation, and re-disposal of CCR. Implementing A5 would require the entire excavation of CCR material that is transported for re-disposal at a separate location. During this excavation, there is a potential for changes to aerobic/anaerobic conditions of the CCR that could mobilize additional impacts. The transportation required for A5 presents the most significant risks to the community and environment. This will affect the community by increasing air emissions from the additional haul vehicles and the deterioration of local roads due to significant traffic. A5 will require hauling approximately 1,319,065 cubic yards of CCR from the site and require an estimated 88,000 truck trips through the community, presenting additional safety, noise and overall quality of life concerns. Additional risks for A5 occur at the receiving facility due to the construction activities required to develop adequate receiving capacity and facility operations to dispose of the CCR from BGS.

A7 and A8 have similar short-term risks associated with the consolidation and capping of the CCR material on-site, and similar benefits derived from capping the CCR to reduce infiltration. An estimated 293,000 cubic yards of CCR will be excavated for consolidation under A7 and A8. In addition to the smaller volume of CCR to be handled compared to A5, the CCR will only be transported short distances on-site and not on local roads. Because CCR is not transported through the community with A7 and A8, there is no associated community risk associated with off-site management of CCR. A7 and A8 share the same risk profile associated with importing construction materials for the final cover system. However, A8 presents elevated excavation risk compared to A7 with respect to both transportation and excavation due to the increased excavation volumes and imported specialty equipment and materials to install the barrier wall.

Time Until Full Protection is Achieved

A5 likely presents the longest time to implement closure and extends the time required to achieve full protection. This is due to the time required to identify and secure off-site disposal capacity, or develop the capacity at an existing Alliant-owned facility. If landfill capacity is not owned by Alliant, additional time may be required to permit and develop the necessary disposal capacity. A prolonged construction timeframe is also likely due to the capacity of the receiving site to unload and place material. A5 also increases the time to reach GPS due to significant and prolonged source disturbance during construction.

The consolidation of CCR and capping for A7 and A8 is complete, and each of these alternatives is anticipated to achieve the GPS in 2 to 10 years following closure. The timeline to achieve will be affected by the number of wells and pumping rates and will be further refined through the design

phase. The GPS is expected to be achieved within the 30-year post-closure monitoring period. These timeframes are anticipated to be reduced as the pumping associated with A7 and the barrier wall associated with A8 are implemented.

The time until full protection is achieved for A5 and A8 is less predictable than A7 because these alternatives rely most heavily on source control and the success of ongoing interim action related to groundwater dewatering activities supporting ongoing consolidation efforts.

Potential for Exposure of Humans and Environmental Receptors

A5 eliminates on-site exposure to remaining waste because no CCR materials remain on-site. However, the overall potential for exposure to humans and environmental receptors is the highest because of the on-site excavation, transportation through the community, and re-disposal of materials at the receiving facility. Unlike A7 and A8, the risk of potential exposure also includes the surrounding community and receiving facility personnel.

The extended excavation and transportation of CCR off-site for disposal poses the greatest risk of exposure and disturbance of the threatened and endangered species communities in the area. Based on reviews completed in support of CCR unit closure planning, threatened and endangered species are not present at the BGS facility due to the long-term presence of the site and operations and the lack of suitable habitat on-site (Impact 7G, 2020). However, at-risk communities are potentially present in adjacent floodplain forests or the Mississippi River and riverbanks. Prolonged disturbance due to construction activities and the short-term risks associated with A5 described above may increase the risk to threatened and endangered species over A7 and A8.

The potential for exposure to remaining wastes is low for both A7 and A8. The ACM has presented that the current risk to humans and the environment is low. Human and environmental exposure is increased during consolidation activities; however, the risk of exposure is substantially reduced upon capping of the consolidated CCR. A7 has an increased potential for exposure in the event of a release to the surface of extracted and untreated groundwater. A8 presents the lowest risk of exposure to humans and environmental receptors.

Long-term Reliability

The long-term reliability for A5 relies on the engineering and institutional controls at the receiving facility. With respect to materials remaining on-site, the reliability of the cap for A7 and A8 is projected to be long-term because:

- There is widely available personnel and industry experience with methods and controls.
- Construction consists of common earth movement practices.
- Capping is common for closure-in-place of remediation and solid wastes.

For materials remaining on-site, A7 offers similar reliability of the engineering and institutional controls as A8. If there are any issues, A7 relies upon equipment that is readily available and serviceable by common trades. In the event the barrier as part A8 requires repair or improvement, specialty equipment and personnel are required.

Potential Need to Replace Remedy

None of the alternatives will need to be replaced. By the nature of A5, there is no replacement possible. A7 and A8 require on-going monitoring and maintenance. A7 is expected to require

replacement of components as part of system maintenance including pumps, conveyances, and treatment system media, if used. A8 requires repair of breaches or short-circuiting if identified.

3.3.2 Source Control to Reduce Future Releases [257.97(c)(2)]

Extent Containment will Reduce Further Releases

A5 eliminates the possibility of further releases on-site, and relies upon the receiving facilities' controls to prevent further releases; however, during transportation of the material to the receiving facility, there is a significant risk of release by way of a spill or accident while in transit. Also, the release of CCR as particulate material during transport is significant. A7 and A8 reduce the potential for further releases by minimizing or eliminating infiltration through CCR with reduction due to the consolidated and smaller closure footprint. A7 offers the ability to contain or restore groundwater impacts by creating an inward gradient. A8 relies upon continuity of the barrier wall without a breach to reduce further releases.

Extent Treatment Technologies May be Used

A5 does not rely upon treatment technologies. A7 relies upon conventional pump-and-treat remediation measures, and A8 relies upon availability of a suitable barrier wall with the required specialized field implementation and health and safety measures.

3.3.3 Implementation [257.97(c)(3)]

Degree of Difficulty Constructing the Technology

A5 has low complexity construction; however, it has a high degree of logistical complexity associated with permitting and developing off-site disposal capacity, and a significant degree of dewatering to accommodate removing the full CCR volume, and hauling the CCR off-site. A7 has some low to moderate construction complexity. The consolidation and capping is generally low complexity, and increases to moderate complexity when some dewatering is required to facilitate CCR consolidation. The design and installation of a pump-and-treat system also introduces some complexity, but overall the technology is not complex.

A8 has high complexity construction for the barrier wall that requires specialty installation equipment and contractor knowledge. Construction for consolidation and capping is the same as A7 with a similar degree of logistical complexity.

Expected Operation Reliability of the Technology

A5 does not rely on specialized technologies, but the overall success relies upon the off-site disposal facility. The success with A7 relies upon the successful operation of a groundwater pump-and-treat system. The technology associated with A7 is well understood and serviceable with common trades. A8 relies upon a continuous impermeable barrier. Breaches can develop and must be monitored. The reliability of A8 is complicated by the presence of underground utilities that serve the operating generating facility and multiple transmission lines traversing the barrier wall alignment that will

require rerouting of those lines or building the wall around them, complicating the construction and potentially compromising the barrier wall function.

Need to Coordinate with and Obtain Approvals and Permits from Other Agencies

Each alternative will require a State Closure Permit, and state and local construction stormwater management permits. Federal, State, and local waterway and floodplain permitting is anticipated for each alternative.

The need for coordination and approval of permits from other agencies is the highest with A5, and will require approval of the off-site disposal site owner and may require Iowa solid waste comprehensive planning approval. Based on research and discussions with nearby landfills, the capacity to dispose of the CCR from the CCR units at BGS does not currently exist and would need to be developed, which will require significant additional siting and permitting. Local road use permits are likely required as well for A5.

A7 will require State and local groundwater well permitting for extraction well installation; a State Water Use Permit for groundwater extraction depending on the design capacity; a State Wastewater Construction permit for the groundwater treatment system; an NPDES permit for the treated groundwater discharge; and may require Federal, State, and/or local permits for system construction related to erosion control, stormwater management, floodplains, and wetlands. Depending on the methods of emplacing the barrier, A8 may require additional permitting related to underground injection control (UIC).

Availability of Necessary Equipment and Specialists

The construction equipment and trained personnel to implement A5 and A7 are readily available. A8 requires highly specialized equipment and personnel. The off-site air space needed for CCR disposal as part of A5 is not readily available. There are a few suppliers with the equipment and expertise available to implement A8.

Available Capacity and Location of Needed Treatment, Storage, and Disposal Services

There is readily available capacity and on-site locations for treatment, storage, and disposal for A7 and A8, and this is not a limiting factor for these alternatives. For A5, the off-site air space needed for CCR disposal is not readily available. Disposal under A5 is also limited by the receiving facility's logistical capacity and time required to develop the necessary capacity. Both are significant limiting factors.

3.3.4 Community Acceptance [257.97(c)(4)]

No comments were received during the initial public meeting held on October 14, 2020, presenting the ACM. Additionally, no comments related to ACM Addendum No. 1 or potential groundwater corrective actions were received during the public meeting held on June 26, 2023, presenting the November 2020 addendum to the ACM. In the absence of comments, all considered alternatives are acceptable to the interested and affected parties.

In addition, the Iowa Department of Natural Resources (IDNR) has issued a Sanitary Disposal Project Closure Permit (Permit Number 29-SDP-13-23C) to accommodate the construction of the final cover, which is now complete, and the post-closure care of the consolidated and capped CCR at BGS (as required by A7 and A8), once the ash ponds are certified as closed per 40 CFR 257.102(f)(3). While A7 still requires coordination with and approvals from IDNR wastewater and potentially water use staff, IPL is confident that the required permits will not be a roadblock to the success of this

Alternative. An issued permit exhibits local regulatory acceptance, which is critical to the overall success of any selected remedy.

3.4 SELECTED REMEDY

A7 - Consolidate and Cap with Groundwater Collection has been selected based on the evaluation of factors defined in 257.97(c), presented above, and is the selected remedy. This alternative results in low long-term and short-term risks. A7 does not completely remove the CCR from the facility; however, the CCR and resulting groundwater impacts are controlled and it does not present additional exposure risks to the surrounding community. The implementation of A7 can be achieved more quickly than the other possible alternatives, and is expected to achieve the GPS more quickly as a result.

3.4.1 Remedy Description

A7 includes closing the impoundments after eliminating all wastewater discharges to the ash ponds, relocating and consolidating CCR into a smaller footprint within the existing CCR surface impoundments, covering the CCR materials with a cap, and establishing vegetation in accordance with the requirements for closure in place in 40 CFR 257.102(d). This measure is consistent with landfill cover systems to minimize, control, or eliminate infiltration of surface water into the CCR. Impacted groundwater will be collected using pumps and treated prior to discharge according to state and federal requirements.

This alternative eliminates CCR sluicing/plant process water discharges and, with the consolidation of the CCR footprint and the installation of a cap, will minimize, control, or eliminate infiltration through the CCR. This is expected to address the major contributor to the observed GPS exceedances, which is the exposure of CCR material to ash sluice water, low-volume plant wastewaters, and precipitation/surface water infiltration. The reasonable potential of exposure to human health and the environment will be reduced and may be eliminated as impacted groundwater is collected near the waste boundary to contain and restore molybdenum and lithium concentrations in groundwater to levels below the GPS. A discussion of how this alternative meets the minimum standards in 257.97(b) is provided below. Drawings showing the proposed closure of the BGS ash ponds are provided in **Appendix B**.

3.4.2 Satisfying Minimum Criteria

The selected remedy is expected to meet the minimum criteria established in 257.97(b) and described in **Section 3.2**. Each requirement is discussed below. The selected remedy was evaluated along with other potential corrective measures considering the factors in 40 CFR 257.97(c), which are discussed in **Section 3.3** and **Table 8**.

257.97(b)(1) – Be protective of human health and the environment:

As discussed in the November 2020 ACM Addendum No. 1 and **Section 2.2** above, the available data do not indicate completion of an exposure pathway for molybdenum and lithium. A7 sustains or improves the current level of protectiveness by capturing CCR-impacted groundwater and providing an inward gradient. A7 provides active groundwater recovery. As a result, the current exposure risk is low, and the level of protection provided with this alternative is enhanced with the capacity to reduce or reverse the flow of impacted groundwater toward potential receptors.

In addition, the selected remedy minimizes the handling of CCR and therefore the exposure of construction workers, the public, and other sensitive receptors (e.g., nearby communities or threatened or endangered species, if present) to CCR. It also reduces secondary impacts from the remedy implementation such as fine particulates from fugitive dust (e.g., dust generated while traveling local gravel roads), particulate in equipment exhaust, noise, and traffic.

257.97(b)(2) – Attain the GPS as specified pursuant to §257.95(h):

Capturing impacted groundwater and preventing migration past the impoundment boundary will serve to attain the GPS for lithium and molybdenum.

257.97(b)(3) – Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in Appendix IV to this part into the environment:

The source of the molybdenum and lithium release to groundwater is attributed to CCR in the ash ponds. The selected remedy reduces or eliminates, to the maximum extent feasible, infiltration through the CCR and further releases of CCR constituents into the environment by consolidating CCR from the Ash Seal Pond and Upper Ash Pond into the reduced footprint of the Main Ash Pond and Economizer Pond. The installation of a cap in accordance with 40 CFR 257.102(d)(3)(i), will reduce, control or eliminate infiltration through the CCR. This is expected to address the major contributor to the observed GPS exceedances, which is exposure of CCR material to precipitation/surface water infiltration. The groundwater collection system is intended to capture future releases, if any, for treatment at the surface.

257.97(b)(4) – Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems:

No releases of CCR have been identified from the BGS ash ponds. As described above, addressing infiltration in combination with groundwater collection is expected to reduce or eliminate molybdenum and lithium impacts to groundwater by removing CCR-impacted groundwater from the environment without disturbing sensitive ecosystems.

IPL evaluated the potential presence of threatened and endangered species at BGS in preparation for the closure of the CCR units. Due to the long history of disturbance at the facility and a lack of habitat within the existing facility, there is little risk of disturbing threatened and endangered species due to on-site closure and groundwater remedy activities of limited duration such as the selected remedy.

257.97(b)(5) – Comply with standards for management of wastes as specified in §257.98(d):

All CCR or other waste generated during the BGS ash pond closure can be managed in accordance with all applicable Resource Conservation and Recovery Act (RCRA) requirements. The selected remedy will comply with the standards for management of wastes described in 257.98(d) by monitoring the generation, transportation, treatment, storage, and disposal of wastes subject to RCRA requirements. IPL will work with project management, corporate and on-site environmental staff, consultants, contractors, and vendors to identify the materials generated during the construction, operation, and maintenance of the selected remedy. The management of wastes subject to RCRA will be documented through appropriate recordkeeping, reporting, labeling, exportation, and containerization to uphold the RCRA program's principal objectives as described by U.S. EPA (U.S. EPA, 2023):

- Protect human health and the environment from potential adverse effects of improper solid waste management.
- Conserve material and energy resources through waste recycling and recovery.
- Reduce or eliminate the generation of waste as expeditiously as possible.

4.0 SCHEDULE

An estimated schedule for the implementation of the selected groundwater corrective action is provided in **Appendix C**. The estimated schedule for the groundwater collection system builds on the estimated ash pond closure schedule provided in the latest written closure plan (SCS, 2023b).

The implementation schedule includes an evaluation of the effect of temporary groundwater pumping activities undertaken to support CCR consolidation and ash pond closure construction. These temporary groundwater dewatering activities have served in an interim capacity to reduce the spread of lithium and molybdenum-impacted groundwater in advance of selecting A7. The temporary groundwater dewatering activities, including temporary dewatering and observation well installation and operation, have been supported by permits similar to those required for full implementation of A7, including:

- IDNR General Permit No. 6, Discharge Associated with Well Construction Activities.
- IDNR General Permit No. 9, NPDES and State Operation permit, Dewatering and Residential Geothermal Systems.
- IDNR Antidegradation Authorization No. IAG9-2022-0047.

The evaluation of the effects of these interim actions is ongoing as ash pond closure construction groundwater dewatering activities were completed in 2023. Temporary groundwater dewatering activities that supported ash pond closure construction lowered groundwater levels in the uppermost aquifer in the area of the ash ponds to the extent that the shallow wells in the CCR unit monitoring system are dry. Once the ash pond closure construction dewatering activities were completed, water levels in the uppermost aquifer recovered allowing IPL to resume groundwater sampling activities at shallow monitoring wells. The post-recovery groundwater samples will be used to evaluate the updated extent of molybdenum and lithium concentrations that are above the GPS, which will be used as the basis for designing the groundwater collection system that will serve as a final remedy. The recovery of water levels in the area of the CCR units will also be monitored and used in the design of the groundwater collection system.

The schedule provided in **Appendix C** includes 1 year of groundwater collection system OM&M. The full duration and final completion of the groundwater corrective action at BGS are not represented on the enclosed Gantt chart schedule to provide clarity on short-term activities. The current estimate for the completion of the groundwater corrective action at BGS is 2 to 10 years. This estimated range will continue to be refined as the updated plume evaluation is completed and the groundwater collection system design progresses.

The schedule described above and provided in **Appendix C** is based on the following considerations, as described in 257.97(d) and discussed below.

257.97(d)(1) – Extent and nature of contamination, as determined by the characterization required under §257.95(g):

Investigations of the nature and extent of molybdenum and lithium in groundwater attributed to the BGS ash ponds are complete. Given the lack of human and ecological receptors, ongoing monitoring and the remedy schedule enclosed should be protective of human health and the environment even if local molybdenum and lithium concentrations in groundwater increase during or shortly after closure construction is completed. Groundwater monitoring will continue as the selected remedy is implemented, and, unless significant changes in the nature of the impacts are observed, the schedule described above will not be impacted.

257.97(d)(2) – Reasonable probabilities of remedial technologies in achieving compliance with the GPS's established under §257.95(h) and other objectives of the remedy:

The cessation of wastewater discharges and capping the consolidated CCR from the BGS ash ponds is expected to be a reliable method of attaining the GPS for molybdenum and lithium. Capping is a common practice and standard method for site remediation and solid waste management projects. There is significant industry experience with the design and construction of this method.

The combination of closure in place with a cap and groundwater collection and treatment will require time to evaluate and achieve the GPS. The combination of capping with groundwater collection and treatment is consistent with prior industry practice and the U.S. EPA's presumptive remedy approach for CERCLA municipal landfills where high-volume waste poses a low long-term risk and it is not practical, technically feasible, or prudent to treat or re-dispose of the waste off-site (U.S. EPA, 1993 and 1994). Both elements of the selected remedy are also listed in the Federal Remediation Technologies Roundtable (FRTR) Technology Screening Matrix as full-scale, commercially available, and proven to have attained cleanup goals at multiple sites with inorganic contaminants. As such, it is reasonable to expect the selected remedy will achieve the GPS. It is also reasonable to expect that molybdenum and lithium concentrations in groundwater may fluctuate (increase or decrease) in the near term as CCR is disturbed during remedy implementation.

257.97(d)(3) – Availability of treatment or disposal capacity for CCR managed during implementation of the remedy:

The availability of treatment or disposal capacity is not a factor for the selected remedy schedule. The capacity to manage CCR from the BGS ash ponds is available on-site within the current footprint of the ponds in accordance with the Closure Plan and 257.102(d).

257.97(d)(4) – Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy:

As discussed in the ACM, ACM Addendum No. 1, and **Section 2.0**, there is minimal risk to human health and the environment due to the molybdenum and lithium in groundwater that is attributable to the BGS ash ponds because no exposure pathways are currently completed. Based on what we know of the site today, there is little reason to expect the receptors or potential exposure pathways will change prior to the completion of the remedy. The potential risk of new or increased exposure to receptors over the period of time required to implement the selected remedy is low.

In addition, surface waters, including the Mississippi River, and a Pleistocene aquifer (Burlington, 2022 & 2023) are the source of most water supply in the area due to the low quality of shallow groundwater supplies. The potable water supply to the BGS site and surrounding area is provided by

the Rathbun Regional Water Association (RRWA), which sources water from the Burlington Municipal Waterworks (RRWA, 2022 & 2023). As discussed in **Section 2.2**, the Mississippi River is not affected by molybdenum and lithium attributable to the BGS ash ponds.

257.97(d)(5) – Resource value of the aquifer:

The aquifer in the area of molybdenum and lithium impacts (downgradient of the BGS ash ponds) is not currently used as a water supply for human or animal consumption or irrigation. The value of the aquifer in this area is unlikely to change significantly over the time required to implement the selected remedy as the facility will continue to operate as it currently does over the near term. Due to the availability of an alternative local water supply to the unconsolidated sand and gravel aquifer where the groundwater impacts exist, it is also unlikely that the resource value of the aquifer will change over the 30-year post-closure period for the CCR units. If needed, the area of impact could be protected further using institutional controls such as a deed notice or restriction.

257.97(d)(6) – Other relevant factors:

The schedule provided in **Appendix C** captures the remedy-specific components that are in development. These aspects are essential to properly size the groundwater collection system for effectiveness prior to installation. These elements include:

- Creating a preliminary numerical model using Visual MODFLOW and calibrating using water level data collected as the ash pond closure construction dewatering activities end.
- Updated characterization of CCR and water in contact with CCR.
- Pilot-scale field testing and optimize pumping protocol using the calibrated model.
- Final groundwater collection system design.

5.0 CONCLUSION

The Selection of Remedy Report was prepared to fulfill the requirements of the final report identified in 40 CFR 257.97(a) and identify the remedy selected to address the lithium and molybdenum GPS exceedances at BGS. Based on the site information currently available, A7 - Consolidate and Cap with Groundwater Collection has been selected as the remedy that meets the requirements of 40 CFR 257.97(b) based on the evaluation factors described in 257.97(c).

A schedule for the implementation and completion of the selected remedy was established under 40 CFR 257.97(d) that describes how IPL will initiate remedial activities within 90 days of this Selection of Remedy Report as required in 40 CFR 257.98(a). Remedial activities will begin with the design of a groundwater extraction system.

6.0 REFERENCES

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Tables

Table 1. Groundwater Monitoring Well Network
Burlington Generating Station / SCS Engineers Project #25220081.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-301	Downgradient	Compliance
MW-302	Downgradient	Compliance
MW-302A	Downgradient, deeper	Delineation
MW-303	Downgradient	Compliance
MW-304	Downgradient	Compliance
MW-305	Downgradient	Compliance
MW-306	Downgradient	Compliance
MW-307	Downgradient	Compliance
MW-307A	Downgradient, deeper	Delineation
MW-307B	Downgradient, deeper	Delineation
MW-308	Downgradient	Compliance
MW-309	Downgradient	Compliance
MW-310	Upgradient	Background
MW-310A	Upgradient, deeper	Supplemental Background
MW-311	Upgradient	Background
MW-312	Downgradient	Delineation
MW-313	Downgradient	Delineation
MW-313A	Downgradient, deeper	Delineation
MW-313B	Downgradient, deeper	Delineation
MW-314	Sidegradient	Supplemental Background

Created by:	NDK	Date:	9/19/2022
Last revision by:	RM	Date:	12/16/2022
Checked by:	NDK	Date:	12/19/2022

I:\25220081.00\Deliverables\2023 Selection of Remedy Report\Tables\[Table 1 - GW Monitoring Well Network.xlsx]GW Summary

Table 2. CCR Rule Groundwater Samples Summary
Burlington Generating Station
SCS Engineers Project #25220081.00

	Compliance wells		Delineation Well	Compliance wells					Delineation Wells		Compliance wells		Background Well	Supplemental Background Well	Background Well	Delineation Wells				Supplemental Background Well
Sample Dates	MW-301	MW-302	MW-302A	MW-303	MW-304	MW-305	MW-306	MW-307	MW-307A	MW-307B	MW-308	MW-309	MW-310	MW-310A	MW-311	MW-312	MW-313	MW-313A	MW-313B	MW-314
2/22/2022	--	A-S	--	--	--	--	--	--	--	A-S	--	--	--	--	--	--	--	--	A-S	NI
4/4-6/2022	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
10/20/2022	--	--	A	--	--	--	--	--	A	A	--	--	--	A	--	--	A	A	A	A
4/24-27/2023	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	--
8/1-3/2023	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S	A-S
10/3-5/2023	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Total Samples	4	5	5	4	4	4	4	4	5	6	4	4	4	5	4	4	5	5	6	4

Abbreviations:
A = Assessment Monitoring Program
A-S = Supplemental Sampling Event for Assessment Monitoring Program
-- = Not Sampled
NI = Not Installed

Created by: NDK Date: 9/19/2022
Last revision by: NLB Date: 12/26/2023
Checked by: RM Date: 12/26/2023

Table 3. Groundwater Elevation Summary
Burlington Generating Station / SCS Engineers Project #25220081.00

Well Number	MW-301	MW-302	MW-302A	MW-303	MW-304	MW-305	MW-306	MW-307	MW-307A	MW-307B	MW-308	MW-309	MW-310	MW-310A	MW-311	MW-312	MW-313	MW-313A	MW-313B	MW-314
Top of Casing Elevation (feet amsl)	538.38	535.69	535.89	533.60	534.42	533.28	539.42	539.96	539.32	539.65	540.26	536.42	531.99	532.53	532.32	536.43	535.82	536.03	536.14	526.58
Screen Length (ft)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Total Depth (ft from top of casing)	31.90	29.95	62.55	28.59	25.27	29.43	36.91	31.64	65.03	83.00	33.37	27.31	18.76	48.8	22.63	27.70	32.97	63.38	72.0	25.47
Top of Well Screen Elevation (ft)	511.48	510.74	478.34	510.01	514.15	508.85	507.51	513.32	476.19	458.65	511.89	514.11	518.23	488.73	514.69	513.80	507.85	477.65	469.14	506.11
Measurement Date																				
April 20, 2016	522.63	521.91	NI	521.76	521.78	521.96	521.74	522.38	NI	NI	521.93	522.09	525.43	NI	523.72	NM	NM	NI	NI	NI
June 6 & 7, 2016	521.07	521.21	NI	521.26	521.28	521.48	521.43	521.75	NI	NI	521.43	521.39	524.13	NI	521.80	NM	NM	NI	NI	NI
August 16 & 17, 2016	521.81	521.35	NI	521.31	521.37	521.46	521.53	521.91	NI	NI	521.56	521.70	524.84	NI	522.92	NM	NM	NI	NI	NI
October 3, 2016	527.48	527.54	NI	527.57	527.57	527.71	527.67	527.81	NI	NI	527.62	527.57	527.58	NI	527.34	NM	NM	NI	NI	NI
January 9 & 10, 2017	525.38	525.50	NI	525.56	525.62	525.74	525.67	525.81	NI	NI	525.65	525.57	525.78	NI	525.16	NM	NM	NI	NI	NI
April 3 & 4, 2017	523.08	522.84	NI	522.81	522.87	523.03	523.07	523.14	NI	NI	523.07	523.10	525.52	NI	524.01	NM	NM	NI	NI	NI
June 12 & 13, 2017	523.21	522.84	NI	522.80	522.90	522.78	522.87	523.17	NI	NI	522.90	522.91	524.94	NI	523.55	NM	NM	NI	NI	NI
August 15 & 16, 2017	519.96	519.39	NI	519.30	519.23	519.93	519.82	520.16	NI	NI	519.80	519.93	523.89	NI	521.12	NM	NM	NI	NI	NI
October 16, 2017	522.13	522.20	NI	522.23	522.32	522.48	522.72	522.55	NI	NI	522.46	522.67	525.49	NI	523.44	NM	NM	NI	NI	NI
May 8 & 9, 2018	525.51	525.81	NI	525.80	525.85	526.06	526.00	526.06	NI	NI	525.62	525.54	525.79	NI	525.08	NM	NM	NI	NI	NI
August 13 & 14, 2018	520.19	519.87	NI	519.78	519.81	520.29	520.14	520.46	NI	NI	520.22	520.22	523.69	NI	521.06	NM	NM	NI	NI	NI
October 9 &10, 2018	528.01	528.08	NI	528.78	528.82	528.97	528.95	529.08	NI	NI	528.98	528.93	529.00	NI	528.49	NM	NM	NI	NI	NI
March 11, 2019	523.38	522.83	NI	522.74	522.80	NM	523.21	523.49	NI	NI	523.13	NM	NM	NI	NM	NM	NM	NI	NI	NI
April 3, 2019	528.15	528.21	NI	528.22	528.27	528.36	528.40	528.63	NI	NI	528.39	528.40	528.62	NI	528.20	NM	NM	NI	NI	NI
June 6, 2019	530.70	531.02	NI	531.00	531.04	TOC	531.19	531.38	NI	NI	531.15	531.08	531.48	NI	531.07	531.08	531.05	NI	NI	NI
October 10 & 11, 2019	526.80	526.88	NI	526.87	526.97	527.03	527.22	527.45	NI	NI	527.08	527.02	526.25	NI	526.68	526.97	526.97	NI	NI	NI
June 2-4, 2020	523.94	523.98	NI	523.97	524.02	524.12	524.45	524.62	NI	NI	524.10	524.06	525.36	NI	524.05	524.05	524.02	NI	NI	NI
September 9, 2020	519.90	519.79	519.71	519.73	519.83	520.00	520.14	520.41	519.97	NI	520.11	520.13	524.13	509.16	520.87	519.85	519.83	519.76	NI	NI
October 14-16 & 19, 2020	519.26	518.94	518.79	518.78	518.69	519.00	519.05	519.33	519.00	NI	519.02	519.28	523.81	489.84	520.59	518.68	518.70	518.61	NI	NI
March 1-3, 2021	521.10	520.21	520.14	520.09	520.15	520.48	520.65	521.01	520.52	NI	520.70	520.75	--	487.06	522.89	520.12	520.18	520.02	NI	NI
April 19 - 20, 2021	522.87	522.27	522.25	522.13	522.24	522.31	522.52	522.89	522.39	NI	522.57	522.72	525.46	521.12	523.89	522.20	522.23	522.11	NI	NI
July 1, 2021	NM	NM	NM	NM	NM	NM	NM	NM	NM	520.12	NM	NM	NM	NM	NM	NM	NM	NM	519.51	NI
September 21-22, 2021	NM	NM	NM	NM	518.29	NM	NM	NM	NM	NM	NM	NM	524.42	NM	NM	NM	NM	NM	NM	NI
October 11-14, 2021	519.40	518.75	518.64	518.58	518.68	519.18	519.15	519.55	519.09	519.13	519.25	519.43	524.69	521.83	522.00	518.78	518.72	518.62	518.72	NI
February 22, 2022	NM	519.03	NM	NM	NM	NM	NM	519.74	519.32	519.37	NM	NM	NM	NM	NM	NM	518.91	518.81	518.88	NI
April 4-6, 2022	522.99	522.34	522.28	522.20	522.41	522.60	522.63	522.91	522.47	522.37	522.61	522.74	525.44	522.58	523.78	522.51	522.48	522.38	522.45	522.27
October 17, 2022	DRY	DRY	506.87	DRY	DRY	DRY	DRY	DRY	508.27	508.35	DRY	DRY	DRY	512.84	DRY	DRY	512.08	511.86	511.91	517.58
October 20, 2022	DRY	DRY	506.87	DRY	DRY	DRY	DRY	DRY	508.27	508.35	DRY	DRY	DRY	512.84	DRY	DRY	512.08	511.86	511.91	517.58
April 24-27, 2023	524.21	525.56	525.51	525.42	525.20	517.35	522.20	519.61	520.77	520.77	521.08	523.02	518.44	509.69	522.07	524.68	524.37	524.29	524.39	NM
July 31, 2023	518.30	518.26	518.20	518.15	518.20	518.16	518.16	518.37	519.70	518.25	518.38	518.34	520.39	517.83	518.63	518.13	518.19	518.08	518.14	518.31
August 1-3, 2023	518.33	518.19	518.09	517.91	518.19	518.03	518.07	518.04	519.42	518.20	518.22	518.22	520.29	490.83	518.28	517.93	518.09	518.00	518.01	518.28
October 2-5, 2023	518.33	518.19	518.12	518.06	518.08	518.00	518.13	518.30	519.61	518.14	520.25	518.42	520.39	517.75	518.68	518.03	518.18	518.05	518.12	518.02
Bottom of Well Elevation (ft)	506.48	505.74	473.34	505.01	509.15	503.85	500.01	505.32	471.19	453.65	503.83	509.11	513.23	483.73	509.69	508.73	502.85	472.65	464.14	501.11

Notes:
NM = not measured
TOC = top of casing
NI = not installed

Created by: MDB Date: 6/15/2016
Last revision by: RM Date: 10/20/2023
Checked by: NLB Date: 10/20/2023

I:\25220081.00\Deliverables\2023 Selection of Remedy Report\Tables\[Table 3 - GW Elevation Summary - BGS (through Oct 2023).xls]levels

Table 4. Groundwater Analytical Results Summary - Assessment Monitoring - 2022-2023
Burlington Generating Station, Burlington, IA / SCS Engineers Project #25220081.00

				Background Wells			Supplemental Background Well			Background Well			Supplemental Background Well			Compliance Wells						
Parameter Name	**UPL Method**	**UPL**	**GPS**	**MW-310**			**MW-310A**			**MW-311**			**MW-314**			**MW-301**			**MW-302**			
				4/4/2022	10/20/2022	4/27/2023	4/6/2022	10/20/2022	4/27/2023	4/4/2022	10/20/2022	4/27/2023	4/6/2022	10/20/2022	4/27/2023	4/6/2022	10/20/2022	4/26/2023	2/22/2022	4/5/2022	10/20/2022	4/26/2023
Groundwater Elevation, ft amsl				525.44	DRY	518.44	522.58	512.84	509.69	523.78	DRY	522.07	522.27	517.58	Flooded[5]	522.99	DRY	524.21	519.03	522.34	DRY	525.56
Appendix III																						
Boron, ug/L	NP	3,500		230	--	150	910	670	870	1,600	--	1200	360	160	--	11,000	--	5100	--	11,000	--	5600
Calcium, mg/L	P	220		80	--	120	52	39.0	48	160	--	160	150	140	--	260	--	200	--	190	--	370
Chloride, mg/L	P	193		10	--	9.7	11	9.60	9.4	85	--	23	13	14	--	19	--	26	--	12	--	21
Fluoride, mg/L	P	0.650		<0.22	--	0.39 J	<0.22	<0.22	0.57 J	<0.22	--	0.45 J	<0.22	<0.22	--	<0.22	--	<1.5	--	<0.22	--	<1.5
Field pH, Std. Units	P	7.55		7.38	--	7.13	7.29	7.54	7.05	7.22	--	6.83	6.79	7.11	--	6.96	--	6.83	8.16	8.05	--	6.11
Sulfate, mg/L	P	288		74	--	340	89	82.0	100	170	--	290	130	85.0	--	550	--	910	--	310	--	1300
Total Dissolved Solids, mg/L	P	1,160		320 H	--	580	540 H	530	530	750 H	--	750	630 H	560	--	1,300 H	--	1900	--	770 H	--	1900
Appendix IV		**UPL**	**GPS**																			
Antimony, ug/L	P*	1.9	6	<0.69	--	<1.0	<0.69	<0.69	<1.0	<0.69	--	<1.0	<0.69	<0.69	--	<0.69	--	<4.0	--	<0.69	--	<1.0
Arsenic, ug/L**	P	79.8	79.8	52	--	32	1.2 J	1.00 J	1.2 J	19	--	4.7	4.1	2.10	--	80	--	2.1 J	94	86	--	3.1
Barium, ug/L	P	829	2,000	270	--	330	61	46.0	55	220	--	220	330	290	--	190	--	67	--	320	--	38
Beryllium, ug/L	NP*	0.270	4	<0.27	--	<0.33	<0.27	<0.27	<0.33	<0.27	--	<0.33	<0.27	<0.27	--	<0.27	--	<1.3	--	<0.27	--	1.1
Cadmium, ug/L	NP*	0.0770	5	<0.055	--	<0.10	<0.055	<0.055	<0.10	<0.055	--	<0.10	<0.055	<0.055	--	0.19	--	0.54 J	--	0.055 J	--	0.89
Chromium, ug/L	P*	1.33	100	<1.1	--	<1.1	<1.1	<1.10	<1.1	<1.1	--	<1.1	<1.1	<1.10	--	<1.1	--	<4.4	--	<1.1	--	<1.1
Cobalt, ug/L	P	2.70	6	1.2	--	3.1	2.6	0.63	0.34 J	0.30 J	--	3.8	0.48 J	0.27 J	--	0.70	--	4.8	--	0.21 J	--	78
Fluoride, mg/L	P	0.650	4	<0.22	--	0.39 J	<0.22	<0.22	0.57 J	<0.22	--	0.45 J	<0.22	<0.22	--	<0.22	--	<1.5	--	<0.22	--	<1.5
Lead, ug/L	NP*	1.10	15	<0.24	--	<0.24	0.29 J	0.52	<0.24	<0.24	--	<0.24	<0.24	<0.24	--	<0.24	--	<0.96	--	<0.24	--	0.37 J
Lithium, ug/L	NP*	9.80	40	<2.5	--	<2.5	38	29.0	33	<2.5	--	<2.5	3.9 J	3.10 J	--	12	--	<10	--	78	--	66
Mercury, ug/L	DQ	DQ	2	<0.11	--	<0.14	<0.11	<0.11	<0.14	<0.11	--	<0.14	<0.11	<0.11	--	<0.11	--	<0.14	--	<0.11	--	<0.14
Molybdenum, ug/L	NP	25.2	100	5.2	--	1.9 J	14	11.0	11	8.9	--	3.4	1.2 J	<1.20	--	55	--	29	--	89	--	26
Selenium, ug/L	P*	1.00	50	<0.96	--	<1.4	<0.96	<0.96	<1.4	<0.96	--	<1.4	<0.96	<0.96	--	<0.96	--	<5.6	--	<0.96	--	<5.6
Thallium, ug/L	NP*	0.500	2	<0.26	--	<0.26	<0.26	<0.26	<0.26	<0.26	--	<.26	<0.26	<0.26	--	<0.26	--	<1.0 F1	--	1.8	--	<1.0
Radium 226/228 Combined, pCi/L	P	3.28	5	0.838	--	0.696	0.842	2.04	0.818	0.593	--	1.26	1.3	1.14	--	1.69	--	0.0545	--	0.687	--	0.438
Additional Parameters for Selection of Remedy																						
Lithium, dissolved, ug/L	UPL or GPS not applicable			<2.5	--	--	38	34.0	--	<2.5	--	--	4.8 J	3.60 J	--	13	--	--	--	80	--	--
Iron, dissolved, ug/L				15,000	--	--	88 J	<36.0	--	17,000	--	--	12,000	12,000	--	40,000	--	--	--	1,300	--	--
Iron, ug/L				16,000	--	--	85 J	290	--	17,000	--	--	13,000	11,000	--	43,000	--	340 J	--	1,200	--	3700
Magnesium, ug/L				18,000	--	--	21,000	16,000	--	31,000	--	--	47,000	40,000	--	78,000	--	--	--	14,000	--	--
Manganese, dissolved, ug/L				3,700	--	--	150	22.0	--	5,700	--	--	7700	5,000	--	22,000	--	--	--	1,000	--	--
Manganese, ug/L				3,800	--	--	280	41.0	--	6,000	--	--	7800	5,500	--	19,000	--	--	--	930	--	--
Molybdenum, dissolved, ug/L				5.6	--	--	17	14.0	--	8.6	--	--	1.6 J	1.40 J	--	53	--	--	--	89	--	--
Potassium, ug/L				1,700	--	--	5,000	4,200	--	2,000	--	--	550	440 J	--	3,700	--	--	--	14,000	--	--
Sodium, ug/L				8,400	--	--	140,000	120,000	--	57,000	--	--	11,000	11,000	--	130,000	--	--	--	33,000	--	--
Bicarbonate Alkalinity, mg/L				240	--	--	450	420	--	410	--	--	460	450	--	740	--	--	--	310	--	--
Carbonate Alkalinity, mg/L				<4.6	--	--	<4.6	<4.60	--	<4.6	--	--	<4.6	<4.6	--	<4.6	--	--	--	<4.6	--	--
Total Alkalinity, mg/L				240	--	--	450	420	--	410	--	--	460	450	--	740	--	--	--	310	--	--

4.4
30.8
17

Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
Yellow highlighted cell indicates the compliance well result exceeds the GPS.
Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of Monitored Natural Attenuation.

Table 4. Groundwater Analytical Results Summary - Assessment Monitoring - 2022-2023
Burlington Generating Station, Burlington, IA / SCS Engineers Project #25220081.00

				Delineation Well			Compliance Wells														
Parameter Name	**UPL Method**	**UPL**	**GPS**	**MW-302A**			**MW-303**			**MW-304**			**MW-305**			**MW-306**			**MW-307**		
				4/5/2022	10/20/2022	4/26/2023	4/5/2022	10/20/2022	4/26/2023	4/5/2022	10/20/2022	4/26/2023	4/6/2022	10/20/2022	4/26/2023	4/5/2022	10/20/2022	4/27/2023	4/5/2022	10/20/2022	4/24/2023
Groundwater Elevation, ft amsl				522.28	506.87	525.51	522.20	DRY	525.42	522.41	DRY	525.20	522.60	DRY	517.35	522.63	DRY	522.20	522.91	DRY	519.61
Appendix III																					
Boron, ug/L	NP	3,500		15,000	1,600	--	22,000	--	3,200	12,000	--	1,400	2,400	--	1,100	3,300	--	4,100	3,300	--	4,800
Calcium, mg/L	P	220		160	160	--	140	--	85	130	--	100	110	--	97	45	--	70	46	--	53
Chloride, mg/L	P	193		21	13.0	--	16	--	25	27	--	26	31	--	27	19	--	31	20	--	28
Fluoride, mg/L	P	0.650		<0.22	<0.22	--	<0.22	--	<0.38	<0.22	--	<0.38	<0.22	--	<0.38	<0.22	--	<0.38	<0.22	--	<0.38
Field pH, Std. Units	P	7.55		7.25	7.09	7.52	7.36	--	6.92	8.08	--	7.03	7.25	--	5.18	5.95	--	8.77	9.88	--	8.35
Sulfate, mg/L	P	288		450	170	--	310	--	180	240	--	220	19	--	450	120	--	50	190	--	100
Total Dissolved Solids, mg/L	P	1,160		910 H	630	--	650 H	--	430	640 H	--	470	490 H	--	640	310 H	--	310	360 H	--	390
Appendix IV		**UPL**	**GPS**																		
Antimony, ug/L	P*	1.9	6	<0.69	<0.69	--	<0.69	--	<1.0	<0.69	--	<1.0	<0.69	--	<1.0	<0.69	--	<1.0	<0.69	--	<1.0
Arsenic, ug/L**	P	79.8	79.8	3.0	2.3	--	5.7	--	4	44	--	1.4 J	0.92 J	--	<0.53	48	--	36	41	--	8.8
Barium, ug/L	P	829	2,000	310	420	--	270	--	65	140	--	57	210	--	38	19	--	61	41	--	76
Beryllium, ug/L	NP*	0.270	4	<0.27	<0.27	--	<0.27	--	<0.33	<0.27	--	<0.33	<0.27	--	<0.33	<0.27	--	<0.33	<0.27	--	<0.33
Cadmium, ug/L	NP*	0.0770	5	0.087 J	<0.055	--	0.097 J	--	<0.10	<0.055	--	<0.10	<0.055	--	0.45	<0.055	--	<0.10	<0.055	--	0.12 J
Chromium, ug/L	P*	1.33	100	<1.1	<1.1	--	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	--	<1.1	<1.1	--	<1.1
Cobalt, ug/L	P	2.70	6	0.20 J	<0.19	--	0.35 J	--	1.3	<0.19	--	1.3	0.22 J	--	290	<0.19	--	0.42 J	<0.19	--	0.31 J
Fluoride, mg/L	P	0.650	4	<0.22	<0.22	--	<0.22	--	<0.38	<0.22	--	<0.38	<0.22	--	<0.38	<0.22	--	<0.38	<0.22	--	<0.38
Lead, ug/L	NP*	1.10	15	<0.24	<0.24	--	<0.24	--	<0.24	<0.24	--	<0.24	<0.24	--	<0.24	<0.24	--	<0.24	<0.24	--	<0.24
Lithium, ug/L	NP*	9.80	40	22	13.0	<2.5	80	--	23	74	--	63	36	--	37	42	--	34	50	--	72
Mercury, ug/L	DQ	DQ	2	<0.11	<0.11	--	<0.11	--	<0.14	<0.11	--	<0.14	<0.11	--	<0.14	<0.11	--	<0.14	<0.11	--	<0.14
Molybdenum, ug/L	NP	25.2	100	120	36	3.4	190	--	94	85	--	190	<1.2	--	1.5 J	74	--	12	100	--	320
Selenium, ug/L	P*	1.00	50	<0.96	<0.96	--	<0.96	--	<1.4	<0.96	--	<1.4	<0.96	--	<1.4	<0.96	--	<1.4	<0.96	--	<1.4
Thallium, ug/L	NP*	0.500	2	<0.26	<0.26	--	<0.26	--	<0.26	<0.26	--	<0.26	<0.26	--	<0.26	<0.26	--	<0.26	<0.26	--	<0.26
Radium 226/228 Combined, pCi/L	P	3.28	5	2.14	2.65	--	1.52	--	0.530	0.469	--	0.689	0.768	--	0.449	0.489	--	0.735	0.134	--	0.258
Additional Parameters for Selection of Remedy																					
Lithium, dissolved, ug/L	UPL or GPS not applicable			21	14.0	--	77	--	--	72	--	--	34	--	--	37	--	--	47.0	--	--
Iron, dissolved, ug/L				8,400	11,000	--	4,400	--	--	830	--	--	1,500	--	--	<36	--	--	<36	--	--
Iron, ug/L				8,800	11,000	2800	4,600	--	750	990	--	11000	1,700	--	2500	<36	--	<36	<36	--	<36
Magnesium, ug/L				34,000	33,000	--	16,000	--	--	6,400	--	--	21,000	--	--	<150	--	--	<150	--	--
Manganese, dissolved, ug/L				3,800	3,700	--	3,400	--	--	880	--	--	2,300	--	--	5.7 J	--	--	6.8 J	--	--
Manganese, ug/L				4,000	4,300	--	3,500	--	--	920	--	--	2,400	--	--	6.0 J	--	--	7.5 J	--	--
Molybdenum, dissolved, ug/L				120	36.0	--	180	--	--	83	--	--	1.5 J	--	--	81	--	--	140	--	--
Potassium, ug/L				4,400	6,900	--	22,000	--	--	13,000	--	--	6,000	--	--	22,000	--	--	38,000	--	--
Sodium, ug/L				70,000	14,000	--	29,000	--	--	51,000	--	--	49,000	--	--	46,000	--	--	56,000	--	--
Bicarbonate Alkalinity, mg/L				250	430	--	210	--	--	250	--	--	470	--	--	100	--	--	21	--	--
Carbonate Alkalinity, mg/L				<4.6	<4.6	--	<4.6	--	--	<4.6	--	--	<4.6	--	--	<4.6	--	--	82	--	--
Total Alkalinity, mg/L				250	430	--	210	--	--	250	--	--	470	--	--	100	--	--	100	--	--

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17	Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of Monitored Natural Attenuation.

Table 4. Groundwater Analytical Results Summary - Assessment Monitoring - 2022-2023
Burlington Generating Station, Burlington, IA / SCS Engineers Project #25220081.00

				Delineation Wells							Compliance Wells					
Parameter Name	**UPL Method**	**UPL**	**GPS**	**MW-307A**			**MW-307B**				**MW-308**			**MW-309**		
				4/5/2022	10/20/2022	4/24/2023	2/22/2022	4/5/2022	10/20/2022	4/24/2023	4/4/2022	10/20/2022	4/24/2023	4/4/2022	10/20/2022	4/27/2023
Groundwater Elevation, ft amsl				522.47	508.27	520.77	519.37	522.37	508.35	520.77	522.61	DRY	521.08	522.74	DRY	523.02
Appendix III																
Boron, ug/L	NP	3,500		4,000	4,100	--	4,000	6,700	1,400	--	4,400	--	5,700	3,900	--	12,000
Calcium, mg/L	P	220		11	27.0	--	71.0	84	59.0	--	42	--	61	59	--	82
Chloride, mg/L	P	193		37	47.0	--	25.0	35	11.0	--	37	--	26	53	--	39
Fluoride, mg/L	P	0.650		<0.22	<0.22	--	<0.22	<0.22	<0.22	--	<0.22	--	<0.38	<0.22	--	0.43 J
Field pH, Std. Units	P	7.55		7.78	7.69	7.63	7.43	7.36	7.10	7.49	9.58	--	7.49	7.18	--	6.93
Sulfate, mg/L	P	288		120	190	--	120	180	68.0	--	190	--	240	99	--	210
Total Dissolved Solids, mg/L	P	1,160		360 H	470	--	310	410	260	--	470 H	--	650	450 H	--	550
Appendix IV		**UPL**	**GPS**													
Antimony, ug/L	P*	1.9	6	<0.69	<0.69	--	<2.8	<0.69	<0.69	--	<0.69	--	<1.0	<0.69	--	<1.0
Arsenic, ug/L**	P	79.8	79.8	<0.75	<0.75	--	<0.75	<0.75	1.40 J	--	62	--	1.9 J	21	--	21
Barium, ug/L	P	829	2,000	46	110	--	350	450	310	--	85	--	87	260	--	220
Beryllium, ug/L	NP*	0.270	4	<0.27	<0.27	--	<0.27	<0.27	<0.27	--	<0.27	--	<0.33	<0.27	--	<0.33
Cadmium, ug/L	NP*	0.0770	5	0.084 J	<0.055	--	<0.055	<0.055	0.055 J	--	<0.055	--	0.15 J	<0.055	--	<0.10
Chromium, ug/L	P*	1.33	100	<1.1	<1.1	--	<1.1	<1.1	<1.1	--	<1.1	--	<1.1	<1.1	--	<1.1
Cobalt, ug/L	P	2.70	6	<0.19	<0.19	--	<0.19	<0.19	<0.19	--	<0.19	--	0.18 J	0.42 J	--	1.3
Fluoride, mg/L	P	0.650	4	<0.22	<0.22	--	<0.22	<0.22	<0.22	--	<0.22	--	<0.38	<0.22	--	0.43 J
Lead, ug/L	NP*	1.10	15	1.2	<0.24	--	<0.24	<0.24	<0.24	--	<0.24	--	<0.24	<0.24	--	0.41 J
Lithium, ug/L	NP*	9.80	40	8.5 J	12.0	7 J	9.4 J	11	6.10 J	6.8 J	57	--	73	2.9 J	--	4.9 J
Mercury, ug/L	DQ	DQ	2	<0.11	<0.11	--	<0.11	<0.11	<0.11	--	<0.11	--	<0.14	<0.11	--	<0.14
Molybdenum, ug/L	NP	25.2	100	120	120	4.3	37.0	59	32.0	7.5	100	--	480	62	--	69
Selenium, ug/L	P*	1.00	50	<0.96	<0.96	--	<0.96	<0.96	<0.96	--	<0.96	--	<1.4	<0.96	--	<1.4
Thallium, ug/L	NP*	0.500	2	<0.26	<0.26	--	<0.26	<0.26	<0.26	--	<0.26	--	<0.26	<0.26	--	<0.26
Radium 226/228 Combined, pCi/L	P	3.28	5	0.326	1.151	--	0.710	1.50	1.426	--	0.321	--	1.14	0.847	--	1.13
Additional Parameters for Selection of Remedy																
Lithium, dissolved, ug/L	UPL or GPS not applicable			7.7 J	11.0	--	7.9 J	10.0	6.70 J	--	54	--	--	2.7 J	--	--
Iron, dissolved, ug/L				440	1000	--	1,700	2100	1500	--	<36	--	--	9,100	--	--
Iron, ug/L				530	1200	1100	1,900	2300	3000	1400	<36	--	54 J	11,000	--	22000
Magnesium, ug/L				1,600	4,300	--	15,000	15,000	14,000	--	1,300	--	--	18,000	--	--
Manganese, dissolved, ug/L				400	870	--	470	770	370	--	120	--	--	2,800	--	--
Manganese, ug/L				420	940	--	500	810	360	--	130	--	--	3,000	--	--
Molybdenum, dissolved, ug/L				120	120	--	37.0	58	35.0	--	110	--	--	59	--	--
Potassium, ug/L				3,100	4,200	--	2,200	3,200	1,600	--	39,000	--	--	2,100	--	--
Sodium, ug/L				110,000	130,000	--	23,000	35,000	19,000	--	87,000	--	--	81,000	--	--
Bicarbonate Alkalinity, mg/L				150	170	--	160	130	190	--	21	--	--	240	--	--
Carbonate Alkalinity, mg/L				<4.6	<4.6	--	<4.6	<4.6	<4.6	--	82	--	--	<4.6	--	--
Total Alkalinity, mg/L				150	170	--	160	130	190	--	100	--	--	240	--	--

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17	Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of Monitored Natural Attenuation.

Table 4. Groundwater Analytical Results Summary - Assessment Monitoring - 2022-2023
Burlington Generating Station, Burlington, IA / SCS Engineers Project #25220081.00

Parameter Name	UPL Method	UPL	GPS	Delineation Wells												
				MW-312			MW-313			MW-313A			MW-313B			
				4/6/2022	10/20/2022	4/26/2023	4/6/2022	10/20/2022	4/25/2023	4/6/2022	10/20/2022	4/25/2023	2/22/2022	4/6/2022	10/20/2022	4/25/2023
Groundwater Elevation, ft amsl				522.51	DRY	524.68	522.48	512.08	524.37	522.38	511.86	524.29	518.88	522.45	511.91	524.39
Appendix III																
Boron, ug/L	NP	3,500		6,900	--	--	5,700	1,400	--	4,400	2,700	--	5,500	5,800	4,400	--
Calcium, mg/L	P	220		69	--	--	57	37.0	--	28	18.0	--	51.0	55	50.0	--
Chloride, mg/L	P	193		25	--	--	200	26.0	--	69	57.0	--	56.0	52	85.0	--
Fluoride, mg/L	P	0.650		<0.22	--	--	<0.22	<0.22	--	0.24	<0.22	--	<0.22	<0.22	<0.22	--
Field pH, Std. Units	P	7.55		7.35	--	6.86	7.14	7.65	7.20	7.62	7.72	7.59	7.64	7.50	7.51	7.41
Sulfate, mg/L	P	288		230	--	--	200	23.0	--	110	52.0	--	120	120	150	--
Total Dissolved Solids, mg/L	P	1,160		490 H	--	--	620 H	320	--	430	310	--	360	390 H	490	--
Appendix IV		**UPL**	**GPS**													
Antimony, ug/L	P*	1.9	6	<0.69	--	--	<0.69	<0.69	--	<0.69	<0.69	--	<0.69	<0.69	<0.69	--
Arsenic, ug/L**	P	79.8	79.8	12	--	--	4.3	10.0	--	<0.75	<0.75	--	<0.75	<0.75	<0.75	--
Barium, ug/L	P	829	2,000	130	--	--	290	810	--	170	110	--	190	210	260	--
Beryllium, ug/L	NP*	0.270	4	<0.27	--	--	<0.27	<0.27	--	<0.27	<0.27	--	<0.27	<0.27	<0.27	--
Cadmium, ug/L	NP*	0.0770	5	0.090 J	--	--	0.086 J	<0.055	--	<0.055	<0.055	--	<0.055	<0.055	<0.055	--
Chromium, ug/L	P*	1.33	100	<1.1	--	--	<1.1	<1.10	--	<1.1	<1.10	--	<1.1	<1.1	<1.10	--
Cobalt, ug/L	P	2.70	6	0.28 J	--	--	0.33 J	<0.19	--	<0.19	<0.19	--	<0.19	<0.19	<0.19	--
Fluoride, mg/L	P	0.650	4	<0.22	--	--	<0.22	<0.22	--	0.24	<0.22	--	<0.22	<0.22	<0.22	--
Lead, ug/L	NP*	1.10	15	<0.24	--	--	<0.24	<0.24	--	<0.24	<0.24	--	<0.24	<0.24	0.30 J	--
Lithium, ug/L	NP*	9.80	40	28	--	11	18	32.0	9.9 J	12	7.00 J	<2.5	13.0	13	14.0	4.9 J
Mercury, ug/L	DQ	DQ	2	<0.11	--	--	<0.11	<0.11	--	<0.11	<0.11	--	<0.11	<0.11	<0.11	--
Molybdenum, ug/L	NP	25.2	100	210	--	28	190	39.0	18	100	64.0	2.8	89.0	100	110.0	14
Selenium, ug/L	P*	1.00	50	<0.96	--	--	<0.96	<0.96	--	<0.96	<0.96	--	<0.96	<0.96	<0.96	--
Thallium, ug/L	NP*	0.500	2	<0.26	--	--	<0.26	<0.26	--	<0.26	<0.26	--	<0.26	<0.26	<0.26	--
Radium 226/228 Combined, pCi/L	P	3.28	5	0.443	--	--	1.36	1.11	--	0.828	0.586	--	0.912	1.01	1.45	--
Additional Parameters for Selection of Remedy																
Lithium, dissolved, ug/L	UPL or GPS not applicable			28	--	--	19	32.0	--	11	7.30 J	--	12.0	13	14.0	--
Iron, dissolved, ug/L				5,200	--	--	7,400	3,600	--	850	610	--	1,000	1,000	750	--
Iron, ug/L				5,700	--	3900	7,900	16,000	6600	2,000	910	2000	1,100	1,100	1,300	3400
Magnesium, ug/L				7,700	--	--	12,000	6,000	10000	2,100	1,400	--	7,200	7,800	4,800	--
Manganese, dissolved, ug/L				7,800	--	--	4,200	2,000	--	350	250	--	460	480	350	--
Manganese, ug/L				8,000	--	--	4,300	2,700	3200	370	290	--	430	510	410	--
Molybdenum, dissolved, ug/L				210	--	--	180	47.0	--	97	63.0	--	91.0	97	100	--
Potassium, ug/L				13,000	--	--	6,200	15,000	--	7,100	7,200	--	5,500	5,800	9,100	--
Sodium, ug/L				67,000	--	--	140,000	47,000	--	120,000	96,000	--	69,000	67,000	100,000	--
Bicarbonate Alkalinity, mg/L				150	--	--	110	170	160	120	170	--	140	140.0	160	--
Carbonate Alkalinity, mg/L				<4.6	--	--	<4.6	<4.60	<2.5	<4.6	<4.60	--	<4.6	<4.6	<4.60	--
Total Alkalinity, mg/L				150	--	--	110	170	160	120	170	--	140	140	160	--

4.4 Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8 Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17 Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of Monitored Natural Attenuation.

Table 4. Groundwater Analytical Results Summary - Assessment Monitoring - 2022-2023
Burlington Generating Station, Burlington, IA / SCS Engineers Project #25220081.00

Abbreviations:

UPL = Upper Prediction Limit
NA = Not Analyzed
mg/L = milligrams per liter
GPS = Groundwater Protection Standard
DQ = Double Quantification Rule (not detected in background)
NP = Nonparametric UPL (highest background value) with 1-of2- retesting
LOD = Limit of Detection
LOQ = Limit of Quantification
P = Parametric UPL with 1-of-2 retesting

J = Estimated concentration at or above the LOD and below the LOQ.
H = Sample was prepped or analyzed beyond the specified holding time

* = UPL is below the LOQ for background sampling. For compliance wells, only results confirmed above the LOQ are evaluated as potential SSIs above background.
** = UPL for arsenic is greater than the MCL and will be used as the GPS.
FL - Well was inaccessible due to flooding.

Notes:

1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or statistically significant level above the GPS. See the accompanying letter text for identification of statistically significant results.
2. GPS is the United States Environmental Protection Agency (U.S. EPA) Maximum Contamination Level (MCL), if established, or the value from 40 CFR 257.95(h)(2), or the background UPL if it is higher.
3. Interwell UPLs calculated based on results from background wells MW-310 and MW-311.
4. The following wells were not sampled in October 2022. These wells were dry due to ongoing dewatering related to pond closure activities: MW-301, MW-302, MW-303, MW-304, MW-305, MW-306, MW-307, MW-308, MW-309, MW-310, MW-311, and MW-312.
5. MW-314 was inaccessible in April 2023 due to flooding.

Created by: NDK Date: 9/19/2022
Last revision by: RM Date: 10/2/2023
Checked by: NLB Date: 10/16/2023
Scientist or Proj Mgr QA/QC: TK Date: 10/16/2023

Table 5. Field Monitoring Data
Burlington Generating Station
October 2017 - April 2023

Well	Sample Date	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Groundwater Elevation (feet)
MW-301	10/16/2017	13.8	7.58	0.12	1065	38	1.26	522.13
	5/9/2018	12.9	7.40	0.08	601	-167	4.23	525.51
	8/13/2018	16.8	7.91	0.35	1400	-145	5.78	520.19
	10/9/2018	17.2	7.34	0.24	892	-64	8.43	528.01
	3/12/2019	12.6	6.38	2.61	1055	-73	17.1	523.38
	4/3/2019	12.4	7.53	0.59	1213	-145	21.1	528.15
	10/10/2019	13.9	6.85	0.23	1063	-163	12.55	--
	6/3/2020	13.4	6.99	0.25	1167	37	20.15	523.94
	10/16/2020	13.7	7.07	0.09	1503	-188	3.41	519.26
	3/1/2021	12.2	6.9	0.16	1562	-176.6	3.50	521.10
	4/19/2021	12.3	7.0	1.61	1760	-162.4	3.82	522.87
	10/13/2021	13.6	7.0	0.17	1858	-142.8	14.10	519.40
	4/6/2022	12.3	6.96	0.13	1,982	-157	21.00	522.99
	10/20/2022	--	--	--	--	--	--	--
	4/26/2023	11.7	6.83	0.20	2,584	48.6	9.39	524.21
MW-302	10/17/2017	13.9	8.72	0.09	1165	-49.7	2.04	522.20
	5/9/2018	13.0	8.19	1.0	1268	-217.2	2.25	525.81
	8/13/2018	14.9	9.32	0.15	1226	-237	3.75	519.87
	10/9/2018	15.2	7.89	0.3	1334	-198	6.48	528.08
	3/12/2019	12.2	6.94	2.68	792	-70.3	22.1	522.83
	4/3/2019	11.4	8.70	0.58	1164	-215.8	18.8	528.21
	10/10/2019	14.5	7.49	0.28	1249	-186.8	1.16	--
	6/3/2020	12.9	7.88	0.18	1245	36.7	25.27	523.98
	10/16/2020	12.9	7.87	0.08	1168	-237.1	0.07	518.94
	3/1/2021	12.3	8.0	0.11	1101	-236.9	2.70	520.21
	4/19/2021	12.0	8.2	0.07	1169	-225.8	4.07	522.27
	10/12/2021	13.8	8.3	0.18	1043	-193.7	31.20	518.75
	2/22/2022	12.5	8.16	0.13	1,082	--	2.10	519.03
	4/5/2022	12.3	8.05	0.07	989	-199	9.00	522.34
	10/20/2022	--	--	--	--	--	--	--
	4/26/2023	12.4	6.11	0.10	2,283	21.4	7.19	525.56

Table 5. Field Monitoring Data
Burlington Generating Station
October 2017 - April 2023

Well	Sample Date	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Groundwater Elevation (feet)
MW-302A	9/9/2020	13.3	7.31	--	1013	-142	0.01	519.71
	10/16/2020	13.1	7.26	0.19	951	-175.3	3.82	518.79
	3/1/2021	12.5	7.2	0.16	975	-165.6	0.48	520.14
	4/19/2021	12.7	7.3	0.18	1026	-150.2	2.94	522.25
	10/12/2021	13.6	7.7	0.26	1124	-115.3	11.20	518.64
	4/5/2022	12.7	7.25	0.12	1,108	-153	5.00	522.28
	10/20/2022	16.7	7.09	0.0	1,090	-115	5.00	506.87
	4/26/2023	7.9	7.52	0.37	466.9	-98.2	0.02	525.51
MW-303	10/17/2017	14.5	8.59	0.13	613	21.3	2.79	522.23
	5/9/2018	13.8	7.51	0.11	536	-165.5	0.97	525.80
	8/13/2018	16.8	8.03	0.24	748	-153	14.26	519.78
	10/10/2018	15.6	7.10	1.0	774	-132	17.3	528.78
	3/12/2019	13.6	6.46	2.38	549	-68.1	19.4	522.74
	4/3/2019	12.6	7.79	0.67	711	-122.8	18.2	528.22
	10/10/2019	14.9	7.13	0.26	767	-161	5.36	--
	6/3/2020	14.8	7.12	0.18	934	58.1	16.03	523.97
	10/16/2020	13.7	7.19	0.12	902	-185.6	2.03	518.78
	3/1/2021	13.6	7.2	0.12	916	-174.2	1.82	520.09
	4/19/2021	13.2	7.3	0.19	995	-144.8	4.35	522.13
	10/13/2021	13.9	7.3	0.16	843	-118.4	13.60	518.58
	4/5/2022	12.7	7.36	0.10	845	-156	21.00	522.20
	10/20/2022	--	--	--	--	--	--	--
	4/26/2023	12.6	6.92	0.13	757	25.3	0.02	525.42

Table 5. Field Monitoring Data
Burlington Generating Station
October 2017 - April 2023

Well	Sample Date	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Groundwater Elevation (feet)
MW-304	10/17/2017	15.1	9.52	0.1	756	5.9	1.89	522.32
	5/9/2018	13.5	8.51	1.4	906	-273	2.84	525.85
	8/13/2018	18.1	7.60	0.09	836	-202	4.26	519.81
	10/10/2018	17.4	9.01	0.23	780	-100.2	1.36	528.82
	3/12/2019	13.9	6.94	2.11	460	-73.8	9.28	522.80
	4/3/2019	13.0	8.56	0.39	658	-216.7	6.22	528.27
	10/10/2019	15.6	7.17	0.28	934	-157.5	1.18	--
	6/3/2020	14.6	7.23	0.15	1087	52.4	18.18	524.02
	10/15/2020	14.7	8.46	0.08	1062	-282.6	0.02	518.69
	3/1/2021	14.1	8.3	0.07	971	-280.2	0.02	520.15
	4/19/2021	13.2	8.3	0.07	935	-257.8	3.34	522.24
	10/13/2021	14.5	7.5	0.15	806	-149.0	7.70	518.68
	4/5/2022	13.2	8.08	0.07	825	-205	9.00	522.41
	10/20/2022	--	--	--	--	--	--	--
	4/26/2023	11.3	7.03	0.09	855	-71.6	10.6	525.20
MW-305	10/16/2017	15.1	7.78	0.14	759	44.9	0.71	522.48
	5/9/2018	15.2	7.72	1.4	733	-146.8	0.64	526.06
	8/13/2018	16.3	7.81	0.35	901	-134	3.85	520.29
	10/10/2018	16.2	7.29	0.2	846	-140	4.94	528.97
	4/3/2019	14.5	7.80	0.59	733	-133.5	3.88	528.36
	10/11/2019	14.3	7.36	0.2	795	-132.9	3.02	--
	6/3/2020	15.9	7.12	0.14	972	39.8	13.46	524.12
	10/15/2020	14.6	7.23	0.37	987	-175	0.02	519.00
	3/2/2021	14.8	7.3	0.44	865	-154.0	0.02	520.48
	4/20/2021	14.7	7.3	0.11	839	-135.7	1.97	522.31
	10/14/2021	14.7	7.2	0.17	911	-95.1	9.00	519.18
	4/6/2022	14.3	7.25	0.06	870	-116	9.00	522.60
	10/20/2022	--	--	--	--	--	--	--
	4/26/2023	11.4	5.18	0.14	977	40.5	0.02	517.35

Table 5. Field Monitoring Data
Burlington Generating Station
October 2017 - April 2023

Well	Sample Date	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Groundwater Elevation (feet)
MW-306	10/16/2017	14.8	10.66	0.37	448	286.2	0.35	522.72
	5/9/2018	14.7	6.80	0.05	354	-104.3	0.71	526.00
	8/14/2018	15.9	10.33	0.3	447	-265	2.88	520.14
	10/10/2018	17.3	6.04	0.38	478	58.1	2.67	528.95
	3/11/2019	14.3	6.27	0.8	343	-88.9	0.56	523.21
	4/3/2019	13.4	6.69	0.69	4711	-92.8	0.81	528.40
	10/11/2019	14.3	10.53	0.21	473	-165.1	1.84	--
	6/4/2020	14.4	10.48	0.16	482	59	15.96	524.45
	10/15/2020	14.1	10.00	0.11	454	-273.7	0.02	519.05
	3/2/2021	14.1	9.5	0.39	415	-196.0	0.02	520.65
	4/19/2021	13.8	10.0	0.34	442	-188.0	0.02	522.52
	10/11/2021	16.0	5.8	0.28	476.1	12.3	6.90	519.15
	4/5/2022	13.6	5.95	0.14	468.4	-75	4.00	522.63
	10/20/2022	--	--	--	--	--	--	--
	4/27/2023	12.5	8.77	0.11	577.0	48.4	0.02	522.20
MW-307	10/16/2017	14.7	10.46	0.18	486	-78.9	0.32	522.55
	5/9/2018	14.4	10.30	1.1	500	-168.6	1.87	526.06
	8/14/2018	15.6	10.12	0.49	512	-221	5.09	520.46
	10/10/2018	15.6	9.88	0.22	497	-87.3	1.85	529.08
	3/11/2019	14.4	9.71	1.07	367	-78.3	1.05	523.49
	4/3/2019	13.6	10.39	0.68	500	-167.8	3.1	528.63
	10/11/2019	14.4	10.14	0.24	536	-126.3	3.23	--
	6/4/2020	14.8	10.03	0.3	586	60.2	14.33	524.62
	10/15/2020	14.0	10.05	0.11	565	-269.7	0.02	519.33
	3/2/2021	14.0	10.0	0.38	552	-233.0	0.49	521.01
	4/20/2021	13.9	10.0	0.08	546	-242.4	2.38	522.89
	10/11/2021	14.4	9.9	0.16	547.9	-215.3	8.20	519.55
	4/5/2022	13.4	9.88	0.03	549.8	-219	4.00	522.91
	10/20/2022	--	--	--	--	--	--	--
	4/24/2023	13.7	8.35	0.13	634.9	110.6	3.93	519.61

Table 5. Field Monitoring Data
Burlington Generating Station
October 2017 - April 2023

Well	Sample Date	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Groundwater Elevation (feet)
MW-307A	9/9/2020	14.4	7.83	--	585	-154.2	0.00	519.97
	10/14/2020	14.6	7.80	0.18	554	-189.9	2.96	519.00
	3/2/2021	14.0	7.7	0.29	568	-171.0	0.95	520.52
	4/20/2021	13.7	7.7	0.13	566	-167.3	2.89	522.39
	10/11/2021	14.4	7.8	0.12	551	-133.4	7.40	519.09
	4/5/2022	13.4	7.78	0.06	547.4	-154	5.00	522.47
	10/20/2022	15.5	7.69	0.0	791.0	-131	0.30	508.27
	4/24/2023	7.7	7.63	0.12	477.0	-117.1	0.02	520.77
MW-307B	7/1/2021	15.3	7.7	0.41	587.1	-76.5	1.26	520.12
	10/11/2021	14.4	7.7	0.10	459.6	-130.6	10.10	519.13
	2/22/2022	13.1	7.43	0.18	570.0	--	2.64	519.37
	4/5/2022	13.5	7.36	0.08	627.3	-147	6.00	522.37
	10/20/2022	14.1	7.10	0.0	492.0	-34	17.00	508.35
	4/24/2023	13.4	7.49	2.08	434.6	-48.4	1.08	520.77
MW-308	10/17/2017	14.6	9.75	0.09	689	-109.4	0.6	522.46
	5/8/2018	14.4	9.75	1.5	698	-158.2	1.26	525.62
	8/13/2018	15.4	9.86	0.11	710	-238	4.63	520.22
	10/10/2018	15.3	9.82	0.2	709	-201	1.35	528.98
	3/12/2019	14.1	7.72	2.57	500	-60.7	1.68	523.13
	4/3/2019	14.0	9.97	1.16	681	-142.3	1.66	528.39
	10/10/2019	14.6	9.42	0.21	671	-82.6	2.93	--
	6/4/2020	15.4	9.65	0.23	713	28	13.38	524.10
	10/14/2020	14.7	9.70	0.1	682	-264.6	0.15	519.02
	3/2/2021	13.9	9.4	0.11	695	-207.2	0.02	520.70
	4/20/2021	14.1	9.6	0.08	690	-172.9	1.77	522.57
	10/12/2021	15.0	10.0	0.06	728	-219.8	8.80	519.25
	4/4/2022	13.9	9.58	0.08	680	-247	5.00	522.61
	10/20/2022	--	--	--	--	--	--	--
	4/24/2023	14.2	7.49	0.10	994	122.6	10.80	521.08

Table 5. Field Monitoring Data
Burlington Generating Station
October 2017 - April 2023

Well	Sample Date	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Groundwater Elevation (feet)
MW-309	10/17/2017	14.6	8.50	0.08	1058	-31	3.08	522.67
	5/8/2018	13.5	7.25	0.05	813	-139.2	6.49	525.54
	8/14/2018	14.2	7.39	0.14	1093	-143	12.67	520.22
	10/10/2018	15.7	7.46	0.18	1038	-53.5	34.45	528.93
	4/4/2019	12.6	7.45	0.51	997	-99.4	20.1	528.40
	10/11/2019	13.7	7.19	0.21	1040	-165.6	8.93	--
	6/3/2020	14.8	7.09	0.23	1086	37	18.88	524.06
	10/14/2020	14.3	7.61	0.14	851	-208.4	18.9	519.28
	3/1/2021	13.7	7.2	0.12	816	-196.3	13.80	520.75
	4/19/2021	13.2	7.3	0.16	1017	-170.7	21.20	522.72
	10/12/2021	15.3	7.2	0.17	927	-155.1	19.60	519.43
	4/4/2022	13.0	7.18	0.24	748	-139	21.00	522.74
	10/20/2022	--	--	--	--	--	--	--
	4/27/2023	13.0	6.93	0.07	1,004	-117.2	55.8	523.02
MW-310	10/16/2017	16.6	7.92	0.16	791	-63.6	2.86	525.49
	5/8/2018	11.1	7.46	0.14	595	-198.8	12.81	525.79
	8/14/2018	15.0	7.44	0.05	840	-194	3.11	523.69
	10/10/2018	17.0	7.20	0.1	938	-166	0	529.00
	4/4/2019	10.8	7.84	1.12	1034	-175.8	16.7	528.62
	10/11/2019	15.9	6.95	0.28	961	-189.7	5.23	--
	6/2/2020	12.8	7.30	0.13	881	38.6	17.82	525.36
	10/14/2020	16.4	7.34	0.08	711	-223.6	3.79	523.81
	4/19/2021	10.8	7.2	0.17	735	-193.2	2.57	525.46
	10/12/2021	17.3	7.2	0.18	668	-181.6	11.40	524.69
	4/4/2022	10.6	7.38	0.14	548.8	-177	19.00	525.44
	10/20/2022	--	--	--	--	--	--	--
	4/27/2023	10.6	7.13	0.23	999	-146.4	11.8	518.44

Table 5. Field Monitoring Data
Burlington Generating Station
October 2017 - April 2023

Well	Sample Date	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Groundwater Elevation (feet)
MW-310A	9/9/2020	14.2	7.33	--	1026	145.3	714.3	509.16
	10/16/2020	--	--	--	--	--	--	489.84
	3/3/2021	13.2	7.2	3.10	1051	145.9	NM	487.06
	4/20/2021	11.7	7.4	3.69	1042	55.0	NM	521.12
	10/12/2021	15.5	7.1	2.04	842	153.3	80.00	521.83
	4/6/2022	11.7	7.29	0.41	907	-11	39.00	522.58
	10/20/2022	18.9	7.54	0.01	874	21	2.00	512.84
	4/27/2023	12.6	7.05	7.56	1,010	-21.9	NM	509.69
MW-311	10/16/2017	14.7	8.27	0.25	972	308.3	2.19	523.44
	5/8/2018	11.5	7.26	1.6	1282	-143.3	1.48	525.08
	8/14/2018	14.8	7.33	0.12	1177	-158	12.3	521.06
	10/10/2018	16.4	7.49	0.45	1003	-62.2	17.8	528.49
	4/4/2019	11.4	7.64	0.78	1422	145.8	10.8	528.20
	10/11/2019	14.2	7.07	0.3	1088	-163.4	13.4	--
	6/2/2020	12.3	7.10	0.16	1464	-1.1	17.95	524.05
	10/14/2020	14.5	7.41	0.1	1041	-194	2.36	520.59
	3/1/2021	11.5	7.0	0.13	1363	-179.2	1.33	522.89
	4/19/2021	10.9	7.2	0.48	1473	-158.6	4.56	523.89
	10/12/2021	14.9	7.2	0.17	1431	-157.6	11.10	522.00
	4/4/2022	11.8	7.22	0.07	1,190	-178	7.00	523.78
	10/20/2022	--	--	--	--	--	--	--
	4/27/2023	10.9	6.83	0.10	1,225	-81.9	2.75	522.07
MW-312	6/6/2019	14.4	6.99	0.12	783	-146.4	2.86	--
	10/10/2019	15.6	7.19	8.75	785	-163.8	2.56	--
	6/3/2020	14.7	7.13	0.17	878	53.3	21.16	524.05
	10/15/2020	15.1	7.37	0.13	854	-203.1	0.02	518.68
	3/1/2021	14.1	7.1	0.14	814	-192.4	0.89	520.12
	4/19/2021	13.7	7.2	0.12	875	-162.9	8.82	522.20
	10/14/2021	15.7	7.2	0.20	688	-143.4	13.10	518.78
	4/6/2022	14.0	7.35	0.06	746	-156	23.00	522.51
	10/20/2022	--	--	--	--	--	--	--
	4/26/2023	6.9	6.86	1.27	853	-30.3	9.97	524.68

Table 5. Field Monitoring Data
Burlington Generating Station
October 2017 - April 2023

Well	Sample Date	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	Groundwater Elevation (feet)
MW-313	6/6/2019	14.9	6.94	0.07	1059	-141.6	7.23	--
	10/10/2019	16.0	7.06	0.37	1007	-163.4	11.03	--
	6/3/2020	17.2	7.03	0.29	1099	50.9	50.81	524.02
	10/15/2020	15.3	7.16	0.14	999	-183.3	14.3	518.70
	3/2/2021	14.8	7.0	0.13	1224	-148.0	7.46	520.18
	4/19/2021	14.5	7.1	0.21	1165	-152.8	4.54	522.23
	10/13/2021	15.9	7.3	0.10	1198	-117.9	24.80	518.72
	4/6/2022	14.4	7.14	0.07	1,076	-154	15.00	522.48
	10/20/2022	19.6	7.65	0.00	477	-181.0	185.00	512.08
	4/25/2023	7.1	7.20	0.13	643.3	-95.7	1.91	524.37
MW-313A	9/9/2020	15.3	7.60	--	1243	-164.4	0	515.36
	10/15/2020	14.8	7.64	0.1	1133	-190.1	0.02	518.61
	3/1/2021	14.1	7.5	0.12	927	-195.9	0.78	520.02
	4/19/2021	14.2	7.6	0.09	1023	-172.1	1.71	522.11
	10/13/2021	15.4	7.5	0.11	757	-117.7	7.70	518.62
	4/6/2022	14.0	7.62	0.07	695	-158	23.00	522.38
	10/20/2022	17.1	7.72	0.00	621	-105	10.00	511.86
	4/25/2023	5.5	7.59	0.16	437.3	-108.6	0.02	524.29
MW-313B	7/1/2021	15.2	7.6	0.37	1052	-5.1	0.00	519.51
	10/13/2021	15.4	7.5	0.09	714	-90.8	8.60	518.72
	2/22/2022	13.7	7.64	0.17	665	--	2.40	518.88
	4/6/2022	14.1	7.50	0.01	622.6	-144	9.00	522.45
	10/20/2022	17.99	7.51	0.00	804	-105	4.00	511.91
	4/25/2023	9.7	7.41	1.33	571.9	-66.0	13.7	524.39
MW-314	4/6/2022	11.4	6.79	0.13	1001	-82	35.00	522.27
	10/20/2022	13.3	7.11	0.00	930	-120	5	517.78
	4/25/2023	well flooded and not sampled						

Abbreviations:
mg/L = milligrams per liter
mV = millivolts
amsl = above mean sea level
µmhos/cm = micromohs per cm
-- = Not Applicable
NM = not measured

Last revision by: NLB Date: 9/29/2023
Checked by: RM Date: 9/29/2023

Table 6. Horizontal Gradients and Flow Velocity Table
Burlington Generating Station
SCS Engineers Project #25220081.00
2022 - 2023

	Shallow Potentiometric Surface					
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**	**Direction**
April 4-6, 2022	524.00	522.51	1530.93	0.0010	0.24	East-Southeast
October 20, 2022	Not sampled due to De-watering System in place					
April 24-27, 2023	524.68	517.35	762.60	0.0096	2.39	Northwest
July 31, 2023	519.50	518.50	703.10	0.0014	0.35	East-Southeast

	Deeper Potentiometric Surface					
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**	**Direction**
April 4-6, 2022	522.40	522.28	806.95	0.0001	0.04	South-Southeast
October 20, 2022	511.86	508.00	626.76	0.0062	1.53	South-Southeast
April 24-27, 2023	524.29	520.77	685.56	0.0051	1.28	Northwest
July 31, 2023	519.70	518.08	685.71	0.0024	0.59	Southeast

Well	**K Values (cm/sec)**	**K Values (ft/d)**
MW-301	1.6E-03	4.4
MW-302	2.9E-02	82
MW-302A	4.9E-02	140
MW-303	8.3E-03	24
MW-304	6.0E-02	171
MW-305	6.1E-02	173
MW-306	1.0E-01	295
MW-307	8.5E-03	24
MW-307A	4.1E-02	116
MW-307B	6.2E-02	175
MW-308	7.6E-02	215
MW-309	1.2E-02	34
MW-310	3.7E-02	104
MW-310A	1.49E-07	0
MW-311	9.1E-03	26
MW-312	6.6E-02	187
MW-313	1.1E-01	298
MW-313A	1.2E-01	334
MW-313B	4.8E-02	135
Geometric Mean	3.5E-02	100

Assumed Porosity, n
0.40

ft = feet
ft/d = feet per day
K = hydraulic conductivity
n = effective porosity

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

1. MW-310, MW-310A, and MW-311 are background wells and are not included in geometric mean calculation.

Groundwater flow velocity equation: $V = [K*(\Delta h/\Delta l)] / n$

Created by: NDK Date: 9/19/2022
Last revision by: RM Date: 12/29/2023
Checked by: NLB Date: 12/29/2023

Table 7. Vertical Gradients
Burlington Generating Station - SCS Engineers #25220081.00
February 2022 - October 2023

Vertical Hydraulic Gradients	MW302/MW302A		MW307/MW307A		MW-307A/MW-307B		MW310/MW310A		MW313/MW313A		MW313A/MW313B	
Shallow Well	MW302		MW307		MW307A		MW310		MW313		MW313A	
Screen midpoint (feet amsl)	508.24		510.82		476.79		515.73		505.35		475.15	
Deep Well	MW302A		MW307A		MW307B		MW310A		MW313A		MW313B	
Screen midpoint (feet amsl)	475.84		476.79		459.15		486.23		475.15		466.64	
Measurement Date	**Distance between midpoints (feet)**	**Vertical Gradient (ft/ft)**	**Distance between midpoints (feet)**	**Vertical Gradient (ft/ft)**	**Distance between midpoints (feet)**	**Vertical Gradient (ft/ft)**	**Distance between midpoints (feet)**	**Vertical Gradient (ft/ft)**	**Distance between midpoints (feet)**	**Vertical Gradient (ft/ft)**	**Distance between midpoints (feet)**	**Vertical Gradient (ft/ft)**
February 22, 2022	32.4	--*	34.0	-0.012	17.6	0.003	29.5	--*	30.2	-0.003	8.5	0.008
April 4-6, 2022	32.4	-0.002	34.0	-0.013	17.6	-0.006	29.5	-0.097	30.2	-0.003	8.5	0.008
October 17, 2022	32.4	DRY	34.0	DRY	17.6	0.005	29.5	DRY	30.2	-0.007	8.5	0.006
October 20, 2022	32.4	DRY	34.0	DRY	17.6	0.005	29.5	DRY	30.2	-0.007	8.5	0.006
April 24-27, 2023	32.4	-0.002	34.0	0.0341	17.6	0.000	29.5	-0.297	30.2	-0.003	8.5	0.012
July 31, 2023	32.4	-0.002	34.0	0.0361	17.6	-0.077	29.5	-0.087	30.2	-0.004	8.5	0.007
August 1-3, 2023	32.4	-0.003	34.0	0.0376	17.6	-0.063	29.5	-0.999	30.2	-0.003	8.5	0.001
October 2-5, 2023	32.4	-0.002	34.0	0.0356	17.6	-0.078	29.5	-0.089	30.2	-0.004	8.5	0.008

Notes:
1: A positive vertical gradient indicates upward groundwater flow. A negative gradient indicates downward flow.
2: The screen midpoint for water table wells is calculated as the midpoint between the water table elevation and screen bottom elevation.
*: Groundwater elevation was not measured at one or both wells in the pair, therefore vertical gradient cannot be calculated.
DRY: Shallow well was dry, vertical gradient cannot be calculated.

Created by: RM Date: 12/20/2021
Last revision by: NLB Date: 12/26/2023
Checked by: RM Date: 12/26/2023
Checked by PM: TK Date: 12/29/2023

Table 8. Evaluation of Corrective Measure Alternatives
Burlington Generating Station / SCS Engineers Project #25220081.00

	Alternative #5	Alternative #7	Alternative #8
	Excavate and Dispose in Off-site Landfill	Consolidate and Cap with Groundwater Collection	Consolidate and Cap with Barrier Wall
CORRECTIVE ACTION ASSESSMENT - 40 CFR 257.97(b)			
Threshold Criteria	**Able to Meet Criteria?**	**Able to Meet Criteria?**	**Able to Meet Criteria?**
257.97(b)(1) Is remedy protective of human health and the environment?	Yes	Yes	Yes
257.97(b)(2) Can the remedy attain the groundwater protection standard?	Yes	Yes	Yes
257.97(b)(3) Can the remedy control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in appendix IV to this part into the environment?	Yes	Yes	Yes
257.97(b)(4) Can the remedy remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible?	Yes, if interim measures such as groundwater dewatering to facilitate CCR excavation recovers groundwater with contaminant concentrations above groundwater protection standards (GPS).	Yes	Yes, if interim measures such as groundwater dewatering to facilitate CCR excavation recovers groundwater with contaminant concentrations above groundwater protection standards (GPS).
257.97(b)(5) Can the remedy comply with standards for management of wastes as specified in §257.98(d)?	Yes	Yes	Yes
DETERMINATION	**This alternative is retained and assessed in further detail.**	**This alternative is retained and assessed in further detail.**	**This alternative is retained and assessed in further detail.**

Table 8. Evaluation of Corrective Measure Alternatives
Burlington Generating Station / SCS Engineers Project #25220081.00

	Alternative #5	Alternative #7	Alternative #8
	Excavate and Dispose in Off-site Landfill	**Consolidate and Cap with Groundwater Collection**	**Consolidate and Cap with Barrier Wall**
LONG- AND SHORT-TERM EFFECTIVENESS - 40 CFR 257.97(c)(1)			
Criteria	**Assessment**	**Assessment**	**Assessment**
257.97(c)(1)(i) Magnitude of reduction of existing risks	Existing risk reduced by achieving GPS	Groundwater extraction and treatment presents an additional risk and potential exposure pathways via surface release or disruption of treatment processes.	Long-term risk may be reduced with additional containment offered by barrier wall.
257.97(c)(1)(ii) Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy	Magnitude of residual risk of further releases is lower than current conditions due to removal of CCR material from the site.	Magnitude of residual risk of further releases is lower than current conditions due to final cover eliminating infiltration through CCR; Potential further reduction in release risk due to CCR material footprint; Residual risks are managed by capturing and treating impacts to groundwater. Groundwater impacts from CCR are captured by groundwater collection. This is an active control measure and the potential for further release in the event of system shutdown.	Magnitude of residual risk of further releases is lower than current conditions due to final cover eliminating infiltration through CCR; Potential further reduction in release risk due to CCR material footprint; Groundwater impacts from CCR are prevented from further release by the barrier wall. Continuity of the wall is required for ongoing success. In the event the wall is discontinuous or groundwater migrates through the wall, further release may occur.
257.97(c)(1)(iii) The type and degree of long-term management required, including monitoring, operation, and maintenance	No on-site long-term management required; Limited on-site post-closure groundwater monitoring until GPS are achieved; Receiving disposal facility will have same/similar long-term monitoring, operation, and maintenance requirements including 30-year post-closure groundwater monitoring described in Alternative #6	30-year post-closure groundwater monitoring; Groundwater monitoring network maintenance and as-needed repair/replacement Final cover maintenance (e.g., mowing and as-needed repair); Periodic final cover inspections; with groundwater pump operation and maintenance (O&M), groundwater treatment system O&M, and treatment system discharge monitoring/reporting.	30-year post-closure groundwater monitoring; Groundwater monitoring network maintenance and as-needed repair/replacement Final cover maintenance (e.g., mowing and as-needed repair); Periodic final cover inspections; with monitoring of wall performance. Breaches or short circuiting can develop and must be monitored and repaired.
257.97(c)(1)(iv) Short-term risks - Implementation	(Excavation / Transportation / Redisposal)	(Excavation / Transportation / Redisposal)	(Excavation / Transportation / Redisposal)
Excavation	*Reduced risk to environment from excavation due to elimination of on-site of CCR. Potential for change of aerobic/anaerobic conditions causing short-term mobilization of impacts.*	*Magnitude of residual risk of further releases is lower than current conditions due to final cover eliminating infiltration through CCR; Increased risk to environment due to increased excavation volumes required for consolidation with increased risk to environment due to increased excavation volumes required for consolidation.*	*Magnitude of residual risk of further releases is lower than current conditions due to final cover eliminating infiltration through CCR; Increased risk to environment due to increased excavation volumes required for consolidation with increased risk to environment due to increased excavation volumes required for consolidation. Increased excavation for the installation of a barrier wall.*
Transportation	*Highest level of community and environmental risk due to volume of CCR export required. Larger population affected and potential roadway deterioration from truck traffic.*	*No risk to community or environment from off-site CCR transportation; Typical risk due to construction traffic delivering materials of construction to site.*	*No risk to community or environment from off-site CCR transportation; Typical risk due to construction traffic delivering materials of construction to site with slightly elevated risk associated with the receipt of additional materials of construction for the barrier wall, and delivery of specialized trenching equipment.*
Re-Disposal	*Risk to community and environment due to re-disposal of large CCR volume at another facility; Added risk due to construction event required to develop adequate disposal capacity at receiving disposal facility; Re-disposal risks are managed by the receiving disposal facility*	*Limited risk to community and environment due to CCR re-disposal occurring on-site.*	*Limited risk to community and environment due to CCR re-disposal occurring on-site.*

Table 8. Evaluation of Corrective Measure Alternatives
Burlington Generating Station / SCS Engineers Project #25220081.00

	Alternative #5	Alternative #7	Alternative #8
	Excavate and Dispose in Off-site Landfill	**Consolidate and Cap with Groundwater Collection**	**Consolidate and Cap with Barrier Wall**
257.97(c)(1)(v) Time until full protection is achieved	Extensive time required to implement remedy in and potentially the longest required time to implement closure. Implementation schedule extends the time required to achieve full protection. Extended implementation timeframe is driven by the time required to identifying and secure off-site disposal capacity, or develop the capacity at an existing Alliant-owned facility. If landfill capacity is not owned by Alliant, additional time may be required to permit and develop the necessary disposal capacity. Increased construction time likely required due to the capacity of the receiving site to unload and place material. Potential for increase in time to reach GPS due to significant source disturbance during construction. Potential decrease in time to reach GPS due to impounded CCR source removal.	Closure and capping can be completed by end of 2024. Groundwater protection timeframe to reach GPS potentially 2 to10 years following closure construction, achievable within 30-year post-closure monitoring period. Potential decrease in time to reach GPS from implementation of groundwater pumping.	Closure and capping can be completed by end of 2024. Groundwater protection timeframe to reach GPS potentially 2 to 10 years following closure construction, achievable within 30-year post-closure monitoring period. Potential decrease in time to reach GPS upon implementation of barrier wall.
257.97(c)(1)(vi) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment	No potential for on-site exposure to remaining waste since no waste remains on site; Risk of potential exposure is transferred to receiving disposal facility. Highest level of risk due to excavation, transportation, and re-disposal for construction workers removing CCR and solid waste workers at receiving facility.	Potential for exposure is low. Remaining waste is capped, with increased risk to construction workers during consolidation of CCR. The use of an active groundwater pumping to the surface creates an increased potential for a release of extracted groundwater to the surface.	Potential for exposure is low. Remaining waste is capped, with increased risk to construction workers during consolidation of CCR with increased risk to construction workers during consolidation of CCR.
257.97(c)(1)(vii) Long-term reliability of the engineering and institutional controls	Success of remedy at BGS does not rely on long-term reliability of engineering or institutional controls; Overall success relies on reliability of the engineering and institutional controls at the receiving facility	Long-term reliability of cap is good; Significant industry experience with methods/controls; Capping is common practice/industry standard for closure in place for remediation and solid waste management. Although remedy relies upon active equipment that will require additional operations and maintenance.	Long-term reliability of cap is good; Significant industry experience with methods/controls; Capping is common practice/industry standard for closure in place for remediation and solid waste management. Remedy relies on continued hydraulic conductivity of the selected barrier. Breaches or short circuiting can develop and must be monitored.
257.97(c)(1)(viii) Potential need for replacement of the remedy	No potential for remedy replacement; Limited potential for remedy enhancement due to residual groundwater impacts following source control	Added expectation for pump, conveyance system and treatment system replacement.	It is unlikely that an impermeable barrier wall will require replacement. However, breaches or short circuiting must be repaired if identified.
SOURCE CONTROL TO MITIGATE FUTURE RELEASES - 40 CFR 257.97(c)(2)			
257.97(c)(2)(i) The extent to which containment practices will reduce further releases	Removal of CCR prevents further releases at BGS; Receiving disposal site risk is expected to be a licensed solid waste facility with controls to prevent further releases.	Cap will reduce further releases by minimizing infiltration through CCR with reduction due to consolidated/smaller closure footprint with the ability to contain or restore groundwater impacts.	Cap will reduce further releases by minimizing infiltration through CCR with reduction due to consolidated/smaller closure footprint with containment provided by barrier.
257.97(c)(2)(ii) The extent to which treatment technologies may be used	Alternative does not rely on treatment technologies	This alternative relies on conventional pump and treat remediation.	Alternative relies on the identification and availability of a suitable barrier wall technology (e.g., slurry wall). Implementation of barrier wall materials will require specialized field implementation methods and health and safety measures.

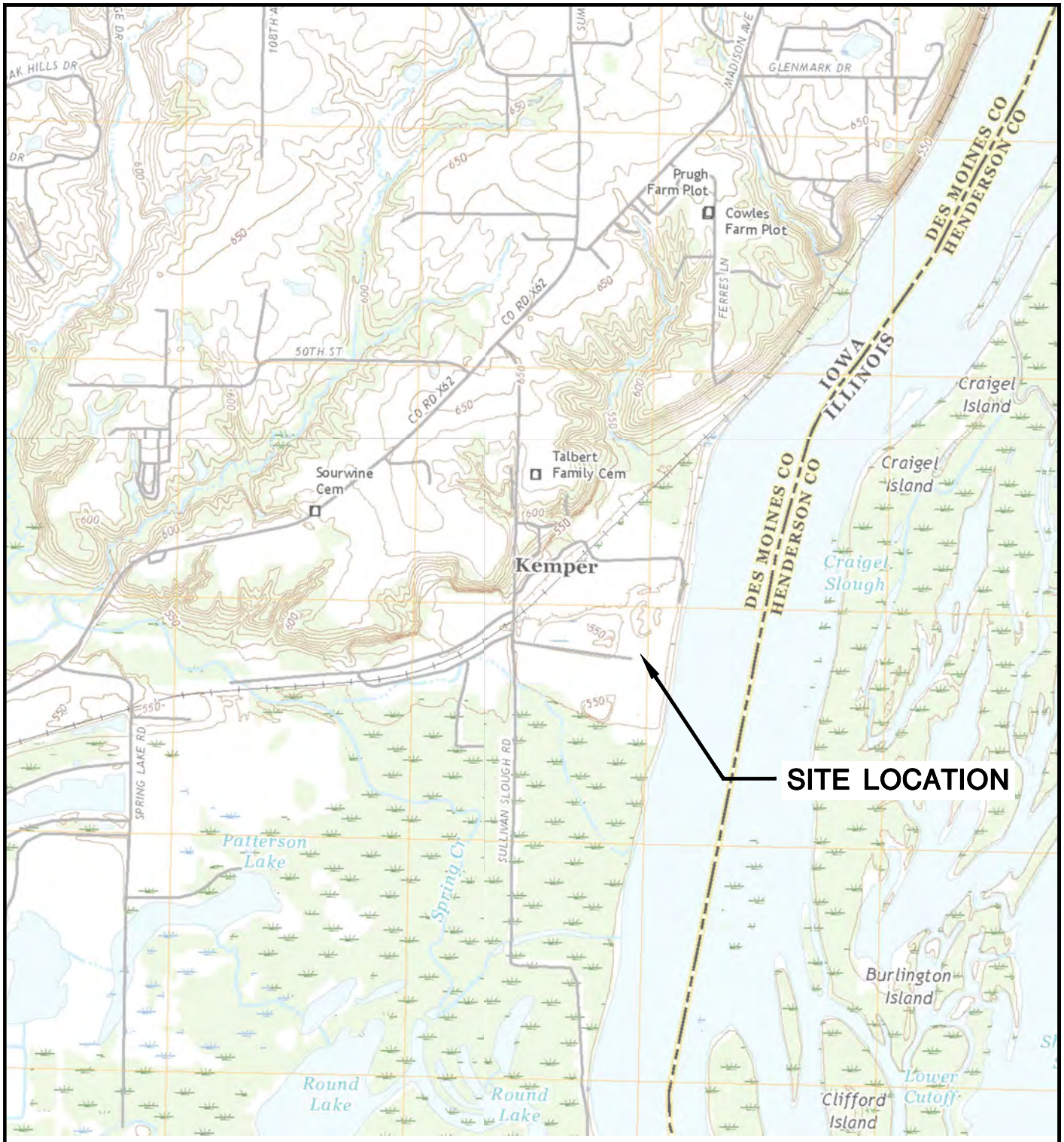
Table 8. Evaluation of Corrective Measure Alternatives
Burlington Generating Station / SCS Engineers Project #25220081.00

	Alternative #5	Alternative #7	Alternative #8
	Excavate and Dispose in Off-site Landfill	**Consolidate and Cap with Groundwater Collection**	**Consolidate and Cap with Barrier Wall**
IMPLEMENTATION - 40 CFR 257.97(c)(3)			
257.97(c)(3)(i) Degree of difficulty associated with constructing the technology	Low complexity construction; High degree of logistical complexity including the excavation and off-site transport of a significant quantity of CCR and permitting/development of off-site disposal facility airspace; High level of dewatering effort - dewatering required for excavation of full CCR volume	Low complexity construction; Moderate degree of logistical complexity; Moderate to low level of dewatering effort - dewatering required for material excavation/placement and capping. Moderate complexity construction for the installation of extraction wells and conveyance to a site-specific groundwater treatment plant.	High complexity construction; Barrier walls require specialty installation equipment and knowledge. Highly specialized and experience contractors required to achieve proper installation. Moderate degree of logistical complexity; Moderate to low level of dewatering effort - dewatering required for material excavation/placement and capping.
257.97(c)(3)(ii) Expected operational reliability of the technologies	Success does not rely on operational reliability of technologies; Overall success relies on off-site disposal facility.	Success of this remedy relies on the successful operation of a site-specific groundwater extraction system and treatment plant.	Success this remedy relies on continued hydraulic conductivity of the selected barrier. Breaches or short circuiting can develop and must be monitored. The presence of multiple transmission lines traversing the barrier wall alignment requires rerouting of lines or building the wall around these line, compromising function.
257.97(c)(3)(iii) Need to coordinate with and obtain necessary approvals and permits from other agencies	Need is highest in comparison to other alternatives; State Closure Permit required; Approval of off-site disposal site owner required; May require State solid waste comprehensive planning approval; Local road use permits likely required. State and local erosion control/construction stormwater management permits required; Federal/State/Local Floodplain permitting likely required	Need is moderate in comparison to other alternatives; State Closure Permit required; Well permitting for extraction well installation; State water use permit for groundwater extraction depending on the design extraction rate; State wastewater construction permit for treatment system; NPDES Permit for groundwater treatment and discharge; State and local erosion control/construction stormwater management permits required; Federal/State/Local Floodplain permitting likely required.	Need is moderate in comparison to other alternatives; State Closure Permit required; Well permitting for barrier wall monitoring; May require underground injection control (UIC) permit depending on method of barrier emplacement; Federal/State/Local Floodplain permitting required; State and local erosion control/construction stormwater management permits required.
257.97(c)(3)(iv) Availability of necessary equipment and specialists	Availability of necessary equipment to develop necessary off-site disposal facility airspace and transport CCR to new disposal facility will be a limiting factor in the schedule for executing this alternative; No liner or cover material demands for on-site implementation of remedy	Necessary equipment and specialists for cap construction are highly available; Highest level of demand for cap construction material, which are readily available and accessible in the area. Moderate level of demand for liner and cap construction material. Increased demand for dewatering, treatment and conditioning of CCR. A site-specific, trained employee will be required to operate the groundwater treatment system.	Necessary equipment and specialists for cap construction are highly available; Highest level of demand for cap construction material, which are readily available and accessible in the area. Moderate level of demand for liner and cap construction material. Increased demand for dewatering, treatment and conditioning of CCR. Availability of the necessary specialized equipment is low and extensive experience required for barrier installation.
257.97(c)(3)(v) Available capacity and location of needed treatment, storage, and disposal services	Off-site disposal capacity, facility logistical capacity, or the time required to develop the necessary off-site disposal and logistical capacity is a significant limiting factor.	Capacity and location of treatment, storage, and disposal services is unlikely to be a factor for this alternative.	Capacity and location of treatment, storage, and disposal services is unlikely to be a factor for this alternative
COMMUNITY ACCEPTANCE - 40 CFR 257.97(c)(4)			
257.97(c)(4) The degree to which community concerns are addressed by a potential remedy	No comments were received during the public meetings held to discuss the ACM and addendums. Assume all alternatives are acceptable to interested/affected parties.	No comments were received during the public meetings held to discuss the ACM and addendums. Assume all alternatives are acceptable to interested/affected parties.	No comments were received during the public meetings held to discuss the ACM and addendums. Assume all alternatives are acceptable to interested/affected parties.

Created by: SK Date: 12/28/2022
Last revision by: EJN Date: 12/27/2023
Checked by: LMH Date: 12/29/2023

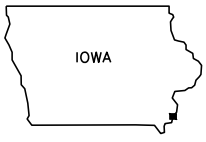
I:\25220081.00\Deliverables\2023 Selection of Remedy Report\Tables\[Table 8 - Evaluation of Assessment of Corrective Measure_BGS.xlsx]Table 8 - BGS_Evaluation Matrix

Figures



N

LOMAX QUADRANGLE
ILLINOIS / IOWA–DES MOINES CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'



CLIENT	ALLIANT ENERGY 4902 N. BILTMORE LANE, #1000 MADISON, WI 53718	SITE	ALLIANT ENERGY BURLINGTON GENERATING STATION BURLINGTON, IOWA

SITE LOCATION MAP

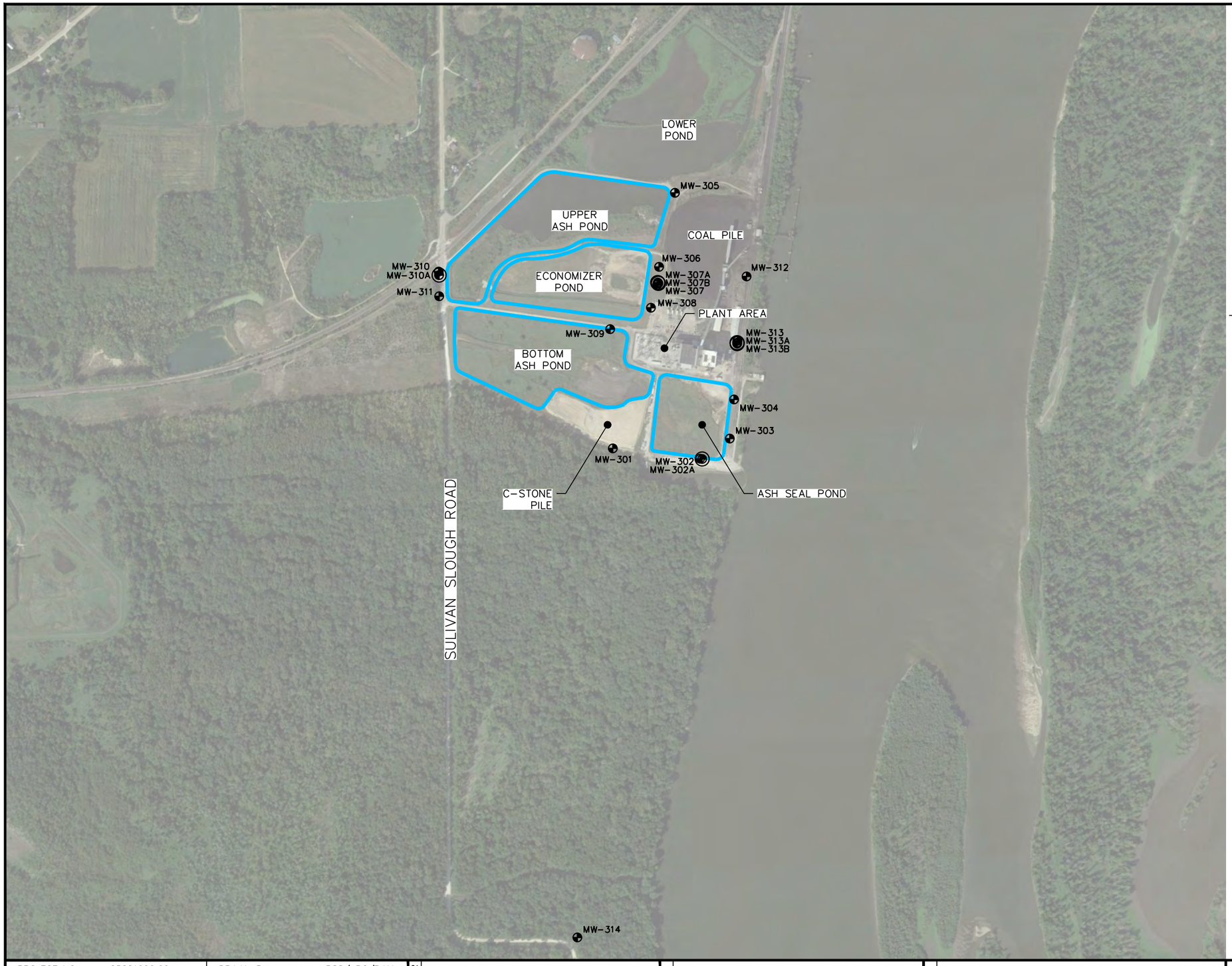
PROJECT NO.	25220081.00	DRAWN BY:	BSS
DRAWN:	11/14/2019	CHECKED BY:	MDB
REVISED:	10/05/2023	APPROVED BY:	TK 10/16/2023

ENGINEER

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

FIGURE 1

I:\25220081.00\Drawings\SOR Report\Site Location Map.dwg, 10/6/2023 2:34:28 PM



LEGEND

- EXISTING CCR RULE MONITORING WELL
- CCR RULE PIEZOMETER
- CCR UNITS

NOTES:

1. MONITORING WELLS MW-303 THROUGH MW-308 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 15-17, 2015.
2. MONITORING WELLS MW-301, MW-302, AND MW-309 THROUGH MW-311 WERE INSTALLED BY DIRECT PUSH ANALYTICAL SERVICES CORP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM FEBRUARY 29, 2016 TO MARCH 1, 2016.
3. MONITORING WELLS MW-312 AND MW-313 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
4. PIEZOMETERS MW-302A, MW-307A, MW-310A, AND MW-311A WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN JUNE-JULY 2020.
5. PIEZOMETERS MW-307B AND MW-313B INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM AMY 10-12, 2021.
6. MONITORING WELL MW-314 INSTALLED BY TERRACON CONSULTANTS, INC. UNDER THE SUPERVISION OF SCS ENGINEERS ON FEBRUARY 25, 2022.
7. 2017 AERIAL PHOTOGRAPH SOURCES: GOOGLE EARTH DATED SEPTEMBER 14, 2017.

N

700 0 700

SCALE: 1" = 700'

PROJECT NO.	25221060.00	DRAWN BY:	BSS/KRG/BWM
DRAWN:	09/14/2020	CHECKED BY:	MDB
REVISED:	12/13/2022	APPROVED BY:	TK 3/21/2023

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

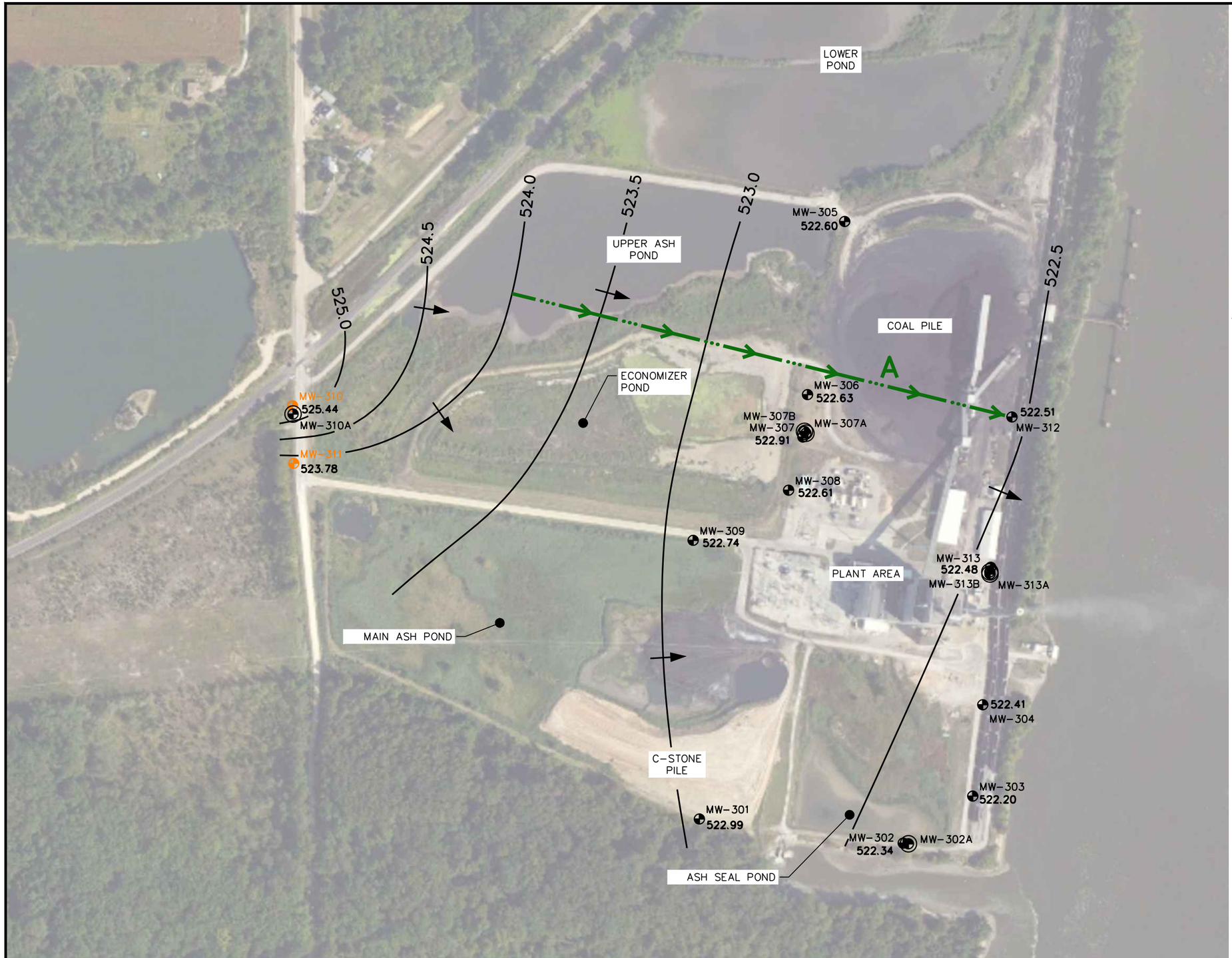
CLIENT: ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

SITE: ALLIANT ENERGY
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

\\Mad-fs01\data\Projects\25221160.00\Drawings\SitePlan-Wells-2022-02-25.dwg, 12/13/2022 11:59:38 AM



LEGEND

- MONITORING WELL
- DEEP PIEZOMETER
- CCR BACKGROUND MONITORING WELL
- **522.11** WATER LEVEL MEASURED APRIL 4–6, 2022
- POTENTIOMETRIC SURFACE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 6)
- APPROXIMATE FLOW DIRECTION

NOTES:

1. MONITORING WELLS MW–303 THROUGH MW–308 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 15–17, 2015.
2. MONITORING WELLS MW301, MW302, AND MW309–MW311 WERE INSTALLED BY DIRECT PUSH ANALYTICAL SERVICES CORP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM FEBRUARY 29, 2016 TO MARCH 1, 2016.
3. MONITORING WELLS MW–301 THROUGH MW–311 WERE SURVEYED BY FRENCH–RENEKER ASSOCIATES OF FRANKLIN, IA ON MARCH 16, 2016.
4. MONITORING WELLS MW–312 AND MW–313 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
5. PIEZOMETERS MW–302A, MW–307A, MW–310A, AND MW–313A WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN JUNE–JULY 2020.
6. PIEZOMETERS MW–307B AND MW–313B WERE INSTALLED BY CASCADE DRILLING IN MAY 2021.
7. GROUNDWATER ELEVATION ESTIMATED BASED ON MONITORING WELLS SCREENED BELOW THE POTENTIOMETRIC SURFACE IN THE SAND UNIT.
8. MW–314 IS LOCATED APPROXIMATELY 4,000 FEET SOUTH OF THE PLANT AND IS NOT SHOWN ON THE MAP.
9. BACKGROUND MONITORING WELLS FOR THE BURLINGTON GENERATING STATION ARE: MW–310 AND MW–311.

N

300 0 300

SCALE: 1" = 300'

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	08/17/2022	CHECKED BY:	RM
REVISED:	01/20/2023	APPROVED BY:	TK 10/16/2023

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

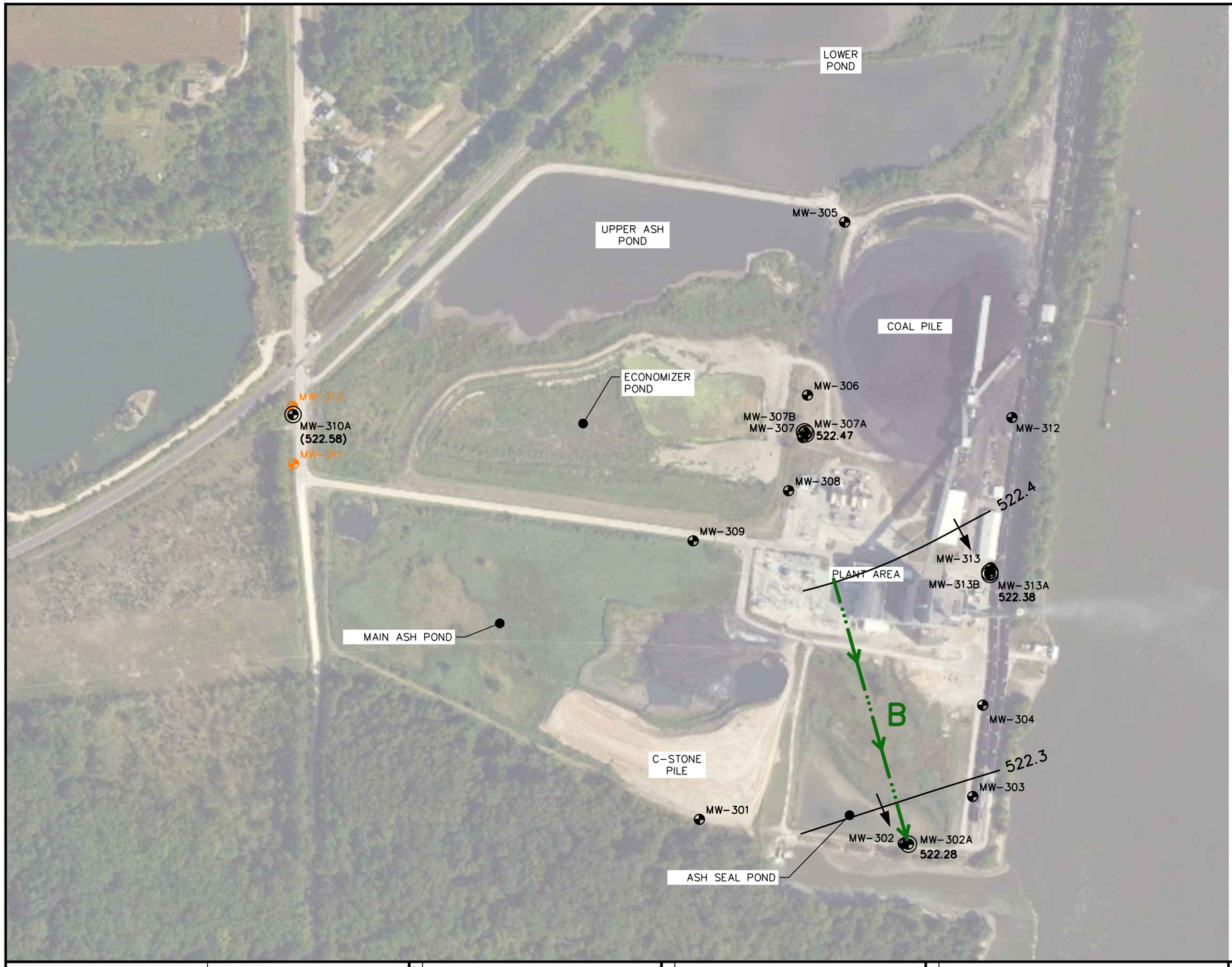
CLIENT: ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

SITE: ALLIANT ENERGY
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SHALLOW POTENTIOMETRIC SURFACE MAP
APRIL 4–6, 2022

FIGURE 3

I:\25220081.00\Drawings\SOR Report\April 2022 Wtbl.dwg, 10/6/2023 2:50:45 PM



LEGEND

◕	MONITORING WELL
◉	DEEP PIEZOMETER
◕	CCR BACKGROUND MONITORING WELL
522.11	WATER LEVEL MEASURED APRIL 4–6, 2022
(521.83)	WATER LEVEL MEASURED APRIL 4–6, 2022, NOT USED FOR CONTOURING
———	POTENTIOMETRIC SURFACE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- - →	FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 6)
→	APPROXIMATE FLOW DIRECTION

NOTES:

1. MONITORING WELLS MW–303 THROUGH MW–308 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 15–17, 2015.
2. MONITORING WELLS MW301, MW302, AND MW309–MW311 WERE INSTALLED BY DIRECT PUSH ANALYTICAL SERVICES CORP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM FEBRUARY 29, 2016 TO MARCH 1, 2016.
3. MONITORING WELLS MW–301 THROUGH MW–311 WERE SURVEYED BY FRENCH–RENEKER ASSOCIATES OF FRANKLIN, IA ON MARCH 16, 2016.
4. MONITORING WELLS MW–312 AND MW–313 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
5. PIEZOMETERS MW–302A, MW–307A, MW–310A, AND MW–313A WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN JUNE–JULY 2020.
6. PIEZOMETERS MW–307B AND MW–313B WERE INSTALLED BY CASCADE DRILLING IN MAY 2021.
7. GROUNDWATER ELEVATION ESTIMATED BASED ON MONITORING WELLS SCREENED BELOW THE POTENTIOMETRIC SURFACE IN THE SAND UNIT.
8. BACKGROUND MONITORING WELLS FOR THE BURLINGTON GENERATING STATION ARE: MW–310 AND MW–311.
9. MW–310A IS SCREENED WITHIN MUDSTONE BEDROCK. THE GROUNDWATER ELEVATION AT THIS WELL IS NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.

N

300 0 300

SCALE: 1" = 300'

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	08/17/2022	CHECKED BY:	RM
REVISED:	01/20/2023	APPROVED BY:	TK 10/16/2023

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

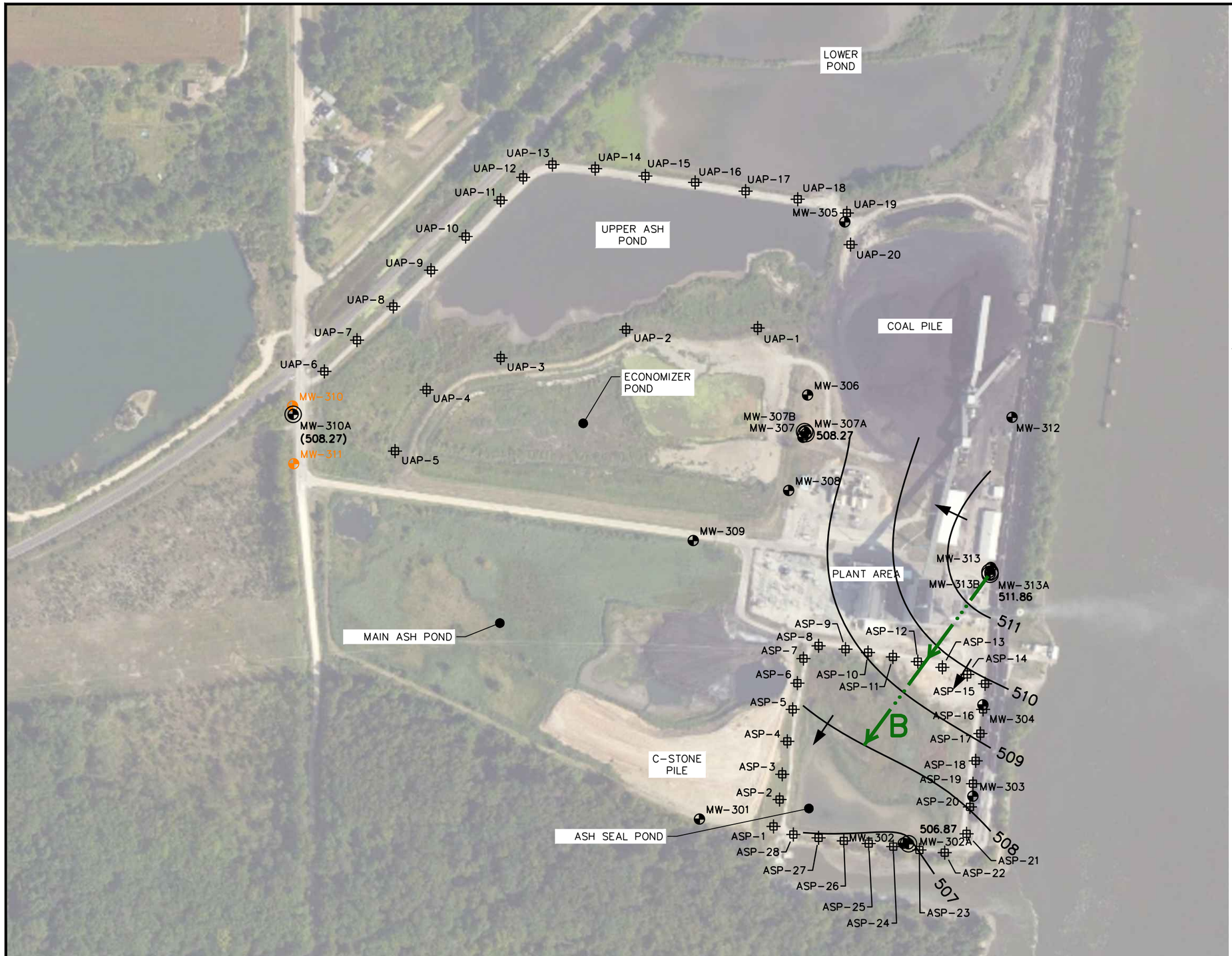
CLIENT: ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

SITE: ALLIANT ENERGY
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

DEEP POTENTIOMETRIC SURFACE MAP
APRIL 4–6, 2022

FIGURE 4

I:\25220081.00\Drawings\SOR Report\April 2022 Wtbl.dwg, 10/6/2023 2:50:19 PM



LEGEND

- MONITORING WELL
- DEEP PIEZOMETER
- CCR BACKGROUND MONITORING WELL
- DEWATERING PUMPING WELL
- **522.11** — WATER LEVEL MEASURED OCTOBER 20, 2022
- **(521.83)** — WATER LEVEL MEASURED OCTOBER 20, 2022, NOT USED FOR CONTOURING
- POTENTIOMETRIC SURFACE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 6)
- APPROXIMATE FLOW DIRECTION

NOTES:

1. MONITORING WELLS MW-303 THROUGH MW-308 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 15-17, 2015.
2. MONITORING WELLS MW301, MW302, AND MW309-MW311 WERE INSTALLED BY DIRECT PUSH ANALYTICAL SERVICES CORP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM FEBRUARY 29, 2016 TO MARCH 1, 2016.
3. MONITORING WELLS MW-301 THROUGH MW-311 WERE SURVEYED BY FRENCH-RENEKER ASSOCIATES OF FRANKLIN, IA ON MARCH 16, 2016.
4. MONITORING WELLS MW-312 AND MW-313 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
5. PIEZOMETERS MW-302A, MW-307A, MW-310A, AND MW-313A WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN JUNE-JULY 2020.
6. PIEZOMETERS MW-307B AND MW-313B WERE INSTALLED BY CASCADE DRILLING IN MAY 2021.
7. GROUNDWATER ELEVATION ESTIMATED BASED ON MONITORING WELLS SCREENED BELOW THE POTENTIOMETRIC SURFACE IN THE SAND UNIT.
8. BACKGROUND MONITORING WELLS FOR THE BURLINGTON GENERATING STATION ARE: MW-310 AND MW-311.
9. MW-310A IS SCREENED WITHIN MUDSTONE BEDROCK. THE GROUNDWATER ELEVATION AT THIS WELL IS NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.
10. ALL DEWATERING WELLS WERE IN OPERATION DURING THE OCTOBER 2022 WATER LEVEL MEASUREMENT EVENT.

N

300 0 300

SCALE: 1" = 300'

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	12/10/2022	CHECKED BY:	RM
REVISED:	12/28/2023	APPROVED BY:	TK 12/29/2023

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

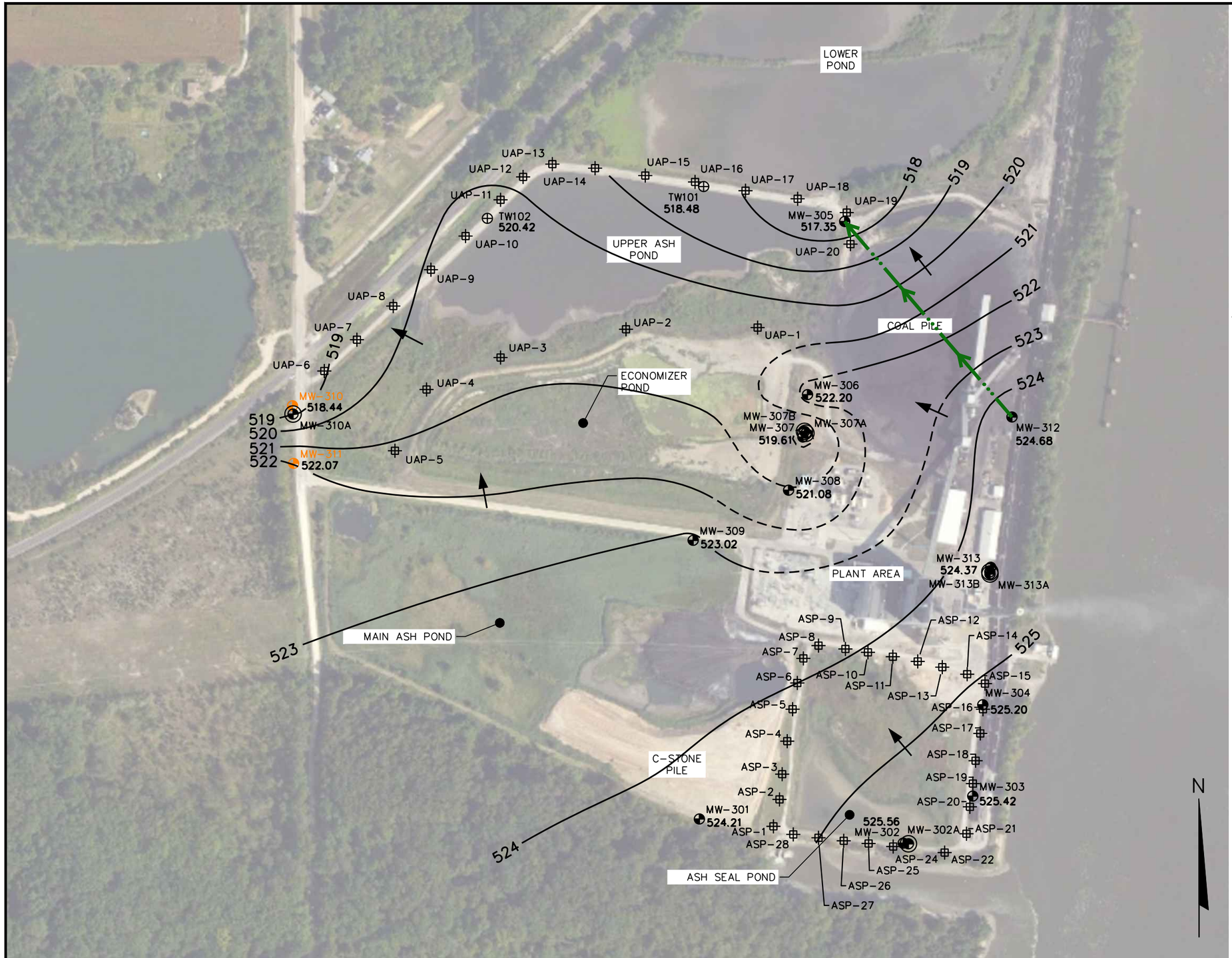
CLIENT: ALLIANT ENERGY, 4902 N. BILTMORE LANE, #1000, MADISON, WI 53718

SITE: ALLIANT ENERGY, BURLINGTON GENERATING STATION, BURLINGTON, IOWA

DEEP POTENTIOMETRIC SURFACE MAP OCTOBER 20, 2022

FIGURE 5

I:\25220081.00\Drawings\SOR Report\Oct 2022 Wtbl.dwg, 12/28/2023 1:35:57 PM



LEGEND

- MONITORING WELL
- DEEP PIEZOMETER
- CCR BACKGROUND MONITORING WELL
- TEMPORARY MONITORING WELL
- DEWATERING WELL
- 522.11 — WATER LEVEL MEASURED APRIL 24–27, 2023
- POTENTIOMETRIC SURFACE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 6)
- APPROXIMATE FLOW DIRECTION

NOTES:

1. MONITORING WELLS MW-303 THROUGH MW-308 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 15–17, 2015.
2. MONITORING WELLS MW301, MW302, AND MW309–MW311 WERE INSTALLED BY DIRECT PUSH ANALYTICAL SERVICES CORP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM FEBRUARY 29, 2016 TO MARCH 1, 2016.
3. MONITORING WELLS MW-301 THROUGH MW-311 WERE SURVEYED BY FRENCH-RENEKER ASSOCIATES OF FRANKLIN, IA ON MARCH 16, 2016.
4. MONITORING WELLS MW-312 AND MW-313 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
5. PIEZOMETERS MW-302A, MW-307A, MW-310A, AND MW-313A WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN JUNE–JULY 2020.
6. PIEZOMETERS MW-307B AND MW-313B WERE INSTALLED BY CASCADE DRILLING IN MAY 2021.
7. GROUNDWATER ELEVATION ESTIMATED BASED ON MONITORING WELLS SCREENED BELOW THE POTENTIOMETRIC SURFACE IN THE SAND UNIT.
8. MW-314 IS LOCATED APPROXIMATELY 4,000 FEET SOUTH OF THE PLANT AND IS NOT SHOWN ON THE MAP.
9. BACKGROUND MONITORING WELLS FOR THE BURLINGTON GENERATING STATION ARE: MW-310 AND MW-311.
10. WATER LEVELS WERE MEASURED BETWEEN APRIL 24 AND 27, 2023.
11. POND CLOSURE CONSTRUCTION DEWATERING ACTIVITIES WERE ONGOING AT THE SITE DURING APRIL 2023 WHERE DEWATERING WELLS UAP-1 THROUGH UAP-20 WERE ACTIVELY DEWATERING OR INTERMITTENTLY DEWATERING DURING THE APRIL 2023 EVENT. IN ADDITION, THE MISSISSIPPI RIVER STAGE WAS APPROXIMATELY 1.5 HIGHER OVER THE COURSE OF THE APRIL 2023 EVENT, SO THE GROUNDWATER GRADIENT IS REVERSED FROM TYPICAL OBSERVATIONS. DASHED LINES ARE USED TO INDICATE WHERE GROUNDWATER ELEVATION CONDITIONS ARE APPROXIMATE DUE TO TRANSIENT WATER TABLE CONDITIONS DURING THE APRIL 2023 GROUNDWATER EVENT.

300 0 300

SCALE: 1" = 300'

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	06/15/2023	CHECKED BY:	RM
REVISED:	10/28/2023	APPROVED BY:	TK 12/29/2023

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

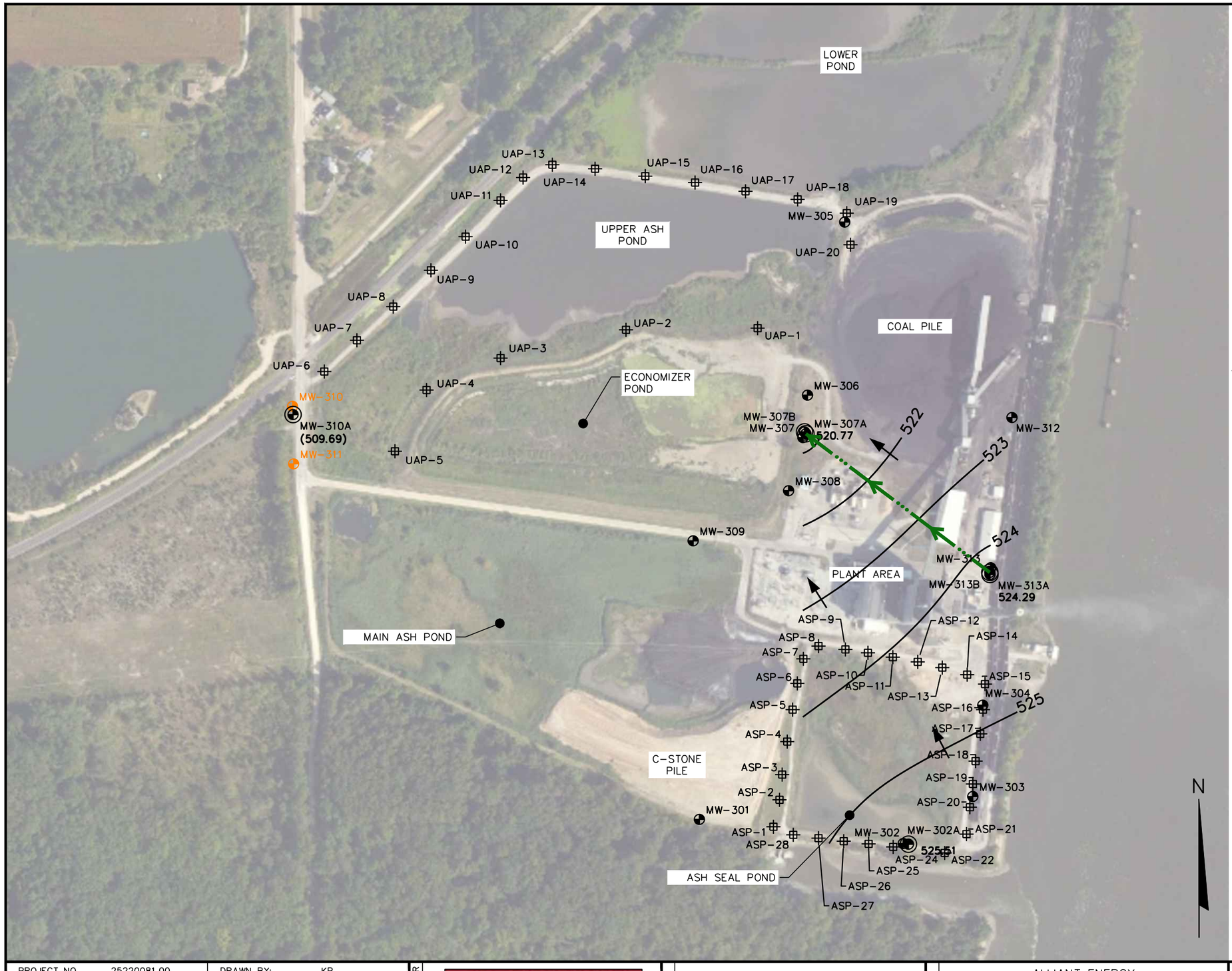
CLIENT: ALLIANT ENERGY, 4902 N. BILTMORE LANE, #1000, MADISON, WI 53718

SITE: ALLIANT ENERGY, BURLINGTON GENERATING STATION, BURLINGTON, IOWA

SHALLOW POTENTIOMETRIC SURFACE MAP APRIL 24–27, 2023

FIGURE 6

I:\25220081.00\Drawings\SOR Report\2023 Wtbl.dwg, 12/28/2023 11:53:09 AM



LEGEND

- MONITORING WELL
- DEEP PIEZOMETER
- CCR BACKGROUND MONITORING WELL
- TEMPORARY MONITORING WELL
- DEWATERING WELL
- **522.11** — WATER LEVEL MEASURED APRIL 24–27, 2023
- **(521.83)** — WATER LEVEL MEASURED APRIL 24–27, 2023, NOT USED FOR CONTOURING
- POTENTIOMETRIC SURFACE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 6)
- APPROXIMATE FLOW DIRECTION

NOTES:

1. MONITORING WELLS MW–303 THROUGH MW–308 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 15–17, 2015.
2. MONITORING WELLS MW301, MW302, AND MW309–MW311 WERE INSTALLED BY DIRECT PUSH ANALYTICAL SERVICES CORP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM FEBRUARY 29, 2016 TO MARCH 1, 2016.
3. MONITORING WELLS MW–301 THROUGH MW–311 WERE SURVEYED BY FRENCH–RENEKER ASSOCIATES OF FRANKLIN, IA ON MARCH 16, 2016.
4. MONITORING WELLS MW–312 AND MW–313 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
5. PIEZOMETERS MW–302A, MW–307A, MW–310A, AND MW–313A WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN JUNE–JULY 2020.
6. PIEZOMETERS MW–307B AND MW–313B WERE INSTALLED BY CASCADE DRILLING IN MAY 2021.
7. GROUNDWATER ELEVATION ESTIMATED BASED ON MONITORING WELLS SCREENED BELOW THE POTENTIOMETRIC SURFACE IN THE SAND UNIT.
8. BACKGROUND MONITORING WELLS FOR THE BURLINGTON GENERATING STATION ARE: MW–310 AND MW–311.
9. MW–310A IS SCREENED WITHIN MUDSTONE BEDROCK. THE GROUNDWATER ELEVATION AT THIS WELL IS NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.

300 0 300

SCALE: 1" = 300'

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	06/15/2023	CHECKED BY:	RM
REVISED:	10/28/2023	APPROVED BY:	

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

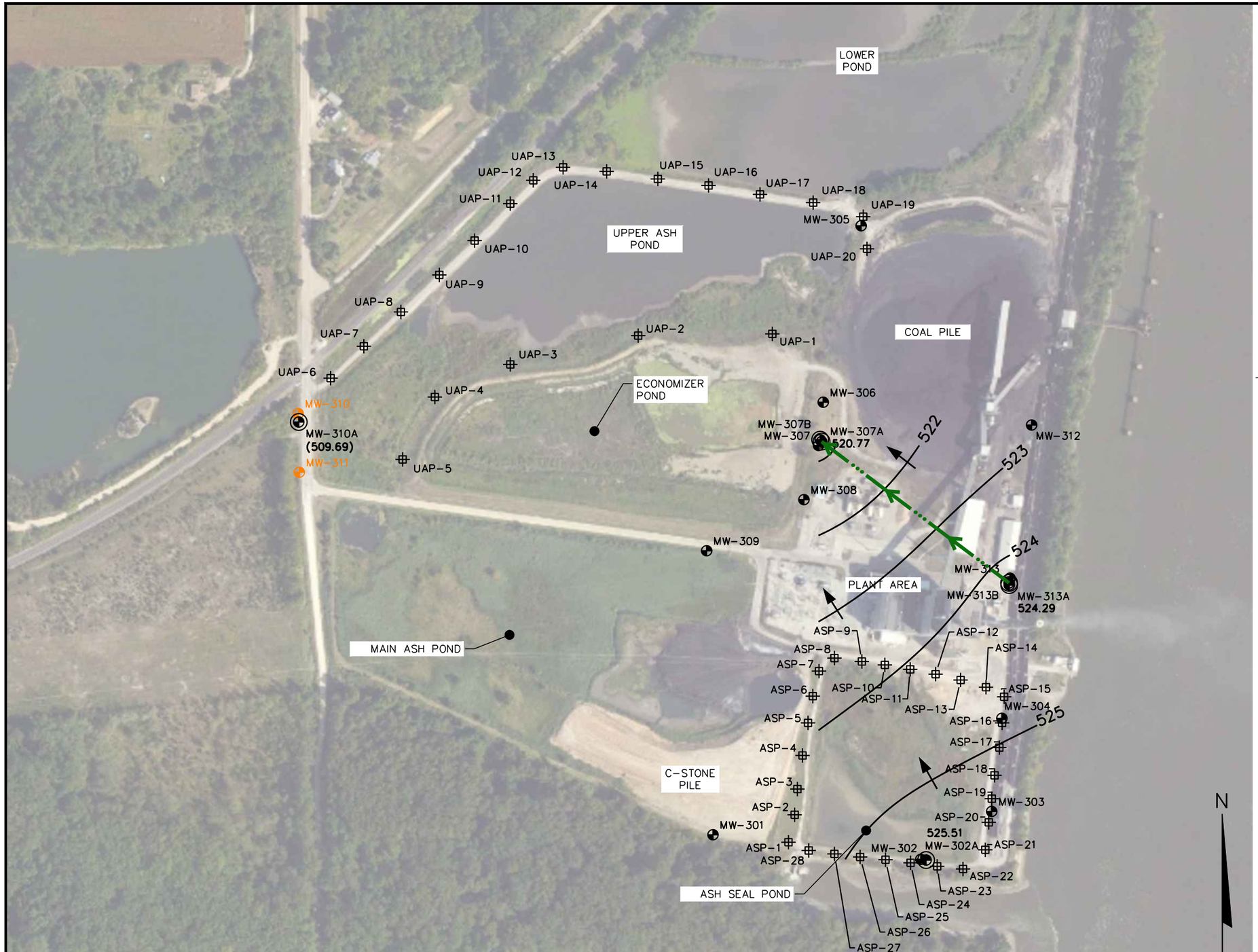
CLIENT: ALLIANT ENERGY, 4902 N. BILTMORE LANE, #1000, MADISON, WI 53718

SITE: ALLIANT ENERGY, BURLINGTON GENERATING STATION, BURLINGTON, IOWA

DEEP POTENTIOMETRIC SURFACE MAP APRIL 24–27, 2023

FIGURE 7

I:\25220081.00\Drawings\SOR Report\2023 Wtbl.dwg, 12/28/2023 11:53:11 AM



LEGEND

- MONITORING WELL
- DEEP PIEZOMETER
- CCR BACKGROUND MONITORING WELL
- TEMPORARY MONITORING WELL
- DEWATERING WELL
- **522.11** — WATER LEVEL MEASURED APRIL 24–27, 2023
- **(521.83)** — WATER LEVEL MEASURED APRIL 24–27, 2023, NOT USED FOR CONTOURING
- POTENTIOMETRIC SURFACE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 6)
- APPROXIMATE FLOW DIRECTION

NOTES:

1. MONITORING WELLS MW–303 THROUGH MW–308 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 15–17, 2015.
2. MONITORING WELLS MW301, MW302, AND MW309–MW311 WERE INSTALLED BY DIRECT PUSH ANALYTICAL SERVICES CORP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM FEBRUARY 29, 2016 TO MARCH 1, 2016.
3. MONITORING WELLS MW–301 THROUGH MW–311 WERE SURVEYED BY FRENCH–RENEKER ASSOCIATES OF FRANKLIN, IA ON MARCH 16, 2016.
4. MONITORING WELLS MW–312 AND MW–313 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
5. PIEZOMETERS MW–302A, MW–307A, MW–310A, AND MW–313A WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN JUNE–JULY 2020.
6. PIEZOMETERS MW–307B AND MW–313B WERE INSTALLED BY CASCADE DRILLING IN MAY 2021.
7. GROUNDWATER ELEVATION ESTIMATED BASED ON MONITORING WELLS SCREENED BELOW THE POTENTIOMETRIC SURFACE IN THE SAND UNIT.
8. BACKGROUND MONITORING WELLS FOR THE BURLINGTON GENERATING STATION ARE: MW–310 AND MW–311.
9. MW–310A IS SCREENED WITHIN MUDSTONE BEDROCK. THE GROUNDWATER ELEVATION AT THIS WELL IS NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.
10. POND CLOSURE CONSTRUCTION DEWATERING ACTIVITIES WERE ONGOING AT THE SITE DURING APRIL 2023 WHERE DEWATERING WELLS UAP–1 THROUGH UAP–20 WERE ACTIVELY DEWATERING OR INTERMITTENTLY DEWATERING DURING THE APRIL 2023 EVENT. IN ADDITION, THE MISSISSIPPI RIVER STAGE WAS APPROXIMATELY 1.5 HIGHER OVER THE COURSE OF THE APRIL 2023 EVENT, SO THE GROUNDWATER GRADIENT IS REVERSED FROM TYPICAL OBSERVATIONS. DASHED LINES ARE USED TO INDICATE WHERE GROUNDWATER ELEVATION CONDITIONS ARE APPROXIMATE DUE TO TRANSIENT WATER TABLE CONDITIONS DURING THE APRIL 2023 GROUNDWATER EVENT.

300 0 300

SCALE: 1" = 300'

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	06/15/2023	CHECKED BY:	RM
REVISED:	10/29/2023	APPROVED BY:	TK 12/29/2023

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

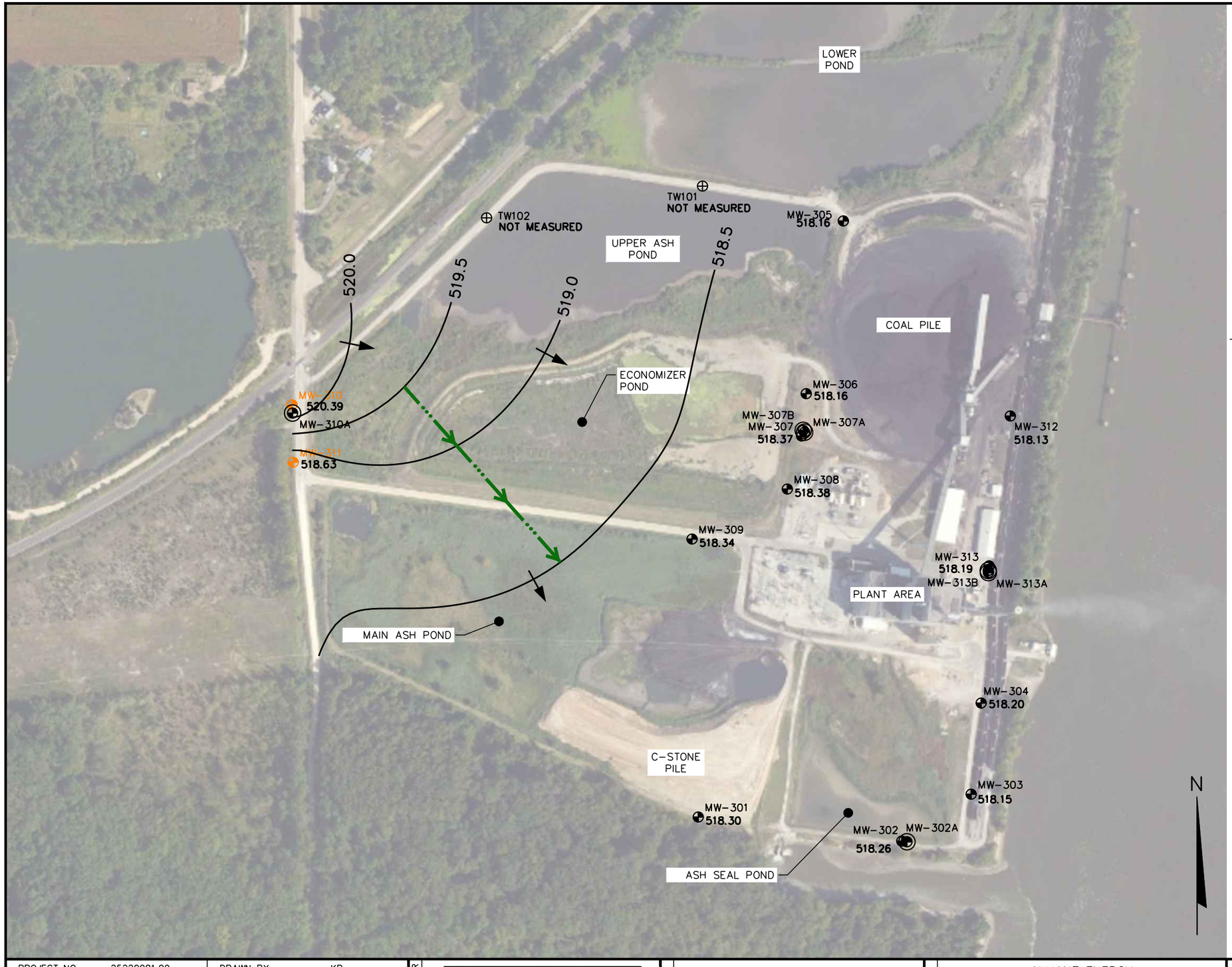
CLIENT: ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

SITE: ALLIANT ENERGY
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

DEEP POTENTIOMETRIC SURFACE MAP
APRIL 24–27, 2023

FIGURE 7

I:\25220081.00\Drawings\SOR Report\2023 Wtbl.dwg, 12/29/2023 2:04:49 PM



LEGEND

- MONITORING WELL
- DEEP PIEZOMETER
- CCR BACKGROUND MONITORING WELL
- TEMPORARY MONITORING WELL
- 522.11 — WATER LEVEL MEASURED JULY 31, 2023
- POTENTIOMETRIC SURFACE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 6)
- APPROXIMATE FLOW DIRECTION

NOTES:

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6. PIEZOMETERS MW-307B AND MW-313B WERE INSTALLED BY CASCADE DRILLING IN MAY 2021.
7. GROUNDWATER ELEVATION ESTIMATED BASED ON MONITORING WELLS SCREENED BELOW THE POTENTIOMETRIC SURFACE IN THE SAND UNIT.
8. MW-314 IS LOCATED APPROXIMATELY 4,000 FEET SOUTH OF THE PLANT AND IS NOT SHOWN ON THE MAP.
9. BACKGROUND MONITORING WELLS FOR THE BURLINGTON GENERATING STATION ARE: MW-310 AND MW-311.

300 0 300

SCALE: 1" = 300'

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	08/03/2023	CHECKED BY:	RM
REVISED:	12/29/2023	APPROVED BY:	TK 12/29/2023

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

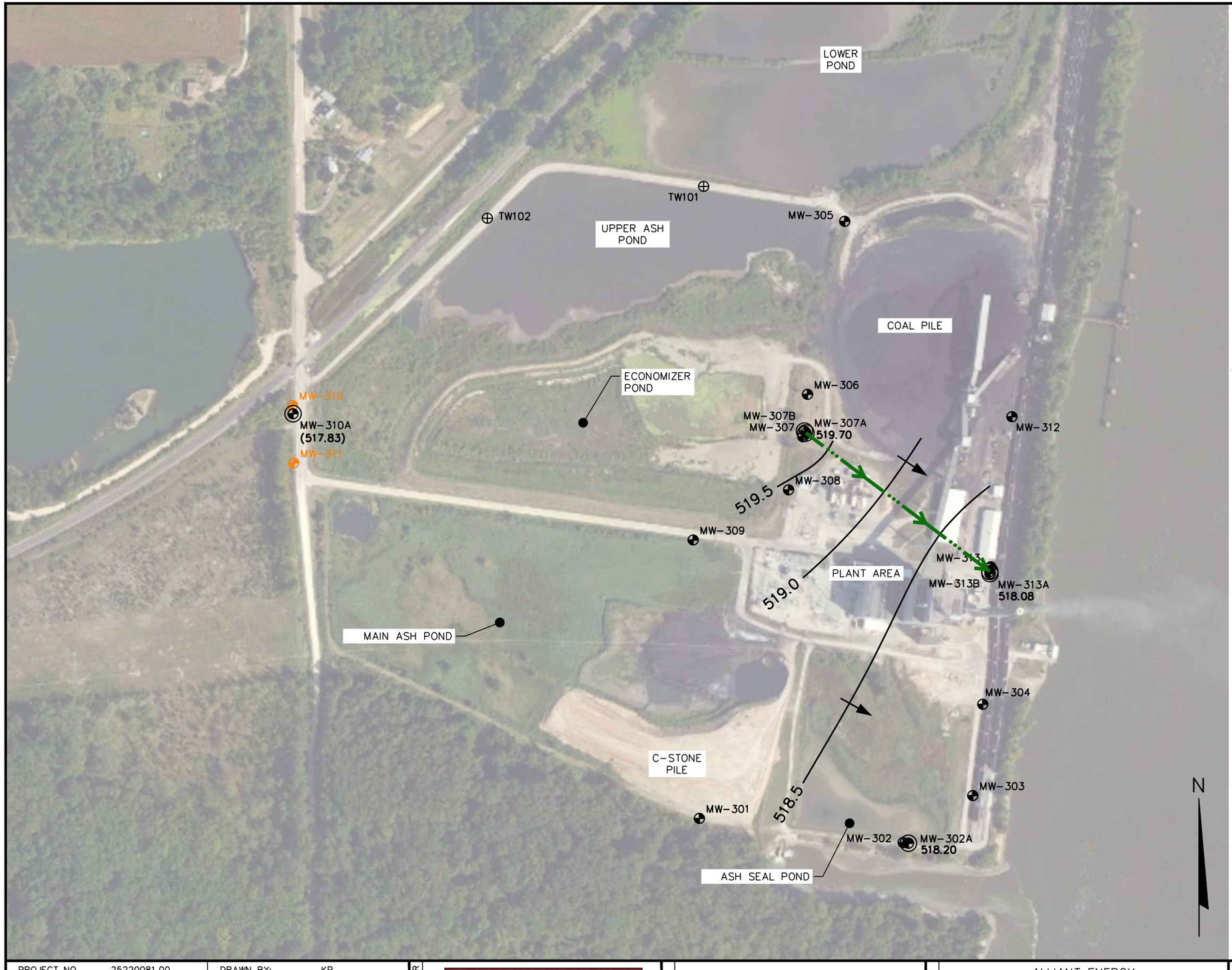
CLIENT: ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

SITE: ALLIANT ENERGY
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SHALLOW POTENTIOMETRIC SURFACE MAP
JULY 31, 2023

FIGURE 8

I:\25220081.00\Drawings\SOR Report\2023 Wtbl.dwg, 12/29/2023 2:00:15 PM



LEGEND

- MONITORING WELL
- DEEP PIEZOMETER
- CCR BACKGROUND MONITORING WELL
- TEMPORARY MONITORING WELL
- **522.11** — WATER LEVEL MEASURED JULY 31, 2023
- **(521.83)** — WATER LEVEL MEASURED JULY 31, 2023, NOT USED FOR CONTOURING
- POTENTIOMETRIC SURFACE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 6)
- APPROXIMATE FLOW DIRECTION

NOTES:

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6. PIEZOMETERS MW-307B AND MW-313B WERE INSTALLED BY CASCADE DRILLING IN MAY 2021.
7. GROUNDWATER ELEVATION ESTIMATED BASED ON MONITORING WELLS SCREENED BELOW THE POTENTIOMETRIC SURFACE IN THE SAND UNIT.
8. BACKGROUND MONITORING WELLS FOR THE BURLINGTON GENERATING STATION ARE: MW-310 AND MW-311.
9. MW-310A IS SCREENED WITHIN MUDSTONE BEDROCK. THE GROUNDWATER ELEVATION AT THIS WELL IS NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.

300 0 300

SCALE: 1" = 300'

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	08/03/2023	CHECKED BY:	RM
REVISED:	10/04/2023	APPROVED BY:	TK 10/16/2023

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

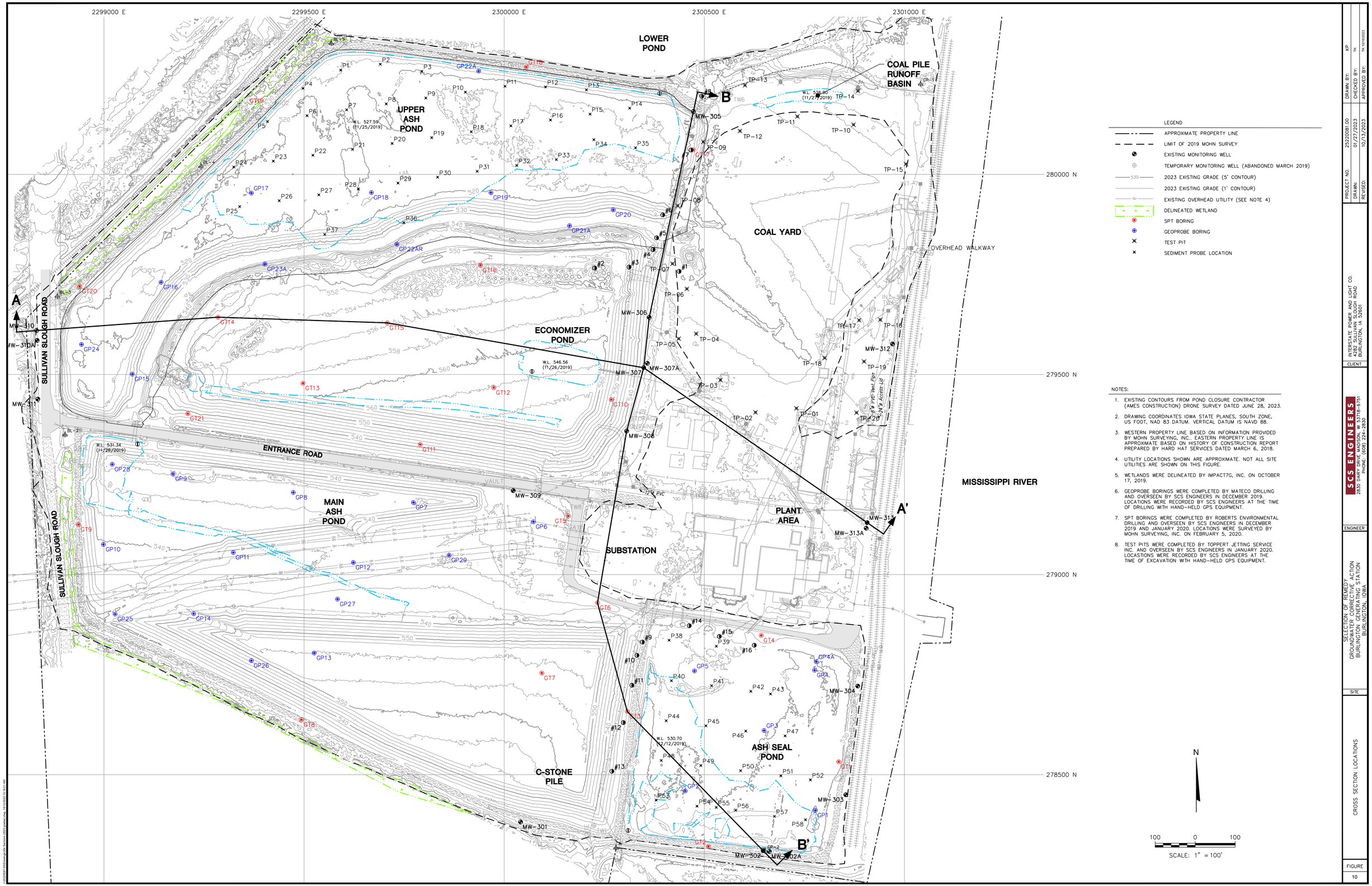
CLIENT: ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

SITE: ALLIANT ENERGY
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

DEEP POTENTIOMETRIC SURFACE MAP
JULY 31, 2023

FIGURE
9

I:\25220081.00\Drawings\SOR Report\2023 Wtbl.dwg, 10/6/2023 2:59:27 PM



NOTES:

1. EXISTING CONTOURS FROM POND CLOSURE CONTRACTOR (AMES CONSTRUCTION) DRONE SURVEY DATED JUNE 28, 2023.
2. DRAWING COORDINATES IOWA STATE PLANES, SOUTH ZONE, US FOOT, NAD 83 DATUM. VERTICAL DATUM IS NAVD 88.
3. WESTERN PROPERTY LINE BASED ON INFORMATION PROVIDED BY MOHN SURVEYING, INC.. EASTERN PROPERTY LINE IS APPROXIMATE BASED ON HISTORY OF CONSTRUCTION REPORT PREPARED BY HARD HAT SERVICES DATED MARCH 6, 2018.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. NOT ALL SITE UTILITIES ARE SHOWN ON THIS FIGURE.
5. WETLANDS WERE DELINEATED BY IMPACT7G, INC. ON OCTOBER 17, 2019.
6. GEOPROBE BORINGS WERE COMPLETED BY MATECO DRILLING AND OVERSEEN BY SCS ENGINEERS IN DECEMBER 2019. LOCATIONS WERE RECORDED BY SCS ENGINEERS AT THE TIME OF DRILLING WITH HAND-HELD GPS EQUIPMENT.
7. SPT BORINGS WERE COMPLETED BY ROBERTS ENVIRONMENTAL DRILLING AND OVERSEEN BY SCS ENGINEERS IN DECEMBER 2019 AND JANUARY 2020. LOCATIONS WERE SURVEYED BY MOHN SURVEYING, INC. ON FEBRUARY 5, 2020.
8. TEST PITS WERE COMPLETED BY TOPPERT JETTING SERVICE INC. AND OVERSEEN BY SCS ENGINEERS IN JANUARY 2020. LOCASTIONS WERE RECORDED BY SCS ENGINEERS AT THE TIME OF EXCAVATION WITH HAND-HELD GPS EQUIPMENT.

N

100 0 100

SCALE: 1" = 100'

DRAWN BY: KP
CHECKED BY: TK
APPROVED BY: TK 10/19/2023

PROJECT NO. 25220081.00
DRAWN: 01/27/2023
REVISED: 10/13/2023

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

CLIENT

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

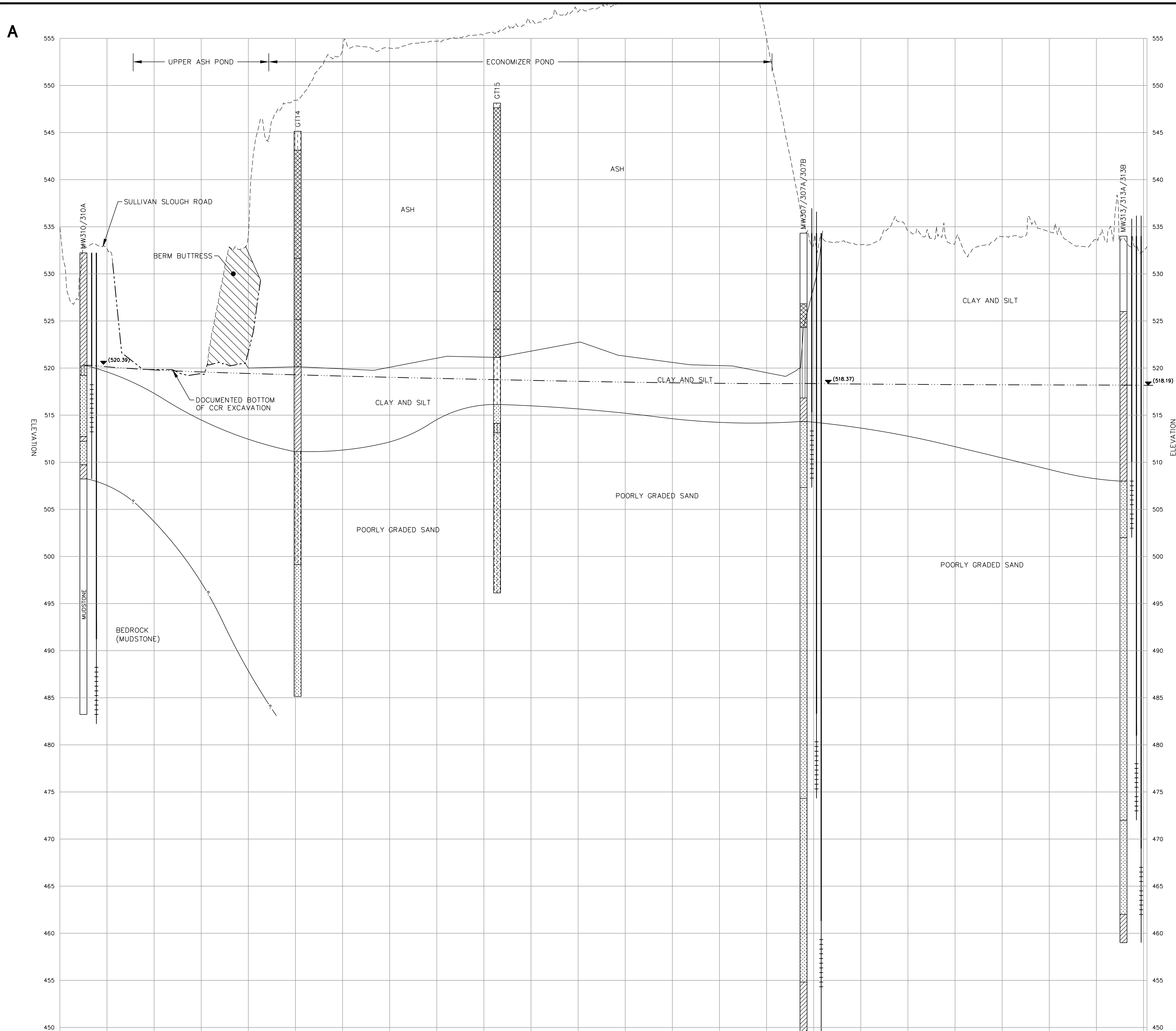
ENGINEER

SELECTION OF REMEDY / CORRECTIVE ACTION
GROUNDWATER MONITORING SYSTEM
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

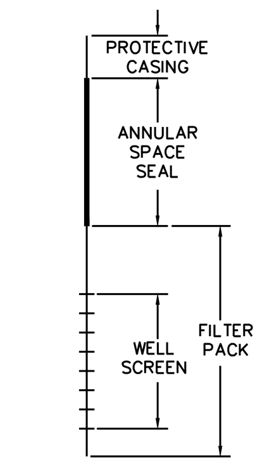
CROSS SECTION LOCATIONS

FIGURE
10



LEGEND

- SAND FILL (HYDROVAC BACKFILL)
- NON-GEOLOGIC MATERIAL
- SAND, POORLY GRADED, LITTLE OR NO FINES (SP)
- SILT (ML)
- ORGANIC SILT OR CLAY, LOW PLASTICITY (OL)
- LEAN CLAY (CL)
- FAT CLAY (CH)
- ORGANIC SILT OR CLAY WITH HIGH PLASTICITY (OH)
- GRAVEL, WELL GRADED, LITTLE OR NO FINES (GW)
- SILTY SAND (SM)
- SAND, POORLY GRADED WITH SILT (SP-SM)
- SILTY CLAY (CL-ML)
- PEAT (PT)
- EXISTING GRADE (2023)
- BOTTOM OF EXCAVATION
- POTENTIOMETRIC SURFACE ON JULY 31, 2023



WELL DETAIL

NOTES:

1. EXISTING GRADE FROM AMES DRONE SURVEY DATED JUNE 28, 2023.
2. THE POTENTIOMETRIC SURFACE ELEVATIONS WERE MEASURED ON JULY 31, 2023 AFTER COMPLETION OF EXCAVATIONS, CONSOLIDATION, AND TERMINATION OF DEWATERING.
3. THE BERM BUTTRESS WAS CONSTRUCTED BETWEEN THE FORMER UPPER ASH POND AND THE ECONOMIZER POND TO PROVIDE ADDITIONAL GEOTECHNICAL STABILITY TO THE CCR/SLOPE, SEPARATION OF CCR FROM THE NEW STORM WATER BASIN, AND FLOOD PROTECTION FOR THE CLOSURE AREA. THE BUTTRESS WAS CONSTRUCTED OF LOW PERMEABILITY SOIL.

0 100

HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 5'
VERTICAL EXAGGERATION = 20X

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	01/27/2023	CHECKED BY:	TK
REVISED:	10/13/2023	APPROVED BY:	TK 12/29/203

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

CLIENT

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

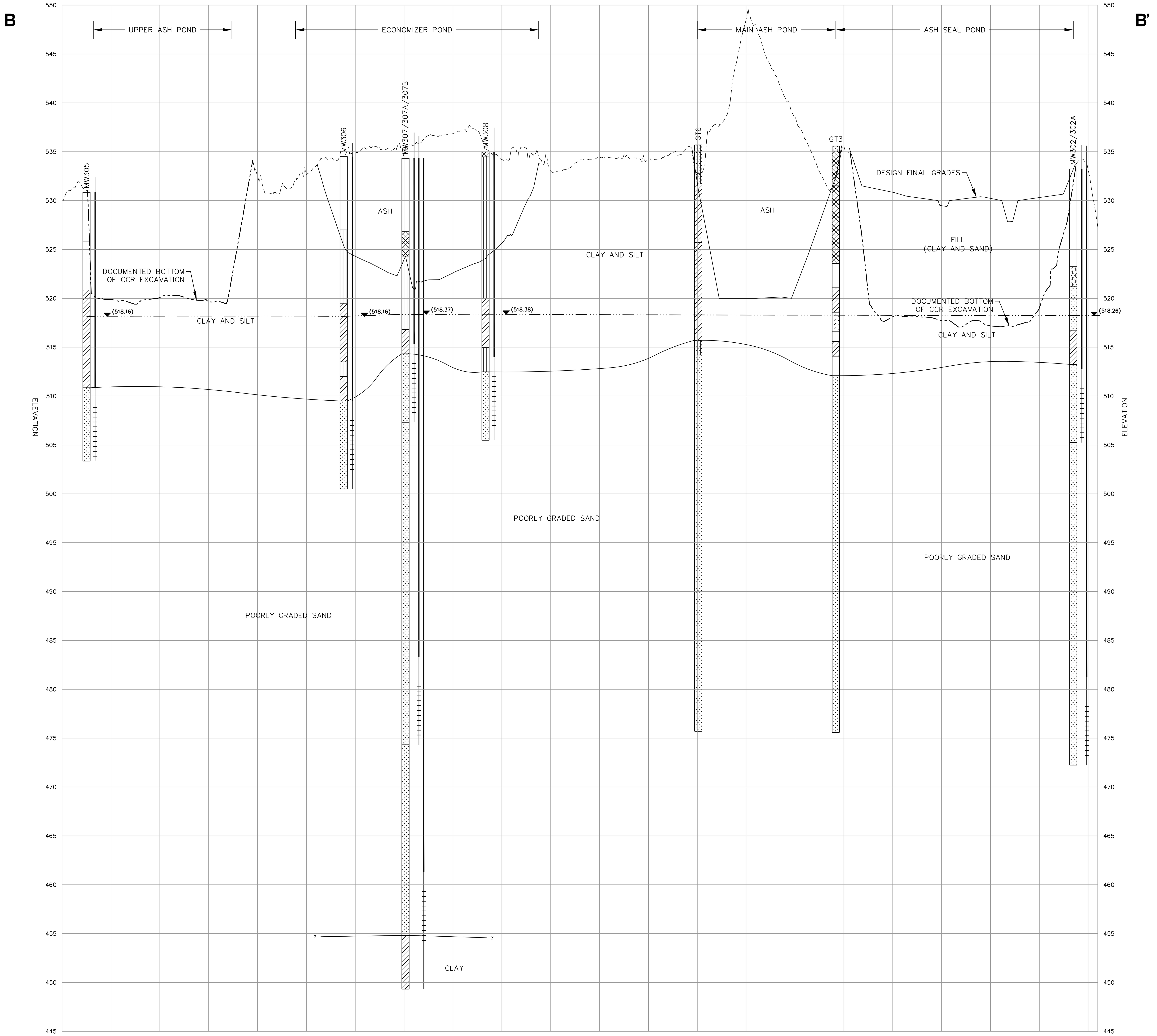
ENGINEER

SELECTION OF REMEDY
GROUNDWATER CORRECTIVE ACTION
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

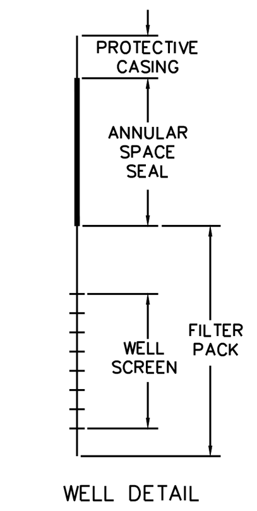
CROSS SECTION A-A'

FIGURE
11



LEGEND

- SAND FILL (HYDROVAC BACKFILL)
- NON-GEOLOGIC MATERIAL
- SAND, POORLY GRADED, LITTLE OR NO FINES (SP)
- SILT (ML)
- ORGANIC SILT OR CLAY, LOW PLASTICITY (OL)
- LEAN CLAY (CL)
- FAT CLAY (CH)
- ORGANIC SILT OR CLAY WITH HIGH PLASTICITY (OH)
- GRAVEL, WELL GRADED, LITTLE OR NO FINES (GW)
- SILTY SAND (SM)
- SAND, POORLY GRADED WITH SILT (SP-SM)
- SILTY CLAY (CL-ML)
- PEAT (PT)
- EXISTING GRADE (2023)
- BOTTOM OF EXCAVATION
- POTENTIOMETRIC SURFACE ON JULY 31, 2023



WELL DETAIL

NOTES:

1. EXISTING GRADE FROM AMES DRONE SURVEY DATED JUNE 28, 2023.
2. THE POTENTIOMETRIC SURFACE ELEVATIONS WERE MEASURED ON JULY 31, 2023 AFTER COMPLETION OF EXCAVATIONS, CONSOLIDATION, AND TERMINATION OF DEWATERING.

0 100

HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 5'
VERTICAL EXAGGERATION = 20X

PROJECT NO.	25220081.00	DRAWN BY:	KP
DRAWN:	01/27/2023	CHECKED BY:	TK
REVISED:	10/13/2023	APPROVED BY:	TK 12/29/2023

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

CLIENT

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

ENGINEER

SELECTION OF REMEDY
GROUNDWATER CORRECTIVE ACTION
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

CROSS SECTION B-B'

FIGURE 12

Appendix A

Historical Groundwater Quality Data

Single Location

Name: IPL - Burlington

Location ID: MW-301
Number of Sampling Dates: 21

Parameter Name	Units	4/20/2016	6/6/2016	8/16/2016	10/3/2016	1/10/2017	4/3/2017	6/12/2017	8/16/2017	10/16/2017	5/9/2018	8/13/2018	10/9/2018	3/12/2019	4/3/2019	10/10/2019	6/3/2020	10/16/2020	3/1/2021	4/19/2021	10/13/2021	4/6/2022
Boron	ug/L	12400	10600	13100	10500	12000	14500	10500	14000	9900	9140	12800	8040	--	12000	8100	10000	12000	--	9600	7300	11000
Calcium	mg/L	156	100	178	131	140	220	156	211	140	85.3	174	103	--	150	130	140	220	--	240	260	260
Chloride	mg/L	23.3	22.4	22.3	21.6	21.3	20.7	21.5	20.8	22	22.7	21.7	21.5	--	21	20	22	20	--	18	19	19
Fluoride	mg/L	0.55	0.29	0.43	0.3	0.37	0.36	0.23	0.45	0.27	0.36	0.52	0.26	--	0.77	<0.23	0.26	<0.23	--	0.58	<0.28	<0.22
Field pH	Std. Units	7.27	7.65	7.53	7.61	7.41	7.37	7.36	6.89	7.58	7.4	7.91	7.34	6.38	7.53	6.85	6.99	7.07	6.88	7.03	7.01	6.96
Sulfate	mg/L	193	170	206	378	385	215	511	327	454	188	187	358	--	190	390	250	170	--	240	630	550
Total Dissolved Solids	mg/L	782	630	857	729	816	1020	960	1190	780	568	960	656	--	890	690	910	970	--	1200	1500	1300
Antimony	ug/L	0.062	0.12	0.13	0.073	<0.058	0.049	<0.026	0.2	--	<0.026	<0.15	0.08	--	<0.53	<0.53	<0.58	<0.51	--	<1.1	<1.1	<0.69
Arsenic	ug/L	39.4	35	44.1	36.9	39.7	46.1	33.4	42.7	--	34.9	40.1	37.7	--	42	40	46	54	--	61	66	80
Barium	ug/L	381	239	406	294	343	464	380	479	--	198	420	276	--	380	320	330	500	--	560	170	190
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.046	<0.012	0.014	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	<0.029	<0.029	0.032	<0.018	<0.018	<0.018	--	0.04	<0.07	<0.033	--	<0.077	<0.039	<0.039	<0.049	--	0.066	0.098	0.19
Chromium	ug/L	0.67	0.38	0.56	<0.34	0.44	0.34	0.17	0.49	--	0.25	0.36	0.12	--	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1
Cobalt	ug/L	0.64	<0.5	0.52	<0.5	<0.5	0.57	0.16	0.46	--	0.15	0.45	0.1	--	0.44	0.18	0.31	0.7	--	0.81	0.74	0.7
Lead	ug/L	0.31	<0.19	<0.19	<0.19	<0.19	0.091	0.12	0.23	--	0.17	0.13	<0.13	--	<0.27	<0.27	<0.27	<0.11	--	<0.21	<0.21	<0.24
Lithium	ug/L	10.3	11.7	<4.9	22.8	20.1	13.2	29.4	18.2	--	17.8	18.9	24.5	--	13	26	16	10	--	10	11	12
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	--	<0.1	--	<0.1	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	108	116	94.5	114	113	82.8	116	98.5	--	113	81.7	120	62.7	77	130	110	67	--	46	47	55
Selenium	ug/L	0.34	<0.18	0.29	<0.18	<0.18	0.4	0.1	0.35	--	0.25	0.28	0.13	--	<1	<1	<1	<1	--	1.3	0.97	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.08	0.08	0.059	--	<0.036	--	<0.099	--	<0.27	--	<0.26	--	--	1	<0.26	<0.26
Total Radium	pCi/L	1.33	0.933	2.03	0.643	0.512	1.16	1.86	1.81	--	0.712	1.15	1.5	--	1.15	1.03	0.928/0.928	1	--	1.02	0.97	1.69
Radium-226	pCi/L	0.6	0.144	0.367	0	0.0709	0.347	0.901	1.14	--	0.712	0.693	0.534	--	0.411	0.498	0.553/0.553	0.57	--	0.774	0.406	0.719
Radium-228	pCi/L	0.729	0.789	1.66	0.643	0.441	0.817	0.954	0.671	--	-0.016	0.459	0.966	--	0.736	0.527	<0.411/0.376	0.43	--	0.247	0.564	0.973
Field Oxidation Potential	mV	-135.3	-110.7	-162.3	-156.4	-146.1	-164.7	-89.6	-90.4	38	-167.1	-145	-63.5	-73.1	-144.7	-162.9	37.1	-187.5	-176.6	-162.4	-142.8	-156.9
Field Specific Conductance	umhos/cm	898	1702	2499	1776	1985	2507	859	1925	1065	600.8	1400	892	1055	1213	1063	1167	1503	1562	1760	1858	1982
Field Temperature	deg C	12.6	13.2	13.5	14.1	13.6	12.9	13	13.8	13.8	12.9	16.8	17.2	12.56	12.35	13.9	13.4	13.7	12.2	12.3	13.6	12.3
Groundwater Elevation	feet	522.63	521.07	521.81	527.48	525.38	523.08	523.21	519.96	522.13	525.51	520.19	528.01	523.38	528.15	--	523.94	519.26	521.1	522.87	519.4	522.99
Oxygen, Dissolved	mg/L	0.09	1.12	0.11	0.5	0.1	0.12	0.17	0.05	0.12	0.08	0.35	0.24	2.61	0.59	0.23	0.25	0.09	0.16	1.61	0.17	0.13
Turbidity	NTU	10.49	1	0.51	0.54	0.9	1.12	2.02	0.4	1.26	4.23	5.78	8.43	17.1	21.1	12.55	20.15	3.41	3.5	3.82	14.1	21
pH at 25 Degrees C	Std. Units	7	7.1	7	7.2	7.2	7.4	6.9	7.1	7.2	7.2	7.2	7	--	7	7.1	7	7.8	--	7.1	7	7.1
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	760	800	720	650	740
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<4.6	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	34000	41000	39000	39000	40000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13000	13000	14000	16000	22000
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66	41	44	49	53
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	760	800	720	650	740
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	34000	40000	41000	38000	43000
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	63000	68000	75000	72000	78000
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12000	13000	15000	15000	19000
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4100	4000	3700	3300	3700
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	45000	50000	63000	110000	130000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	13

Single Location

Name: IPL - Burlington

Location ID: MW-302
Number of Sampling Dates: 22

Parameter Name	Units	4/20/2016	6/6/2016	8/16/2016	10/3/2016	1/10/2017	4/3/2017	6/12/2017	8/15/2017	10/17/2017	5/9/2018	8/13/2018	10/9/2018	3/12/2019	4/3/2019	10/10/2019	6/3/2020	10/16/2020	3/1/2021	4/19/2021	10/12/2021	2/22/2022	4/5/2022
Boron	ug/L	8570	8400	9050	9500	9590	10100	10700	9450	10000	10200	10000	10400	--	12000	11000	13000	11000	--	11000	10000	--	11000
Calcium	mg/L	242	243	231	251	225	232	216	225	231	231	210	219	--	220	220	210	200	--	200	160	--	190
Chloride	mg/L	18.3	15.2	16.1	15.4	15.2	16.6	15	15.7	16.4	14.1	14.7	13.5	--	13	11	12	10	--	10	12	--	12
Fluoride	mg/L	0.11	<0.073	0.08	0.086	<0.027	<0.1	<0.1	<0.1	0.11	0.11	<0.063	<0.19	--	0.37	<0.23	<0.23	<0.23	--	<0.28	<0.28	--	<0.22
Field pH	Std. Units	8.17	8.06	8.3	8.24	8.22	8.71	8.06	8.38	8.72	8.19	9.32	7.89	6.94	8.7	7.49	7.88	7.87	7.95	8.15	8.28	8.16	8.05
Sulfate	mg/L	666	525	669	579	536	540	552	512	541	553	542	658	--	510	510	490	460	--	410	280	--	310
Total Dissolved Solids	mg/L	1040	1140	988	977	969	945	937	989	951	1080	1000	1030	--	1000	960	1000	910	--	860	680	--	770
Antimony	ug/L	0.14	0.15	<0.058	0.096	<0.058	0.043	0.04	0.16	--	<0.026	<0.15	0.082	--	<0.53	<0.53	<0.58	<0.51	--	<1.1	<1.1	--	<0.69
Arsenic	ug/L	71.3	68.4	64.1	73.5	64.9	49.1	72	58.5	--	56.2	49.6	76.4	--	53	73	110	76	--	75	100	94	86
Barium	ug/L	430	476	361	446	355	356	370	348	--	363	340	180	--	320	260	340	250	--	320	270	--	320
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.023	<0.012	0.012	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	--	<0.27
Cadmium	ug/L	0.043	<0.029	<0.029	<0.029	<0.029	<0.018	0.021	<0.018	--	0.037	<0.07	0.04	--	<0.077	<0.039	0.045	0.11	--	0.089	0.12	--	0.055
Chromium	ug/L	<0.34	<0.34	0.45	<0.34	0.46	0.15	0.11	0.31	--	0.22	0.33	0.097	--	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	--	<1.1
Cobalt	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.19	0.24	0.24	--	0.19	0.15	0.18	--	0.19	0.23	0.21	0.26	--	0.21	0.27	--	0.21
Lead	ug/L	0.21	<0.19	<0.19	<0.19	<0.19	0.058	0.064	0.22	--	0.17	<0.12	<0.13	--	0.58	<0.27	<0.27	0.17	--	<0.21	<0.21	--	<0.24
Lithium	ug/L	60.5	69.6	37.6	64.2	62.6	57.3	60.7	56.9	--	65.4	61.4	57.8	59.9	56	57	55	64	--	64	64	--	78
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	--	<0.1	--	<0.1	<0.1	--	<0.15	--	--	<0.11
Molybdenum	ug/L	85.8	84.4	92.5	105	104	105	131	113	--	118	121	122	123	100	100	140	130	--	130	91	--	89
Selenium	ug/L	0.3	0.22	0.27	0.2	<0.18	0.24	0.23	0.24	--	0.25	0.22	0.23	--	<1	<1	<1	1.1	--	1.4	<0.96	--	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.04	0.078	0.41	--	<0.036	--	<0.099	--	<0.27	--	<0.26	--	--	1.2	<0.26	--	1.8
Total Radium	pCi/L	1.82	1.11	0.202	1.24	1.59	1.13	1.84	1.2	--	1.51	1.53	2.15	--	0.872	0.644	0.626/0.626	0.245	--	0.906	1.22	--	0.687
Radium-226	pCi/L	0	0.392	0	0.803	0.604	0.639	0.713	0.238	--	0.621	0.443	1.1	--	0.362	0.374	0.263/0.263	0.245	--	0.493	0.605	--	0.401
Radium-228	pCi/L	1.82	0.715	0.202	0.439	0.987	0.494	1.13	0.962	--	0.886	1.09	1.05	--	0.51	0.27	<0.394/0.363	-0.113	--	0.413	0.611	--	0.286
Field Oxidation Potential	mV	-181.1	-147	-167.1	-194.3	-182.6	-227.8	-154.4	-179.2	-49.7	-217.2	-237	-198	-70.3	-215.8	-186.8	36.7	-237.1	-236.9	-225.8	-193.7	207.4	-198.6
Field Specific Conductance	umhos/cm	1032	2053	34.4	2202	2167	2037	833	1752	1165	1268	1226	1334	792	1164	1249	1245	1168	1101	1169	1043	1082	989
Field Temperature	deg C	12.7	12.7	13.6	13.8	13.7	13.2	12.94	13.7	13.9	13	14.9	15.2	12.16	11.41	14.46	12.9	12.9	12.3	12	13.8	12.5	12.3
Groundwater Elevation	feet	521.91	521.21	521.35	527.54	525.5	522.84	522.84	519.39	522.2	525.81	519.87	528.08	522.83	528.21	--	523.98	518.94	520.21	522.27	518.75	519.03	522.34
Oxygen, Dissolved	mg/L	0.1	0.8	9.35	0.39	0.21	0.12	0.13	0.18	0.09	1	0.15	0.3	2.68	0.58	0.28	0.18	0.08	0.11	0.07	0.18	0.13	0.07
Turbidity	NTU	10.65	2.56	0.19	1.36	0.47	1.99	0.59	0.25	2.04	2.25	3.75	6.48	22.1	18.8	1.16	25.27	0.07	2.7	4.07	31.2	2.1	9
pH at 25 Degrees C	Std. Units	7.8	7.8	7.6	7.8	7.9	8	7.6	7.8	8	7.9	8	7.7	--	8.1	7.7	7.6	8.2	--	8.2	7.9	--	8.1
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	240	190	220	560	--	310
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<4.2	<4.6	<4.6	--	<4.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3200	2000	1600	2900	--	1300
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1600	1300	1100	1700	--	1000
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	120	130	120	110	--	89
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	240	190	220	560	--	310
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2900	2400	2000	3600	--	1200
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18000	15000	15000	17000	--	14000
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1400	1300	1200	1700	--	930
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12000	13000	13000	12000	--	14000
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24000	27000	30000	28000	--	33000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64	66	59	63	--	80

Single Location

Name: IPL - Burlington

Location ID: MW-302A
Number of Sampling Dates: 7

Parameter Name	Units	9/9/2020	10/16/2020	3/1/2021	4/19/2021	10/12/2021	4/5/2022	10/20/2022
Boron	ug/L	11000	11000	--	9400	9000	15000	1600
Calcium	mg/L	120	130	--	140	140	160	160
Chloride	mg/L	27	23	--	17	20	21	13
Fluoride	mg/L	<0.23	<0.23	--	<0.28	<0.28	<0.22	<0.22
Field pH	Std. Units	7.31	7.26	7.2	7.34	7.69	7.25	7.09
Sulfate	mg/L	340	330	--	310	410	450	170
Total Dissolved Solids	mg/L	730	710	--	710	780	910	630
Antimony	ug/L	<0.51	1.7	--	<1.1	<1.1	<0.69	<0.69
Arsenic	ug/L	2.9	2.9	--	2.1	1.7	3	2.3
Barium	ug/L	270	280	--	310	230	310	420
Beryllium	ug/L	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.049	0.065	--	<0.051	<0.051	0.087	<0.055
Chromium	ug/L	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	0.12	0.11	--	0.11	<0.19	0.2	<0.19
Lead	ug/L	0.11	<0.11	--	<0.21	<0.21	<0.24	<0.24
Lithium	ug/L	11	11	11	9.6	12	22	13
Mercury	ug/L	<0.1	<0.1	--	<0.15	--	<0.11	<0.11
Molybdenum	ug/L	120	110	87	95	93	120	36
Selenium	ug/L	<1	<1	--	<0.96	<0.96	<0.96	<0.96
Thallium	ug/L	<0.26	--	--	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	1.15	0.785	--	1.4	2.08	2.14	2.65
Radium-226	pCi/L	0.421	-0.0548	--	0.641	0.854	0.694	0.82
Radium-228	pCi/L	0.727	0.785	--	0.755	1.22	1.45	1.83
Field Oxidation Potential	mV	-142	-175.3	-165.6	-150.2	-115.3	-153.2	-115
Field Specific Conductance	umhos/cm	1013	951	975	1026	1124	1108	1090
Field Temperature	deg C	13.3	13.1	12.5	12.7	13.6	12.7	16.7
Groundwater Elevation	feet	519.71	518.79	520.14	522.25	518.64	522.28	506.87
Oxygen, Dissolved	mg/L	0.27	0.19	0.16	0.18	0.26	0.12	0
Turbidity	NTU	0.01	3.82	0.48	2.94	11.2	5	5
pH at 25 Degrees C	Std. Units	7.4	8	--	7.4	7.3	7.3	7.1
Bicarbonate Alkalinity as CaCO3	mg/L	--	150	180	190	200	250	430
Carbonate Alkalinity as CaCO3	mg/L	--	<3.8	<4.2	<2.3	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	8600	8600	7500	6600	8400	11000
Manganese, dissolved	ug/L	--	3800	3500	3500	3300	3800	3700
Molybdenum, dissolved	ug/L	--	120	90	89	99	120	36
Total Alkalinity as CaCO3	mg/L	--	150	180	190	200	250	430
Iron, total	ug/L	--	8400	8300	8000	6900	8800	11000
Magnesium, total	ug/L	--	28000	32000	34000	33000	34000	33000
Manganese, total	ug/L	--	3600	3300	3600	3500	4000	4300
Potassium, total	ug/L	--	3600	3600	3500	3600	4400	6900
Sodium, total	ug/L	--	34000	32000	33000	51000	70000	14000
Lithium, dissolved	ug/L	--	--	12	9.1	12	21	14

Single Location

Name: IPL - Burlington

Location ID: MW-303
Number of Sampling Dates: 21

Parameter Name	Units	4/20/2016	6/6/2016	8/16/2016	10/3/2016	1/10/2017	4/3/2017	6/12/2017	8/15/2017	10/17/2017	5/9/2018	8/13/2018	10/10/2018	3/12/2019	4/3/2019	10/10/2019	6/3/2020	10/16/2020	3/1/2021	4/19/2021	10/13/2021	4/5/2022
Boron	ug/L	25800	27500	26700	26100	25400	28800	26600	24100	25400	22900	24500	24500	--	22000	21000	23000	19000	--	16000	17000	22000
Calcium	mg/L	86.3	79.9	81.3	87.8	71.2	88.6	105	79.4	84.5	87	85.9	87.8	--	86	91	120	120	--	140	130	140
Chloride	mg/L	17	16	16.3	16.1	14.4	15.2	17.3	15.3	15.3	15.1	15.7	16.3	--	15	16	18	17	--	15	17	16
Fluoride	mg/L	0.43	0.16	0.28	0.28	0.18	0.2	0.22	0.24	0.25	0.22	0.44	0.27	--	0.43	<0.23	0.27	<0.23	--	<0.28	<0.28	<0.22
Field pH	Std. Units	7.39	7.48	7.57	7.56	7.64	7.57	7.24	6.97	8.59	7.51	8.03	7.1	6.46	7.79	7.13	7.12	7.19	7.15	7.25	7.25	7.36
Sulfate	mg/L	34.6	23.3	14.8	6.6	34.1	24.1	3.9	46	42.1	128	78.7	31.8	--	120	84	100	190	--	250	250	310
Total Dissolved Solids	mg/L	450	441	440	447	404	454	557	434	436	502	520	462	--	540	420	640	630	--	670	610	650
Antimony	ug/L	0.55	0.12	<0.058	0.09	<0.058	0.029	<0.026	0.13	--	<0.026	<0.15	<0.078	--	<0.53	<0.53	<0.58	0.57	--	<1.1	<1.1	<0.69
Arsenic	ug/L	38.6	26.5	44.5	33	12.8	21.7	48.1	30.9	--	7.9	52	29.8	--	6.4	17	18	14	--	15	14	5.7
Barium	ug/L	361	250	230	237	267	334	386	281	--	412	354	415	--	440	440	610	480	--	450	360	270
Beryllium	ug/L	0.9	<0.08	<0.08	<0.08	<0.08	0.019	0.018	0.02	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	0.58	<0.029	<0.029	<0.029	<0.029	<0.018	<0.018	0.018	--	0.028	<0.07	<0.033	--	<0.077	<0.039	<0.039	<0.049	--	<0.051	0.051	0.097
Chromium	ug/L	23.4	0.48	0.4	<0.34	0.78	0.2	0.43	0.38	--	0.27	0.29	0.69	--	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1
Cobalt	ug/L	7.8	0.56	0.55	0.64	<0.5	0.38	0.68	0.42	--	0.31	0.46	0.62	--	0.36	0.45	0.56	0.49	--	0.42	0.42	0.35
Lead	ug/L	21	<0.19	<0.19	<0.19	0.21	0.047	<0.033	0.14	--	0.21	0.22	0.54	--	0.49	<0.27	0.29	0.18	--	<0.21	<0.21	<0.24
Lithium	ug/L	35.8	34.6	24	30.3	48.8	46.6	26.2	45.1	--	50.7	42.1	35.8	51.6	52	46	48	59	--	66	61	80
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	--	<0.1	--	<0.1	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	67.4	55.4	39.4	34.2	52.8	51.7	33.8	73.1	--	75.4	77.9	56.5	--	110	76	66	84	--	120	120	190
Selenium	ug/L	2.2	<0.18	0.3	0.22	0.26	0.28	0.3	0.23	--	0.19	0.24	0.33	--	<1	<1	<1	<1	--	<0.96	<0.96	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.063	<0.036	0.13	--	<0.036	--	<0.099	--	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	2.18	0.522	1.59	0.464	1.98	1.53	1.86	2.19	--	1.64	1.79	1.91	--	1.26	1.04	0.892/0.892	1.26	--	2.21	0.678	1.52
Radium-226	pCi/L	0.866	0	0.269	0.393	0.677	0.542	0.734	1.37	--	0.677	0.462	0.997	--	0.552	0.728	0.804/0.804	0.317	--	0.866	0.628	0.795
Radium-228	pCi/L	1.31	0.522	1.32	0.0706	1.3	0.99	1.13	0.821	--	0.965	1.33	0.913	--	0.703	0.316	<0.511/0.0877	0.944	--	1.35	0.0509	0.723
Field Oxidation Potential	mV	-101.6	-113	-184.4	-164.5	-150.6	-163.9	-102.9	-132	21.3	-165.5	-153	-132	-68.1	-122.8	-161	58.1	-185.6	-174.2	-144.8	-118.4	-155.8
Field Specific Conductance	umhos/cm	513	1009	1271	1175	1024	1100	599.8	887	612.6	535.7	748	774	549	711	767	934	902	916	995	843	845
Field Temperature	deg C	13.8	13.9	14.2	14.8	14.3	14.1	14.2	14.4	14.5	13.8	16.8	15.6	13.62	12.63	14.91	14.8	13.7	13.6	13.2	13.9	12.7
Groundwater Elevation	feet	521.76	521.26	521.31	527.57	525.56	522.81	522.8	519.3	522.23	525.8	519.78	528.78	522.74	528.22	--	523.97	518.78	520.09	522.13	518.58	522.2
Oxygen, Dissolved	mg/L	0.08	1.02	1.31	0.48	0.1	0.1	0.2	0.07	0.13	0.11	0.24	1	2.38	0.67	0.26	0.18	0.12	0.12	0.19	0.16	0.1
Turbidity	NTU	487.4	2.45	0.24	3.76	3.85	4.42	2.57	0.46	2.79	0.97	14.26	17.3	19.4	18.2	5.36	16.03	2.03	1.82	4.35	13.6	21
pH at 25 Degrees C	Std. Units	7.2	7.4	7.2	7.3	7.6	7.6	6.9	7.2	7.3	7.4	7.3	7.1	--	7.4	7.4	7.2	8	--	7.3	7.3	7.5
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290	210	280	270	210
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<4.6	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8700	7600	7500	7000	4400
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3900	3400	3800	4000	3400
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	85	120	110	130	180
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290	210	280	270	210
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8500	7600	7900	6900	4600
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	21000	20000	22000	20000	16000
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3400	4000	4000	3500
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22000	22000	23000	18000	22000
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30000	33000	34000	28000	29000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	59	66	59	62	77

Single Location

Name: IPL - Burlington

Location ID: MW-304
Number of Sampling Dates: 21

Parameter Name	Units	4/20/2016	6/6/2016	8/16/2016	10/3/2016	1/9/2017	4/3/2017	6/12/2017	8/15/2017	10/17/2017	5/9/2018	8/13/2018	10/10/2018	3/12/2019	4/3/2019	10/10/2019	6/3/2020	10/15/2020	3/1/2021	4/19/2021	10/13/2021	4/5/2022
Boron	ug/L	5020	5050	5050	4910	5350	5340	5160	5370	5580	5140	5440	6180	--	6300	5100	6400	7400	--	7700	7600	12000
Calcium	mg/L	142	137	144	155	136	118	90.1	97.2	103	107	102	88.5	--	72	140	150	150	--	110	130	130
Chloride	mg/L	34.7	30	28.2	30.7	47.7	39.2	35.2	30.2	46.5	58.1	25.9	50.3	--	39	25	21	21	--	18	23	27
Fluoride	mg/L	0.092	<0.073	<0.027	0.072	<0.027	<0.1	<0.1	<0.1	0.12	0.11	0.13	<0.19	--	0.35	<0.23	<0.23	<0.23	--	<0.28	<0.28	<0.22
Field pH	Std. Units	9.2	8.65	9.42	9.25	9.44	8.58	7.93	8.71	9.52	8.51	7.6	9.01	6.94	8.56	7.17	7.23	8.46	8.26	8.32	7.53	8.08
Sulfate	mg/L	397	324	383	431	330	263	211	216	248	273	188	271	--	140	220	250	420	--	280	220	240
Total Dissolved Solids	mg/L	706	678	718	721	651	593	519	501	540	657	551	537	--	460	710	750	820	--	640	570	640
Antimony	ug/L	0.77	0.77	0.76	0.51	0.8	0.63	0.51	0.88	--	0.75	0.3	0.77	--	0.66	<0.53	<0.58	0.52	--	<1.1	<1.1	<0.69
Arsenic	ug/L	60	59.4	64.3	58.9	68.7	60	58.4	65.6	--	57.2	45.4	58.3	--	59	36	35	49	--	41	32	44
Barium	ug/L	112	127	115	130	117	131	126	84.7	--	115	140	92	--	90	210	220	170	--	180	160	140
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.036	<0.012	<0.012	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	<0.029	<0.029	<0.029	<0.018	<0.018	<0.018	--	<0.018	<0.07	0.054	--	<0.077	<0.039	<0.039	<0.049	--	<0.051	<0.051	<0.055
Chromium	ug/L	<0.34	<0.34	0.58	0.42	<0.34	0.16	0.087	0.3	--	0.22	0.34	0.091	--	<0.98	<0.98	<1.1	<4.4	--	<1.1	<1.1	<1.1
Cobalt	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.13	0.11	0.1	--	0.098	<0.15	0.19	--	0.11	0.13	0.15	<0.36	--	<0.091	<0.19	<0.19
Lead	ug/L	<0.19	<0.19	<0.19	<0.19	<0.19	<0.033	<0.033	0.9	--	<0.033	<0.12	<0.13	--	<0.27	<0.27	<0.27	<0.11	--	<0.21	<0.21	<0.24
Lithium	ug/L	52.4	57.8	48.5	61	70.7	52.1	44.1	51	--	63.8	34.3	82.4	35.9	52	38	47	92	--	75	60	74
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	--	<0.1	--	0.11	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	101	105	118	131	121	90.6	67.4	66.8	--	126	74.9	113	47.4	58	47	45	140	--	100	59	85
Selenium	ug/L	<0.18	<0.18	0.23	0.24	0.24	0.31	0.19	0.26	--	0.24	0.21	0.26	--	<1	<1	<1	<4	--	<0.96	<0.96	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.068	<0.036	0.12	--	<0.036	--	<0.099	--	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	1.26	0.659	1.1	1.16	0.455	0.742	1.29	0.752	--	0.589	0.725	0.706	--	0.408	0.781	0.573/0.573	0.304	--	0.699	0.797	0.469
Radium-226	pCi/L	0	0.0649	0.22	0.458	0.067	0.48	0.928	0.404	--	0.405	0.151	0.233	--	0.116	0.353	0.3/0.3	0.0765	--	0.213	0.201	0.0974
Radium-228	pCi/L	1.26	0.594	0.881	0.704	0.388	0.262	0.362	0.348	--	0.184	0.574	0.473	--	0.292	0.428	<0.375/0.272	0.227	--	0.486	0.596	0.371
Field Oxidation Potential	mV	-309.5	-153	-301	-251.4	-274.8	-260.1	-160.6	-231.3	5.9	-273	-202	-100.2	-73.8	-216.7	-157.5	52.4	-282.6	-280.2	-257.8	-149	-204.7
Field Specific Conductance	umhos/cm	766	1455	1840	1712	1634	1427	512.5	971	756	906	836	780	460	658	934	1087	1062	971	935	806	825
Field Temperature	deg C	13.9	14	14.4	15.3	15	14.1	14.3	14.8	15.1	13.5	18.1	17.41	13.87	12.96	15.64	14.6	14.7	14.1	13.2	14.5	13.2
Groundwater Elevation	feet	521.78	521.28	521.37	527.57	525.62	522.87	522.9	519.23	522.32	525.85	519.81	528.82	522.8	528.27	--	524.02	518.69	520.15	522.24	518.68	522.41
Oxygen, Dissolved	mg/L	0.04	1.55	4.79	0.43	0.11	0.11	0.17	0.03	0.1	1.4	0.09	0.23	2.11	0.39	0.28	0.15	0.08	0.07	0.07	0.15	0.07
Turbidity	NTU	1.43	1.26	0.01	0.3	0	0.61	0.23	0.26	1.89	2.84	4.26	1.36	9.28	6.22	1.18	18.18	0.02	0.02	3.34	7.7	9
pH at 25 Degrees C	Std. Units	8.8	8.9	8.8	8.8	8.2	7.9	7.9	8.8	8.9	8.3	7.5	8.6	--	8	7.5	7.4	8.4	--	8.3	8	7.9
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	130	130	150	250	250
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<2.6	<2.3	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	720	1100	1300	1900	830
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	440	760	680	1100	880
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	140	140	99	90	83
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	130	130	150	250	250
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	660	1200	1500	2000	990
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3800	5200	6300	6600	6400
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	380	750	710	1100	920
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14000	15000	11000	12000	13000
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	51000	46000	53000	46000	51000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	93	86	57	61	72

Single Location

Name: IPL - Burlington

Location ID: MW-305
Number of Sampling Dates: 20

Parameter Name	Units	4/20/2016	6/6/2016	8/17/2016	10/3/2016	1/10/2017	4/3/2017	6/13/2017	8/16/2017	10/16/2017	5/9/2018	8/13/2018	10/10/2018	4/3/2019	10/11/2019	6/3/2020	10/15/2020	3/2/2021	4/20/2021	10/14/2021	4/6/2022
Boron	ug/L	1990	2040	1750	1730	1910	1880	2180	1950	2480	2000	2400	2040	2000	2100	2200	2400	--	2200	2400	2400
Calcium	mg/L	116	119	95.1	93.1	88.8	82.8	96.3	80.2	92.2	82.5	103	93.2	83	90	120	120	--	110	130	110
Chloride	mg/L	34.8	32.9	34.5	32.3	34.8	34.2	37	34.3	35.8	34.8	34.8	34.9	33	33	36	32	--	28	34	31
Fluoride	mg/L	0.45	0.28	0.3	0.43	0.34	0.42	0.43	0.48	0.43	0.48	0.45	0.44	0.75	0.37	0.45	<0.23	--	0.45	0.31	<0.22
Field pH	Std. Units	7.25	7.75	7.54	7.63	7.48	7.55	7.74	7	7.78	7.72	7.81	7.29	7.8	7.36	7.12	7.23	7.29	7.3	7.24	7.25
Sulfate	mg/L	35.7	68	26.9	38.1	19.2	10.2	35	13.4	24.6	11.7	24.8	19.6	10	8.8	33	54	--	28	52	19
Total Dissolved Solids	mg/L	574	590	502	467	455	410	532	435	437	441	542	490	470	490	640	600	--	420	570	490
Antimony	ug/L	0.11	0.11	<0.058	0.082	<0.058	<0.026	<0.026	0.13	--	<0.026	<0.15	<0.078	<0.53	<0.53	<0.58	<0.51	--	<1.1	<1.1	<0.69
Arsenic	ug/L	0.91	0.4	0.33	0.61	0.23	0.32	0.22	0.32	--	0.28	0.39	0.44	<0.75	<0.75	<0.88	<0.88	--	<0.75	<0.75	0.92
Barium	ug/L	231	242	208	190	208	178	231	186	--	173	219	197	160	180	230	250	--	220	240	210
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.038	0.013	0.018	--	<0.012	<0.12	<0.089	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	<0.029	<0.029	<0.029	<0.018	<0.018	<0.018	--	<0.018	<0.07	<0.033	<0.077	<0.039	<0.039	<0.049	--	<0.051	<0.051	<0.055
Chromium	ug/L	0.43	0.36	0.57	0.76	0.54	0.29	0.27	0.43	--	0.25	0.21	0.27	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1
Cobalt	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.14	0.2	0.15	--	0.14	<0.15	0.17	0.16	0.13	0.18	0.15	--	0.14	0.21	0.22
Lead	ug/L	0.22	<0.19	<0.19	<0.19	<0.19	0.19	0.11	0.24	--	0.034	<0.12	0.2	<0.27	<0.27	<0.27	<0.11	--	<0.21	<0.21	<0.24
Lithium	ug/L	24	29.8	17.2	25.2	28.5	25	26	26.6	--	27.8	33.6	27.6	29	26	28	34	--	36	32	36
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	<0.1	--	0.12	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	0.6	0.79	1.2	1.2	0.76	0.89	1.1	1.3	--	0.87	1	0.72	<1.1	<1.1	<1.1	1.1	--	<1.3	<1.3	<1.2
Selenium	ug/L	<0.18	<0.18	0.19	<0.18	<0.18	0.19	<0.086	0.18	--	0.24	0.16	0.16	<1	<1	<1	<1	--	<0.96	<0.96	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.036	<0.036	0.15	--	<0.036	--	<0.099	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	1.73	1.58	1.55	1.54	1.31	0.73	1.35	1.14	--	2.11	1.78	1.22	0.519	0.441	0.759/0.759	0.55	--	0.761	0.871	0.768
Radium-226	pCi/L	0.125	0.529	0.143	0.43	0.467	0.128	0.551	0.454	--	0.992	0.411	0.423	0.154	0.256	0.248/0.248	0.282	--	0.264	0.332	0.47
Radium-228	pCi/L	1.6	1.05	1.41	1.11	0.847	0.602	0.795	0.683	--	1.12	1.37	0.8	0.365	0.185	0.511/0.511	0.269	--	0.496	0.539	0.298
Field Oxidation Potential	mV	-142	-120	-133.3	-133.6	-119.8	-145.1	-80.8	-94.7	44.9	-146.8	-134	-140	-133.5	-132.9	39.8	-175	-154	-135.7	-95.1	-116.2
Field Specific Conductance	umhos/cm	807	1919	1611	1328	1371	1195	624	972	759	733	901	846	733	795	972	987	865	839	911	870
Field Temperature	deg C	14.9	14.9	15	15.1	14.7	14.9	15.5	15.4	15.1	15.2	16.3	16.2	14.47	14.29	15.9	14.6	14.8	14.7	14.7	14.3
Groundwater Elevation	feet	521.96	521.48	521.46	527.71	525.74	523.03	522.78	519.93	522.48	526.06	520.29	528.97	528.36	--	524.12	519	520.48	522.31	519.18	522.6
Oxygen, Dissolved	mg/L	0.13	1.18	0.92	0.44	0.16	0.13	0.09	0.11	0.14	1.4	0.35	0.2	0.59	0.2	0.14	0.37	0.44	0.11	0.17	0.06
Turbidity	NTU	10.6	1.79	0.41	1.15	0.46	1.88	0.89	0.25	0.71	0.64	3.85	4.94	3.88	3.02	13.46	0.02	0.02	1.97	9	9
pH at 25 Degrees C	Std. Units	7.1	7.2	7	7.4	7.8	7.5	7.1	7.3	7.2	7.5	7.5	7.3	7.4	7.5	7.3	8.1	--	7.5	7.4	7.4
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	470	410	390	550	470
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<4.6	<4.3	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3000	1800	1700	2100	1500
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2900	1900	2000	2900	2300
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.3	1.5
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	470	410	390	550	470
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3000	1900	1800	2100	1700
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26000	21000	22000	24000	21000
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2800	1900	2100	2800	2400
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5700	6300	5500	6100	6000
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54000	47000	51000	53000	49000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	31	34

Single Location

Name: IPL - Burlington

Location ID: MW-306
Number of Sampling Dates: 21

Parameter Name	Units	4/21/2016	6/6/2016	8/17/2016	10/3/2016	1/10/2017	4/4/2017	6/13/2017	8/16/2017	10/16/2017	5/9/2018	8/14/2018	10/10/2018	3/11/2019	4/3/2019	10/11/2019	6/4/2020	10/15/2020	3/2/2021	4/19/2021	10/11/2021	4/5/2022
Boron	ug/L	3460	3340	3300	3340	3630	3770	3350	3700	3680	3480	3430	3350	--	2900	3100	3200	3200	--	3000	2800	3300
Calcium	mg/L	37.5	38.1	41.2	40.8	37.5	40.3	34.5	38.9	35.3	32	33.5	34.6	--	37	38	41	37	--	41	42	45
Chloride	mg/L	22.9	22.6	20.6	21.1	20.6	20.2	20.6	20.6	20.6	20.3	20.6	20.9	--	21	20	21	18	--	17	19	19
Fluoride	mg/L	0.093	<0.073	0.03	0.075	0.052	<0.1	<0.1	<0.1	0.15	0.12	0.1	<0.19	--	0.36	<0.23	<0.23	<0.23	--	<0.28	<0.28	<0.22
Field pH	Std. Units	10.4	10.36	6.37	6.5	6.33	6.29	11.25	6.59	10.66	6.8	10.33	6.04	6.27	6.69	10.53	10.48	10	9.46	10.02	5.83	5.95
Sulfate	mg/L	152	132	135	137	123	120	126	93.4	97.5	107	111	121	--	110	110	120	71	--	110	120	120
Total Dissolved Solids	mg/L	333	321	348	333	307	302	305	312	301	396	303	289	--	320	290	320	300	--	260	250	310
Antimony	ug/L	1.2	1.2	1	1.2	1.3	1.2	1.4	0.92	--	1.2	1.4	1.2	--	1.1	1.2	1.1	0.9	--	1.4	<1.1	<0.69
Arsenic	ug/L	56.6	47.4	43.9	46.4	53.4	50.5	48.1	43.2	--	52.6	48	50.6	--	50	46	50	46	--	53	43	48
Barium	ug/L	21.2	18.2	18.8	15.5	14.4	14.8	14.1	14.3	--	13.6	15.5	14.8	--	14	14	16	16	--	19	17	19
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.024	0.054	<0.012	--	<0.012	0.14	<0.089	--	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	<0.029	<0.029	<0.029	<0.018	0.036	<0.018	--	0.029	0.18	<0.033	--	<0.077	<0.039	<0.039	<0.049	--	<0.051	<0.051	<0.055
Chromium	ug/L	<0.34	<0.34	0.4	<0.34	0.45	0.49	0.31	0.43	--	0.24	0.25	0.18	--	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1
Cobalt	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.034	0.046	0.054	--	0.035	0.18	<0.062	--	<0.091	<0.091	<0.091	<0.091	--	<0.091	<0.19	<0.19
Lead	ug/L	0.28	<0.19	<0.19	<0.19	0.19	0.16	0.25	0.3	--	0.26	0.69	0.37	--	<0.27	0.44	0.33	0.43	--	<0.21	0.26	<0.24
Lithium	ug/L	33.5	37.9	39.5	35.9	44.1	41.2	41.4	46.8	--	36.6	46.8	41.4	39.2	45	46	43	42	--	43	41	42
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	--	<0.1	--	0.1	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	95.7	84.1	80.9	83.7	88.9	87.4	80.4	94.4	--	84.7	82.9	83.5	--	78	84	86	82	--	87	69	74
Selenium	ug/L	0.66	0.54	0.81	0.46	0.55	0.48	0.74	0.52	--	0.66	0.97	0.6	--	<1	<1	<1	<1	--	<0.96	1.2	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.036	<0.036	0.15	--	<0.036	--	<0.099	--	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	1.28	0.858	0.208	0.0727	0.744	1.19	0.254	1.03	--	0.482	1.04	1.1	--	0.165	0.526	<0.313/0.0769	0.119	--	0.415	0.114	0.489
Radium-226	pCi/L	0.438	0.144	0	-0.143	0.0633	0.457	0.157	0.424	--	0.174	0.397	0.383	--	0.0333	0.21	<0.0638/0.0516	0.0226	--	0.121	0.11	0.0776
Radium-228	pCi/L	0.841	0.714	0.208	0.0727	0.681	0.731	0.0974	0.604	--	0.308	0.64	0.712	--	0.132	0.316	<0.313/0.0253	0.0962	--	0.294	0.00348	0.412
Field Oxidation Potential	mV	-127.8	-181	-155.5	-96.8	-26.7	-64.7	-151	-52.5	286.2	-104.3	-265	58.1	-88.9	-92.8	-165.1	59	-273.7	-196	-188	12.3	-75.3
Field Specific Conductance	umhos/cm	398	977	1000	874	864	823	331.7	662	447.9	354.2	447	478	343	4711	473	482	453.7	415	442	476.1	468.4
Field Temperature	deg C	14.5	14.4	14.8	14.8	14.4	14.5	15.8	14.9	14.8	14.7	15.9	17.25	14.27	13.44	14.28	14.4	14.1	14.1	13.8	16	13.6
Groundwater Elevation	feet	521.74	521.43	521.53	527.67	525.67	523.07	522.87	519.82	522.72	526	520.14	528.95	523.21	528.4	--	524.45	519.05	520.65	522.52	519.15	522.63
Oxygen, Dissolved	mg/L	0.11	0.57	1.91	0.14	0.06	0.12	0.22	0.03	0.37	0.05	0.3	0.38	0.8	0.69	0.21	0.16	0.11	0.39	0.34	0.28	0.14
Turbidity	NTU	0.4	0.1	0.4	0.97	0.19	0.14	0.81	0.1	0.35	0.71	2.88	2.67	0.56	0.81	1.84	15.96	0.02	0.02	0.02	6.9	4
pH at 25 Degrees C	Std. Units	9.9	10.2	6.1	6.8	7.1	6.8	10.2	6.8	9.7	6.5	10	6	--	6	10.5	10.3	9.6	--	10.3	6.2	6.2
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	52	68	<2.3	95	100
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	82	46	50	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<36	<36	<36	<36
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<4	5.4	<4.4	8	5.7
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	77	81
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	130	110	74	95	100
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	54	<36	<36	<36
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<100	<100	<100	120	<150
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.4	6.5	<4.4	7.7	6
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	20000	19000	23000	20000	22000
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	46000	50000	40000	45000	46000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	42	29	41	38	37

Single Location

Name: IPL - Burlington

Location ID: MW-307
Number of Sampling Dates: 21

Parameter Name	Units	4/20/2016	6/6/2016	8/17/2016	10/3/2016	1/10/2017	4/4/2017	6/13/2017	8/16/2017	10/16/2017	5/9/2018	8/14/2018	10/10/2018	3/11/2019	4/3/2019	10/11/2019	6/4/2020	10/15/2020	3/2/2021	4/20/2021	10/11/2021	4/5/2022
Boron	ug/L	3720	3760	3720	3880	3960	4050	3740	3780	3920	3910	4090	3720	--	3400	3700	3600	3400	--	3400	3000	3300
Calcium	mg/L	31.9	30.8	31.3	34.1	31.3	32.3	28.1	29.8	31.3	27.3	27.2	27.6	--	29	31	37	36	--	39	42	46
Chloride	mg/L	23.5	22.6	21.4	21.6	21.3	20.9	21.3	20.7	20.8	20.1	20.1	21.6	--	21	19	21	17	--	17	19	20
Fluoride	mg/L	0.099	<0.073	0.032	0.079	0.057	<0.1	<0.1	<0.1	0.13	0.11	0.094	<0.19	--	0.51	<0.23	<0.23	<0.23	--	<0.28	<0.28	<0.22
Field pH	Std. Units	10.28	10.19	10.6	10.5	10.82	10.94	10.74	10.8	10.46	10.3	10.12	9.88	9.71	10.39	10.14	10.03	10.05	9.96	10.02	9.89	9.88
Sulfate	mg/L	183	150	160	161	145	135	136	130	126	119	119	143	--	120	130	180	160	--	140	170	190
Total Dissolved Solids	mg/L	408	385	386	374	355	354	353	356	341	347	340	336	--	420	340	390	370	--	330	280	360
Antimony	ug/L	0.46	0.62	0.48	0.64	0.53	0.48	0.48	0.54	--	0.5	0.58	0.62	--	<0.53	<0.53	<0.58	0.56	--	<1.1	<1.1	<0.69
Arsenic	ug/L	53	57.4	57.1	59.2	59.2	56.2	55.8	52.8	--	54.3	52.3	52.8	--	43	47	47	47	--	52	34	41
Barium	ug/L	38.3	42.2	38.7	38.4	34.7	33.4	33	31.1	--	32.3	29	31.1	--	29	31	36	39	--	39	39	41
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.033	<0.012	<0.012	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	<0.029	<0.029	<0.029	<0.018	<0.018	0.023	--	0.12	<0.07	0.068	--	<0.077	<0.039	0.044	<0.049	--	<0.051	<0.051	<0.055
Chromium	ug/L	<0.34	0.84	0.5	0.62	<0.34	0.19	0.24	0.33	--	0.27	0.36	0.15	--	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1
Cobalt	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.037	0.042	0.034	--	0.033	<0.15	<0.062	--	<0.091	<0.091	<0.091	<0.091	--	<0.091	<0.19	<0.19
Lead	ug/L	0.48	1.1	0.36	0.36	0.45	0.43	0.43	0.46	--	0.39	0.43	0.49	--	0.37	0.41	<0.27	0.19	--	<0.21	<0.21	<0.24
Lithium	ug/L	43.1	45.6	42.4	45.1	49.6	48.4	42.2	47.5	--	47.8	56.1	45.4	50.7	50	48	48	51	--	53	52	50
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	0.047	<0.046	<0.046	--	<0.09	--	<0.09	--	<0.1	--	0.12	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	146	155	142	150	154	154	155	152	--	154	155	159	156	100	130	130	140	--	140	85	100
Selenium	ug/L	0.47	0.45	0.46	0.45	0.44	0.42	0.46	0.42	--	0.36	0.41	0.36	--	<1	<1	<1	<1	--	<0.96	<0.96	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.036	<0.036	0.18	--	<0.036	--	<0.099	--	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	1.6	0.194	0.882	0.552	0	0.651	0.85	0.673	--	0.0587	0.415	1.43	--	0.447	0.232	<0.471/0.277	0.18	--	0.0114	1.14	0.134
Radium-226	pCi/L	0.153	-0.064	0.068	0.197	-0.075	-0.156	0.735	0.393	--	0.0587	0	0.988	--	0.0752	0.218	<0.101/0.0806	0.18	--	0.0114	0.103	0.0536
Radium-228	pCi/L	1.45	0.258	0.814	0.355	-0.0697	0.651	0.115	0.28	--	-0.024	0.415	0.439	--	0.372	0.0141	<0.471/0.197	-2.16	--	-0.01	1.04	0.0809
Field Oxidation Potential	mV	-201.7	-168	-212.1	-289.4	-253.6	-287.1	-177.1	-168.9	-78.9	-168.6	-221	-87.3	-78.3	-167.8	-126.3	60.2	-269.7	-233	-242.4	-215.3	-218.8
Field Specific Conductance	umhos/cm	480.2	1142	1064	958	940	901	368.3	735	485.7	499.9	512	497	367	500	536	586	564.8	552	546	547.9	549.8
Field Temperature	deg C	14.2	14.1	14.2	14.6	14.4	14.4	14.9	14.6	14.7	14.4	15.6	15.64	14.36	13.56	14.37	14.8	14	14	13.9	14.4	13.4
Groundwater Elevation	feet	522.38	521.75	521.91	527.81	525.81	523.14	523.17	520.16	522.55	526.06	520.46	529.08	523.49	528.63	--	524.62	519.33	521.01	522.89	519.55	522.91
Oxygen, Dissolved	mg/L	0.08	0.6	6.01	0.29	0.11	0.28	0.12	0.19	0.18	1.1	0.49	0.22	1.07	0.68	0.24	0.3	0.11	0.38	0.08	0.16	0.03
Turbidity	NTU	1.54	0.46	0.6	1.4	0.6	0.14	3.11	1.98	0.32	1.87	5.09	1.85	1.05	3.1	3.23	14.33	0.02	0.49	2.38	8.2	4
pH at 25 Degrees C	Std. Units	9.8	10	9.8	10.1	9.6	9.8	9.8	9.8	9.8	9.9	9.9	9.9	--	10	10.2	10	9.5	--	10.4	10.2	9.9
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	35	<4.6	9.5	21
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	79	49	79	110	82
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<36	<36	<36	<36
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.6	5.3	5.1	6.5	6.8
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	140	130	140	90	140
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	84	84	89	120	100
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<36	<36	<36	<36
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<100	<100	<100	<100	<150
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.4	5.4	5.5	6.4	7.5
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	36000	38000	37000	36000	38000
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54000	52000	53000	49000	56000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50	52	51	50	47

Single Location

Name: IPL - Burlington

Location ID: MW-307A
Number of Sampling Dates: 7

Parameter Name	Units	9/9/2020	10/14/2020	3/2/2021	4/20/2021	10/11/2021	4/5/2022	10/20/2022
Boron	ug/L	3900	4100	--	4100	4300	4000	4100
Calcium	mg/L	10	11	--	11	10	11	27
Chloride	mg/L	34	31	--	28	31	37	47
Fluoride	mg/L	<0.23	<0.23	--	0.38	<0.28	<0.22	<0.22
Field pH	Std. Units	7.83	7.8	7.66	7.74	7.83	7.78	7.69
Sulfate	mg/L	110	110	--	110	140	120	190
Total Dissolved Solids	mg/L	370	360	--	330	310	360	470
Antimony	ug/L	<0.51	<0.51	--	<1.1	<1.1	<0.69	<0.69
Arsenic	ug/L	<0.88	<0.88	--	<0.75	<0.75	<0.75	<0.75
Barium	ug/L	45	47	--	48	43	46	110
Beryllium	ug/L	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27
Cadmium	ug/L	0.058	0.052	--	<0.051	0.069	0.084	<0.055
Chromium	ug/L	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	0.11	0.15	--	<0.091	<0.19	<0.19	<0.19
Lead	ug/L	0.69	0.63	--	0.59	0.77	1.2	<0.24
Lithium	ug/L	6.8	8.3	9.1	8.7	7.7	8.5	12
Mercury	ug/L	<0.1	<0.1	--	<0.15	--	<0.11	<0.11
Molybdenum	ug/L	110	120	120	120	110	120	120
Selenium	ug/L	<1	<1	--	<0.96	<0.96	<0.96	<0.96
Thallium	ug/L	<0.26	--	--	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.605	0.412	--	0.307	0.981	0.326	1.15
Radium-226	pCi/L	0.168	0.169	--	0.133	0.0614	0.326	0.268
Radium-228	pCi/L	0.438	0.243	--	0.175	0.92	-0.0921	0.883
Field Oxidation Potential	mV	-154.2	-189.9	-171	-167.3	-133.4	-154	-131
Field Specific Conductance	umhos/cm	585	553.6	568	566	551	547.4	791
Field Temperature	deg C	14.4	14.6	14	13.7	14.4	13.4	15.47
Groundwater Elevation	feet	519.97	519	520.52	522.39	519.09	522.47	508.27
Oxygen, Dissolved	mg/L	0.17	0.18	0.29	0.13	0.12	0.06	0
Turbidity	NTU	0	2.96	0.95	2.89	7.4	5	0.3
pH at 25 Degrees C	Std. Units	8	7.9	--	8.1	7.8	7.8	7.7
Bicarbonate Alkalinity as CaCO3	mg/L	--	110	94	93	100	150	170
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	<2.3	<2.3	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	460	450	430	390	440	1000
Manganese, dissolved	ug/L	--	420	360	390	390	400	870
Molybdenum, dissolved	ug/L	--	120	120	120	120	120	120
Total Alkalinity as CaCO3	mg/L	--	110	94	93	100	150	170
Iron, total	ug/L	--	610	510	500	450	530	1200
Magnesium, total	ug/L	--	1700	1500	1600	1500	1600	4300
Manganese, total	ug/L	--	430	360	410	390	420	940
Potassium, total	ug/L	--	3100	3200	3100	2800	3100	4200
Sodium, total	ug/L	--	110000	110000	110000	100000	110000	130000
Lithium, dissolved	ug/L	--	--	9.6	8.3	6.9	7.7	11

Single Location

Name: IPL - Burlington

Location ID: MW-307B
Number of Sampling Dates: 5

Parameter Name	Units	7/1/2021	10/11/2021	2/22/2022	4/5/2022	10/20/2022
Boron	ug/L	4700	2700	4000	6700	1400
Calcium	mg/L	75	66	71	84	59
Chloride	mg/L	28	18	25	35	11
Fluoride	mg/L	<0.28	<0.28	<0.22	<0.22	<0.22
Field pH	Std. Units	7.67	7.72	7.43	7.36	7.1
Sulfate	mg/L	110	77	120	180	68
Total Dissolved Solids	mg/L	330	230	310	410	260
Antimony	ug/L	<1.1	<1.1	<2.8	<0.69	<0.69
Arsenic	ug/L	<0.75	<0.75	<0.75	<0.75	1.4
Barium	ug/L	260	310	350	450	310
Beryllium	ug/L	<0.27	<0.27	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.051	0.065	<0.055	<0.055	0.055
Chromium	ug/L	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	0.26	<0.19	<0.19	<0.19	<0.19
Lead	ug/L	<0.21	<0.21	<0.24	<0.24	<0.24
Lithium	ug/L	9.6	7	9.4	11	6.1
Mercury	ug/L	<0.15	--	<0.11	<0.11	<0.11
Molybdenum	ug/L	40	25	37	59	32
Selenium	ug/L	<0.96	<0.96	<0.96	<0.96	<0.96
Thallium	ug/L	<0.26	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.955	1.38	0.71	1.5	1.43
Radium-226	pCi/L	0.289	0.377	0.453	0.674	0.515
Radium-228	pCi/L	0.666	1.01	0.257	0.83	0.911
Field Oxidation Potential	mV	-76.5	-130.6	211.7	-147	-34
Field Specific Conductance	umhos/cm	587.1	459.6	570	627.3	492
Field Temperature	deg C	15.3	14.4	13.1	13.5	14.11
Groundwater Elevation	feet	520.12	519.13	519.37	522.37	508.35
Oxygen, Dissolved	mg/L	0.41	0.1	0.18	0.08	0
Turbidity	NTU	1.26	10.1	2.64	6	17
pH at 25 Degrees C	Std. Units	7.6	7.6	7.5	7.5	7.6
Bicarbonate Alkalinity as CaCO3	mg/L	150	160	160	130	190
Carbonate Alkalinity as CaCO3	mg/L	<4.6	<4.6	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	1700	1200	1700	2100	1500
Manganese, dissolved	ug/L	800	330	470	770	370
Molybdenum, dissolved	ug/L	40	28	37	58	35
Total Alkalinity as CaCO3	mg/L	150	160	160	130	190
Iron, total	ug/L	2100	1300	1900	2300	3000
Magnesium, total	ug/L	15000	16000	15000	15000	14000
Manganese, total	ug/L	850	310	500	810	360
Potassium, total	ug/L	3000	1600	2200	3200	1600
Sodium, total	ug/L	23000	16000	23000	35000	19000
Lithium, dissolved	ug/L	9.5	7	7.9	10	6.7

Single Location

Name: IPL - Burlington

Location ID: MW-308
Number of Sampling Dates: 21

Parameter Name	Units	4/21/2016	6/6/2016	8/17/2016	10/3/2016	1/10/2017	4/4/2017	6/13/2017	8/16/2017	10/17/2017	5/8/2018	8/13/2018	10/10/2018	3/12/2019	4/3/2019	10/10/2019	6/4/2020	10/14/2020	3/2/2021	4/20/2021	10/12/2021	4/4/2022
Boron	ug/L	4960	4980	4870	4760	4980	5160	4680	4910	4850	5030	5070	4710	--	4300	4500	4700	4500	--	4300	3900	4400
Calcium	mg/L	39.8	36.8	35.1	33.5	33.2	34.2	30.1	32.3	32.6	28.7	28.7	28.5	--	32	30	34	37	--	38	38	42
Chloride	mg/L	72.3	65.7	53.1	47.8	43.5	42.6	40.6	39.8	38.2	36.2	36.7	35.9	--	38	40	58	45	--	39	41	37
Fluoride	mg/L	0.16	0.095	0.078	0.13	0.084	0.11	0.12	0.14	0.17	0.17	0.16	<0.19	--	0.37	<0.23	0.37	<0.23	--	<0.28	<0.28	<0.22
Field pH	Std. Units	9.77	9.76	9.95	10.17	10.21	10.34	9.99	10.15	9.75	9.75	9.86	9.82	7.72	9.97	9.42	9.65	9.7	9.4	9.56	9.97	9.58
Sulfate	mg/L	222	187	180	194	192	175	188	181	177	164	167	193	--	170	160	190	160	--	140	190	190
Total Dissolved Solids	mg/L	577	548	541	495	474	494	501	483	472	494	468	440	--	490	400	470	460	--	430	410	470
Antimony	ug/L	0.29	0.34	0.22	0.38	0.33	0.28	0.32	0.3	--	0.32	0.32	0.36	--	<0.53	<0.53	<0.58	<0.51	--	<1.1	<1.1	<0.69
Arsenic	ug/L	83.8	80.5	84.2	82.6	86.4	83.1	80.3	77.9	--	79.1	82.5	79.5	--	78	72	76	69	--	73	59	62
Barium	ug/L	130	110	110	89.8	90.6	85.1	81.5	76.2	--	64.3	67.1	66.5	--	70	70	66	74	--	79	82	85
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.017	<0.012	<0.012	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	<0.029	0.097	0.034	<0.018	0.035	<0.018	--	0.02	<0.07	0.058	--	<0.077	<0.039	0.044	<0.049	--	<0.051	<0.051	<0.055
Chromium	ug/L	0.46	0.41	0.52	<0.34	0.37	0.22	0.16	0.38	--	0.25	<0.19	0.16	--	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1
Cobalt	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.06	0.068	0.069	--	0.057	<0.15	0.074	--	<0.091	<0.091	<0.091	<0.091	--	<0.091	<0.19	<0.19
Lead	ug/L	0.33	<0.19	<0.19	0.28	0.27	0.21	0.34	0.33	--	0.25	0.27	0.45	--	<0.27	<0.27	0.4	0.15	--	<0.21	<0.21	<0.24
Lithium	ug/L	45.6	45.8	41.5	41.2	47	46.9	42.4	44.1	--	46	52	43.6	48.9	50	52	48	51	--	54	58	57
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	0.047	<0.046	<0.046	--	<0.09	--	<0.09	--	<0.1	--	0.13	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	153	139	133	138	140	140	136	137	--	140	140	145	135	110	120	120	110	--	120	81	100
Selenium	ug/L	0.69	0.47	0.58	0.45	0.68	0.4	0.3	0.47	--	0.31	0.43	0.4	--	<1	<1	<1	<1	--	<0.96	<0.96	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.036	<0.036	<0.036	--	<0.036	--	<0.099	--	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.712	1.22	0.376	0.549	0	0.854	0.881	0.229	--	0.283	0.0726	0.334	--	0.328	0.288	<0.42/0.268	0.106	--	0.0966	-0.00135	0.321
Radium-226	pCi/L	0.0744	0	0.0777	0.312	0	0.213	0.4	0.063	--	0.182	0.0726	0.275	--	0.0363	0.202	<0.118/0.109	-0.0615	--	-0.0307	-0.00135	0.321
Radium-228	pCi/L	0.638	1.22	0.298	0.237	-0.059	0.641	0.481	0.166	--	0.101	-0.068	0.0585	--	0.291	0.0862	<0.42/0.159	0.106	--	0.0966	0	-0.143
Field Oxidation Potential	mV	-77.2	-149	-213.7	-239.6	-163.8	-300.6	-162.3	-139.8	-109.4	-158.2	-238	-201	-60.7	-142.3	-82.6	28	-264.6	-207.2	-172.9	-219.8	-246.6
Field Specific Conductance	umhos/cm	712	1678	1533	1306	1303	1258	514.6	1039	689	698	710	709	500	681	671	713	682	695	690	728	680
Field Temperature	deg C	14.2	14.2	14.3	14.6	13.7	14.1	14.9	14.5	14.6	14.4	15.4	15.3	14.06	14.04	14.64	15.4	14.7	13.9	14.1	15	13.9
Groundwater Elevation	feet	521.93	521.43	521.56	527.62	525.65	523.07	522.9	519.8	522.46	525.62	520.22	528.98	523.13	528.39	--	524.1	519.02	520.7	522.57	519.25	522.61
Oxygen, Dissolved	mg/L	0.09	0.81	0.16	0.55	0.11	0.16	0.2	0.21	0.09	1.5	0.11	0.2	2.57	1.16	0.21	0.23	0.1	0.11	0.08	0.06	0.08
Turbidity	NTU	1.83	0.42	0.34	0.73	1.27	0.43	1.56	0.61	0.6	1.26	4.63	1.35	1.68	1.66	2.93	13.38	0.15	0.02	1.77	8.8	5
pH at 25 Degrees C	Std. Units	9.4	9.6	9.3	9.7	9.4	9.2	9.5	9.4	9.4	9.4	9.4	9.5	--	9.6	9.9	9.6	9.6	--	9.8	10	9.6
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54	69	38	4.7	21
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	89	39	75	95	82
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<36	<36	<36	<36
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290	210	250	30	120
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	110	110	110	82	110
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	140	110	110	99	100
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<36	<36	<36	<36
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1700	1600	1800	420	1300
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	210	250	32	130
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35000	38000	37000	40000	39000
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	84000	85000	88000	79000	87000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	53	54	51	57	54

Single Location

Name: IPL - Burlington

Location ID: MW-309
Number of Sampling Dates: 20

Parameter Name	Units	4/21/2016	6/7/2016	8/16/2016	10/3/2016	1/10/2017	4/4/2017	6/13/2017	8/16/2017	10/17/2017	5/8/2018	8/14/2018	10/10/2018	4/4/2019	10/11/2019	6/3/2020	10/14/2020	3/1/2021	4/19/2021	10/12/2021	4/4/2022
Boron	ug/L	5270	5590	5180	5140	4880	3800	4070	4310	4400	4720	4930	4720	4200	4300	4400	4400	--	5000	4400	3900
Calcium	mg/L	118	100	99.2	126	141	156	118	130	101	83.6	74.1	72.4	73	68	82	59	--	76	71	59
Chloride	mg/L	145	152	126	117	104	82.7	89.5	92.5	85.4	112	111	105	100	74	84	64	--	85	79	53
Fluoride	mg/L	0.57	0.36	0.35	0.39	0.39	0.41	0.5	0.4	0.47	0.4	0.43	0.4	0.71	0.29	0.58	<0.23	--	0.36	0.39	<0.22
Field pH	Std. Units	7.33	7.43	7.66	7.66	7.37	7.31	7.1	7.62	8.5	7.25	7.39	7.46	7.45	7.19	7.09	7.61	7.22	7.26	7.18	7.18
Sulfate	mg/L	49	51.2	100	104	127	198	171	136	149	107	98.9	111	78	160	180	160	--	57	120	99
Total Dissolved Solids	mg/L	768	728	726	772	839	955	841	859	671	688	668	650	650	610	730	550	--	570	470	450
Antimony	ug/L	0.087	0.12	<0.058	0.09	<0.058	0.039	0.03	0.051	--	<0.026	<0.15	<0.078	<0.53	<0.53	<0.58	<0.51	--	<1.1	<1.1	<0.69
Arsenic	ug/L	31.5	27.3	29.3	31.5	34.5	30	36.2	34.6	--	28.2	33.3	35.6	30	34	34	33	--	30	24	21
Barium	ug/L	384	337	316	364	362	264	256	274	--	154	180	194	130	180	260	220	--	340	370	260
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.037	0.012	<0.012	--	0.012	<0.12	<0.089	<0.27	<0.54	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	<0.029	<0.029	<0.029	<0.018	0.021	<0.018	--	0.021	<0.07	<0.033	<0.077	<0.039	<0.039	<0.049	--	<0.051	<0.051	<0.055
Chromium	ug/L	0.38	0.35	0.53	<0.34	0.4	0.23	0.18	0.49	--	0.32	0.22	0.18	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1
Cobalt	ug/L	2.1	1.2	0.98	1.1	1.7	6.5	2.9	1.3	--	4.9	0.82	0.68	1.3	0.52	0.57	0.33	--	0.39	0.29	0.42
Lead	ug/L	<0.19	<0.19	<0.19	<0.19	<0.19	<0.033	0.12	0.26	--	0.045	<0.12	<0.13	<0.27	<0.27	<0.27	<0.11	--	<0.21	<0.21	<0.24
Lithium	ug/L	<4.9	<4.9	<4.9	<4.9	<4.9	5	<2.9	6.3	--	<4.6	<4.6	<4.6	3.3	<5.4	2.4	<2.5	--	3.8	2.8	2.9
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	<0.1	--	<0.1	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	30.7	31.1	43.5	49.1	44.8	41.5	60.8	67.5	--	43.4	52.8	71.8	47	90	87	100	--	50	39	62
Selenium	ug/L	0.39	0.25	0.24	0.31	0.25	0.44	0.35	0.34	--	0.3	0.31	0.29	<1	<1	<1	<1	--	<0.96	<0.96	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.036	<0.036	<0.036	--	<0.036	--	<0.099	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	2.55	2.28	1.74	1.38	0.455	1.76	0.846	1.09	--	0.218	0.96	1.05	0.42	0.596	<0.398/0.296	0.372	--	0.509	0.618	0.847
Radium-226	pCi/L	0.991	0.561	0.67	0.694	0.65	0.573	0.292	0.615	--	-0.061	0.28	0.127	0.126	0.274	0.182/0.182	0.142	--	0.336	0.553	0.358
Radium-228	pCi/L	1.56	1.72	1.07	0.69	0.39	1.19	0.554	0.47	--	0.218	0.68	0.919	0.295	0.322	<0.398/0.114	0.23	--	0.172	0.065	0.489
Field Oxidation Potential	mV	-138.9	-121	-150.9	-176.2	-131.4	-138	-60.7	-112.8	-31	-139.2	-143	-53.5	-99.4	-165.6	37	-208.4	-196.3	-170.7	-155.1	-139.4
Field Specific Conductance	umhos/cm	1034	2369	228.5	2265	2502	2528	936	1853	1058	813	1093	1038	997	1040	1086	851	816	1017	927	748
Field Temperature	deg C	13.4	13.4	13.8	14.6	14.3	13.9	14.2	14.6	14.6	13.5	14.2	15.67	12.6	13.73	14.8	14.3	13.7	13.2	15.3	13
Groundwater Elevation	feet	522.09	521.39	521.7	527.57	525.57	523.1	522.91	519.93	522.67	525.54	520.22	528.93	528.4	--	524.06	519.28	520.75	522.72	519.43	522.74
Oxygen, Dissolved	mg/L	0.1	0.78	2.36	0.54	0.11	0.2	0.15	0.2	0.08	0.05	0.14	0.18	0.51	0.21	0.23	0.14	0.12	0.16	0.17	0.24
Turbidity	NTU	3.93	0.59	0.58	0.72	5.84	15.11	4.62	4.61	3.08	6.49	12.67	34.45	20.1	8.93	18.88	18.9	13.8	21.2	19.6	21
pH at 25 Degrees C	Std. Units	7	7	7	7.2	7.3	7.4	6.9	7.2	7	7.4	7.3	7.1	7.1	7.2	7.2	7.2	--	7.3	7.2	7.3
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	190	250	310	280	240
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<2.3	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11000	9300	12000	14000	9100
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3400	2500	3700	3500	2800
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	56	49	39	59
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	190	250	310	280	240
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12000	11000	14000	15000	11000
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18000	18000	24000	22000	18000
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3200	2500	3700	3500	3000
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1800	2600	2900	2600	2100
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	90000	97000	100000	79000	81000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.8	2.7

Single Location

Name: IPL - Burlington

Location ID: MW-310
Number of Sampling Dates: 19

Parameter Name	Units	4/21/2016	6/7/2016	8/16/2016	10/3/2016	1/9/2017	4/4/2017	6/12/2017	8/16/2017	10/16/2017	5/8/2018	8/14/2018	10/10/2018	4/4/2019	10/11/2019	6/2/2020	10/14/2020	4/19/2021	10/12/2021	4/4/2022
Boron	ug/L	437	422	326	400	413	503	2210	365	305	217	256	268	560	380	500	290	220	310	230
Calcium	mg/L	166	181	140	167	145	180	116	139	105	104	102	107	120	120	130	92	190	84	80
Chloride	mg/L	154	196	96.9	143	113	187	94.7	121	38.3	24.4	33.8	67.1	88	59	87	17	16	14	10
Fluoride	mg/L	0.39	0.28	0.29	0.34	0.33	0.26	0.32	0.32	0.39	0.33	0.39	0.4	0.55	0.34	0.65	<0.23	0.37	<0.28	<0.22
Field pH	Std. Units	7.37	7.21	7.7	7.71	7.38	7.5	7.3	7.5	7.92	7.46	7.44	7.2	7.84	6.95	7.3	7.34	7.21	7.22	7.38
Sulfate	mg/L	53.1	47.7	54	62.6	48.5	34.3	101	41.3	35.1	28.8	27.2	37.9	21	51	100	19	55	55	74
Total Dissolved Solids	mg/L	879	1040	703	743	653	853	625	760	445	462	472	512	600	410	590	390	370	280	320
Antimony	ug/L	<0.058	0.12	<0.058	0.099	<0.058	0.032	0.048	0.1	--	<0.026	<0.15	<0.078	<0.53	<0.53	<0.58	1.9	<1.1	<1.1	<0.69
Arsenic	ug/L	60.6	60.2	64.1	74	72.6	79.8	64	68.2	--	57.8	56.2	62.1	65	61	55	63	16	63	52
Barium	ug/L	813	829	589	734	605	825	586	665	--	403	398	450	560	500	550	400	280	290	270
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.019	<0.012	<0.012	--	<0.012	<0.12	<0.089	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	<0.029	<0.029	<0.029	<0.018	0.025	<0.018	--	<0.018	<0.07	<0.033	<0.077	<0.039	<0.039	<0.049	<0.051	<0.051	<0.055
Chromium	ug/L	<0.34	<0.34	0.85	0.5	0.45	0.19	0.2	0.52	--	0.16	<0.19	0.082	<0.98	<0.98	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	2.6	2.7	1.8	2	1.6	1.9	1.4	1.8	--	1.2	1.4	1.4	1.9	1.9	2.3	1.5	0.29	1.4	1.2
Lead	ug/L	<0.19	<0.19	<0.19	<0.19	<0.19	<0.033	0.081	0.64	--	0.044	<0.12	<0.13	<0.27	<0.27	<0.27	<0.11	<0.21	<0.21	<0.24
Lithium	ug/L	<4.9	<4.9	<9.8	<4.9	<4.9	<2.9	<2.9	7.7	--	<4.6	5.3	<4.6	<2.7	<2.7	<2.3	<2.5	<2.5	<2.5	<2.5
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	<0.1	--	<0.1	<0.1	<0.15	--	<0.11
Molybdenum	ug/L	5.1	3.9	4.4	4.8	4.4	3.4	10	4.1	--	4.2	4	4.6	5.2	6	5.8	3.6	14	4.9	5.2
Selenium	ug/L	<0.18	<0.18	<0.18	<0.18	<0.18	0.24	0.18	0.2	--	0.14	<0.16	0.19	<1	<1	<1	<1	<0.96	<0.96	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.036	<0.036	0.35	--	<0.036	--	<0.099	<0.27	--	<0.26	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	2.41	1.28	1.99	1.34	0.941	3.17	1.7	2.21	--	0.755	1.55	2.56	1.19	0.49	0.844/0.844	0.552	0.869	1.25	0.838
Radium-226	pCi/L	0.951	0.839	0.644	0.796	0.527	0.175	0.505	0.793	--	0	0.616	1.1	0.471	0.473	0.457/0.457	0.333	0.41	0.161	0.22
Radium-228	pCi/L	1.46	0.437	1.35	0.54	0.414	2.99	1.19	1.42	--	0.755	0.938	1.46	0.724	0.0174	0.387/0.387	0.219	0.46	1.09	0.618
Field Oxidation Potential	mV	-125.4	-122	-172.9	-184	-161.2	-175.4	-101.1	102.8	-63.6	-198.8	-194	-166	-175.8	-189.7	38.6	-223.6	-193.2	-181.6	-177.3
Field Specific Conductance	umhos/cm	1082	3170	2224	2295	2116	2528	742	1783	791	594.6	840	938	1034	961	881	711	735	668	548.8
Field Temperature	deg C	11.7	12.2	15.1	16.6	14.3	12	13.5	15.4	16.6	11.1	15	17	10.8	15.88	12.8	16.4	10.8	17.3	10.6
Groundwater Elevation	feet	525.43	524.13	524.84	527.58	525.78	525.52	524.94	523.89	525.49	525.79	523.69	529	528.62	--	525.36	523.81	525.46	524.69	525.44
Oxygen, Dissolved	mg/L	0.19	0.98	2.4	0.43	0.19	0.2	0.13	0.21	0.16	0.14	0.05	0.1	1.12	0.28	0.13	0.08	0.17	0.18	0.14
Turbidity	NTU	3	0.2	0.83	4.23	4.64	2.23	2.55	1.2	2.86	12.81	3.11	0	16.7	5.23	17.82	3.79	2.57	11.4	19
pH at 25 Degrees C	Std. Units	7.1	7	7	7.2	7.2	7.3	6.9	7.1	7.1	7.4	7.3	7.1	7	7.2	7.1	7.2	7.3	7.2	7.2
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	330	310	280	240
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	20000	15000	15000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4000	4200	3900	3700
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.2	5.6
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	330	310	280	240
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18000	20000	15000	16000
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24000	25000	20000	18000
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4400	4300	3900	3800
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2700	2100	2100	1700
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13000	11000	12000	8400
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<2.5

Single Location

Name: IPL - Burlington

Location ID: MW-310A
Number of Sampling Dates: 7

Parameter Name	Units	9/9/2020	10/16/2020	3/3/2021	4/20/2021	10/14/2021	4/6/2022	10/20/2022
Boron	ug/L	2200	1200	--	1100	940	910	670
Calcium	mg/L	150	62	--	52	51	52	39
Chloride	mg/L	18	16	--	14	14	11	9.6
Fluoride	mg/L	0.27	<0.23	--	0.44	0.75	<0.22	<0.22
Field pH	Std. Units	7.33	--	7.22	7.41	7.07	7.29	7.54
Sulfate	mg/L	100	130	--	120	99	89	82
Total Dissolved Solids	mg/L	570	620	--	660	520	540	530
Antimony	ug/L	1.1	1.5	--	<1.1	<1.1	<0.69	<0.69
Arsenic	ug/L	15	5.1	--	3.5	3.6	1.2	1
Barium	ug/L	290	90	--	75	64	61	46
Beryllium	ug/L	2.3	<0.27	--	<0.27	<0.27	<0.27	<0.27
Cadmium	ug/L	0.69	0.062	--	<0.051	<0.051	<0.055	<0.055
Chromium	ug/L	5.4	<1.1	--	1.5	<1.1	<1.1	<1.1
Cobalt	ug/L	28	3.4	--	3	3	2.6	0.63
Lead	ug/L	20	3.5	--	2.8	3.3	0.29	0.52
Lithium	ug/L	32	36	--	40	34	38	29
Mercury	ug/L	<0.1	<0.1	--	<0.15	--	<0.11	<0.11
Molybdenum	ug/L	19	33	--	24	20	14	11
Selenium	ug/L	1.5	<1	--	<0.96	<0.96	<0.96	<0.96
Thallium	ug/L	<0.26	--	--	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	4.91	0.878	--	2.51	4.2	0.842	2.04
Radium-226	pCi/L	2.48	0.662	--	1.04	1.44	0.706	0.592
Radium-228	pCi/L	2.44	0.215	--	1.47	2.76	0.136	1.45
Field Oxidation Potential	mV	145.3	--	145.9	55	153.3	-10.5	21
Field Specific Conductance	umhos/cm	1026	--	1051	1042	842	907	874
Field Temperature	deg C	14.2	--	13.2	11.7	15.5	11.7	18.9
Groundwater Elevation	feet	509.16	489.84	487.06	521.12	521.83	522.58	512.84
Oxygen, Dissolved	mg/L	4.68	--	3.1	3.69	2.04	0.41	0.01
Turbidity	NTU	714.3	--	--	0	80	39	2
pH at 25 Degrees C	Std. Units	7.7	7.6	--	7.6	6.5	7.4	7.4
Bicarbonate Alkalinity as CaCO3	mg/L	--	410	400	410	440	450	420
Carbonate Alkalinity as CaCO3	mg/L	--	<3.8	<2.3	<4.6	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	<50	2100	<36	<36	88	<36
Manganese, dissolved	ug/L	--	420	300	240	170	150	22
Molybdenum, dissolved	ug/L	--	--	--	--	21	17	14
Total Alkalinity as CaCO3	mg/L	--	410	400	410	440	450	420
Iron, total	ug/L	--	1600	1900	1000	950	85	290
Magnesium, total	ug/L	--	25000	25000	21000	20000	21000	16000
Manganese, total	ug/L	--	470	330	250	270	280	41
Potassium, total	ug/L	--	6900	6600	5900	5200	5000	4200
Sodium, total	ug/L	--	140000	170000	180000	140000	140000	120000
Lithium, dissolved	ug/L	--	--	--	--	32	38	34

Single Location

Name: IPL - Burlington

Location ID: MW-311
Number of Sampling Dates: 20

Parameter Name	Units	4/21/2016	6/7/2016	8/16/2016	10/3/2016	1/9/2017	4/4/2017	6/12/2017	8/16/2017	10/16/2017	5/8/2018	8/14/2018	10/10/2018	4/4/2019	10/11/2019	6/2/2020	10/14/2020	3/1/2021	4/19/2021	10/12/2021	4/4/2022
Boron	ug/L	1810	2070	2320	2950	2160	2400	2130	360	2810	2200	2580	2820	1800	2800	2500	3500	--	2000	1800	1600
Calcium	mg/L	200	164	158	150	164	176	158	139	145	173	156	130	200	150	190	140	--	98	160	160
Chloride	mg/L	125	75.4	77.4	62.7	78.7	83.3	81.1	45	50.9	79.9	69.9	54	110	65	120	61	--	100	110	85
Fluoride	mg/L	0.38	0.27	0.28	0.35	0.32	0.27	0.36	0.36	0.36	0.31	0.36	0.35	0.41	0.37	0.64	<0.23	--	<0.28	<0.28	<0.22
Field pH	Std. Units	7.33	7.28	7.63	7.59	7.24	7.51	7.3	7.05	8.27	7.26	7.33	7.49	7.64	7.07	7.1	7.41	6.99	7.16	7.17	7.22
Sulfate	mg/L	283	179	170	161	179	184	173	112	119	176	144	127	230	130	220	110	--	200	190	170
Total Dissolved Solids	mg/L	1060	843	799	694	776	808	803	623	615	864	777	678	980	590	950	640	--	870	750	750
Antimony	ug/L	<0.058	0.12	<0.058	0.084	<0.058	<0.026	0.03	0.057	--	<0.026	<0.15	<0.078	<0.53	<0.53	<0.58	<0.51	--	<1.1	<1.1	<0.69
Arsenic	ug/L	17.7	12.4	16.4	13	17.6	17.1	15.2	11.6	--	14	15.7	15.2	19	18	19	15	--	55	22	19
Barium	ug/L	292	248	232	229	244	240	248	198	--	256	239	214	280	210	300	220	--	370	230	220
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	0.036	0.013	<0.012	--	<0.023	<0.12	<0.089	<0.27	<0.27	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	<0.029	<0.029	<0.029	<0.018	<0.018	<0.018	--	<0.018	<0.07	<0.033	<0.077	<0.039	<0.039	<0.049	--	<0.051	<0.051	<0.055
Chromium	ug/L	0.45	0.42	0.51	<0.34	0.35	0.18	0.14	0.32	--	0.2	0.22	0.78	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1
Cobalt	ug/L	0.52	<0.5	<0.5	<0.5	<0.5	0.27	0.35	0.24	--	0.3	0.37	0.57	0.45	0.27	0.81	0.28	--	1.4	0.31	0.3
Lead	ug/L	0.2	<0.19	<0.19	<0.19	<0.19	<0.033	0.32	0.096	--	0.043	0.13	0.48	0.37	<0.27	1.1	<0.11	--	<0.21	<0.21	<0.24
Lithium	ug/L	<4.9	<4.9	<9.8	<4.9	<4.9	<2.9	<2.9	3.3	--	<4.6	<4.6	<4.6	<2.7	<2.7	<2.3	<2.5	--	<2.5	<2.5	<2.5
Mercury	ug/L	<0.046	<0.039	<0.039	<0.039	<0.055	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	<0.1	--	0.13	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	10.4	11.7	12.5	14.7	10.9	12.4	11.2	16	--	11.6	13.9	16.3	8.5	15	11	23	--	4.1	6.9	8.9
Selenium	ug/L	0.19	<0.18	<0.18	<0.18	0.2	0.17	0.19	0.12	--	0.17	0.18	0.23	<1	<1	<1	<1	--	<0.96	<0.96	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.036	<0.036	0.14	--	<0.036	--	<0.099	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.831	1.22	1.19	0.22	1.19	1.13	0.785	1	--	0.987	0.969	0.819	0.815	0.599	0.802/0.802	0.297	--	0.52	0.189	0.593
Radium-226	pCi/L	0.207	0.18	0.605	0.149	0.299	0.484	0.445	0.653	--	0.183	0.502	0.245	0.198	0.354	0.324/0.324	0.104	--	0.224	0.256	0.328
Radium-228	pCi/L	0.624	1.04	0.581	0.0707	0.886	0.641	0.34	0.349	--	0.804	0.467	0.574	0.617	0.245	0.479/0.479	0.193	--	0.297	-0.0672	0.265
Field Oxidation Potential	mV	-129.9	-69.7	-139	-151.4	-171.4	-157.4	-102.5	-107.1	308.3	-143.3	-158	-62.2	145.8	-163.4	-1.1	-194	-179.2	-158.6	-157.6	-177.6
Field Specific Conductance	umhos/cm	1173	2425	2304	1833	2126	2059	865	1280	972	1282	1177	1003	1422	1088	1464	1041	1363	1473	1431	1190
Field Temperature	deg C	11.6	11.6	13	14.3	14.3	12.4	12.5	13.7	14.7	11.5	14.8	16.35	11.41	14.19	12.3	14.5	11.5	10.9	14.9	11.8
Groundwater Elevation	feet	523.72	521.8	522.92	527.34	525.16	524.01	523.55	521.12	523.44	525.08	521.06	528.49	528.2	--	524.05	520.59	522.89	523.89	522	523.78
Oxygen, Dissolved	mg/L	0.08	1.01	0.83	0.51	0.18	0.22	0.21	0.03	0.25	1.6	0.12	0.45	0.78	0.3	0.16	0.1	0.13	0.48	0.17	0.07
Turbidity	NTU	4.41	1.05	1.74	2.08	1.16	3	4.12	1.15	2.19	1.48	12.3	17.8	10.8	13.4	17.95	2.36	1.33	4.56	11.1	7
pH at 25 Degrees C	Std. Units	7	7.2	7.1	7.2	7.5	7.1	7	7.2	7.4	7.4	7.2	7.1	7	7.2	7	7.1	--	7.2	7.2	7.3
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	380	400	390	430	410
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<2.3	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	21000	20000	15000	17000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4300	5400	5600	4800	5700
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8	8.6
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	380	400	390	430	410
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	21000	20000	15000	17000
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30000	39000	39000	31000	31000
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4200	5700	5600	4800	6000
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2300	2200	2300	2200	2000
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	36000	65000	62000	56000	57000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.5	<2.5

Single Location

Name: IPL - Burlington

Location ID: MW-312
Number of Sampling Dates: 8

Parameter Name	Units	6/6/2019	10/10/2019	6/3/2020	10/15/2020	3/1/2021	4/19/2021	10/14/2021	4/6/2022
Boron	ug/L	6100	6600	6700	6500	--	5800	5300	6900
Calcium	mg/L	67	71	74	78	--	84	70	69
Chloride	mg/L	27	25	36	23	--	20	24	25
Fluoride	mg/L	1.1	0.25	0.57	<0.23	--	0.33	<0.28	<0.22
Field pH	Std. Units	6.99	7.19	7.13	7.37	7.07	7.22	7.2	7.35
Sulfate	mg/L	220	230	200	210	--	190	190	230
Total Dissolved Solids	mg/L	540	510	670	560	--	540	480	490
Antimony	ug/L	<0.53	<0.53	<0.58	<0.51	--	<1.1	<1.1	<0.69
Arsenic	ug/L	14	15	22	19	--	18	17	12
Barium	ug/L	160	150	190	200	--	200	170	130
Beryllium	ug/L	<0.27	<0.54	<0.27	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.077	0.044	0.095	0.066	--	0.053	0.086	0.09
Chromium	ug/L	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1
Cobalt	ug/L	0.65	0.36	0.67	0.5	--	0.54	0.42	0.28
Lead	ug/L	0.54	<0.27	<0.27	<0.11	--	<0.21	<0.21	<0.24
Lithium	ug/L	24	27	22	27	--	30	24	28
Mercury	ug/L	<0.1	--	<0.1	<0.1	--	<0.15	--	<0.11
Molybdenum	ug/L	290	280	320	290	--	310	240	210
Selenium	ug/L	<1	<1	<1	<1	--	<0.96	<0.96	<0.96
Thallium	ug/L	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.875	0.438	0.543/0.543	0.627	--	0.218	0.071	0.443
Radium-226	pCi/L	0.301	0.433	0.356/0.356	0.443	--	0.218	0.123	0.296
Radium-228	pCi/L	0.574	0.00445	<0.323/0.187	0.184	--	-0.00944	-0.0521	0.147
Field Oxidation Potential	mV	-146.4	-163.8	53.3	-203.1	-192.4	-162.9	-143.4	-155.7
Field Specific Conductance	umhos/cm	783	785	878	854	814	875	688	746
Field Temperature	deg C	14.4	15.6	14.7	15.1	14.1	13.7	15.7	14
Groundwater Elevation	feet	--	--	524.05	518.68	520.12	522.2	518.78	522.51
Oxygen, Dissolved	mg/L	0.12	8.75	0.17	0.13	0.14	0.12	0.2	0.06
Turbidity	NTU	2.86	2.56	21.16	0.02	0.89	8.82	13.1	23
pH at 25 Degrees C	Std. Units	7.5	7.3	7.1	7.2	--	7.4	7.2	7.4
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	240	190	190	210	150
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	<3.8	<4.6	<4.2	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	11000	9800	11000	8500	5200
Manganese, dissolved	ug/L	--	--	--	8200	7500	7800	5900	7800
Molybdenum, dissolved	ug/L	--	--	--	300	300	300	250	210
Total Alkalinity as CaCO3	mg/L	--	--	--	240	190	190	210	150
Iron, total	ug/L	--	--	--	11000	10000	11000	8500	5700
Magnesium, total	ug/L	--	--	--	12000	12000	13000	9700	7700
Manganese, total	ug/L	--	--	--	7900	7900	8900	5900	8000
Potassium, total	ug/L	--	--	--	11000	13000	11000	11000	13000
Sodium, total	ug/L	--	--	--	73000	74000	76000	68000	67000
Lithium, dissolved	ug/L	--	--	--	--	--	--	23	28

Single Location

Name: IPL - Burlington

Location ID: MW-313
Number of Sampling Dates: 9

Parameter Name	Units	6/6/2019	10/10/2019	6/3/2020	10/15/2020	3/2/2021	4/19/2021	10/13/2021	4/6/2022	10/20/2022
Boron	ug/L	7400	8500	8600	7600	--	6900	4800	5700	1400
Calcium	mg/L	110	120	120	110	--	120	70	57	37
Chloride	mg/L	85	51	83	50	--	72	230	200	26
Fluoride	mg/L	0.33	0.28	0.52	<0.23	--	<0.28	0.47	<0.22	<0.22
Field pH	Std. Units	6.94	7.06	7.03	7.16	6.98	7.09	7.25	7.14	7.65
Sulfate	mg/L	210	210	230	170	--	120	230	200	23
Total Dissolved Solids	mg/L	700	520	830	640	--	680	740	620	320
Antimony	ug/L	<0.53	<0.53	<0.58	<0.51	--	<1.1	<1.1	<0.69	<0.69
Arsenic	ug/L	5.5	6.3	6.9	5.5	--	5.2	4.7	4.3	10
Barium	ug/L	510	490	680	610	--	630	390	290	810
Beryllium	ug/L	<0.27	<1.1	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.077	<0.039	0.039	<0.049	--	<0.051	0.069	0.086	<0.055
Chromium	ug/L	<0.98	<0.98	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	0.41	0.32	0.23	0.19	--	0.2	<0.19	0.33	<0.19
Lead	ug/L	<0.27	0.31	<0.27	<0.11	--	<0.21	<0.21	<0.24	<0.24
Lithium	ug/L	43	62	52	51	--	36	18	18	32
Mercury	ug/L	<0.1	--	0.13	<0.1	--	<0.15	--	<0.11	<0.11
Molybdenum	ug/L	130	110	130	100	--	140	170	190	39
Selenium	ug/L	<1	<1	<1	<1	--	<0.96	<0.96	<0.96	<0.96
Thallium	ug/L	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.987	1.7	1.81/1.81	1.26	--	2.3	1.6	1.36	1.11
Radium-226	pCi/L	0.532	0.968	1.18/1.18	0.52	--	0.861	0.524	0.332	0.434
Radium-228	pCi/L	0.455	0.736	0.631/0.631	0.739	--	1.44	1.07	1.03	0.676
Field Oxidation Potential	mV	-141.6	-163.4	50.9	-183.3	-148	-152.8	-117.9	-153.5	-181
Field Specific Conductance	umhos/cm	1059	1007	1099	999	1224	1165	1198	1076	477
Field Temperature	deg C	14.9	16.04	17.2	15.3	14.8	14.5	15.9	14.4	19.6
Groundwater Elevation	feet	--	--	524.02	518.7	520.18	522.23	518.72	522.48	512.08
Oxygen, Dissolved	mg/L	0.07	0.37	0.29	0.14	0.13	0.21	0.1	0.07	0
Turbidity	NTU	7.23	11.03	50.81	14.3	7.46	4.54	24.8	15	185
pH at 25 Degrees C	Std. Units	7.4	7.2	7.1	7.2	--	7.3	7	7.2	7.4
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	380	310	190	110	110	170
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	<3.8	<2.3	<4.6	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	--	--	14000	18000	18000	9800	7400	3600
Manganese, dissolved	ug/L	--	--	--	--	7300	8400	4700	4200	2000
Molybdenum, dissolved	ug/L	--	--	--	100	150	140	180	180	47
Total Alkalinity as CaCO3	mg/L	--	--	--	380	310	190	110	110	170
Iron, total	ug/L	--	--	--	15000	19000	18000	11000	7900	16000
Magnesium, total	ug/L	--	--	--	21000	28000	29000	16000	12000	6000
Manganese, total	ug/L	--	--	--	6300	8100	8700	4900	4300	2700
Potassium, total	ug/L	--	--	--	14000	9500	9900	5500	6200	15000
Sodium, total	ug/L	--	--	--	58000	82000	75000	160000	140000	47000
Lithium, dissolved	ug/L	--	--	--	53	36	36	19	19	32

Single Location

Name: IPL - Burlington

Location ID: MW-313A
Number of Sampling Dates: 7

Parameter Name	Units	9/9/2020	10/15/2020	3/1/2021	4/19/2021	10/13/2021	4/6/2022	10/20/2022
Boron	ug/L	4300	4200	--	4100	3500	4400	2700
Calcium	mg/L	48	44	--	42	30	28	18
Chloride	mg/L	210	200	--	140	100	69	57
Fluoride	mg/L	<0.23	<0.23	--	0.46	0.38	0.24	<0.22
Field pH	Std. Units	7.6	7.64	7.48	7.58	7.53	7.62	7.72
Sulfate	mg/L	200	190	--	150	140	110	52
Total Dissolved Solids	mg/L	730	660	--	580	440	430	310
Antimony	ug/L	<0.51	<0.51	--	<1.1	<1.1	<0.69	<0.69
Arsenic	ug/L	<0.88	<0.88	--	<0.75	<0.75	<0.75	<0.75
Barium	ug/L	270	270	--	240	150	170	110
Beryllium	ug/L	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.049	<0.049	--	<0.051	<0.051	<0.055	<0.055
Chromium	ug/L	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	<0.091	<0.091	--	<0.091	<0.19	<0.19	<0.19
Lead	ug/L	<0.11	<0.11	--	<0.21	<0.21	<0.24	<0.24
Lithium	ug/L	13	13	15	14	11	12	7
Mercury	ug/L	<0.1	<0.1	--	<0.15	--	<0.11	<0.11
Molybdenum	ug/L	120	120	110	100	100	100	64
Selenium	ug/L	<1	<1	--	<0.96	<0.96	<0.96	<0.96
Thallium	ug/L	<0.26	--	--	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	1.5	0.914	--	1.09	1.76	0.828	0.586
Radium-226	pCi/L	0.513	0.431	--	0.428	0.496	0.333	0.206
Radium-228	pCi/L	0.984	0.483	--	0.659	1.26	0.494	0.38
Field Oxidation Potential	mV	-164.4	-190.1	-195.9	-172.1	-117.7	-158	-105
Field Specific Conductance	umhos/cm	1243	1133	927	1023	757	695	621
Field Temperature	deg C	15.3	14.8	14.1	14.2	15.4	14	17.06
Groundwater Elevation	feet	515.36	518.61	520.02	522.11	518.62	522.38	511.86
Oxygen, Dissolved	mg/L	0.21	0.1	0.12	0.09	0.11	0.07	0
Turbidity	NTU	0	0.02	0.78	1.71	7.7	23	10
pH at 25 Degrees C	Std. Units	7.7	7.5	--	7.7	7.7	7.7	7.9
Bicarbonate Alkalinity as CaCO3	mg/L	--	88	94	97	130	120	170
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	<2.3	<4.3	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	--	1700	1400	1400	920	850	610
Manganese, dissolved	ug/L	--	680	530	600	420	350	250
Molybdenum, dissolved	ug/L	--	120	100	100	110	97	63
Total Alkalinity as CaCO3	mg/L	--	88	94	97	130	120	170
Iron, total	ug/L	--	1600	1400	1500	960	2000	910
Magnesium, total	ug/L	--	4300	3400	3900	2400	2100	1400
Manganese, total	ug/L	--	670	530	600	420	370	290
Potassium, total	ug/L	--	12000	11000	11000	7600	7100	7200
Sodium, total	ug/L	--	160000	150000	150000	130000	120000	96000
Lithium, dissolved	ug/L	--	--	15	14	10	11	7.3

Single Location

Name: IPL - Burlington

Location ID: MW-313B
Number of Sampling Dates: 5

Parameter Name	Units	7/1/2021	10/13/2021	2/22/2022	4/6/2022	10/20/2022
Boron	ug/L	4300	4200	5500	5800	4400
Calcium	mg/L	70	44	51	55	50
Chloride	mg/L	160	89	56	52	85
Fluoride	mg/L	0.44	<0.28	<0.22	<0.22	<0.22
Field pH	Std. Units	7.62	7.54	7.64	7.5	7.51
Sulfate	mg/L	170	140	120	120	150
Total Dissolved Solids	mg/L	620	420	360	390	490
Antimony	ug/L	<1.1	<1.1	<0.69	<0.69	<0.69
Arsenic	ug/L	<0.75	<0.75	<0.75	<0.75	<0.75
Barium	ug/L	210	170	190	210	260
Beryllium	ug/L	<0.27	<0.27	<0.27	<0.27	<0.27
Cadmium	ug/L	0.06	0.09	<0.055	<0.055	<0.055
Chromium	ug/L	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	0.25	<0.19	<0.19	<0.19	<0.19
Lead	ug/L	<0.21	<0.21	<0.24	<0.24	0.3
Lithium	ug/L	18	13	13	13	14
Mercury	ug/L	<0.15	--	<0.11	<0.11	<0.11
Molybdenum	ug/L	100	100	89	100	110
Selenium	ug/L	<0.96	<0.96	<0.96	<0.96	<0.96
Thallium	ug/L	<0.26	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	1	0.457	0.912	1.01	1.45
Radium-226	pCi/L	0.447	0.356	0.24	0.281	0.349
Radium-228	pCi/L	0.557	0.101	0.672	0.73	1.1
Field Oxidation Potential	mV	-5.1	-90.8	210	-144.4	-105
Field Specific Conductance	umhos/cm	1052	714	665	622.6	804
Field Temperature	deg C	15.2	15.4	13.7	14.1	17.99
Groundwater Elevation	feet	519.51	518.72	518.88	522.45	511.91
Oxygen, Dissolved	mg/L	0.37	0.09	0.17	0.01	0
Turbidity	NTU	0	8.6	2.4	9	4
pH at 25 Degrees C	Std. Units	6.4	7.7	7.6	7.6	7.7
Bicarbonate Alkalinity as CaCO3	mg/L	100	140	140	140	160
Carbonate Alkalinity as CaCO3	mg/L	<4.6	<4.6	<4.6	<4.6	<4.6
Iron, dissolved	ug/L	880	700	1000	1000	750
Manganese, dissolved	ug/L	570	390	460	480	350
Molybdenum, dissolved	ug/L	100	110	91	97	100
Total Alkalinity as CaCO3	mg/L	100	140	140	140	160
Iron, total	ug/L	990	730	1100	1100	1300
Magnesium, total	ug/L	9500	5800	7200	7800	4800
Manganese, total	ug/L	590	410	430	510	410
Potassium, total	ug/L	9500	6800	5500	5800	9100
Sodium, total	ug/L	130000	110000	69000	67000	100000
Lithium, dissolved	ug/L	18	13	12	13	14

Single Location

Name: IPL - Burlington

Location ID: MW-314
Number of Sampling Dates: 2

Parameter Name	Units	4/6/2022	10/20/2022
Boron	ug/L	360	160
Calcium	mg/L	150	140
Chloride	mg/L	13	14
Fluoride	mg/L	<0.22	<0.22
Field pH	Std. Units	6.79	7.11
Sulfate	mg/L	130	85
Total Dissolved Solids	mg/L	630	560
Antimony	ug/L	<0.69	<0.69
Arsenic	ug/L	4.1	2.1
Barium	ug/L	330	290
Beryllium	ug/L	<0.27	<0.27
Cadmium	ug/L	<0.055	<0.055
Chromium	ug/L	<1.1	<1.1
Cobalt	ug/L	0.48	0.27
Lead	ug/L	<0.24	<0.24
Lithium	ug/L	3.9	3.1
Mercury	ug/L	<0.11	<0.11
Molybdenum	ug/L	1.2	<1.2
Selenium	ug/L	<0.96	<0.96
Thallium	ug/L	<0.26	<0.26
Total Radium	pCi/L	1.3	1.14
Radium-226	pCi/L	0.506	0.458
Radium-228	pCi/L	0.795	0.685
Field Oxidation Potential	mV	-82	-120
Field Specific Conductance	umhos/cm	1001	930
Field Temperature	deg C	11.4	13.3
Groundwater Elevation	feet	522.27	517.78
Oxygen, Dissolved	mg/L	0.13	0
Turbidity	NTU	35	5
pH at 25 Degrees C	Std. Units	7.1	7.1
Bicarbonate Alkalinity as CaCO3	mg/L	460	450
Carbonate Alkalinity as CaCO3	mg/L	<4.6	<4.6
Iron, dissolved	ug/L	12000	12000
Manganese, dissolved	ug/L	7700	5000
Molybdenum, dissolved	ug/L	1.6	1.4
Total Alkalinity as CaCO3	mg/L	460	450
Iron, total	ug/L	13000	11000
Magnesium, total	ug/L	47000	40000
Manganese, total	ug/L	7800	5500
Potassium, total	ug/L	550	440
Sodium, total	ug/L	11000	11000
Lithium, dissolved	ug/L	4.8	3.6

Appendix B

Burlington Ash Pond Closure Drawings

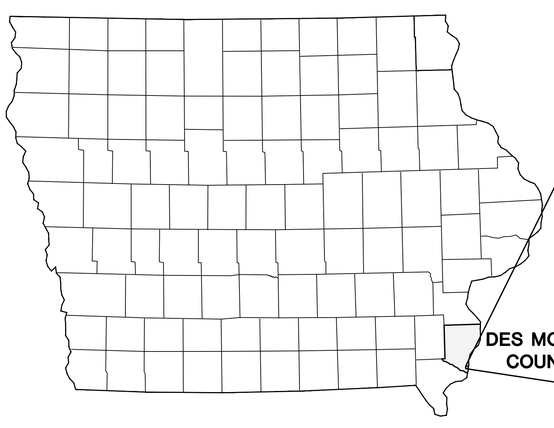
ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING

BURLINGTON GENERATING STATION
BURLINGTON, IOWA

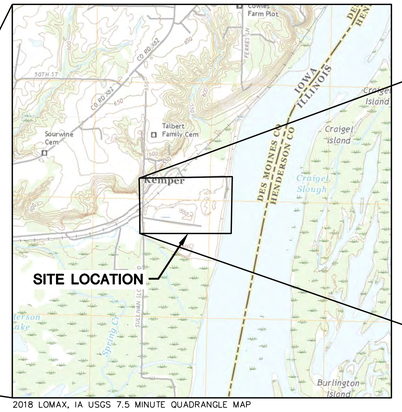
PREPARED FOR: INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IOWA

PREPARED BY: SCS ENGINEERS
MADISON, WISCONSIN

DATE: MARCH 2022



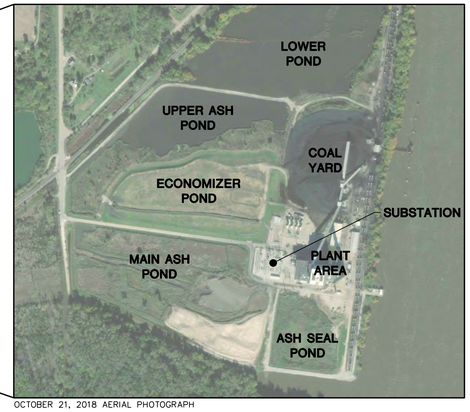
IOWA



2018 LOMAX, IA USGS 7.5 MINUTE QUADRANGLE MAP

SITE LOCATOR MAP

APPROXIMATE SCALE: 1" = 2,000'



OCTOBER 21, 2018 AERIAL PHOTOGRAPH

SITE AERIAL

SCALE: 1" = 400'

INDEX

PRELIMINARY
NOT FOR CONSTRUCTION

PROJECT NO.	25219168.00
DRAWN:	03/24/2021
REVISED:	03/18/2022
DRAWN BY:	BSS/KP
CHECKED BY:	MRH
APPROVED BY:	E.M. 03/18/2022

CLIENT: INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

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

ENGINEER

ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

TITLE SHEET

SHEET 1 of 21

2299000 E
2299500 E
2300000 E
2300500 E
2301000 E
280000 N
279500 N
279000 N
278500 N

LOWER POND
UPPER ASH POND
ECONOMIZER POND
COAL YARD
ADDITIONAL COAL AREA
COAL YARD RUNOFF BASIN
MAIN ASH POND
BOTTOM ASH PILE
C-STONE PILE
ASH SEAL POND
PLANT AREA
LIFT STATION
FROM 2016 SURVEY BY FRENCH-RENEKER-ASSOCIATES
STORAGE CONTAINERS
SUBSTATION
OVERHEAD WALKWAY
PUMP STATION
MISSISSIPPI RIVER
SULLIVAN SLOUGH ROAD
ENTRANCE ROAD
GATE
W.L. 527.59 (11/25/2019)
W.L. 531.34 (11/26/2019)
W.L. 526.90 (11/27/2019)
W.L. 530.70 (12/12/2019)
W.L. 546.56 (11/26/2019)
NPDES OUTFALL 001 ALTERNATE SAMPLE POINT (ACTUAL OUTFALL OUTSIDE MAP LIMITS TO THE NORTH)
STAFF GAUGE 'O' GAUGE = ELEV. 526.8 (BASED ON JULY 16, 2020 MOHN SURVEY)
LIMITS OF EROSION STONE
21" CMP CONNECTED TO HDPE PIPE INLET: 531.0 OUTLET: 530.1
14" HDPE (DRAWINGS FROM HARDHAT SHOW AS 18" HDPE SD-17) INLET (VERTICAL RISER): 544.6 OUTLET: 531.0
GAS VALVE IN FENCED ENCLOSURE
12" CMP INLET (VERTICAL RISER): 531.2 OUTLET: 529.8
12" CMP INLET (VERTICAL RISER): 531.7 OUTLET: 529.6
STAFF GAUGE
OIL WATER SEPERATOR MANHOLE ACCESS RIM ELEV: 534.9 FLOW ELEV: ???
APPROXIMATE PIPE LOCATIONS
GAS UTILITY STRUCTURES AND COMBUSTION TURBINES
MANHOLE [WATER METER] RIM ELEV: 533.6
MANHOLE RIM ELEV: 532.5 FLOW ELEV: 523.8
POWER LINE OVERHEAD (SEE NOTE 12)
STEEL STAIRS
14" PVC INLET: 522.6 OUTLET: 521.7
MANHOLE RIM ELEV: 530.4 FLOW ELEV: 522.6
14" PVC INLET (VERTICAL RISER): 528.9 OUTLET: 525.1
7" PLASTIC INLET (VERTICAL RISER): 526.3 OUTLET: 525.5
6" PVC INLET: 530.6 OUTLET: 530.4
8" PVC INSIDE 10" STEEL CASING PIPE OUTLET (WEST): 549.0
15" CMP CASING PIPE INLET: 547.9 OUTLET: 547.8
14" HDPE INLET (VERTICAL RISER): 546.5 OUTLET: 543.5
12" PVC INLET: 536.0 OUTLET: 548.9
10" PVC (ABOVEGROUND) OUTLET: 547.9
12" PVC INLET: 536.0 OUTLET: 548.6
24" HDPE
12" PVC INLET (AT INT-1): 528.1 OUTLET (AT INT-2): ???
12" PVC ELEV (AT INT-2): 517.6
10" HDPE INLET: 534.4 OUTLET: 534.3
INLET RIM ELEV: 532.7
12" PVC
10" PVC INLET: 532.9 OUTLET: 532.0
8" HDPE OUTLET: 536.4
10" STEEL OUTLET: 533.9
16" PVC INLET: 532.6 OUTLET: 531.9
10" PVC INLET: 532.4 OUTLET: 531.8
UNIDENTIFIED IN FIELD (SEE NOTE 13) INLET: 532.37 OUTLET: 531.71
8" HDPE OUTLET: 534.3
10" STEEL INLET: 534.0 OUTLET: 535.5
10" STEEL INLET: 534.2
10" STEEL INLET: 534.3 OUTLET: 534.2
PIPE FROM VALVES BACK TO PLANT UNIDENTIFIED IN FIELD (SEE NOTE 13)
PCC OUTLET STRUCTURE
PCC INLET STRUCTURE TOP: 529.0
66" STEEL OUTLET: 523.1
RCP INLET: 533.2 OUTLET: 532.8
TOP ~6.28 FT DIA CONCRETE FOUNDATION ELEV: 536.87
TOP ~4.28 FT DIA CONCRETE FOUNDATION ELEV: 539.74
TOP ~6.65 FT DIA CONCRETE FOUNDATION ELEV: 534.73
STEPS AND OVERHEAD STRUCTURE
18" HDPE INLET: ??? OUTLET: ???
PIPE (UNKNOWN INFORMATION)
MANHOLE RIM ELEV: 534.5
MANHOLE RIM ELEV: 534.2
MANHOLE RIM ELEV: 533.8
INLET RIM ELEV: 533.3
INLET (AT INT-7): 528.9 OUTLET (AT INT-6): 525.2
INLET RIM ELEV: 532.3
INLET (AT INT-6): 525.2 OUTLET (AT INT-5): 524.5
INLET RIM ELEV: 532.1
INLET (AT INT-5): 524.5 OUTLET (AT INT-4): 523.6
INLET RIM ELEV: 532.2
12" STEEL INLET: 532.7 OUTLET: 532.1
18" HDPE INLET: ??? OUTLET: ???
12" RCP OUTLET: 528.8
INLET RIM ELEV: 533.1 FLOW ELEV: 523.0
18" HDPE
INLET (APPROXIMATE LOCATION)
24" HDPE
12" HDPE
INLET (APPROXIMATE LOCATION)
MANHOLE (APPROXIMATE LOCATION)
NORMAL HIGH WATER LINE OF MISSISSIPPI RIVER ELEV. 522.5+/-
COOLING WATER INTAKE STRUCTURE ELEV. 534.5+/-
6" TILE INLET: 530.4 (OUTLET UNIDENTIFIED)
FROM 2016 SURVEY BY FRENCH-RENEKER-ASSOCIATES 4" PVC OUTLET: 523.17 (INLET UNIDENTIFIED)
STAFF GAUGE FORMER 12" PVC OUTLET STRUCTURE FROM ASH SEAL POND (ABANDONED IN PLACE)
POWER LINE OVERHEAD MAXIMUM GROUND ELEVATION = 545.8' (SEE NOTE 12)
POWER LINE OVERHEAD MAXIMUM GROUND ELEVATION = 544.5' (SEE NOTE 12)
POWER LINE OVERHEAD MAXIMUM GROUND ELEVATION = 537.9' (SEE NOTE 12)
POWER LINE OVERHEAD MAXIMUM GROUND ELEVATION = 533.8' (SEE NOTE 12)
POWER LINE OVERHEAD MAXIMUM GROUND ELEVATION = 534.7' (SEE NOTE 12)
POWER LINE OVERHEAD MAXIMUM GROUND ELEVATION = 542.1' (SEE NOTE 12)
POWER LINE OVERHEAD MAXIMUM GROUND ELEVATION = 541.2' (SEE NOTE 12)
MW-310
MW-310A
MW-311
MW-301
MW-302
MW-302A
MW-303
MW-304
MW-305
MW-306
MW-307
MW-307A
MW-308
MW-309
MW-312
MW-313
MW-313A
TP-1 TP-2 TP-3 TP-4 TP-5 TP-6 TP-7 TP-8 TP-9 TP-10 TP-11 TP-12 TP-13 TP-15 TP-16 TP-18 TP-19

PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- PAVED ROAD
- GRAVEL/DIRT ROAD
- FENCE
- RAILROAD TRACKS
- DELINEATED WETLAND
- EDGE OF WATER
- PROCESS WATER FLOW DIRECTION
- APPROXIMATE LOCATION OF SOIL-BENTONITE SLURRY WALL (BASED ON HARD HAT SERVICES OCTOBER 2007 DRAFT DESIGN)
- HESCO BARRIER
- GAS MAIN
- OVERHEAD UTILITY
- SANITARY SEWER
- STORM SEWER/CULVERT
- PROCESS WATER CONVEYANCE PIPE
- TELEPHONE
- UNDERGROUND ELECTRIC
- WATER MAIN
- IMPRESSED CURRENT ANODE INSTALLATION
- VALVE
- BOLLARD
- SANITARY SEWER MANHOLE
- STORM SEWER INLET
- STORM SEWER MANHOLE
- UTILITY POLE AND GUY WIRE
- UTILITY POLE WITH AREA LIGHT
- UTILITY POLE WITH CONCRETE FOUNDATION
- SURVEY CONTROL POINT
- MONITORING WELL
- TEMPORARY MONITORING WELL (ABANDONED MARCH 2016)
- DEWATERING PUMP TEST WELL (PUMPING WELL/MONITORING WELL)
- STAFF GAUGE
- GEOPROBE SOIL BORING
- GEOTECHNICAL SOIL BORING
- SEDIMENT PROBE
- TEST PIT

NOTES:

1. EXISTING CONTOURS OUTSIDE OF THE 2019 SURVEY LIMIT ARE FROM DES MOINES COUNTY DATED OCTOBER 2010. EXISTING CONTOURS INSIDE THE DESIGNATED LIMIT AND WATER LEVELS ARE FROM NOVEMBER 2019 SURVEY AND DECEMBER 2019 TOPOGRAPHIC AND BATHYMETRIC SURVEY BY MOHN SURVEYING, INC.
2. DRAWING COORDINATES IOWA STATE PLANES, SOUTH ZONE, US FOOT, NAD 83 DATUM. VERTICAL DATUM IS NAVD 88.
3. WESTERN PROPERTY LINE AND EASTERN NORMAL HIGH WATER LINE BASED ON INFORMATION PROVIDED BY MOHN SURVEYING, INC. REMAINDER OF EASTERN PROPERTY LINE IS APPROXIMATE BASED ON HISTORY OF CONSTRUCTION REPORT PREPARED BY HARD HAT SERVICES DATED MARCH 6, 2018.
4. BUILDINGS WITHIN THE PLANT AREA ARE APPROXIMATE AND ARE BASED ON AN OCTOBER 2018 AERIAL PHOTOGRAPH.
5. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. NOT ALL SITE UTILITIES ARE SHOWN ON THIS FIGURE.
6. PROCESS TRANSPORT WATER FLOW LINE BASED ON INFLOW DESIGN FLOOD CONTROL PLAN BY HARD HAT SERVICES, JULY 26, 2017, REV. 1.
7. WETLANDS WERE DELINEATED BY IMPACT7G, INC. ON OCTOBER 17, 2019.
8. GEOPROBE BORINGS WERE COMPLETED BY MATECO DRILLING AND OVERSEEN BY SCS ENGINEERS IN DECEMBER 2019. LOCATIONS WERE RECORDED BY SCS ENGINEERS AT THE TIME OF DRILLING WITH HAND-HELD GPS EQUIPMENT.
9. SPT BORINGS WERE COMPLETED BY ROBERTS ENVIRONMENTAL DRILLING AND OVERSEEN BY SCS ENGINEERS IN DECEMBER 2019 AND JANUARY 2020. LOCATIONS WERE SURVEYED BY MOHN SURVEYING, INC. ON FEBRUARY 5, 2020.
10. TEST PITS WERE COMPLETED BY TOPPERT JETTING SERVICE INC. AND OVERSEEN BY SCS ENGINEERS IN JANUARY 2020. LOCATIONS WERE RECORDED BY SCS ENGINEERS AT THE TIME OF EXCAVATION WITH HAND-HELD GPS EQUIPMENT.
11. SEDIMENT PROBES WERE COMPLETED BY MOHN SURVEYING, INC. IN NOVEMBER AND DECEMBER 2019.
12. MAXIMUM GROUND ELEVATIONS MEET NESC CODE CLEARANCE PLUS THE ITC BUFFER BASED ON RECORDS FROM 2016. ELEVATION CLEARANCES APPLY FOR TYPICAL VEHICLE ACCESS (E.G. CARS, TRACTORS, COMBINES, ETC.) BUT LARGER EQUIPMENT MAY REQUIRE ADDITIONAL CLEARANCE (E.G. EXCAVATOR). ADDITIONALLY, A MINIMUM OF 20 FEET OVERHEAD SEPARATION DISTANCES IS REQUIRED FOR EQUIPMENT OPERATING UNDER OR AROUND OVERHEAD POWER LINES.
13. INFORMATION FROM HARD HAT SERVICES BOILER SEAL WATER REROUTE, ASH POND REDESIGN, AND BAGHOUSE GRADING PLAN DRAWINGS DATED MARCH 27, 2009.

SURVEY CONTROL MONUMENT INFORMATION

CONTROL MONUMENT	NORTHING	EASTING	ELEVATION	DESCRIPTION
A	278317.11	2300279.28	525.90	BRASS CAP ON TOP OF IN CONCRETE WALL
BL-2	279349.30	2298902.70	532.66	5/8"ø STEEL ROD W/ALUM. CAP
BL-3	279695.16	2298883.44	531.89	5/8"ø STEEL ROD WITH ALUM. CAP
BL-4	280020.25	2299242.52	529.66	5/8"ø STEEL ROD WITH ALUM. CAP
BL-5	280327.44	2299567.72	529.49	5/8"ø STEEL ROD WITH ALUM. CAP
CP-1	280225.65	2301040.41	532.30	CONCRETE MONUMENT WITH BRASS CAP
CP-2	278309.02	2300651.97	533.70	CONCRETE MONUMENT WITH BRASS CAP

HORIZONTAL DATUM: IOWA STATE PLANE COORDINATE SYSTEM SOUTH ZONE (1402) NAD 83 (2011) GEOID 12A
VERTICAL DATUM: NAVD 1988

N

100 0 100
SCALE: 1" = 100'

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJK 03/16/2022
PROJECT NO. 2529168.00
DRAWN: 03/23/2021
REVISED: 12/03/2021

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601
CLIENT

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

ASH POND CLOSURE DRAWINGS
LANSING GENERATING STATION
BURLINGTON, IOWA
SITE

EXISTING CONDITIONS
SHEET
2 of 21

2299000 E
2299500 E
2300000 E
2300500 E
2301000 E
280000 N
279500 N
279000 N
278500 N

LOWER POND
UPPER ASH POND CLOSURE
ECONOMIZER POND CLOSURE
MAIN ASH POND CLOSURE
ASH SEAL POND CLOSURE
ADDITIONAL COAL AREA
COAL YARD RUNOFF BASIN CLOSURE
COAL YARD CLOSURE
PLANT AREA
SUBSTATION
SULLIVAN SLOUGH ROAD
ENTRANCE ROAD
OVERHEAD WALKWAY
MISSISSIPPI RIVER
WATER METER
CP-1
CP-2

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING PAVED ROAD
- EXISTING GRAVEL/DIRT ROAD
- EXISTING FENCE
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- EDGE OF WATER
- EXISTING GAS MAIN
- EXISTING OVERHEAD UTILITY
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING TELEPHONE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING WATER MAIN
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING VALVE
- EXISTING BOLLARD
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER INLET
- EXISTING STORM SEWER MANHOLE
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- EXISTING MONITORING WELL
- PROPOSED GRADES (10' CONTOUR)
- PROPOSED GRADES (2' CONTOUR)
- PROPOSED LIMITS OF FINAL COVER
- PROPOSED SILT FENCE/FILTER SOCK
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED DRAINAGE
- PROPOSED STORM WATER DISCHARGE PIPE
- PROPOSED SILT FENCE
- PROPOSED REVETMENT STONE

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.

N

100 0 100

SCALE: 1" = 100'

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY:	BSS/KP
CHECKED BY:	MRH
APPROVED BY:	EJK/ 03/18/2022
PROJECT NO.	25219168.00
DRAWN:	03/24/2021
REVISED:	03/17/2022

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
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PHONE: (608) 224-2830

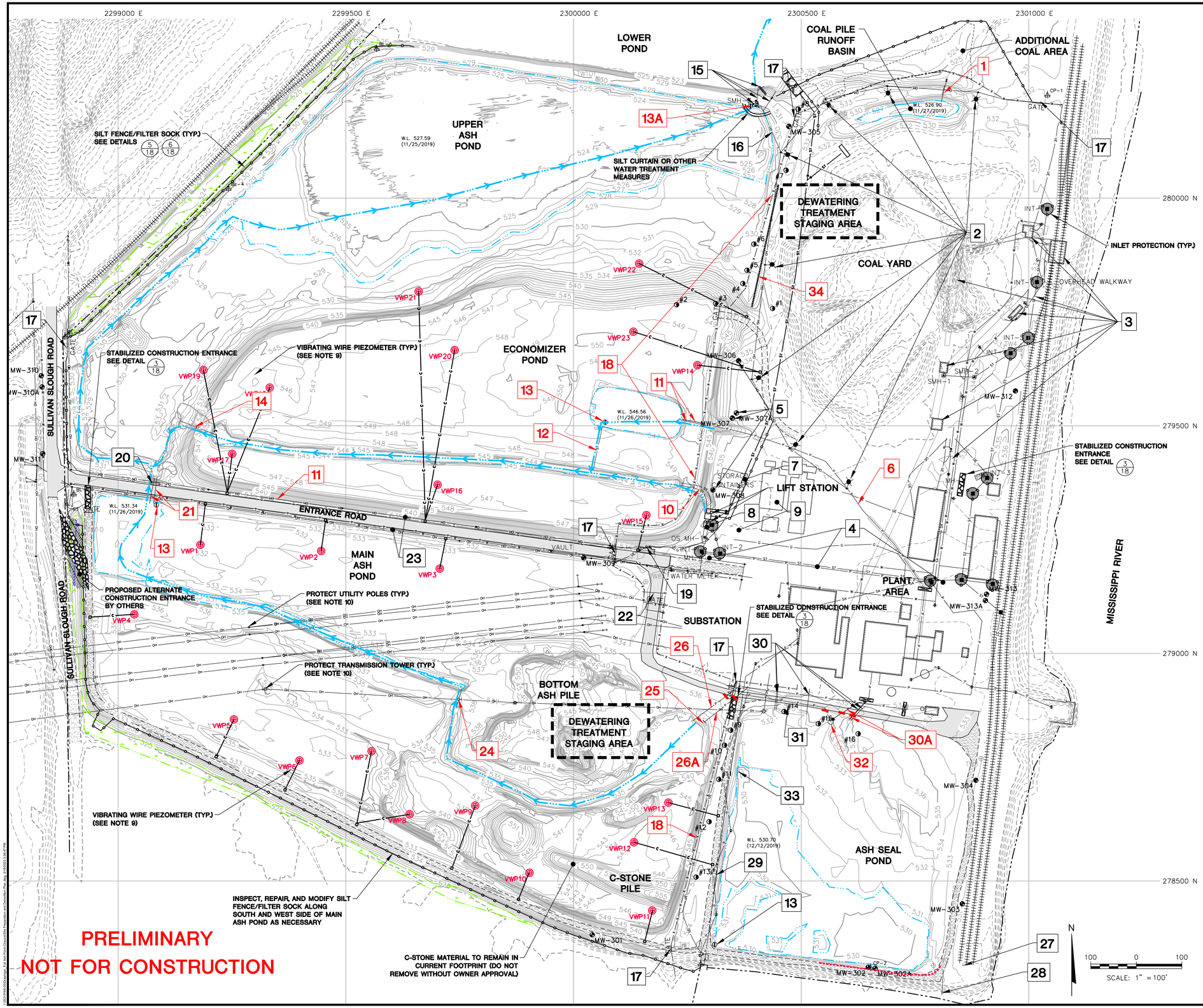
ENGINEER

ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

OVERALL SITE DEVELOPMENT PLAN

SHEET
3 of 21



LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING FENCE
- EXISTING OVERHEAD UTILITY
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING TELEPHONE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING WATER MAIN
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH AREA LIGHT
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- PROPOSED STORM WATER DISCHARGE PIPE
- PROPOSED REVETMENT STONE
- PROPOSED SILT FENCE/FILTER SOCK
- PROPOSED INLET PROTECTION
- PROPOSED LIMITS OF PIPE ABANDONMENT
- PROPOSED LIMITS OF PIPE REMOVAL
- PROPOSED VIBRATING WIRE PIEZOMETER
- PROPOSED VIBRATING WIRE PIEZOMETER CABLE
- PROPOSED 6"x6" PRESSURE TREATED POST SET 2' INTO GROUND (BY OTHERS)

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, SIZES, AND MATERIALS.
3. PROTECT EXISTING MONITORING WELLS AND STRUCTURES DURING CONSTRUCTION. TO BE REPLACED AT CONTRACTORS COST IF DAMAGED.
4. UTILITY AND STRUCTURE LOCATIONS ARE APPROXIMATE. FIELD VERIFY AND PROTECT UTILITIES AND STRUCTURES.
5. INSTALL EROSION CONTROLS PRIOR TO BEGINNING EARTHWORK.
6. INSTALL STORM WATER INLET FILTERS ON STORM INLETS THAT ARE DOWN GRADIENT OR ADJACENT TO GRADING WORK.
7. CONTRACTOR TO INSTALL TRACKING PADS AT CONSTRUCTION SITE ENTRANCE/EXITS TO LIMIT TRACKING OF MATERIAL ON TO PAVED SITE ROADS AND TRACKING OF MATERIAL OFF SITE.
8. CLEAR AND GRUB WORK AREA AS NEEDED TO COMPLETED WORK.
9. INSTALL VIBRATING WIRE PIEZOMETERS AND CABLE FOR MONITORING PORE WATER PRESSURES IN EXITING ECONOMIZER POND AREA CCR DURING FILLING. INSTALL PIEZOMETER IN THE BOTTOM OF THE BOREHOLE. VIBRATING WIRE PIEZOMETERS IN MAIN ASH POND INSTALLED BY OTHERS. PROTECT AND MAINTAIN VIBRATING WIRE PIEZOMETERS AND CABLES THROUGHOUT CONSTRUCTION.
10. PROTECT UTILITY POLES AND TRANSMISSION TOWERS. TWO (2) WEEKS PRIOR TO WORK NEAR POWER POLES/TOWERS COORDINATE POLE/TOWER PROTECTION/WRAPPING WITH ITC. CONTRACT JACK HORN (319-855-8444) OR DON KELCHEN [BACKUP CONTRACT] (319-826-5755).
11. ALL WORK WITHIN 25 FEET OF THE GAS MAIN ON THE EAST SIDE OF THE PROPERTY MUST BE OBSERVED BY ALLIANT GAS DISTRIBUTION METERING. COORDINATE WORK WITH ALLIANT GAS DISTRIBUTION METERING. CONDUCT HYDROVAC EXCAVATION TO DETERMINE LOCATION OF GAS LINE.

DEMOLITION NOTES: 7 (PROTECT) 11 (REMOVE)

1. REMOVE 7-INCH PLASTIC DISCHARGE PIPE WITH VERTICAL RISER AND VALVE. REMOVE 6-INCH PVC DISCHARGE PIPE. DISPOSE OFF SITE.
2. PROTECT UTILITY POLE WITH AREA LIGHTS. REMOVE UTILITY POLES WITH AREA LIGHTS AS NECESSARY TO COMPLETE WORK AND REPLACE OUTSIDE OF FINAL COVER LIMITS AND BASIN AREA UPON COMPLETION.
3. PROTECT EXISTING UTILITIES AROUND THE COAL CONVEYOR INFRASTRUCTURE. DEMOLITION OF COAL CONVEYOR INFRASTRUCTURE, BAG HOUSES, AND OTHER EQUIPMENT TO BE COMPLETED BY OTHERS.
4. PROTECT EXISTING UTILITIES NEAR PLANT AND SUBSTATION AREA.
5. PROTECT EXISTING MONITORING WELLS. ASSIST OTHERS WITH RAISING OF WELLS TO ABOVE FINAL COVER GRADES.
6. REMOVE 10" PVC PIPE AND DISPOSE OFF SITE.
7. PROTECT EXISTING STORAGE CONTAINERS. COORDINATE WITH SITE ON RELOCATION DURING CONSTRUCTION.
8. PROTECT OIL WATER SEPARATOR, LIFT STATION, AND WASTEWATER PIPING.
9. PROTECT GAS UTILITY AND COMBUSTION TURBINE STRUCTURES.
10. REMOVE TWO (2) 12-INCH PVC PIPES BACK TO THE LIFT STATION AND DISPOSE OFF SITE.
11. REMOVE 8-INCH PVC PIPE AND 10-INCH STEEL CASING PIPE AND 15-INCH CMP CASING PIPE. DISPOSE OFF SITE.
12. REMOVE 14-INCH HDPE PIPE WITH VERTICAL RISER AND DISPOSE OFF SITE.
13. REMOVE STAFF GAUGE TO FACILITATE CCR REMOVAL.
13A. REMOVE STAFF GAUGE TO FACILITATE CCR REMOVAL. REINSTALL STAFF GAUGE AFTER CCR HAS BEEN REMOVED.
14. REMOVE 14-INCH HDPE PIPE WITH VERTICAL RISER AND 21-INCH CMP PIPE. DISPOSE OFF SITE.
15. PROTECT EXISTING UPPER ASH POND OUTLET STRUCTURE AND ASSOCIATED INFRASTRUCTURE. PROTECT EXISTING 14-INCH PVC DISCHARGE PIPE. PROTECT EXISTING 14-INCH PIPE WITH VERTICAL RISER AND VALVE. PROTECT EXISTING STEEL STAIRS.
16. MAINTAIN UTILITY POWER TO UPPER ASH POND OUTLET FLOW MONITOR DURING CONSTRUCTION AND PROVIDE POWER REROUTE IF NEEDED. COORDINATE WITH OWNER ON TIMING FOR ABANDONMENT.
17. PROTECT AND MAINTAIN GATE THROUGHOUT CONSTRUCTION.
18. REMOVE FENCE WITHIN LIMITS OF WORK.
19. PROTECT EXISTING GUARD SHACK AND ASSOCIATED INFRASTRUCTURE.
20. PROTECT EXISTING GAS VALVE IN FENCED ENCLOSURE.
21. ABANDON TWO (2) 12-INCH CMP DISCHARGE PIPES IN PLACE.
22. PROTECT EXISTING 10-INCH PVC DRAINAGE PIPE, SEE SHEET 7.
23. PROTECT EXISTING UTILITIES AND STRUCTURES DURING CONSTRUCTION. FOLLOW REQUIREMENTS BY OWNER AND TRANSMISSION LINE COMPANY.
24. REMOVE EXISTING RCP PIPE AND DISPOSE OFF SITE.
25. REMOVE EXISTING CONCRETE OUTLET STRUCTURE AND DISPOSE OFF SITE.
26. REMOVE 10-INCH STEEL PIPE TO DESIGNATED LOCATION AND DISPOSE OFF SITE. ABANDON REMAINING LINE IN PLACE TO DESIGNATED LOCATION.
26A. REMOVE 8-INCH HDPE PIPE TO DESIGNATED LOCATION AND DISPOSE OFF SITE. ABANDON REMAINING LINE IN PLACE.
27. PROTECT 6-INCH TILE INLET.
28. PROTECT 4-INCH PVC DRAINAGE PIPE.
29. PROTECT EXISTING 66-INCH STEEL CONDENSER AND CURRENT ANODE INSTALLATION.
30. PROTECT EXISTING STRUCTURES AND PIPES LEADING INTO THE ASH SEAL POND.
30A. REMOVE PROCESS WATER PIPES TO DESIGNATED LOCATION AND DISPOSE OFF SITE. ABANDON REMAINING LINE IN PLACE BY REMOVING VALVES AND FILLING WITH LOW STRENGTH BACKFILL
31. PROTECT EXISTING STEPS AND OVERHEAD STRUCTURE.
32. REMOVE EXISTING PUMP STATION AND DISCHARGE PIPING AND DISPOSE OFF SITE.
33. REMOVE CONCRETE INLET STRUCTURE.
34. HESCO BARRIER TO BE REMOVED BY IPL.

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJH 03/16/2022

PROJECT NO. 2529168.00
DRAWN: 03/24/2021
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ENGINEER

ASH POND CLOSURE DRAWINGS
LOUISA GENERATING STATION
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

SITE PREPARATION AND DEMOLITION PLAN

SHEET
4 of 21

2300300 E 2300400 E 2300500 E 2300600 E 2300700 E 2300800 E 2300900 E

278900 N 278800 N 278700 N 278600 N 278500 N 278400 N 278300 N

PRESERVE/PROTECT STEPS AND OVERHEAD STRUCTURE, DO NOT UNDERMINE STRUCTURE

PLANT AREA

MAIN ASH POND

PRESERVE/PROTECT STORM WATER DRAINAGE PIPES

PROTECT TRANSMISSION TOWER (SEE NOTE 5)

REMOVE AND DISPOSE CONCRETE INLET STRUCTURE

PRESERVE/PROTECT 66" CONDENSER DISCHARGE PIPE AND CURRENT ANODE INSTALLATION

W.L. 530.70 (12/12/2019)

ASH SEAL POND

REMOVE EXISTING STAFF GAUGE

REMOVE FORMER OUTLET STRUCTURE TO A MINIMUM 2 FT BELOW FINAL GRADES

MISSISSIPPI RIVER

GATE

TP-1 TP-8 TP-9 TP-10 TP-11

MW-302 MW-302A MW-303 MW-304

GP1 GP2 GP3 GP4 GP4A GP5

GT1 GT2 GT3

TW1 TW3

P38 P39 P40 P41 P42 P43 P44 P45 P46 P47 P48 P49 P50 P51 P52 P53 P54 P55 P56 P57 P58

#9 #10 #11 #12 #13 #14 #15 #16

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING PAVED ROAD
- EXISTING GRAVEL/DIRT ROAD
- EXISTING FENCE
- EXISTING RAILROAD TRACKS
- APPROXIMATE LOCATION OF SOIL-BENTONITE SLURRY WALL (BASED ON HARD HAT SERVICES OCTOBER 2007 DRAFT DESIGN)
- EXISTING OVERHEAD UTILITY
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING VALVE
- EXISTING BOLLARD
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- SURVEY CONTROL POINT
- EXISTING MONITORING WELL
- TEMPORARY MONITORING WELL (ABANDONED MARCH 2016)
- STAFF GAUGE
- EXISTING GEOPROBE SOIL BORING
- EXISTING GEOTECHNICAL SOIL BORING
- EXISTING SEDIMENT PROBE
- AMES TEST PIT
- ANTICIPATED EXCAVATION GRADES (5' CONTOUR)
- ANTICIPATED EXCAVATION GRADES (1' CONTOUR)
- POTENTIAL DEMOLITION DEBRIS ZONE

NOTES:

1. SEE SHEET 2 OF THE ASH POND CLOSURE REQUEST FOR PROPOSAL DRAWINGS FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. PROTECT EXISTING MONITORING WELLS AND STRUCTURES DURING CONSTRUCTION. TO BE REPLACED AT CONTRACTORS COST IF DAMAGED.
3. PROPOSED GRADES REPRESENT ANTICIPATED BOTTOM OF CCR REMOVAL LIMITS. ACTUAL LIMITS WILL BE DETERMINED BY THE ENGINEER/OWNER BASED ON FIELD CONDITIONS.
4. HYDRO EXCAVATE AROUND STRUCTURES TO BE PRESERVED/PROTECTED IF NEEDED.
5. TWO (2) WEEKS PRIOR TO WORK NEAR POWER POLES/TOWERS COORDINATE POLE/TOWER PROTECTION/WRAPPING WITH ITC. CONTACT JACK HORN (319-855-8444) OR DON KELCHEN [BACKUP CONTACT] (319-826-5755).

PRELIMINARY

NOT FOR CONSTRUCTION

N

30 0 30

SCALE: 1" = 30'

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJN 03/16/2022

PROJECT NO. 2521916B.00
DRAWN: 01/26/2021
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ASH POND CLOSURE DRAWINGS
ISSUED FOR BIDDING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

ASH SEAL POND EXCAVATION PLAN

SHEET
5 of 21

L:\2521916B.00\Drawings_Full Ash Pond Closure\Ash Seal Pond Excavation Plan.dwg, 3/7/2022 1:37:20 PM

2299000 E
2299500 E
2300000 E
2300500 E
2301000 E
280500 N
280000 N
279500 N
279000 N

LOWER POND
UPPER ASH POND
ECONOMIZER POND
MAIN ASH POND
COAL YARD RUNOFF BASIN
ADDITIONAL COAL AREA
COAL YARD
SUBSTATION
PLANT AREA
OVERHEAD WALKWAY
MISSISSIPPI RIVER
EASTERN PORTION OF STRUCTURE TO REMAIN
PROTECT TRANSFORMERS
FRAC TANK
GATE
CP-1
SULLIVAN SLOUGH ROAD
ENTRANCE ROAD
PROTECT GAS LINE (SEE NOTE 7)
PROPOSED ALTERNATE CONSTRUCTION ENTRANCE BY OTHERS
PROPOSED SITE PREPARATION REGRADE (SEE NOTE 4)
PROPOSED APPROX. 50-FT EXCAVATION SEQUENCING (TYP.) SEE DETAIL 7/15
ECONOMIZER POND EXCAVATION AND BERM BUTTRESS SEQUENCING SEE DETAIL 7/15
PROPOSED 12" HDPE DR11 FROM STORM WATER VAULT
PROPOSED HYDRODYNAMIC SEPARATOR
W.L. 527.59 (11/25/2019)
W.L. 546.56 (11/26/2019)
W.L. 531.34 (11/26/2019)
MW-305
MW-306
MW-307
MW-307A
MW-308
MW-309
MW-310
MW-310A
MW-311
MW-312
MW-313
MW-313A
TP-2
TP-3
TP-4
TP-5
TP-6
TP-7
TP-11
TP-13
SL-1
SL-2
SL-4
SL-5

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING PAVED ROAD
- EXISTING GRAVEL/DIRT ROAD
- EXISTING FENCE
- EXISTING RAILROAD TRACKS
- DELINEATED WETLAND
- EDGE OF WATER
- EXISTING GAS MAIN
- EXISTING OVERHEAD UTILITY
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING TELEPHONE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING WATER MAIN
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING VALVE
- EXISTING BOLLARD
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER INLET
- EXISTING STORM SEWER MANHOLE
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH AREA LIGHT
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- PROPOSED GRADES (10' CONTOUR)
- PROPOSED GRADES (2' CONTOUR)
- PROPOSED LIMITS OF SITE PREPARATION REGRADE
- PROPOSED SILT FENCE/FILTER SOCK
- PROPOSED STORM WATER DISCHARGE PIPE
- PROPOSED REVETMENT STONE

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. UTILITY LOCATIONS APPROXIMATE. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS AND PROTECT UTILITIES.
3. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, SIZES, AND MATERIALS.
4. REGRADE THE EXISTING ECONOMIZER POND SLOPES TO NO STEEPER THAN 4H:1V GRADES PRIOR TO PLACEMENT OF EXCAVATED MATERIAL FROM THE UPPER ASH POND OR COAL YARD ON TOP OF THE ECONOMIZER POND AREA.
5. EXISTING GRADES SHOWN IN THE COAL YARD NOT REPRESENTATIVE OF CONDITIONS TO BE ENCOUNTERED PRIOR TO EXCAVATION. SURVEY COAL YARD PRIOR TO EXCAVATION TO DETERMINE ACTUAL EXCAVATION QUANTITY.
6. PROPOSED EXCAVATION GRADES REPRESENT ANTICIPATED BOTTOM OF CCR OR COAL REMOVAL LIMITS. ACTUAL LIMITS WILL BE DETERMINED BY THE ENGINEER/OWNER BASED ON FIELD CONDITIONS.
7. ALL WORK WITHIN 25 FEET OF THE GAS MAIN ON THE EAST SIDE OF THE PROPERTY MUST BE OBSERVED BY ALLIANT GAS DISTRIBUTION METERING. COORDINATE WORK WITH ALLIANT GAS DISTRIBUTION METERING. CONDUCT HYDROVAC EXCAVATION TO DETERMINE LOCATION OF GAS LINE.

N

100 0 100

SCALE: 1" = 100'

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJN 03/18/2022

PROJECT NO. 2529168.00
DRAWN: 03/24/2021
REVISED: 03/08/2022

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ENGINEER

ASH POND CLOSURE DRAWINGS
PRAIRIE CREEK GENERATING STATION
BURLINGTON, IOWA
SITE

PROPOSED EXCAVATION GRADES – COAL YARD AND UPPER ASH POND
SHEET
6 of 21

I:\2529\168\05\Drawings\...\Ext Ash Pond Closure\Upper Ash Pond and Coal Yard Excavation.dwg, 3/18/2022 2:37:28 PM

2300300 E
2300400 E
2300500 E
2300600 E
2300700 E
2300800 E
2300900 E

278900 N
278800 N
278700 N
278600 N
278500 N
278400 N
278300 N

PROTECT TRANSMISSION TOWER (SEE NOTE 5)

MAIN ASH POND

PLANT AREA

ASH SEAL POND

PRESERVE/PROTECT STORM WATER DRAINAGE PIPES

ROCK CHECK DAM (TYP.)
SEE SHEET CH106

CULVERT C6
SEE SHEETS CG104 AND CG105

ROCK CHUTE RC9
INSTALL TEMPORARY EROSION CONTROLS BELOW CULVERT
DISCHARGE PRIOR TO INSTALLATION

FLEXIMAT
SEE SHEET CG106

MISSISSIPPI RIVER

GATE

#9
#10
#11
#12
#13

GT3
GT2
TW1
TW3
304S
MW-303S
MW-302S
CP-2

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING PAVED ROAD
- EXISTING GRAVEL/DIRT ROAD
- EXISTING FENCE
- EXISTING RAILROAD TRACKS
- APPROXIMATE LOCATION OF SOIL-BENTONITE SLURRY WALL (BASED ON HARD HAT SERVICES OCTOBER 2007 DRAFT DESIGN)
- EXISTING OVERHEAD UTILITY
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING VALVE
- EXISTING BOLLARD
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- SURVEY CONTROL POINT
- EXISTING MONITORING WELL
- TEMPORARY MONITORING WELL (ABANDONED MARCH 2016)
- STAFF GAUGE
- EXISTING GEOPROBE SOIL BORING
- EXISTING GEOTECHNICAL SOIL BORING
- EXISTING SEDIMENT PROBE
- PROPOSED ASH SEAL POND FINAL GRADES (10' CONTOUR)
- PROPOSED ASH SEAL POND FINAL GRADES (2' CONTOUR)
- PROPOSED DRAINAGE
- PROPOSED LIMITS OF PIPE ABANDONMENT
- PROPOSED ROCK CHECK DAM

NOTES:

1. SEE SHEET 2 OF THE ASH POND CLOSURE REQUEST FOR PROPOSAL DRAWINGS FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. PROTECT EXISTING MONITORING WELLS AND STRUCTURES DURING CONSTRUCTION. TO BE REPLACED AT CONTRACTORS COST IF DAMAGED.
3. PROPOSED GRADES REPRESENT ANTICIPATED BOTTOM OF CCR REMOVAL LIMITS. ACTUAL LIMITS WILL BE DETERMINED BY THE ENGINEER/OWNER BASED ON FIELD CONDITIONS.
4. HYDRO EXCAVATE AROUND STRUCTURES TO BE PRESERVED/PROTECTED IF NEEDED.
5. TWO (2) WEEKS PRIOR TO WORK NEAR POWER POLES/TOWERS COORDINATE POLE/TOWER PROTECTION/WRAPPING WITH ITC. CONTACT JACK HORN (319-855-8444) OR DON KELCHEN [BACKUP CONTACT] (319-826-5755).

PRELIMINARY
NOT FOR CONSTRUCTION

N
30 0 30
SCALE: 1" = 30'

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJH 03/18/2022

PROJECT NO. 2521916B.00
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REVISED: 03/17/2022

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SITE
ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SHEET
PROPOSED ASH SEAL POND FINAL GRADES
7 of 21

L:\2521916B.00\Drawings_Full Auto Pond Closure\Ash Seal Pond Final Grades.dwg, 3/18/2022 3:12:43 PM

2299800 E 2299900 E 2300000 E 2300100 E 2300200 E 2300300 E 2300400 E 2300500 E 2300600 E 2300700 E 2300800 E 2300900 E 2301000 E 2301100 E 2301200 E

279400 N
279300 N
279200 N
279100 N
279000 N
278900 N
278800 N
278700 N
278600 N
278500 N
278400 N
278300 N

SULLIVAN SLOUGH ROAD

PROPOSED ALTERNATE CONSTRUCTION ENTRANCE BY OTHERS

ENTRANCE ROAD

ECONOMIZER POND

STORAGE CONTAINERS

MW-308

MW-309

VAULT

WATER METER

SUBSTATION

PROTECT UTILITY POLES (TYP.) (SEE NOTE 3)

PROTECT TRANSMISSION TOWER (TYP.) (SEE NOTE 3)

MAIN ASH POND CLOSURE

MW-301

BL-2

INT-1

INT-2

MH-1

#9

#10

#11

#12

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING PAVED ROAD
- EXISTING GRAVEL/DIRT ROAD
- EXISTING FENCE
- EXISTING RAILROAD TRACKS
- DELINEATED WETLAND
- EDGE OF WATER
- EXISTING GAS MAIN
- EXISTING OVERHEAD UTILITY
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING TELEPHONE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING WATER MAIN
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING VALVE
- EXISTING BOLLARD
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER INLET
- EXISTING STORM SEWER MANHOLE
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH AREA LIGHT
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- PROPOSED GRADES (10' CONTOUR)
- PROPOSED GRADES (2' CONTOUR)
- PROPOSED LIMITS OF FINAL COVER
- PROPOSED SILT FENCE/FILTER SOCK

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. UTILITY LOCATIONS APPROXIMATE. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS AND PROTECT UTILITIES.
3. TWO (2) WEEKS PRIOR TO WORK NEAR POWER POLES/TOWERS COORDINATE POLE/TOWER PROTECTION/WRAPPING WITH ITC. CONTACT JACK HORN (319-855-8444) OR DON KELCHEN [BACKUP CONTACT] (319-826-5755).
4. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, SIZES, AND MATERIALS.
5. PROPOSED GRADES IN MAIN ASH POND REPRESENT TOP OF CCR AND COAL IMPACTED MATERIAL.
6. PROPOSED GRADES ARE SUBJECT TO CHANGE DEPENDENT ON ON-SITE MATERIAL BALANCING.

N

60 0 60

SCALE: 1" = 60'

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJN 03/18/2022

PROJECT NO. 25219168.00
DRAWN: 01/26/2021
REVISED: 12/03/2021

CLIENT
INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

ENGINEER
SCS ENGINEERS
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PHONE: (608) 224-2830

SITE
ASH POND CLOSURE DRAWINGS
IN SUPPORT OF CCR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

PROPOSED MAIN ASH POND SUBGRADES

SHEET
8 of 21

I:\25\21916\8\Drawings_Full Ash Pond Closure\Base Ash Pond Subgrade.mxd, 3/18/2022 3:38:45 PM

2299800 E | 2299900 E | 2300000 E | 2300100 E | 2300200 E | 2300300 E | 2300400 E | 2300500 E | 2300600 E | 2300700 E | 2300800 E | 2300900 E | 2301000 E | 2301099.2798 E | 2301199.2798 E | 2301

279400 N | 279300 N | 279200 N | 279100 N | 279000 N | 278900 N | 278800 N | 278700 N | 278600 N | 278500 N | 278400 N | 278300 N

PROTECT EXISTING UTILITIES (SEE NOTE 2)

ROCK CHUTE RC3 SEE DETAIL 4/18

CULVERT C3
2 - 18" DIA CPEP CULVERT
INLET IE = 531.0
OUTLET IE = 530.7
SEE DETAILS 3/16, 4/16, 8/16

PERIMETER SWALE (TYP.) SEE DETAIL 5/15

UTILITY POLE BOOT (TYP.) SEE DETAIL 9/18

ENTRANCE ROAD

ECONOMIZER POND

STORAGE CONTAINERS

MW-308

PROTECT EXISTING UTILITIES (SEE NOTE 2)

MW-309

REUSE AND RELAY EXISTING 10" DIA. PVC PIPE SEE DETAIL 7/16

SUBSTATION

WATER METER

INT-1 | INT-2

SULLIVAN SLOUGH ROAD

FLUME 6

PROTECT UTILITY POLES (TYP.) (SEE NOTE 3)

DOWNSLOPE FLUME (TYP.) SEE DETAIL 2/17

FLUME 5

FLUME 4

FLUME 3

ENERGY DISSIPATOR (TYP.) SEE DETAIL 3/17

PROTECT TRANSMISSION TOWER (TYP.) (SEE NOTE 3)

MAIN ASH POND CLOSURE

FLUME 2

FLUME 1

CULVERT C2
INLET IE = 529.2
OUTLET IE = 528.8

ROCK CHUTE RC2

ACCESS ROAD SEE DETAIL 4/15

DIVERSION BERM (TYP.) SEE DETAIL 3/15

MW-301

PERIMETER SWALE (TYP.) SEE DETAIL 5/15

CULVERT C1
INLET IE = 530.1
OUTLET IE = 529.5

RESTORE EXISTING ACCESS ROAD TO PRE-CONSTRUCTION GRADES SEE DETAIL 4/15

EMERGENCY SPILLWAY AND ROCK APRON

#1 | #2 | #3

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING PAVED ROAD
- EXISTING GRAVEL/DIRT ROAD
- EXISTING FENCE
- EXISTING RAILROAD TRACKS
- DELINEATED WETLAND
- EDGE OF WATER
- EXISTING GAS MAIN
- EXISTING OVERHEAD UTILITY
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING TELEPHONE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING WATER MAIN
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING VALVE
- EXISTING BOLLARD
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER INLET
- EXISTING STORM SEWER MANHOLE
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH AREA LIGHT
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- PROPOSED GRADES (10' CONTOUR)
- PROPOSED GRADES (2' CONTOUR)
- PROPOSED LIMITS OF FINAL COVER
- PROPOSED SILT FENCE/FILTER SOCK
- PROPOSED DIVERSION BERM
- PROPOSED SWALE
- PROPOSED DOWNSLOPE FLUME
- PROPOSED ENERGY DISSIPATOR
- PROPOSED CULVERT
- PROPOSED REVETMENT STONE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. UTILITY LOCATIONS APPROXIMATE. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS AND PROTECT UTILITIES.
3. TWO (2) WEEKS PRIOR TO WORK NEAR POWER POLES/TOWERS COORDINATE POLE/TOWER PROTECTION/WRAPPING WITH ITC. CONTACT JACK HORN (319-855-8444) OR DON KELCHEN [BACKUP CONTACT] (319-826-5755).
4. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, SIZES, AND MATERIALS.
5. PROPOSED GRADES ARE SUBJECT TO CHANGE DEPENDENT ON ON-SITE MATERIAL BALANCING.

N

60 0 60

SCALE: 1" = 60'

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJN 03/18/2022

PROJECT NO. 25219168.00
DRAWN: 03/24/2021
REVISED: 03/17/2022

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

CLIENT

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PHONE: (608) 224-2830

ENGINEER

ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

PROPOSED MAIN ASH POND FINAL GRADES

SHEET
9 of 21

2299000 E
2299500 E
2300000 E
2300500 E
2301000 E
280500 N
280000 N
279500 N
279000 N

LOWER POND
UPPER ASH POND CLOSURE
ECONOMIZER POND CLOSURE
COAL YARD RUNOFF BASIN CLOSURE
ADDITIONAL COAL AREA
COAL YARD CLOSURE
MAIN ASH POND
SUBSTATION
PLANT AREA
ENTRANCE ROAD
SULLIVAN SLOUGH ROAD
MISSISSIPPI RIVER
OVERHEAD WALKWAY

ECONOMIZER POND EXCAVATION AND BERM BUTTRESS SEQUENCING SEE DETAIL 7/15
ECONOMIZER AREA BERM BUTTRESS SEE DETAIL 8/15
BERM BUTTRESS (SEE NOTE 5)
CCR OR COAL IMPACTED MATERIAL
CONTRACTOR TO VERIFY CCR IMPACTED MATERIAL LIMITS WITH TEST PITS
PROPOSED ALTERNATE CONSTRUCTION ENTRANCE BY OTHERS
W.L. 531.34 (11/26/2019)

MW-305
MW-306
MW-307
MW-307A
MW-308
MW-309
MW-310
MW-310A
MW-311
MW-312
MW-313
MW-313A
CP-1
TW5
#1
#2
#3
#4
#5
#6
#7
#8
#9
#10
#14
#15
#16

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING PAVED ROAD
- EXISTING GRAVEL/DIRT ROAD
- EXISTING FENCE
- EXISTING RAILROAD TRACKS
- DELINEATED WETLAND
- EDGE OF WATER
- EXISTING GAS MAIN
- EXISTING OVERHEAD UTILITY
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING TELEPHONE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING WATER MAIN
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING VALVE
- EXISTING BOLLARD
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER INLET
- EXISTING STORM SEWER MANHOLE
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH AREA LIGHT
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- PROPOSED EXCAVATION GRADE (10' CONTOUR)
- PROPOSED EXCAVATION GRADE (2' CONTOUR)
- PROPOSED GRADES (10' CONTOUR)
- PROPOSED GRADES (2' CONTOUR)
- PROPOSED LIMITS OF FINAL COVER
- PROPOSED SILT FENCE/FILTER SOCK
- PROPOSED STORM WATER DISCHARGE PIPE
- PROPOSED REVETMENT STONE

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. UTILITY LOCATIONS APPROXIMATE. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS AND PROTECT UTILITIES.
3. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, SIZES, AND MATERIALS.
4. PROPOSED GRADES SHOWN IN THE UPPER ASH POND AND COAL YARD AREAS REPRESENT ANTICIPATED POST EXCAVATION GRADES. SEE SHEET 5.
5. PROPOSED GRADES SHOWN FOR THE ECONOMIZER POND AREA BERM BUTTRESS DO NOT REPRESENT FULL BERM BUTTRESS CONSTRUCTION. SEE CROSS SECTIONS AND DETAILS FOR SPECIFICS ON CONSTRUCTION.
6. CONSTRUCT TEMPORARY ACCESS ROAD INTO ECONOMIZER CLOSURE AREA FOR RELOCATED CCR MATERIAL PLACEMENT AND FINAL COVER INSTALLATION. REMOVE ROAD AS FINAL COVER INSTALLATION PROGRESSES.
7. PROPOSED GRADES ARE SUBJECT TO CHANGE DEPENDENT ON ON-SITE MATERIAL BALANCING.

N

100 0 100

SCALE: 1" = 100'

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJN 03/18/2022

PROJECT NO. 2529168.00
DRAWN: 03/23/2021
REVISED: 03/08/2022

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PHONE: (608) 224-2830

SITE
ASH POND CLOSURE DRAWINGS
INTERSTATE POWER AND LIGHT
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

PROPOSED ECONOMIZER POND AREA SUBGRADES

SHEET
10 of 21

2299000 E
2299500 E
2300000 E
2300500 E
2301000 E
280500 N
280000 N
279500 N
279000 N

LOWER POND
ACCESS ROAD SEE DETAIL 4/15
PROTECT/PRESERVE EXISTING OUTLET STRUCTURE AND PIPING
COAL YARD RUNOFF BASIN CLOSURE
ADDITIONAL COAL AREA
UPPER ASH POND CLOSURE
ROCK CHUTE (TYP) SEE DETAIL 4/18
ROCK CHUTE RC8
ROCK CHUTE RC6
ROCK CHUTE RC7
ROCK CHUTE RC5
MW-305
CP-1
GATE
COAL YARD CLOSURE
CULVERT C5
1 - 18" DIA. CPEP CULVERT
SEE DETAIL 1/16 2/16 8/16
FLUME 7
FLUME 8
FLUME 9
FLUME 10
ECONOMIZER POND CLOSURE
OVERHEAD WALKWAY
FLAT BOTTOM PERIMETER SWALE SEE DETAIL 6/15
MW-306
MW-307
MW-307A
MW-308
MW-312
EASTERN PORTION OF STRUCTURE TO REMAIN
PROTECT TRANSFOMRERS
MISSISSIPPI RIVER
MW-310
MW-310A
SULLIVAN SLOUGH ROAD
MW-311
W.L. 531.34 (11/26/2019)
ROCK CHUTE RC4
DOWNSLOPE FLUME WITH ENERGY DISSIPATOR
ENTRANCE ROAD
CULVERT C4
1 - 24" CPEP CULVERT
SEE DETAIL 1/16 2/16 8/16
DIVERSION BERM (TYP.) SEE DETAIL 3/15
PERIMETER SWALE SEE DETAIL 5/15
PROTECT EXISTING UTILITIES (SEE NOTE 2)
MW-309
MAIN ASH POND
SUBSTATION
PLANT AREA
MW-313
MW-313A
SULLIVAN SLOUGH ROAD

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING PAVED ROAD
- EXISTING GRAVEL/DIRT ROAD
- EXISTING FENCE
- EXISTING RAILROAD TRACKS
- DELINEATED WETLAND
- EDGE OF WATER
- EXISTING GAS MAIN
- EXISTING OVERHEAD UTILITY
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING TELEPHONE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING WATER MAIN
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING VALVE
- EXISTING BOLLARD
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER INLET
- EXISTING STORM SEWER MANHOLE
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH AREA LIGHT
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- PROPOSED GRADES (10' CONTOUR)
- PROPOSED GRADES (2' CONTOUR)
- PROPOSED LIMITS OF FINAL COVER
- PROPOSED STORM WATER DISCHARGE PIPE
- PROPOSED SILT FENCE/FILTER SOCK
- PROPOSED DIVERSION BERM
- PROPOSED DOWNSLOPE FLUME
- PROPOSED ENERGY DISSIPATOR
- PROPOSED PERIMETER SWALE
- PROPOSED CULVERT
- PROPOSED REVETMENT STONE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. UTILITY LOCATIONS APPROXIMATE. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS AND PROTECT UTILITIES.
3. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, SIZES, AND MATERIALS.
4. CONSTRUCT TEMPORARY ACCESS ROAD INTO ECONOMIZER CLOSURE AREA FOR RELOCATED CCR MATERIAL PLACEMENT AND FINAL COVER INSTALLATION. REMOVE ROAD AS FINAL COVER INSTALLATION PROGRESSES.
5. PROPOSED GRADES ARE SUBJECT TO CHANGE DEPENDENT ON ON-SITE MATERIAL BALANCING.

N

100 0 100
SCALE: 1" = 100'

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJN 03/18/2022
PROJECT NO. 2521916B.00
DRAWN: 01/26/2021
REVISED: 03/17/2022

INTERSTATE POWER AND LIGHT CO.
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ENGINEER

ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA
SITE

PROPOSED ECONOMIZER POND AREA AND COAL YARD FINAL GRADES

SHEET 11 of 21

2299000 E
2299500 E
2300000 E
2300500 E
2301000 E
280000 N
279500 N
279000 N
278500 N

LOWER POND
OUTLET STRUCTURE INLET AT ~527 FT
ADDITIONAL COAL AREA
COAL YARD RUNOFF BASIN CLOSURE
UPPER ASH POND CLOSURE
STORMWATER BASIN ARMOR STONE RESTORATION SEE DETAIL 2 18
COAL YARD CLOSURE
OVERHEAD WALKWAY
FLUME 8
FLUME 9
FLUME 7
ECONOMIZER POND CLOSURE
FLUME 10
ENTRANCE ROAD
FLUME 6
FLUME 5
FLUME 4
FLUME 3
FLUME 2
FLUME 1
MAIN ASH POND CLOSURE
ASH SEAL POND CLOSURE
SUBSTATION
PLANT AREA
GATE
SCALE
MISSISSIPPI RIVER
SULLIVAN SLOUGH ROAD
MW-305
MW-306
MW-307A
MW-307
MW-308
MW-309
MW-310
MW-310A
MW-311
MW-312
MW-313
MW-313A
MW-301
MW-302
MW-302A
CP-1
CP-2
INT-2
WATER METER

LEGEND

- APPROXIMATE PROPERTY LINE
- 2010 EXISTING GRADE (5' CONTOUR)
- 2010 EXISTING GRADE (1' CONTOUR)
- 2019 EXISTING GRADE (5' CONTOUR)
- 2019 EXISTING GRADE (1' CONTOUR)
- EXISTING PAVED ROAD
- EXISTING GRAVEL/DIRT ROAD
- EXISTING FENCE
- EXISTING RAILROAD TRACKS
- DELINEATED WETLAND
- EDGE OF WATER
- EXISTING GAS MAIN
- EXISTING OVERHEAD UTILITY
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER/CULVERT
- EXISTING PROCESS WATER CONVEYANCE PIPE
- EXISTING TELEPHONE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING WATER MAIN
- EXISTING IMPRESSED CURRENT ANODE INSTALLATION
- EXISTING VALVE
- EXISTING BOLLARD
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER INLET
- EXISTING STORM SEWER MANHOLE
- EXISTING UTILITY POLE AND GUY WIRE
- EXISTING UTILITY POLE WITH CONCRETE FOUNDATION
- PROPOSED GRADES (10' CONTOUR)
- PROPOSED GRADES (2' CONTOUR)
- PROPOSED LIMITS OF FINAL COVER
- PROPOSED STORM WATER DISCHARGE PIPE
- PROPOSED SILT FENCE/FILTER SOCK
- PROPOSED FENCE
- PROPOSED DIVERSION BERM
- PROPOSED DRAINAGE SWALE
- PROPOSED DOWNSLOPE FLUME
- PROPOSED ENERGY DISSIPATOR
- PROPOSED ACCESS ROAD RESTORATION
- PROPOSED REVETMENT STONE
- PROPOSED VEGETATED RESTORATION
- PROPOSED ARMOR STONE RESTORATION
- PROPOSED STORM WATER BASIN RESTORATION

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. RESTORE COAL YARD AND COAL YARD RUNOFF BASIN CLOSURE AREAS WITH A MINIMUM OF 6 INCHES OF TOPSOIL OVER ALL AREAS TO BE SEEDED.
3. PLACE NON-CHANNEL EROSION MAT ON RESTORED SLOPES STEEPER OR EQUAL TO 4:1 OR AS NOTED.
4. PLACE CHANNEL EROSION MAT IN PERIMETER DRAINAGE SWALES AND DIVERSION BERMS.
5. PROPOSED GRADES ARE SUBJECT TO CHANGE DEPENDENT ON ON-SITE MATERIAL BALANCING.

N

100 0 100

SCALE: 1" = 100'

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJM 03/18/2022

PROJECT NO. 25219168.00
DRAWN: 03/24/2021
REVISED: 03/17/2022

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

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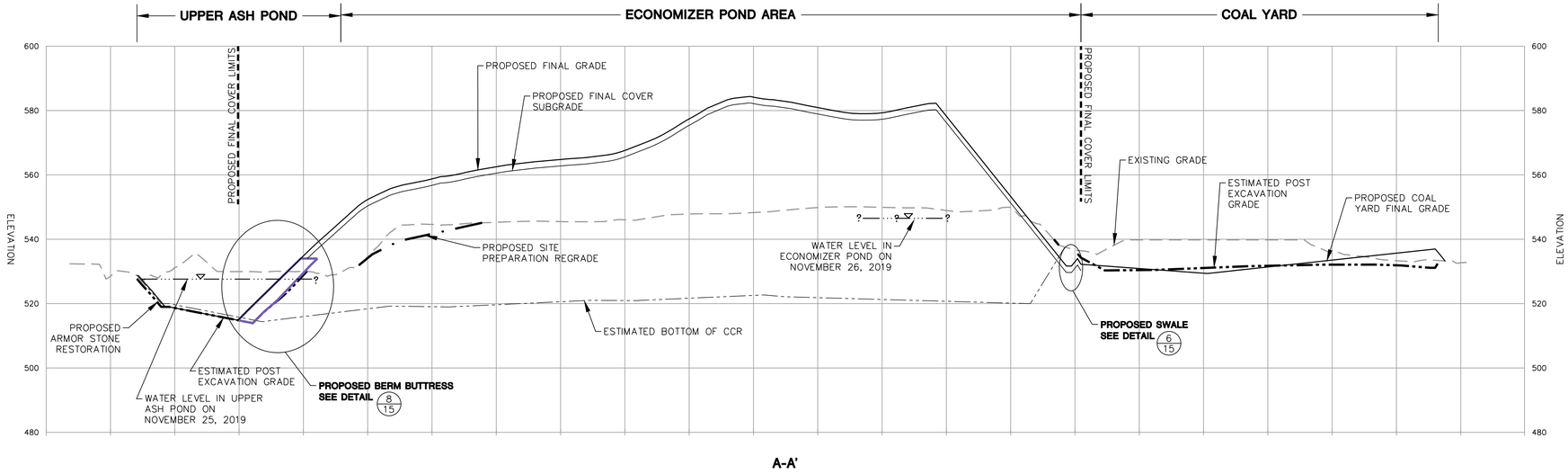
ENGINEER

ASH POND CLOSURE DRAWINGS
AND PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

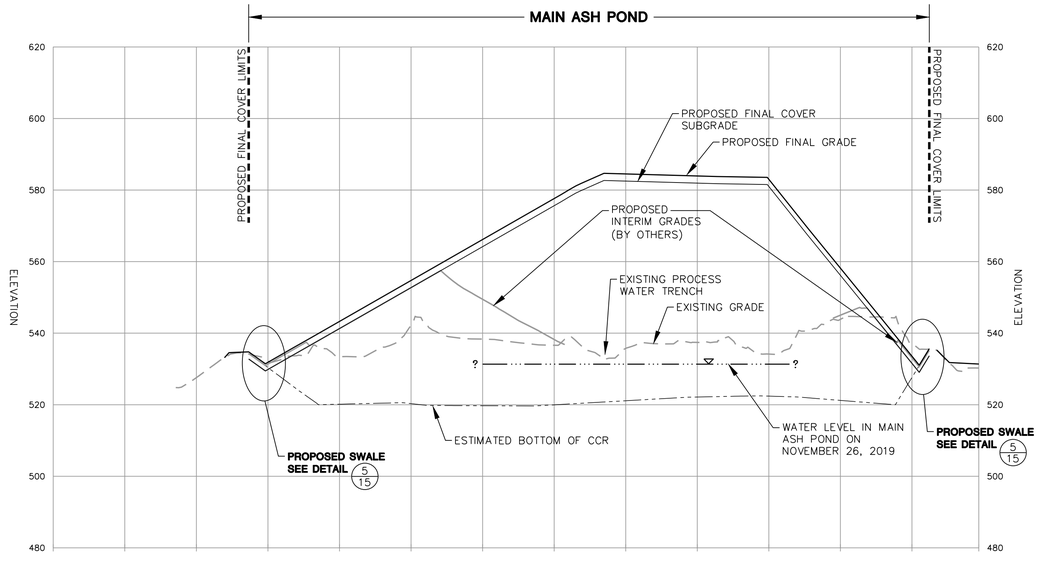
SITE

RESTORATION PLAN

SHEET
12 of 21



A-A'



B-B'

PRELIMINARY

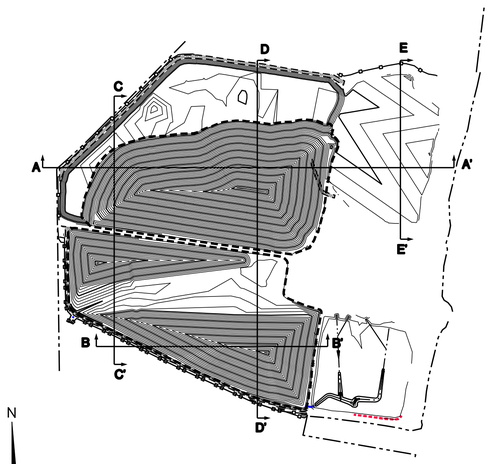
NOT FOR CONSTRUCTION

100 0 100

SCALE: 1" = 100'
VERTICAL EXAGGERATION: 5X

NOTES:

1. EXISTING GRADES BASED ON NOVEMBER AND DECEMBER 2019 TOPOGRAPHIC AND BATHYMETRIC SURVEY BY MOHN SURVEYING, INC.
2. ESTIMATED BOTTOM OF CCR IS APPROXIMATE BASED ON GEOPROBE BORINGS, SPT BORINGS, AND SEDIMENT PROBING COMPLETED FROM NOVEMBER 2019 TO JANUARY 2020.
3. ESTIMATED BOTTOM OF COAL BASED ON TEST PITS COMPLETED IN JANUARY OF 2020. ESTIMATED POST EXCAVATION GRADE IN THE COAL YARD SHOWN IS 1 FOOT BELOW ESTIMATED BOTTOM OF COAL.
4. EXISTING GRADE IN THE COAL YARD IS ESTIMATED ELEVATION COAL PILE WILL BE REMOVED DOWN TO BY OWNER.
5. WATER LEVEL IN PONDS BASED ON NOVEMBER 25 AND 26, 2019 MEASUREMENT IN STANDING WATER AREA AT ONE LOCATION. WATER LEVEL VARIES ON LOCATION.



CROSS SECTION LOCATION MAP

SCALE: 1" = 400'

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
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ENGINEER

ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

CROSS SECTIONS - A AND B

SHEET

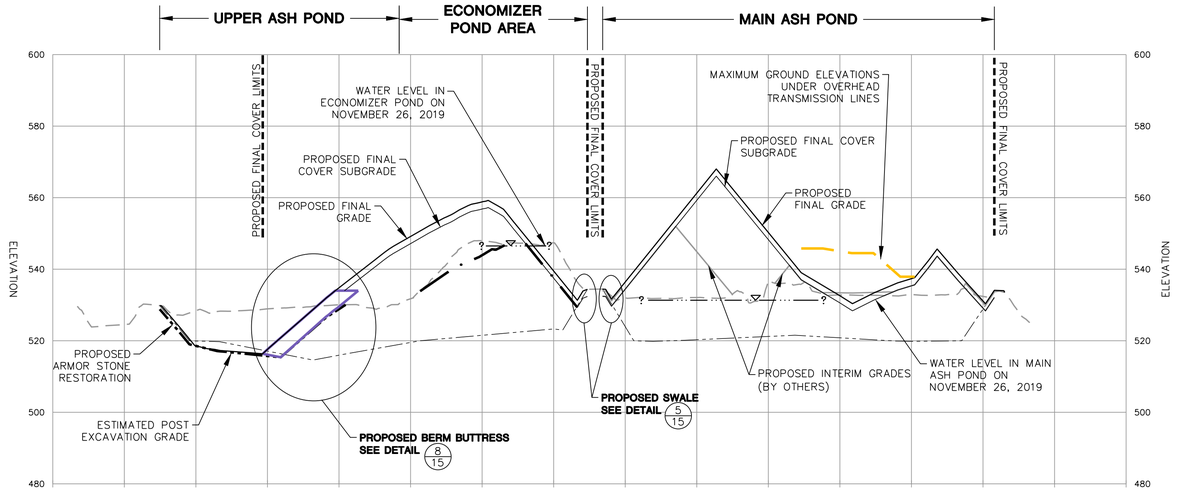
13 of 21

PROJECT NO.	25219168.00	DRAWN BY:	BSS/KP
DRAWN:	03/24/2021	CHECKED BY:	MRH
REVISED:	03/17/2022	APPROVED BY:	EJH 03/18/2022

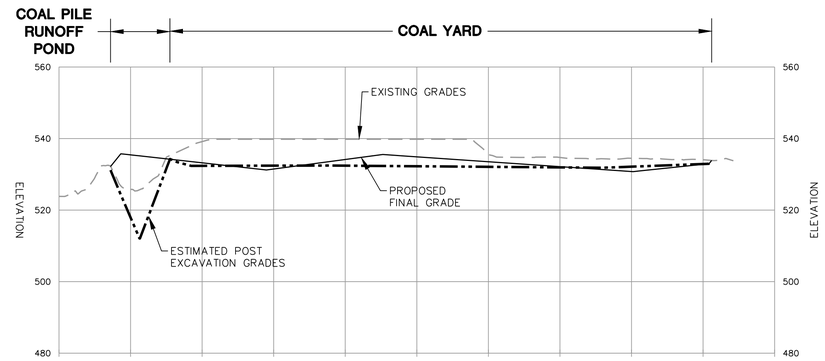
CLIENT

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

L:\25\219168.00\Drawings_Full Ash Pond Closure\Sections.dwg, 3/18/2022 2:40:34 PM



C-C'



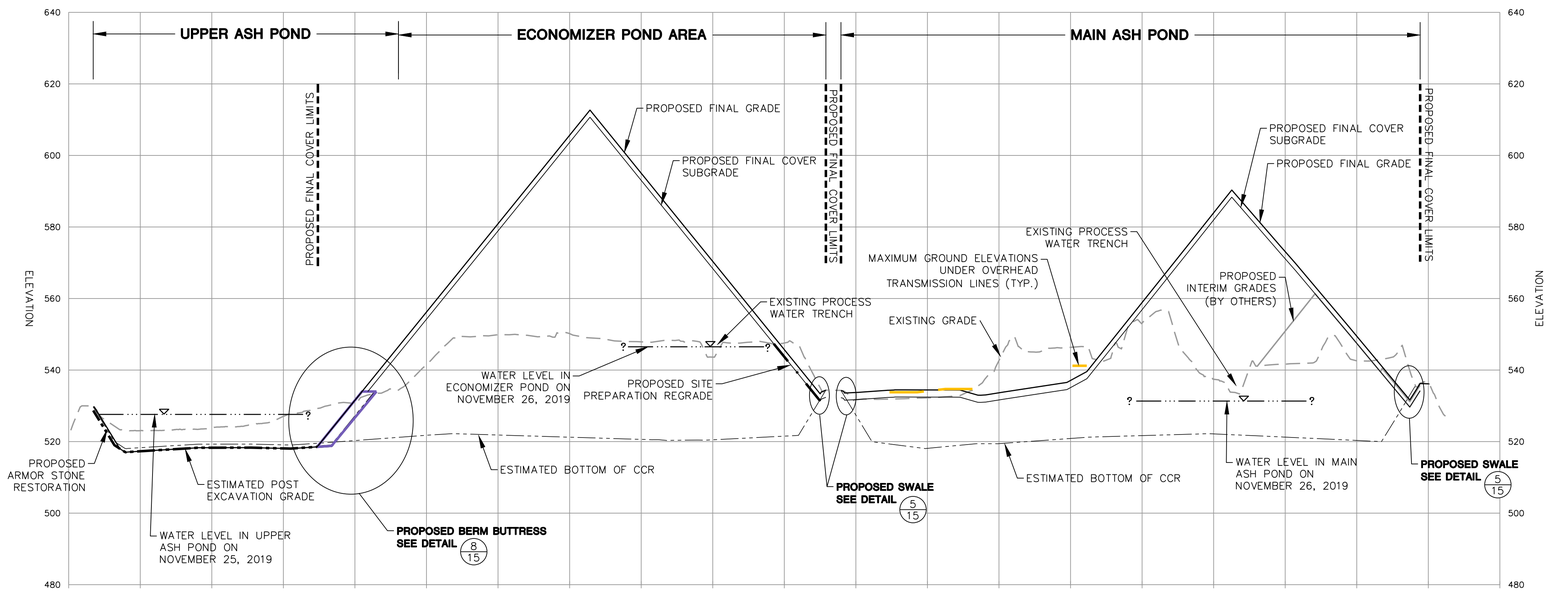
E-E'

100 0 100

SCALE: 1" = 100'
VERTICAL EXAGGERATION: 5X

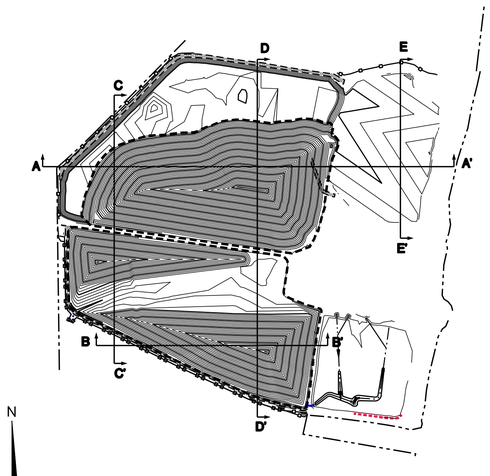
NOTES:

1. EXISTING GRADES BASED ON NOVEMBER AND DECEMBER 2019 TOPOGRAPHIC AND BATHYMETRIC SURVEY BY MOHN SURVEYING, INC.
2. ESTIMATED BOTTOM OF CCR IS APPROXIMATE BASED ON GEOPROBE BORINGS, SPT BORINGS, AND SEDIMENT PROBING COMPLETED FROM NOVEMBER 2019 TO JANUARY 2020.
3. ESTIMATED BOTTOM OF COAL BASED ON TEST PITS COMPLETED IN JANUARY OF 2020. ESTIMATED POST EXCAVATION GRADE IN THE COAL YARD SHOWN IS 1 FOOT BELOW ESTIMATED BOTTOM OF COAL.
4. EXISTING GRADE IN THE COAL YARD IS ESTIMATED ELEVATION COAL PILE WILL BE REMOVED DOWN TO BY OWNER.
5. WATER LEVEL IN PONDS BASED ON NOVEMBER 25 AND 26, 2019 MEASUREMENT IN STANDING WATER AREA AT ONE LOCATION. WATER LEVEL VARIES ON LOCATION.



D-D'

PRELIMINARY
NOT FOR CONSTRUCTION



CROSS SECTION LOCATION MAP

SCALE: 1" = 400'

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJK 03/18/2022

PROJECT NO. 2529168.00
DRAWN: 03/24/2021
REVISED: 03/17/2022

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

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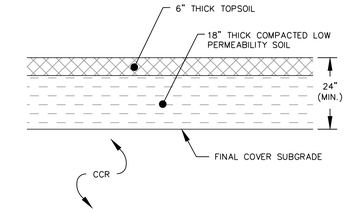
ENGINEER

ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

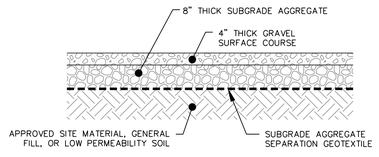
SITE

CROSS SECTIONS – C, D, AND E

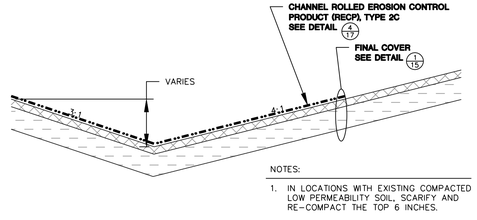
SHEET
14 of 21



1/15 **FINAL COVER**
SCALE: 1" = 2'

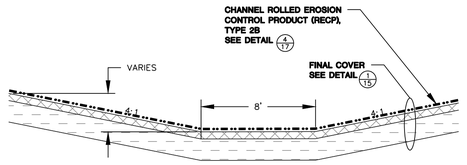


4/15 **ACCESS ROAD**
SCALE: 1" = 2'



NOTES:
1. IN LOCATIONS WITH EXISTING COMPACTED LOW PERMEABILITY SOIL, SCARIFY AND RE-COMPACT THE TOP 6 INCHES.

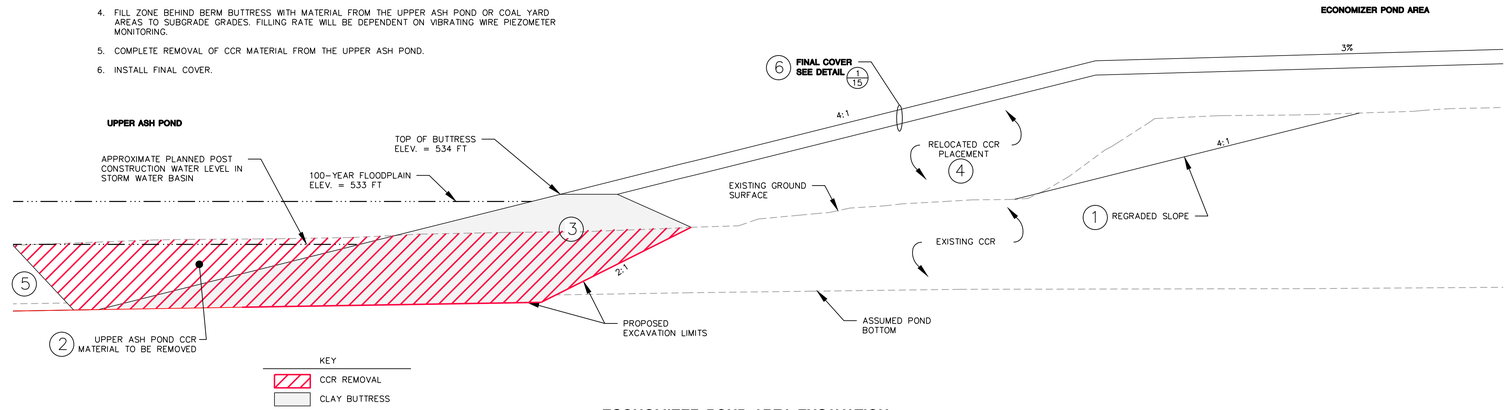
5/15 **PERIMETER SWALE**
SCALE: 1" = 5'



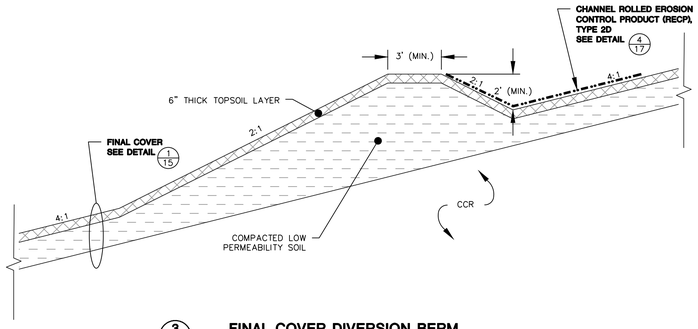
6/15 **FLAT BOTTOM PERIMETER SWALE**
SCALE: 1" = 5'

SEQUENCING NOTES:

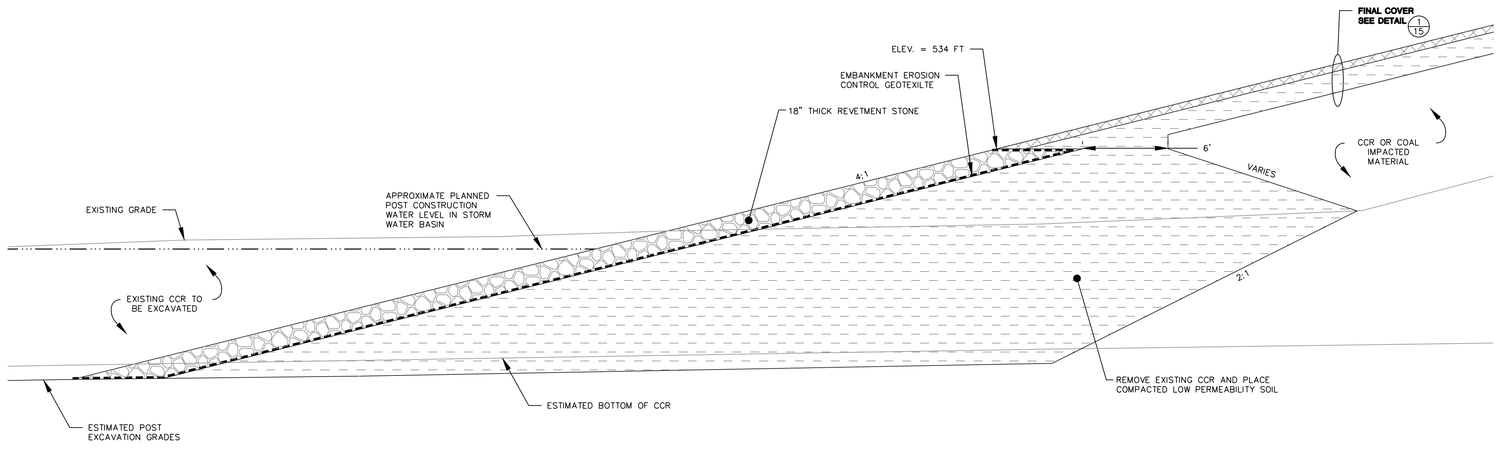
1. REGRADE EXISTING ECONOMIZER POND AREA SLOPE TO AT LEAST A 4H:1V SLOPE. DO NOT PLACE FILL MATERIALS ON TOP OF THE ECONOMIZER POND AREA BEFORE REGRADING EXISTING SLOPE.
2. REMOVE THE UPPER ASH POND MATERIAL IN 50-FT SECTIONS PARALLEL ECONOMIZER POND SLOPE.
3. IN CONJUNCTION WITH STEP 2, PLACE AND CONSTRUCT THE ECONOMIZER POND BERM BUTTRESS WITHIN THE REMOVED 50-FT SECTION.
4. FILL ZONE BEHIND BERM BUTTRESS WITH MATERIAL FROM THE UPPER ASH POND OR COAL YARD AREAS TO SUBGRADE GRADES. FILLING RATE WILL BE DEPENDENT ON VIBRATING WIRE PIEZOMETER MONITORING.
5. COMPLETE REMOVAL OF CCR MATERIAL FROM THE UPPER ASH POND.
6. INSTALL FINAL COVER.



7/15 **ECONOMIZER POND AREA EXCAVATION AND BERM SEQUENCING**
SCALE: 1" = 10'



3/15 **FINAL COVER DIVERSION BERM**
SCALE: 1" = 4'



8/15 **ECONOMIZER POND BERM BUTTRESS**
SCALE: 1" = 5'

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJH 03/18/2022

PROJECT NO. 25219168.00
DRAWN: 03/24/2021
REVISED: 03/08/2022

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ENGINEER

ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

DETAILS

SHEET
15 of 21

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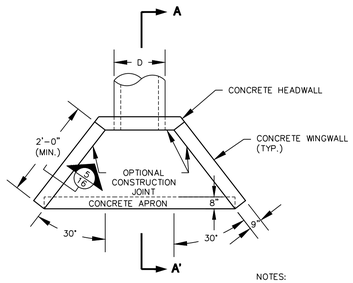
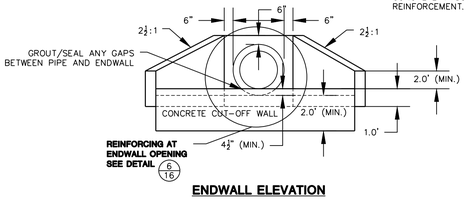
PRELIMINARY
NOT FOR CONSTRUCTION



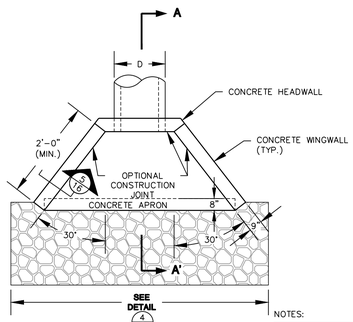
ENDWALL PLAN VIEW

NOTES:
1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.



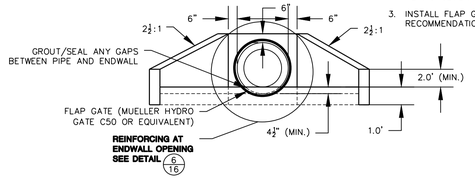
ENDWALL ELEVATION

1/16 SINGLE CULVERT ENDWALL INLET
NOT TO SCALE



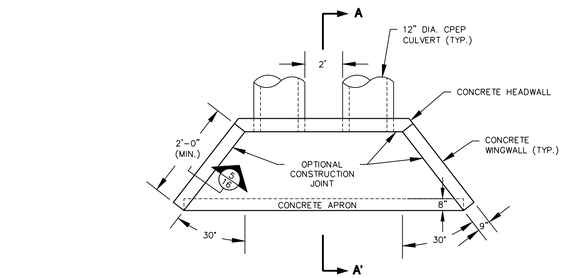
ENDWALL PLAN VIEW

NOTES:
1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.
3. INSTALL FLAP GATE PER MANUFACTURER RECOMMENDATIONS.



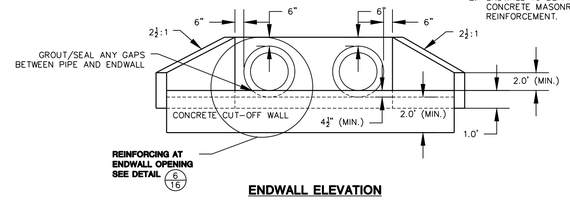
ENDWALL ELEVATION

2/16 SINGLE CULVERT ENDWALL OUTLET
NOT TO SCALE



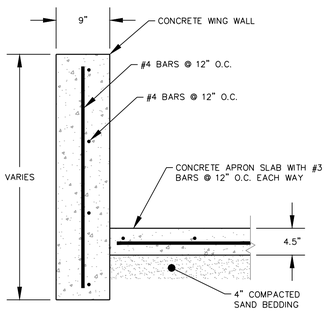
ENDWALL PLAN VIEW

NOTES:
1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.

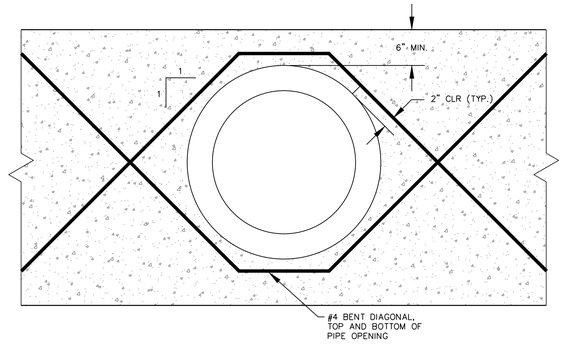


ENDWALL ELEVATION

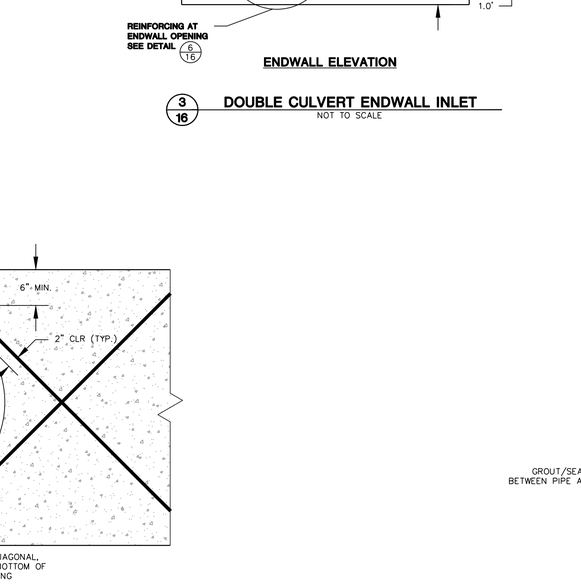
3/16 DOUBLE CULVERT ENDWALL INLET
NOT TO SCALE



5/16 REINFORCEMENT AT APRON ENDWALL
NOT TO SCALE

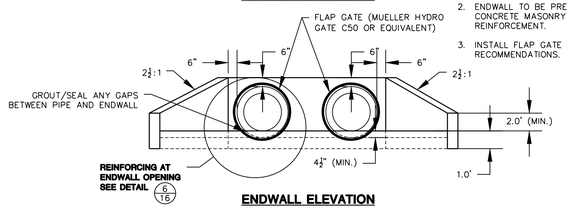


6/16 REINFORCEMENT AT ENDWALL OPENING
NOT TO SCALE



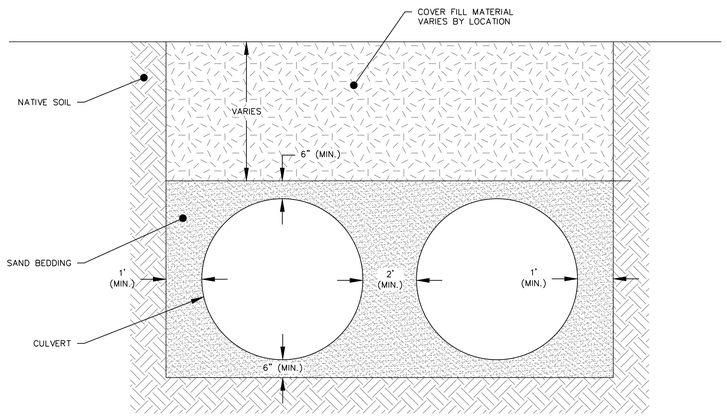
ENDWALL PLAN VIEW

NOTES:
1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.
3. INSTALL FLAP GATE PER MANUFACTURER RECOMMENDATIONS.

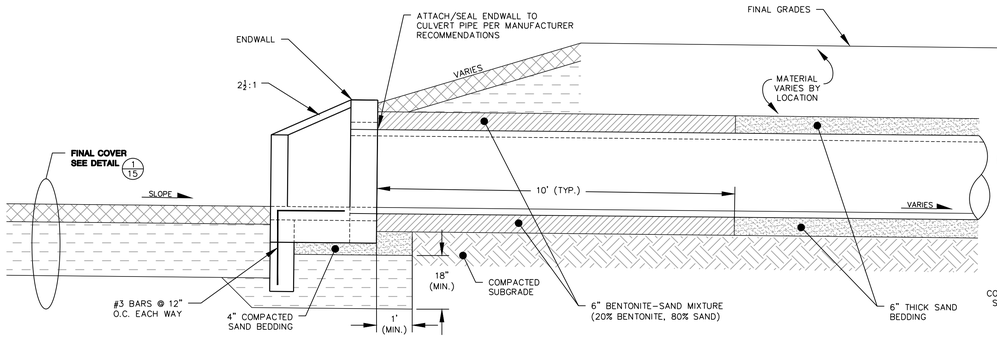


ENDWALL ELEVATION

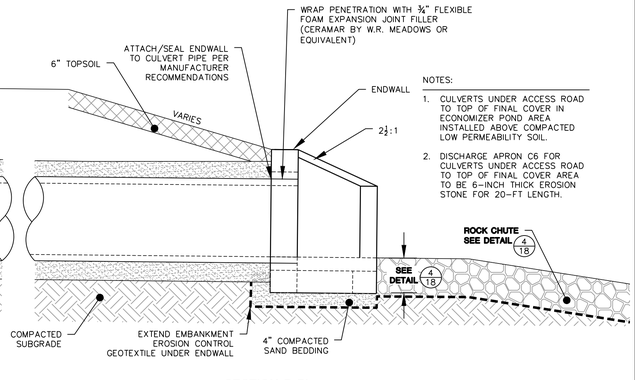
4/16 DOUBLE CULVERT ENDWALL OUTLET
NOT TO SCALE



7/16 PIPE BEDDING
NOT TO SCALE



SECTION A-A'



NOTES:
1. CULVERTS UNDER ACCESS ROAD TO TOP OF FINAL COVER IN ECONOMIZER POND AREA INSTALLED ABOVE COMPACTED LOW PERMEABILITY SOIL.
2. DISCHARGE APRON C6 FOR CULVERTS UNDER ACCESS ROAD TO TOP OF FINAL COVER AREA TO BE 6-INCH THICK EROSION STONE FOR 20-FT LENGTH.

SECTION B-B'

8/16 CULVERT PROFILE
SCALE: 1" = 2'

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DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: EJM 03/18/2022
PROJECT NO. 2521/168.00
DRAWN: 03/24/2021
REVISED: 03/08/2022

INTERSTATE POWER AND LIGHT CO.
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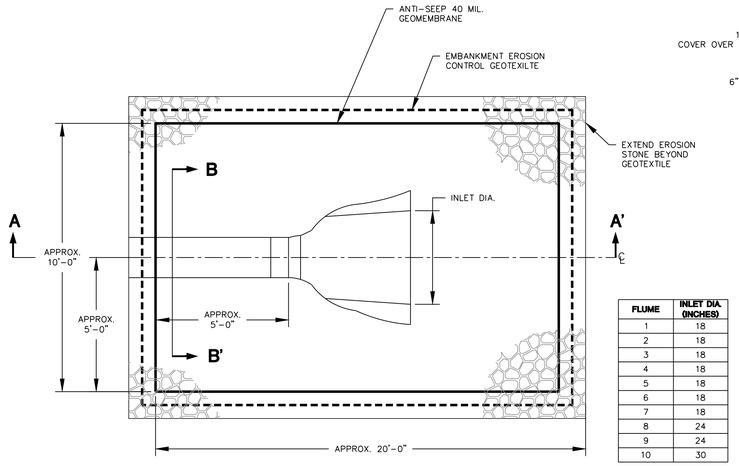
ENGINEER

ASH POND CLOSURE DRAWINGS
FOR CERTIFICATION
BURLINGTON GENERATING STATION
BURLINGTON, IOWA
SITE

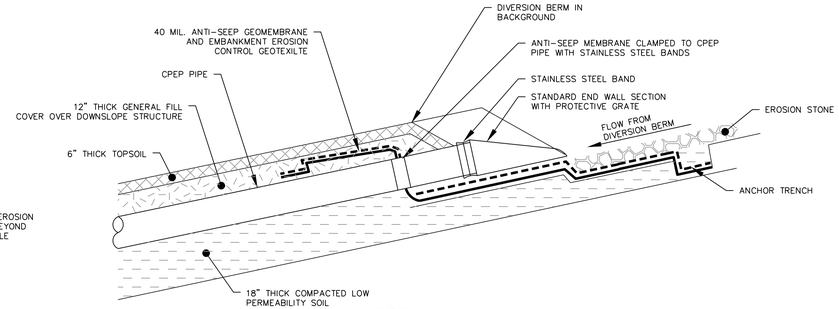
DETAILS

SHEET
16 of 21

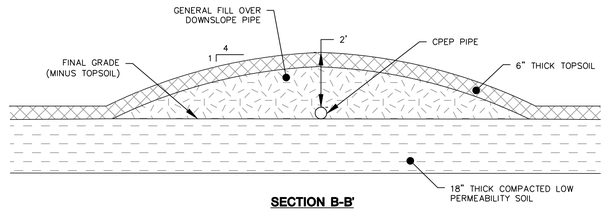


FLUME	INLET DIA. (INCHES)
1	18
2	18
3	18
4	18
5	18
6	18
7	18
8	24
9	24
10	30

PLAN VIEW

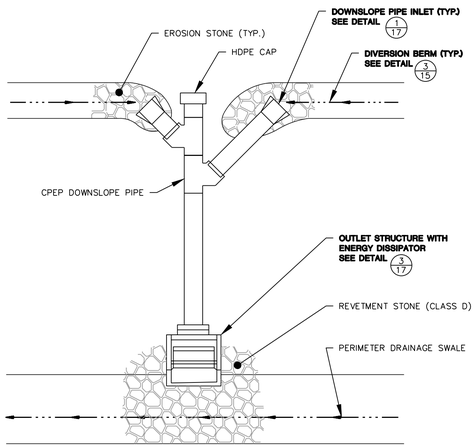


SECTION A-A'

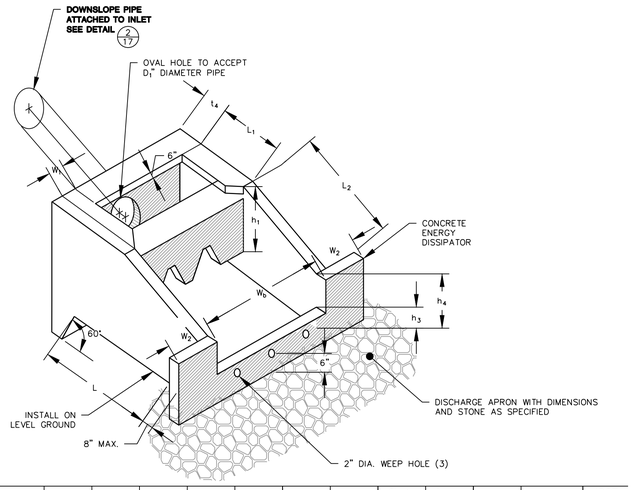


SECTION B-B'

1/17 DOWNSLOPE INLET STRUCTURE
NOT TO SCALE

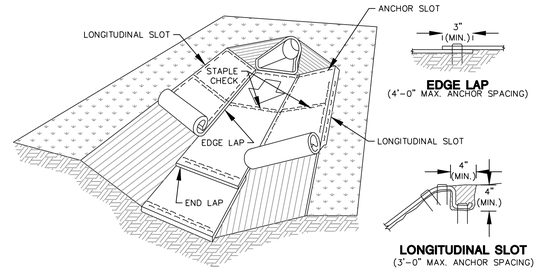


2/17 DOWNSLOPE FLUME
NOT TO SCALE



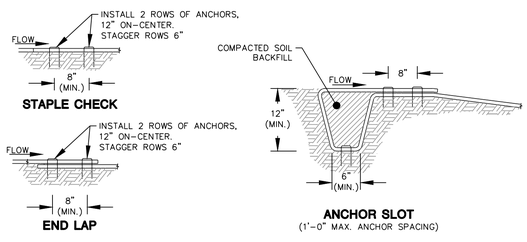
D1 in.)	Wb	h1	h3	h4	L	L1	L2	W1	W2	t4	Chute Width (ft.)	Apron Width (ft)	Length (ft.)	Thickness (in.)	IDOT Stone Type
12	6	4.58	1	2.5	8	3.42	4.58	0.5	1.67	0.5	8	8	8	14	Erosion Stone
18	7	5.42	1.17	2.92	9.42	4	5.42	0.5	1.92	0.5	10	10	10	16	

3/17 ENERGY DISSIPATOR
NOT TO SCALE



EDGE LAP
(4'-0" MAX. ANCHOR SPACING)

LONGITUDINAL SLOT
(3'-0" MAX. ANCHOR SPACING)

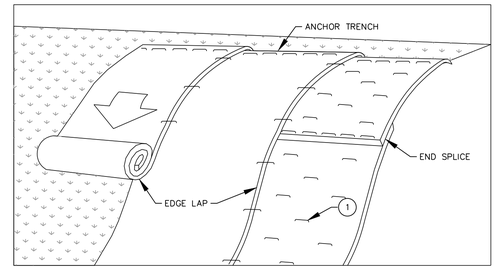


STAPLE CHECK

END LAP

ANCHOR SLOT
(1'-0" MAX. ANCHOR SPACING)

4/17 CHANNEL ROLLED EROSION CONTROL PRODUCT (RECP)
NOT TO SCALE



ANCHOR TRENCH
(12" MAX. ANCHOR SPACING)

EDGE LAP
(4'-0" MAX. ANCHOR SPACING)

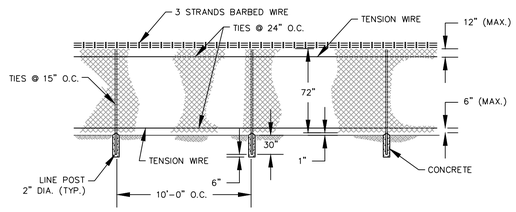
END SPLICE
(18" MAX. ANCHOR SPACING)

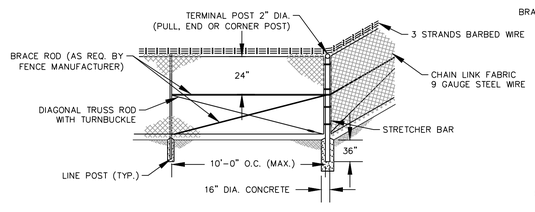
TABLE 1

MAX. SLOPE	MIN. ANCHORS
≤ 3:1	1.5/yd²
2:1	2/yd²
1:1	2.5/yd²

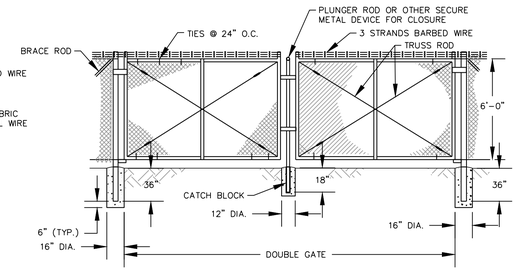
(1) SECURE BLANKET TO GROUND ACCORDING TO MANUFACTURER'S RECOMMENDED ANCHORING PATTERN AND MINIMUM SHOWN IN TABLE 1.

5/17 NON-CHANNEL ROLLED EROSION CONTROL PRODUCT (RECP)
NOT TO SCALE





6/17 CHAIN LINK FENCE
NOT TO SCALE



PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: E.M. 03/16/2022
PROJECT NO. 2521916B.00
DRAWN: 03/24/2021
REVISED: 03/09/2022

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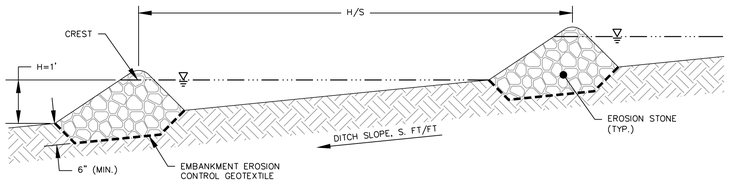
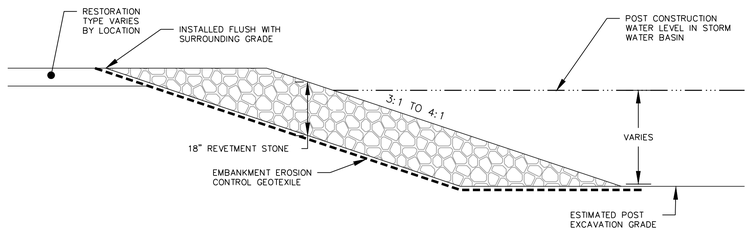
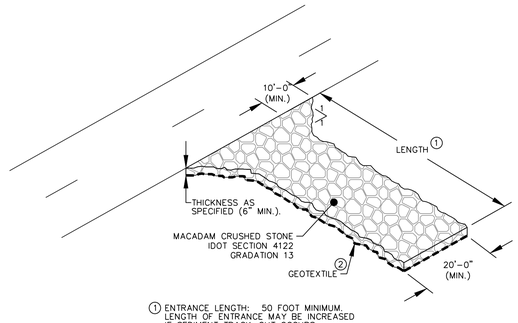
SHEET
17 OF 21



1/18 ROCK CHECK DAM
NOT TO SCALE



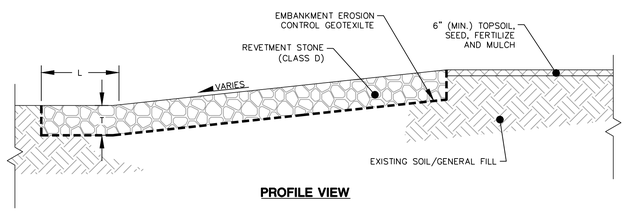
2/18 STORM WATER BASIN ARMOR STONE RESTORATION
NOT TO SCALE



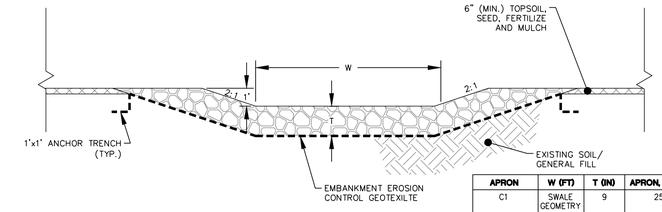
(1) ENTRANCE LENGTH: 50 FOOT MINIMUM. LENGTH OF ENTRANCE MAY BE INCREASED IF SEDIMENT TRACK-OUT OCCURS.

(2) INSTALL SUBGRADE AGGREGATE SEPARATION GEOTEXTILE BELOW STONE.

3/18 STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



PROFILE VIEW



SECTION VIEW

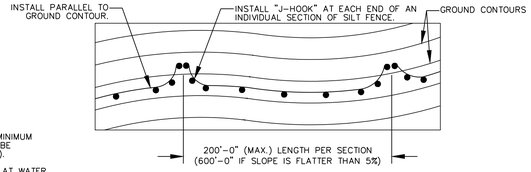
APRON	W (FT)	T (IN)	APRON, L (FT)	IDO
C1	SWALE GEOMETRY	9	25	ER

ROCK CHUTE	W (FT)	T (IN)	APRON, L (FT)	IDO
RC2	10	18	11	ER
RC3	8	9	6	ER
RC4	10	16	10	ER
RC5	8	14	8	ER
RC6	8	12	7	ER
RC7	8	15	9	ER

NOTES:

1. TOP OF REVETMENT STONE TO BE FLUSH WITH SURROUNDING GRADES.
2. REVETMENT STONE CAN BE REPLACED WITH FLEXAMAT WITH ENGINEER/OWNER APPROVAL.

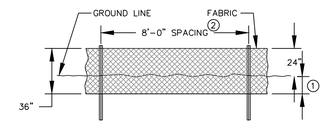
4/18 ROCK CHUTE
NOT TO SCALE



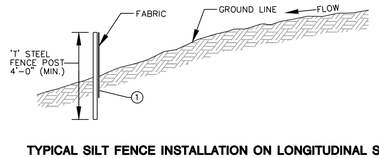
(1) INSERT 12 INCHES OF FABRIC A MINIMUM OF 6 INCHES DEEP (FABRIC MAY BE FOLDED BELOW THE GROUND LINE).

(2) REDUCE POST SPACING TO 5'-0" AT WATER CONCENTRATION AREAS, OR AS REQUIRED TO ADEQUATELY SUPPORT FENCE.

TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES (Plan View)

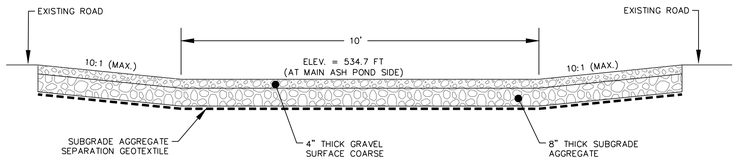


DETAILS OF SILT FENCE ON LONGITUDINAL SLOPES

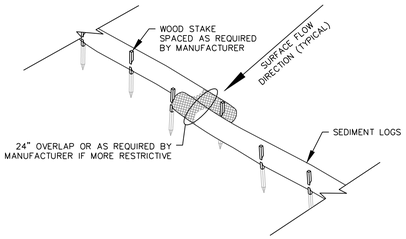


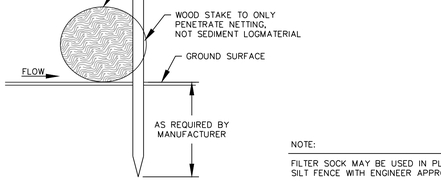
TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES (Profile View)

5/18 SILT FENCE
NOT TO SCALE



10/18 EMERGENCY SPILLWAY
NOT TO SCALE

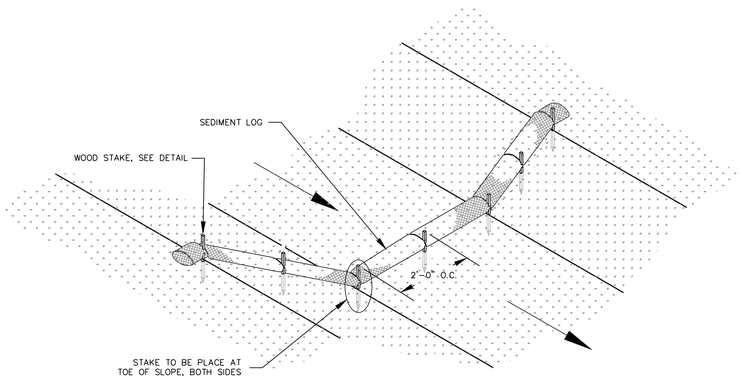




NOTE:

FILTER SOCK MAY BE USED IN PLACE OF SILT FENCE WITH ENGINEER APPROVAL.

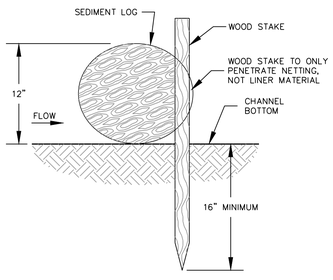
6/18 FILTER SOCK
NOT TO SCALE



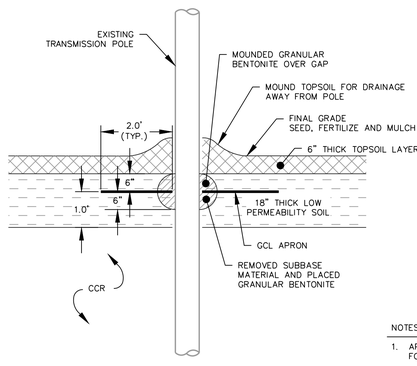
NOTES:

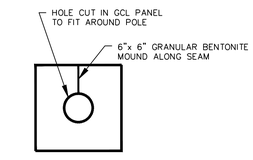
1. INSTALL SEDIMENT LOGS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

8/18 SEDIMENT LOG
NOT TO SCALE



STAKE DETAIL (NO TRENCH)





GEOSYNTHETIC CLAY LINER (GCL) APRON

NOTES:

1. APPLIES FOR TRANSMISSION TOWER FOUNDATION FINAL COVER PENETRATIONS.

9/18 UTILITY POLE BOOT
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY:	BSS/KP
CHECKED BY:	MRH
APPROVED BY:	E.M. 03/16/2022
PROJECT NO.	25219168.00
DRAWN:	03/24/2021
REVISED:	03/09/2022

CLIENT: INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

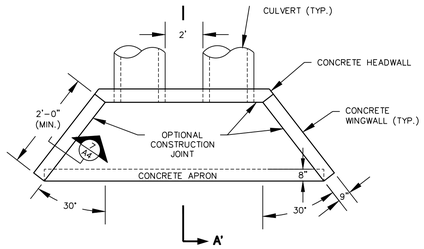
ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

SITE: ASH POND CLOSURE DRAWINGS
INSTALLATION OF CONTROL STRUCTURE
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

DETAILS

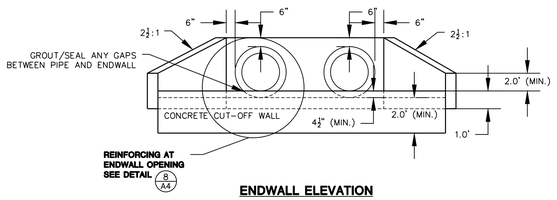
SHEET
18 OF 21

PRELIMINARY
NOT FOR CONSTRUCTION



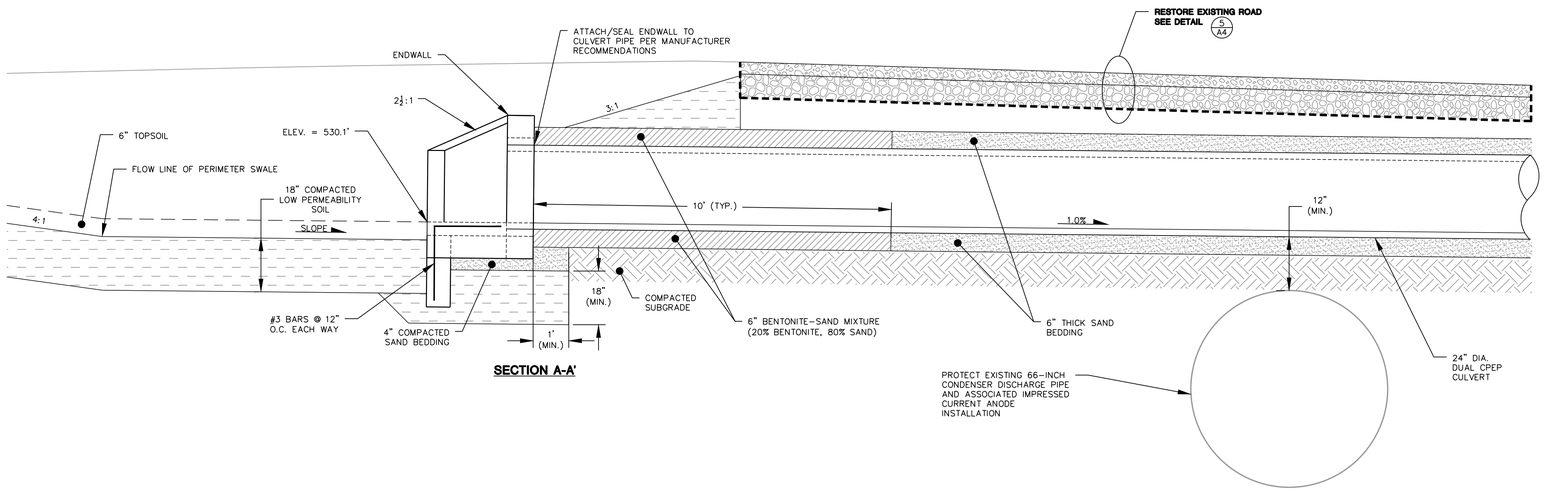
ENDWALL PLAN VIEW

NOTES:
1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.



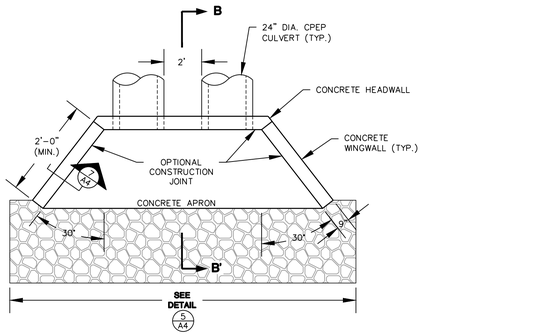
ENDWALL ELEVATION

1/19 CULVERT C1 ENDWALL INLET
NOT TO SCALE



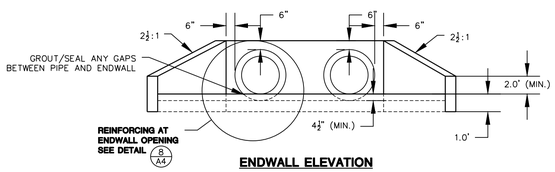
SECTION A-A'

3/19 CULVERT C1 INLET
SCALE: 1" = 2'



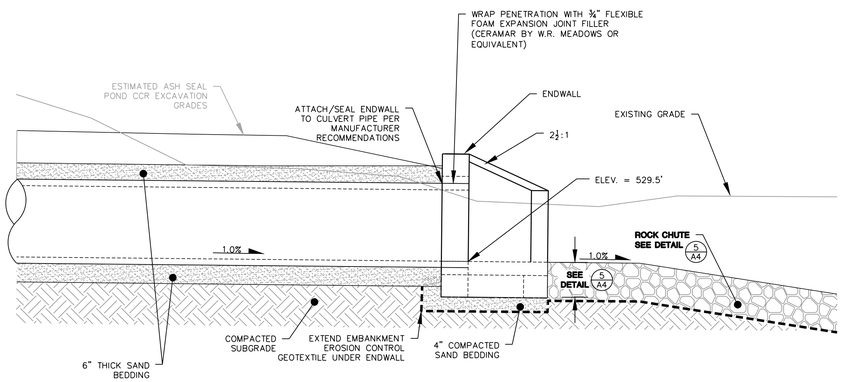
ENDWALL PLAN VIEW

NOTES:
1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.



ENDWALL ELEVATION

2/19 CULVERT C1 ENDWALL OUTLET
NOT TO SCALE



SECTION B-B'

4/19 CULVERT C1 OUTLET
SCALE: 1" = 2'

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

DRAWN BY: BSS/KP
CHECKED BY: MRH
APPROVED BY: E.M. 03/16/2022

PROJECT NO. 25219168.00
DRAWN: 03/24/2021
REVISED: 03/08/2022

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601
CLIENT

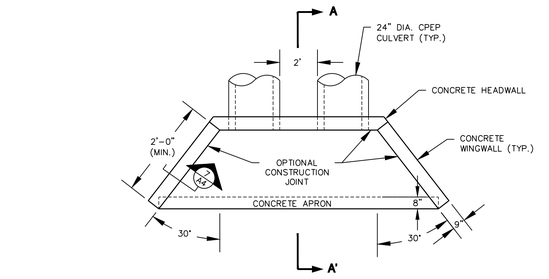
ENGINEER

ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA
SITE

DETAILS

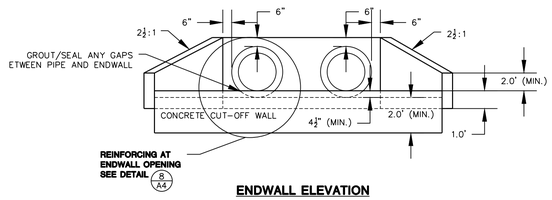
SHEET
19 OF 21

PRELIMINARY
NOT FOR CONSTRUCTION



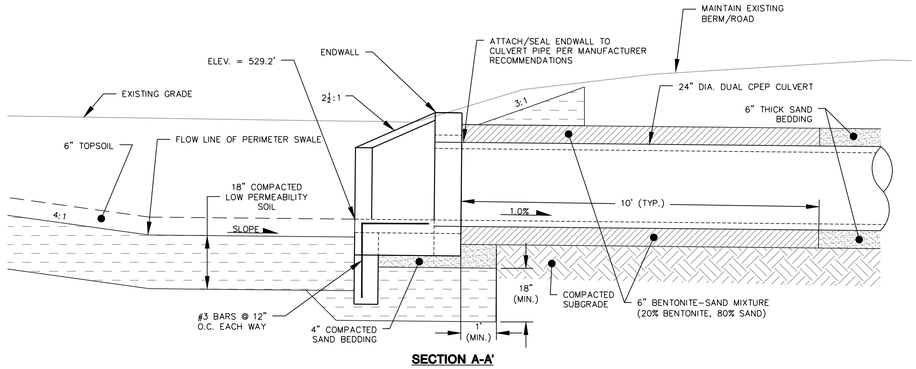
ENDWALL PLAN VIEW

NOTES:
1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.



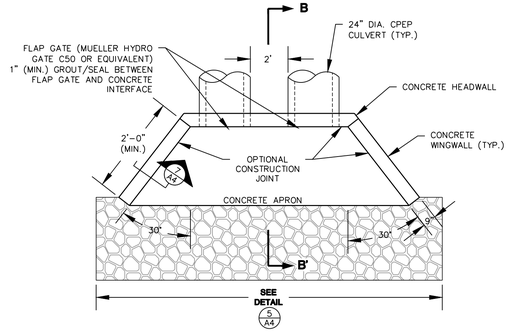
ENDWALL ELEVATION

1/20 CULVERT C2 ENDWALL INLET
NOT TO SCALE



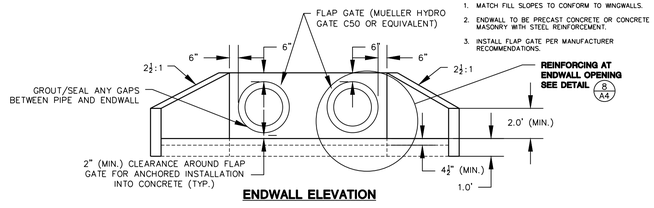
SECTION A-A'

3/20 CULVERT C2 INLET
SCALE: 1" = 2'



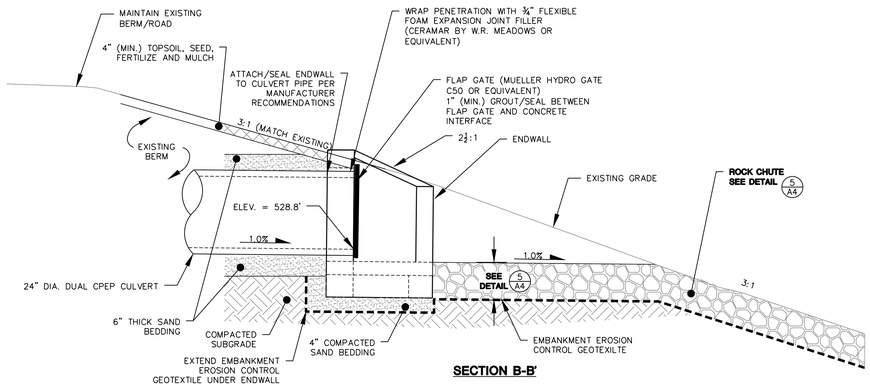
ENDWALL PLAN VIEW

NOTES:
1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.
3. INSTALL FLAP GATE PER MANUFACTURER RECOMMENDATIONS.



ENDWALL ELEVATION

2/20 CULVERT C2 ENDWALL OUTLET
NOT TO SCALE



SECTION B-B'

4/20 CULVERT C2 OUTLET
SCALE: 1" = 2'

PROJECT NO.	2529168.00
DRAWN:	03/24/2021
REVISED:	03/09/2022
DRAWN BY:	BSS/KP
CHECKED BY:	MRH
APPROVED BY:	E.M. 03/16/2022

INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

CLIENT

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

ENGINEER

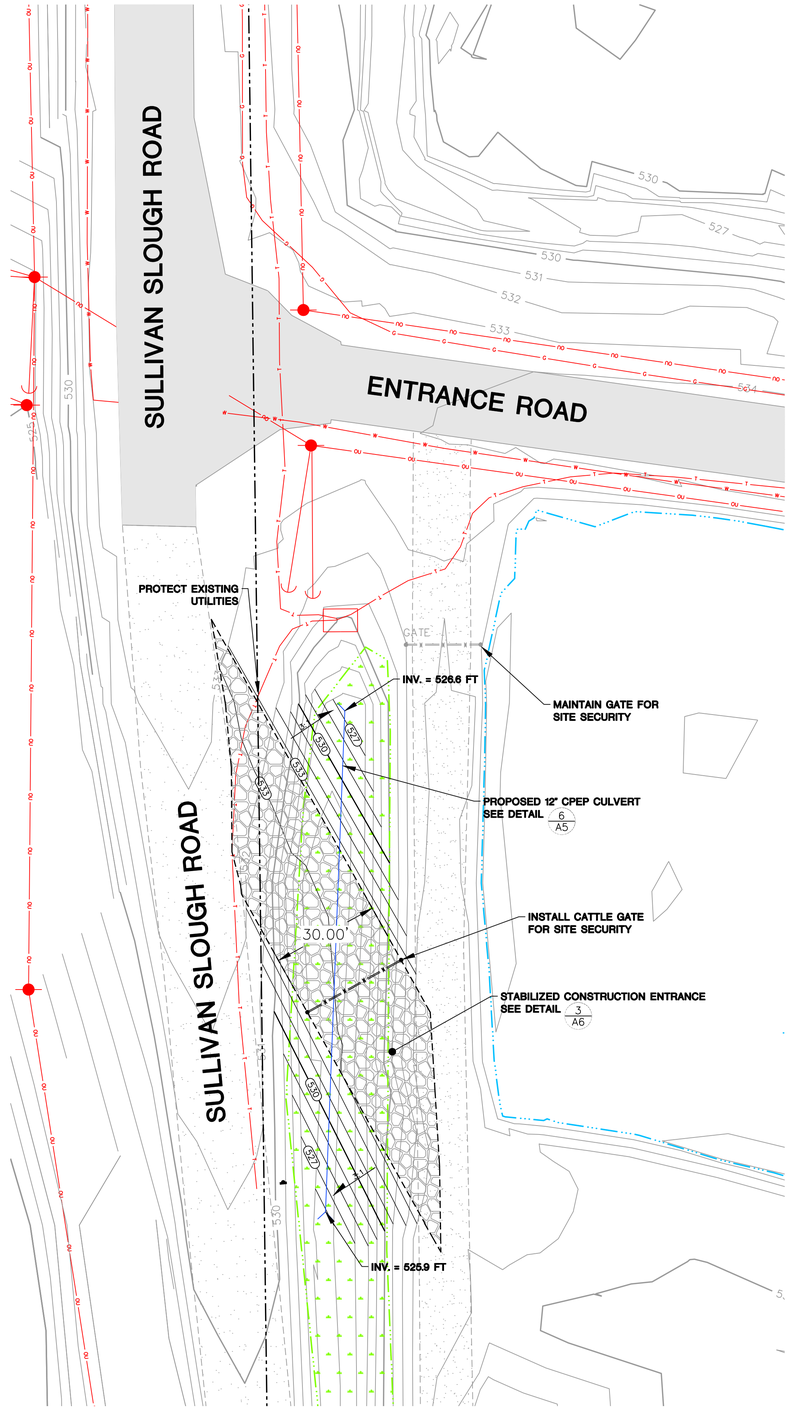
ASH POND CLOSURE DRAWINGS
ISSUED FOR PERMITTING
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

SITE

DETAILS

SHEET
20 OF 21

PRELIMINARY
NOT FOR CONSTRUCTION



1/21 ALTERNATE SITE ACCESS FOR CONSTRUCTION
SCALE: 1" = 20'

PROJECT NO.	25219168.00
DRAWN:	03/24/2021
REVISED:	03/09/2022
DRAWN BY:	BSS/KP
CHECKED BY:	MRH
APPROVED BY:	E.M. 03/16/2022

CLIENT
INTERSTATE POWER AND LIGHT CO.
4282 SULLIVAN SLOUGH ROAD
BURLINGTON, IA 52601

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

SITE
ASH POND CLOSURE DRAWINGS
SOUTH CCR PERIMETER
BURLINGTON GENERATING STATION
BURLINGTON, IOWA

DETAILS

SHEET
21 of 21

EP: 10+05.06
N: 280229.17
E: 2300496.88
DRAIN TO ROCK CHUTE IN LOWER ASH POND

PI: 9+50.06
N: 280185.87
E: 2300530.79

EP: 21+95.00
N: 280098.05
E: 2300587.79
CAP PIPE WITH BLIND FLANGE

NEW 12" HDPE DR 11

GATE VALVE WITH CAST IRON BOX
SEE DRAWING CG101 FOR DETAILS
STA: 8+12.58
N: 280049.39
E: 2300514.21

FRAC TANK TO BE USED AS REQUIRED

PI: 8+20.90
N: 280057.65
E: 2300515.21

45° WYE CONNECTION TO 12" HDPE
STA: 8+02.58
N: 280039.46
E: 2300513.00

GATE VALVE WITH CAST IRON BOX
SEE DRAWING CG101 FOR DETAILS
STA: 21+10.00
N: 280045.63
E: 2300520.87

MAINTAIN MIN. 4' OF COVER ON PIPE FOR ENTIRE LENGTH

PI: 5+94.50
N: 279832.91
E: 2300487.90

NEW 12" HDPE DR 11 FROM STORMWATER VAULT

PI: 2+79.07
N: 279522.43
E: 2300432.22

SEE SCS DETAIL 1/13 OR 2/13 FOR SILT FENCE

IN-LINE FLOWMETER

STORMWATER VAULT

CONTECH CDS2025-5-C HYDRODYNAMIC SEPARATOR

IN-LINE FLOWMETER
SEE DRAWING CG101 FOR DETAILS
STA: 0+66.00
N: 279327.12
E: 2300347.07

STA 0+58.15 WEST ALIGNMENT =
STA 0+49.45 MAIN ALIGNMENT

GATE VALVE WITH CAST IRON BOX
SEE DRAWING CG101 FOR DETAILS
STA: 0+52.63
N: 279312.66
E: 2300334.98

PI: 0+10.00
N: 279318.14
E: 2300292.70

PI: 0+05.00
N: 279312.06
E: 2300300.69

BP: 0+00.00
N: 279308.23
E: 2300291.42
MATCH EXISTING ELEVATION

PI: 0+44.45
N: 279306.99
E: 2300339.81

BP: 0+00.00
N: 279307.11
E: 2300300.04
MATCH EXISTING ELEVATION

GATE VALVE WITH CAST IRON BOX
SEE DRAWING CG101 FOR DETAILS
STA: 0+38.93
N: 279307.70
E: 2300334.34

0 10' 20'
SCALE IN FEET

DETAIL A

NORTH

0 50' 100'
SCALE IN FEET

no.	date	by	ckd	description
0	2/25/22	ADH	RNO	ISSUED FOR PERMITTING

BURNS McDONNELL

designed R. OWENS | detailed A. HEYWOOD

Alliant Energy

DES MOINES COUNTY, IA

WASTEWATER TREATMENT PIPING RELOCATION
HYDRODYNAMIC SEPARATOR/STORMWATER VAULT DISCHARGE PLAN

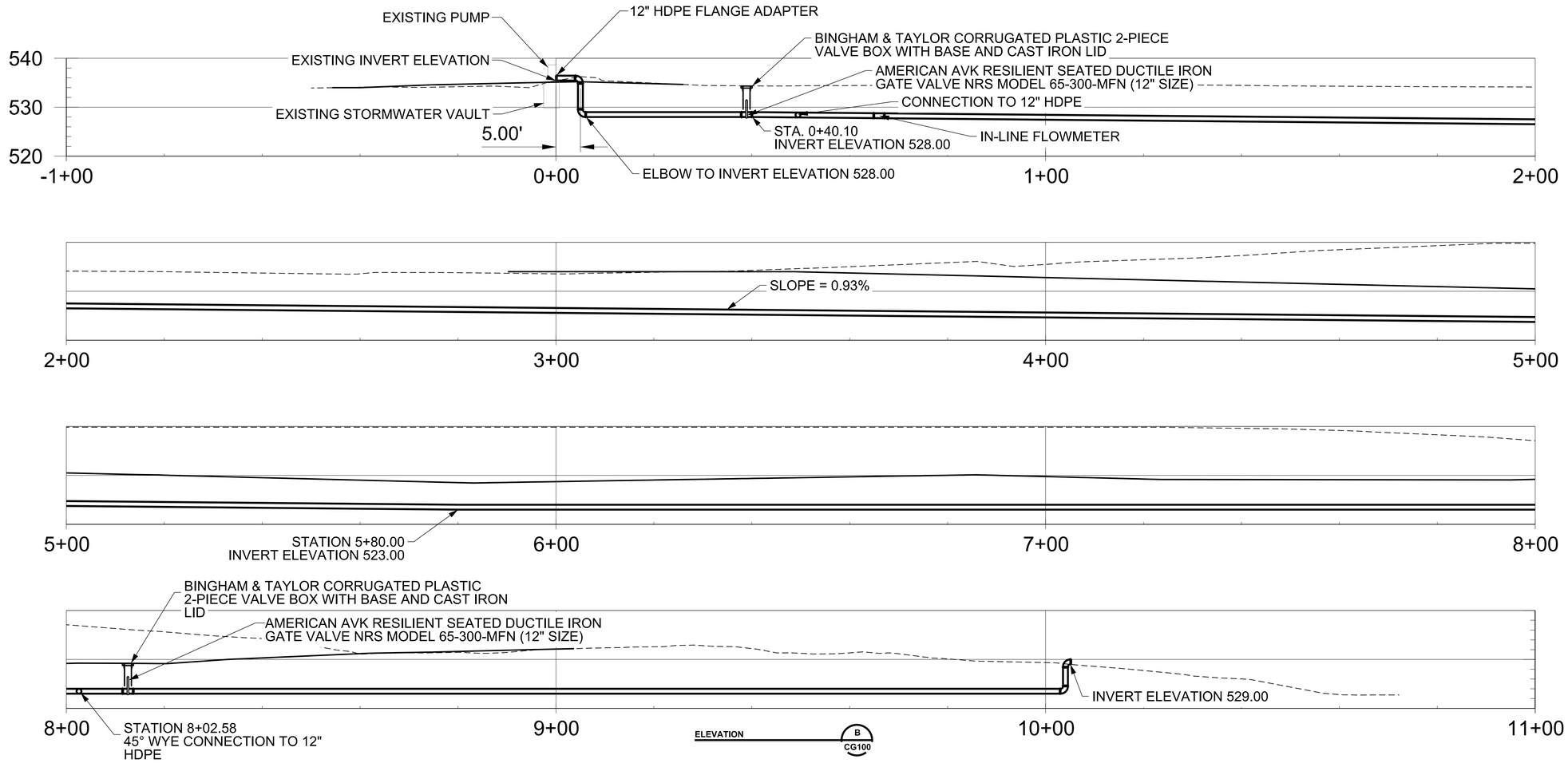
project 120715 | contract

drawing **CG100** | rev. **0**

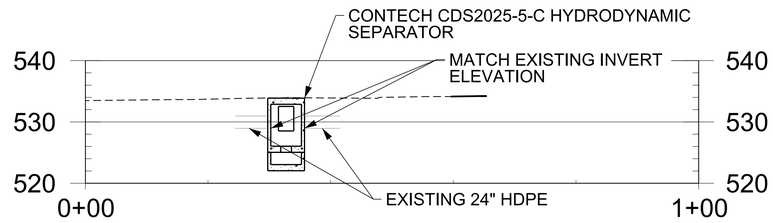
sheet | of | sheets

file 120715-CG100.DGN

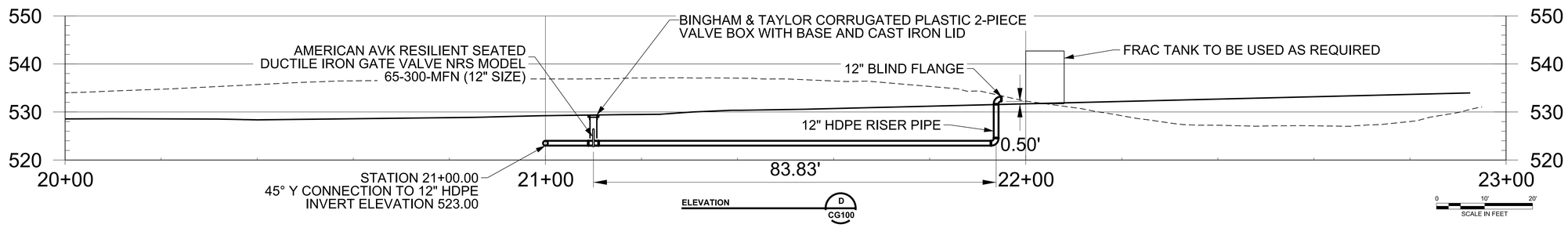
Millimeters
Inches
Scale For Microfilming



ELEVATION B CG100



ELEVATION C CG100



ELEVATION D CG100

Millimeters
Inches
Scale For Microfilming

no.	date	by	ckd	description
0	2/25/22	ADH	RNO	ISSUED FOR PERMITTING

no.	date	by	ckd	description

BURNS McDONNELL

designed R. OWENS | detailed A. HEYWOOD

Alliant Energy

DES MOINES COUNTY, IA

WASTEWATER TREATMENT PIPING RELOCATION

HYDRODYNAMIC SEPARATOR/STORMWATER VAULT DISCHARGE PROFILE

project 120715 | contract

drawing **CG101** | rev. — **0**

sheet | of | sheets

file 120715-CG101.DGN

NPDES SAMPLE POINT AFTER COMBINED WITH STORMWATER

NPDES SAMPLE POINT FROM OIL WATER SEPARATOR WITH COMPOSITE SAMPLER SEE THIS DRAWING FOR SAMPLE LOCATION IN EXISTING VAULT

CONTECH CDS2025-5-C HYDRODYNAMIC SEPARATOR

EXISTING OIL WATER SEPARATOR

NPDES SAMPLE POINT FROM BOILER BLOWDOWN WITH COMPOSITE SAMPLER TUBE CONNECTED TO EXISTING PIPING WITH SADDLE CONNECTION

NEW CONCRETE SEPERATION WALL UPSTREAM OF STORMWATER INLET

CONSTRUCT WET WELL STRUCTURE 12'x12' PRECAST RCB SECTIONS

CONSTRUCT LIFT STATION STRUCTURE 12'x12' PRECAST RCB SECTIONS

OIL SEPARATION TANK

STEEL BAR SUPPORT (SEE SECTION B-B)

ELECTRICAL SUPPLY TO PUMPS

INSTALL BOLLARD (TYP.) SEE DETAIL

10' WIDE ACCESS DRIVE SURFACE WITH 6" CRUSHED ROCK (SEE PLAN)

TO TURBINE CONTROL PANEL

17½" DIA. OPENING WITH 1"x3" STEEL BAND WELDED TO GRATE

FOUNDATION PAD

GRATE COVER

6 L.F. OF 24" DIA. PIPE (TYP.)

OIL SEPARATOR TANK PLAN

WET WELL /LIFT STATION PLAN

SCALE: 1"=5'

LIFT STATION AND OIL SEPARATOR CONTROL PANELS (SEE RISER DIAGRAM)

PLACE SAMPLE TUBE IN THIS CHAMBER PRIOR TO MIXING WITH STORMWATER

30" I.D. MANWAY

4" OIL PUMPOUT

CASTING RIM=101.00

STEEL SUPPORT BEAMS

12" DIA. FORCEMAIN (SEE PIPING DIAGRAM)

4 EQ. WIDTH GRATES "B"

3 EQ. WIDTH GRATES "B"

3' GRATE "A"

TOP EL.= 101.00

EXIST. GROUND 99±

NOZZLE FOR CONTROL PANEL

PROPOSED WET WELL

PROPOSED LIFT STATION

JOINTS (SEE NOTE)

P15

INV. 88.96

P15A

INV. 88.96

INV. 88.84

LEAD PUMP/LAG PUMP ON EL.= 88.30

LEAD PUMP ON EL.= 87.30

MIN. WATER EL.= 83.56

BELL PUMP

8' DIA.

6" (TYP.)

2" CL.

BOTTOM EL.= 80.00

FDN. EL.= 78.67

ANODE (TYP.)

32'

3" CL.

14"

8" (MIN.)

6" CRUSHED ROCK BASE

#5 @ 12" O.C. PLACED EACH WAY, TOP AND BOTTOM. MIN. STRENGTH SHALL BE 60 psi.

24" DIA. PIPE (2) INV. EL.= 83.56

30" DIA. INLET PIPE (P1) INV. EL.= 83.56

CONCRETE FOUNDATION PAD MATERIALS AND MIXING SHALL CONFORM TO IOWA DOT SPECIFICATION SECTION 2301.01 THRU 2301.06. COMPRESSIVE STRENGTH SHALL BE 4000 psi AT 28 DAYS.

NEW CONCRETE SEPERATION WALL UPSTREAM OF STORMWATER INLET

NORTH

0 50' 100'

SCALE IN FEET

no.	date	by	ckd	description
0	2/25/22	ADH	RNO	ISSUED FOR PERMITTING

designed R. OWENS | detailed A. HEYWOOD

BURNS McDONNELL

Alliant Energy

DES MOINES COUNTY, IA

WASTEWATER TREATMENT PIPING RELOCATION
NDPES SAMPLE LOCATIONS

project 120715 | contract

drawing **CG200** | rev. **0**

sheet of sheets

file 120715-CG100.DGN

Scale For Microfilming: Millimeters / Inches

Appendix C

Estimated Groundwater Corrective Action Schedule

Estimated Groundwater Corrective Action Schedule
Burlington Generating Station
Interstate Power and Light Company

ID	Task Name	Duration	Start	Finish
1	Planning/Engineering	355 days	Mon 1/4/21	Fri 5/13/22
2	RFP Level (60%) Engineering/Design	74 days	Mon 1/4/21	Thu 4/15/21
3	Contractor Design Review	107 days	Wed 8/4/21	Thu 12/30/21
4	Field/Pilot Testing	68 days	Wed 8/18/21	Fri 11/19/21
5	Issued for Permit (IFP) Engineering/Design	58 days	Mon 11/15/21	Wed 2/2/22
6	Issued for Construction (IFC) Engineering/Design	72 days	Thu 2/3/22	Fri 5/13/22
7	Procurement	347 days	Wed 12/2/20	Thu 3/31/22
8	Initial Request for Information (RFI)	40 days	Wed 12/2/20	Tue 1/26/21
9	Initial Construction Request for Proposal (RFP)	73 days	Fri 4/16/21	Tue 7/27/21
10	Ash Seal Pond Closure Procurement	45 days	Mon 3/1/21	Fri 4/30/21
11	Remaining CCR Surface Impoundment Closure Procurement	181 days	Thu 7/22/21	Thu 3/31/22
12	Permitting	448 days	Mon 3/15/21	Wed 11/30/22
13	State/Federal Joint Application and Amendments	300 days	Mon 3/15/21	Fri 5/6/22
14	Local Flood Plain Permit	18 days	Mon 5/9/22	Wed 6/1/22
15	State/Local Erosion Control Permit and SWPPP Amendments	258 days	Fri 4/16/21	Tue 4/12/22
16	Wastewater Construction Permit	25 days	Wed 3/9/22	Tue 4/12/22
17	Local Right-of-Way Permit	22 days	Mon 4/18/22	Tue 5/17/22
18	Groundwater Dewatering Well Permits	29 days	Mon 5/2/22	Thu 6/9/22
19	Groundwater Dewatering Discharge Permits	141 days	Wed 5/18/22	Wed 11/30/22
20	State Sanitary Disposal Project Permit	231 days	Fri 12/31/21	Fri 11/18/22
21	Closure Construction	395 days	Thu 3/31/22	Wed 10/4/23
22	Civil/Sitework	395 days	Thu 3/31/22	Wed 10/4/23
23	Wastewater Updates and Commissioning	155 days	Mon 8/29/22	Fri 3/31/23
24	Coal Yard and Coal Yard Runoff Basin Decommissioning	322 days	Fri 6/24/22	Mon 9/18/23
25	Dewatering System Installation and Commissioning	99 days	Tue 6/21/22	Fri 11/4/22
26	Ash Seal Pond Preparation and Closure	305 days	Tue 6/21/22	Mon 8/21/23
27	Upper Ash Pond Preparation and Closure	322 days	Mon 6/27/22	Tue 9/19/23
28	Main Ash Pond Preparation and Closure	327 days	Tue 6/21/22	Wed 9/20/23
29	Economizer Pond Preparation and Closure	334 days	Wed 6/15/22	Mon 9/25/23
30	Groundwater Collection System	1021 days	Mon 7/31/23	Mon 6/28/27
31	Post-Construction Dewatering Groundwater Evaluation	90 days	Mon 7/31/23	Fri 12/1/23
32	Extraction System Design	264 days	Fri 1/5/24	Wed 1/8/25
33	Capture Zone Analysis	46 days	Mon 2/5/24	Mon 4/8/24
34	Updated CCR/Water Characterization (Plan/Execute)	198 days	Fri 1/5/24	Tue 10/8/24
35	Pilot-testing (Plan/Execute)	93 days	Mon 2/5/24	Wed 6/12/24
36	Well Layout and Design	45 days	Fri 9/6/24	Thu 11/7/24
37	Pump Selection	44 days	Fri 11/8/24	Wed 1/8/25
38	Treatment System Design	134 days	Thu 11/7/24	Tue 5/13/25
39	Facilities, Process and Control Design	110 days	Wed 12/11/24	Tue 5/13/25
40	Procurement	91 days	Wed 5/14/25	Wed 9/17/25
41	Permitting	90 days	Mon 6/16/25	Fri 10/17/25
42	Construction	179 days	Mon 10/20/25	Thu 6/25/26
43	Operation, Maintenance and Monitoring (Year 1)	262 days	Fri 6/26/26	Mon 6/28/27