Selection of Remedy
Landfill and Surface Impoundment

Former Lansing Generating Station
Lansing, Iowa

Prepared for:

Alliant Energy

SCS ENGINEERS

25220082.00 | May 6, 2024

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EXECUTIVE SUMMARY

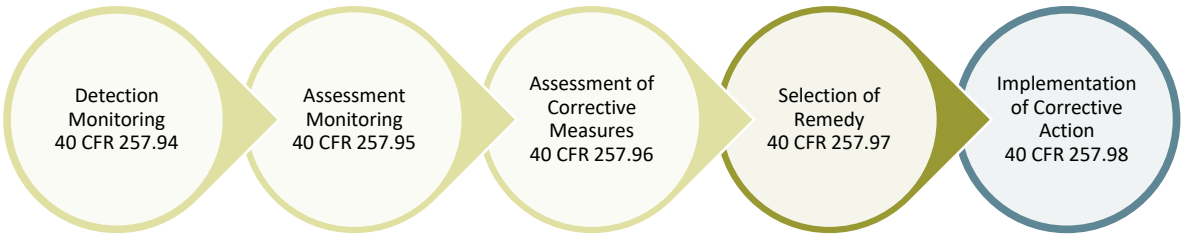
Interstate Power and Light Company (IPL), an Alliant Energy company, operates a dry ash landfill and ash pond at the Lansing Generating Station (LAN). The landfill and pond were used to manage coal combustion residuals (CCR) and wastewater from the power plant, which burned coal to generate electricity until December 31, 2022. The power plant at the LAN facility has been decommissioned, and the landfill has been closed. Construction to consolidate the remaining CCR in the ash pond and cap is complete.

IPL samples and tests the groundwater in the area of the landfill and pond 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 monitoring is also conducted under an Iowa Department of Natural Resources (IDNR) sanitary disposal project permit for the landfill.

Groundwater samples from one of the wells installed under the Rule to monitor the landfill and pond contain arsenic at levels higher than the Groundwater Protection Standards (GPS) defined in the Rule. Arsenic occurs naturally and can 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, ACM Addendum No. 1 issued in November 2020, and ACM Addendum No. 2 issued in June 2023. The ACM and ACM Addendums were prepared in response to the groundwater sampling results at the LAN facility.

The Selection of Remedy process is one step in a series of steps defined in the Rule and shown below.



Prior to developing the Selection of Remedy Report, the nature and extent of groundwater impacts at the LAN facility were discussed in the ACM and ACM Addendums No. 1 and No. 2. Through the development of the ACM and subsequent addendums, IPL worked to understand the following:

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

IPL has identified appropriate options, or Corrective Measures, to bring the levels of arsenic in groundwater below U.S. EPA standards. In addition to stopping landfill disposal of CCR and the discharge of CCR and LAN wastewater to the pond, these corrective measures include:

- No Action
- Cap CCR in Place with Monitored Natural Attenuation (MNA)
- Consolidate CCR and Cap with MNA
- Excavate and Dispose CCR on Site with MNA
- Excavate and Dispose CCR in Off-site Landfill with MNA
- Consolidate and Cap with Chemical Amendment
- Consolidate and Cap with Groundwater Collection
- Consolidate and Cap with Barrier Wall

Because the time allowed by the Rule to prepare the ACM was limited, IPL worked to improve the understanding of the items listed above and issued ACM Addendum No. 1 in November 2020 and ACM Addendum No. 2 in June 2023.

Based on the assessment of the nature and extent of arsenic, current data indicates that the source of the arsenic GPS exceedances is unrelated to the dry ash landfill and ash pond.

Arsenic occurs naturally in air, water, soil, and rock. Arsenic is also commonly present in coal and CCR. The LAN CCR Units do not appear to be the source of the arsenic GPS exceedances. Lines of evidence that indicate the arsenic GPS exceedances are not from the CCR Units are:

- Low arsenic concentrations have repeatedly been reported in laboratory tests of groundwater samples from a monitoring well nest installed between the CCR Units and the well where arsenic concentrations exceed the GPS.

- The arsenic concentration in a sample collected from the Upper Ash Pond outfall was below the arsenic GPS. The outfall sample included the flow from a groundwater interceptor drain installed between the Upper Ash Pond and the well where arsenic concentrations exceed the GPS.

Lines of evidence that support an alternate source of arsenic GPS exceedances are:

- Anoxic reducing conditions that can result in increased arsenic concentrations are present in a localized area near the well with arsenic GPS exceedances.

- Anoxic conditions, resulting in potential higher arsenic concentrations, may be caused by the organic material described in the boring log of the well with arsenic GPS exceedances. The organic material is absent in other site monitoring wells.

IPL held a public meeting on October 12, 2020, to discuss the contents of the September 2019 ACM with interested and affected parties. IPL held an additional public meeting on January 11, 2022, to discuss the ACM Addendum No. 1. IPL held a public meeting with interested and affected parties to discuss Addendum No. 2 on June 12, 2023.

For more information on Alliant Energy, view the Alliant Energy Corporate Responsibility Report at https://poweringwhatsnext.alliantenergy.com/crr/.

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 that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

5/6/2024

(signature) (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 Report, Lansing Generating Station

May 6, 2024

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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 Residual from Electric Utilities; Final Rule*, date 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 arsenic Groundwater Protection Standard (GPS) exceedances observed in groundwater samples from detection monitoring wells for the former Lansing Generating Station (LAN) Upper Ash Pond and now closed LAN Landfill. These GPS exceedances for arsenic were initially identified in the Notification of GPS Exceedance dated February 13, 2019.

Although IPL has concluded that the source of the arsenic GPS exceedance is not associated with the CCR units at the former LAN facility and no further action is required, this Selection of Remedy report was prepared to address the requirements in 40 CFR 257.97(a). 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**.

The situation encountered at the LAN facility where further investigation of the nature and extent of GPS exceedances during corrective action reveals a potential source other than the CCR unit is not specifically addressed in the CCR Rule. This Selection of Remedy report was developed to meet the corrective action requirements of the CCR Rule and the content is based on guidance from other relevant U.S. EPA programs, such as the Superfund program (U.S. EPA 1999), that contemplate similar circumstances.

2.0 BACKGROUND

2.1 SITE INFORMATION AND MAP

LAN is located along the west bank of the Mississippi River, south of the City of Lansing, in Allamakee County, Iowa. The address of the former plant is 2320 Power Plant Drive in Lansing, Iowa (**Figure 1**). The coal-fired generating plant at LAN ceased coal-fired electric generating activities at the end of 2022 and has been decommissioned. The facility also includes a CCR landfill and a CCR settling pond. The LAN facility was originally constructed in 1948, with additional units added in 1957 and 1976.

The groundwater monitoring system at LAN is a multi-unit system monitoring two existing CCR Units that are contiguous:

- LAN Landfill (existing landfill)
- LAN Upper Ash Pond (existing surface impoundment)

The LAN Landfill has been closed under a sanitary disposal project closure permit (Permit #03 SDP-05-01C) administered by the Iowa Department of Natural Resources (IDNR). A separate groundwater monitoring system has been established to monitor the landfill for the state permit. The landfill was closed in 2023 by installing a state-permitted final cover that meets the CCR Rule minimum design requirements in 40 CFR 257.102(d)(3).

The LAN Upper Ash Pond was operated until disposal activities ended on July 27, 2023. The LAN Upper Ash Pond was operated with discharges regulated under individual National Pollutant Discharge Elimination System (NPDES) Permit Number IA0300100. The LAN Upper Ash Pond will close in accordance with the CCR Closure Plan and the Notification of Intent to Close issued on August 14, 2023. The ash pond will be closed by installing a state-permitted final cover that meets the CCR Rule minimum design requirements in 40 CFR 257.102(d)(3). The consolidation of CCR and construction of the final cover was completed in 2023 under a sanitary disposal project closure permit (Permit #03-SDP-13-23C) administered by the IDNR.

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**. Monitoring wells installed for the state monitoring program for the CCR landfill are also shown on **Figure 2**. The monitoring wells and their location and role in the monitoring network are included in **Table 1**. A summary of the monitoring event dates are included in **Table 2**.

2.2 UPDATED NATURE AND EXTENT OF GROUNDWATER IMPACTS

The potential sources of the arsenic impacts in groundwater have been under evaluation since the initiation of the ACM that was issued in September 2019. Based on the data obtained to date, the LAN Upper Ash Pond and LAN Landfill are no longer considered the likely source of the statistically significant levels (SSLs) above the GPS for arsenic at monitoring well MW-302. Instead, arsenic impacts in groundwater in the area of MW-302 are likely due to in-situ geochemical processes in organic-rich sediments present near MW-302. These processes and the source of arsenic in groundwater at MW-302 were described in ACM Addendum No. 2 (SCS, 2023).

Since ACM Addendum No. 2 was issued in June 2023, IPL has continued groundwater assessment monitoring. Current groundwater monitoring results were summarized in the 2023 Annual Groundwater Monitoring and Corrective Action Report issued for the LAN Landfill and LAN Upper Ash Pond on January 31, 2024.

3.0 CORRECTIVE MEASURES AND REMEDY SELECTION

Several corrective measure options were presented in detail in ACM Addendum No. 2, dated June 5, 2023.

This report identified the following corrective measure alternatives for the arsenic impacts to groundwater associated with the closed LAN Landfill and the LAN Upper Ash Pond where closure construction is complete:

- Alternative 1 (A1) – No Additional Action
- Alternative 2 (A2) – Close and Cap in Place with MNA
- Alternative 3 (A3) – Consolidate and Cap with MNA
- Alternative 4 (A4) – Excavate CCR and Dispose On Site with MNA
- Alternative 5 (A5) – Excavate CCR and Dispose Off Site with MNA
- 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

IPL is committed to implementing corrective measures as required under the Rule, and the No Additional Action alternative was included in ACM Addendum No. 2 as a viable alternative based on the available data indicating the CCR Units are not the source of groundwater impacts above the GPS at LAN. Under this alternative the closure of the LAN Upper Ash Pond will proceed as described in the Closure Plan for Existing CCR Surface Impoundment (currently Amendment No. 2 [SCS, 2020]) and in accordance with the requirements of 40 CFR 257.102(d), the closed LAN Landfill will be monitored in accordance with an existing State of Iowa sanitary disposal project closure permit, and groundwater monitoring will continue in accordance with 40 CFR 257.94.

A2 through A8

Based on the updated nature and extent of the groundwater impacts at LAN and the conclusion that the CCR units are not the source of arsenic in groundwater at concentrations exceeding the GPS in samples from MW-302, the arsenic detected in groundwater samples from MW-302 is no longer a matter of CCR Rule compliance. Therefore, corrective actions to address GPS exceedances via Alternatives 2 through 8 are no longer necessary and they have been eliminated from further consideration.

3.2 MINIMUM CRITERIA

The selected remedy must meet the minimum criteria set forth in 40 CFR 257.97(b). It is our opinion that Alternative 1 can meet the requirements in 40 CFR 257.97(b)(1) through (5) based on the information currently available and that no other alternatives are necessary since the arsenic GPS exceedances at MW-302 are not attributable to the CCR units at the LAN facility.

3.3 EVALUATION FACTORS

Each remaining alternative remedy was evaluated based on the criteria set forth in 257.97(c). Since the only remaining alternative is A1, the remedies were not compared with each other. However, to be responsive to the requirements in the CCR Rule, an evaluation of A1 based on the following evaluation criteria is provided in the sections that follow:

- 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)]

Based on the discussion of potential receptors and pathways provided in ACM Addendum No. 2, the existing long- and short-term risks associated with the arsenic GPS exceedances at MW-302 are minimal.

- A1 provides a suitable reduction in existing risk.

- The magnitude of residual risks in terms of the likelihood of further releases due to CCR remaining at the LAN facility are adequately addressed by A1 and will be monitored during the post-closure period in accordance with the requirements of 40 CFR 257.104.

- The long-term monitoring, operation, and maintenance under A1 is defined by the post-closure care requirements in 40 CFR 257.104.

- There are no remaining short-term risks to human health and the environment associated with excavation, transportation, or re-disposal of CCR with A1 since all closure construction for the LAN Landfill and LAN Upper Ash Pond were completed in 2023.

- Full protection as required by the CCR Rule will be achieved with A1 once the certification of closure of the LAN Upper Ash Pond is completed, which is expected to occur in 2024.

- The potential for exposure for humans and environmental receptors to remaining wastes with A1 has been minimized by the closure construction completed to date.

- The long-term reliability of the engineering and institutional controls provided by A1 is good as they meet or exceed the requirements for final cover in 40 CFR 257.102(d)(3).

There is significant industry experience with the methods used in the construction of the final cover over CCR in the LAN Landfill and LAN Upper Ash Pond. Capping is a common practice and the industry standard for closure in place for remediation and solid waste management.

- The potential need to replace A1 is likely low. The success of this alternative will be evaluated during the post-closure care required by 40 CFR 257.104.

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

Based on investigations performed at the LAN facility to date, the LAN Landfill and LAN Upper Ash Pond are not the source of the SSLs above the GPS for arsenic at monitoring well MW-302. The additional information presented in ACM Addendum No. 2 indicates that there has not been a release from the CCR units at the LAN facility. Therefore, A1 provides suitable source control to reduce future releases.

3.3.3 Implementation [257.97(c)(3)]

The most difficult stages of implementing A1 have been completed with the design, permitting, and closure construction that concluded in 2023.

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

No comments were received during the initial public meeting held on October 12, 2020, presenting the ACM. Additionally, no comments related to the ACM Addendum No. 1 were received during the public meeting held on January 11, 2022, presenting the November 2020 addendum to the ACM, nor were comments related to the ACM Addendum No. 2 during the public meeting on June 12, 2023.

In addition, the IDNR issued Sanitary Disposal Project Closure Permits #03-SDP-05-01C and #03-SDP-13-23C for the construction of the final cover at the LAN Landfill and the LAN Upper Ash Pond. The closure permits also regulate post-closure care of the consolidated and capped CCR at LAN that is part of A1.

3.4 SELECTED REMEDY

3.4.1 Remedy Description

A1 – No Additional Action has been selected based on the evaluation of factors defined in 257.97(c), presented above, and is the selected remedy.

IPL is committed to implementing corrective measures as required under the Rule, and the No Additional Action alternative is a viable alternative based on the available data, which indicates the CCR Units are not the source of groundwater impacts above the GPS at LAN. This alternative was presented in ACM Addendum No. 2 under the presumption that the closure of the LAN Upper Ash Pond would proceed as described in the Closure Plan for Existing CCR Surface Impoundment (currently Amendment No. 2 [SCS, 2020]) and in accordance with the requirements of 40 CFR 257.102(d), the LAN Landfill would close in accordance with the CCR Rule and existing State of Iowa sanitary disposal project permit, and groundwater monitoring will continue in accordance with 40 CFR 257.94. The presumed activities are underway or completed and A1 is an appropriate remedy.

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 considering the factors in 40 CFR 257.97(c), which are discussed in Section 3.3.

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

Based on the currently available information for this site the CCR units are not the source of groundwater impacts. Thus, restoration under the federal CCR Rule corrective action process is not required.

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

Currently there are no GPS exceedances pursuant to 257.95(h) that are attributable to the LAN Landfill or LAN Upper Ash Pond. No additional action (A1) is appropriate considering the lack of groundwater impacts related to the CCR Units at LAN.

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:

Although no release has occurred, the closure of the LAN Landfill and the LAN Upper Ash Pond in accordance with the written closure plans under A1 will minimize the potential for future releases from the CCR remaining in the LAN Landfill and LAN Upper Ash Pond.

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 from the LAN Landfill or the LAN Upper Ash Pond or groundwater impacts attributable to these CCR Units have been identified.

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

All CCR or other waste generated during closure construction for the LAN Landfill and LAN Upper Ash Pond were managed in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements. The selected remedy will comply with the standards for the management of wastes described in 40 CFR 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 future 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.

It is our opinion that Alternative 1 can meet the requirements in 40 CFR 257.97(b)(1) through (5) based on the information currently available and that no other alternatives are necessary since the arsenic GPS exceedances at MW-302 are not attributable to the CCR units at the LAN facility.

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 for the LAN Upper Ash Pond (SCS, 2020).

The schedule provided in **Appendix C** is based on the LAN Landfill closure completed in 2023 and assumes the closure certification for the LAN Upper Ash Pond will occur in 2024 and post-closure care for both units will continue in accordance with 40 CFR 257.104. The schedule only shows the first year of post-closure care. The full duration and final completion of the post-closure care period for the CCR Units at LAN are not represented on the enclosed Gantt chart schedule.

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 arsenic in groundwater attributed to the CCR Units at LAN are complete, and no GPS exceedances attributable to the CCR Units were identified. Given the lack of CCR Unit-related GPS exceedances and human and ecological receptors, ongoing monitoring and the remedy schedule enclosed should be protective of human health and the environment. 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 selected alternative (A1) does not require remedial technologies to achieve compliance with the arsenic GPS established under §257.95(h) or other objectives of the remedy, and remedial technologies did not impact the schedule provided in **Appendix C**.

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 LAN CCR Units was available on-site within the current footprint of the units in accordance with the written closure plans 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:

Based on the discussion of potential receptors and exposure pathways provided in ACM Addendum No. 2 (SCS 2023), the potential risks to human health and the environment from exposure to arsenic in groundwater near MW-302 are minimal.

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

The aquifer in the area of arsenic impacts is not currently used as a water supply for human or animal consumption or irrigation. However, the uppermost aquifer is a regional water supply source. The two nearest active water supply wells are onsite wells operated by IPL that were recently abandoned as part of the plant decommissioning. The next closest water supply well in the area is located upgradient across County Highway X52. As discussed in ACM Addendum No. 2, this well is over 400 feet deep and arsenic was not detected in the most recent sample from this well. IPL and SCS Engineers (SCS) are not aware of any additional samples from this well since. The value of the aquifer in this area is unlikely to change significantly over the time required to implement the selected remedy. 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:

Because the No Further Action alternative has been selected, the schedule provided in Appendix C reflects the LAN CCR unit closure construction activities completed to date, and only an estimated closure date for the LAN Upper Ash Pond. The remaining scheduled activities focus on post-closure care requirements in 40 CFR 257.104.

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 arsenic GPS exceedances at LAN. Based on the site information currently available, A1 – No Additional Action 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 post-closure care of the LAN Landfill and LAN Upper Ash Pond under 40 CFR 257.104.

6.0 REFERENCES

U.S. Environmental Protection Agency, 2015, in the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residual from Electric Utilities; Final Rule, date April 17, 2015

United States Environmental Protection Agency, 1999, “A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents.” July 1999

SCS Engineers, 2023, Addendum No. 2 Assessment of Corrective Measures Landfill and Surface Impoundment, June 5, 2023.

SCS Engineers, 2020, Closure Plan for Existing CCR Surface Impoundment – Amendment No. 2 Upper Ash Pond, November 13, 2020.

U.S. Environmental Protection Agency, 2023, Resource Conservation and Recovery Act, Basics of RCRA (URL https://www.epa.gov/fedfacts/resource-conservation-and-recovery-act-rcra#Basics) March, 20 2023

Tables

1 Groundwater Monitoring Well Network
2 CCR Rule Groundwater Samples Summary

Table 1. Groundwater Monitoring Well Network
Lansing Generating Station / SCS Engineers Project #25220082.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-6	Upgradient	Background
MW-301	Downgradient	Compliance
MW-302	Downgradient	Compliance
MW-302A	Downgradient, deeper	Delineation
MW-303	Downgradient	Compliance
MW-304	Downgradient	Delineation
MW-304A	Downgradient, deeper	Delineation
MW-305	Downgradient	Delineation
MW-306	Downgradient	Delineation
MW-306A	Downgradient, deeper	Delineation
MW-307	Downgradient	Delineation
MW-307A	Downgradient, deeper	Delineation
MW-308	Downgradient	Groundwater Elevation Only
MW-309	Downgradient	Groundwater Elevation Only

Created by:	RM	Date:	12/14/2020
Last revision by:	NLB	Date:	12/27/2023
Checked by:	RM	Date:	1/3/2024

Table 2. CCR Rule Groundwater Samples Summary
Lansing Generating Station / SCS Engineers Project #25220082.00

Sample Dates	Background Well	Downgradient Wells												
	MW-6	MW-301	MW-302	MW-302A	MW-303	MW-304	MW304A	MW-305	MW-306	MW-306A	MW-307	MW-307A	MW-308	MW-309
10/2/2019	A	A	A	NI	A	A	NI	A	A	NI	NI	NI	NI	NI
12/5/2019	--	--	--	NI	--	--	NI	--	Add.	NI	NI	NI	NI	NI
2/5/2020	--	--	--	--	--	--	--	--	Add.	--	NI	NI	NI	NI
5/20/2020	A	A	A	A	A	A	A	A	A	A	NI	NI	NI	NI
7/6/2020	--	--	--	A	--	--	A	--	--	A	NI	NI	NI	NI
8/18/2020	Add.	Add.	Add.	Add.	Add.	Add.	Add.	Add.	Add.	Add.	NI	NI	NI	NI
10/19-20/2020	A	A	A	A	A	A	A	A	A	A	NI	NI	NI	NI
2/23/2021	--	--	--	--	--	--	Add.	--	Add.	--	NI	NI	NI	NI
4/7-9/2021	A	A	A	A	A	A	A	A	A	A	NI	NI	NI	NI
7/12/2021	--	--	--	--	--	--	Add.	--	Add.	--	A	A	--	--
8/13/2021	--	--	--	--	--	--	--	--	--	--	A	A	--	--
10/25-27/2021	A	A	A	A	A	A	A	A	A	A	A	A	--	--
4/4-6/2022	A	A	A	A	A	A	A	A	A	A	A	A	WL	WL
10/17-19/2022	A	A	A	A	A	A	A	A	A	A	A	A	WL	WL
4/10-11/2023	A	A	A	A	DRY	A	A	A	A	A	A	A	WL	WL
10/30-31/2023	A	A	A	A	DRY	A	A	A	A	A	A	A	WL	WL
Total Samples	10	10	10	10	10	10	12	10	14	10	7	7	N/A	N/A

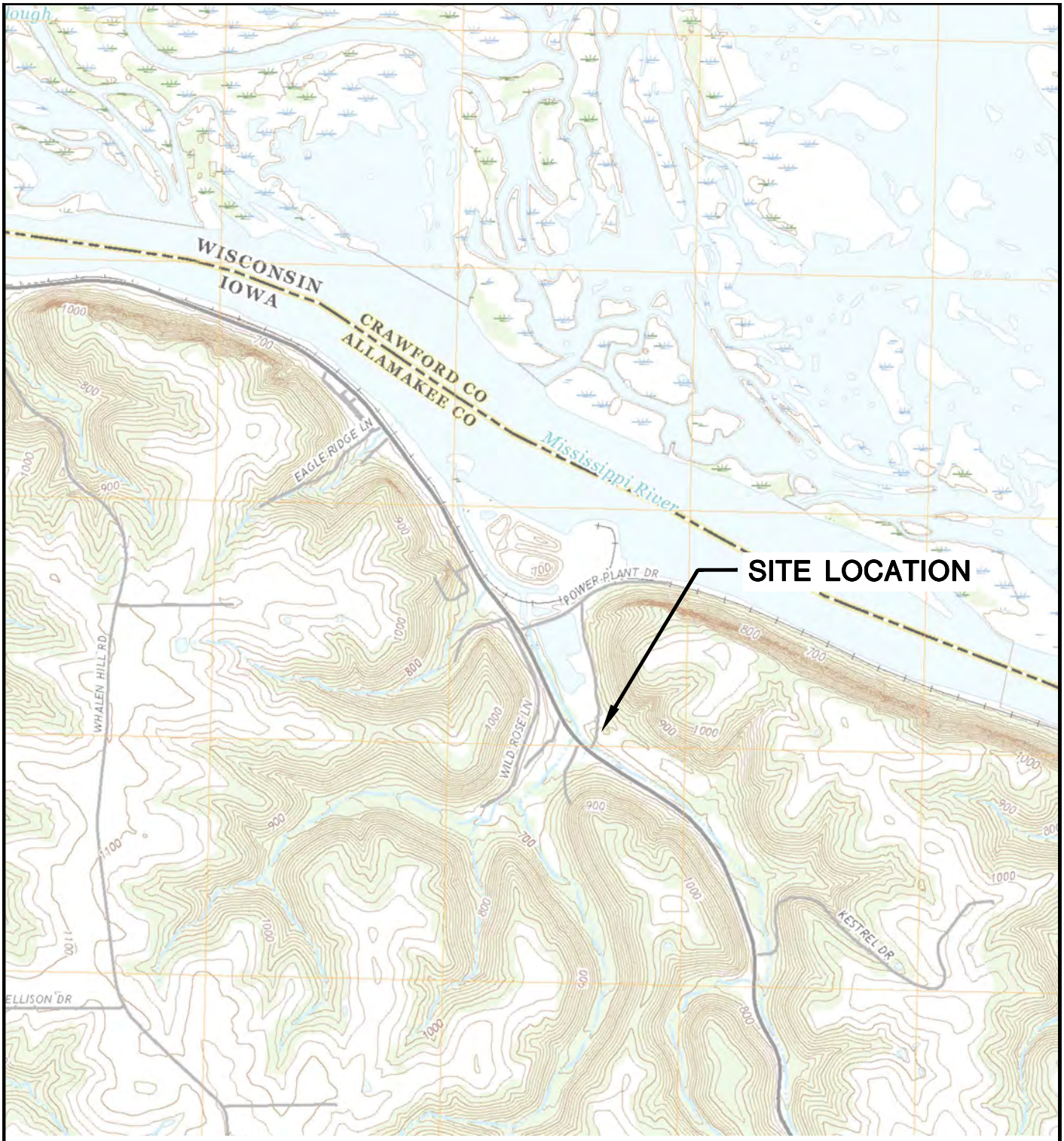
Abbreviations:
A = Samples analyzed for assessment monitoring parameters
Add. = Additional sampling event for selected parameters
-- = Not Sampled
NI = Not Installed
N/A= not applicable
WL = Water level measurement only

Notes:
Monitoring wells MW-308 and MW-309 were installed for horizontal groundwater flow and sample collection is not currently planned for these two wells.

Created by: NDK Date: 2/19/2020
Last revision by: RM Date: 4/8/2024
Checked by: NLB Date: 4/8/2024

Figures

1 Site Location Map
2 Site Plan and Monitoring Well Locations



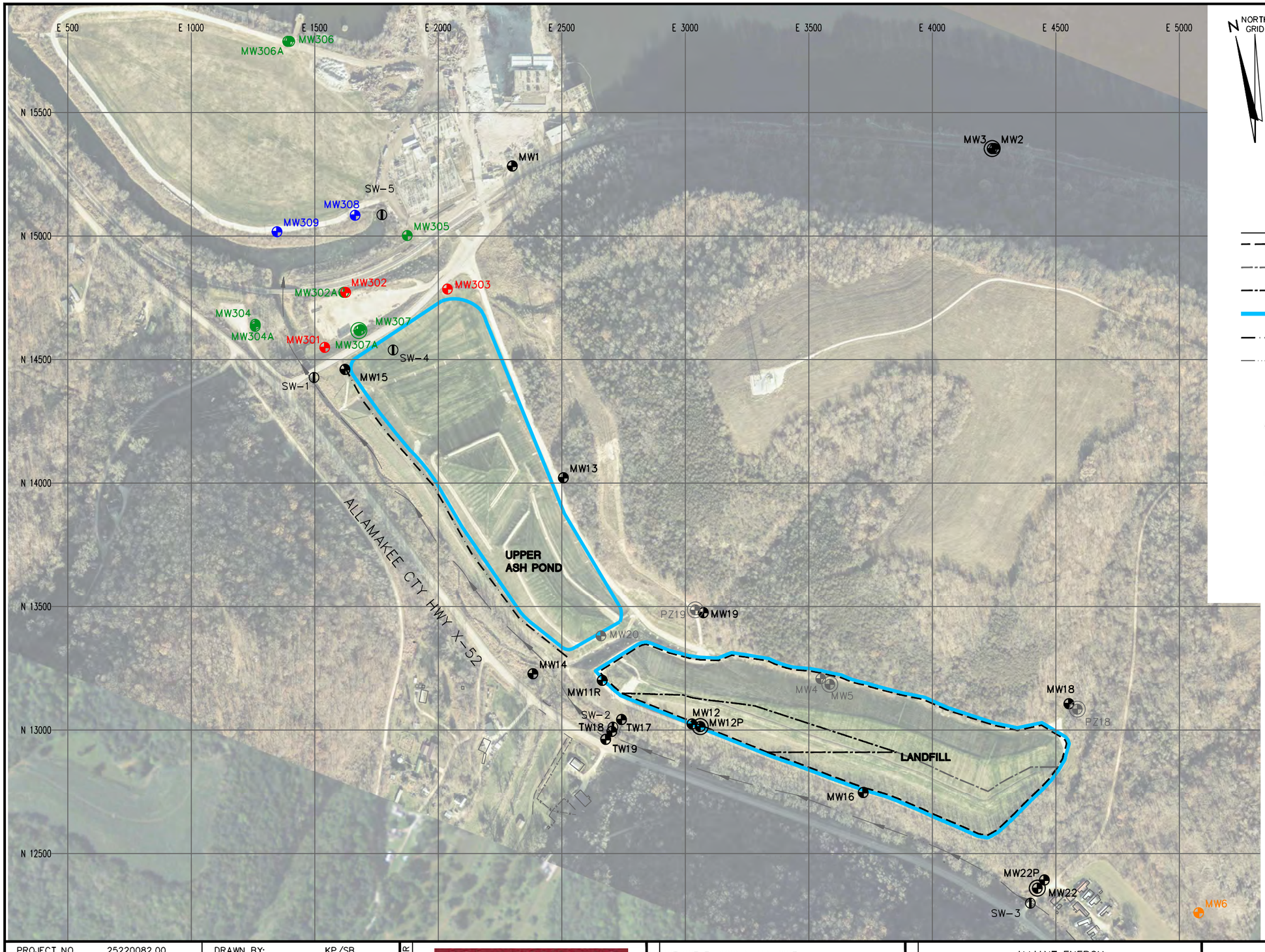
N

LANSING QUADRANGLE
IOWA–ALLAMAKEE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	SITE	
INTERSTATE POWER AND LIGHT 2320 POWER PLANT DRIVE LANSING, IA 52151-9733	ALLIANT ENERGY LANSING GENERATING STATION LANSING, IOWA	SITE LOCATION MAP

PROJECT NO.	25219070.00	DRAWN BY:	BSS	ENGINEER	FIGURE
DRAWN:	11/27/2019	CHECKED BY:	MDB	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	1
REVISED:	11/27/2019	APPROVED BY:	TK 01/30/2020		

I:\25219070.00\Drawings\CCR 2019 Annual Report\Site Location Map.dwg, 1/30/2020 3:31:40 PM



NORTH GRID

LEGEND

	APPROVED LIMITS OF WASTE
	LIMITS OF PHASE 1 FINAL COVER
	LIMITS OF PHASE 2 FINAL COVER
	CCR LIMITS
	SLURRY WALL
	EXISTING STREAM
SW-1	EXISTING STAFF GAUGE
MW17	EXISTING MONITORING WELL
MW12P	EXISTING PIEZOMETER
MW4	ABANDONED MONITORING WELL
MW5	ABANDONED PIEZOMETER
MW301	CCR DELINEATION MONITORING WELL
MW301	CCR COMPLIANCE MONITORING WELL
MW6	CCR BACKGROUND MONITORING WELL
MW308	WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)

NOTES:

1. MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
2. MONITORING WELL MW20 WAS ABANDONED ON MAY 5, 2022.
3. BACKGROUND AERIAL IMAGE IS A COMPOSITE OF A PHOTOGRAPH FROM DRONEVIEW MAPPING DATED NOVEMBER 25, 2023 AND 2011 AERIAL IMAGERY.

400 0 400

SCALE: 1" = 400'

PROJECT NO.	25220082.00	DRAWN BY:	KP/SB
DRAWN:	05/26/2021	CHECKED BY:	RM
REVISED:	04/23/2024	APPROVED BY:	EJN, 5/3/2024

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

CLIENT: INTERSTATE POWER AND LIGHT
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

SITE: ALLIANT ENERGY
LANSING POWER STATION
LANSING, IOWA

SITE PLAN AND
MONITORING WELL LOCATIONS

FIGURE
2

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Appendix A

Historical Groundwater Quality Data

Single Location

Name: IPL - Lansing

Location ID: MW-6
Number of Sampling Dates: 24

Parameter Name	Units	12/10/2015	4/29/2016	7/20/2016	10/27/2016	1/18/2017	4/19/2017	6/19/2017	8/15/2017	10/16/2017	4/16/2018	4/26/2018	8/7/2018	10/8/2018	4/15/2019	10/2/2019	5/20/2020	8/19/2020	10/20/2020	4/7/2021	10/26/2021	4/6/2022	10/18/2022	4/11/2023	10/30/2023
Boron	ug/L	25.7	<50	<50	<50	<50	31.9	42.1	40	41.2	--	29.8	42.9	40.2	<110	<110	<73	--	<80	<58	64	<58	<58	<76	<76
Calcium	mg/L	64	72.6	68.9	68.6	68.6	67.8	64.6	68.2	66.9	--	72.7	66.5	69.6	67	70	72	--	69	71	72	71	70	79	73
Chloride	mg/L	7.5	7.6	8.1	6.8	6.5	6.3	6.2	6.5	6.5	--	6.5	7.3	6.6	6.7	6.9	7.7	6.8	5.6	7	6.8	5.3	5.1	6.5	5.5
Fluoride	mg/L	0.094	0.15	0.082	0.12	0.092	<0.1	0.1	0.12	0.14	--	0.084	0.12	<0.19	0.63	<0.23	<0.23	--	<0.23	0.34	<0.28	<0.22	<0.22	<0.38	<0.38
Field pH	Std. Units	7.44	7.64	7.25	7.56	7.62	7.48	7.4	7.48	7.03	--	7.34	7.18	7.06	7.59	7.46	7.34	7.98	7.42	7.39	7.7	7.32	7.4	7.15	7.38
Sulfate	mg/L	23	22.2	22.5	25.2	24.8	25.5	27.4	26.9	25.8	--	26.4	24.8	25.5	26	24	27	25	25	23	25	25	21	21	22
Total Dissolved Solids	mg/L	382	328	352	337	324	350	337	333	318	--	343	351	319	340	280	580	--	300	290	240	280	250	350	280
Antimony	ug/L	0.18	<0.058	<0.058	<0.058	<0.058	<0.026	0.027	0.037	--	--	<0.026	<0.15	<0.078	<0.53	--	<0.58	--	--	<1.1	<1.1	<0.69	<0.69	<1	<1
Arsenic	ug/L	<4.5	0.28	0.26	0.19	0.23	0.28	0.18	0.28	--	--	0.23	0.26	0.24	<0.75	<0.75	<0.88	--	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53
Barium	ug/L	45.5	45.6	43.8	44.6	46.5	45.4	41.9	44	--	--	44.1	43.1	43	43	46	46	--	45	49	47	48	49	49	46
Beryllium	ug/L	<0.17	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	--	<0.012	<0.12	<0.089	<0.27	--	<0.27	--	--	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33
Cadmium	ug/L	<0.56	<0.029	<0.029	<0.029	<0.029	<0.018	<0.018	<0.018	--	--	<0.018	--	<0.033	<0.077	--	<0.039	--	<0.049	<0.051	<0.051	<0.055	<0.055	<0.1	<0.1
Chromium	ug/L	<0.96	0.82	0.81	0.81	1.1	0.76	0.68	0.71	--	--	0.66	0.97	0.73	<0.98	<0.98	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	<0.1	<0.5	<0.5	<0.5	<0.5	0.034	0.021	<0.014	--	--	<0.014	<0.15	<0.062	<0.091	<0.091	<0.091	--	<0.091	<0.091	<0.19	<0.19	<0.19	<0.17	<0.17
Lead	ug/L	<1.9	<0.19	<0.19	<0.19	<0.19	0.13	<0.033	0.065	--	--	<0.033	<0.12	<0.13	<0.27	<0.27	<0.27	--	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	<2.5	<4.9	<4.9	<4.9	<4.9	<2.9	<2.9	3	--	--	<4.6	--	<4.6	<2.7	<2.7	<2.3	--	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Mercury	ug/L	<0.012	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	--	<0.09	<0.09	<0.09	<0.1	--	<0.1	--	--	<0.15	<0.15	<0.11	--	<0.14	<0.14
Molybdenum	ug/L	<1.5	0.25	0.24	0.31	0.21	0.25	0.26	0.31	--	--	0.26	0.28	<0.57	<1.1	<1.1	<1.1	<1.1	<1.1	<1.3	<1.3	<1.2	<1.2	<0.91	<0.91
Selenium	ug/L	<5.8	0.57	0.46	0.54	0.36	0.5	0.36	0.52	--	--	0.47	0.5	0.46	<1	--	<1	--	<1	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4
Thallium	ug/L	0.18	<0.5	<0.5	<0.5	<0.5	0.11	<0.036	0.29	--	--	<0.036	--	<0.099	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	1.51	0.458	0.724	0.6	0.397	0.0972	1.06	0.826	--	1.35	--	0.974	1.37	--	0.495	--	--	0.644	0.359	0.779	0.0823	1.29	0.0554	<0.643
Radium-226	pCi/L	0.599	0.232	0.0668	0.126	0	-0.07	0.457	0.633	--	0	--	0.547	0.705	--	0.237	--	--	0.0266	0.109	0.232	0.0404	0.109	0.0554	<0.286
Radium-228	pCi/L	0.913	0.226	0.657	0.474	0.397	0.0972	0.606	0.193	--	1.35	--	0.427	0.668	--	0.259	--	--	0.618	0.249	0.547	0.0419	1.18	-0.0629	<0.643
pH at 25 Degrees C	Std. Units	8	7.7	7.4	7.7	8.1	7.8	7.2	7.5	7.5	--	7.7	7.5	7.4	7.5	7.5	7.5	--	7.4	7.5	7.5	7.6	7.6	7.6	7.5
Field Oxidation Potential	mV	166.8	243.7	45.8	122	163	321	251	142	282	--	34.6	233	119	274	88.9	119.6	113.9	68.5	186.2	136.2	197.7	47.3	141.4	-12.3
Field Specific Conductance	umhos/cm	606.4	596.2	582.4	590	589	589	580	588	591	--	569.1	609	587	618	590	597	597	575.5	599	601	599	552.6	595.6	565.2
Field Temperature	deg C	9.6	9.7	9.9	10	8	10.3	11.2	11.4	10.2	--	11.1	10.5	11.5	10	10	10	9.8	9.7	10	9.9	8.9	9.7	9.9	9.7
Groundwater Elevation	feet	662.28	662.08	663.21	670.82	666.28	669.82	670.65	670.61	669.58	--	667.96	668.13	664.71	672.78	675.54	674.47	674.64	673.37	671.08	668.14	667.14	665.34	664.79	663.59
Oxygen, Dissolved	mg/L	9.44	7.7	4.98	8.6	9.8	7.1	3.7	5.8	8.8	--	3.46	7.4	9.1	8.7	10.29	9.2	9.45	8.23	9.06	9.34	8.92	8.16	8.38	7.94
Turbidity	NTU	--	0.41	0.01	2.1	0	1.71	1.35	0	0	--	0.81	1.77	0.01	0.75	0.7	0.01	0	0	0	0	0	0.6	0.97	0
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290	300	310	380	330	300	--	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50	49	<36	<36	<36	<36	--
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.6	25	5.1	<4.4	14	<3.6	--	--
Calcium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	74000	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.05	<50	<36	<36	<36	<36	--	<36
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	37000	36000	35000	35000	32000	--	--
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.004	<4	<4.4	<4.4	<3.6	<3.6	--	--
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1100	1100	1100	1100	930	--	--
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4500	4600	4500	4500	4100	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290	300	310	380	330	300	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<3.8	<4.4	<4.6	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.8	--	--	<0.75	--	--	--	--
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.7	--	--	--	--	--	--	--

Single Location

Name: IPL - Lansing

Location ID: MW-301
Number of Sampling Dates: 24

Parameter Name	Units	12/10/2015	4/29/2016	7/20/2016	10/26/2016	1/17/2017	4/19/2017	6/19/2017	8/15/2017	10/16/2017	4/16/2018	6/4/2018	8/7/2018	10/8/2018	4/15/2019	10/2/2019	5/19/2020	8/18/2020	10/19/2020	4/8/2021	10/26/2021	4/5/2022	10/17/2022	4/10/2023	10/31/2023
Boron	ug/L	739	436	417	554	471	405	333	365	436	198	--	279	357	250	360	150	--	260	160	260	220	260	440	650
Calcium	mg/L	41	39.1	45.1	55.5	56.4	61.7	59.5	66.4	65.9	64.5	--	65.1	72.5	73	68	56	--	57	58	68	69	67	48	83
Chloride	mg/L	25.5	18.5	18.2	15.8	16	18.3	18	16.2	17.3	20.2	--	17.7	15.9	17	14	17	15	15	18	17	22	15	23	29
Fluoride	mg/L	0.3	0.32	0.25	0.26	0.21	0.19	0.23	0.26	0.24	0.24	--	0.23	0.27	0.9	0.23	0.56	--	<0.23	0.38	<0.28	<0.22	<0.22	<0.38	<0.38
Field pH	Std. Units	7.96	8.23	7.86	8.1	8.37	8.5	8.25	8.19	7.66	8.39	8.1	8.08	8.16	8.47	8.11	7.85	8.33	8.06	8.04	8.11	8.3	8.1	8.05	7.71
Sulfate	mg/L	62.2	38.8	37.5	45.7	55.6	48.7	44.7	49.4	52.7	49.3	--	53.2	64.4	51	56	34	44	48	27	49	86	63	38	58
Total Dissolved Solids	mg/L	280	176	218	246	271	289	278	285	289	--	300	326	320	350	310	480	--	280	240	210	260	280	180	340
Antimony	ug/L	0.078	0.086	<0.058	<0.058	0.088	<0.026	0.08	0.079	--	0.071	--	0.16	0.085	<0.53	--	<0.58	--	--	<1.1	<1.1	<0.69	<0.69	<1	<1
Arsenic	ug/L	<4.5	2.3	2.8	3.5	3.8	3.1	3	3.8	--	3.9	--	4.4	5.4	5.4	5.6	3.8	--	6	5	7.1	4.9	5	3.7	2.9
Barium	ug/L	146	139	182	220	227	182	175	196	--	163	--	156	155	160	180	140	--	150	140	160	130	160	73	160
Beryllium	ug/L	<0.17	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	--	<0.12	<0.089	<0.27	--	<0.27	--	--	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33
Cadmium	ug/L	<0.56	<0.029	<0.029	<0.029	<0.029	0.021	<0.018	<0.018	--	<0.018	--	--	<0.033	<0.077	--	<0.039	--	<0.049	0.06	<0.051	<0.055	<0.055	<0.1	<0.1
Chromium	ug/L	<0.96	<0.34	<0.34	0.35	0.49	0.97	0.21	0.23	--	1.1	--	<0.19	0.09	<0.98	<0.98	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	0.13	<0.5	<0.5	<0.5	<0.5	0.098	0.074	0.07	--	0.086	--	0.16	0.11	0.11	0.11	0.11	--	0.11	0.11	0.23	<0.19	<0.19	<0.17	<0.17
Lead	ug/L	<1.9	<0.19	0.23	<0.19	0.23	0.36	0.041	<0.033	--	0.037	--	<0.12	<0.13	<0.27	<0.27	<0.27	--	<0.11	<0.21	0.37	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	5	5.3	5	6.4	<4.9	<2.9	4.2	7.3	--	<4.6	--	--	9.1	8.7	8	7	--	7.9	7.1	6.7	7.3	8.7	5.8	8.1
Mercury	ug/L	<0.012	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	0.31	--	<0.09	<0.09	<0.1	--	<0.1	--	--	<0.15	<0.15	<0.11	--	<0.14	<0.14
Molybdenum	ug/L	2.5	5.5	5	8.1	9.3	6.9	5.5	6.8	--	4.4	--	5.6	10.3	11	10	8.1	5.8	7.5	6.8	6.2	7.6	12	14	11
Selenium	ug/L	<5.8	<0.18	<0.18	<0.18	<0.18	0.12	0.1	0.13	--	<0.086	--	0.22	0.18	<1	--	<1	--	<1	<0.96	<0.96	<0.96	<0.96	1.9	<1.4
Thallium	ug/L	0.064	<0.5	<0.5	<0.5	<0.5	0.14	0.05	0.31	--	<0.036	--	--	<0.099	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.436	0.525	0.126	1.03	0.647	0.752	0.453	1.86	--	0.689	--	1.66	0.556	--	0.488	--	--	0.889	0.244	0.814	0.103	0.83	0.521	0.324
Radium-226	pCi/L	0.349	0.111	0.126	0.236	0.334	0.374	0.0591	1.03	--	0	--	0.692	0.115	--	0.372	--	--	0.339	0.0913	0.259	0.103	0.296	0.043	0.288
Radium-228	pCi/L	0.087	0.414	-0.0306	0.791	0.313	0.378	0.394	0.826	--	0.689	--	0.972	0.441	--	0.116	--	--	0.55	0.153	0.555	-0.168	0.534	0.478	0.0367
pH at 25 Degrees C	Std. Units	7.8	8	7.8	7.8	7.8	7.8	7.7	8.1	7.9	8	--	8.1	8	7.9	8.1	8.1	--	8.1	8	8.1	8.2	8.2	8.2	7.8
Field Oxidation Potential	mV	-94.9	-134.2	-166.3	-156	-98	-181	-230	-178	-221	-40	-145.5	-149	-180	-171	-156.8	-77.6	-115.3	-97	-10.1	-159.7	200	-185.1	-149.6	-96
Field Specific Conductance	umhos/cm	431.4	355.2	377.4	456	491	471	468	498	497	505	507	524	545	539	501.8	474	476	488.8	461	534	554	526	352.2	639.4
Field Temperature	deg C	13.6	8.9	13.3	15.4	12.3	10.6	12.2	14.7	17	9.5	12.2	14.6	17.4	11.3	15.6	11.3	15	14.7	11.5	16.1	8.7	12.5	10.3	12.4
Groundwater Elevation	feet	623.54	622.19	624.76	624.97	624.09	624.7	624.89	624.09	625.7	624.29	624.62	624.51	625.73	629.19	626.54	624.46	625.02	624.42	624.02	627	630.67	630.79	623.4	622.2
Oxygen, Dissolved	mg/L	1.08	0.34	0.16	0	1.6	0.3	0	0	0	1	0.89	0.2	0.3	0.2	0.13	0.75	0.16	0.42	0.27	0.1	0.15	0.08	0.19	0.62
Turbidity	NTU	--	1.9	2	6.79	4.27	3.04	0.2	4.87	0.05	8.31	2.72	5.5	9.19	9.33	1.36	1.39	1.65	0.75	0	0.81	0	1.31	0	0.49
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	200	160	220	260	200	230	--	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	330	110	320	430	280	410	250	--
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	810	530	650	530	570	590	--	--
Calcium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	62000	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	500	740	640	620	620	--	250
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18000	19000	18000	21000	18000	--	--
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	560	670	530	590	640	--	--
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3600	2600	3700	3000	3200	--	--
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11000	13000	13000	16000	14000	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	200	160	220	260	200	230	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<3.8	<4.6	<4.6	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.5	--	--	6.8	--	--	--	--
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.1	--	--	--	--	--	--	--

Single Location

Name: IPL - Lansing

Location ID: MW-302
Number of Sampling Dates: 24

Parameter Name	Units	12/10/2015	4/29/2016	7/20/2016	10/26/2016	1/17/2017	4/19/2017	6/19/2017	8/15/2017	10/16/2017	4/16/2018	6/4/2018	8/7/2018	10/8/2018	4/15/2019	10/2/2019	5/20/2020	8/19/2020	10/19/2020	4/9/2021	10/27/2021	4/5/2022	10/19/2022	4/11/2023	10/30/2023
Boron	ug/L	564	468	579	673	576	527	558	645	708	489	--	648	694	690	690	480	--	640	460	630	540	780	480	590
Calcium	mg/L	95.1	96.5	97.8	110	116	112	110	118	116	120	--	116	122	130	130	120	--	110	120	120	120	110	130	130
Chloride	mg/L	17	14.9	15.1	15.5	15.7	12.9	14.4	15	13.9	13	--	13.9	13.5	13	12	14	12	11	11	14	12	11	15	16
Fluoride	mg/L	0.26	0.28	0.22	0.26	0.21	0.22	0.25	0.25	0.28	0.24	--	0.23	0.27	0.79	0.24	0.25	--	<0.23	0.31	1.3	<0.22	<0.22	0.66	<0.38
Field pH	Std. Units	7.15	7.41	6.86	7.12	7.25	7.25	7.03	6.96	7.1	7.26	6.97	6.92	6.93	7.66	7.15	6.93	7.18	7.06	7.08	6.89	6.92	6.87	7.19	7.21
Sulfate	mg/L	9.8	0.72	0.29	0.32	<0.15	<0.5	<0.5	<0.5	<0.5	<0.24	--	<0.24	<0.24	<1.8	<1.8	<3.6	<3.6	<3.6	<2.5	<2.5	<2	<2	<2.1	<2.1
Total Dissolved Solids	mg/L	503	422	438	499	497	503	512	517	507	--	535	562	518	450	480	710	--	490	470	450	490	520	530	520
Antimony	ug/L	0.091	<0.058	<0.058	<0.058	0.14	<0.026	0.048	0.069	--	0.035	--	<0.15	<0.078	<0.53	--	<0.58	--	--	<1.1	<1.1	<0.69	<0.69	<1	<1
Arsenic	ug/L	33.9	30.4	41	50.2	45	31.7	36.7	47.3	--	30.8	--	47.6	50.4	37	53	33	--	48	33	51	40	51	42	64
Barium	ug/L	483	479	540	648	706	559	597	660	--	789	--	661	603	690	740	610	--	630	630	680	690	790	800	830
Beryllium	ug/L	<0.17	<0.08	<0.08	<0.08	0.1	0.016	<0.012	0.012	--	<0.012	--	<0.12	<0.089	<0.27	--	<0.27	--	--	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33
Cadmium	ug/L	<0.56	<0.029	<0.029	<0.029	0.074	<0.018	<0.018	<0.018	--	<0.018	--	--	<0.033	<0.077	--	<0.039	--	<0.049	0.06	0.076	<0.055	<0.055	<0.1	<0.1
Chromium	ug/L	<0.96	0.56	0.39	0.56	3.5	1	0.51	0.44	--	0.35	--	0.49	0.39	<0.98	<0.98	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	10
Cobalt	ug/L	1.6	1.1	1.2	1.1	3.2	1.1	1.2	1.2	--	1.1	--	1.1	1.1	1.5	1.3	1	--	0.86	1	1.1	1.5	1.2	1.3	1.3
Lead	ug/L	<1.9	<0.19	0.32	<0.19	3.3	0.36	0.14	0.075	--	0.084	--	0.23	<0.13	<0.27	<0.27	<0.27	--	<0.11	<0.21	1	<0.24	0.39	<0.24	<0.24
Lithium	ug/L	<2.5	<4.9	<4.9	<4.9	<4.9	<2.9	<2.9	<2.9	--	<4.6	--	--	<4.6	<2.7	<2.7	<2.3	--	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Mercury	ug/L	<0.012	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	0.35	--	<0.09	<0.09	<0.1	--	<0.1	--	--	<0.15	<0.15	<0.11	--	<0.14	<0.14
Molybdenum	ug/L	<1.5	0.81	0.98	1.2	1.1	0.87	0.91	1.2	--	0.91	--	1.2	1.5	<1.1	1.4	<1.1	<1.1	<1.1	1.7	1.4	<1.2	1.2	1.9	1.4
Selenium	ug/L	<5.8	0.2	0.22	0.28	0.36	0.25	0.19	0.31	--	<0.086	--	0.3	0.26	<1	--	<1	--	<1	1.2	<0.96	<0.96	<0.96	2.9	<1.4
Thallium	ug/L	0.25	<0.5	<0.5	<0.5	<0.5	0.042	<0.036	0.14	--	<0.036	--	--	<0.099	<0.27	--	<0.26	--	--	2.5	0.31	<0.26	<0.26	<0.26	0.34
Total Radium	pCi/L	1.46	2.14	2.07	1.73	1.49	1.25	2.75	1.68	--	1.96	--	2.09	3.52	--	1.48	--	--	1.41	1.57	1.59	1.35	4.33	1.07	2.68
Radium-226	pCi/L	0.415	0.985	0.969	0.539	0.514	0.672	1.36	0.619	--	0.776	--	1.23	1.67	--	0.807	--	--	0.531	0.747	0.907	0.604	0.888	0.964	0.714
Radium-228	pCi/L	1.04	1.15	1.1	1.19	0.978	0.576	1.39	1.06	--	1.18	--	0.858	1.85	--	0.675	--	--	0.88	0.819	0.68	0.744	3.44	0.11	1.96
pH at 25 Degrees C	Std. Units	7.3	7.2	7	7	6.9	7.2	7.2	7	7	7.3	--	7	6.9	7	7	7	--	7.1	7	7	7	7	7	7
Field Oxidation Potential	mV	-150.3	-163.3	-141.5	-171	-154	-172	-189	-181	-179	-152	-179.3	-164	-43.9	-159	-160	-161.5	-173	-182.5	-171.2	-128.1	202.8	-186.2	-181.4	-177.4
Field Specific Conductance	umhos/cm	918	875	891	1004	1036	971	1017	1053	1045	1098	1068	1095	1039	1089	1049	1070	1039	1074	1043	1075	1151	1045	871	1185
Field Temperature	deg C	12.7	7.8	14.2	15.6	9.3	7.6	11.4	15.7	16.2	6	10.8	15.3	16.99	7.1	15.9	8.7	16.2	14.4	7.5	15.7	6.3	14.5	6.9	13.4
Groundwater Elevation	feet	627.88	626.93	628.6	628.35	627.32	628.98	627.75	627.28	628.75	628.98	628.27	627.62	628.59	629.99	630.04	627.68	627.53	627.14	627.87	628.86	623.29	629.51	628.61	627.05
Oxygen, Dissolved	mg/L	0.08	0.1	0.03	0	0.2	0	0	0	0	0.8	0.12	0.1	0.48	0.2	0.11	0.19	0.05	0.1	0.03	1.07	0.13	0.03	0.29	0.26
Turbidity	NTU	--	4.98	2.6	11.14	93.1	3.36	4.61	4.28	3.96	5.25	1.46	11.23	5.92	18.39	4.71	4.16	4	2.96	3.15	3.35	3.21	23.33	4.54	0.82
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	530	540	540	550	620	540	--	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	32000	30000	33000	33000	44000	40000	47000	--
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2800	2500	2400	2600	3000	2500	--	--
Calcium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	130000	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	33000	36000	35000	45000	43000	--	45000
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	42000	41000	39000	49000	42000	--	--
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2700	2500	2700	3000	2300	--	--
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4300	3200	4300	3900	3900	--	--
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17000	16000	18000	21000	19000	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	530	540	540	550	620	540	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<7.6	<3.8	<4.6	<4.6	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	46	44	33	48	38	50	--	--
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.4	--	--	--	--	--	--	--

Single Location

Name: IPL - Lansing

Location ID: MW-302A
Number of Sampling Dates: 10

Parameter Name	Units	5/20/2020	7/6/2020	8/19/2020	10/19/2020	4/9/2021	10/27/2021	4/5/2022	10/17/2022	4/11/2023	10/31/2023
Boron	ug/L	190	250	--	160	170	140	170	190	--	--
Calcium	mg/L	79	78	--	72	75	75	73	74	--	--
Chloride	mg/L	7.8	6.9	7.1	6	6.7	6.9	5.6	5.2	--	--
Fluoride	mg/L	<0.23	<0.23	--	<0.23	<0.28	<0.28	<0.22	<0.22	--	--
Field pH	Std. Units	7.27	7.22	7.41	7.33	7.25	7.15	7.34	7.28	7.38	7.34
Sulfate	mg/L	53	47	49	47	45	50	52	44	--	--
Total Dissolved Solids	mg/L	520	350	--	350	330	280	300	310	--	--
Antimony	ug/L	<0.58	<0.51	--	--	<1.1	<1.1	<0.69	<0.69	--	--
Arsenic	ug/L	<0.88	<0.88	--	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53
Barium	ug/L	51	47	--	46	51	48	49	50	--	--
Beryllium	ug/L	<0.27	<0.27	--	--	<0.27	<0.27	<0.27	<0.27	--	--
Cadmium	ug/L	<0.039	<0.049	--	<0.049	<0.051	<0.051	<0.055	<0.055	--	--
Chromium	ug/L	<1.1	<1.1	--	1.2	<1.1	<1.1	<1.1	<1.1	--	--
Cobalt	ug/L	0.41	0.098	--	<0.091	<0.091	<0.19	0.45	<0.19	--	--
Lead	ug/L	0.48	0.14	--	<0.11	<0.21	0.22	<0.24	<0.24	--	--
Lithium	ug/L	<2.3	<2.5	--	<2.5	<2.5	<2.5	<2.5	<2.5	--	--
Mercury	ug/L	<0.1	<0.1	--	--	<0.15	<0.15	<0.11	--	--	--
Molybdenum	ug/L	<1.1	<1.1	<1.1	<1.1	<1.3	<1.3	<1.2	<1.2	<0.91	--
Selenium	ug/L	1.3	1.1	--	<1	1.2	1	1.3	<0.96	--	--
Thallium	ug/L	<0.26	<0.26	--	--	<0.26	<0.26	<0.26	<0.26	--	--
Total Radium	pCi/L	--	0.0963	--	0.732	0.714	1.01	0.402	0.371	--	--
Radium-226	pCi/L	--	0.0963	--	0.229	0.076	0.233	0.196	0.0611	--	--
Radium-228	pCi/L	--	-0.00723	--	0.503	0.638	0.778	0.206	0.31	--	--
pH at 25 Degrees C	Std. Units	7.4	7.6	--	7.4	7.4	7.6	7.4	7.5	--	--
Field Oxidation Potential	mV	126.9	47	74.1	125.4	104.7	159.1	199.7	105.7	98.5	36.1
Field Specific Conductance	umhos/cm	644	641	638	650.1	597	627	630	619.9	458.5	616.4
Field Temperature	deg C	11.7	11.7	11.8	11.4	11.1	12	10.2	11.6	11.2	11.4
Groundwater Elevation	feet	623.19	624.2	623.52	623.03	623.12	623.1	623.71	622.97	621.32	622.91
Oxygen, Dissolved	mg/L	6.55	6.6	6.23	6.46	7.88	7.27	6.49	6.27	3.72	5.16
Turbidity	NTU	11.9	4.68	0.19	0.58	0.86	0	0	1.39	0	0
Total Alkalinity as CaCO3	mg/L	--	--	290	300	300	300	330	290	--	--
Iron, dissolved	ug/L	--	--	330	56	440	38	<36	55	37	--
Manganese, dissolved	ug/L	--	--	38	10	59	<4.4	8.3	5.4	--	--
Calcium, total	ug/L	--	--	--	81000	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	<50	47	41	<36	<36	--	<36
Magnesium, total	ug/L	--	--	--	38000	37000	35000	37000	32000	--	--
Manganese, total	ug/L	--	--	--	<4	4.5	<4.4	<3.6	<3.6	--	--
Potassium, total	ug/L	--	--	--	1000	1000	1000	1100	900	--	--
Sodium, total	ug/L	--	--	--	6700	7000	6300	7400	6800	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	290	300	300	300	330	290	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	<3.8	<3.8	<4.2	<4.6	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	--	--	<0.88	--	--	<0.75	--	--	--	--
Molybdenum, dissolved	ug/L	--	--	<1.1	--	--	--	--	--	--	--

Single Location

Name: IPL - Lansing

Location ID: MW-303
Number of Sampling Dates: 22

Parameter Name	Units	12/10/2015	4/29/2016	7/20/2016	10/26/2016	1/17/2017	4/19/2017	6/20/2017	8/15/2017	10/16/2017	4/16/2018	6/4/2018	8/7/2018	10/8/2018	4/15/2019	10/2/2019	5/19/2020	8/18/2020	10/19/2020	4/8/2021	10/26/2021	4/5/2022	10/17/2022
Boron	ug/L	178	178	405	235	133	177	390	386	592	144	--	675	474	150	520	150	--	370	120	170	110	590
Calcium	mg/L	38.2	48.6	64.5	67.1	72.5	60.1	62.2	42	84.7	54.6	--	46	35.3	49	46	54	--	34	47	49	48	42
Chloride	mg/L	18.7	16.8	18.1	17.7	21.9	16.1	17.3	18.4	17.2	24.1	--	14.6	16.3	18	16	15	16	15	21	25	23	17
Fluoride	mg/L	0.43	0.32	0.37	0.31	0.22	0.24	0.36	0.48	0.25	0.32	--	0.47	0.72	1	0.42	0.38	--	<0.23	0.52	<0.28	0.33	<0.22
Field pH	Std. Units	8.03	8.07	7.12	7.93	8.16	8.19	7.93	7.78	7.2	8	7.59	7.66	7.91	7.95	7.83	7.67	7.65	7.77	8	7.45	8.07	7.66
Sulfate	mg/L	30.8	35.8	56	62.2	67.9	43.7	71.9	43.4	69.9	43.5	--	52.5	29.1	35	39	42	33	20	25	28	54	58
Total Dissolved Solids	mg/L	240	200	317	340	350	317	346	219	379	--	256	262	181	280	210	450	--	180	210	150	180	200
Antimony	ug/L	0.22	0.27	0.55	0.25	0.19	0.26	0.34	0.26	--	0.16	--	0.34	0.19	<0.53	--	<0.58	--	--	<1.1	<1.1	<0.69	<0.69
Arsenic	ug/L	<4.5	1.4	1.4	1.8	1.8	2.4	2.5	2.5	--	1.2	--	2.3	2.3	1.4	2.5	1.4	--	3.2	1.5	2.2	1.3	1.9
Barium	ug/L	102	122	178	169	174	159	214	147	--	173	--	194	121	160	220	210	--	190	170	240	200	230
Beryllium	ug/L	<0.17	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	0.046	--	<0.12	<0.089	<0.27	--	<0.27	--	--	<0.27	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.56	<0.029	<0.029	<0.029	0.042	0.018	<0.018	<0.018	--	<0.018	--	--	<0.033	<0.077	--	<0.039	--	<0.049	<0.051	<0.051	<0.055	<0.055
Chromium	ug/L	<0.96	0.52	<0.34	<0.34	0.81	0.71	0.36	0.36	--	0.51	--	0.44	0.089	<0.98	<0.98	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	0.14	<0.5	<0.5	<0.5	<0.5	0.09	0.22	0.14	--	0.14	--	0.36	0.21	<0.091	0.12	<0.091	--	0.098	<0.091	<0.19	<0.19	<0.19
Lead	ug/L	<1.9	<0.19	0.2	<0.19	0.24	0.078	0.085	<0.033	--	<0.033	--	0.24	<0.13	<0.27	<0.27	<0.27	--	<0.11	<0.21	<0.21	<0.24	<0.24
Lithium	ug/L	5.1	6.2	13.9	10.4	5.9	4.7	10.4	16.1	--	<4.6	--	--	8.1	3.3	9.1	4.2	--	9.5	3.5	11	5.4	10
Mercury	ug/L	<0.012	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	<0.09	--	<0.09	<0.09	<0.1	--	<0.1	--	--	<0.15	<0.15	<0.11	--
Molybdenum	ug/L	<1.5	5	16.8	16.1	10.7	7.6	15.9	11.8	--	7.3	--	21.6	12	6.2	9.8	3.1	23	10	4.8	7.1	9.2	22
Selenium	ug/L	<5.8	1.2	0.9	0.6	1.9	0.63	0.67	0.59	--	3.3	--	0.38	0.39	<1	--	1.4	--	<1	1.1	<0.96	<0.96	<0.96
Thallium	ug/L	0.14	<0.5	<0.5	<0.5	<0.5	<0.036	<0.036	0.17	--	<0.036	--	--	<0.099	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.926	0.73	0.768	1.24	0.416	0.339	0.639	0.477	--	0.787	--	0.929	1.87	--	0.463	--	--	0.27	0.243	0.359	0.533	0.512
Radium-226	pCi/L	-0.132	0.18	0.372	0.653	-0.077	0.339	0.217	0.155	--	0.359	--	0.929	0.664	--	0.444	--	--	0.217	0.125	0.278	0.296	0.2
Radium-228	pCi/L	0.926	0.555	0.396	0.582	0.416	-0.167	0.422	0.322	--	0.428	--	-0.073	1.21	--	0.0185	--	--	0.0528	0.118	0.0804	0.236	0.312
pH at 25 Degrees C	Std. Units	8	8	7.6	7.8	7.7	8.1	7.7	7.9	7.4	8	--	8	7.9	8	8	7.9	--	7.9	8	7.7	8.1	7.4
Field Oxidation Potential	mV	84.2	133.2	-27.2	10	221	81	9	-75	49	53	68	-71	139	-76	156	28.9	25.8	38.4	78.4	125.8	202.1	25.5
Field Specific Conductance	umhos/cm	375.2	409	535	776	614	520	567	423	687	552	431	425	328	448	409	464	468	340.3	425	452	452.4	397.1
Field Temperature	deg C	8.5	6.7	30.4	22.1	6.3	10.5	24.8	31.7	25.2	4.1	17	31.5	28.5	4.2	25.2	6.3	30.4	23.5	3.7	24.8	4.6	23.1
Groundwater Elevation	feet	638.79	638.07	639.33	638.65	638.1	639.2	638.77	637.86	638.79	638.62	638.81	637.85	637.32	638.22	638.03	637.98	638.22	636.96	638.07	638.68	641.69	639.39
Oxygen, Dissolved	mg/L	2.38	2.63	0.15	8.1	3	1.4	0	0	1.9	3.5	0.36	0.4	0.4	1.4	0.27	1.29	0.15	0.58	2.03	0.17	1.17	0.11
Turbidity	NTU	--	2.13	0.39	3.02	2.53	0	0	0	0	0.4	1.08	4.51	2.62	6.6	0.58	0	1.62	0	0	0.65	0	2.07
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	190	120	170	220	210	120
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50	320	69	<36	46
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	120	160	66	38	60	110
Calcium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35000	--	--	--	--
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.05	<50	<36	38	<36	<36
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13000	18000	16000	20000	13000
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	180	30	39	89	220
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2200	1500	2800	1900	3100
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12000	13000	15000	16000	15000
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	190	120	170	220	210	120
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<3.8	<3.8	<3.8	<4.6	<4.6	<4.6
Arsenic, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.1	--	--	2.2	--	--
Molybdenum, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23	--	--	--	--	--

Single Location

Name: IPL - Lansing

Location ID: MW-304
Number of Sampling Dates: 11

Parameter Name	Units	6/20/2019	10/2/2019	5/20/2020	8/19/2020	10/19/2020	4/9/2021	10/26/2021	4/5/2022	10/17/2022	4/10/2023	10/30/2023
Boron	ug/L	<110	<110	<73	--	<80	64	<58	71	78	--	--
Calcium	mg/L	82	72	70	--	66	69	71	70	79	--	--
Chloride	mg/L	5.9	7	6.2	7.7	6.2	6.5	6.9	5.3	8.6	--	--
Fluoride	mg/L	<0.23	<0.23	<0.23	--	<0.23	<0.28	<0.28	<0.22	<0.22	--	--
Field pH	Std. Units	7.01	7.16	7.32	7.55	7.16	7.27	7.29	7.25	7.17	7.27	7.17
Sulfate	mg/L	20	17	17	15	16	15	18	20	14	--	--
Total Dissolved Solids	mg/L	350	300	470	--	270	290	200	240	290	--	--
Antimony	ug/L	<0.53	--	<0.58	--	--	<1.1	<1.1	<0.69	<0.69	--	--
Arsenic	ug/L	<0.75	<0.75	<0.88	--	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53
Barium	ug/L	54	47	42	--	42	43	44	42	49	--	--
Beryllium	ug/L	<0.27	--	<0.27	--	--	<0.27	<0.27	<0.27	<0.27	--	--
Cadmium	ug/L	<0.077	--	<0.039	--	<0.049	<0.051	<0.051	<0.055	<0.055	--	--
Chromium	ug/L	1.6	1	8.2	--	<1.1	<1.1	<1.1	<1.1	<1.1	--	--
Cobalt	ug/L	1.1	0.19	0.22	--	<0.091	<0.091	0.22	<0.19	<0.19	--	--
Lead	ug/L	1.2	0.35	<0.27	--	<0.11	<0.21	0.23	<0.24	<0.24	--	--
Lithium	ug/L	<2.7	<2.7	<2.3	--	<2.5	<2.5	<2.5	<2.5	<2.5	--	--
Mercury	ug/L	<0.1	--	<0.1	--	--	<0.15	<0.15	<0.11	--	--	--
Molybdenum	ug/L	<1.1	<1.1	<1.1	1.2	<1.1	<1.3	<1.3	2.7	2.1	2.5	--
Selenium	ug/L	<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	0.356	0.9	--	--	0.139	0.497	0.87	0.143	0.0692	--	--
Radium-226	pCi/L	0.217	0.246	--	--	-0.0496	0.0825	0.331	0.143	0.0692	--	--
Radium-228	pCi/L	0.139	0.653	--	--	0.139	0.415	0.539	-0.0479	-0.288	--	--
pH at 25 Degrees C	Std. Units	7.4	7	7.3	--	7.3	7.4	7.4	7.5	7.4	--	--
Field Oxidation Potential	mV	41	107.3	104.9	109.6	155.6	160.3	171.3	201.4	169.2	195.5	-29.7
Field Specific Conductance	umhos/cm	593	578.4	574	583	601.9	520	562.3	571.8	643.3	481.6	575.6
Field Temperature	deg C	10.6	12.4	9	11.8	11.8	8.8	12.1	8.2	11.9	8.9	12
Groundwater Elevation	feet	0	623.79	621.57	621.75	621.4	621.46	621.29	621.72	621.21	622.31	621.21
Oxygen, Dissolved	mg/L	6.2	7.51	7.78	6.76	6.84	8.69	8.32	7.2	6.97	7.75	7.54
Turbidity	NTU	104	3.51	3.72	1.06	0.42	0	0	0	0.01	0	0
Total Alkalinity as CaCO3	mg/L	280	--	--	300	310	300	370	320	330	--	--
Iron, dissolved	ug/L	--	--	--	<50	<50	<36	67	<36	<36	50	--
Manganese, dissolved	ug/L	--	--	--	6.9	4.1	10	<4.4	<3.6	<3.6	--	--
Calcium, total	ug/L	--	--	--	--	75000	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	51	<50	37	<36	<36	<36	--	290
Magnesium, total	ug/L	--	--	--	--	35000	33000	32000	33000	34000	--	--
Manganese, total	ug/L	--	--	--	--	6	5.9	<4.4	<3.6	<3.6	--	--
Potassium, total	ug/L	--	--	--	--	1300	1200	1300	1300	1400	--	--
Sodium, total	ug/L	--	--	--	--	6100	4900	4000	5900	6300	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	300	310	300	370	320	330	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	<3.8	<3.8	<4.2	<4.6	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	--	--	--	<0.88	--	--	<0.75	--	--	--	--
Molybdenum, dissolved	ug/L	--	--	--	1.6	--	--	--	--	--	--	--

Single Location

Name: IPL - Lansing

Location ID: MW-304A
Number of Sampling Dates: 12

Parameter Name	Units	5/20/2020	7/6/2020	8/19/2020	10/19/2020	2/23/2021	4/9/2021	7/12/2021	10/26/2021	4/5/2022	10/17/2022	4/10/2023	10/30/2023
Boron	ug/L	1800	1700	--	1700	--	1400	--	1300	1500	1600	--	--
Calcium	mg/L	54	41	--	35	--	43	--	35	38	37	--	--
Chloride	mg/L	15	13	13	12	--	13	--	15	16	16	--	--
Fluoride	mg/L	0.57	0.42	--	<0.23	--	0.53	--	<0.28	0.32	<0.22	--	--
Field pH	Std. Units	8.04	7.9	8.48	7.89	8.01	7.78	8.09	7.94	7.97	7.81	7.74	7.93
Sulfate	mg/L	83	77	76	76	--	77	--	91	87	69	--	--
Total Dissolved Solids	mg/L	680	330	--	310	--	300	--	240	270	270	--	--
Antimony	ug/L	<0.58	<0.51	--	--	--	<1.1	--	<1.1	<0.69	<0.69	--	--
Arsenic	ug/L	1.3	<0.88	--	<0.88	--	0.78	--	<0.75	<0.75	<0.75	0.63	0.76
Barium	ug/L	67	34	--	28	--	36	--	26	30	29	--	--
Beryllium	ug/L	<0.27	<0.27	--	--	--	<0.27	--	<0.27	<0.27	<0.27	--	--
Cadmium	ug/L	0.19	0.098	--	0.073	--	0.096	--	<0.051	0.074	0.076	--	--
Chromium	ug/L	2.2	1.1	--	<1.1	--	1.6	--	<1.1	<1.1	<1.1	--	--
Cobalt	ug/L	3.2	0.83	--	0.43	--	0.88	--	<0.19	0.48	0.88	--	--
Lead	ug/L	4.3	1.2	--	0.48	--	1.1	--	0.37	0.81	1.1	--	--
Lithium	ug/L	2.7	<2.5	--	<2.5	--	<2.5	--	<2.5	<2.5	<2.5	--	--
Mercury	ug/L	<0.1	<0.1	--	--	--	<0.15	--	<0.15	<0.11	--	--	--
Molybdenum	ug/L	110	140	140	130	120	110	100	120	120	130	150	--
Selenium	ug/L	<1	<1	--	<1	--	<0.96	--	<0.96	<0.96	<0.96	--	--
Thallium	ug/L	<0.26	<0.26	--	--	--	<0.26	--	<0.26	<0.26	<0.26	--	--
Total Radium	pCi/L	--	0.573	--	0.157	--	0.468	--	0.698	0.51	0.296	--	--
Radium-226	pCi/L	--	0.221	--	0.117	--	0.0845	--	0.245	-0.00262	0.207	--	--
Radium-228	pCi/L	--	0.352	--	0.0402	--	0.384	--	0.454	0.51	0.0889	--	--
pH at 25 Degrees C	Std. Units	8	8	--	8	--	8	--	8.1	8	8	--	--
Field Oxidation Potential	mV	61.8	-15.8	50.5	162.7	44.9	151.6	80.3	157.1	198.1	-24.7	115.7	-120.7
Field Specific Conductance	umhos/cm	529	541	533	547.4	534	533	543.1	526.8	520.9	480.6	422.5	472.9
Field Temperature	deg C	12.6	19.1	14	10.1	9.1	10.1	13.8	13.4	9.4	10.6	10.6	10.9
Groundwater Elevation	feet	624.88	625.76	0	624.41	625.04	624.31	623.87	623.87	619	623.56	623.95	623.57
Oxygen, Dissolved	mg/L	0.48	0.3	0.27	0.78	0.39	0.41	0.48	2.53	0.19	0.13	0.21	0.18
Turbidity	NTU	585.9	181.9	236.2	90.29	116.6	165.2	36.09	2.78	42.65	77.88	28.82	23.95
Total Alkalinity as CaCO3	mg/L	--	--	190	190	--	180	--	210	210	180	--	--
Iron, dissolved	ug/L	--	--	<50	55	--	<36	--	<36	<36	<36	390	--
Manganese, dissolved	ug/L	--	--	16	7.3	--	6.2	--	<4.4	6.8	<3.6	--	--
Calcium, total	ug/L	--	--	--	35000	--	--	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	270	--	580	--	<36	240	380	--	160
Magnesium, total	ug/L	--	--	--	16000	--	18000	--	15000	16000	14000	--	--
Manganese, total	ug/L	--	--	--	26	--	54	--	<4.4	25	31	--	--
Potassium, total	ug/L	--	--	--	680	--	710	--	650	740	540	--	--
Sodium, total	ug/L	--	--	--	63000	--	58000	--	55000	58000	49000	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	190	190	--	180	--	210	210	180	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	<7.6	<3.8	--	<4.6	--	<4.6	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	--	--	<0.88	--	--	--	--	<0.75	--	--	--	--
Molybdenum, dissolved	ug/L	--	--	160	140	140	120	--	120	130	140	--	--

Single Location

Name: IPL - Lansing

Location ID: MW-305
Number of Sampling Dates: 11

Parameter Name	Units	6/20/2019	10/2/2019	5/19/2020	8/18/2020	10/20/2020	4/9/2021	10/27/2021	4/4/2022	10/18/2022	4/11/2023	10/31/2023
Boron	ug/L	180	190	210	--	220	140	200	110	240	--	--
Calcium	mg/L	92	97	82	--	76	79	79	78	80	--	--
Chloride	mg/L	6.8	3.2	7.5	6.9	6	4.8	6.6	3.5	5.5	--	--
Fluoride	mg/L	<0.23	<0.23	0.23	--	<0.23	<0.28	<0.28	<0.22	<0.22	--	--
Field pH	Std. Units	7.19	7.03	6.9	7.23	7.24	7.17	7.29	6.94	7.32	7.44	7.17
Sulfate	mg/L	24	26	<3.6	<3.6	<3.6	29	14	42	3.6	--	--
Total Dissolved Solids	mg/L	440	380	540	--	320	300	260	270	300	--	--
Antimony	ug/L	<0.53	--	<0.58	--	--	<1.1	<1.1	<0.69	<0.69	--	--
Arsenic	ug/L	2.2	3.4	3.6	--	5.6	1.7	3.9	0.89	4.7	0.93	1.8
Barium	ug/L	170	190	220	--	200	150	200	97	230	--	--
Beryllium	ug/L	<0.27	--	<0.27	--	--	<0.27	<0.27	<0.27	<0.27	--	--
Cadmium	ug/L	<0.077	--	<0.039	--	<0.049	<0.051	<0.051	<0.055	<0.055	--	--
Chromium	ug/L	<0.98	<0.98	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	--	--
Cobalt	ug/L	0.52	0.27	0.32	--	0.12	0.29	<0.19	<0.19	<0.19	--	--
Lead	ug/L	<0.27	<0.27	<0.27	--	<0.11	<0.21	0.29	<0.24	<0.24	--	--
Lithium	ug/L	3.4	4.6	<2.3	--	<2.5	<2.5	<2.5	2.6	<2.5	--	--
Mercury	ug/L	<0.1	--	<0.1	--	--	<0.15	<0.15	<0.11	--	--	--
Molybdenum	ug/L	1.7	1.6	<1.1	1.8	<1.1	<1.3	<1.3	<1.2	<1.2	1.1	--
Selenium	ug/L	<1	--	<1	--	<1	1.4	<0.96	1.7	<0.96	--	--
Thallium	ug/L	<0.27	--	<0.26	--	--	<0.26	<0.26	<0.26	<0.26	--	--
Total Radium	pCi/L	0.553	0.557	--	--	0.377	0.474	1.43	0.249	1.2	--	--
Radium-226	pCi/L	0.181	0.38	--	--	0.296	0.301	0.55	0.145	0.331	--	--
Radium-228	pCi/L	0.372	0.178	--	--	0.0809	0.173	0.879	0.104	0.871	--	--
pH at 25 Degrees C	Std. Units	7.2	7.2	7.2	--	7.2	7.3	7.3	7.4	7.4	--	--
Field Oxidation Potential	mV	27	-105.6	-138	-162.9	-145.4	-25.8	-128.5	198.9	-186.6	-92.1	-153.3
Field Specific Conductance	umhos/cm	638	635	684	654	634	574	643	545	607.2	396.9	745
Field Temperature	deg C	15.5	19	9.8	19	15.6	7.1	16.3	4.4	15.7	6.2	15.1
Groundwater Elevation	feet	0	629.77	627.24	626.98	626.54	627.02	626.41	627.17	626.36	624.54	626.89
Oxygen, Dissolved	mg/L	0.2	0.21	0.48	0.07	0.22	2.1	0.08	4.06	0.06	3.18	0.71
Turbidity	NTU	9.6	8.87	20.44	27.27	3.65	14.88	0.27	4.57	8.17	1.71	4.18
Total Alkalinity as CaCO3	mg/L	290	--	--	340	340	280	330	290	360	--	--
Iron, dissolved	ug/L	--	--	--	11000	10000	3700	6900	830	7400	3300	--
Manganese, dissolved	ug/L	--	--	--	2000	1800	1100	1400	520	1400	--	--
Calcium, total	ug/L	--	--	--	--	87000	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	--	12000	5900	7300	1500	8500	--	6700
Magnesium, total	ug/L	--	--	--	--	32000	25000	30000	23000	30000	--	--
Manganese, total	ug/L	--	--	--	--	1800	1200	1500	560	1300	--	--
Potassium, total	ug/L	--	--	--	--	1800	1300	1600	1500	1500	--	--
Sodium, total	ug/L	--	--	--	--	7700	5900	6700	5500	7000	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	340	340	280	330	290	360	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	<7.6	<3.8	<4.6	<2.3	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	--	--	--	6.4	--	--	3.7	--	--	--	--
Molybdenum, dissolved	ug/L	--	--	--	2.8	--	--	--	--	--	--	--

Single Location

Name: IPL - Lansing

Location ID: MW-306
Number of Sampling Dates: 15

Parameter Name	Units	6/20/2019	10/2/2019	12/5/2019	2/5/2020	5/19/2020	8/18/2020	10/20/2020	2/23/2021	4/9/2021	7/12/2021	10/27/2021	4/4/2022	10/19/2022	4/11/2023	10/30/2023
Boron	ug/L	860	660	--	--	720	--	720	--	650	--	580	550	600	--	--
Calcium	mg/L	240	260	--	--	340	--	260	--	290	--	210	200	280	--	--
Chloride	mg/L	24	40	--	--	32	28	27	--	33	--	34	41	32	--	--
Fluoride	mg/L	<0.23	<0.23	--	--	<0.23	--	<0.23	--	<0.28	--	<0.28	<0.22	<0.22	--	--
Field pH	Std. Units	6.87	9	6.76	6.95	6.66	7.12	6.88	6.87	6.85	7.51	6.86	6.86	6.8	7.13	7.05
Sulfate	mg/L	280	140	--	--	430	260	220	--	240	--	95	100	500	--	--
Total Dissolved Solids	mg/L	1200	1300	--	--	3400	--	1100	--	1300	--	960	1100	1500	--	--
Antimony	ug/L	<0.53	--	--	--	<0.58	--	--	--	<1.1	--	<1.1	<0.69	<0.69	--	--
Arsenic	ug/L	8.6	12	9.3	9.4	8.5	--	10	9	8	8.2	8.6	7.7	7.1	7	9.5
Barium	ug/L	280	540	--	--	260	--	250	--	280	--	320	350	390	--	--
Beryllium	ug/L	<0.27	--	--	--	<0.27	--	--	--	<0.27	--	<0.27	<0.27	<0.27	--	--
Cadmium	ug/L	<0.077	--	--	--	<0.039	--	<0.049	--	<0.051	--	<0.051	<0.055	<0.055	--	--
Chromium	ug/L	<0.98	<0.98	--	--	<1.1	--	<1.1	--	1.3	--	<1.1	<1.1	<1.1	--	--
Cobalt	ug/L	1	0.98	--	--	0.53	--	0.24	--	0.35	--	0.3	0.49	0.3	--	--
Lead	ug/L	0.52	<0.27	--	--	<0.27	--	<0.11	--	<0.21	--	1.1	<0.24	<0.24	--	--
Lithium	ug/L	19	25	--	--	25	--	26	--	24	--	22	23	27	--	--
Mercury	ug/L	<0.1	--	--	--	<0.1	--	--	--	<0.15	--	<0.15	<0.11	--	--	--
Molybdenum	ug/L	<1.1	<1.1	--	--	<1.1	<1.1	<1.1	--	<1.3	--	<1.3	<1.2	<1.2	<0.91	--
Selenium	ug/L	<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	0.897	1.79	--	--	--	--	1.16	--	1.09	--	2.1	0.757	0.693	--	--
Radium-226	pCi/L	0.432	0.902	--	--	--	--	0.459	--	0.436	--	0.814	0.464	0.431	--	--
Radium-228	pCi/L	0.465	0.889	--	--	--	--	0.696	--	0.659	--	1.29	0.292	0.262	--	--
pH at 25 Degrees C	Std. Units	6.9	7.2	--	--	6.9	--	6.8	--	7.2	--	7	7	7	--	--
Field Oxidation Potential	mV	22	-1205	-127	-127.7	-137	-139.1	-142.3	-127.2	-134.2	-128.3	-126.3	196.3	-173.1	-165.5	-158.8
Field Specific Conductance	umhos/cm	1632	1998	2196	2477	2332	1911	1832	2055	1994	2006	1778	1839	2120	1682	2071
Field Temperature	deg C	13.8	16.33	16.3	13.7	12.7	15	16.2	13.6	12.6	14.4	16.6	12	15.4	12	16.3
Groundwater Elevation	feet	0	622.47	620.6	620.83	620.43	620.37	619.92	619.76	620.03	619.83	619.91	620.42	619.79	622.07	620.41
Oxygen, Dissolved	mg/L	1	0.27	0.9	0.23	0.3	0.1	0.26	0.12	0.05	0.37	0.11	0.26	0.07	0.27	0.2
Turbidity	NTU	25.9	3.67	10.26	4.43	2.63	0.16	3.08	3.11	0.09	0.13	2.72	0	0.98	4.12	33.15
Total Alkalinity as CaCO3	mg/L	620	--	--	--	--	850	800	--	880	--	880	940	800	--	--
Iron, dissolved	ug/L	--	--	--	--	--	44000	39000	--	41000	--	33000	32000	41000	50000	--
Manganese, dissolved	ug/L	--	--	--	--	--	5100	4800	--	5300	--	4100	4500	7000	--	--
Calcium, total	ug/L	--	--	--	--	--	--	280000	--	--	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	--	--	--	40000	--	44000	--	33000	33000	42000	--	53000
Magnesium, total	ug/L	--	--	--	--	--	--	46000	--	50000	--	36000	41000	46000	--	--
Manganese, total	ug/L	--	--	--	--	--	--	4800	--	5500	--	4100	4400	5500	--	--
Potassium, total	ug/L	--	--	--	--	--	--	7100	--	6100	--	6200	7000	8300	--	--
Sodium, total	ug/L	--	--	--	--	--	--	110000	--	98000	--	140000	160000	140000	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	850	800	--	880	--	880	940	800	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	<7.6	<3.8	--	<4.6	--	<4.6	<4.6	<12	--	--
Arsenic, dissolved	ug/L	--	--	--	--	--	9.4	--	8.8	7.8	--	8.4	7.8	7	--	--
Molybdenum, dissolved	ug/L	--	--	--	--	--	<1.1	--	--	--	--	--	--	--	--	--

Single Location

Name: IPL - Lansing

Location ID: MW-306A
Number of Sampling Dates: 10

Parameter Name	Units	5/19/2020	7/6/2020	8/18/2020	10/20/2020	4/9/2021	10/27/2021	4/4/2022	10/19/2022	4/11/2023	10/30/2023
Boron	ug/L	290	340	--	280	280	240	260	290	--	--
Calcium	mg/L	83	82	--	76	78	80	78	77	--	--
Chloride	mg/L	7.8	7.1	7.4	7.2	7.2	7.7	6.3	5.8	--	--
Fluoride	mg/L	<0.23	<0.23	--	<0.23	<0.28	<0.28	<0.22	<0.22	--	--
Field pH	Std. Units	6.99	7.04	7.38	7.18	7.21	7.34	7.19	7.25	7.43	7.43
Sulfate	mg/L	44	40	41	41	39	42	43	34	--	--
Total Dissolved Solids	mg/L	610	360	--	350	350	280	330	350	--	--
Antimony	ug/L	<0.58	<0.51	--	--	<1.1	<1.1	<0.69	<0.69	--	--
Arsenic	ug/L	<0.88	<0.88	--	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53
Barium	ug/L	61	58	--	58	62	59	61	62	--	--
Beryllium	ug/L	<0.27	<0.27	--	--	<0.27	<0.27	<0.27	<0.27	--	--
Cadmium	ug/L	<0.039	<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	<1.1	--	--
Cobalt	ug/L	0.33	0.18	--	0.22	0.17	0.21	0.19	<0.19	--	--
Lead	ug/L	<0.27	<0.11	--	<0.11	<0.21	0.32	<0.24	<0.24	--	--
Lithium	ug/L	<2.3	<2.5	--	<2.5	<2.5	<2.5	<2.5	<2.5	--	--
Mercury	ug/L	<0.1	<0.1	--	--	<0.15	<0.15	<0.11	--	--	--
Molybdenum	ug/L	<1.1	<1.1	<1.1	<1.1	<1.3	<1.3	<1.2	<1.2	<0.91	--
Selenium	ug/L	<1	<1	--	<1	<0.96	0.99	<0.96	<0.96	--	--
Thallium	ug/L	<0.26	<0.26	--	--	<0.26	<0.26	<0.26	<0.26	--	--
Total Radium	pCi/L	--	0.525	--	0.124	0.408	0.682	0.198	1.18	--	--
Radium-226	pCi/L	--	0.0377	--	-0.201	0.12	0.279	0.00526	0.193	--	--
Radium-228	pCi/L	--	0.487	--	0.124	0.288	0.403	0.192	0.99	--	--
pH at 25 Degrees C	Std. Units	7.4	7.5	--	7.4	7.4	7.4	7.4	7.5	--	--
Field Oxidation Potential	mV	-21.7	-55.8	21.2	-38.5	-8.5	78.8	192.7	-91.1	-93.3	-84.3
Field Specific Conductance	umhos/cm	697	683	654	681	669	663	669	624.3	486.3	650
Field Temperature	deg C	14.6	15.3	15.5	14.4	14.2	14.6	13	14	13.7	14.2
Groundwater Elevation	feet	620.4	621.66	620.63	620.17	620.14	620.17	620.61	620.05	622.68	621.02
Oxygen, Dissolved	mg/L	1.18	1.24	1.16	1.3	1.68	1.23	1.13	1.3	0.67	1.25
Turbidity	NTU	4.15	1.4	2.71	1.56	0.01	0.59	0	3.21	0.83	0
Total Alkalinity as CaCO3	mg/L	--	--	330	320	320	330	350	350	--	--
Iron, dissolved	ug/L	--	--	1900	1600	1600	1500	1500	1400	1400	--
Manganese, dissolved	ug/L	--	--	1200	1100	1100	1000	1000	1000	--	--
Calcium, total	ug/L	--	--	--	85000	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	1900	1800	1800	1700	1500	--	1700
Magnesium, total	ug/L	--	--	--	37000	35000	33000	36000	32000	--	--
Manganese, total	ug/L	--	--	--	1100	1100	1000	1000	940	--	--
Potassium, total	ug/L	--	--	--	1200	1200	1200	1300	1000	--	--
Sodium, total	ug/L	--	--	--	11000	10000	9800	10000	9100	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	330	320	320	330	350	350	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	<7.6	<1.9	<4.6	<4.6	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	--	--	<0.88	--	--	<0.75	--	--	--	--
Molybdenum, dissolved	ug/L	--	--	<1.1	--	--	--	--	--	--	--

Single Location

Name: IPL - Lansing

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

Parameter Name	Units	7/12/2021	8/13/2021	10/27/2021	4/5/2022	10/18/2022	4/10/2023	10/30/2023
Boron	ug/L	220	250	280	400	1100	1200	920
Calcium	mg/L	55	47	38	50	39	38	56
Chloride	mg/L	15	16	17	22	18	23	20
Fluoride	mg/L	<0.28	<0.28	<0.28	<0.22	<0.22	<0.38	<0.38
Field pH	Std. Units	8.25	7.86	8.11	8.34	8.44	8.36	8.32
Sulfate	mg/L	44	42	70	76	120	45	36
Total Dissolved Solids	mg/L	210	230	130	210	900	160	250
Antimony	ug/L	<1.1	<1.1	<1.1	<0.69	<0.69	<1	<1
Arsenic	ug/L	2.1	2.4	2.5	1.8	2.7	2.5	2.3
Barium	ug/L	310	300	240	290	280	230	340
Beryllium	ug/L	<0.27	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33
Cadmium	ug/L	<0.051	<0.051	<0.051	<0.055	<0.055	<0.1	<0.1
Chromium	ug/L	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	0.15	0.15	<0.19	<0.19	0.19	<0.17	<0.17
Lead	ug/L	<0.21	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	13	13	12	10	13	11	16
Mercury	ug/L	<0.15	<0.15	<0.15	<0.11	--	<0.14	<0.14
Molybdenum	ug/L	5.5	7.2	12	16	25	7.8	5.5
Selenium	ug/L	<0.96	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4
Thallium	ug/L	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.499	1.91	0.743	0.183	1.51	0.165	1.95
Radium-226	pCi/L	0.171	0.289	0.421	0.0893	0.166	0.165	0.203
Radium-228	pCi/L	0.328	1.62	0.322	0.0932	1.34	-0.128	1.74
pH at 25 Degrees C	Std. Units	8.2	8.1	8.2	8.2	8.1	8.6	8.2
Field Oxidation Potential	mV	-40.6	-17.5	-123.4	198.2	-175.6	-150.4	-102.1
Field Specific Conductance	umhos/cm	449.6	437	361.2	460	399.6	312.4	489.7
Field Temperature	deg C	15.2	17.4	16.4	6.9	15.7	8	13.5
Groundwater Elevation	feet	630.95	630.01	634.9	639.74	639.23	629.13	628.65
Oxygen, Dissolved	mg/L	0.47	0.17	0.93	0.08	0.16	0.28	0.19
Turbidity	NTU	0	0	0	0	4.34	0	0
Total Alkalinity as CaCO3	mg/L	170	--	86	130	100	--	--
Iron, dissolved	ug/L	110	--	110	87	90	68	--
Manganese, dissolved	ug/L	300	--	240	560	450	--	--
Iron, total	ug/L	140	--	95	78	110	--	56
Magnesium, total	ug/L	17000	--	12000	17000	11000	--	--
Manganese, total	ug/L	310	--	230	590	430	--	--
Potassium, total	ug/L	3600	--	2600	2400	2900	--	--
Sodium, total	ug/L	13000	--	11000	16000	24000	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	170	--	86	130	100	--	--
Carbonate Alkalinity as CaCO3	mg/L	<4.1	--	<2.3	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	2	--	2.6	--	--	--	--
Molybdenum, dissolved	ug/L	5.2	--	--	--	--	--	--

Single Location

Name: IPL - Lansing

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

Parameter Name	Units	7/12/2021	8/13/2021	10/27/2021	4/5/2022	10/18/2022	4/10/2023	10/30/2023
Boron	ug/L	370	380	300	430	680	--	--
Calcium	mg/L	67	62	70	58	52	--	--
Chloride	mg/L	6.8	7.2	8.1	13	11	--	--
Fluoride	mg/L	<0.28	<0.28	<0.28	<0.22	<0.22	--	--
Field pH	Std. Units	7.83	7.35	7.29	7.48	7.59	7.33	7.71
Sulfate	mg/L	30	32	33	28	27	--	--
Total Dissolved Solids	mg/L	280	290	230	250	270	--	--
Antimony	ug/L	<1.1	<1.1	<1.1	<0.69	<0.69	--	--
Arsenic	ug/L	<0.75	0.76	1.3	2.1	1.9	0.65	1
Barium	ug/L	120	120	130	110	100	--	--
Beryllium	ug/L	<0.27	<0.27	<0.27	<0.27	<0.27	--	--
Cadmium	ug/L	<0.051	<0.051	<0.051	<0.055	<0.055	--	--
Chromium	ug/L	<1.1	<1.1	<1.1	<1.1	<1.1	--	--
Cobalt	ug/L	0.54	0.57	0.77	0.68	0.65	--	--
Lead	ug/L	<0.21	<0.21	0.21	<0.24	<0.24	--	--
Lithium	ug/L	<2.5	<2.5	<2.5	<2.5	<2.5	--	--
Mercury	ug/L	<0.15	<0.15	<0.15	<0.11	--	--	--
Molybdenum	ug/L	6.8	6.6	6.3	5.7	6.6	7.6	--
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	0.509	0.258	0.957	0.0954	0.683	--	--
Radium-226	pCi/L	0.265	0.163	0.412	0.0954	0.0963	--	--
Radium-228	pCi/L	0.245	0.0954	0.545	-0.076	0.587	--	--
pH at 25 Degrees C	Std. Units	7.5	7.6	7.6	8.1	7.7	--	--
Field Oxidation Potential	mV	73.1	54.3	47.7	199.8	-99.4	-13.8	-52.4
Field Specific Conductance	umhos/cm	615.6	612.3	625.4	563	518.7	521.2	609.6
Field Temperature	deg C	13.2	12.5	12.9	10.8	11.4	11.6	11.9
Groundwater Elevation	feet	625.27	625.48	626.25	626.72	625.77	617.75	625.01
Oxygen, Dissolved	mg/L	0.27	0.17	1.39	0.09	0.1	0.15	0.49
Turbidity	NTU	0	0	0	0	2.57	0	0
Total Alkalinity as CaCO3	mg/L	310	--	310	330	270	--	--
Iron, dissolved	ug/L	<36	--	170	280	300	36	--
Manganese, dissolved	ug/L	600	--	720	700	640	--	--
Iron, total	ug/L	<36	--	160	370	330	--	200
Magnesium, total	ug/L	33000	--	33000	27000	24000	--	--
Manganese, total	ug/L	620	--	720	710	610	--	--
Potassium, total	ug/L	3000	--	2500	2100	2000	--	--
Sodium, total	ug/L	16000	--	14000	22000	28000	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	310	--	310	330	270	--	--
Carbonate Alkalinity as CaCO3	mg/L	<4.2	--	<4.6	<4.6	<4.6	--	--
Arsenic, dissolved	ug/L	<0.75	--	1.4	--	--	--	--
Molybdenum, dissolved	ug/L	7.3	--	--	--	--	--	--

Appendix B

Lansing Landfill and Ash Pond Closure Drawings

ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION

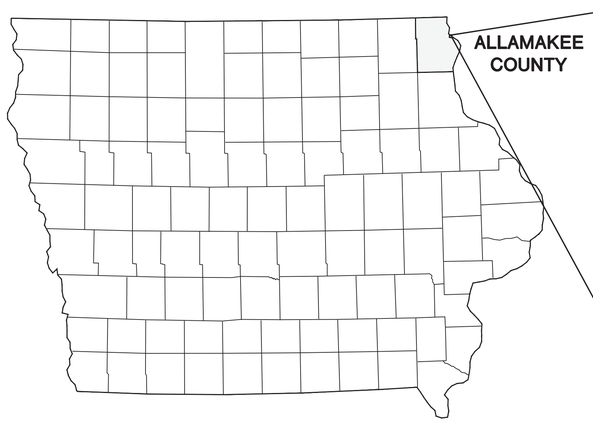
LANSING GENERATING STATION
LANSING, IOWA

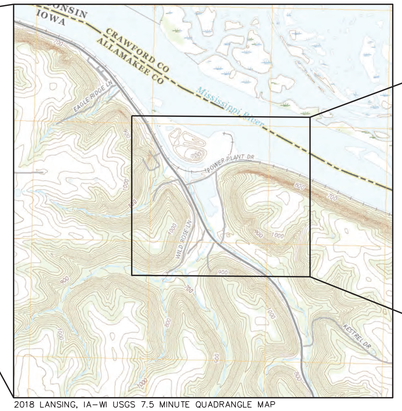
MARK HUBER 15325 IOWA
LICENSED PROFESSIONAL ENGINEER
11/10/2023

PREPARED FOR: INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IOWA

PREPARED BY: SCS ENGINEERS
MADISON, WISCONSIN

DATE: NOVEMBER 2023





2018 LANSING, IA–WI USGS 7.5 MINUTE QUADRANGLE MAP

SITE LOCATOR MAP

APPROXIMATE SCALE: 1" = 2,000'

SEPTEMBER 17, 2018 AERIAL PHOTOGRAPH. SOURCES: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

SITE AERIAL

SCALE: 1" = 700'

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9	SOUTH POND CLOSURE AREA TOP OF CCR-COAL IMPACTED MATERIAL
10	SOUTH POND CLOSURE AREA TOP OF LOW PERMEABILILTY LAYER
11	SOUTH POND CLOSURE AREA FINAL GRADES
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14	COAL YARD FINAL GRADES AND RESTORATION
15	CROSS SECTIONS A AND B
16	CROSS SECTIONS C AND D
17	CROSS SECTIONS E AND F
18	DETAILS
19	DETAILS

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SITE
ASH POND CLOSURE
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LANSING GENERATING STATION
LANSING, IOWA

TITLE SHEET

SHEET
1 of 19

PROJECT NO.	25222159.00	DRAWN BY: BSS/KP
DRAWN:	10/05/2023	CHECKED BY: BSS/MRH
REVISED:	10/26/2023	APPROVED BY: MRS 11/09/2023

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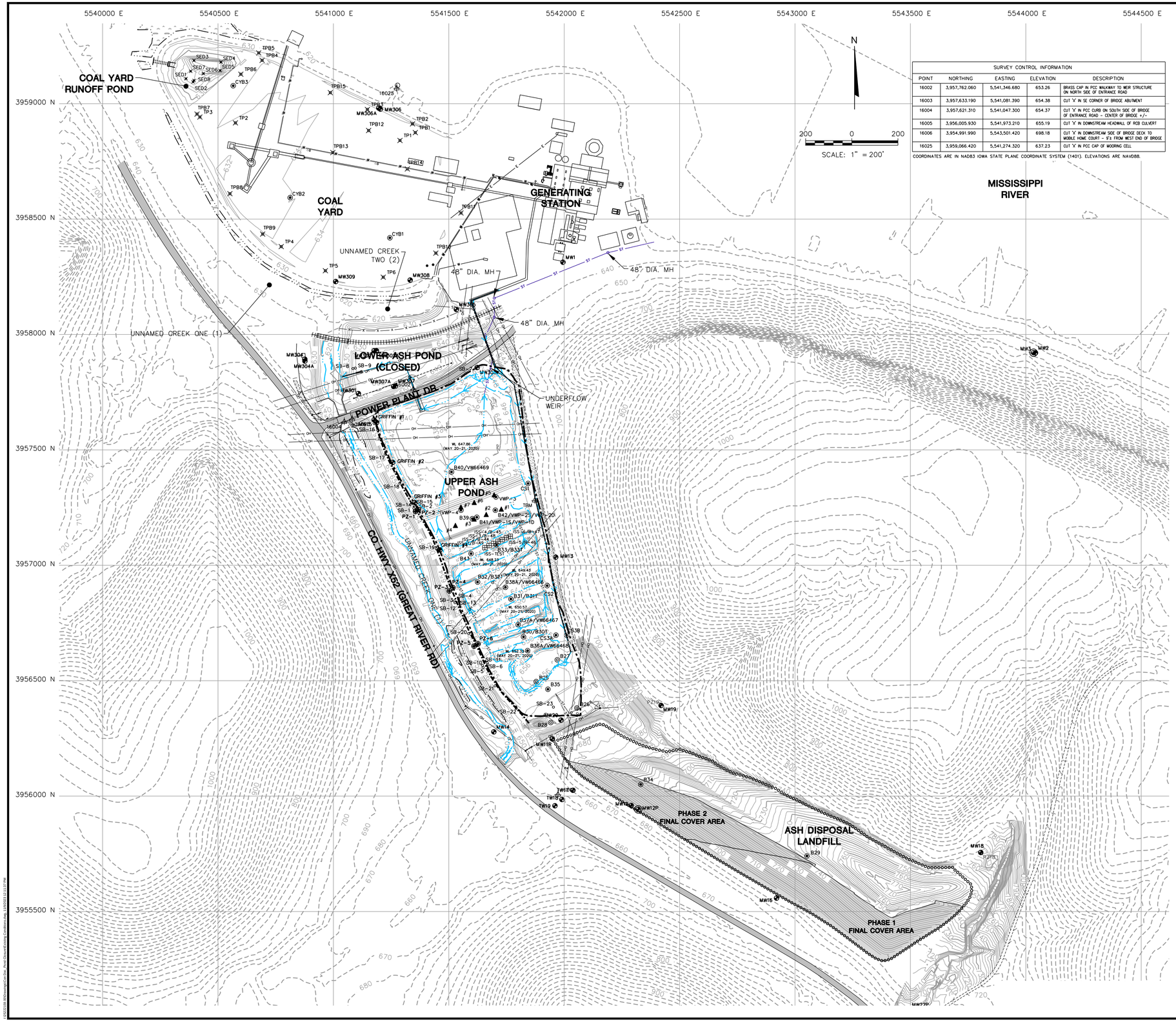

SURVEY CONTROL INFORMATION				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
16002	3,957,762.060	5,541,346.680	653.26	BRASS CAP IN PCC WALKWAY TO WEIR STRUCTURE ON NORTH SIDE OF ENTRANCE ROAD
16003	3,957,633.190	5,541,081.390	654.38	CUT 'X' IN SE CORNER OF BRIDGE ABUTMENT
16004	3,957,621.310	5,541,047.300	654.37	CUT 'X' IN PCC CURB ON SOUTH SIDE OF BRIDGE OF ENTRANCE ROAD - CENTER OF BRIDGE +/-
16005	3,956,005.930	5,541,973.210	655.19	CUT 'X' IN DOWNSTREAM HEADWALL OF RCB CULVERT
16006	3,954,991.990	5,543,501.420	698.18	CUT 'X' IN DOWNSTREAM SIDE OF BRIDGE DECK TO MOBILE HOME COURT - 9'± FROM WEST END OF BRIDGE
16025	3,959,066.420	5,541,274.320	637.23	CUT 'X' IN PCC CAP OF MOORING CELL

COORDINATES ARE IN NAD83 IOWA STATE PLANE COORDINATE SYSTEM (1401). ELEVATIONS ARE NAVD88.

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER (MAY 2020)
- PROCESS TRANSPORT WATER, PLANT AREA RUNOFF, AND DIRECT RAINFALL FLOW DIRECTION
- UNNAMED CREEK FLOW PATH
- BURIED ELECTRIC
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- WATER
- ABANDONED WATER
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- 16002 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- B40/VW66469 SOIL BORING WITH VWP (JUNE 2020/SEPTEMBER 2021/MARCH 2022)
- CS1 CRANE SETUP INVESTIGATION BORING [APPROX.] (NOVEMBER 2019 BY TERRACON)
- B30/B30T SOIL BORING (MAY 2015/SEPTEMBER 2021)
- B26 SOIL BORING (SEPTEMBER 2014)
- SB-1 SOIL BORING (2015 BY HARD HAT SERVICES)
- SED1 SEDIMENT PROBE
- TP1 TEST PIT
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- GRIFFIN #1 DEWATERING PUMPING WELL
- #1 SETTLEMENT PLATE
- ISS-1/B-49 IN-SITU STABILIZATION TEST COLUMN AND BORING
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- WETLAND

NOTES:

1. DRAWING COORDINATES IN IOWA STATE PLANE, NORTH ZONE, US FOOT, NAD 83 DATUM. VERTICAL DATUM IS NAVD 88.
2. EXISTING CONTOURS FOR OUTSIDE THE ASH DISPOSAL LANDFILL AND ASH PONDS ARE FROM ALLAMAKEE COUNTY DATED SPRING 2008.
3. EXISTING CONTOURS FOR THE CREEK AREA WEST OF THE ASH PONDS ARE FROM 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
4. EXISTING CONTOURS IN THE LOWER ASH POND AREA BASED ON HARD HAT SERVICES LOWER POND CLOSURE AS-BUILT DRAWINGS DATED JANUARY 2016.
5. EXISTING CONTOURS FOR THE ASH DISPOSAL LANDFILL PHASE 1 FINAL COVER AREA ARE FROM APRIL 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
6. EXISTING CONTOURS FOR THE ASH DISPOSAL LANDFILL PHASE 2 FINAL COVER ARE FROM MARCH 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
7. EXISTING CONTOURS FOR THE OPEN ASH DISPOSAL LANDFILL, SOUTHEAST OF THE ASH DISPOSAL LANDFILL, AND UPPER ASH POND AREAS ARE FROM MAY 2020 TOPOGRAPHIC/BATHYMETRIC SURVEY AND JANUARY 2022 TOPOGRAPHIC/DRONE SURVEY BY MOHN SURVEYING, INC.
8. EXISTING CONTOURS IN THE COAL YARD AND COAL YARD RUNOFF POND ARE BASED ON JANUARY 2020 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC. AND NOVEMBER 2021 SEDIMENT PROBES COMPLETED BY AMES. CONTOURS REPRESENT ANTICIPATED GRADES AFTER COAL PILES HAVE BEEN REMOVED.
9. EDGE OF WATER IN THE UNNAMED CREEK FROM 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC. AND EDGE OF WATER IN THE UPPER ASH POND AREA FROM MAY 20-21, 2020 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
10. UTILITIES SHOWN FROM 2015 SURVEY BY MOHN SURVEYING, INC. AS SHOWN ON HARD HAT SERVICES LOWER POND CLOSURE AS-BUILT DRAWINGS DATED JANUARY 2016 AND MAY 2020 SURVEY BY MOHN SURVEYING, INC. UTILITIES SHOWN ARE APPROXIMATE AND NOT ALL UTILITIES ARE SHOWN ON THIS DRAWING.
11. STRUCTURES AND UTILITIES IN THE COAL YARD AND GENERATING STATION AREA ARE APPROXIMATE AND BASED ON 2007 LANSING POWER STATION-PLOT PLAN (EIQ NO. 92-2686) AND NOVEMBER 5, 2014 COAL YARD FIRE PROTECTION SITE PLAN (DRAWING NO. 17692-LAN-M-001 AND 17692-LAN-M-002) PROVIDED BY IPL.
12. 2015 BORINGS, PIEZOMETERS, AND SLURRY WALL BY HARD HAT SERVICES LOCATIONS BASED ON MAY 2015 SEEPAGE CONTROL CUT-OFF WALL DRAWINGS BY HARD HAT SERVICES.
13. SOIL BORINGS (B41, B42, AND B43) COMPLETED BY AMERICAN ENGINEERING TESTING IN SEPTEMBER 2021. VWPs IN B42 AND B43 INSTALLED BY AMERICAN ENGINEERING TESTING IN SEPTEMBER 2021. VWP-3 AND VWP-4 INSTALLED BY AMERICAN ENGINEERING TESTING IN MARCH 2022. LOCATIONS SURVEYED BY AMES.
14. TEST PITS AND SEDIMENT PROBES WERE INSTALLED BY AMES IN NOVEMBER 2021. LOCATIONS SURVEYED BY AMES.
15. WEIR STRUCTURE INFORMATION IS FROM A COMBINATION OF THE WEIR BOX SECTIONS & DETAILS ASH SETTLING BASIN DESIGN DRAWINGS BY SARGENT & LUNDY DATED FEBRUARY 25, 1975/JANUARY 30, 1976 (DRAWINGS S-213 AND S-214) AND THE LOWER POND CLOSURE AS-BUILT DRAWINGS BY HARD HAT SERVICES DATED JANUARY 2016.
16. APPROXIMATE LIMITS OF UPPER ASH POND BASED ON JUNE 5, 1974 SARGENT & LUNDY SITE DEVELOPMENT DRAWINGS AND MARCH 15, 1993 SARGENT & LUNDY DRAWING (ALLIANT DRAWING NO. 1-0110-4-5-C8002).
17. UPPER ASH POND OUTFALL REROUTE BASED ON UPPER ASH POND OUTFALL REROUTE ISSUED FOR CONSTRUCTION SET BY HARD HAT SERVICES DATED OCTOBER 2020.
18. WETLANDS WERE DELINEATED BY IMPACT 7G, INC. ON APRIL 19, 2021.

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CHECKED BY: BSS/MRH
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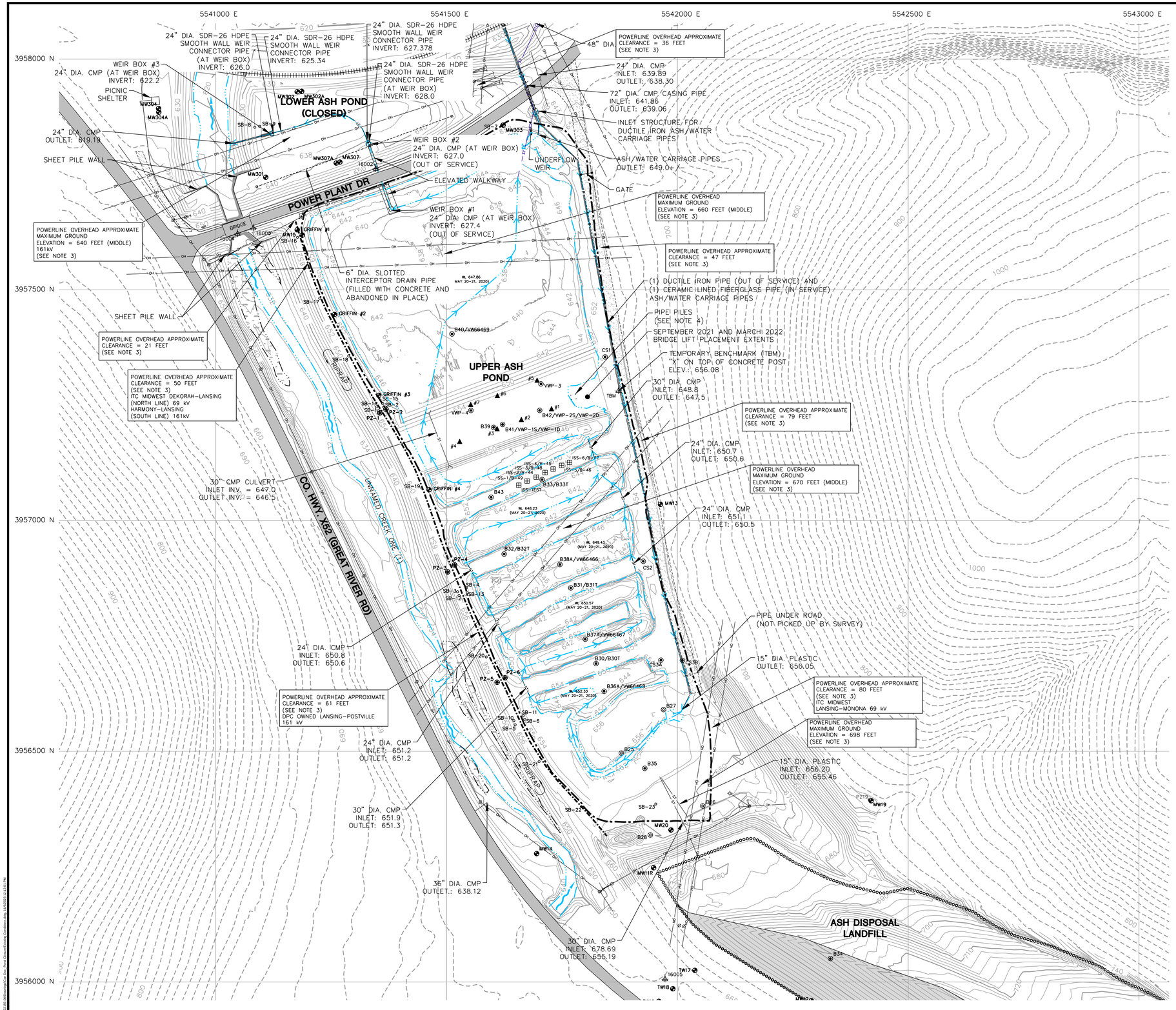
LANSING, IOWA

SHEET
OVERALL SITE PLAN
2 of 19



LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER (MAY 2020)
- PROCESS TRANSPORT WATER, PLANT AREA RUNOFF, AND DIRECT RAINFALL FLOW DIRECTION
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
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- SURVEY CONTROL POINT
- MONITORING WELL
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- SOIL BORING (SEPTEMBER 2014)
- SOIL BORING (2015 BY HARD HAT SERVICES)
- WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
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- SETTLEMENT PLATE
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- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- WETLAND

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. IN-SITU STABILIZATION (ISS) TEST COLUMNS COMPLETED OCTOBER 2021 BY SEVENSON. ISS-1 WAS AUGERED WITH WATER AND THEN GROUTED WITH 12% CEMENT GROUT AFTER. ISS-2 AND ISS-3 WERE AUGERED WITH 12% CEMENT GROUT ADDITION. ISS-4 AND ISS-5 WERE AUGERED WITH 10% CEMENT GROUT ADDITION. ISS-6 AND ISS-7 WERE AUGERED WITH 8% CEMENT GROUT ADDITION. BORINGS THROUGH THE ISS TEST COLUMNS WERE COMPLETED BY AMERICAN ENGINEERING TESTING IN NOVEMBER/DECEMBER 2021.
3. OVERHEAD POWERLINE MAXIMUM ELEVATION INFORMATION OBTAINED FROM ITC AND DAIRYLAND POWER COOPERATIVE. ELEVATION CLEARANCES APPLY FOR TYPICAL VEHICLE ACCESS (CARS, TRACTORS, COMBINES, ETC.) BUT LARGER EQUIPMENT MAY REQUIRE ADDITIONAL CLEARANCE (I.E. EXCAVATOR). APPROXIMATE CLEARANCE HEIGHTS FROM MAY 2015 SEEPAGE CONTROL CUT-OFF WALL DRAWINGS BY HARD HAT SERVICES. A MINIMUM OF 20 FEET OVERHEAD SEPARATION DISTANCES IS REQUIRED FOR EQUIPMENT OPERATING UNDER OR AROUND OVERHEAD POWERLINES.
4. THE FOUR EXISTING PIPE PILES WERE CUT DOWN DURING INITIAL BRIDGE LIFT PLACEMENT. EACH PIPE WAS CUT DOWN APPROXIMATELY 87.5 TO 88 INCHES. APPROXIMATE TOP OF PILE ELEVATION IS NOW 642.63.
5. BRIDGE LIFT FILL AREA TOP WAS SURVEYED BY AMES AND ASSUMED TO HAVE APPROXIMATELY 2H:1V SLOPE ON SOUTH SIDE AND 4H:1V SLOPE ON NORTH SIDE DOWN TO EXISTING TOP OF SEDIMENT.
6. SETTLEMENT PLATES #1–#7 IN THE BRIDGE LIFT FILL AREA WERE INSTALLED BY AMES. LOCATIONS SURVEYED BY AMES.
7. PUMP TESTING WELLS (GRIFFIN #1–#4) INSTALLED BY GRIFFIN IN OCTOBER 2021. WELL #4 WAS A PUMPING WELL AND WELLS #1–#3 WERE MONITORING WELLS FOR THE PUMP TEST. LOCATIONS SURVEYED BY AMES.

100 0 100
SCALE: 1" = 100'

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CHECKED BY: BSS/MRH
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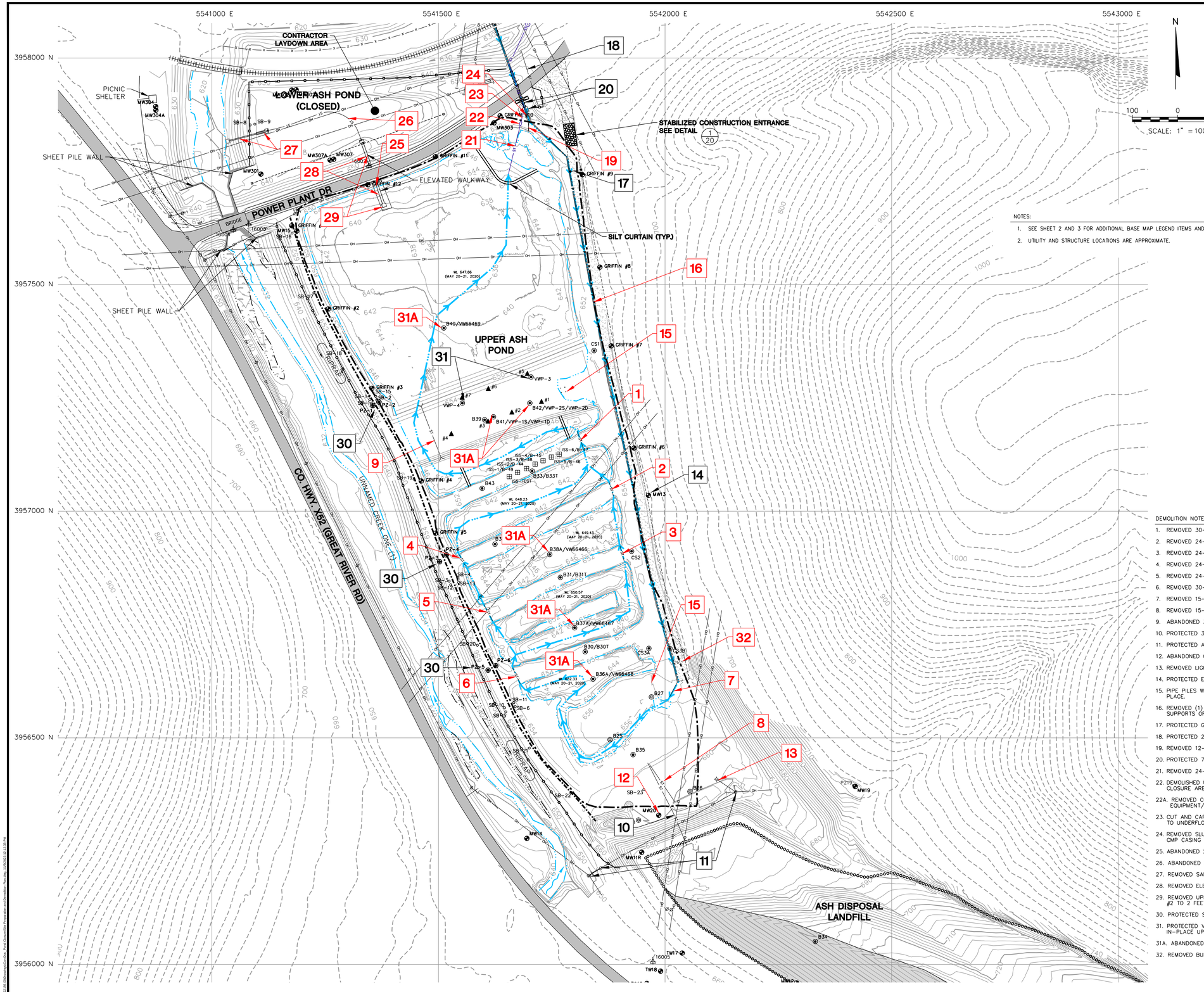
SITE
ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

PRE-CONSTRUCTION CONDITIONS

SHEET
3 of 19



NOTES:

1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. UTILITY AND STRUCTURE LOCATIONS ARE APPROXIMATE.

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
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- UNNAMED CREEK FLOW PATH
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- B40/VW66469 SOIL BORING WITH VWP
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- #1 SETTLEMENT PLATE
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- SILT FENCE/FILTER SOCK
- LIMITS OF PIPE REMOVAL/ABANDONMENT
- GRIFFIN #1 DEWATERING PUMPING WELL

9 (PROTECT) 7 (REMOVED)

DEMOLITION NOTES:

1. REMOVED 30-INCH CMP PIPE AND DISPOSED OFF SITE.
2. REMOVED 24-INCH CMP PIPE AND DISPOSED OFF SITE.
3. REMOVED 24-INCH CMP PIPE AND DISPOSED OFF SITE.
4. REMOVED 24-INCH CMP PIPE AND DISPOSED OFF SITE.
5. REMOVED 24-INCH CMP PIPE AND DISPOSED OFF SITE.
6. REMOVED 30-INCH CMP PIPE AND DISPOSED OFF SITE.
7. REMOVED 15-INCH PLASTIC PIPE AND DISPOSED OFF SITE.
8. REMOVED 15-INCH PLASTIC PIPE AND DISPOSED OFF SITE.
9. ABANDONED 30-INCH CMP PIPE IN-PLACE WITH FLOWABLE FILL.
10. PROTECTED 30-INCH CMP PIPE.
11. PROTECTED AND PRESERVED UTILITY POLES AND GUYED WIRES.
12. ABANDONED GROUNDWATER MONITORING WELL.
13. REMOVED LIGHT POLE.
14. PROTECTED EXISTING MONITORING WELL.
15. PIPE PILES WERE CUT DOWN AS NEEDED TO COMPLETE WORK AND REMAINDER OF PILE FOUNDATION ABANDONED IN PLACE.
16. REMOVED (1) DUCTILE IRON PIPE, (1) CERAMIC LINED FIBERGLASS PIPE, AND SUPPORTS. DISPOSED PIPES AND SUPPORTS OFFSITE.
17. PROTECTED GATE.
18. PROTECTED 24-INCH CMP PIPE.
19. REMOVED 12-INCH STEEL AND 8-INCH PLASTIC PIPES AND DISPOSED OFF SITE.
20. PROTECTED 72-INCH CMP CASING PIPE AND INLET STRUCTURE.
21. REMOVED 24-INCH HDPE PIPE AND DISPOSED OFF SITE.
22. DEMOLISHED UNDERFLOW WEIR STRUCTURE TO A MINIMUM 2 FEET BELOW FINAL GRADE AND DISPOSED OF IN CLOSURE AREA. REMAINING BELOW GRADE STRUCTURE FILLED WITH FLOWABLE FILL.

22A. REMOVED CO2 CYLINDERS, STOP LOGS, STOP LOG GUIDE FRAME, RAILINGS, AND OTHER ASSOCIATED EQUIPMENT/INSTRUMENTATION.

23. CUT AND CAPPED 16-INCH HDPE PIPE AT ABANDONMENT LIMIT. ABANDONED REMAINING 16-INCH HDPE PIPE BACK TO UNDERFLOW WEIR STRUCTURE IN PLACE WITH FLOWABLE FILL.
24. REMOVED SLUICE PIPES OF VARIOUS SIZE AND MATERIAL (STEEL, HDPE, AND FIBERGLASS) LEADING TO THE 72-INCH CMP CASING PIPE AND DISPOSED OFF SITE.
25. ABANDONED 24-INCH CMP PIPE IN PLACE WITH FLOWABLE FILL.
26. ABANDONED 24-INCH HDPE PIPE IN PLACE WITH FLOWABLE FILL.
27. REMOVED SAMPLE HOUSE. ABANDONED WEIR BOX #3 AND OUTFALL STRUCTURE WITH FLOWABLE FILL.
28. REMOVED ELEVATED WALKWAY AND DISPOSED OFF SITE.
29. REMOVED UPPER PORTION OF FOUNDATIONS/STRUCTURES FOR ELEVATED WALKWAY AND WEIR BOX #1 AND WEIR BOX #2 TO 2 FEET BELOW PROPOSED FINAL GRADES. REMAINING BELOW GRADE STRUCTURE FILLED WITH FLOWABLE FILL.
30. PROTECTED SLURRY WALL AND PIEZOMETERS IN UPPER ASH POND WESTERN BERM.
31. PROTECTED VIBRATING WIRE PIEZOMETERS THROUGHOUT CONSTRUCTION. VIBRATING WIRE PIEZOMETERS ABANDONED IN-PLACE UPON COMPLETION OF WORK.

31A. ABANDONED VIBRATING WIRE PIEZOMETER IN-PLACE.

32. REMOVED BURIED PIPE AND DISPOSED OFF SITE.

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SHEET
SITE PREPARATION AND DEMOLITION PLAN

SHEET
4 of 19

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POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 47 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 660 FEET

RELOCATED IN SERVICE CERAMIC LINED FIBERGLASS PIPE, REMOVED AFTER FLOWS TO UPPER ASH POND CEASED

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 79 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 670 FEET

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 80 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 698 FEET

NOTES:
1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.

SCALE: 1" = 60'

LOWER ASH POND (CLOSED)

POWER PLANT DR

UNDERFLOW WEIR

SILT CURTAIN (TYP.)

NORTH POND CLOSURE AREA

SOUTH POND CLOSURE AREA

ASH DISPOSAL LANDFILL

A

A'

B

B'

INC-E (North)

INC1 (INC-E1)

INC2 (INC-W1)

INC-W (North)

VWP-5

VWP-6

VWP-7

VWP-8

VWP-9

VWP-10

IN-SITU STABILIZED ZONE CREATED WITH AUGER MIXING

SEE SHEET 6 FOR AUGER SPACING

IN-SITU STABILIZED WALL INSTALLED IN CMP PIPE LOCATION. RE-INSTALLED CMP PIPE TO MANAGE PLANT FLOWS UNTIL FINAL ABANDONMENT.

GRIFFIN #1

GRIFFIN #2

GRIFFIN #3

GRIFFIN #4

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 50 FEET

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 21 FEET

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 61 FEET

NOTES:
1. INCLINOMETER INC-E AND INC-W INSTALLED NORTH OF THE IN-SITU STABILIZED (ISS) WALL LOCATION PRIOR TO ISS WORK.
2. SETTLEMENT PLATES REMOVED AS NEEDED TO COMPLETE ISS WALL INSTALLATION.
3. REMAINING VIBRATING WIRE PIEZOMETERS AND INCLINOMETERS INSTALLED AFTER ISS WALL AND GEOTEXTILE TUBE SCOUR PROTECTION LAYER GRADING.
4. INSTRUMENTATION AND CABLING PROTECTED THROUGHOUT CONSTRUCTION. VIBRATING WIRE PIEZOMETERS ABANDONED IN-PLACE AND INCLINOMETERS ABANDONED UPON COMPLETION OF WORK.

LEGEND
- EXISTING VIBRATING WIRE PIEZOMETER (VWP)
- EXISTING VIBRATING WIRE PIEZOMETER CABLE
- #1 EXISTING SETTLEMENT PLATE
- VIBRATING WIRE PIEZOMETER (VWP)
- VIBRATING WIRE PIEZOMETER CABLE
- INCLINOMETER

A — A'

ELEVATION

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 660 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 670 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 698 FEET

~170'

~100'

IN-SITU STABILIZATION WORKING PLATFORM

BOTTOM ASH FROM SOUTH POND CLOSURE AREA OR GENERAL FILL

FILL

FILL OR ASH

ASH

IN-SITU STABILIZED WALL CREATED WITH AUGER MIXING

???

???

THIXOTROPIC

NATIVE

NATIVE

~10' INTO NATIVE OR AUGER REFUSAL

~50'

ESTIMATED BOTTOM OF ASH

SCALE: 1" = 60'
5X VERTICAL EXAGGERATION

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

PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	10/26/2023
DRAWN BY:	BSS/KP
CHECKED BY:	BSS/ARH
APPROVED BY:	MAS 11/09/2023

CLIENT: INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

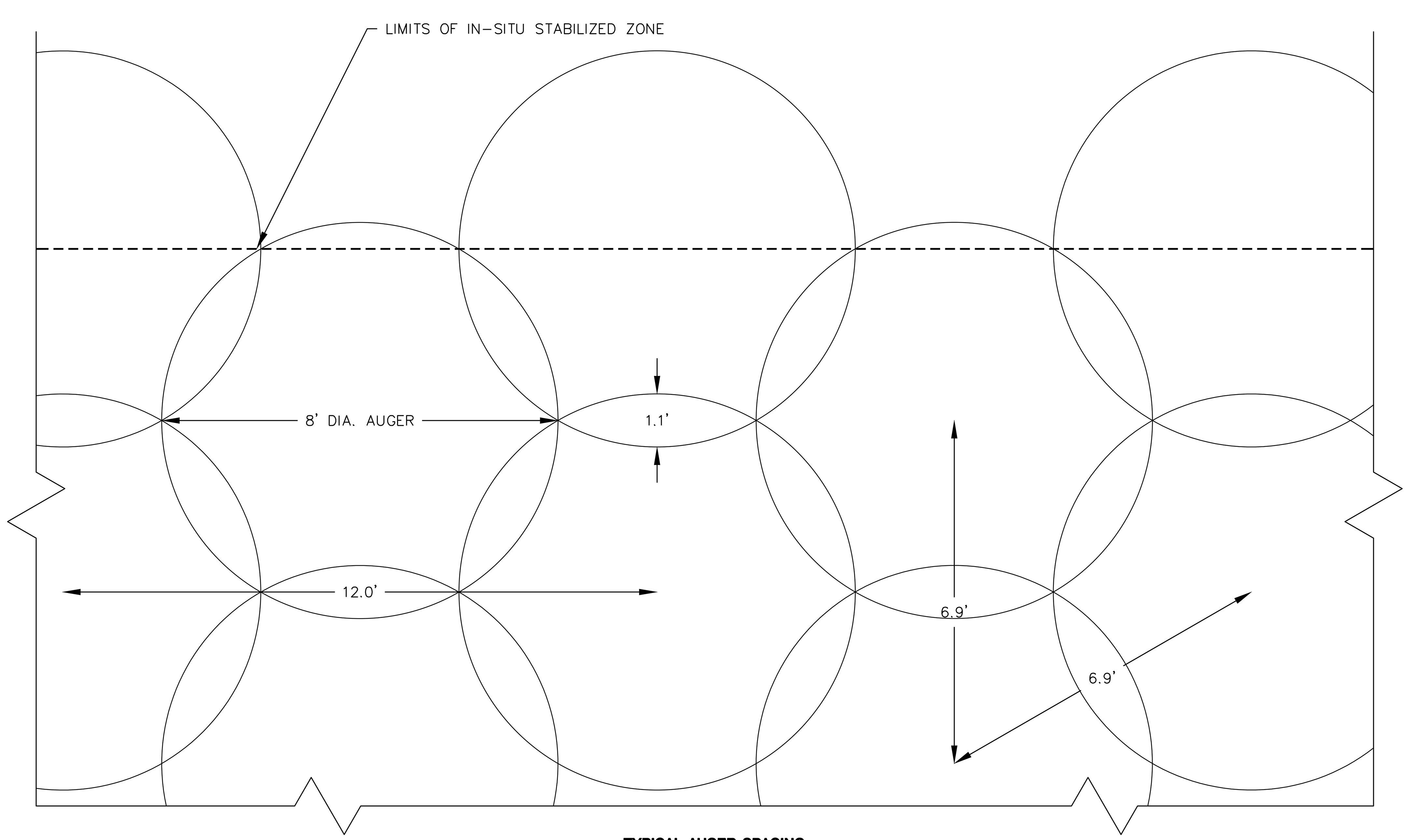
ENGINEER

SITE: ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

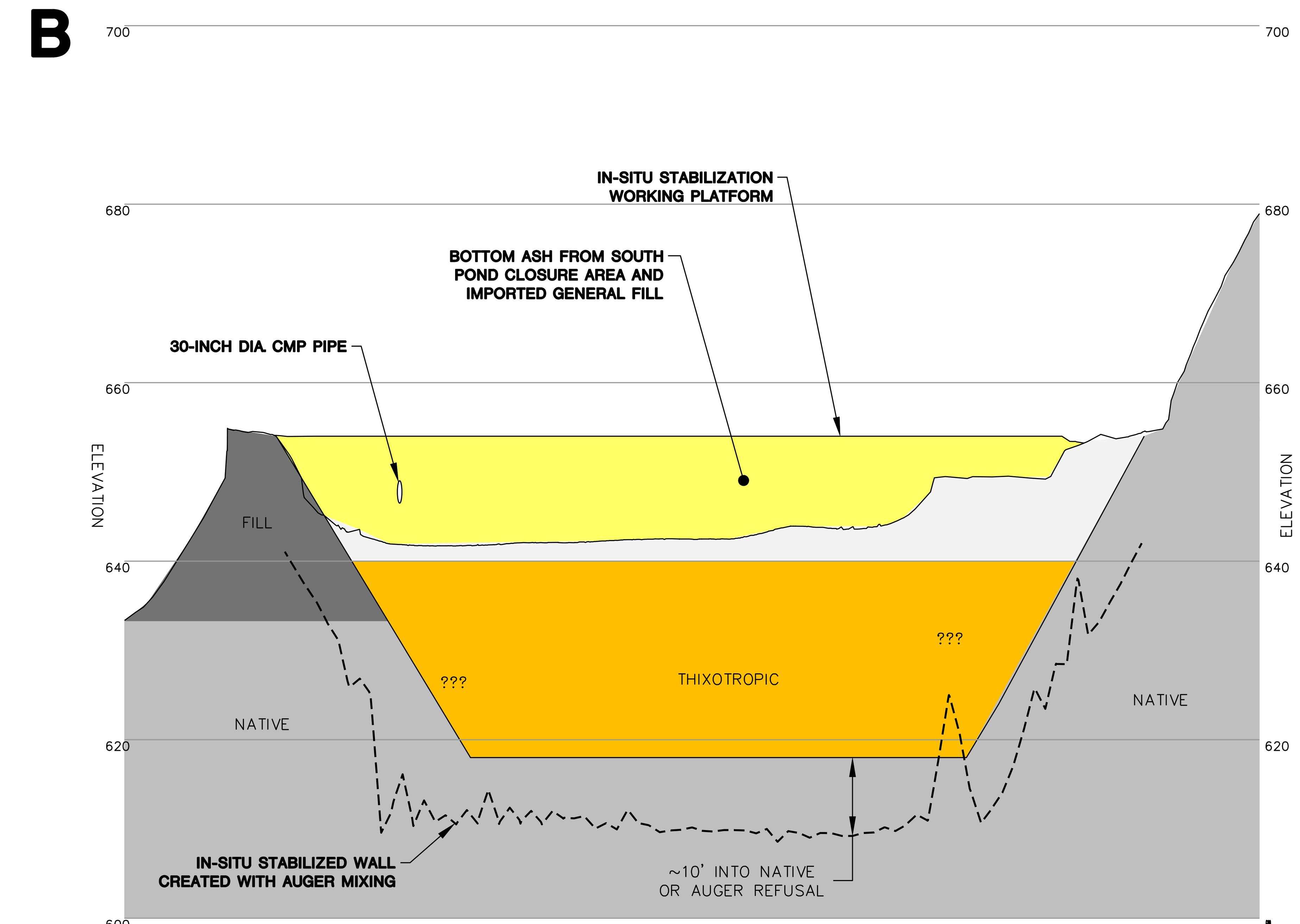
IN-SITU STABILIZATION WALL OVERVIEW

SHEET 5 of 19


NOTES:
1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
POWER PLANT DR
NORTH POND CLOSURE AREA
SOUTH POND CLOSURE AREA
POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 660 FEET
RELOCATED IN SERVICE CERAMIC LINED FIBERGLASS PIPE, REMOVED AFTER FLOWS TO UPPER ASH POND CEASED
POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 79 FEET
POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 670 FEET
POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 80 FEET
POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 698 FEET
UNDERFLOW WEIR
ISS COLUMN SPACING ALTERED TO AVOID CONFLICT WITH EXISTING PIPE PILE FOUNDATIONS
SILT CURTAIN (TYP.)
IN-SITU STABILIZATION AUGER LAYOUT
IN-SITU STABILIZED WALL INSTALLED IN CMP PIPE LOCATION. RE-INSTALLED CMP PIPE TO MANAGE PLANT FLOWS UNTIL FINAL ABANDONMENT.
POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 50 FEET
POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 21 FEET
POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 61 FEET
A
A'
B
B'
SCALE: 1" = 60'



TYPICAL AUGER SPACING
(SCALE: 1" = 2')


B
B'
700
680
660
640
620
600
ELEVATION
IN-SITU STABILIZATION WORKING PLATFORM
BOTTOM ASH FROM SOUTH POND CLOSURE AREA AND IMPORTED GENERAL FILL
30-INCH DIA. CMP PIPE
FILL
THIXOTROPIC
???
NATIVE
IN-SITU STABILIZED WALL CREATED WITH AUGER MIXING
~10' INTO NATIVE OR AUGER REFUSAL

SCALE: 1" = 60'
5X VERTICAL EXAGGERATION

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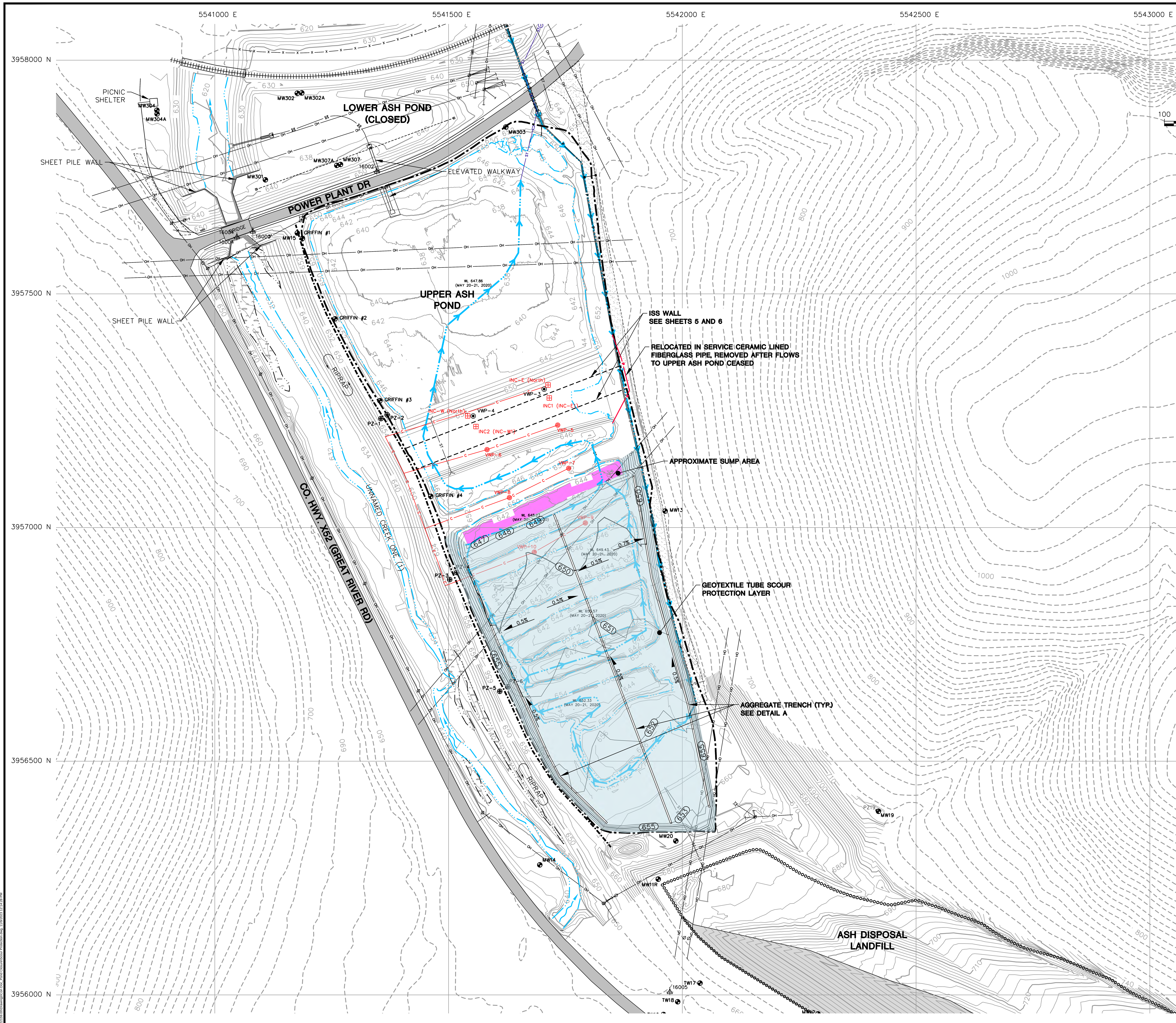
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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

SITE: ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

IN-SITU STABILIZATION WALL
AUGER LAYOUT

SHEET 6 of 19

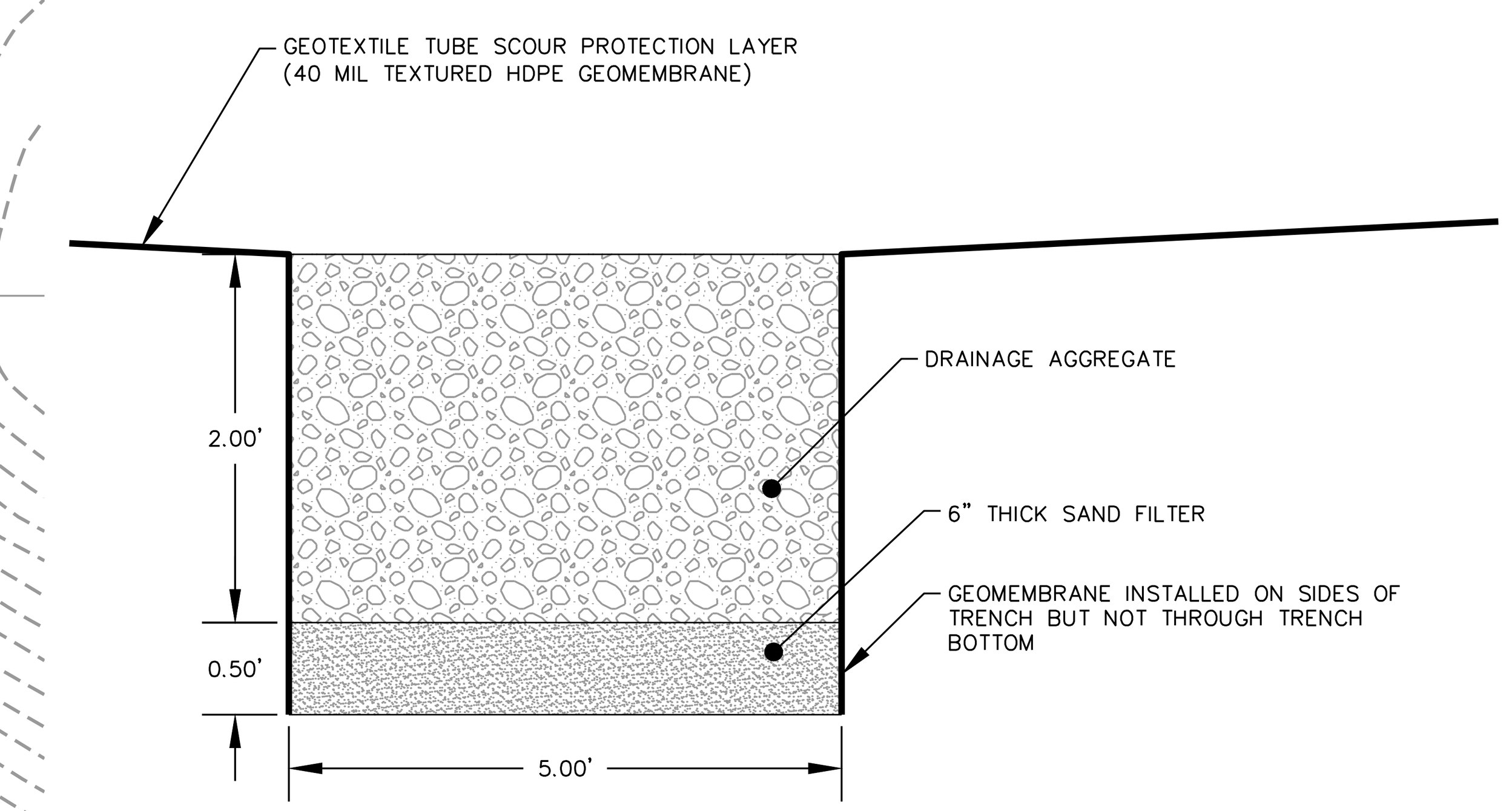


LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- PROCESS TRANSPORT WATER, PLANT AREA RUNOFF, AND DIRECT RAINFALL FLOW DIRECTION
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- 16002 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- VWP-3 VIBRATING WIRE PIEZOMETER (VWP)
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- 650 DOCUMENTED GRADE (10' CONTOUR)
- 652 DOCUMENTED GRADE (2' CONTOUR)
- LIMITS OF SCOUR PROTECTION GEOMEMBRANE
- APPROXIMATE GEOTEXTILE TUBE WATER MANAGEMENT SUMP
- VIBRATING WIRE PIEZOMETER (VWP)
- VIBRATING WIRE PIEZOMETER CABLE
- INCLINOMETER

NOTES:

1. SEE SHEET 2 OF THE POND CLOSURE PLAN SET FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. EXISTING MATERIAL WITHIN THE UPPER ASH POND MANAGED WITHIN THE FOOTPRINT OF THE POND OR RELOCATED TO THE ASH DISPOSAL LANDFILL.
3. DOCUMENTED GRADES FOR THE SCOUR PROTECTION LAYER SURVEYED BY MOHN SURVEYING, INC.



A AGGREGATE TRENCH
SCALE: 1" = 1'

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INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

CLIENT

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

ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

GEOTEXTILE TUBE SCOUR PROTECTION LAYER

SHEET
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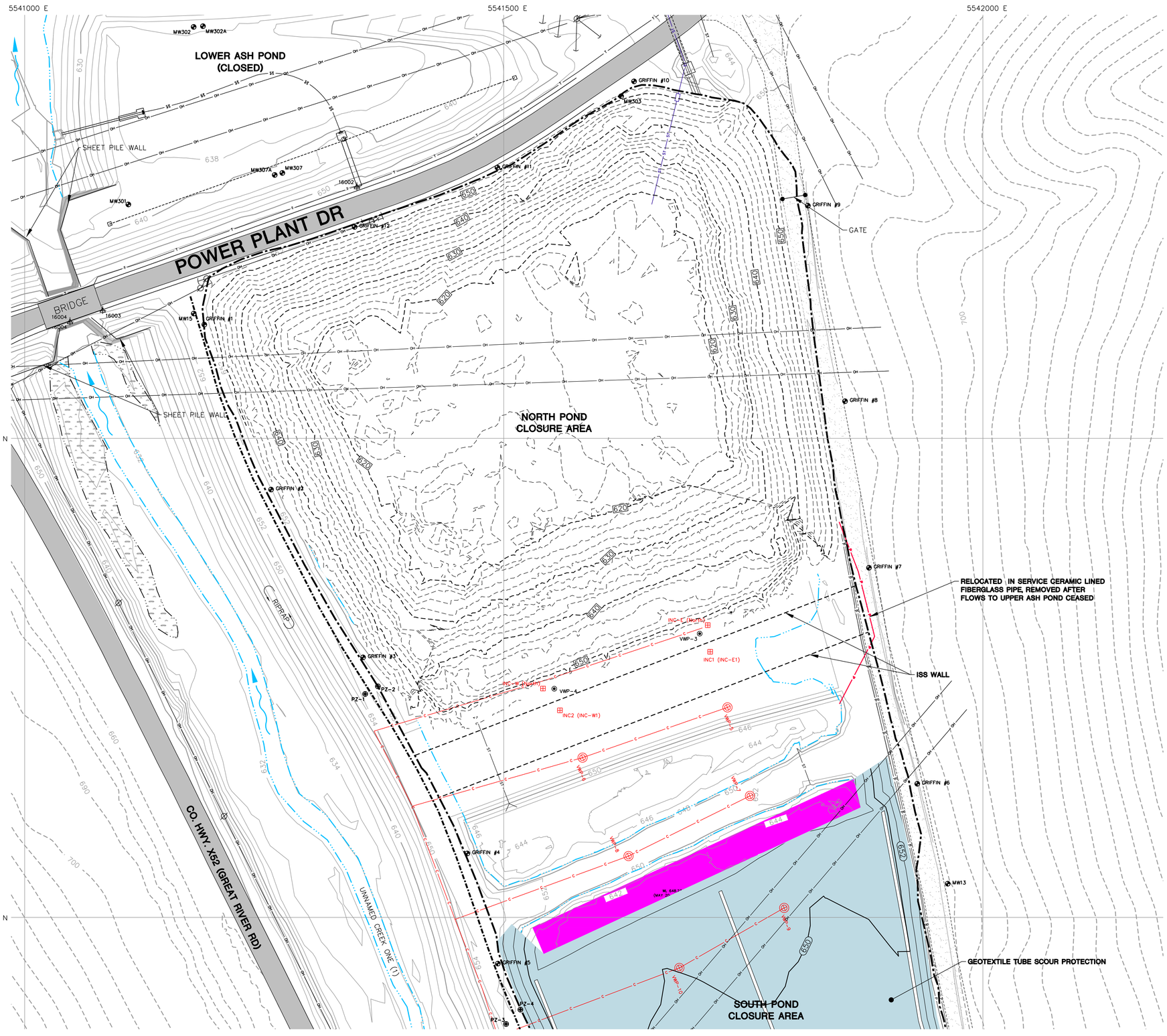

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MONITORING WELL
- ABANDONED MONITORING WELL
- PIEZOMETER
- ABANDONED PIEZOMETER
- ABANDONED SHALLOW PIEZOMETER
- WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- VIBRATING WIRE PIEZOMETER (VWP)
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- DOCUMENTED GRADE (10' CONTOUR)
- DOCUMENTED GRADE (2' CONTOUR)
- LIMITS OF SCOUR PROTECTION GEOMEMBRANE
- APPROXIMATE GEOTEXTILE TUBE WATER MANAGEMENT SUMP
- EXCAVATION GRADE (10' CONTOUR)
- EXCAVATION GRADE (2' CONTOUR)
- DEWATERING PUMPING WELL
- VIBRATING WIRE PIEZOMETER (VWP)
- VIBRATING WIRE PIEZOMETER CABLE
- INCLINOMETER

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. IN-SITU STABILIZATION COMPLETED PRIOR TO EXCAVATION/DREDGE.
3. MATERIAL REMOVED FROM THE NORTH POND CLOSURE AREA MANAGED WITHIN THE UPPER ASH POND LIMITS, GEOTEXTILE TUBE SCOUR PROTECTION AREA, OR RELOCATED TO THE ASH DISPOSAL LANDFILL.
4. DOCUMENTED GRADES FOR THE SCOUR PROTECTION LAYER SURVEYED BY MOHN SURVEYING, INC.
5. EXCAVATION GRADES BASED ON GROUND AND DRONE SURVEYS COMPLETED BY AMES THROUGHOUT CONSTRUCTION.

50 0 50
SCALE: 1" = 50'

N

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INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733
CLIENT

SCS ENGINEERS
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ENGINEER

ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA
SITE

NORTH POND CLOSURE AREA
EXCAVATION GRADES

SHEET
8 of 19

5541500 E

5542000 E

5542500 E

3957000 N

3956500 N

NORTH POND CLOSURE AREA

EXCAVATION GRADES

ISS WALL

SOUTH POND CLOSURE AREA

ASH DISPOSAL LANDFILL

CUT 30" DIA PIPE BACK TO SOUTH SLOPE OF SWALE

CO. HWY. X62 (GREAT RIVER RD)

UNNAMED CREEK ONE (1)

RIPRAP

4H:1V

GRIFFIN #1

GRIFFIN #2

GRIFFIN #3

GRIFFIN #4

GRIFFIN #5

GRIFFIN #6

GRIFFIN #7

PZ-1

PZ-2

PZ-4

PZ-5

PZ-6

MW13

MW14

MW11R

MW19

P219

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- 16002 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- GRIFFIN #1 DEWATERING PUMPING WELL
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- EXCAVATION GRADE (10' CONTOUR)
- EXCAVATION GRADE (2' CONTOUR)
- FINAL COVER DESIGN SUBGRADE (10' CONTOUR)
- FINAL COVER DESIGN SUBGRADE (2' CONTOUR)
- FINAL COVER LIMITS
- POINT NUMBER 2025 649.9' DOCUMENTATION SURVEY POINT
- TOP OF CCR/COAL IMPACTED MATERIAL ELEVATION

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES IN THE NORTH POND CLOSURE AREA REPRESENT BOTTOM OF CCR REMOVAL BASED ON SURVEYS PERFORMED BY AMES DURING CONSTRUCTION.
3. GRADES IN THE SOUTH POND CLOSURE AREA REPRESENT DESIGN TOP OF CCR FILL AND COAL IMPACTED MATERIAL GRADES.
4. EXISTING MATERIAL WITHIN THE UPPER ASH POND MANAGED WITHIN THE UPPER ASH POND LIMITS OR RELOCATED TO THE ASH DISPOSAL LANDFILL.
5. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

60 0 60

SCALE: 1" = 60'

N

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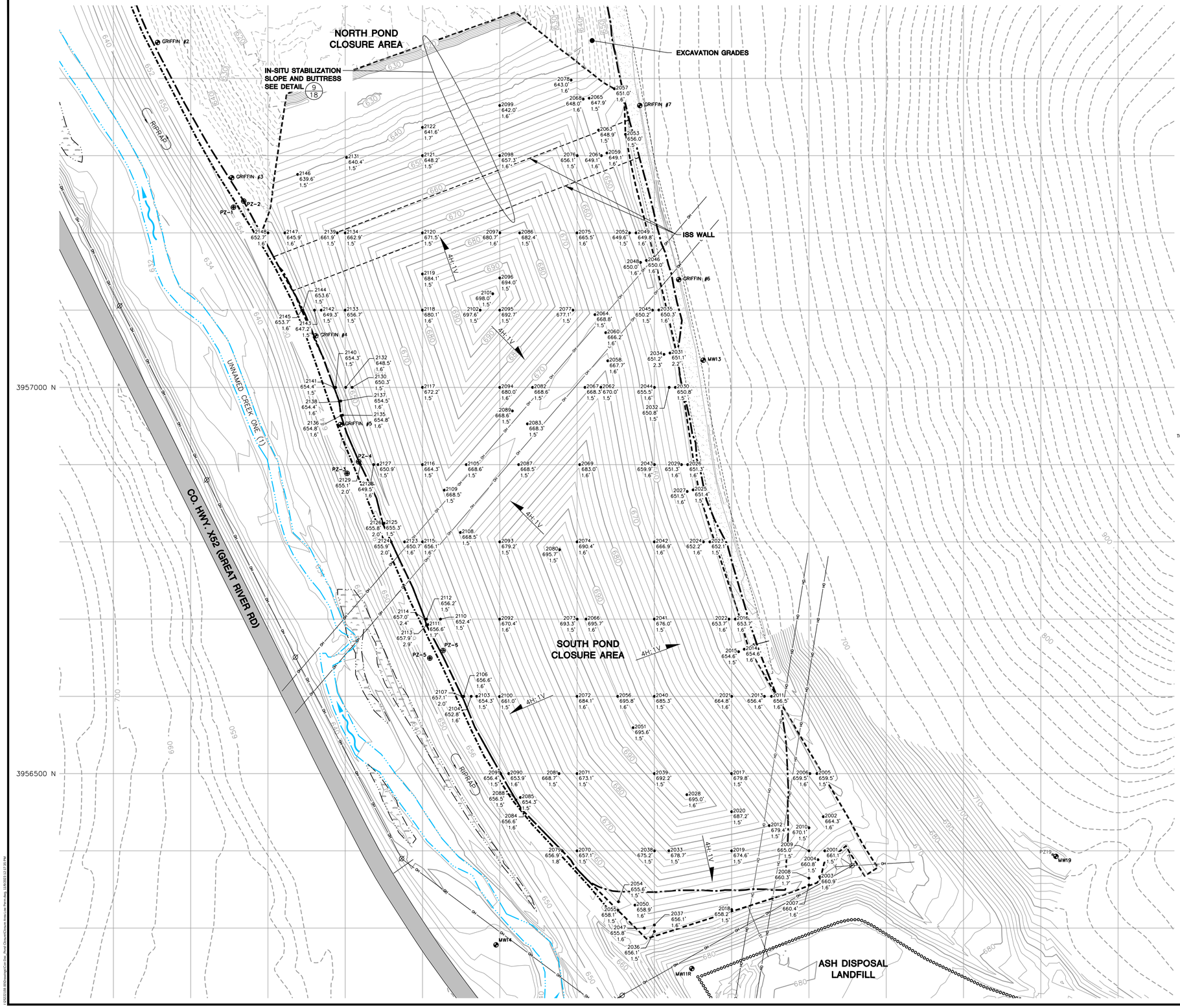
LANSING, IOWA

SITE

SOUTH POND CLOSURE AREA TOP OF CCR-COAL IMPACTED MATERIAL

SHEET 9 of 19



LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- UNNAMED CREEK FLOW PATH
- OH — OVERHEAD UTILITY
- T — TELEPHONE
- ST — STORM DRAINAGE PIPE
- P — PROCESS WATER PIPE
- ST — UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- 16002 — SURVEY CONTROL POINT
- MW17 — MONITORING WELL
- MW17 — ABANDONED MONITORING WELL
- MW12P — PIEZOMETER
- MW12P — ABANDONED PIEZOMETER
- PZ18 — ABANDONED SHALLOW PIEZOMETER
- PZ-1 — WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- GRIFFIN #1 — DEWATERING PUMPING WELL
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- 620 — EXCAVATION GRADE (10' CONTOUR)
- 618 — EXCAVATION GRADE (2' CONTOUR)
- 660 — TOP OF LOW PERMEABILITY SOIL (10' CONTOUR)
- 662 — TOP OF LOW PERMEABILITY SOIL (2' CONTOUR)
- FINAL COVER LIMITS
- DOCUMENTATION SURVEY POINT

POINT NUMBER — 2025 • TOP LOW PERMEABILITY SOIL ELEVATION — 651.4' — LOW PERMEABILITY SOIL THICKNESS — 1.5'

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES IN THE NORTH POND CLOSURE AREA REPRESENT BOTTOM OF CCR REMOVAL BASED ON SURVEYS PERFORMED BY AMES DURING CONSTRUCTION.
3. GRADES IN THE SOUTH POND CLOSURE AREA REPRESENT TOP OF LOW PERMEABILITY SOIL LAYER. TOP OF LOW PERMEABILITY SOIL GRADES BASED ON GROUND AND DRONE SURVEYS COMPLETED BY AMES THROUGHOUT CONSTRUCTION AND DESIGN GRADES.
4. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

100 0 100
SCALE: 1" = 100'

N

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2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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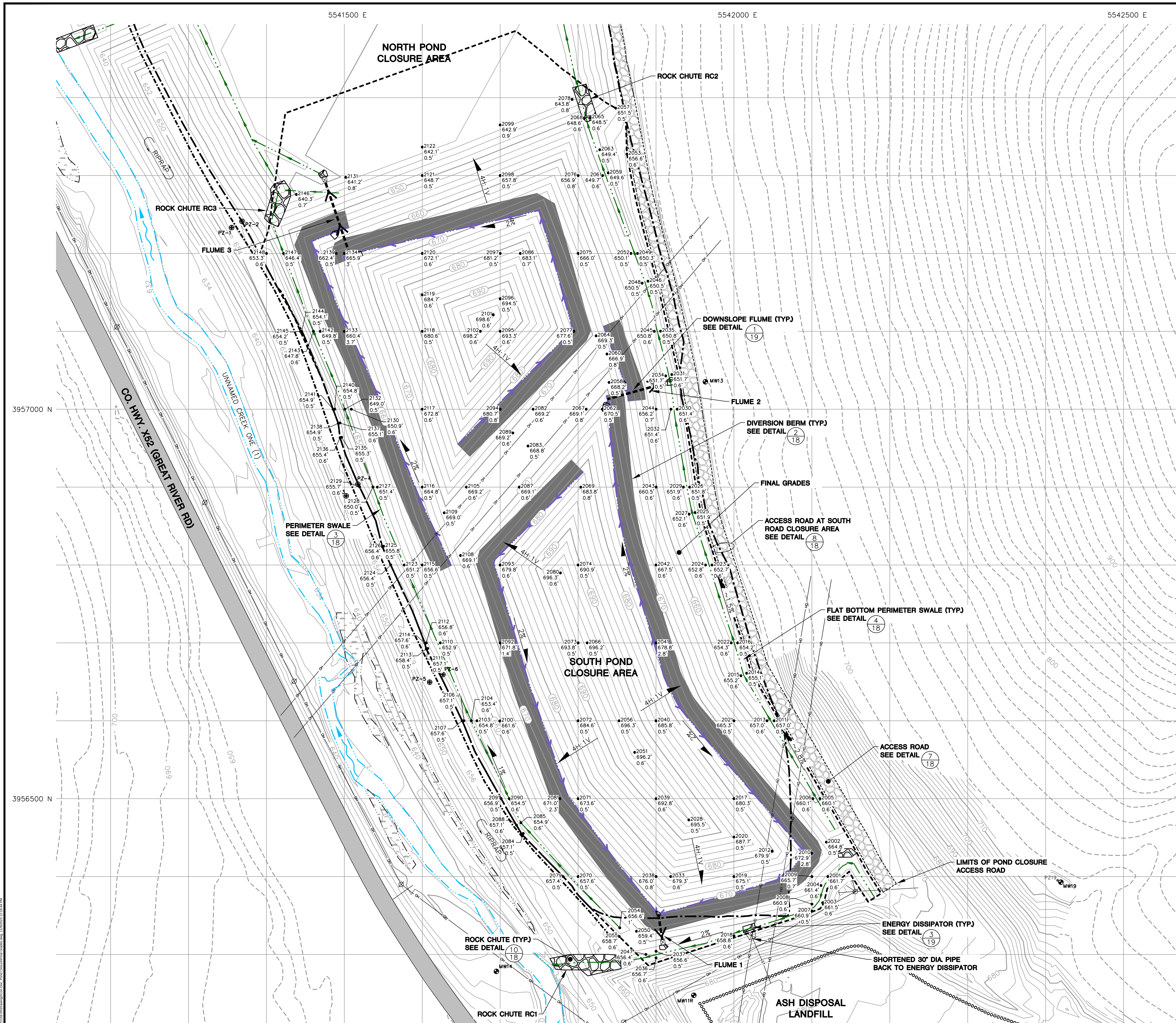
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

SITE
ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SHEET
SOUTH POND CLOSURE AREA TOP OF LOW PERMEABILITY LAYER

SHEET
10 of 19

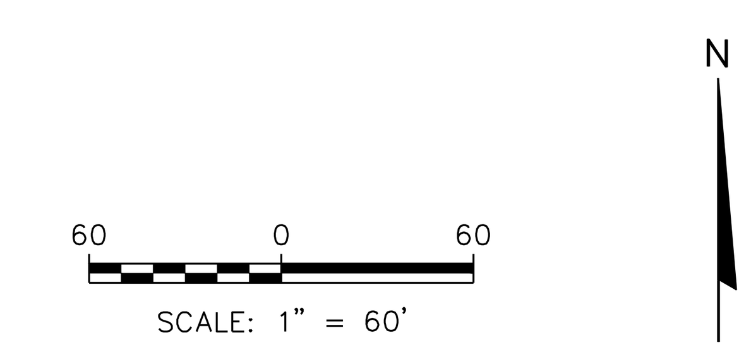


LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- 16002 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- DESIGN FINAL GRADE (10' CONTOUR)
- DESIGN FINAL GRADE (2' CONTOUR)
- FINAL COVER LIMITS
- DRAINAGE SWALE
- DIVERSION BERM
- DOWNSLOPE FLUME
- ENERGY DISSIPATOR
- ROCK CHUTE
- ACCESS ROAD
- DOCUMENTATION SURVEY POINT (POINT NUMBER 2025; TOP OF FINAL COVER 651.9'; TOP SOIL THICKNESS 0.5')

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. NORTH POND CLOSURE AREA GRADES REPRESENT DESIGN FINAL GRADES (TOP OF TOPSOIL).
3. SOUTH POND CLOSURE AREA GRADES REPRESENT DESIGN FINAL COVER GRADES (TOP OF TOPSOIL).
4. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.



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2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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

SITE: ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
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SOUTH POND CLOSURE AREA FINAL GRADES

SHEET 11 OF 19

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL APPROVED LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MONITORING WELL
- ABANDONED MONITORING WELL
- PIEZOMETER
- ABANDONED PIEZOMETER
- ABANDONED SHALLOW PIEZOMETER
- WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- DOCUMENTED FINAL GRADE (5' CONTOUR)
- DOCUMENTED FINAL GRADE (1' CONTOUR)
- FINAL COVER LIMITS
- DRAINAGE SWALE
- DIVERSION BERM
- DOWNSLOPE FLUME
- ENERGY DISSIPATOR
- ROCK CHUTE
- ACCESS ROAD RESTORATION
- VEGETATED RESTORATION

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. PLACED NON-CHANNEL EROSION MAT ON RESTORED SLOPES STEEPER OR EQUAL TO 4:1 OR AS NOTED.
3. PLACED CHANNEL EROSION MAT IN DRAINAGE SWALES.
4. CONTOURS WITHIN CONSTRUCTION LIMITS BASED ON SEPTEMBER 25, 2023 DRONE SURVEY PERFORMED BY AMES.

100 0 100
SCALE: 1" = 100'

N

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ENGINEER

ASH POND CLOSURE
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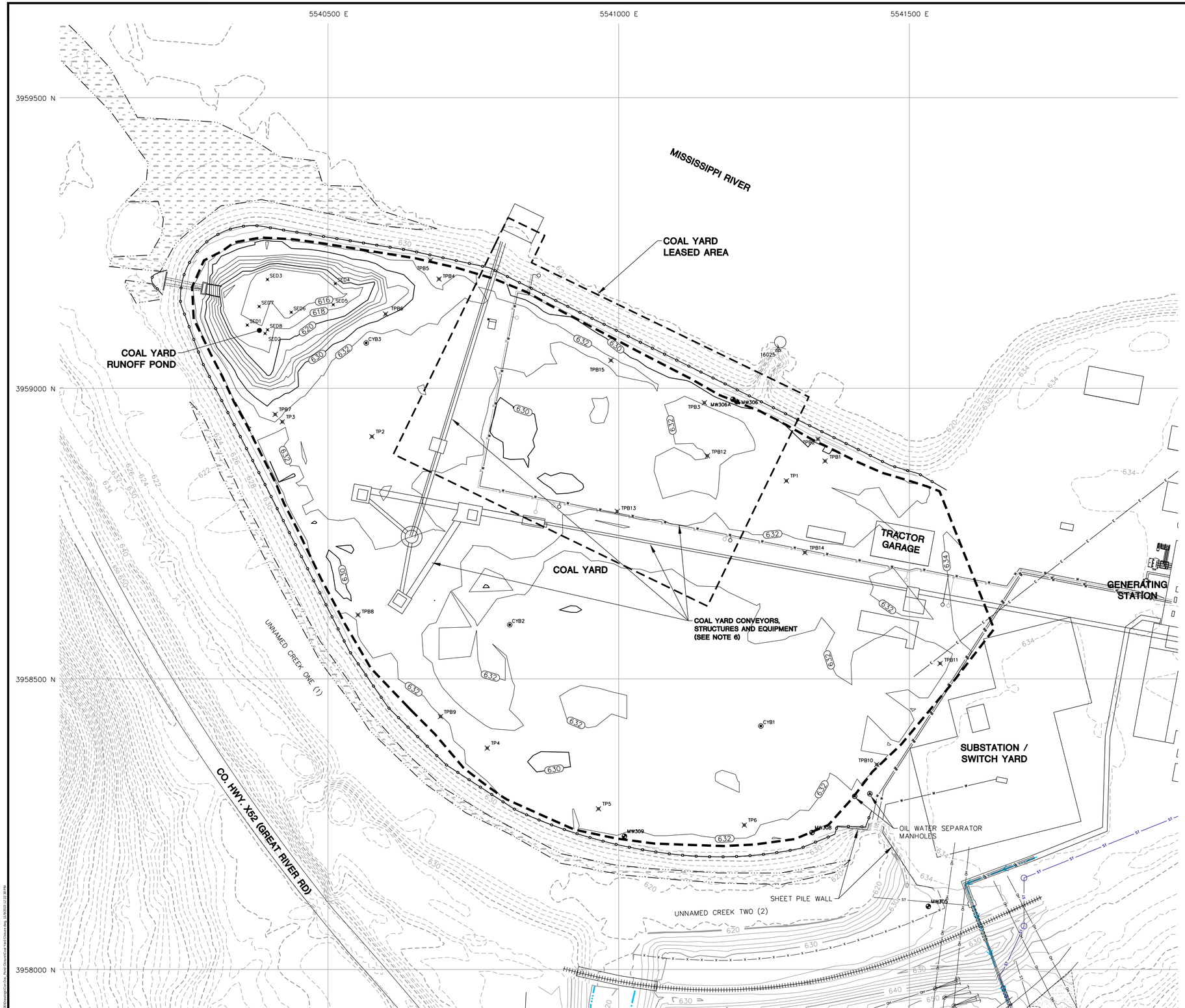
LANSING, IOWA

SITE

CLOSURE AREA RESTORATION

SHEET
12 of 19



LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2008 EXISTING GRADE (2' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- BURIED ELECTRIC
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- WATER
- ABANDONED WATER
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- 16002 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- CYB1 SOIL BORING
- SED1 SEDIMENT PROBE
- TP1 TEST PIT
- WETLAND
- OIL WATER SEPARATOR MANHOLE
- COAL YARD LEASED AREA
- 630 EXCAVATION GRADE (10' CONTOUR)
- 632 EXCAVATION GRADE (2' CONTOUR)
- SILT FENCE/FILTER SOCK
- LIMITS OF COAL YARD EXCAVATION

NOTES:

1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES IN COAL YARD REPRESENT BOTTOM OF COAL IMPACTED MATERIAL REMOVAL BASED ON SURVEYS PERFORMED BY AMES DURING CONSTRUCTION.
3. STRUCTURES AND UTILITIES IN THE COAL YARD AND GENERATING STATION AREA ARE APPROXIMATE AND BASED ON 2007 LANSING POWER STATION – PLOT PLAN (EIQ NO. 92–2686) AND NOVEMBER 5, 2014 COAL YARD FIRE PROTECTION SITE PLAN (DRAWING NO. 17692–LAN–M–001 AND 17692–LAN–M–002) PROVIDED BY IPL.
4. COAL YARD LEASE AREA LIMITS BY MOHN SURVEYING, INC. BASED ON LEASE INFORMATION PROVIDED BY IPL.
5. COAL AND COAL IMPACTED MATERIAL FROM THE COAL YARD AND COAL YARD RUNOFF POND DISPOSED UNDER THE FINAL COVER IN THE POND CLOSURE AREA OR ASH DISPOSAL LANDFILL.
6. COAL YARD CONVEYORS, STRUCTURES, AND EQUIPMENT DEMOLISHED/ABANDONED/REMOVED BY OTHERS. UTILITY AND STRUCTURE LOCATIONS ARE APPROXIMATE.

80 0 80
SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/09/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/03/2023

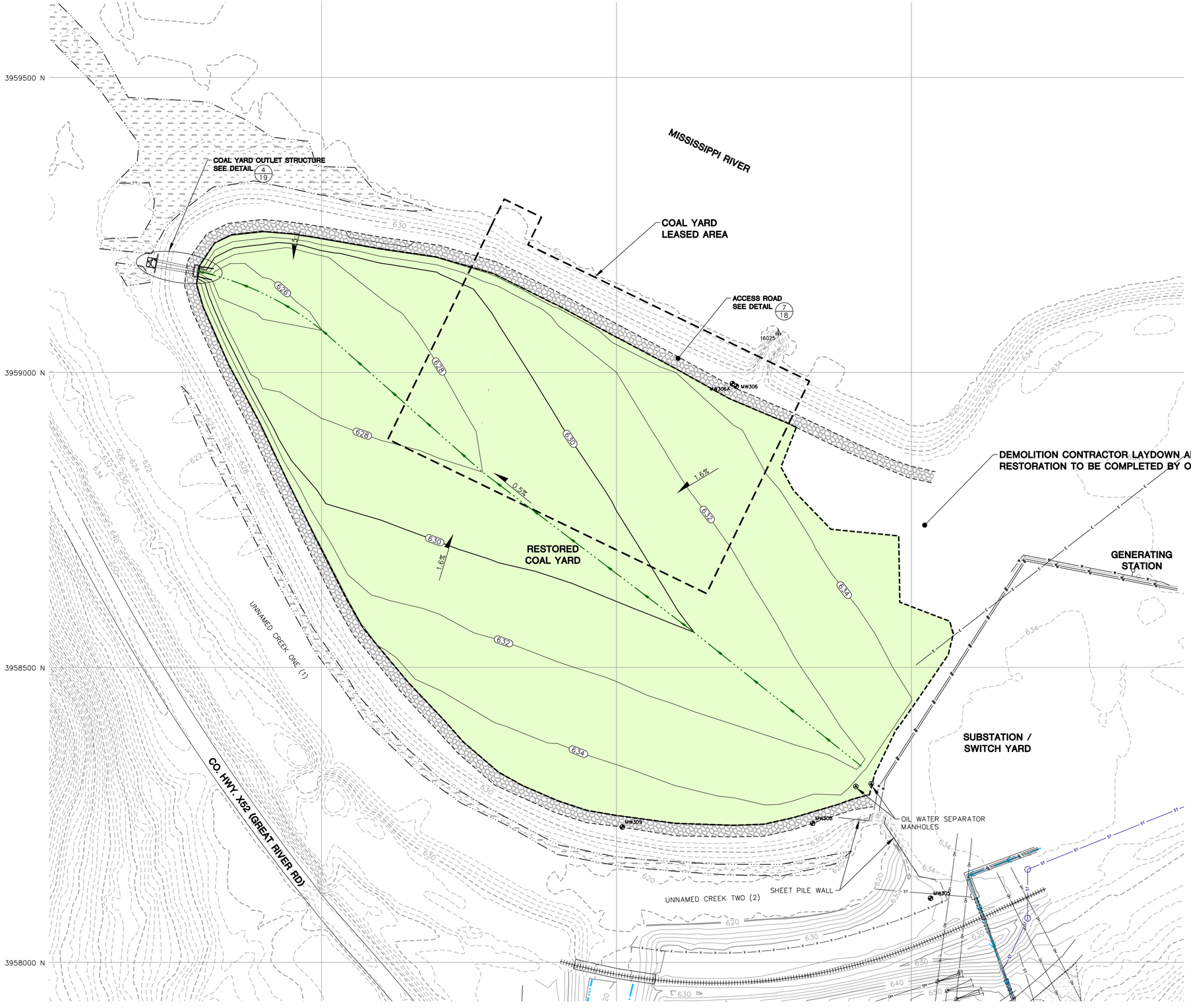
CLIENT
INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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

SITE
ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

COAL YARD EXCAVATION GRADES

SHEET
13 of 19



LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2008 EXISTING GRADE (2' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- BURIED ELECTRIC
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- WATER
- ABANDONED WATER
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- 16002 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- WETLAND
- COAL YARD LEASED AREA
- 630 DOCUMENTED FINAL GRADE (10' CONTOUR)
- 632 DOCUMENTED FINAL GRADE (2' CONTOUR)
- DRAINAGE SWALE
- ROCK CHUTE
- ACCESS ROAD RESTORATION
- VEGETATED RESTORATION
- COAL YARD RESTORATION LIMITS

NOTES:

1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. STRUCTURES AND UTILITIES IN THE COAL YARD AND GENERATING PLANT AREA ARE APPROXIMATE AND BASED ON 2007 LANSING POWER STATION – PLOT PLAN (EIQ NO. 92-2686) AND NOVEMBER 5, 2014 COAL YARD FIRE PROTECTION SITE PLAN (DRAWING NO. 17692-LAN-M-001 AND 17692-LAN-M-002) PROVIDED BY IPL.
3. COAL YARD LEASE AREA LIMITS BY MOHN SURVEYING, INC. BASED ON LEASE INFORMATION PROVIDED BY IPL.
4. CONTOURS IN RESTORED COAL YARD REPRESENT TOP OF TOPSOIL AND TOP OF ACCESS ROAD DOCUMENTED BY MOHN SURVEYING THROUGHOUT CONSTRUCTION.
5. RESTORED COAL YARD COVERED WITH A MINIMUM 4-INCHES OF TOPSOIL, SEED, FERTILIZER, AND MULCH.
6. PLACED NON-CHANNEL EROSION MAT ON RESTORED SLOPES STEEPER OR EQUAL TO 4:1, IN DRAINAGE SWALE, OR AS NOTED.

80 0 80
SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/09/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/03/2023

CLIENT
INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

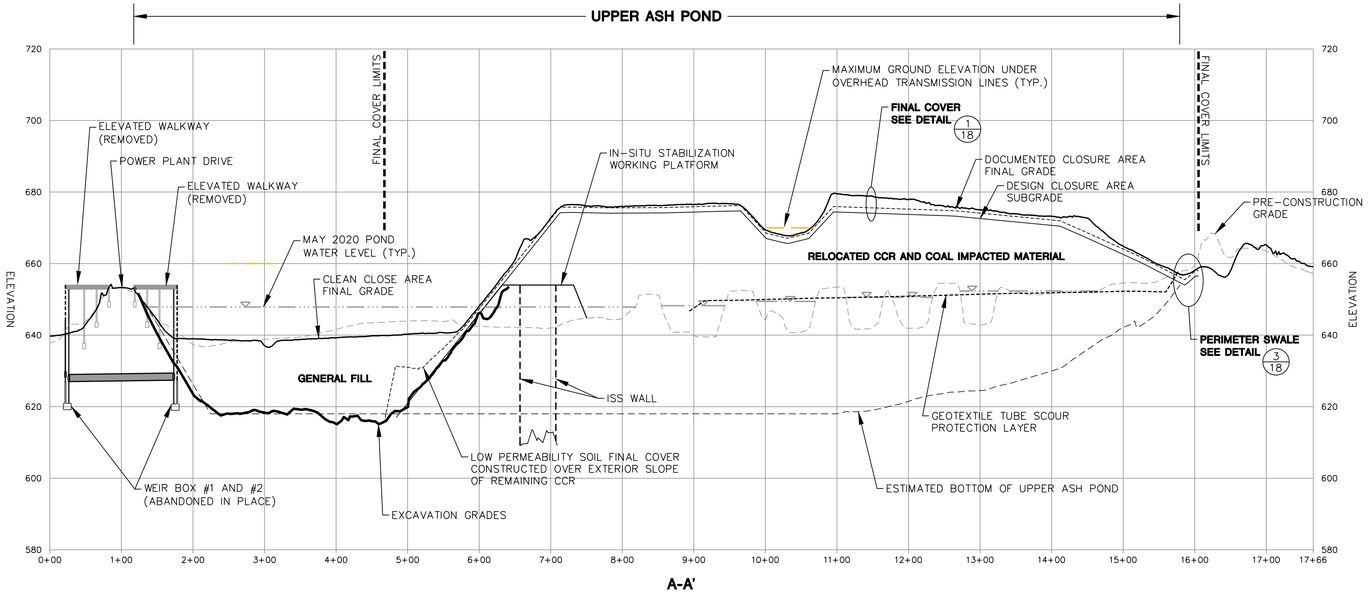
ENGINEER
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

SITE
ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

COAL YARD FINAL GRADES AND RESTORATION

SHEET
14 of 19

L:\2025\159.00\Drawings\Cover\Sht_Prod\ChosenCoal Yard Restoration.dwg, 11/8/2023 2:13:04 PM



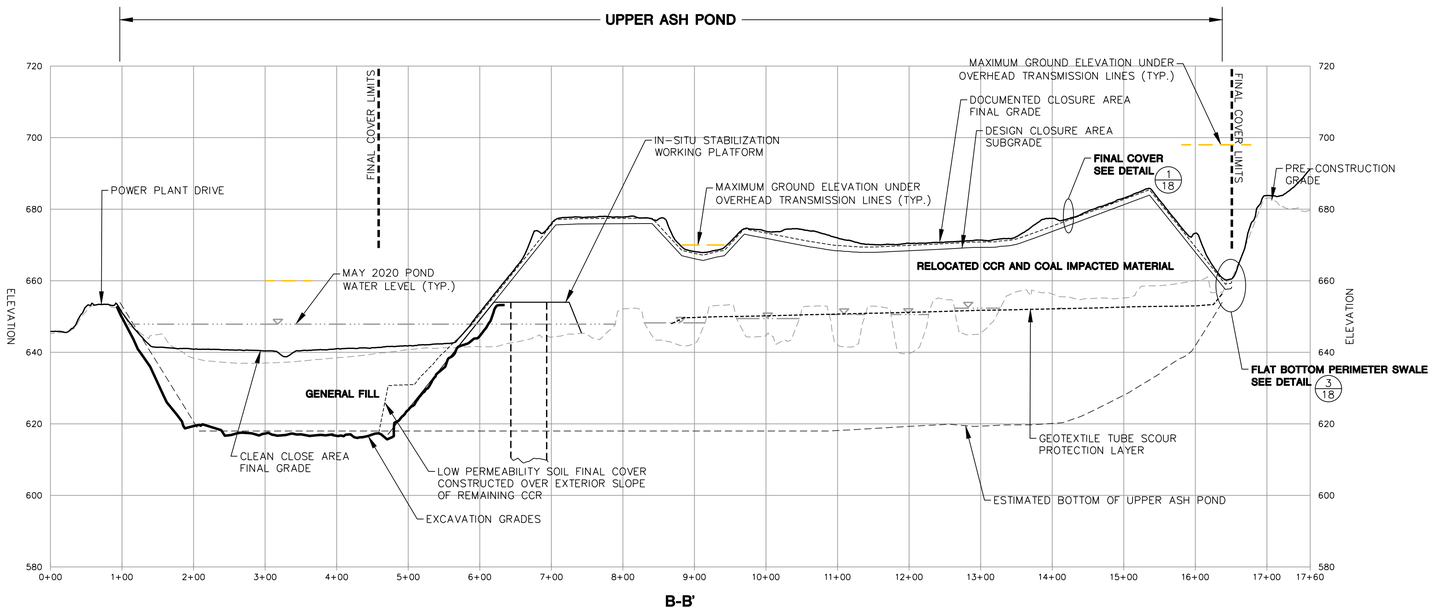
A-A'

NOTES:

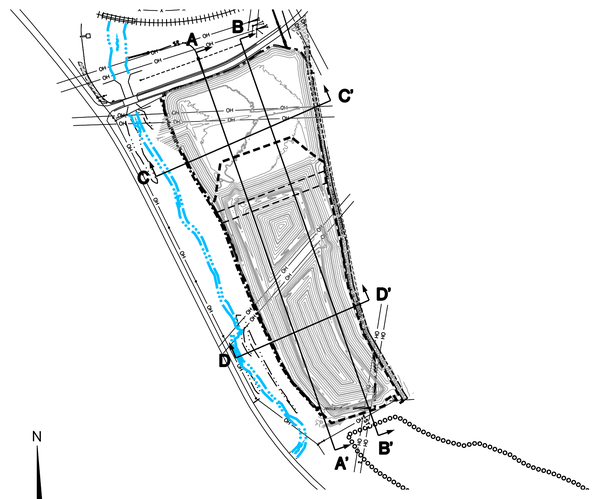
1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP NOTES.
2. DOCUMENTED GRADES FOR THE SCOUR PROTECTION LAYER SURVEYED BY MOHN SURVEYING, INC.
3. EXCAVATION GRADES BASED ON GROUND AND DRONE SURVEYS COMPLETED BY AMES THROUGHOUT CONSTRUCTION.
4. TOP OF LOW PERMEABILITY SOIL GRADES BASED ON GROUND AND DRONE SURVEYS COMPLETED BY AMES THROUGHOUT CONSTRUCTION AND DESIGN GRADES.
5. FINAL GRADES BASED ON SEPTEMBER 25, 2023 DRONE SURVEY PERFORMED BY AMES.
6. THE ESTIMATED BOTTOM OF THE UPPER ASH POND IS BASED ON JUNE 5, 1974 SARGENT & LUNDY SITE DEVELOPMENT DRAWINGS AND MARCH 15, 1993 SARGENT & LUNDY DRAWINGS (ALLIANT DRAWING NO. 1-0110-4-D-C8002) SUPPLEMENTED WITH INFORMATION FROM GEOTECHNICAL BORINGS COMPLETED IN THE UPPER ASH POND AREA OVERSEEN BY SCS ENGINEERS.

100 0 100

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



B-B'



CROSS SECTION LOCATION MAP

SCALE: 1" = 300'

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

DRAWN BY:	BSS/KP
CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/09/2023
PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	10/27/2023

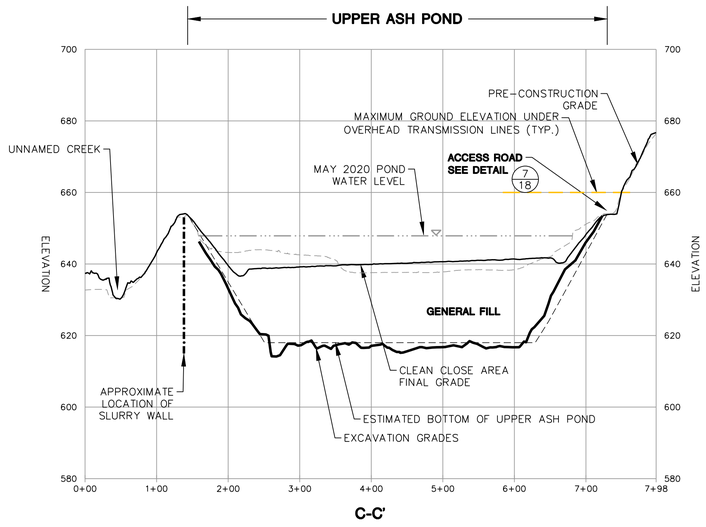
CLIENT
INTERSTATE POWER AND LIGHT CO.
3320 POWER PLANT DRIVE
LANSING, IA 52151-9733

ENGINEER

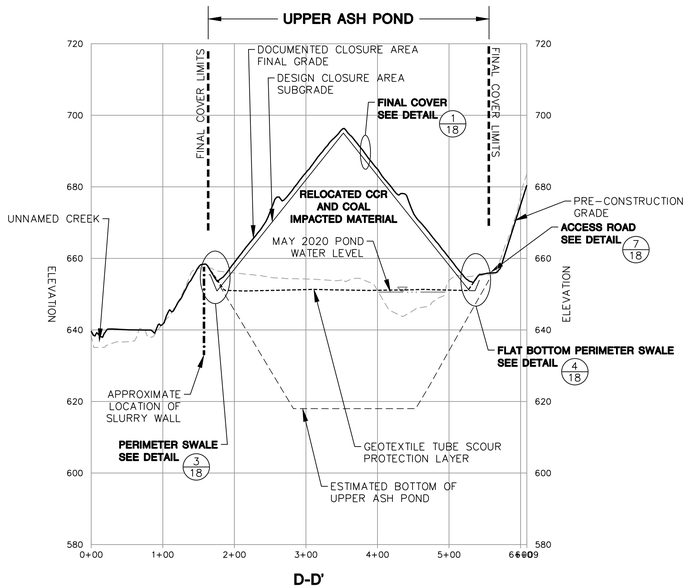
SITE
ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

CROSS SECTIONS A AND B

SHEET
15 of 19



C-C'



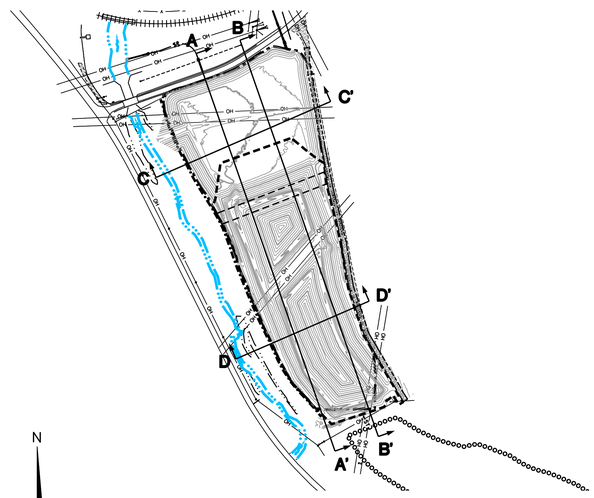
D-D'

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP NOTES.
2. DOCUMENTED GRADES FOR THE SCOUR PROTECTION LAYER SURVEYED BY MOHN SURVEYING, INC.
3. EXCAVATION GRADES BASED ON GROUND AND DRONE SURVEYS COMPLETED BY AMES THROUGHOUT CONSTRUCTION.
4. TOP OF LOW PERMEABILITY SOIL GRADES BASED ON GROUND AND DRONE SURVEYS COMPLETED BY AMES THROUGHOUT CONSTRUCTION AND DESIGN GRADES.
5. FINAL GRADES BASED ON SEPTEMBER 25, 2023 DRONE SURVEY PERFORMED BY AMES.
6. THE ESTIMATED BOTTOM OF THE UPPER ASH POND IS BASED ON JUNE 5, 1974 SARGENT & LUNDY SITE DEVELOPMENT DRAWINGS AND MARCH 15, 1993 SARGENT & LUNDY DRAWINGS (ALLIANT DRAWING NO. 1-0110-4-D-C8002) SUPPLEMENTED WITH INFORMATION FROM GEOTECHNICAL BORINGS COMPLETED IN THE UPPER ASH POND AREA OVERSEEN BY SCS ENGINEERS.

100 0 100

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



CROSS SECTION LOCATION MAP

SCALE: 1" = 300'

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

ENGINEER

ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING CLEAN ENERGY STATION
LANSING, IOWA

SITE

CROSS SECTIONS C AND D

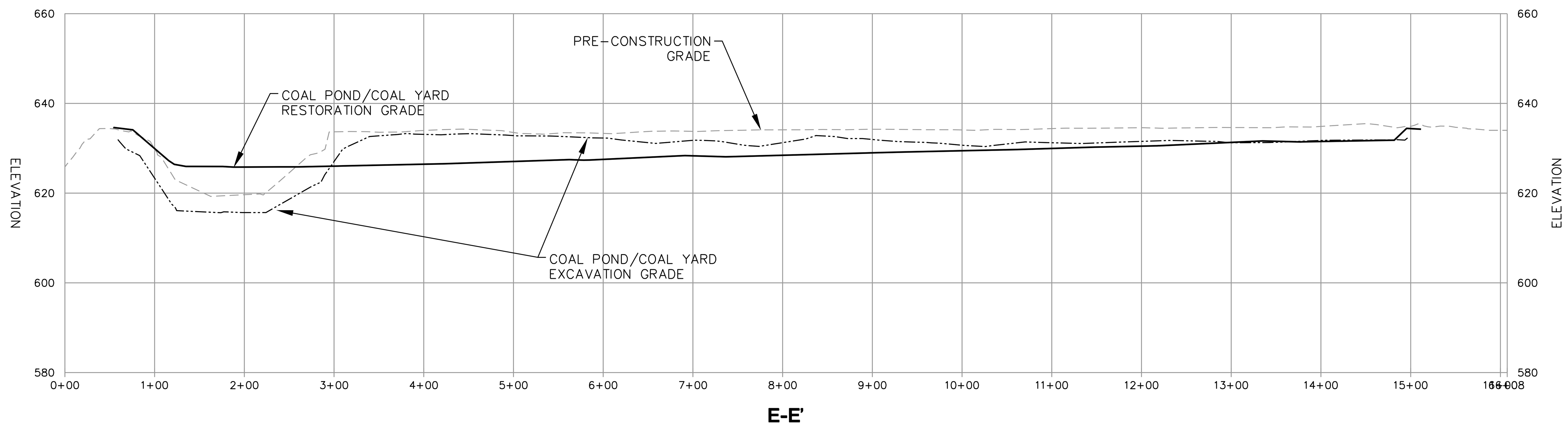
SHEET
16 of 19

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 10/27/2023

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/09/2023

CLIENT

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733



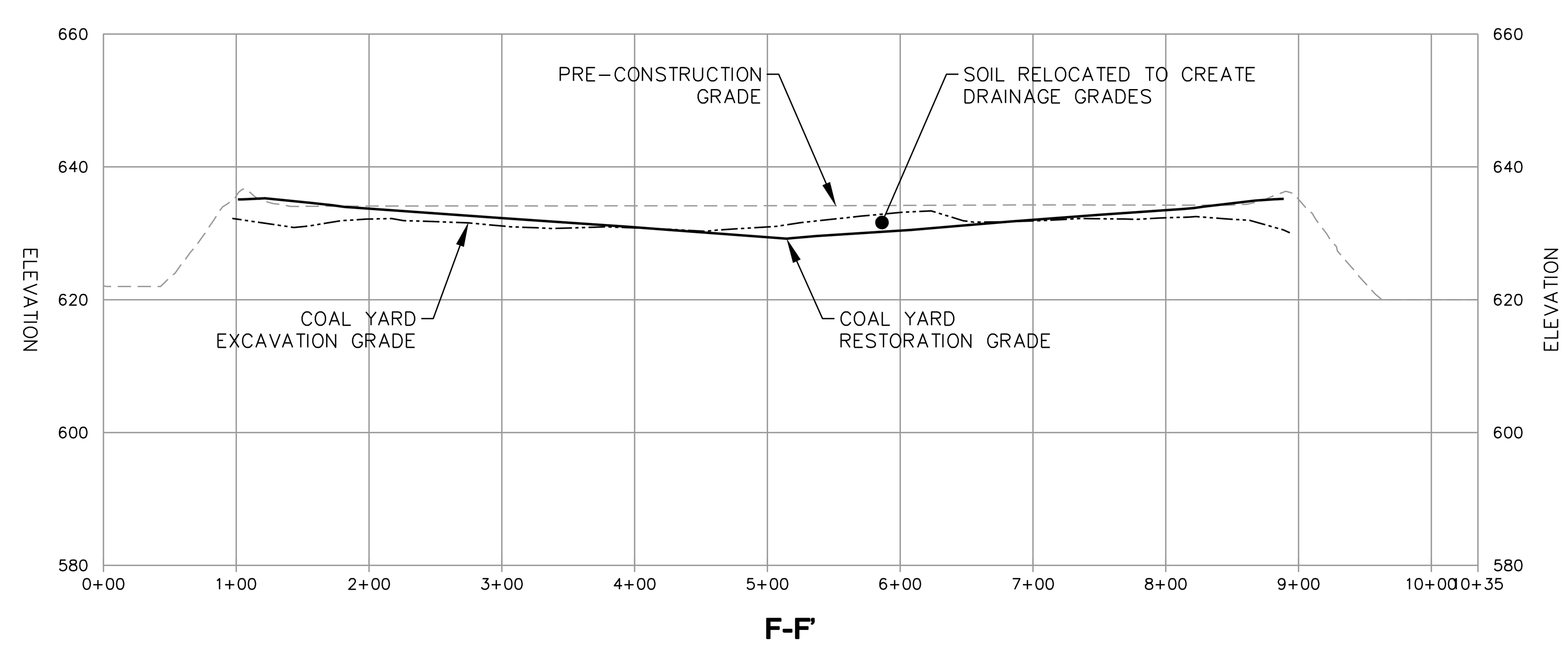
E-E'

NOTES:

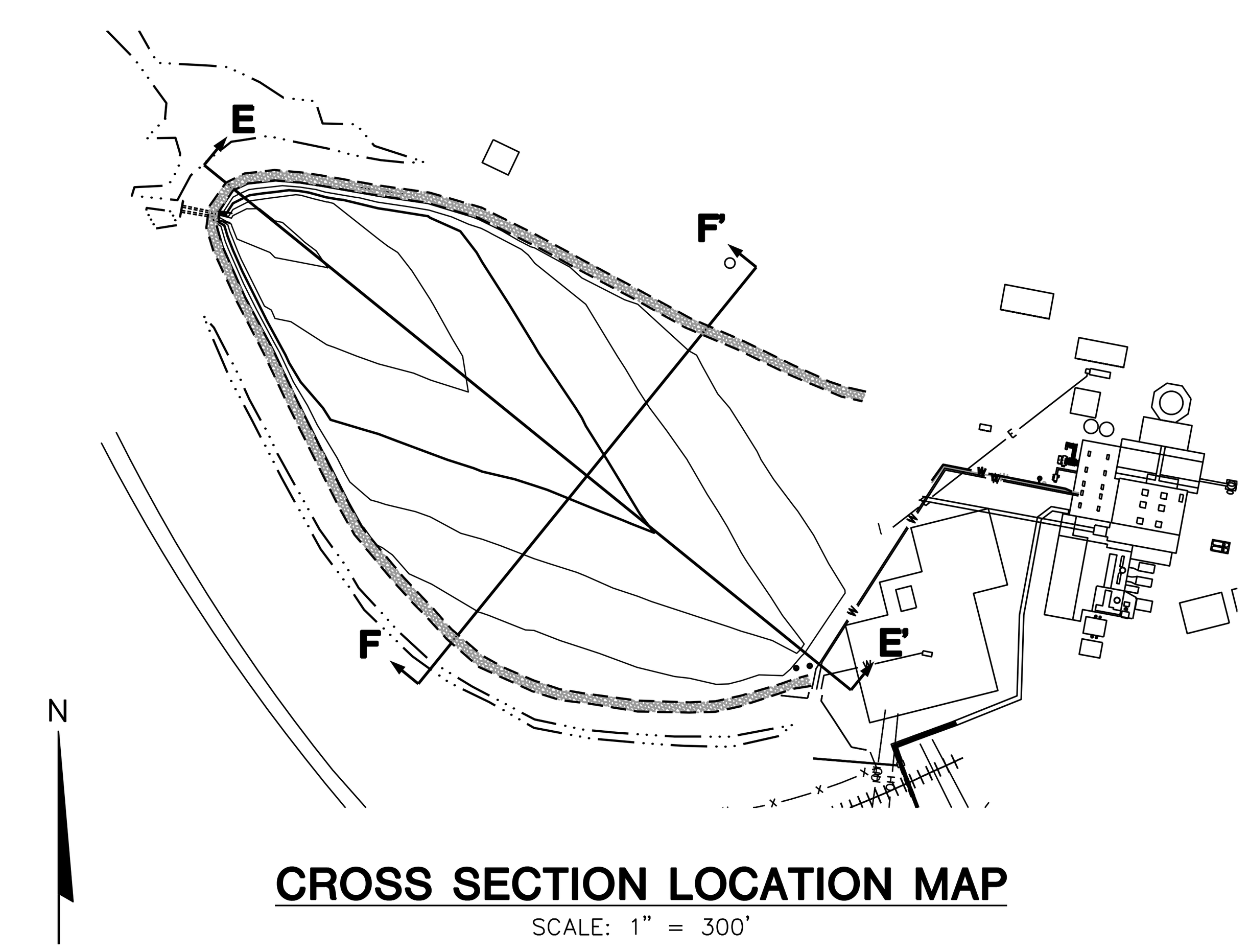
1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP NOTES.
2. EXCAVATION GRADES REPRESENT BOTTOM OF COAL IMPACTED MATERIAL REMOVAL BASED ON SURVEYS PERFORMED BY AMES DURING CONSTRUCTION.
3. COAL YARD RESTORATION GRADES DOCUMENTED BY MOHN SURVEYING, INC. THROUGHOUT CONSTRUCTION.

100 0 100

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



F-F'



CROSS SECTION LOCATION MAP

SCALE: 1" = 300'

PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	10/27/2023
DRAWN BY:	BSS/KP
CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/09/2023

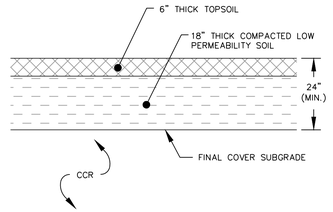
CLIENT: INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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

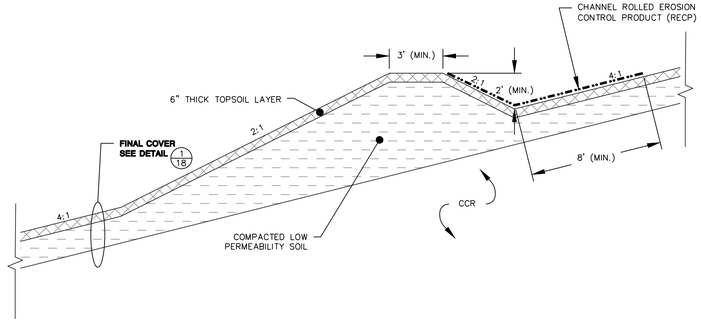
SITE: ASH POND CLOSURE
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

CROSS SECTIONS E AND F

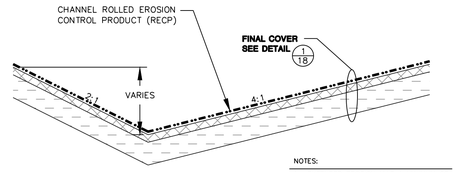
SHEET
17 OF 19



1/18 FINAL COVER
NOT TO SCALE

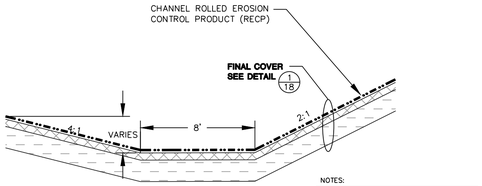


2/18 FINAL COVER DIVERSION BERM
NOT TO SCALE



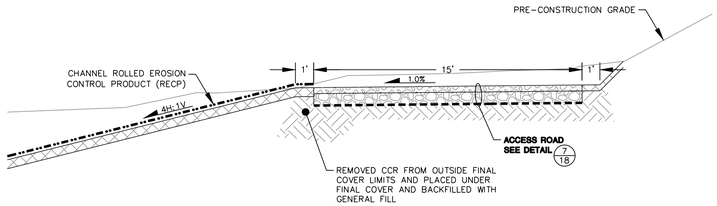
NOTES:
1. EXTENDED EROSION MAT A MINIMUM OF 12 FEET UP SWALE SIDE SLOPES.

3/18 PERIMETER SWALE
NOT TO SCALE

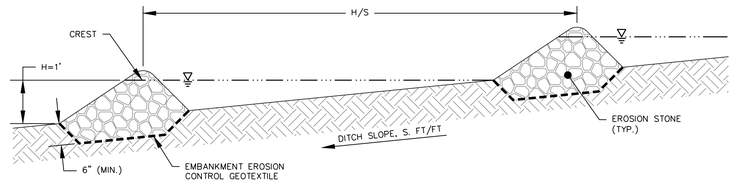


NOTES:
1. EXTENDED EROSION MAT A MINIMUM OF 12 FEET UP SWALE SIDE SLOPES.

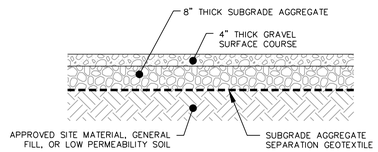
4/18 FLAT BOTTOM PERIMETER SWALE
NOT TO SCALE



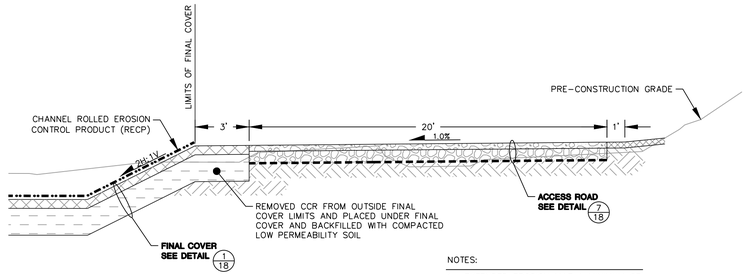
5/18 ACCESS ROAD AT NORTH POND CLOSURE AREA
NOT TO SCALE



6/18 TYPICAL ROCK CHECK DAM
NOT TO SCALE

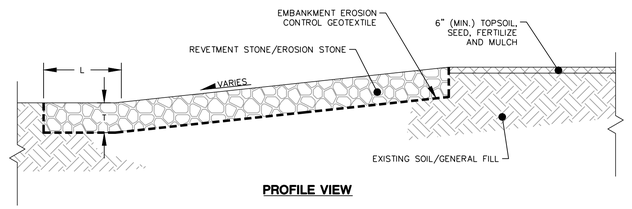


7/18 ACCESS ROAD
NOT TO SCALE

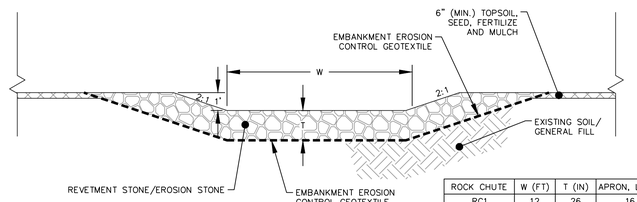


NOTES:
1. EXTENDED EROSION MAT A MINIMUM OF 12 FEET UP SWALE SIDE SLOPES.

8/18 ACCESS ROAD AT SOUTH POND CLOSURE AREA
NOT TO SCALE



PROFILE VIEW



ROCK CHUTE	W (FT)	T (IN)	APRON, L (FT)	IDOT RIPRAP CLASSIFICATION
RC1	12	26	16	REVETMENT STONE CLASS E
RC2	10	16	9	EROSION STONE
RC3	4	16	9	EROSION STONE

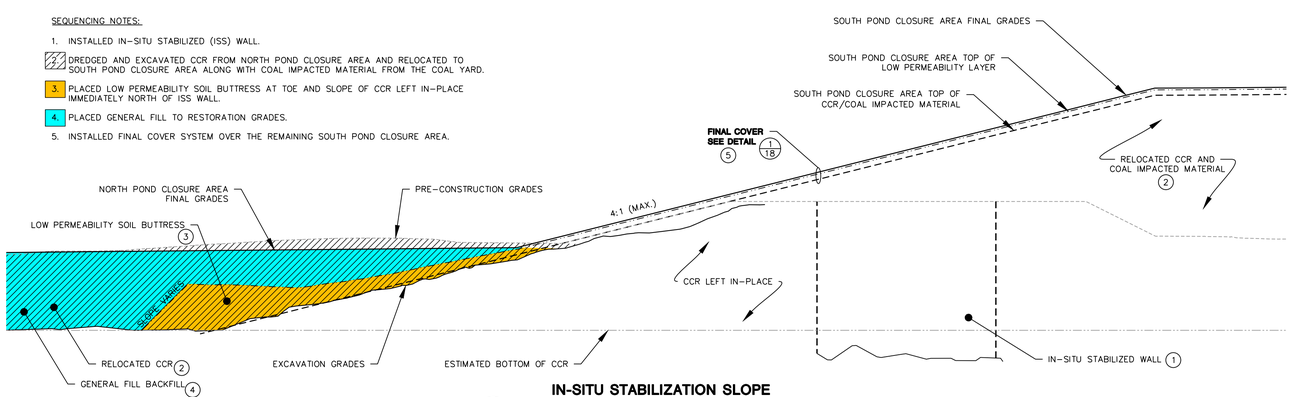
NOTES:
1. TOP OF REVETMENT STONE/EROSION STONE FLUSH WITH SURROUNDING GRADES.

SECTION VIEW

10/18 ROCK CHUTE
NOT TO SCALE

SEQUENCING NOTES:

1. INSTALLED IN-SITU STABILIZED (ISS) WALL.
2. DREDGED AND EXCAVATED CCR FROM NORTH POND CLOSURE AREA AND RELOCATED TO SOUTH POND CLOSURE AREA ALONG WITH COAL IMPACTED MATERIAL FROM THE COAL YARD.
3. PLACED LOW PERMEABILITY SOIL BUTTRESS AT TOE AND SLOPE OF CCR LEFT IN-PLACE IMMEDIATELY NORTH OF ISS WALL.
4. PLACED GENERAL FILL TO RESTORATION GRADES.
5. INSTALLED FINAL COVER SYSTEM OVER THE REMAINING SOUTH POND CLOSURE AREA.



9/18 IN-SITU STABILIZATION SLOPE AND BUTTRESS
SCALE: 1" = 20'

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

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CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/09/2023
PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	10/27/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

CLIENT

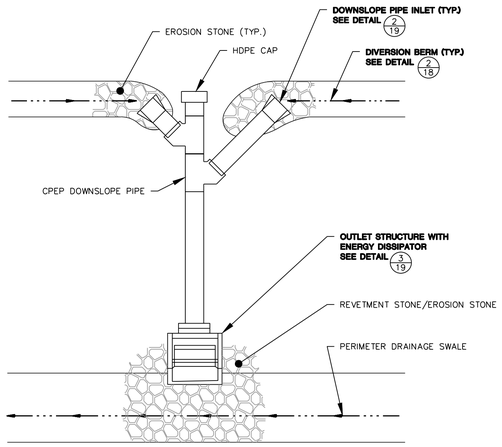
ASH POND CLOSURE CONSTRUCTION DOCUMENTATION LANSING GENERATING STATION LANSING, IOWA

SITE

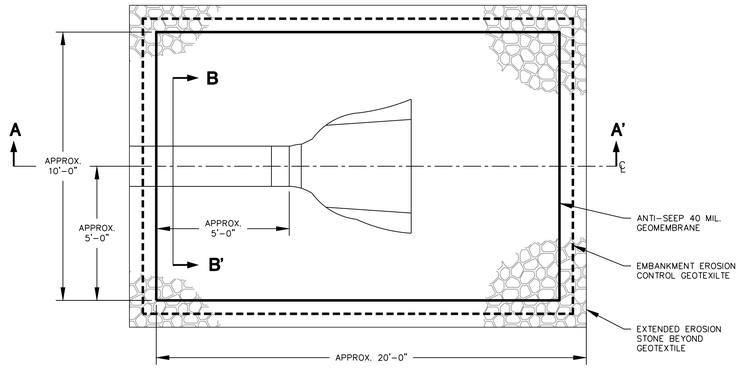
DETAILS

SHEET
18 of 19

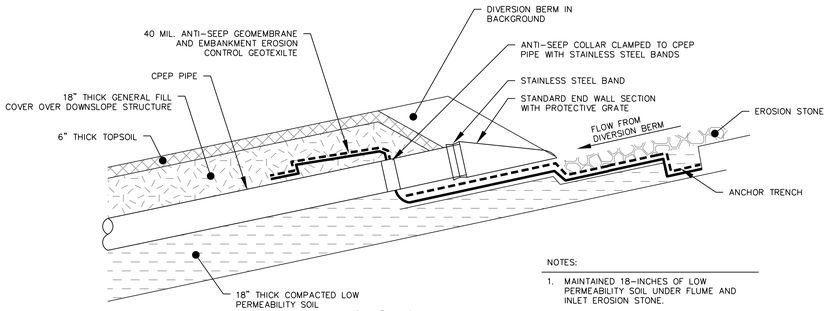
L:\2025\25159.00\Drawings\Cover Sheet Plans\Details.dwg, 11/6/2023 12:35:56 PM



1/19 DOWNSLOPE PIPE
NOT TO SCALE

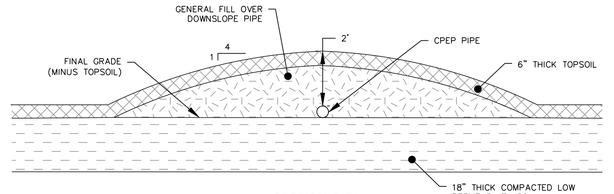


PLAN VIEW



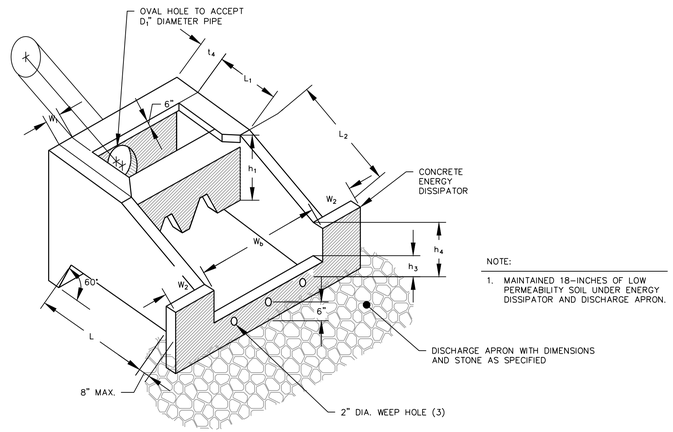
NOTES:
1. MAINTAINED 18-INCHES OF LOW PERMEABILITY SOIL UNDER FLUME AND INLET EROSION STONE.

SECTION A-A'



SECTION B-B'

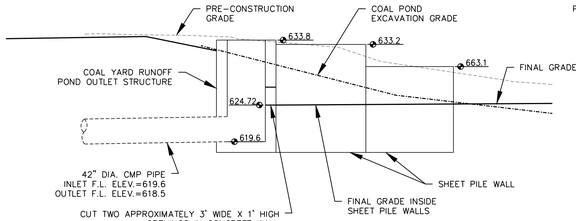
2/19 DOWNSLOPE INLET STRUCTURE
NOT TO SCALE



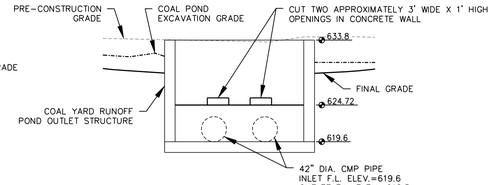
NOTE:
1. MAINTAINED 18-INCHES OF LOW PERMEABILITY SOIL UNDER ENERGY DISSIPATOR AND DISCHARGE APRON.

		Energy Dissipator Dimensions (feet)										Discharge Apron				
Flume	D_1 (in.)	W_b	h_1	h_3	h_4	L	L_1	L_2	W_1	W_2	t_4	Chute Width (ft.)	Apron Width (ft.)	Length (ft.)	Thickness (in.)	Stone Type
Flume 4/ Flume 5	30	8	6.17	1.33	3.33	10.67	4.58	6.17	0.58	2.17	0.5	10	10	12	20	IDOT Revetment Stone Class E
Flume 1																
Flume 2	18	4	3.08	0.67	1.67	5.42	2.33	3.08	0.33	1.08	0.5	6	6	7	12	IDOT Erosion Stone
Flume 3																

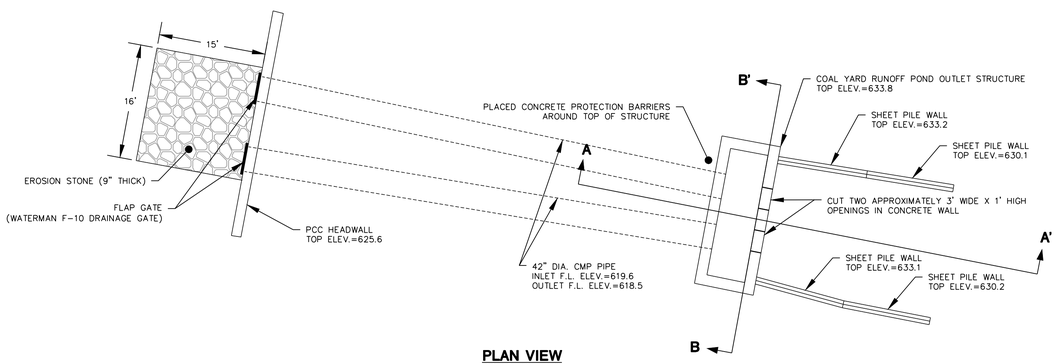
3/19 ENERGY DISSIPATOR
NOT TO SCALE



PROFILE A-A'
SCALE: 1" = 10'



PROFILE B-B'
SCALE: 1" = 10'



PLAN VIEW
SCALE: 1" = 10'

4/19 COAL YARD OUTLET STRUCTURE
NOT TO SCALE

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

ENGINEER

ASH POND CLOSURE CONSTRUCTION
DOCUMENTATION LANSING GENERATING STATION LANSING, IOWA

SITE

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

CLIENT

DETAILS

DRAWN BY:	BSS/KP		
CHECKED BY:	BSS/MRH		
APPROVED BY:	MRS 11/09/2023		
PROJECT NO.	25222159.00		
DRAWN:	10/05/2023		
REVISED:	10/27/2023		

SHEET
19 of 19

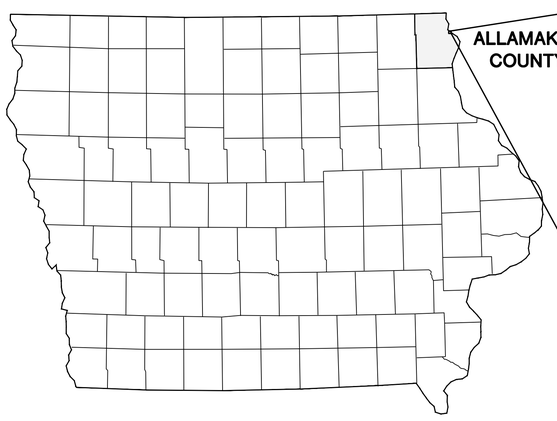
2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION

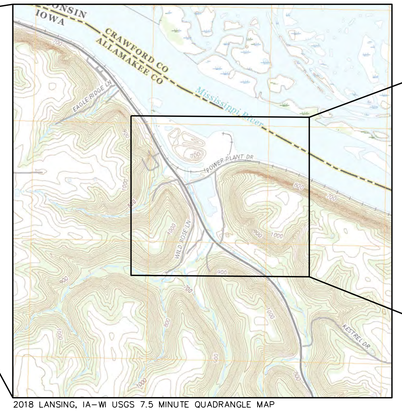
LANSING GENERATING STATION
LANSING, IOWA

PREPARED FOR: INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IOWA

PREPARED BY: SCS ENGINEERS
MADISON, WISCONSIN

DATE: NOVEMBER 2023

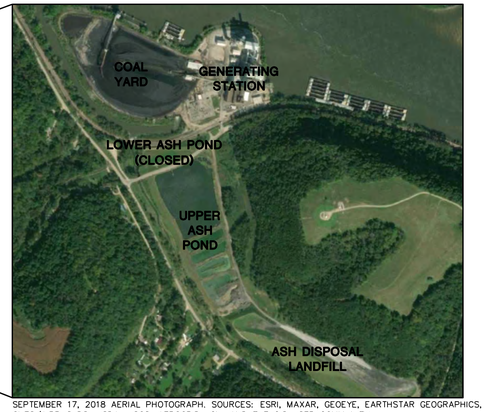




2018 LANSING, IA–WI USGS 7.5 MINUTE QUADRANGLE MAP

SITE LOCATOR MAP

APPROXIMATE SCALE: 1" = 2,000'



SEPTEMBER 17, 2018 AERIAL PHOTOGRAPH. SOURCES: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

SITE AERIAL

SCALE: 1" = 700'

INDEX

SHEET NUMBER	SHEET TITLE
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3	PRE-CONSTRUCTION CONDITIONS
4	LANDFILL COVER SUBGRADES
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6	LANDFILL COVER SUBGRADES - SOUTHEAST
7	LANDFILL TOP OF SELECT CLAY FILL
8	LANDFILL TOP OF SELECT CLAY FILL - NORTHWEST
9	LANDFILL TOP OF SELECT CLAY FILL - SOUTHEAST
10	LANDFILL FINAL GRADES
11	LANDFILL FINAL GRADES - NORTHWEST
12	LANDFILL FINAL GRADES - SOUTHEAST
13	RESTORATION PLAN
14	CROSS SECTIONS
15	DETAILS
16	DETAILS
17	DETAILS

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

ENGINEER

CLIENT
INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

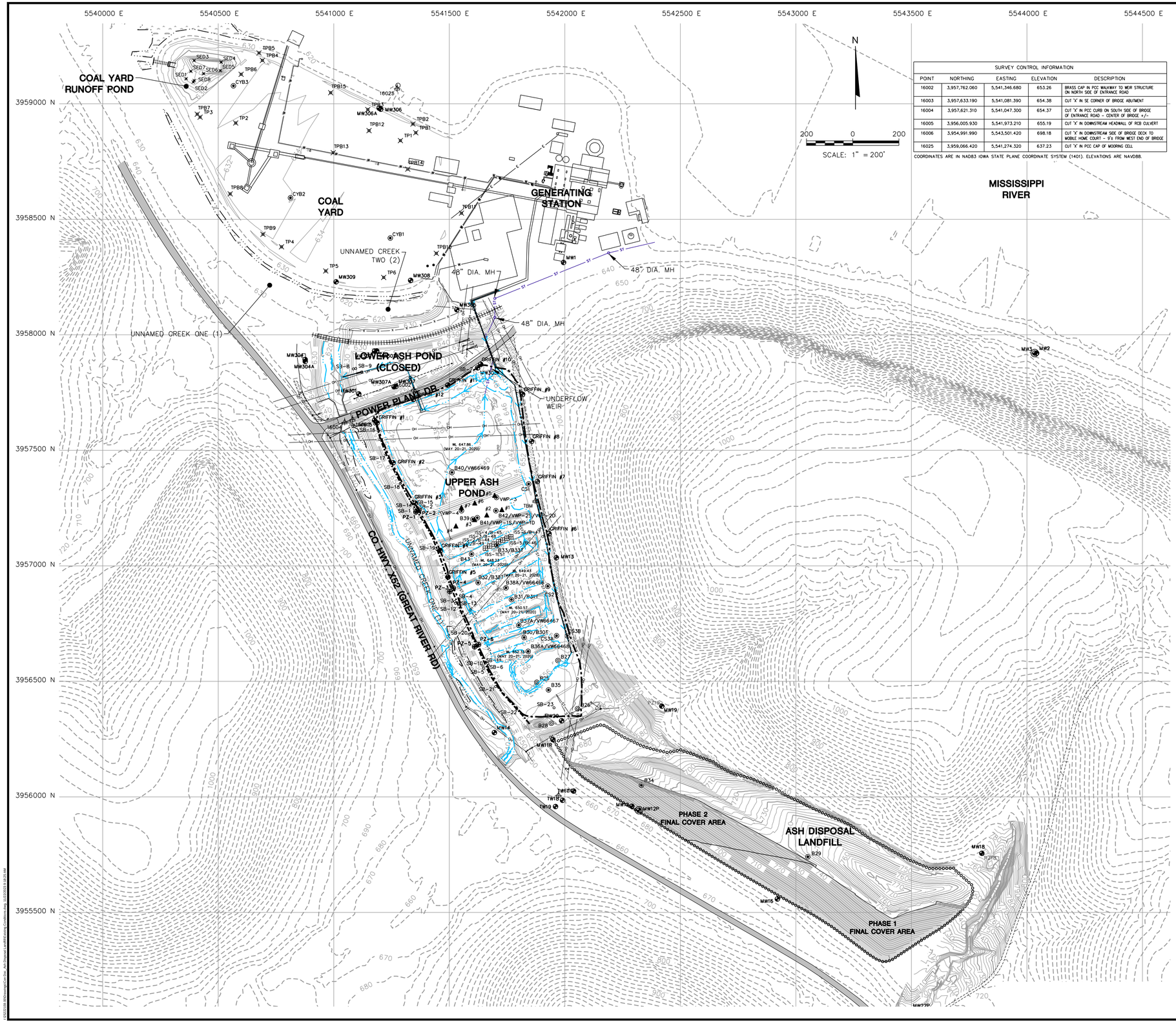
2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

TITLE SHEET

SHEET
1 of 17

PROJECT NO.	25222159.00	DRAWN BY: BSS/KP
DRAWN:	10/05/2023	CHECKED BY: BSS/ARH
REVISED:	11/03/2023	APPROVED BY: MRS 11/22/2023



SURVEY CONTROL INFORMATION				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
16002	3,957,762.060	5,541,346.680	653.26	BRASS CAP IN PCC WALKWAY TO WEIR STRUCTURE ON NORTH SIDE OF ENTRANCE ROAD
16003	3,957,633.190	5,541,081.390	654.38	CUT 'X' IN SE CORNER OF BRIDGE ABUMENT
16004	3,957,621.310	5,541,047.300	654.37	CUT 'X' IN PCC CURB ON SOUTH SIDE OF BRIDGE OF ENTRANCE ROAD - CENTER OF BRIDGE +/-
16005	3,956,005.930	5,541,973.210	655.19	CUT 'X' IN DOWNSTREAM HEADWALL OF RCB CULVERT
16006	3,954,991.990	5,543,501.420	698.18	CUT 'X' IN DOWNSTREAM SIDE OF BRIDGE DECK TO MOBILE HOME COURT - 9'± FROM WEST END OF BRIDGE
16025	3,959,066.420	5,541,274.320	637.23	CUT 'X' IN PCC CAP OF MOORING CELL

COORDINATES ARE IN NAD83 IOWA STATE PLANE COORDINATE SYSTEM (1401). ELEVATIONS ARE NAVD88.

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER (MAY 2020)
- PROCESS TRANSPORT WATER, PLANT AREA RUNOFF, AND DIRECT RAINFALL FLOW DIRECTION
- UNNAMED CREEK FLOW PATH
- BURIED ELECTRIC
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- WATER
- ABANDONED WATER
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 — MONITORING WELL
- MW17 — ABANDONED MONITORING WELL
- MW12P — PIEZOMETER
- MW12P — ABANDONED PIEZOMETER
- PZ18 — ABANDONED SHALLOW PIEZOMETER
- B40/VW66469 — SOIL BORING WITH VWP (JUNE 2020/SEPTEMBER 2021/MARCH 2022)
- CS1 — CRANE SETUP INVESTIGATION BORING [APPROX.] (NOVEMBER 2019 BY TERRACON)
- B30/B30T — SOIL BORING (MAY 2015/SEPTEMBER 2021)
- B26 — SOIL BORING (SEPTEMBER 2014)
- SB-1 — SOIL BORING (2015 BY HARD HAT SERVICES)
- SED1 — SEDIMENT PROBE
- TP1 — TEST PIT
- PZ-1 — WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- GRIFFIN #1 — DEWATERING PUMP TEST WELL (PUMPING WELL/MONITORING WELL)
- #1 — SETTLEMENT PLATE
- ISS-1/B-49 — IN-SITU STABILIZATION TEST COLUMN AND BORING
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- WETLAND

NOTES:

1. DRAWING COORDINATES IN IOWA STATE PLANE, NORTH ZONE, US FOOT, NAD 83 DATUM. VERTICAL DATUM IS NAVD 88.
2. EXISTING CONTOURS FOR OUTSIDE THE ASH DISPOSAL LANDFILL AND ASH PONDS ARE FROM ALLAMAKEE COUNTY DATED SPRING 2008.
3. EXISTING CONTOURS FOR THE CREEK AREA WEST OF THE ASH PONDS ARE FROM 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
4. EXISTING CONTOURS IN THE LOWER ASH POND AREA BASED ON HARD HAT SERVICES LOWER POND CLOSURE AS-BUILT DRAWINGS DATED JANUARY 2016.
5. EXISTING CONTOURS FOR THE ASH DISPOSAL LANDFILL PHASE 1 FINAL COVER AREA ARE FROM APRIL 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
6. EXISTING CONTOURS FOR THE ASH DISPOSAL LANDFILL PHASE 2 FINAL COVER ARE FROM MARCH 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
7. EXISTING CONTOURS FOR THE OPEN ASH DISPOSAL LANDFILL, SOUTHEAST OF THE ASH DISPOSAL LANDFILL, AND UPPER ASH POND AREAS ARE FROM MAY 2020 TOPOGRAPHIC/BATHYMETRIC SURVEY AND JANUARY 2022 TOPOGRAPHIC/DRONE SURVEY BY MOHN SURVEYING, INC.
8. EXISTING CONTOURS IN THE COAL YARD AND COAL YARD RUNOFF POND ARE BASED ON JANUARY 2020 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC. AND NOVEMBER 2021 SEDIMENT PROBES COMPLETED BY AMES. CONTOURS REPRESENT ANTICIPATED GRADES AFTER COAL PILES HAVE BEEN REMOVED.
9. EDGE OF WATER IN THE UNNAMED CREEK FROM 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC. AND EDGE OF WATER IN THE UPPER ASH POND AREA FROM MAY 20-21, 2020 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
10. UTILITIES SHOWN FROM 2015 SURVEY BY MOHN SURVEYING, INC. AS SHOWN ON HARD HAT SERVICES LOWER POND CLOSURE AS-BUILT DRAWINGS DATED JANUARY 2016 AND MAY 2020 SURVEY BY MOHN SURVEYING, INC. UTILITIES SHOWN ARE APPROXIMATE AND NOT ALL UTILITIES ARE SHOWN ON THIS DRAWING.
11. STRUCTURES AND UTILITIES IN THE COAL YARD AND GENERATING STATION AREA ARE APPROXIMATE AND BASED ON 2007 LANSING POWER STATION-PLOT PLAN (EIO NO. 92-2686) AND NOVEMBER 5, 2014 COAL YARD FIRE PROTECTION SITE PLAN (DRAWING NO. 17692-LAN-M-001 AND 17692-LAN-M-002) PROVIDED BY IPL.
12. 2015 BORINGS, PIEZOMETERS, AND SLURRY WALL BY HARD HAT SERVICES LOCATIONS BASED ON MAY 2015 SEEPAGE CONTROL CUT-OFF WALL DRAWINGS BY HARD HAT SERVICES.
13. SOIL BORINGS (B41, B42, AND B43) COMPLETED BY AMERICAN ENGINEERING TESTING IN SEPTEMBER 2021. VWPs IN B42 AND B43 INSTALLED BY AMERICAN ENGINEERING TESTING IN SEPTEMBER 2021. VWP-3 AND VWP-4 INSTALLED BY AMERICAN ENGINEERING TESTING IN MARCH 2022. LOCATIONS SURVEYED BY AMES.
14. TEST PITS AND SEDIMENT PROBES WERE INSTALLED BY AMES IN NOVEMBER 2021. LOCATIONS SURVEYED BY AMES.
15. WEIR STRUCTURE INFORMATION IS FROM A COMBINATION OF THE WEIR BOX SECTIONS & DETAILS ASH SETTLING BASIN DESIGN DRAWINGS BY SARGENT & LUNDY DATED FEBRUARY 25, 1975/JANUARY 30, 1976 (DRAWINGS S-213 AND S-214) AND THE LOWER POND CLOSURE AS-BUILT DRAWINGS BY HARD HAT SERVICES DATED JANUARY 2016.
16. APPROXIMATE LIMITS OF UPPER ASH POND BASED ON JUNE 5, 1974 SARGENT & LUNDY SITE DEVELOPMENT DRAWINGS AND MARCH 15, 1993 SARGENT & LUNDY DRAWING (ALLIANT DRAWING NO. 1-0110-4-5-C8002).
17. UPPER ASH POND OUTFALL REROUTE BASED ON UPPER ASH POND OUTFALL REROUTE ISSUED FOR CONSTRUCTION SET BY HARD HAT SERVICES DATED OCTOBER 2020.
18. WETLANDS WERE DELINEATED BY IMPACT 7G, INC. ON APRIL 19, 2021.

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/13/2023

CLIENT
INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

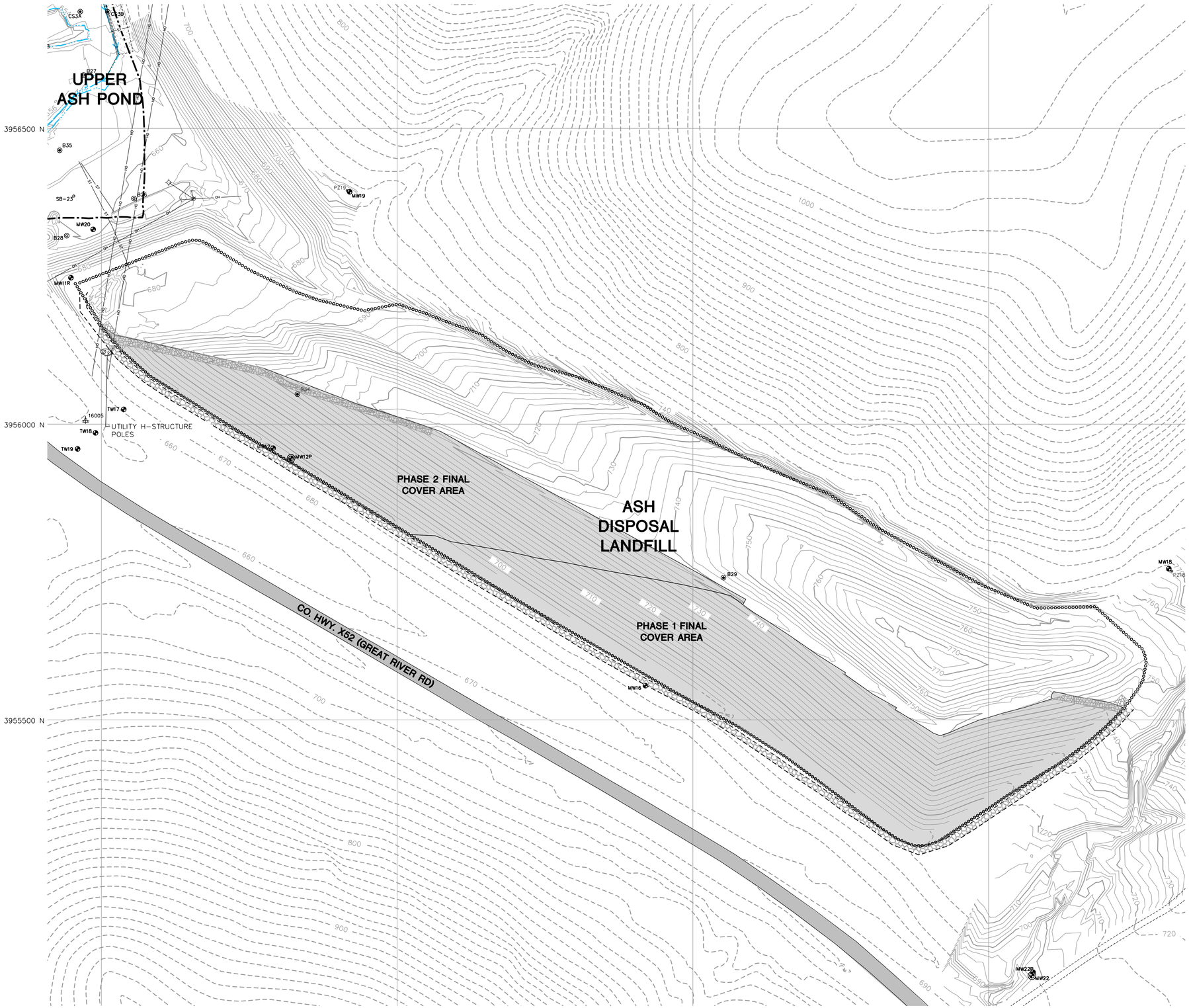
ENGINEER
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

SITE
2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SHEET
OVERALL SITE PLAN

2 of 17

L:\2022\25222159.00\Drawings\Civil\Site Plan - Ash Disposal Landfill\Existing Conditions.dwg, 11/13/2023 9:19:25 AM



LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL APPROVED LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- OVERHEAD UTILITY
- STORM DRAINAGE PIPE
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW12P PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
- EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
- EXISTING RIPRAP

NOTES:

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

80 0 80
SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/13/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

CLIENT

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

ENGINEER

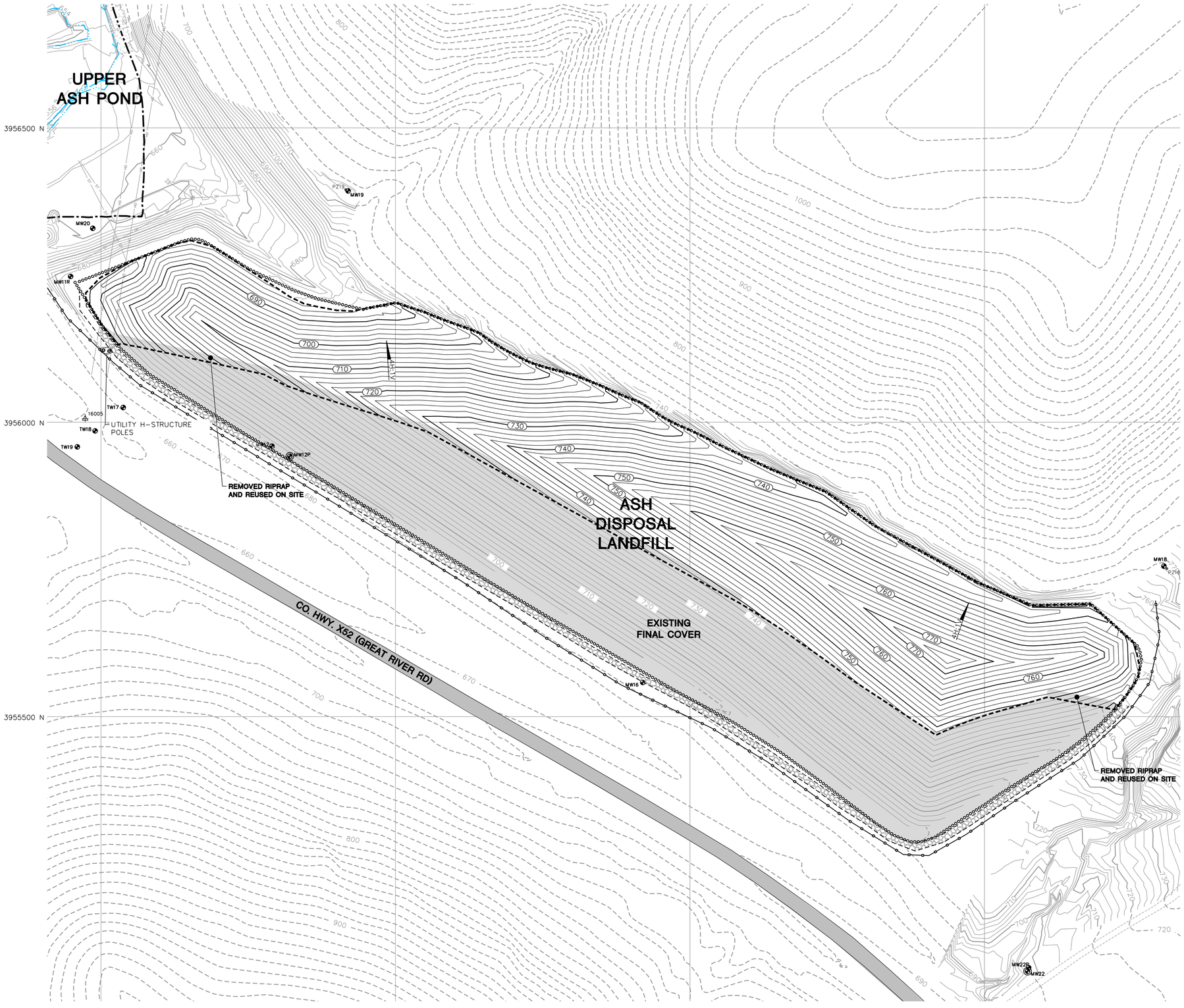
2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

PRE-CONSTRUCTION CONDITIONS

SHEET
3 OF 17

L:\2522\159.00\Drawings\Cover Sheet - Ash Disposal Landfill\Existing Conditions.dwg, 11/20/2023 8:56:45 AM



LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL APPROVED LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- OVERHEAD UTILITY
- STORM DRAINAGE PIPE
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW12P PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
- EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- DESIGN FINAL COVER SUBGRADE (10' CONTOUR)
- DESIGN FINAL COVER SUBGRADE (2' CONTOUR)
- SILT FENCE

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER SUBGRADE (TOP OF WASTE).
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

80 0 80
SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

CLIENT
INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9735

ENGINEER
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
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SITE
2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

LANDFILL COVER SUBGRADES

SHEET
4 of 17

5542000 E | 5542100 E | 5542200 E | 5542300 E | 5542400 E | 5542500 E | 5542600 E | 5542700 E | 5542800 E | 5542900 E

3956300 N | 3956200 N | 3956100 N | 3956000 N | 3955900 N | 3955800 N

690 | 700 | 710 | 720 | 730 | 740 | 750

LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 — DESIGN FINAL COVER SUBGRADE (10' CONTOUR)
- DESIGN FINAL COVER SUBGRADE (2' CONTOUR)
- POINT NUMBER — 2025 • 649.9' TOP OF WASTE ELEVATION — DOCUMENTATION SURVEY POINT

N

30 0 30

SCALE: 1" = 30'

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER SUBGRADE (TOP OF WASTE).
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

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

DRAWN BY:	BSS/KP
CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/22/2023
PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	11/14/2023

CLIENT: INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

ENGINEER

SITE: 2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
OTTUMWA GENERATING STATION
LANSING, IOWA

SHEET: 5 of 17

LANDFILL COVER SUBGRADES – NORTHWEST

PROJECT NO.	25222159.00	DRAWN BY:	BSS/KP
DRAWN:	10/05/2023	CHECKED BY:	BSS/MRH
REVISED:	11/14/2023	APPROVED BY:	MRS 11/22/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

CLIENT

SCS ENGINEERS
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PHONE: (608) 224-2830

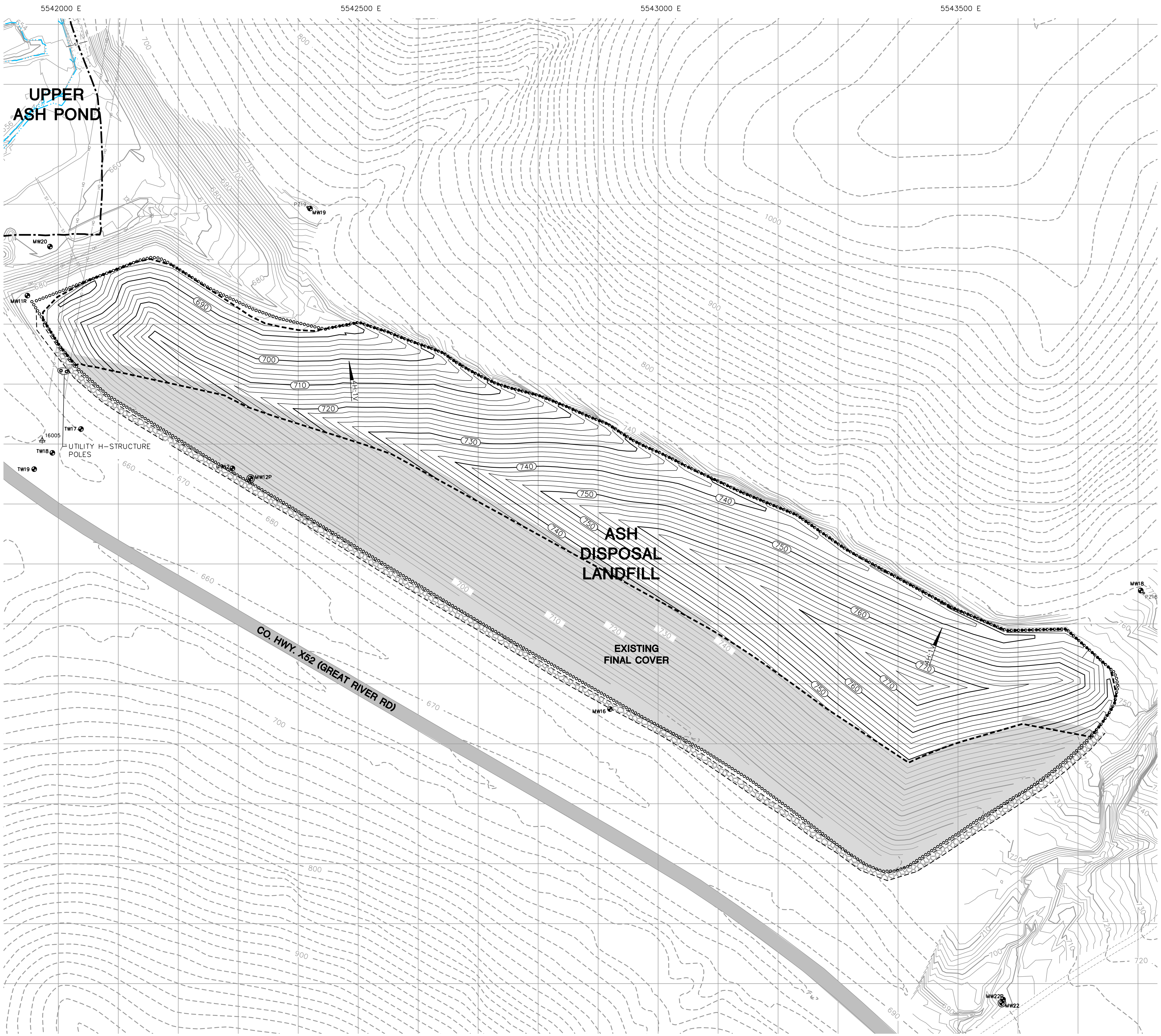
ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

LANDFILL COVER SUBGRADES – SOUTHEAST

SHEET
6 of 17



LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL APPROVED LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- OVERHEAD UTILITY
- STORM DRAINAGE PIPE
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW12P PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
- EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 DESIGN TOP OF SELECT CLAY FILL (10' CONTOUR)
- DESIGN TOP OF SELECT CLAY FILL (2' CONTOUR)

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER TOP OF SELECT CLAY FILL LAYER.
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

80 0 80
SCALE: 1" = 80'

N

PROJECT NO.	25222159.00	DRAWN BY:	BSS/KP
DRAWN:	10/05/2023	CHECKED BY:	BSS/MRH
REVISED:	11/14/2023	APPROVED BY:	MRS 11/22/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

LANDFILL TOP OF SELECT CLAY FILL

SHEET
7 of 17

5542000 E | 5542100 E | 5542200 E | 5542300 E | 5542400 E | 5542500 E | 5542600 E | 5542700 E | 5542800 E | 5542900 E

3956300 N | 3956200 N | 3956100 N | 3956000 N | 3955900 N | 3955800 N

690 | 700 | 710 | 720 | 730 | 740 | 750

LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 — DESIGN TOP OF SELECT CLAY FILL (10' CONTOUR)
- DESIGN TOP OF SELECT CLAY FILL (2' CONTOUR)
- POINT NUMBER → 8025
- TOP OF SELECT CLAY FILL ELEVATION → 693.9'
- SELECT CLAY FILL THICKNESS → 2.1'
- DOCUMENTATION SURVEY POINT

N

30 0 30

SCALE: 1" = 30'

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER TOP OF SELECT CLAY FILL LAYER.
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

L:\2522\2159.00\Drawings\Plan Set_Ash Disposal Landfill Land\Ash Landfill Top of Clay.dwg, 11/27/2023 9:13:39 AM

PROJECT NO. 2522159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

LANDFILL TOP OF SELECT CLAY FILL – NORTHWEST

SHEET
8 OF 17

LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- (770) DESIGN TOP OF SELECT CLAY FILL (10' CONTOUR)
- DESIGN TOP OF SELECT CLAY FILL (2' CONTOUR)
- DOCUMENTATION SURVEY POINT

POINT NUMBER — 8025
TOP OF SELECT CLAY FILL ELEVATION — 693.9'
SELECT CLAY FILL THICKNESS — 2.1'

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER TOP OF SELECT CLAY FILL LAYER.
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

PROJECT NO.	25222159.00	DRAWN BY:	BSS/KP
DRAWN:	10/05/2023	CHECKED BY:	BSS/MRH
REVISED:	11/14/2023	APPROVED BY:	MRS 11/22/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

CLIENT

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PHONE: (608) 224-2830

ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

LANDFILL TOP OF SELECT CLAY FILL – SOUTHEAST

SHEET
9 OF 17

5542000 E
5542500 E
5543000 E
5543500 E
3956500 N
3956000 N
3955500 N

SHORTENED 30" DIA. PIPE BACK TO ENERGY DISSIPATOR SEE DETAIL 3/16

CONNECTED FLUME 4 TO EXISTING FLUME 5 AND INSTALLED 30-INCH DIA. INLET IN SWALE

LIMITS OF ASH DISPOSAL LANDFILL ACCESS ROAD

DOWNSLOPE FLUME 4 SEE DETAIL 2/16

SOUTH POND CLOSURE AREA

RIPRAPPED DISCHARGE APRON

CULVERT 2 - 30-INCH DIA. CPEP SEE DETAILS SHEET 17

FINAL COVER DIVERSION BERM-NEW COVER SEE DETAIL 3/15

FINAL COVER DIVERSION BERM-EXISTING COVER SEE DETAIL 4/15

NORTH PERIMETER DITCH AND FINAL COVER SYSTEM SEE DETAIL 6/15

SOUTH PERIMETER ROAD, DITCH, AND FINAL COVER SYSTEM SEE DETAIL 5/15

UTILITY H-STRUCTURE POLES

ASH DISPOSAL LANDFILL FINAL COVER SEE DETAIL 1/15

ASH DISPOSAL LANDFILL FINAL COVER TIE-IN (TYP) SEE DETAIL 2/15

ASH DISPOSAL LANDFILL

EXISTING FINAL COVER

CO. HWY. X62 (GREAT RIVER RD)

MW11R
MW12P
MW16
MW17
MW18
MW19
MW22
PZ19
PZ18
TW17
TW18
TW19
B29

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (2' CONTOUR)
- PERMITTED ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- OH — OVERHEAD UTILITY
- ST — STORM DRAINAGE PIPE
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 — MONITORING WELL
- MW12P — PIEZOMETER
- PZ18 — ABANDONED SHALLOW PIEZOMETER
- B40/VW66469 — SOIL BORING WITH VWP (JUNE 2020)
- CS1 — CRANE SETUP INVESTIGATION BORING [APPROX.] (NOVEMBER 2019 BY TERRACON)
- B30/B30T — SOIL BORING (MAY 2015)
- B26 — SOIL BORING (SEPTEMBER 2014)
- SB-1 — SOIL BORING (2015 BY HARD HAT SERVICES)
- EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- DESIGN FINAL GRADE (10' CONTOUR)
- DESIGN FINAL GRADE (2' CONTOUR)
- EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
- ASH DISPOSAL LANDFILL ACCESS ROAD
- DOWNSLOPE FLUME
- ENERGY DISSIPATOR
- DIVERSION BERM-EXISTING COVER
- DIVERSION BERM-NEW COVER
- DRAINAGE SWALE
- CULVERT
- RIPRAP

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES OUTSIDE THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN PERIMETER FINAL GRADES (TOP OF TOPSOIL OR TOP OF GRAVEL).
3. GRADES WITHIN THE LIMITS OF FINAL COVER REPRESENT DESIGN FINAL GRADES (TOP OF TOPSOIL).
4. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

80 0 80
SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733
CLIENT

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

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA
SITE

LANDFILL FINAL GRADES

SHEET
10 OF 17

L:\2025\25159.00\Drawing\Cover Sheet - Ash Disposal Landfill Layout.dwg, 11/27/2023 8:29:56 AM

5542000 E | 5542100 E | 5542200 E | 5542300 E | 5542400 E | 5542500 E | 5542600 E | 5542700 E | 5542800 E | 5542900 E

3956300 N | 3956200 N | 3956100 N | 3956000 N | 3955900 N | 3955800 N

LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 — DESIGN FINAL GRADE (10' CONTOUR)
- DESIGN FINAL GRADE (2' CONTOUR)
- DOCUMENTATION SURVEY POINT

POINT NUMBER: 8025 ● 693.9' 0.5/0.5
TOP OF FINAL COVER ELEVATION
ROOTING ZONE THICKNESS/ TOPSOIL THICKNESS (FT)

N

30 0 30
SCALE: 1" = 30'

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL GRADES (TOP OF TOPSOIL).
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

CLIENT
INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

ENGINEER
SCS ENGINEERS
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PHONE: (608) 224-2830

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
INTERSTATE GENERATING STATION
LANSING, IOWA

SITE

LANDFILL FINAL GRADES – NORTHWEST

SHEET
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LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- (770) DESIGN FINAL GRADE (10' CONTOUR)
- DESIGN FINAL GRADE (2' CONTOUR)
- DOCUMENTATION SURVEY POINT

POINT NUMBER — 8025
TOP OF FINAL COVER ELEVATION — 693.9'
ROOTING ZONE THICKNESS/ TOPSOIL THICKNESS (FT) — 0.5/0.5

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL GRADES (TOP OF TOPSOIL).
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

PROJECT NO.	25222159.00	DRAWN BY:	BSS/KP
DRAWN:	10/05/2023	CHECKED BY:	BSS/MRH
REVISED:	11/14/2023	APPROVED BY:	MRS 11/22/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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

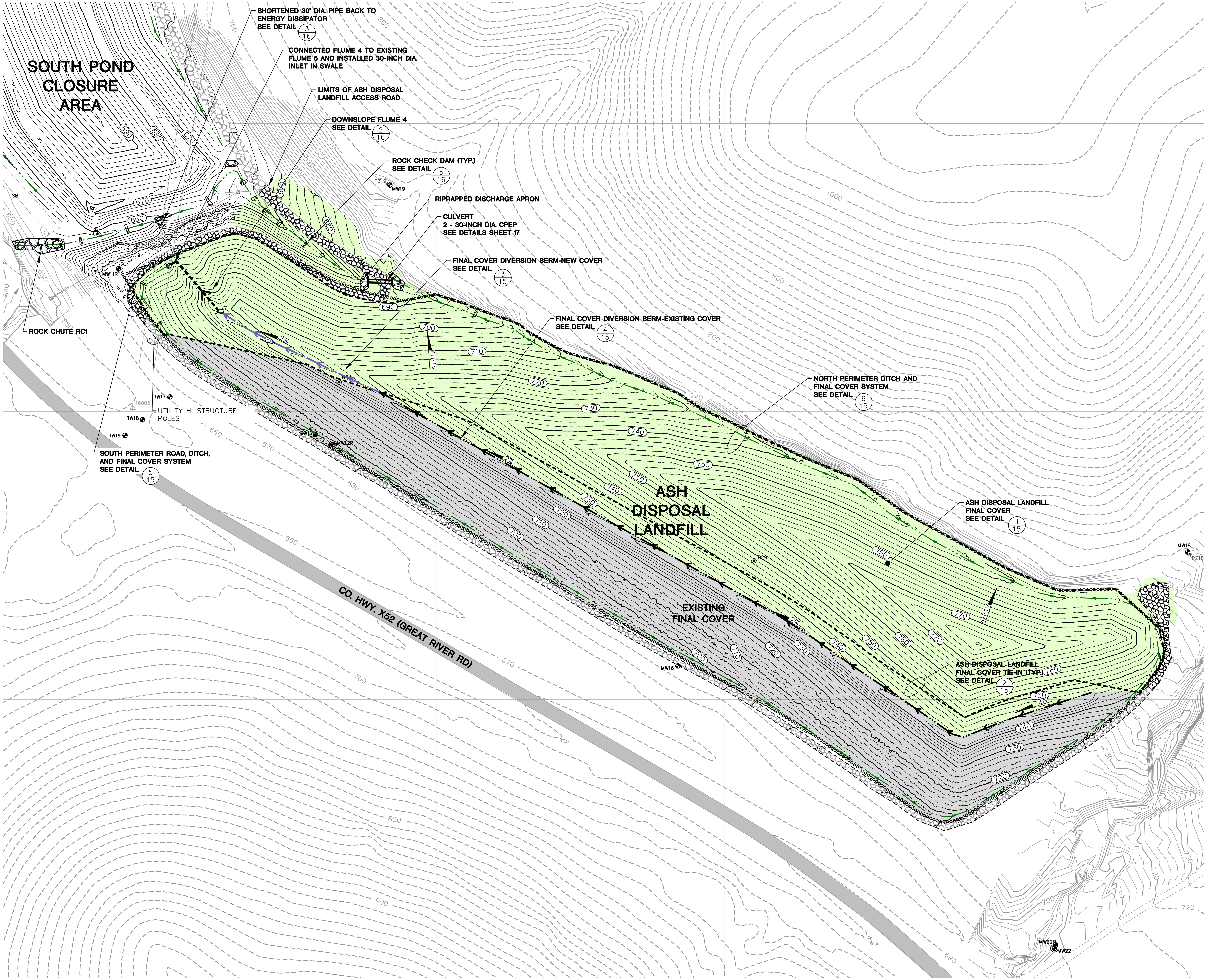
ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

LANDFILL FINAL GRADES – SOUTHEAST

SHEET
12 of 17



LEGEND

1000	2008 EXISTING GRADE (10' CONTOUR)
660	2015/2020 EXISTING GRADE (10' CONTOUR)
656	2015/2020 EXISTING GRADE (2' CONTOUR)
	PERMITTED ASH DISPOSAL LANDFILL LIMITS OF WASTE
	PAVED ROAD
	GRAVEL ROAD
OH	OVERHEAD UTILITY
ST	STORM DRAINAGE PIPE
	UTILITY POLE AND GUY WIRE
	LIGHT POLE
	SURVEY CONTROL POINT
MW17	MONITORING WELL
MW12P	PIEZOMETER
PZ18	ABANDONED SHALLOW PIEZOMETER
B40/VW66469	SOIL BORING WITH VWP (JUNE 2020)
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B26	SOIL BORING (SEPTEMBER 2014)
SB-1	SOIL BORING (2015 BY HARD HAT SERVICES)
	EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
	LIMITS OF 2023 FINAL COVER CONSTRUCTION
770	DOCUMENTED FINAL GRADE (10' CONTOUR)
	DOCUMENTED FINAL GRADE (2' CONTOUR)
	EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
	ASH DISPOSAL LANDFILL ACCESS ROAD
	DOWNSLOPE FLUME
	ENERGY DISSIPATOR
	DIVERSION BERM-EXISTING COVER
	DIVERSION BERM-NEW COVER
	DRAINAGE SWALE
	CULVERT
	RIPRAP
	VEGETATED RESTORATION

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. CONTOURS WITHIN THE CONSTRUCTION LIMITS BASED ON SEPTEMBER 25, 2023 DRONE SURVEY PERFORMED BY AMES.
3. PLACED NON-CHANNEL EROSION MAT ON RESTORED SLOPES STEEPER OR EQUAL TO 4:1 OR AS NOTED.
4. PLACED CHANNEL EROSION MAT IN DRAINAGE SWALES.

80 0 80

SCALE: 1" = 80'

N

PROJECT NO.	25222159.00	DRAWN BY:	BSS/KJP
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INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

RESTORATION PLAN

SHEET
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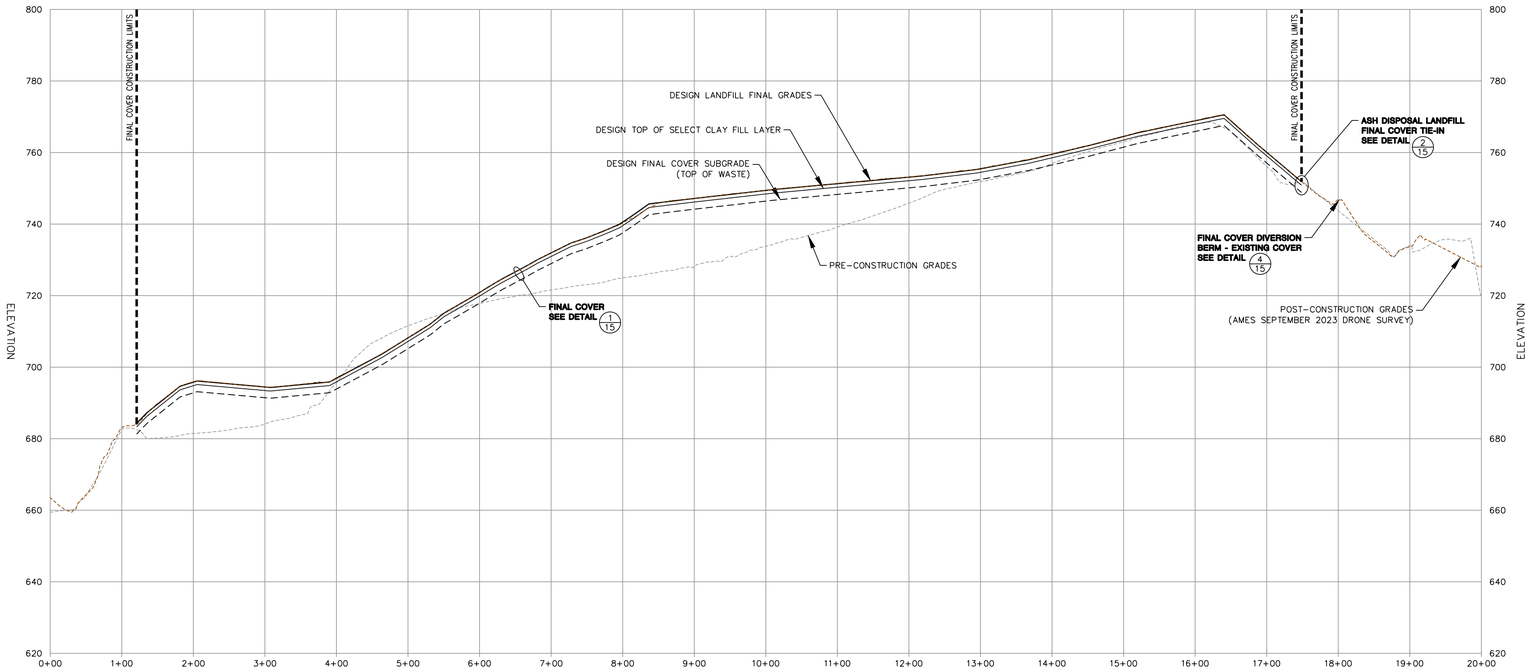


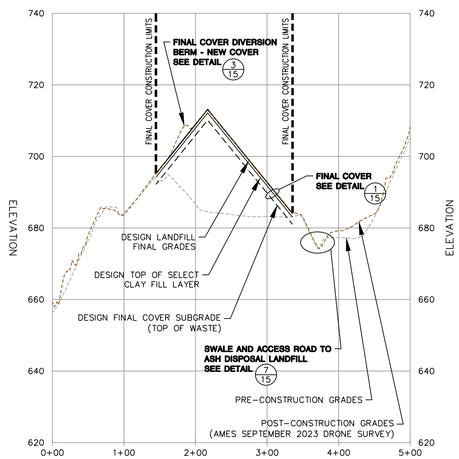
CROSS SECTION A-A'

NOTES:

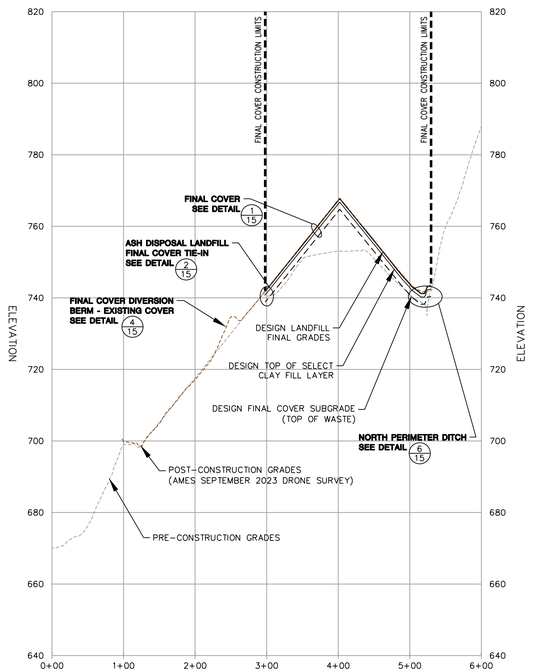
1. SEE SHEET 2 FOR ADDITIONAL BASE MAP NOTES.

100 0 100

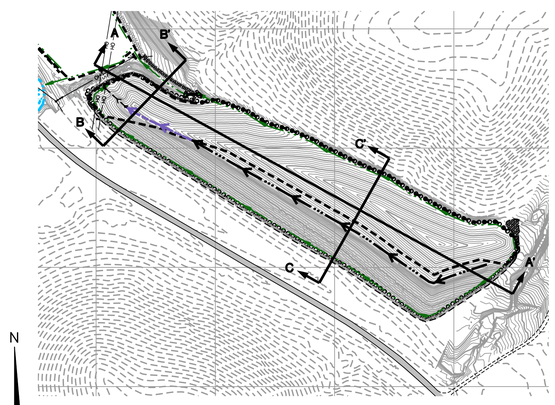
SCALE: 1" = 100'
VERTICAL EXAGGERATION: 5X



CROSS SECTION B-B'



CROSS SECTION C-C'



CROSS SECTION LOCATION MAP

SCALE: 1" = 300'

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

ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
CONSTRUCTION QUALITY ASSURANCE
LANSING GENERATING STATION
LANSING, IOWA

SITE

INTERSTATE POWER AND LIGHT CO.
3320 POWER PLANT DRIVE
LANSING, IA 52151-9733

CLIENT

PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	11/03/2023
DRAWN BY:	BSS/KP
CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/22/2023

CROSS SECTIONS

SHEET
14 OF 17

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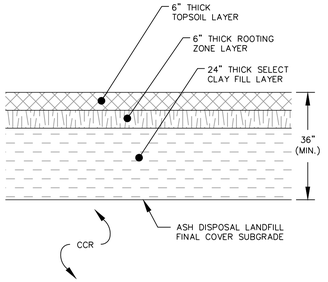
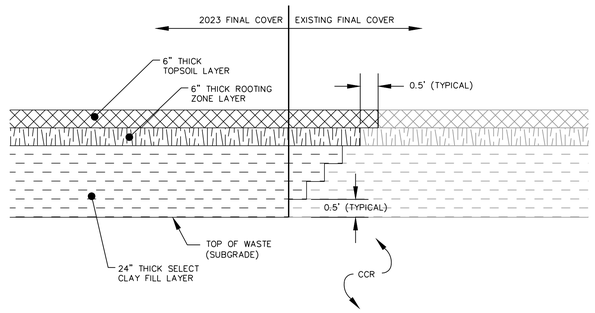
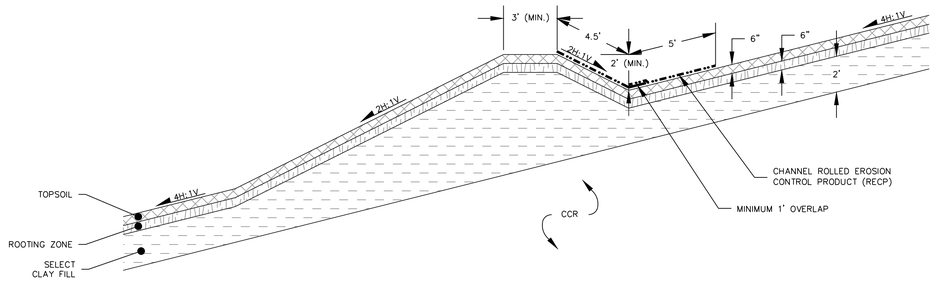


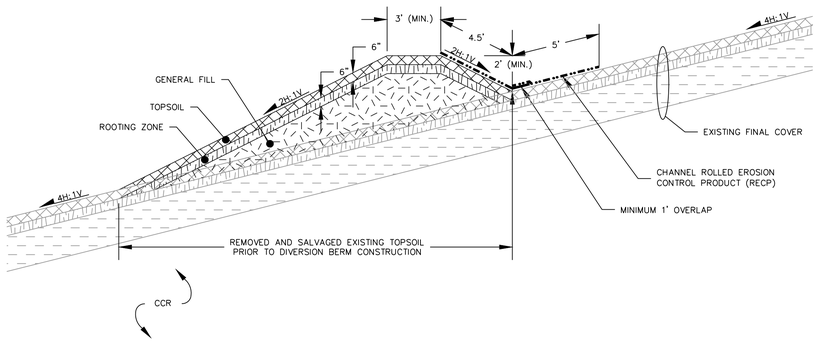
1/15 ASH DISPOSAL LANDFILL FINAL COVER
SCALE: 1" = 2'



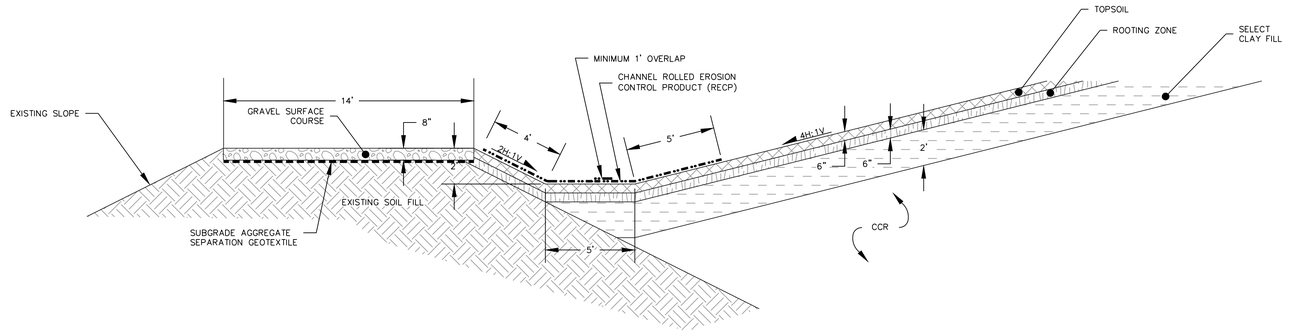
2/15 ASH DISPOSAL LANDFILL FINAL COVER TIE-IN
SCALE: 1" = 2'



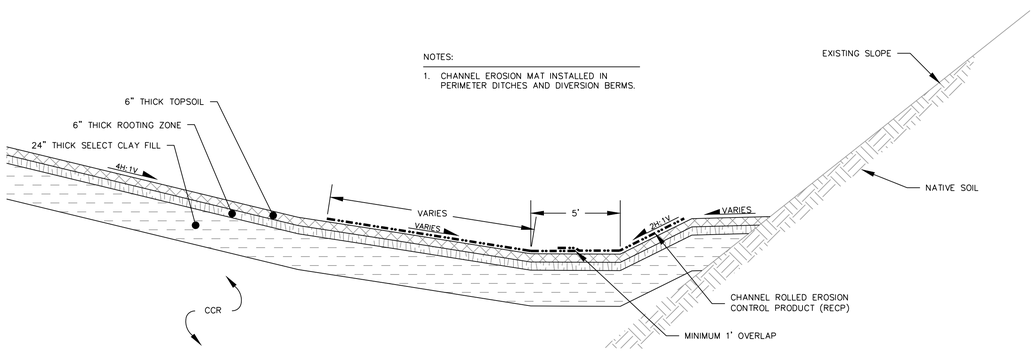
3/15 LANDFILL FINAL COVER DIVERSION BERM - NEW COVER
NOT TO SCALE



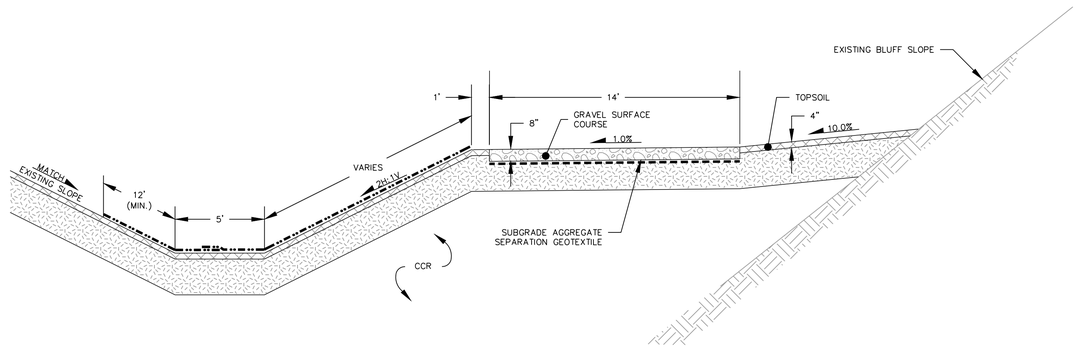
4/15 FINAL COVER DIVERSION BERM - EXISTING COVER
NOT TO SCALE



5/15 SOUTH PERIMETER ROAD AND DITCH
NOT TO SCALE



6/15 NORTH PERIMETER DITCH
NOT TO SCALE



7/15 SWALE AND ACCESS ROAD TO ASH DISPOSAL LANDFILL
NOT TO SCALE

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

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
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REVISED: 11/03/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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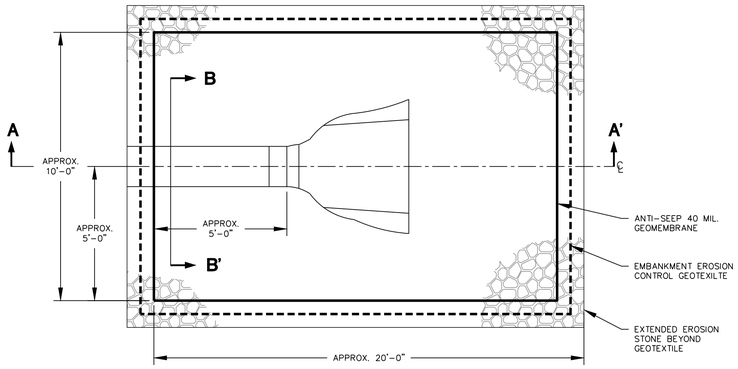
ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

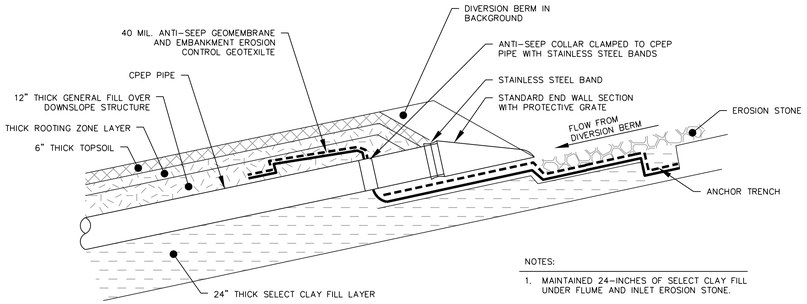
SITE

DETAILS

SHEET
15 of 17



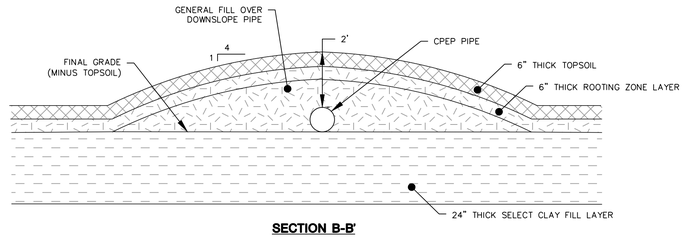
PLAN VIEW



NOTES:

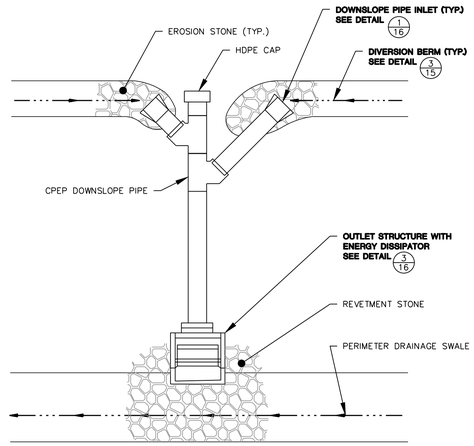
1. MAINTAINED 24-INCHES OF SELECT CLAY FILL UNDER FLUME AND INLET EROSION STONE.

SECTION A-A'

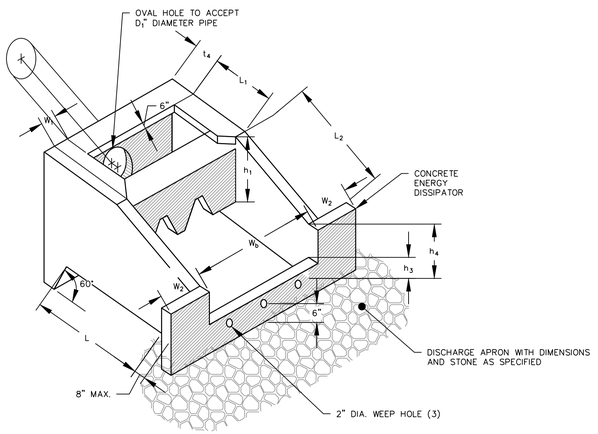


SECTION B-B'

1 / 16 **DOWNSLOPE INLET STRUCTURE**
NOT TO SCALE

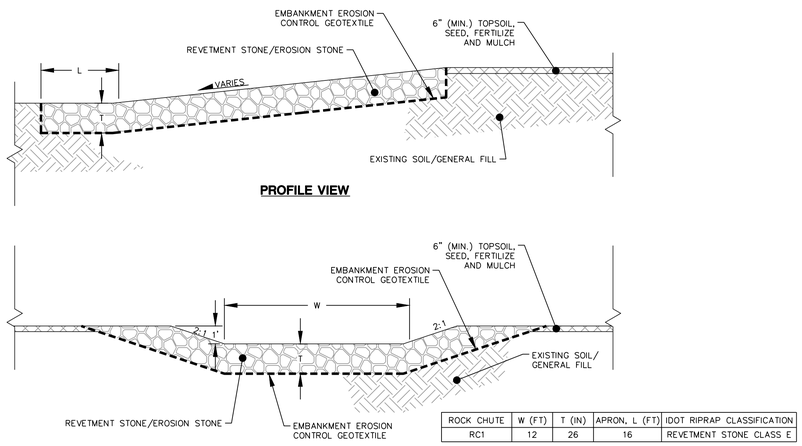


2 / 16 **DOWNSLOPE PIPE**
NOT TO SCALE



Flume	D_1 (in.)	Energy Dissipator Dimensions (feet)										Discharge Apron				
		W_b	h_1	h_3	h_4	L	L_1	L_2	W_1	W_2	t_4	Chute Width (ft.)	Apron Width (ft.)	Length (ft.)	Thickness (in.)	Stone Type
Flume 4/ Flume 5	30	8	6.17	1.33	3.33	10.67	4.58	6.17	0.58	2.17	0.5	10	10	12	20	IDOT Revetment Stone Class E

3 / 16 **ENERGY DISSIPATOR**
NOT TO SCALE



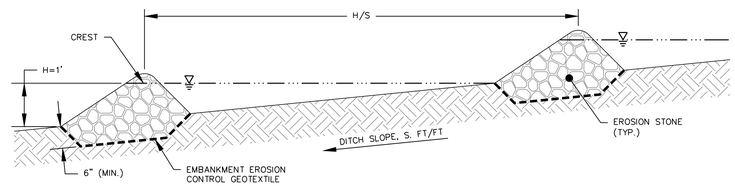
ROCK CHUTE	W (FT)	T (IN)	APRON, L (FT)	IDOT RIPRAP CLASSIFICATION
RC1	12	26	16	REVETMENT STONE CLASS E

NOTES:

1. TOP OF REVETMENT STONE/EROSION STONE FLUSH WITH SURROUNDING GRADES.

SECTION VIEW

4 / 16 **ROCK CHUTE**
NOT TO SCALE



5 / 16 **TYPICAL ROCK CHECK DAM**
NOT TO SCALE

PROJECT NO. 25222159.00 | DRAWN BY: BSS/KP
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REVISED: 11/03/2023 | APPROVED BY: MRS 11/22/2023

INTERSTATE POWER AND LIGHT CO.
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LANSING, IA 52151-9733

CLIENT

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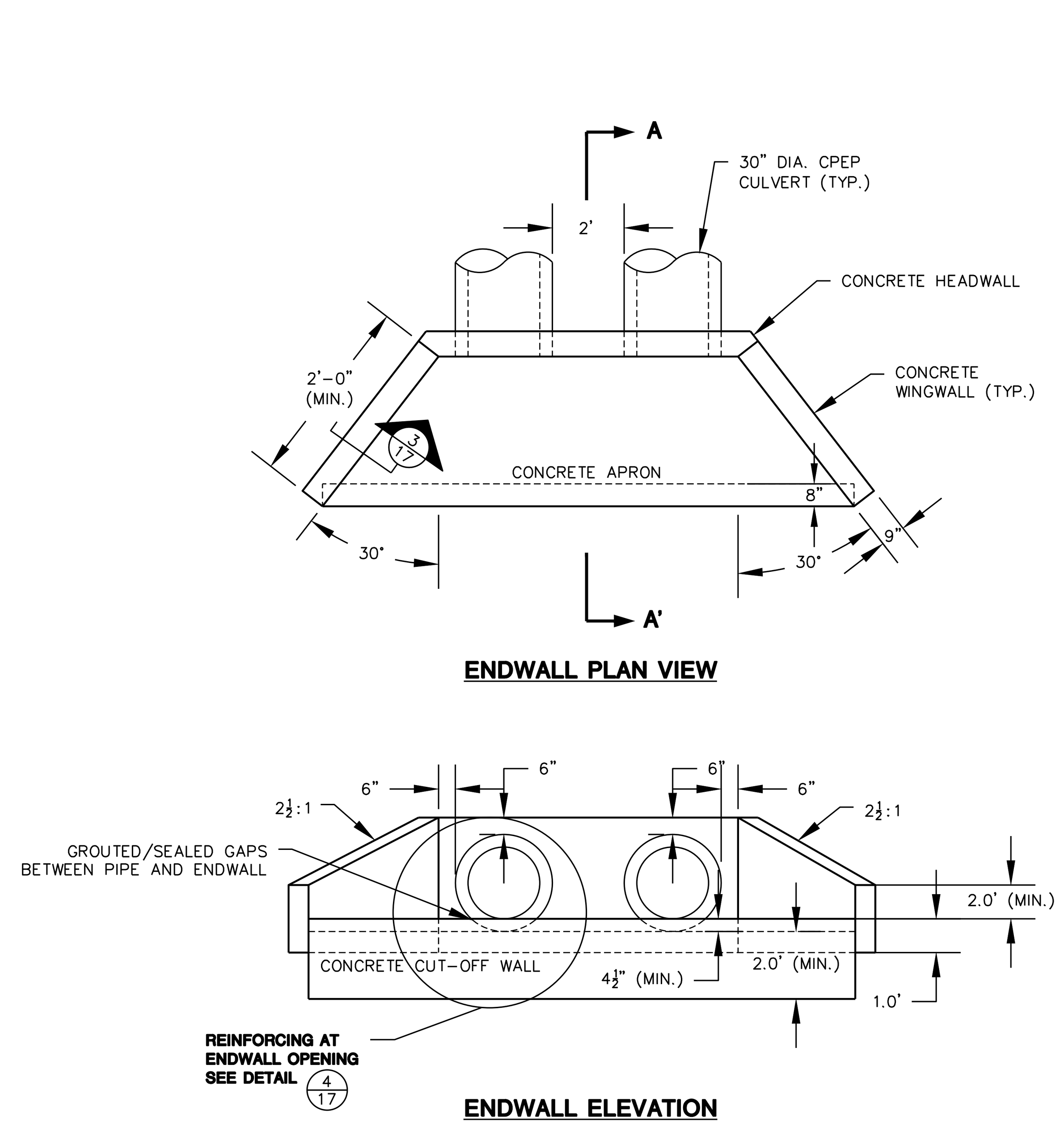
ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

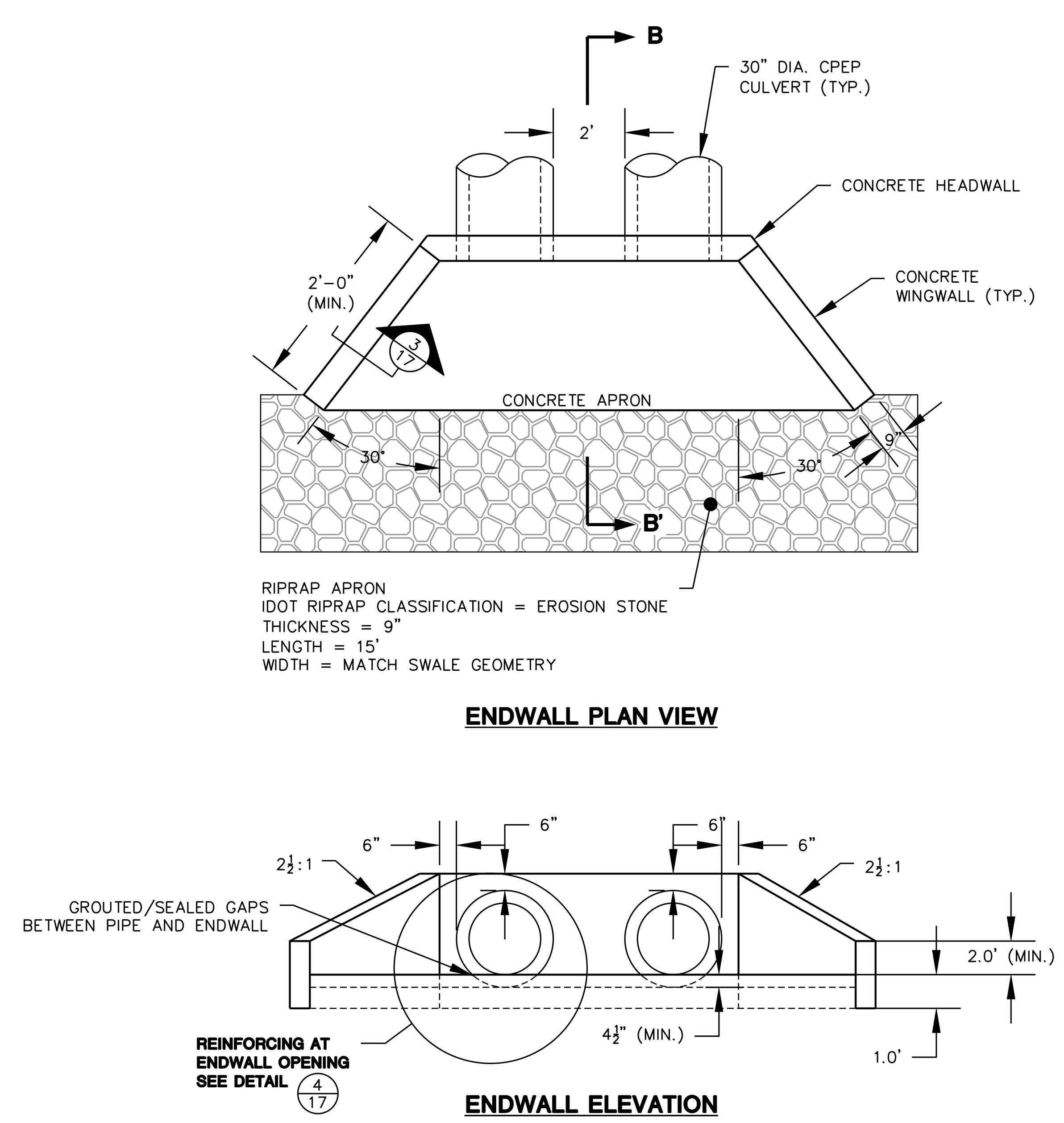
DETAILS

SHEET
16 of 17



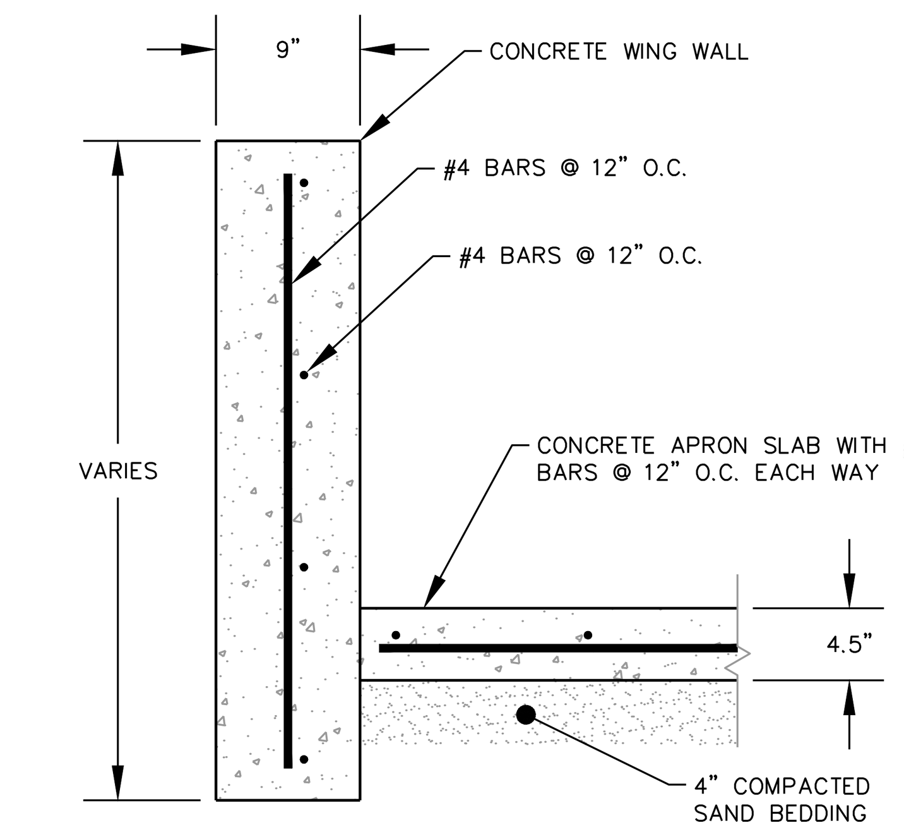
1/17 **CULVERT ENDWALL INLET**

NOT TO SCALE



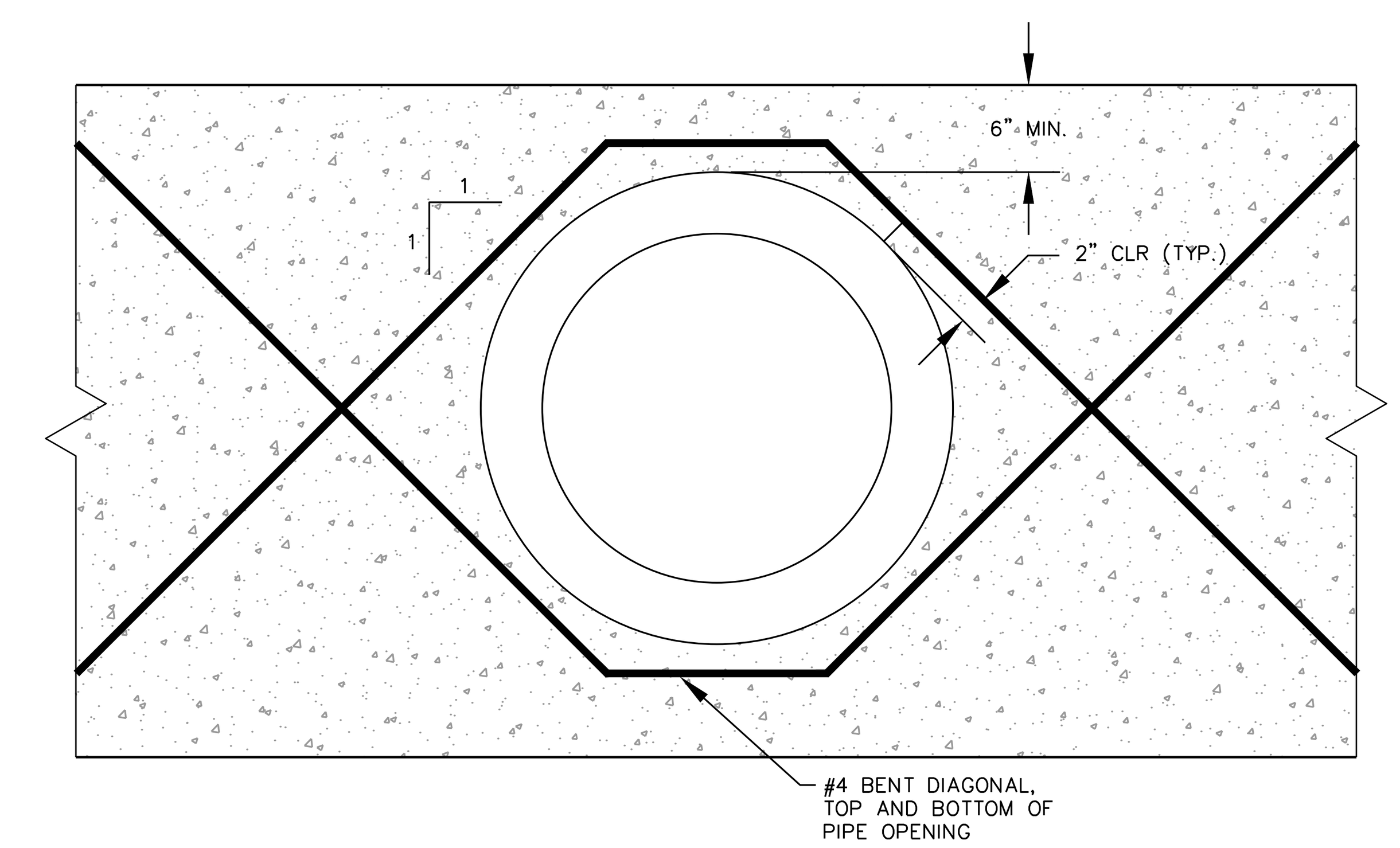
2/17 **CULVERT ENDWALL OUTLET**

NOT TO SCALE



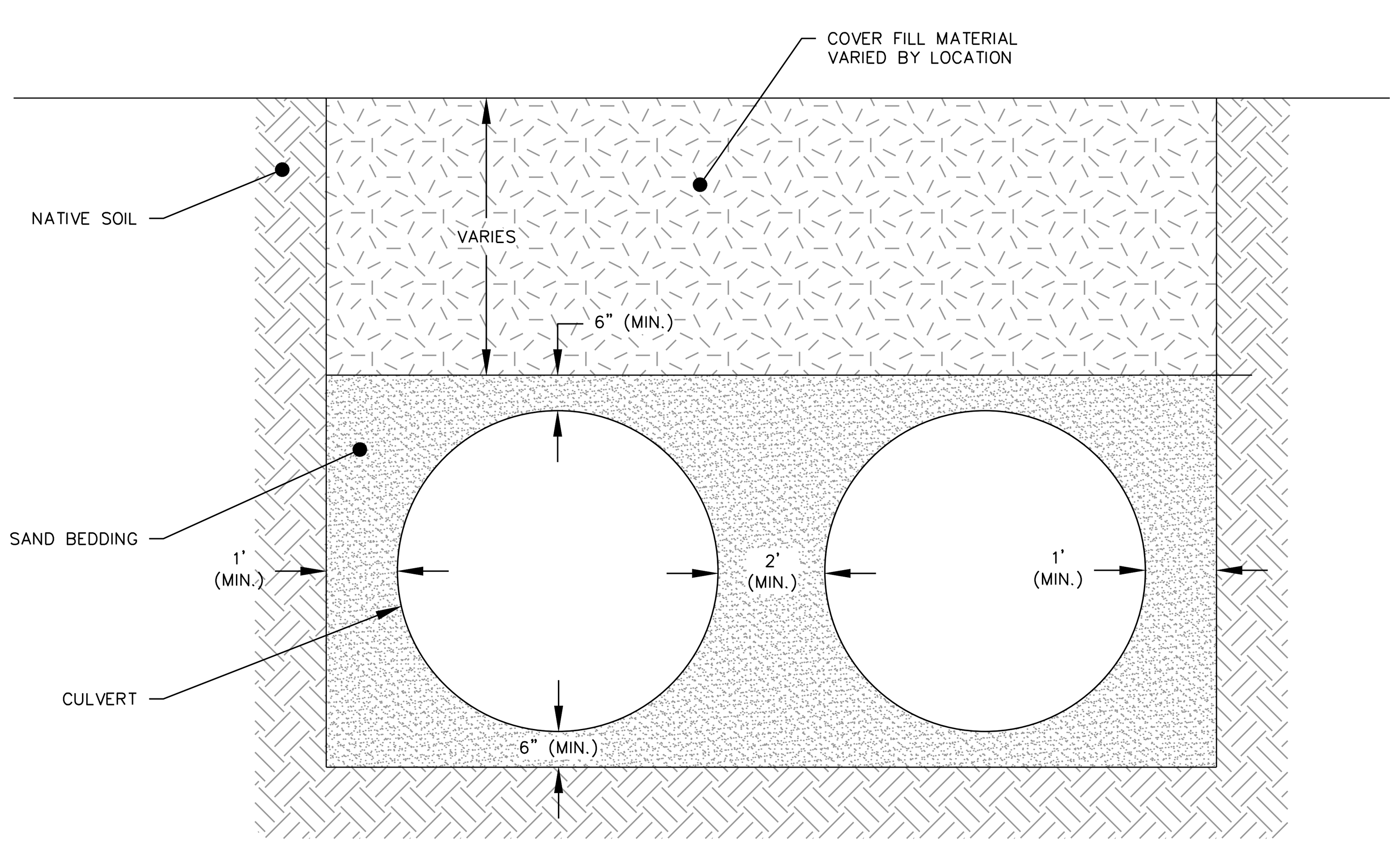
3/17 **REINFORCEMENT AT APRON ENDWALL**

NOT TO SCALE



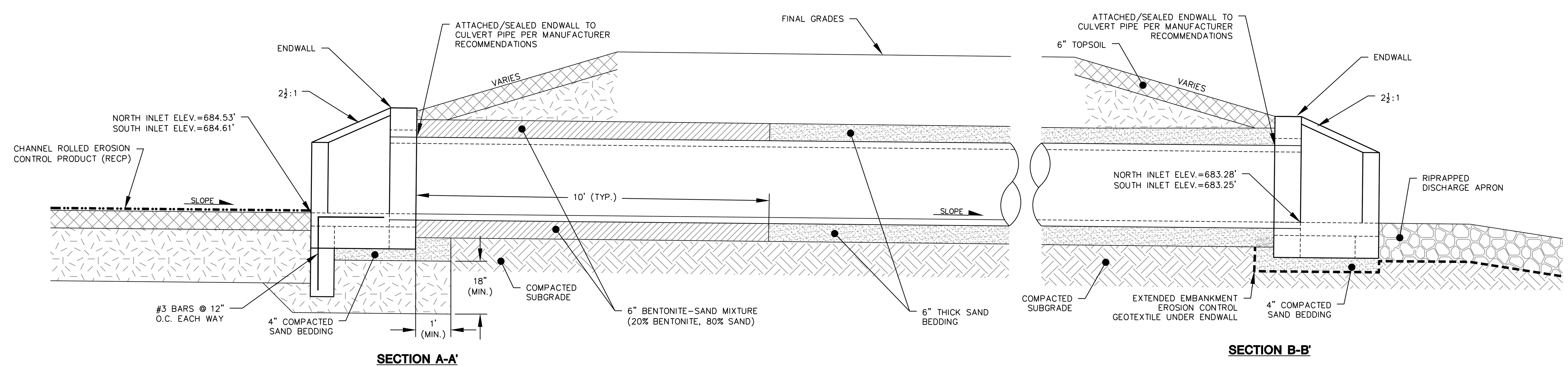
4/17 **REINFORCEMENT AT ENDWALL OPENING**

NOT TO SCALE



5/17 **CULVERT BEDDING**

NOT TO SCALE



6/17 **CULVERT PROFILE**

NOT TO SCALE

PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	11/03/2023
DRAWN BY:	BSS/KP
CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/22/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

DETAILS

SHEET
17 of 17

Appendix C

Estimated Groundwater Corrective Action Schedule

Estimated Groundwater Corrective Action Schedule
Lansing Generating Station
Iowa Power and Light Company

ID	Task Name	Duration	Start	Finish
1	Engineering	411 days	Thu 3/5/20	Thu 9/30/21
2	Permitting	293 days	Wed 11/18/20	Fri 12/31/21
3	Procurement	252 days	Wed 4/14/21	Thu 3/31/22
4	Closure Construction	413 days	**Fri 4/1/22**	**Tue 10/31/23**
5	Startup/Mobilization	22 days	Fri 4/1/22	Mon 5/2/22
6	Civil/Sitework	391 days	Tue 5/3/22	Tue 10/31/23
7	Stabilized Berm	60 days	Mon 5/16/22	Fri 8/5/22
8	South Pond Closure Area	356 days	Mon 5/2/22	Mon 9/11/23
9	North Pond Closure Area	341 days	Mon 5/23/22	Mon 9/11/23
10	Coal Yard	243 days	Mon 10/31/22	Wed 10/4/23
11	Dry Ash Landfill	108 days	Wed 4/12/23	Fri 9/8/23
12	Issue ACM Add. No. 2	0 days	Mon 6/5/23	Mon 6/5/23
13	Public Meeting re: ACM Add. No. 2	0 days	Mon 6/12/23	Mon 6/12/23
14	Selection of Remedy	240 days	Mon 6/5/23	Fri 5/3/24
15	Issue Selection of Remedy	0 days	Mon 5/6/24	Mon 5/6/24
16	Corrective Action Program	65 days	Mon 5/6/24	Fri 8/2/24
17	Establish/Implement Corrective Action Groundwater Monitoring Program	65 days	Mon 5/6/24	Fri 8/2/24
18	Implement Correction Action (Complete)	NA	NA	NA
19	Interim Actions (Not Applicable)	NA	NA	NA
20	Certification of Closure and 30-Year Post-Closure Care (only shown through 2024)	340 days	Wed 9/13/23	Tue 12/31/24