



INDIANA-KENTUCKY ELECTRIC CORPORATION

3932 U. S. Route 23
P. O. Box 468
Piketon, Ohio 45661
740-289-7200

WRITER'S DIRECT DIAL NO:
740-289-7259

February 1, 2024

Delivered Electronically

Mr. Brian Rockensuess and Incoming Commissioner
Commissioner
Indiana Department of Environmental Management
100 N. Senate Avenue
Mail Code 50-01
Indianapolis, IN 46204-2251

**Re: Indiana-Kentucky Electric Corporation
Clifty Creek Station
Notification of CCR Rule Information Posting
Annual Certified CCR Dam and Dike (Surface Impoundment)
Inspection Report Posting**

Dear Mr. Rockensuess and Incoming Commissioner:

As required by 40 CFR 257.106(g), the Indiana-Kentucky Electric Corporation (IKEC) is providing notification to the Commissioner (State Director) of the Indiana Department of Environmental Management that a qualified professional engineer has completed the Annual CCR Dam and Dike (Surface Impoundment) Inspection for the 2024 operating year in accordance with 40 CFR 257.83(b) for IKEC's Clifty Creek Station. The inspection report has been placed in the facility's Operating Record as well as on the company's publicly accessible internet site.

This information can be viewed on IKEC's publicly accessible internet site at:
<http://www.ovec.com/CCRCompliance.php>

If you have any questions, or require any additional information, please call me at (740) 289-7259.

Sincerely,

A handwritten signature in black ink that reads "Jeremy Galloway". The signature is fluid and cursive, with the first name "Jeremy" and last name "Galloway" clearly distinguishable.

Jeremy Galloway
Environmental Specialist

JDG:zsh



**2024 CCR Rule – Surface Impoundments
Clifty Creek Dam/Dike Inspections**



Clifty Creek Generating Station
Madison, Indiana
Jefferson County

January 19, 2025

Prepared for:

Indiana-Kentucky Electric Corporation
Piketon, Ohio

Prepared by:

Stantec Consulting Services Inc.
Cincinnati, Ohio

Sign-off Sheet

This document entitled 2024 CCR Rule – Surface Impoundments, Clifty Creek Dam/Dike Inspections was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of Indiana-Kentucky Electric Corporation (IKEC) (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule, and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use that a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by Casey Race

(signature)

Casey Race, E.I.T.

Reviewed by James R. Swindler, Jr.

(signature)

James R. Swindler, Jr., P.E.

Reviewed by Jacqueline S. Harmon

(signature)

Jacqueline S. Harmon, P.E.



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2024 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

Overview

January 19, 2025

1.0 OVERVIEW

Stantec Consulting Services Inc. (Stantec) performed an annual inspection of the existing coal combustion residuals (CCR) surface impoundments at the Clifty Creek Generating Station in Madison, Indiana on October 30, 2024.

This annual dam and dike inspection is intended to fulfill the requirements of 40 CFR 257.83(b) for the *Disposal of Coal Combustion Residuals from Electric Utilities* rule (CCR Rule) signed by the U.S. Environmental Protection Agency (EPA) Administrator on December 19, 2014 and published in the Federal Register on April 17, 2015.

This report provides an existing conditions assessment with observations, photographs, maintenance recommendations, and conclusions. The weather conditions at the time of inspection consisted of clear sunny skies with temperatures ranging from the mid 60s to the mid to high 70s (Fahrenheit). Based on regional records, no precipitation fell within the week prior to the inspection.

Stantec's team that performed the fieldwork included:

- Jacqueline Harmon, P.E., Principal, Project Manager
29 years of experience in geotechnical engineering, including pump stations, levees, and CCR storage facility design, closure, and operation.
- Casey Race, E.I., Project Engineer
1 year of experience in environmental and water resources engineering, including ecosystem restoration, levees/dams, and CCR storage facility design and closure.

Fieldwork was coordinated with Brooke Canter, Clifty Creek Station's environmental manager. Ms. Canter tracks the maintenance needs and activities through the weekly and monthly inspections. Brent Gray of the environmental group at Clifty Creek Station and Jeremy Galloway and Zachary Hammond of Ohio Valley Electric Corporation's (OVEC) Environmental Affairs group accompanied Stantec's personnel during the inspection. Observations were briefly discussed with onsite personnel during and after completion of the field activities.

2.0 DESCRIPTION OF CLIFTY CREEK IMPOUNDMENTS

The Clifty Creek Generating Station is a coal-combustion generating station located in Madison, Jefferson County, Indiana. It is owned and operated by Indiana-Kentucky Electric Corporation (IKEC), a wholly owned subsidiary of OVEC. The Clifty Creek Station began operating in 1955. It has six generating units with a total capacity of 1,304 megawatts.

The annual assessment included two CCR surface impoundments: the West Boiler Slag Pond (WBSP) and the Landfill Runoff Collection Pond (LRCP).

2024 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

Description of Clifty Creek Impoundments
January 19, 2025

2.1 WEST BOILER SLAG POND

The WBSP is located about 1,500 feet west/southwest of the power plant on the west side of Big Clifty Creek. It has historically served as a settling facility for sluiced bottom ash produced at the plant and as stormwater run-on management for approximately 510 acres west of the station. Recent facility improvements have altered inflows into the WBSP. The impoundment now receives limited stormwater from rainfall directly into the impoundment or immediately adjacent to it. CCR flows are no longer sluiced to the WBSP. A station overview is included in Appendix A.

The WBSP is formed by natural grade to the north, east, and west. The CCR landfill haul road is to the north. A wide berm area along the east side supports several transmission towers, separating the impoundment from Big Clifty Creek. The Devils Backbone borders the west side. An embankment dam/dike extends along the south side, separating the WBSP from upland new field habitat and mixed early successional/second growth riparian forest adjacent to the Ohio River's ordinary high-water mark (Stantec 2022). The embankment dam/dike is approximately 2,500 feet long with a maximum height of about 41 feet. The crest of the dike is at about elevation 475.0 feet. On the southeast side of the pond, there is a gypsum loading station for barge traffic. On the southwest side, CCR was removed and the area repurposed as lined settling basins described as the low-volume wastewater treatment system (LVWTS).

The WBSP consists of three primary areas: the eastern portion where CCR was historically sluiced and dredged/mined for recovery, the central portion that consists of a wide vegetated delta area, and the lined settling basins. Discharge from the settling basins occurs through an outlet structure extending under the southern dam located at the far western end of the pond. Flow passes through an NPDES-permitted outfall and into the Ohio River. The eastern and central portions of the WBSP areas are hydraulically disconnected from the lined basins. Water levels within the remaining WBSP are managed by pumping. Additional reference drawings are provided in Appendix B.

2.2 LANDFILL RUNOFF COLLECTION POND

The LRCP is located about 1.9 miles southwest of the station near the north bank of the Ohio River. It is formed by natural grades to the north, east, and west and a dam to the south, separating it from the upland mixed early successional/second growth riparian forest habitat along the Ohio River's ordinary high-water mark (Stantec 2022). The CCR landfill lies to the northeast. A station overview is included in Appendix A.

The LRCP has historically served as a runoff collection pond for the CCR landfill and run-on stormwater management for approximately 475 acres of the surrounding hillsides. A portion of the CCR landfill leachate flowed to the impoundment as landfill construction progressed westward. Lined ponds southwest of the CCR landfill manage leachate and stormwater runoff. A lined diversion channel and modification of the existing dam allow routing of approximately 350 acres of run-on stormwater around the LRCP to the permitted NPDES outfall. Stormwater flows into the LRCP from approximately 126 acres, 35 acres for the LRCP footprint and 91 acres of run-on from the adjacent hillsides. Additional reference drawings are provided in Appendix B.

2024 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

Observations
January 19, 2025

The LRCP dam is a cross-valley dam approximately 1,025 feet long with a maximum height of about 75 feet. It is registered with the Indiana Department of Natural Resources (IDNR) as Panther Creek Dam, a significant hazard structure identified as No. 39-12. Due to 2023 construction activity at the dam, the crest elevation ranges from approximately 493 to 505 feet, facilitating construction of an outfall for the lined diversion channel, box culvert, and phased pond closure. The primary spillway from the LRCP was not modified.

3.0 OBSERVATIONS

Dam and embankment inspections were conducted in general accordance with 257.83(b) to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection at a minimum included:

1. A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., CCR unit design and construction information required by 40 CFR 257.73(c)(1) and 257.74(c)(1), previous periodic structural stability assessments required under 40 CFR 257.73(d) and 257.74(d), the results of inspections by a qualified person, and results of previous annual inspections),
2. A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures, and
3. A visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.

3.1 WEST BOILER SLAG POND

3.1.1 Changes in Geometry Since Last Inspection (257.83(b)(2)(i))

The WBSP dike has remained relatively unchanged since the last inspection. Reference drawings are provided in Appendix B.

3.1.2 Instrumentation (257.83(b)(2)(ii))

Applied Geology and Environmental Science, Inc. (AGES) of Clinton, Pennsylvania manages the groundwater monitoring network at the Clifty Creek Station for IKEC. Piezometer data for the station was provided AGES.

Nineteen piezometers/monitoring wells are associated with the WBSP. Locations of the instruments are shown on excerpts from the respective reports in Appendix C. The maximum recorded readings for each location within the past year are shown in Table 1.

**2024 CCR RULE – SURFACE IMPOUNDMENTS
CLIFTY CREEK DAM/DIKE INSPECTIONS**

Observations
January 19, 2025

Table 1. WBSP Maximum Piezometer Readings within the Past Year

Instrument⁴	Installation Date	Maximum Reading (ft)	Date of Reading
PZ-1 (B-1) ¹	11/4/2009	--	--
PZ-3 (B-3) ²	11/5/2009	--	--
PZ-4 (B-4) ³	11/11/2009	--	--
PZ-5 (B-5) ³	11/10/2009	--	--
WBSP-15-01	11/30/2015	454.16	4/9/2024
WBSP-15-02	11/11/2015	465.73	3/19/2024
WBSP-15-03	12/4/2015	477.03	5/7/2024
WBSP-15-04a	11/12/2015	438.28	4/9/2024
WBSP-15-05a	11/17/2015	440.8	4/9/2024
WBSP-15-06a	11/19/2015	441.12	4/9/2024
WBSP-15-07	11/23/2015	428.91	7/1/2024
WBSP-15-08	11/25/2015	431.45	5/7/2024
WBSP-15-09	1/6/2016	430.98	5/7/2024
WBSP-15-10	1/5/2016	429.59	5/7/2024
CF-15-04 ⁴	12/3/2015	454.53	8/6/2024
CF-15-05	12/1/2015	436.75	2/6/2024
CF-15-06	11/30/2015	430.19	2/6/2024
WBSP-23-01	7/26/2023	430.6	5/7/2024
WBSP-23-02	7/25/2023	431.41	8/6/2024
WBSP-23-03	7/25/2023	429.47	5/7/2024
WBSP-23-04	7/26/2023	431.55	4/9/2024

Notes:

1. Piezometer PZ-1 could not be located during construction activities in 2023.
2. Piezometer PZ-3 was damaged during construction activities in 2023. It was closed on 7/19/2023.
3. Piezometers PZ-4 and PZ-5 were closed due to construction activities on 7/19/2023 and 7/20/2023, respectively.
4. Wells CF-15-04, CF-15-05, CF-15-06, WBSP-15-01 and WBSP-15-02 are part of both the LRCP and WBSP CCR networks.

Piezometer PZ-1 could not be located due to grading activities for the LVWTS. Piezometer PZ-3 was bent and damaged. Piezometers PZ-4 and PZ-5 were closed as part of the LVWTS construction. The maximum readings for those two instruments are for the portion of the year they were in service.

Per AGES, the uppermost aquifer below the WBSP is a discontinuous confined aquifer with pressures reflected in the potentiometric surface. Some piezometric levels are higher than the pool within the surface impoundment, suggesting artesian conditions.

**2024 CCR RULE – SURFACE IMPOUNDMENTS
CLIFTY CREEK DAM/DIKE INSPECTIONS**

Observations
January 19, 2025

3.1.3 Impoundment Characteristics (257.83(b)(2)(iii, iv, v))

Table 2 summarizes the WBSP impoundment characteristics since the previous annual inspection.

Table 2. Summary of WBSP Impoundment Characteristics

Characteristics²	2024 Values¹
Approximate Minimum Depth (Elevation) of impounded water	4 ft (443.0 ft)
Approximate Maximum Depth (Elev.) of impounded water	9 ft (448.0 ft)
Approximate Current Depth (Elev.) of impounded water ²	9 ft (448.0 ft)
Approximate Minimum Depth (Elev.) of CCR	0 ft (433.0 ft) ³
Approximate Maximum Depth (Elev.) of CCR	40 ft (473.0 ft)
Approximate Current Depth (Elev.) of CCR	Ranges from 0 to 40 ft (433 to 473 ft)
Storage Capacity of impounding structure at the time of the inspection ⁴	2,162,500 cy
Approximate volume of impounded water at the time of the inspection ⁵	130,700 cy (WBSP) 14,000 cy (LVWTS) ⁷
Approximate volume of CCR at the time of the inspection ⁶	2,195,000 cy

Notes:

1. All values in feet (ft) or cubic yards (cy). Elevation (Elev.) is shown in feet (NAVD88).
2. Excludes LVWTS basins. Reflects remaining WBSP footprint.
3. Minimum depth located beneath the LVWTS.
4. Assumes water impounded by WBSP embankment dam/dike, including the LVWTS and remaining WBSP footprint.
5. Based on current depth with and estimated pool of 9 acres in the remaining WBSP footprint.
6. Based on a base elevation of 433.0 ft and neglecting LVWTS footprint.
7. Estimates 4,000 cy in primary basin and 10,000 cy in secondary basin with two feet of freeboard.

The storage capacity and volumes of impounded water assume a water elevation of 436 feet within the primary basin, 440 feet within the secondary basin, and with a minimum elevation for the perimeter dike of 458 feet.

3.1.4 Visual Inspection (257.83(b)(2)(vi))

The visual inspection of the WBSP and appurtenant structures was conducted to identify actual or potential structural weaknesses or a condition disrupting or that has potential to disrupt the operation and safety of the impoundment. Specific items observed included upstream and downstream slopes, crest of the embankment dam/dike, and inlet and outlet structures. Appendix A includes a plan view and table with inspection points identified in the field. Appendix D includes a photographic log of the conditions.

The WBSP can be divided into three areas: the LVWTS at the southwestern end of the pond, the inactive CCR deposition and processing area at the northeast end, and a marsh-like area in between. A plan view of the impoundment is included in Appendix A.

2024 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

Observations
January 19, 2025

At the northwest corner of the WBSP, stormwater run-on from the hillside north of the station property and eastern side of the CCR landfill is directed along a diversion channel north of the WBSP, discharging at the NPDES-permitted outfall into Big Clifty Creek. The existing CON/SPAN (box/arch culvert structure) replaced by the constructed diversion channel has negligible inflow limited to the area immediately adjacent to it. The CON/SPAN crosses under the western access road of the WBSP and appears to be in satisfactory condition. No other flows were noted into the WBSP.

The wide berm area along the east side of the WBSP supports several transmission towers and separates the impoundment from Big Clifty Creek. The Devils Backbone borders the west side. The embankment dam/dike is limited to the southern side of the WBSP adjacent to the LVWTS and the gypsum loading pad.

The southwest exterior slope of the embankment dam/dike (facing the Ohio River) near the LVWTS is covered with tall grass but is clear of tall foliage. The grass is tall enough to limit visual inspection. The area was walked to note soft areas, equipment ruts, potential erosion, and the limits of dense vegetation.

The interior slopes of the LVWTS are relatively uniform, riprap covered and appear to be in good condition. There were a few gaps in riprap at the top of the slope next to the access road. Northeast of the LVWTS the interior is marsh-like, and the interior slopes of the embankment dam/dike on the south side are covered with tall weeds and brush. The riverside slope northeast of the LVWTS is overgrown with small to large trees, dense brush, and tall grass. The end of the cleared path and limits of the inspection are noted on the figure in Appendix A.

Both the upstream and the downstream side of the outfall structure from the LVWTS to the Ohio River appear to be in satisfactory condition. No other water inlet or outlet structures were observed for the WBSP other than the pipe carrying process water to the LVWTS. A culvert controls flow between the two LVWTS lined basins.

In general, the internal and external slopes where the vegetation has been controlled appear to be in satisfactory condition. There were no visible signs of impoundment impairment that could affect the normal operation of the facility.

3.1.5 Changes that Affect Stability or Operation (257.83(b)(2)(vii))

Based on discussions with IKEC representatives and observations made during the field inspection, there were no changes to the WBSP impoundment that would affect its stability or future operational needs. No changes associated with the phased construction have been performed since the 2023 inspection.

3.2 LANDFILL RUNOFF COLLECTION POND

3.2.1 Changes in Geometry Since Last Inspection (257.83(b)(2)(i))

The LRCP dam has remained relatively unchanged since the last inspection. Reference drawings are provided in Appendix B.

2024 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

Observations
January 19, 2025

3.2.2 Instrumentation (257.83(b)(2)(ii))

Prior to the Phase 1 improvements, fifteen piezometers were located in the toe and downstream area of the dam. One of the piezometers, CF-9405, was removed at the start of phased construction due to its location in the proposed downstream channel. Locations of the instruments are shown on excerpts from the respective reports in Appendix C. Table 3 below summarizes the maximum reading since the last annual inspection.

Table 3. LRCP Maximum Piezometer Readings within the Past Year

Instrument ²	Installation Date	Maximum Reading (ft)	Date of Reading
CF-9405A	7/21/2021	446.53	7/1/2024
CF-9406	5/10/1994	452.81	2/6/2024
CF-9407	5/12/1994	445.59	4/9/2024 & 5/7/2024
SP-84-7	9/25/1984	449.47	5/7/2024
SP-84-8A ¹	9/26/1984	--	--
CF-15-04 ²	12/3/2015	454.53	8/6/2024
CF-15-05	12/1/2015	436.75	2/6/2024
CF-15-06	11/30/2015	430.19	2/6/2024
WBSP-15-01	11/30/2015	454.16	4/9/2024
WBSP-15-02	11/11/2015	465.73	3/11/2024
CF-15-07	11/23/2015	437.53	10/7/2024
CF-15-08	11/19/2023	447.99	10/7/2024
CF-15-09	11/25/2023	448.15	4/9/2024
CF-19-14	3/8/2019	446.68	4/9/2024
CF-19-15	3/13/2019	429.24	3/11/2024

Notes:

1. Piezometer SP-84-8A was closed on 7/19/2023.
2. Wells CF-15-04, CF-15-05, CF-15-06, WBSP-15-01 and WBSP-15-02 are part of both the LRCP and WBSP CCR networks.

Per AGES, the uppermost aquifer below the LRCP is a discontinuous confined aquifer with pressures reflected in the potentiometric surface. Some piezometric levels are higher than the pool within the surface impoundment, suggesting artesian conditions.

3.2.3 Impoundment Characteristics (257.83(b)(2)(iii, iv, v))

The LRCP is an inactive facility that ceased wet CCR disposal in 1986 (AEPSC, 2016b). As part of the Phase 1 activities, the surface water in the pond was lowered and maintained at approximately elevation 478 feet. Table 4 summarizes the impoundment characteristics since the previous annual inspection.

**2024 CCR RULE – SURFACE IMPOUNDMENTS
CLIFTY CREEK DAM/DIKE INSPECTIONS**

Observations
January 19, 2025

Table 4. Summary of LRCP Impoundment Characteristics

Characteristics	2024 Values¹
Approximate Minimum Depth (Elevation) of impounded water	2.9 ft (477.9 ft)
Approximate Maximum Depth (Elev) of impounded water	6.2 ft (481.2 ft)
Approximate Current Depth (Elev) of impounded water	3 ft (478 ft)
Approximate Minimum Depth (Elev) of CCR	Less than 5 ft (assumed) (Varying elevations) ³
Approximate Maximum Depth (Elev) of CCR	45 ft (485 ft) ³
Approximate Current Depth (Elev) of CCR	Less than 5 ft to 55 ft (Varying elevations) ³
Storage Capacity of impounding structure at the time of the inspection	697,500 cy
Approximate volume of impounded water at the time of the inspection	21,000 cy
Approximate volume of CCR at the time of the inspection	2,000,000 cy

Notes:

1. All values in feet (ft) or cubic yards (cy). Elevation (Elev.) is shown in feet (NAVD88).
2. Depth of impounded water is shown as water ponded above the CCR elevation (estimated at elevation 475 feet).
3. Ground surface within the LRCP conservatively estimated as 430 feet, reflecting the pond's estimated lowest elevation (Stantec, 2018). Bottom elevation varies across the footprint.
4. Volumes of water based on stage-storage curves and the current depth of impounded water.

3.2.4 Visual Inspection (257.83(b)(2)(vi))

The exterior slope of the LRCP dam is covered with tall grass but is clear of woody foliage. The grass is tall enough to limit visual inspection. The area was walked to note soft damp areas, equipment ruts, potential erosion, and the limits of dense vegetation. These areas should be revisited and monitored once mowing is completed to see if the additional maintenance steps are needed.

With the 2023 Phase 1 improvements, most of the visible surfaces of the dam were regraded and improved with the exception of the riprap-covered downstream eastern slope and the existing untouched western side. The regraded slopes were seeded and mulched following construction. On the downstream side, there are locations along the north edge of the channel where erosion rills have formed. One location below the access road to the toe where the seeded surface had sloughed off the slope. Overall, the dam and associated structures appear to be in satisfactory condition.

The visual inspection of the LRCP and appurtenant structures was conducted to identify actual or potential structural weaknesses or a condition disrupting or that has potential to disrupt the operation and safety of the impoundment. Specific items observed included upstream and downstream slopes, crest of the embankment dam/dike, and inlet and outlet structures. Appendix A includes a plan view and table with inspection points identified in the field. Appendix D includes a photographic log of the conditions.

2024 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

Summary of Findings
January 19, 2025

3.2.5 Changes that Affect Stability or Operation (257.83(b)(2)(vii))

Based on discussions with IKEC representatives and observations made during the field inspection, there were no changes to the LRCP impoundment that would affect its stability or future operational needs. No changes associated with the phased construction have been performed since the 2023 inspection.

4.0 SUMMARY OF FINDINGS

The following recommendations regarding maintenance, monitoring, and deficiencies are offered for the Clifty Creek Station's two CCR surface impoundments.

4.1 MAINTENANCE

4.1.1 West Boiler Slag Pond

The upstream and downstream dike slopes and crest areas, east of the LVWTS, are overgrown with small to large trees and heavy brush (Photographs 3, 4, and 6 in Appendix D). These conditions make it virtually impossible to inspect the slopes. The trees and larger brush can also provide seepage pathways as the larger foliage dies off. Trees that topple in windstorms can leave large holes exposed in the face of the dam. Stantec recommends that the overgrown crest and downstream side of the dam be stripped of foliage, graded for ease of maintenance, and seeded with grass to protect it from erosion. This will allow for future inspections to be conducted on this portion of the dam.

On the downstream face of the dam near the LVWTS, the area should be revisited and monitored once mowing is completed to see if the additional maintenance steps are needed for the soft areas, equipment tracks, and potential erosion. The erosion and minor rutting should be backfilled, graded, and reseeded.

The structural integrity of the dikes and components of the WBSP should be maintained during continuing closure activities.

4.1.2 Landfill Runoff Collection Pond

Minor maintenance for the LRCP includes mowing of the dam slopes to observe potential issues or concerns, repairing the erosion rills above the downstream channel, and monitoring the surface-sloughed area beneath the access road to the toe will likely require attention as well (Photographs 1, 2, 3, 6, and 9).

Some additional riprap and revegetation may be necessary along the downstream channel to fill in bare spots due to removed silt fencing and the thicken the revegetated areas (Photograph 4).

At the outlet for Outfall 001, the brush and foliage around the wingwalls were removed to aid in observation of the outlet structure. A railing around the top of the head and wing walls was added. Any superfluous materials or fixtures associated with the inlet structure should be removed. It is understood that the inlet elevation will be adjusted as part of the Phase 2 construction (Photograph 5).

2024 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

References

January 19, 2025

Appendix A includes a plan view and table with inspection points identified in the field. Appendix D includes a photographic log of the conditions.

4.2 MONITORING

EPA regulations require weekly and monthly inspections of the CCR surface impoundments, which are performed by qualified plant personnel. These inspections include observations for actual or potential structural weaknesses or other conditions that may disrupt the operation or safety of the CCR unit. The discharge from outlets of hydraulic structures under the base of the surface impoundment or through the dike of the CCR unit is observed for abnormal discoloration or discharge of debris or sediment. Available 2024 weekly and monthly inspection reports were provided by plant personnel for review (IKEC 2024a through 2024d).

Per 40 CFR 257.83(a)(iii), instrumentation should be monitored at least every 30 days by a qualified person. AGES performs a monthly inspection/inventory of the instrumentation at the BSP and SFAP. Daily field activity updates are provided to OVEC and Stantec at a frequency less than 30 days, documenting instrument condition and sampling events (AGES 2024c).

Annual inspections by a qualified professional engineer are required under the EPA regulations. The dam and dike inspections for 2015 through 2022 were performed by American Electric Power Service Corporation (AEPSC) (AEPSC 2015, 2016, 2017, 2022a through 2022e). Stantec performed the 2023 inspection (Stantec 2024). Copies are available on IKEC's publicly accessible CCR website (IKEC 2024e).

4.2.1 WBSP Monitoring

Special or more frequent monitoring of the facility other than that already being performed should not be necessary unless conditions change.

4.2.2 LRCP Monitoring

With the Phase 1 construction activities complete, the new culvert performance and newly graded and seeded slopes should be monitored for erosion as grass is sufficiently established. Settlement of the approach fill on either side of the culvert may become evident by a bump that precedes the culvert.

4.3 DEFICIENCIES

No structural deficiencies in the dam/dike structures were observed during the 2024 annual inspection.

5.0 REFERENCES

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2024 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

References

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2024 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

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**2024 CCR RULE – SURFACE IMPOUNDMENTS
CLIFTY CREEK DAM/DIKE INSPECTIONS**

References

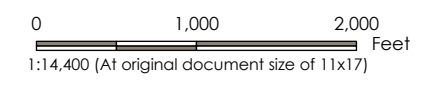
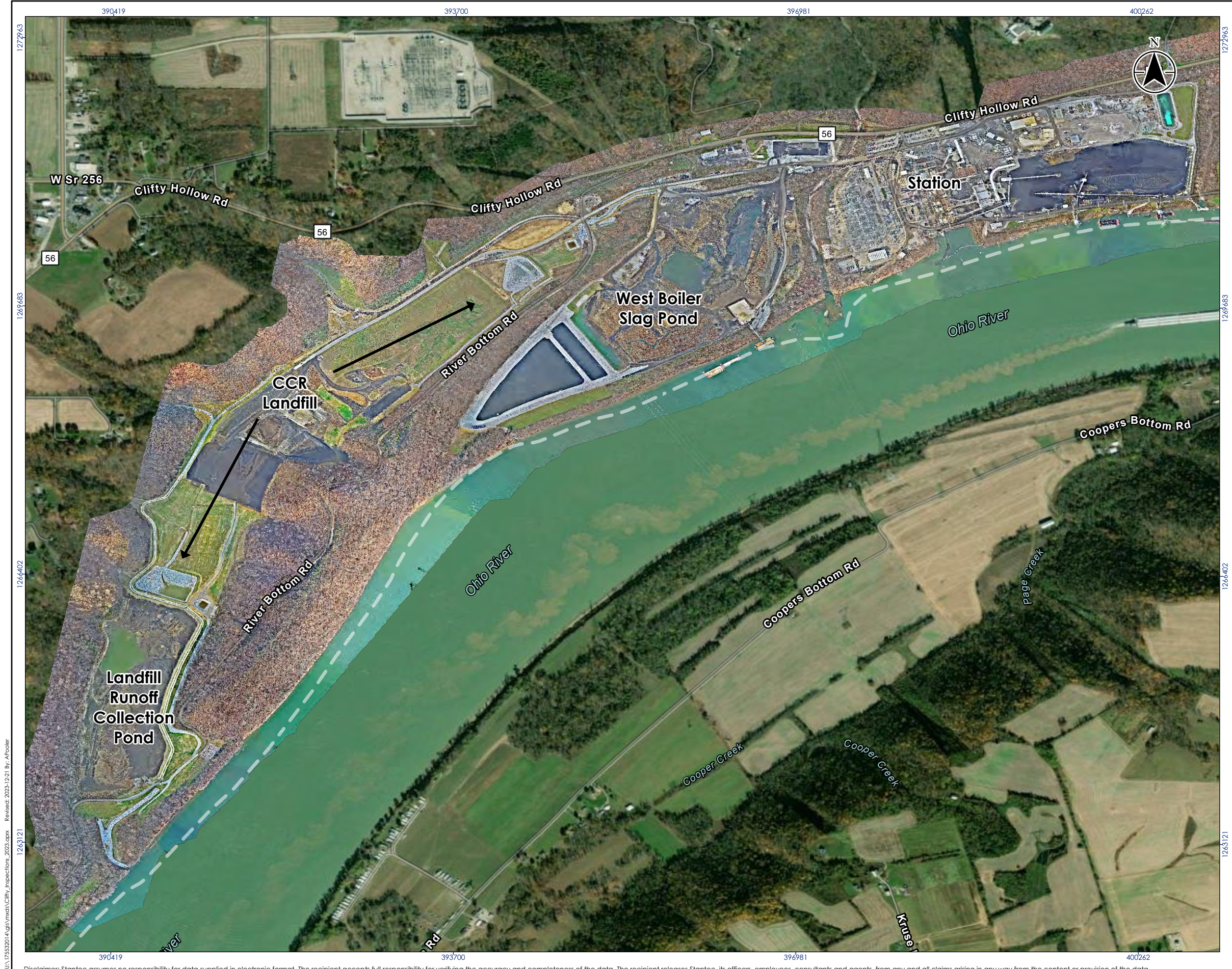
January 19, 2025

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APPENDIX A

Figures



- Notes**
- 1. Coordinate System: Latitude/Longitude NAD83
 - 2. Base features - ESRI
 - 3. Ortho-Imagery represents conditions from November 2023.



Project Location
Clifty Creek Station
Jefferson County, IN

173410747
Prepared by ANP on 2023-12-21
Technical Review by DP on 2023-12-21
Independent Review by JSH on 2023-12-21

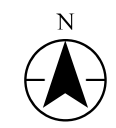
Client/Project
Indiana - Kentucky Electric Corporation
Clifty Creek Station

Figure No.
1

Title
**2024 Annual CCR Facility Inspections -
Station Overview**



- Legend
- 1 → Photo Location
 - Inspection Locations 2024



0 200 400 Feet
1:4,800 (At original document size of 11x17)

- Notes
- 1. Coordinate System: Latitude/Longitude NAD83
 - 2. Base features - ESRI
 - 3. Ortho-Imagery represents conditions from November 2023.



Project Location
Clifty Creek Station
Jefferson County, IN

173410747
Prepared by ANP on 2025-01-14
Technical Review by JS on 2025-01-14
Independent Review by JSH on 2025-01-14

Client/Project
Indiana - Kentucky Electric Corporation
West Boiler Slag Pond

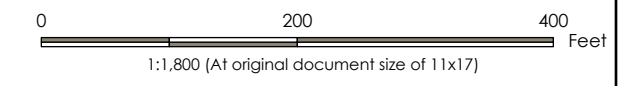
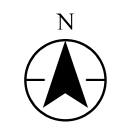
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2

Title
2024 Annual CCR Surface Impoundment Inspection

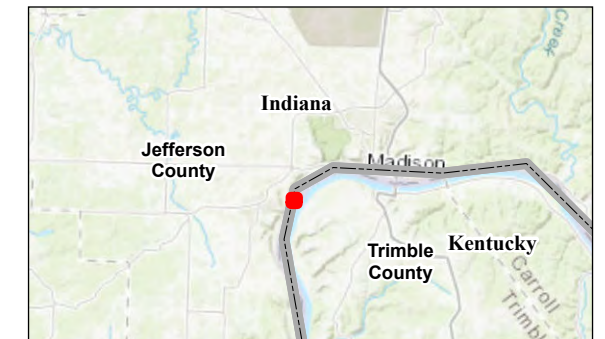
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- Legend
- 1 → Photo Location
 - Inspection Locations 2024



- Notes
- 1. Coordinate System: Latitude/Longitude NAD83
 - 2. Base features - ESRI
 - 3. Ortho-Imagery represents conditions from November 2023.



Project Location
Clifty Creek Station
Jefferson County, IN

173410747
Prepared by ANP on 2025-01-14
Technical Review by JS on 2025-01-14
Independent Review by JSH on 2025-01-14

Client/Project
Indiana - Kentucky Electric Corporation
Landfill Runoff Collection Pond

Figure No.
3

Title
2024 Annual CCR Surface Impoundment Inspection

GPS Data Points
2024 Annual Inspection

Clifty Creek CCR Surface Impoundments
Jefferson County, Indiana

Point ID No.	Photo ID No(s).	Comment	Latitude	Longitude	Location
1		Equipment Track	38.730099	-85.434797	WBSP
2		Erosion/Slough	38.730392	-85.434187	WBSP
3		Erosion Hole	38.730633	-85.433421	WBSP
4		Erosion Hole	38.730863	-85.432921	WBSP
5		Soft Spot	38.731236	-85.431612	WBSP
6		Edge of Dense Vegetation	38.731310	-85.430990	WBSP
7		Edge of Dense Vegetation	38.731299	-85.431136	WBSP
8		Edge of Dense Vegetation	38.731300	-85.431512	WBSP
9		Edge of Dense Vegetation	38.731415	-85.431675	WBSP
10		Erosion from Crest	38.730974	-85.433087	WBSP
11		Visible Boiler Slag	38.730923	-85.433256	WBSP
12		Visible Boiler Slag	38.730834	-85.433510	WBSP
13		Visible Boiler Slag	38.730529	-85.434300	WBSP
14		Low Spot Riprap by Road	38.730558	-85.434325	WBSP
15		Visible Boiler Slag	38.730465	-85.434456	WBSP
16		Visible Boiler Slag	38.730339	-85.434734	WBSP
17		Taller Vegetation	38.733420	-85.426526	WBSP
18		Switchyard to Tower Erosion	38.736115	-85.424045	WBSP

GPS Data Points
2024 Annual Inspection

Clifty Creek CCR Surface Impoundments
Jefferson County, Indiana

Point ID No.	Photo ID No(s).	Comment	Latitude	Longitude	Location
19		Soft Wet Spot	38.717208	-85.448715	LRCP
20		Soft Damp Zone	38.717260	-85.449055	LRCP
21		Soft Damp Zone	38.717218	-85.449040	LRCP
22		Soft Damp Spot	38.717006	-85.448913	LRCP
23		Soft Damp Spot	38.716962	-85.448893	LRCP
24		Erosion Gulley at Top	38.716974	-85.448872	LRCP
25		Soft Spot	38.716904	-85.448253	LRCP
26		Soft Spot	38.716957	-85.448262	LRCP
27		Soft Spot	38.716987	-85.448138	LRCP
28		Previous Location of Silt Fence	38.717001	-85.447903	LRCP
29		Area Revegetation	38.717191	-85.447808	LRCP
30		Area Erosion	38.717255	-85.447815	LRCP
31		Snake Holes	38.717246	-85.448221	LRCP
32		Guardrail Post Hole	38.717504	-85.448919	LRCP
33		Guardrail Post Hole	38.717504	-85.448396	LRCP
34		Erosion Gulley	38.718231	-85.446431	LRCP
35		Bare Earth	38.717532	-85.447798	LRCP
36		Bare Earth	38.717511	-85.447956	LRCP
37		Bare Area, Erosion	38.717396	-85.447960	LRCP
38		Edge of Taller Vegetation	38.717414	-85.448032	LRCP
39		Edge of Taller Vegetation	38.717358	-85.447993	LRCP
40		Hole(6 in. wide by 4 in. deep)	38.717407	-85.447819	LRCP
41		Erosion Hole	38.717400	-85.447441	LRCP
42		Dirt at Base of Stairs	38.717841	-85.446662	LRCP
43		Bare Zone	38.719322	-85.444484	LRCP
44		Bare Zone	38.719392	-85.444419	LRCP
45		Slough	38.718215	-85.445892	LRCP
47		Circular Erosion	38.718547	-85.445557	LRCP
48		Grade Change	38.718669	-85.445453	LRCP
49		Grade Change Near Monument	38.718880	-85.445322	LRCP
50		Bare Spot	38.718524	-85.446053	LRCP

APPENDIX B

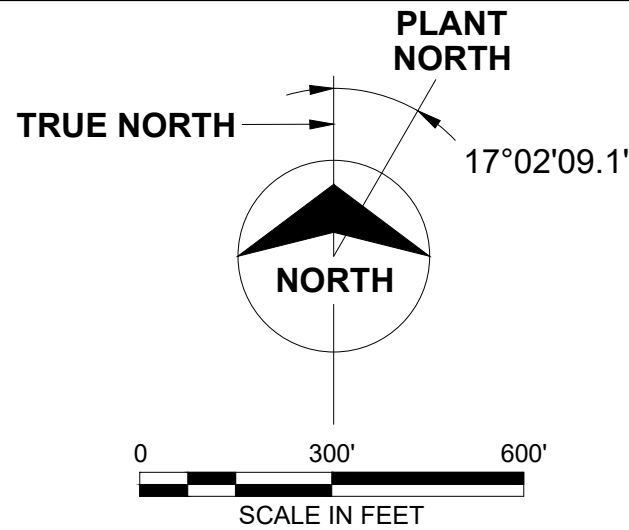
Reference Drawings

APPENDIX B

Burns & McDonnell (2023)



PROJECT CONTROL POINTS						
NAME	PLANT COORDINATES			IN EAST STATE PLANE NAD27		
	NORTHING	EASTING	ELEV	NORTHING	EASTING	NAVD88 ELEV
MON-1	N 5,525.100	E 1,234.577	511.424	N 443,950.450	E 563,164.420	510.084
MON-2	N 10,813.224	E 6,644.368	511.767	N 450,591.790	E 566,786.870	510.427
MON-3	N 10,817.721	E 8,875.428	473.007	N 451,249.940	E 568,918.63	471.667
MON-4	N 8,466.325	E 4,855.629	469.729	N 447,823.730	E 565,764.48	468.389



CONFORMING TO
CONSTRUCTION
RECORDS

9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co., Inc.

designed
A. MYERS

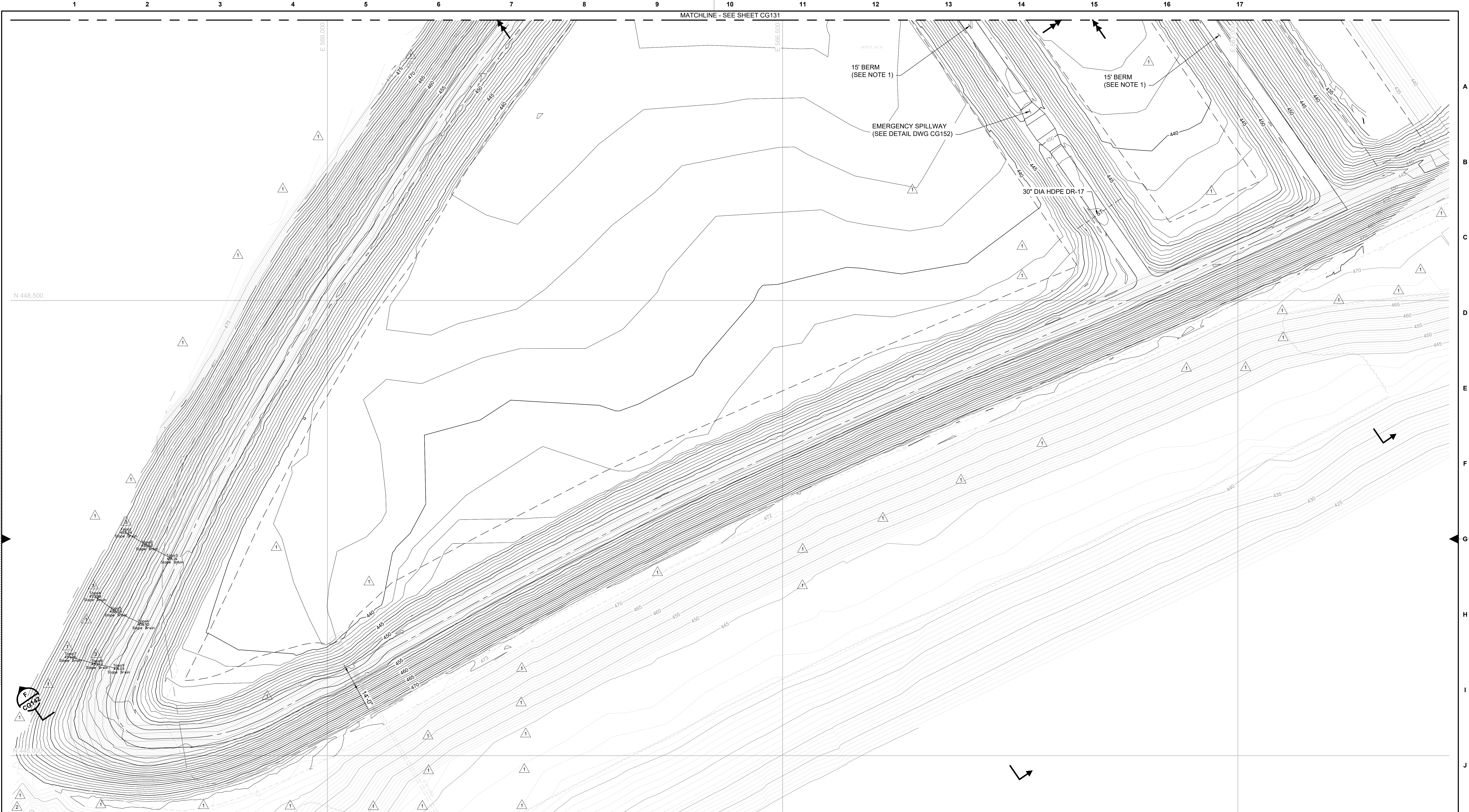
detailed
C. DONNICI

Ohio Valley Electric Corporation | Indiana-Kentucky Electric Corporation

CLIFTY CREEK GENERATING STATION
CCR / ELG PROJECT

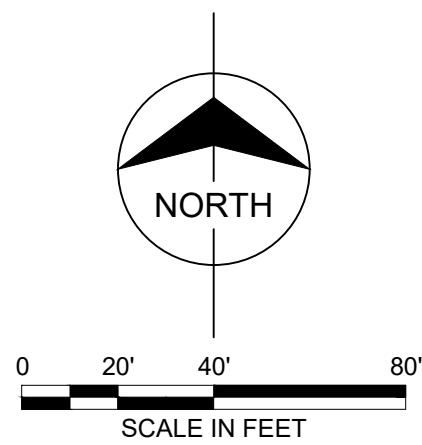
JEFFERSON COUNTY, INDIANA

LVWTS BASIN SITE PLAN			
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sheet	of	sheet	of
file 142597_CS102_SITE_PLAN.dwg			



NOTES:

1. SEE DETAIL DRAWING CG151 FOR BASIN DIVIDER BERM DETAILS.



CONFORMING TO
CONSTRUCTION
RECORDS



9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co., Inc.

designed
A. MYERS

detailed
C. DONNICI



CLIFTY CREEK GENERATING STATION
CCR / ELG PROJECT

JEFFERSON COUNTY, INDIANA

LVWTS BASIN
FINISH GRADING PLAN
SHEET 2

project
142597

contract
8120

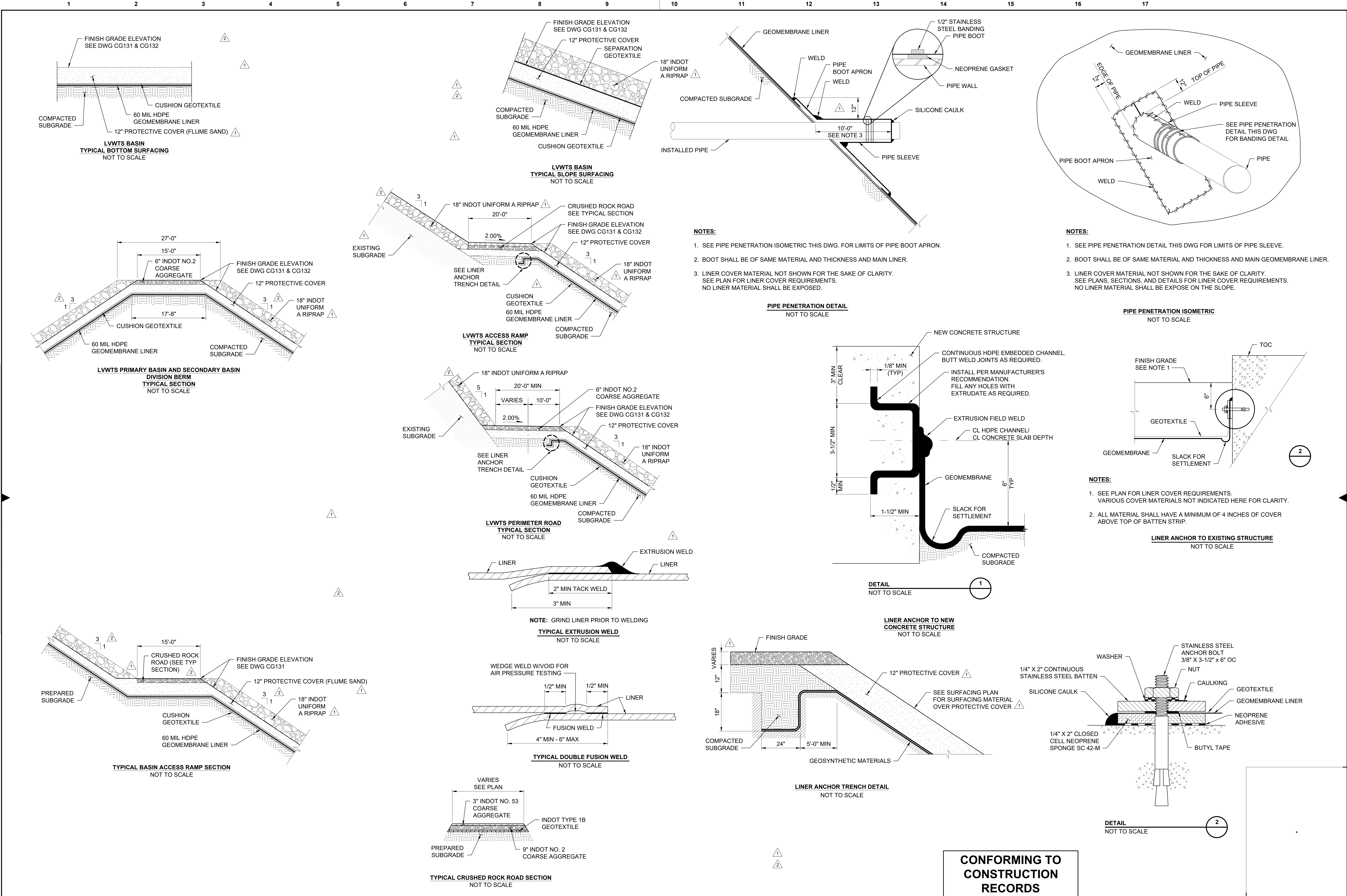
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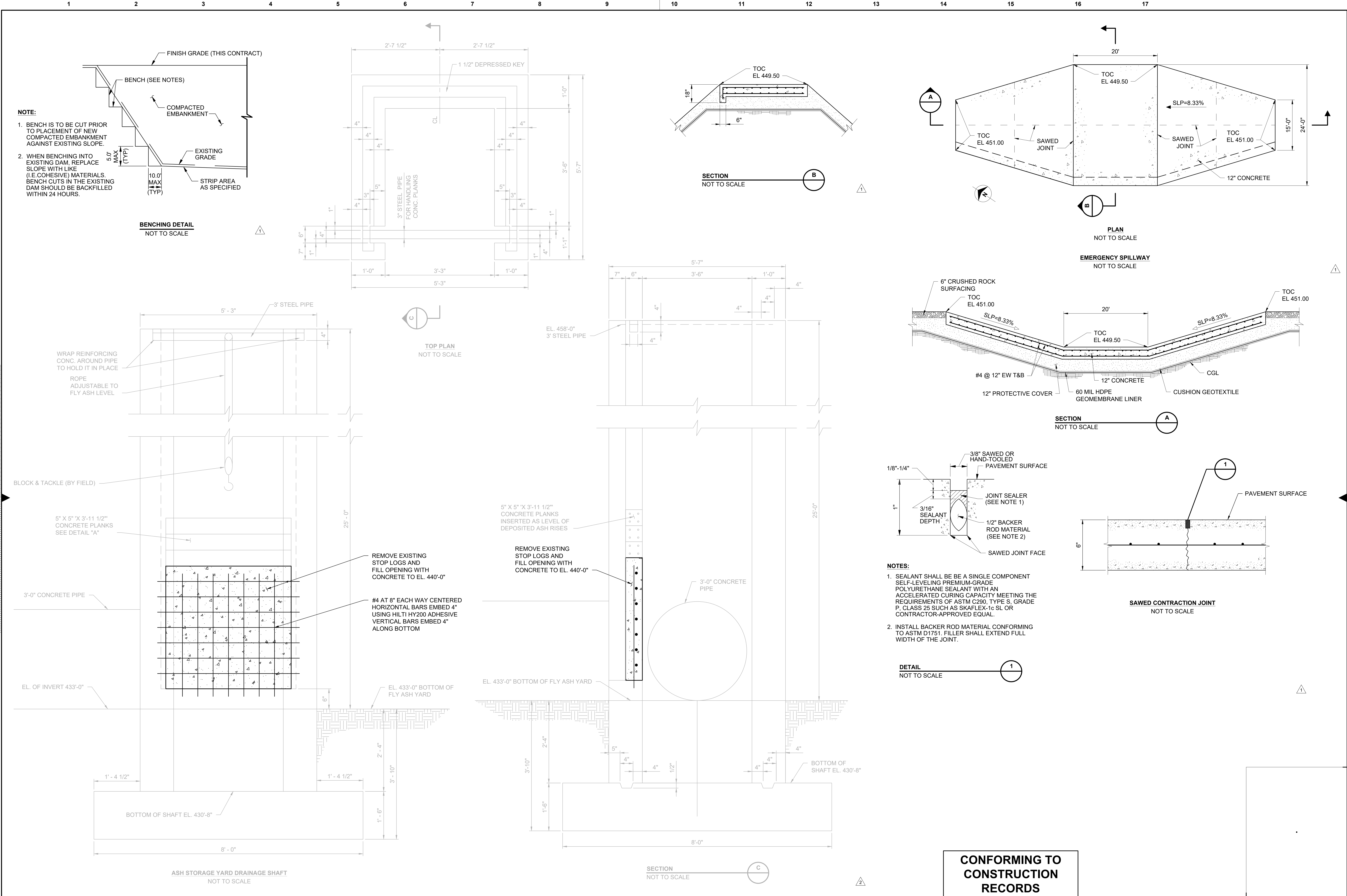
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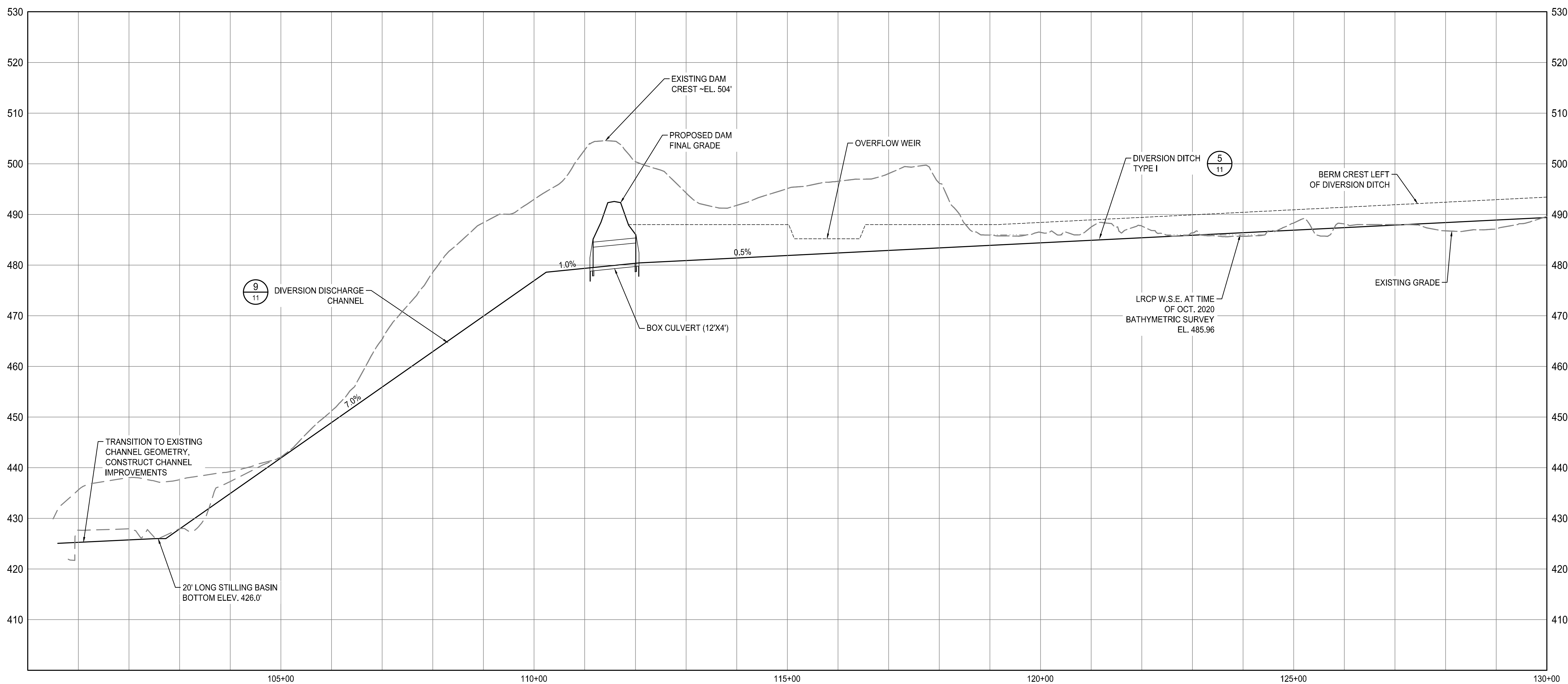
APPENDIX B

Stantec (2021b)



Consultant

Notes



SECTION OR DETAIL NO.
TARGET DRAWING
REFERENCE KEY

ISSUED FOR PERMIT

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Permit/Seal

Client/Project Logo



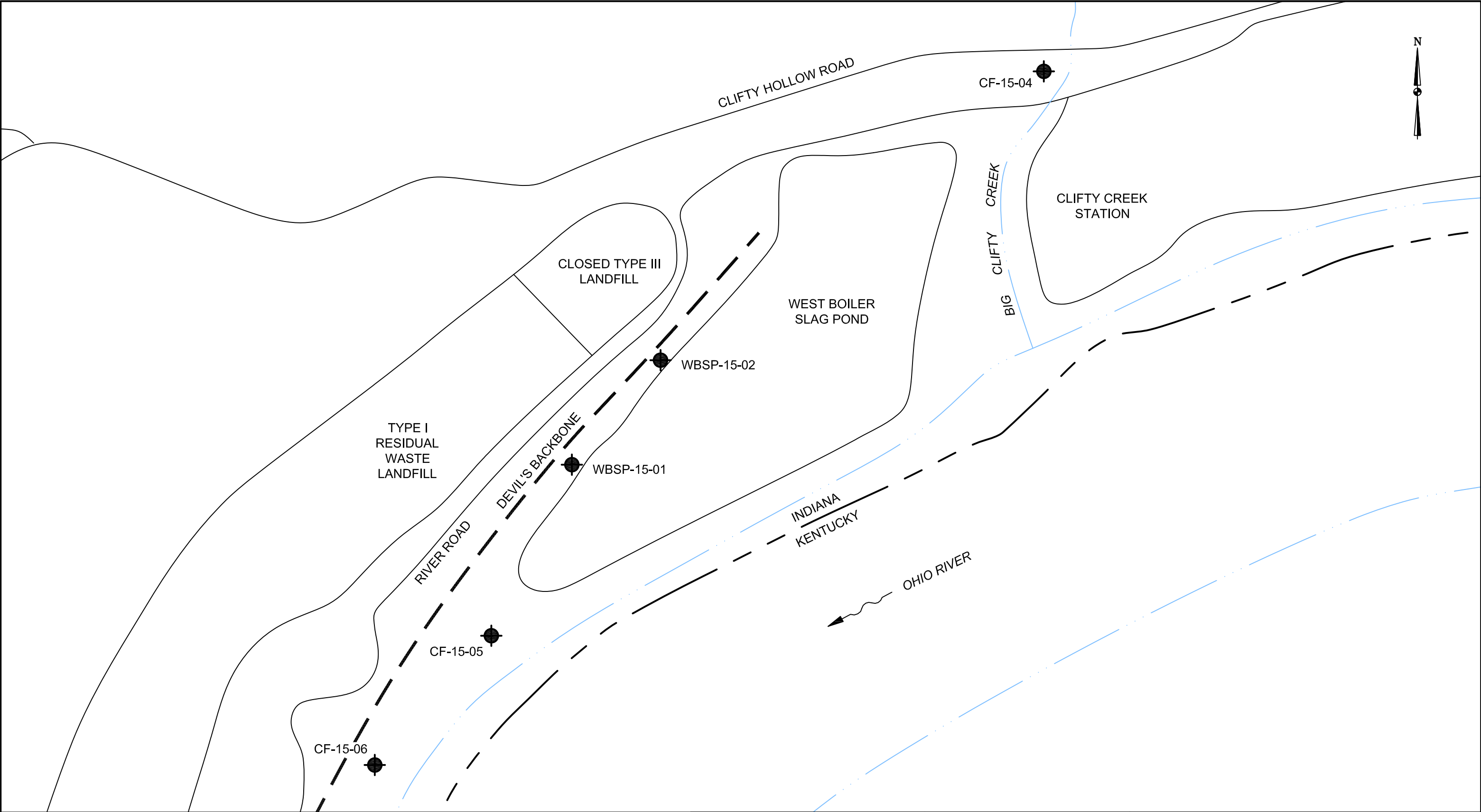
Client/Project
OHIO VALLEY ELECTRIC CORPORATION
INDIANA-KENTUCKY ELECTRIC CORPORATION
POND CLOSURE - LANDFILL RUNOFF
COLLECTION POND, CLIFTY CREEK STATION
MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA

PROFILE - DIVERSION DITCH BASELINE

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Revision A	Sheet 8	Drawing No. P-LRCP-220-PR1

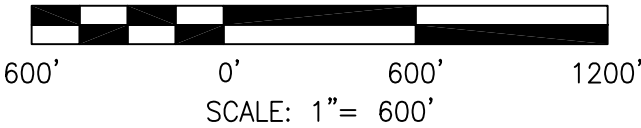
APPENDIX C

Instrumentation



LEGEND:

● MONITORING WELL LOCATION



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CHECKED BY	
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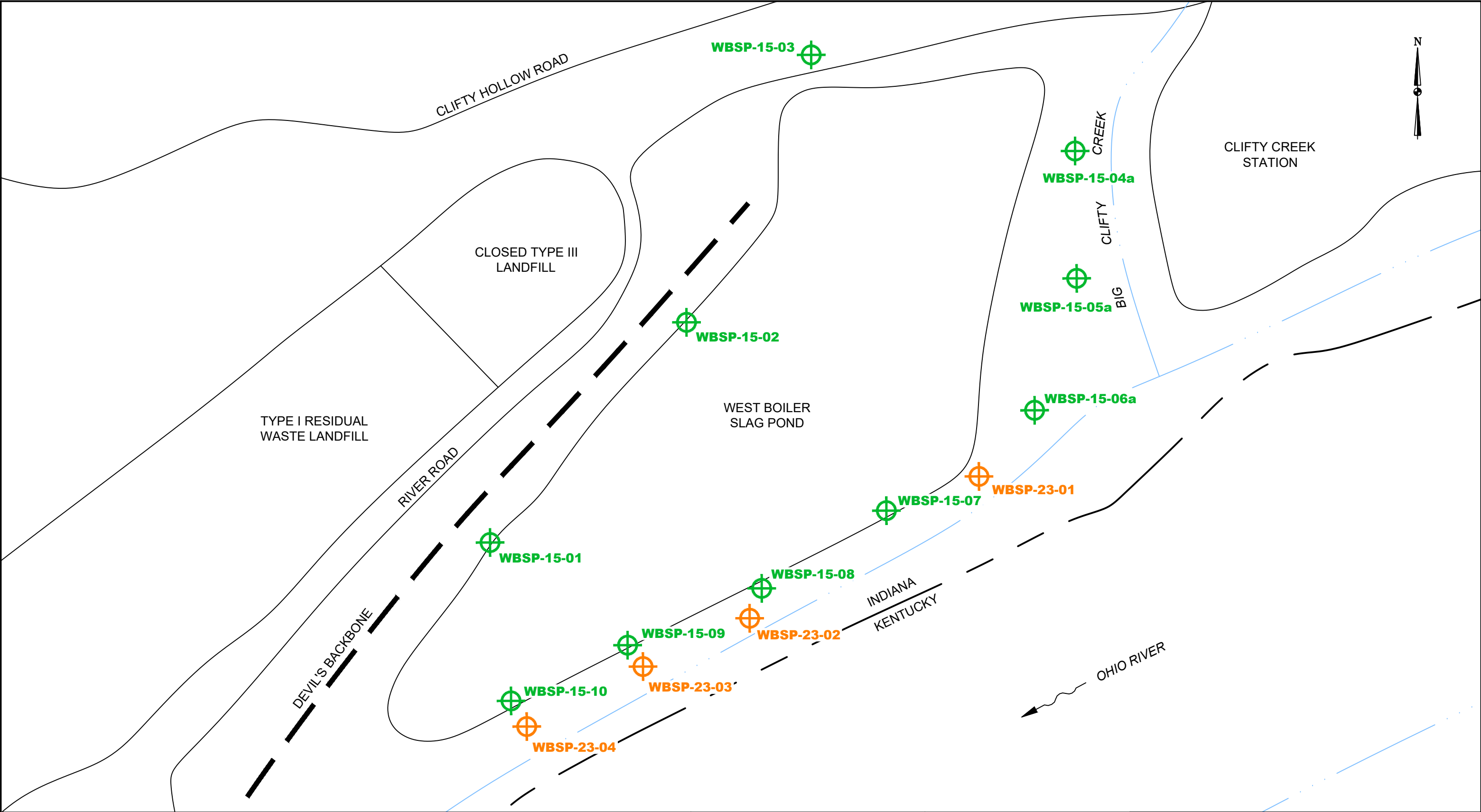
AGES
Applied Geology And Environmental Science, Inc.

2402 Hookstown Grade Road, Suite 200
Clinton, PA 15026
412.264.6453

INDIANA-KENTUCKY ELECTRIC CORPORATION

CLIFTY CREEK STATION
MADISON, INDIANA
TYPE I RESIDUAL WASTE LANDFILL AND
LANDFILL RUNOFF COLLECTION POND
BACKGROUND MONITORING WELL LOCATIONS

DRAWING NAME	FIGURE 9	REV.	0
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LEGEND:

- CCR EXISTING PROGRAM MONITORING WELL
- CCR INTERIM PROGRAM MONITORING WELL

SCALE: 1"= 400'

DATE	AB
CHECKED BY	
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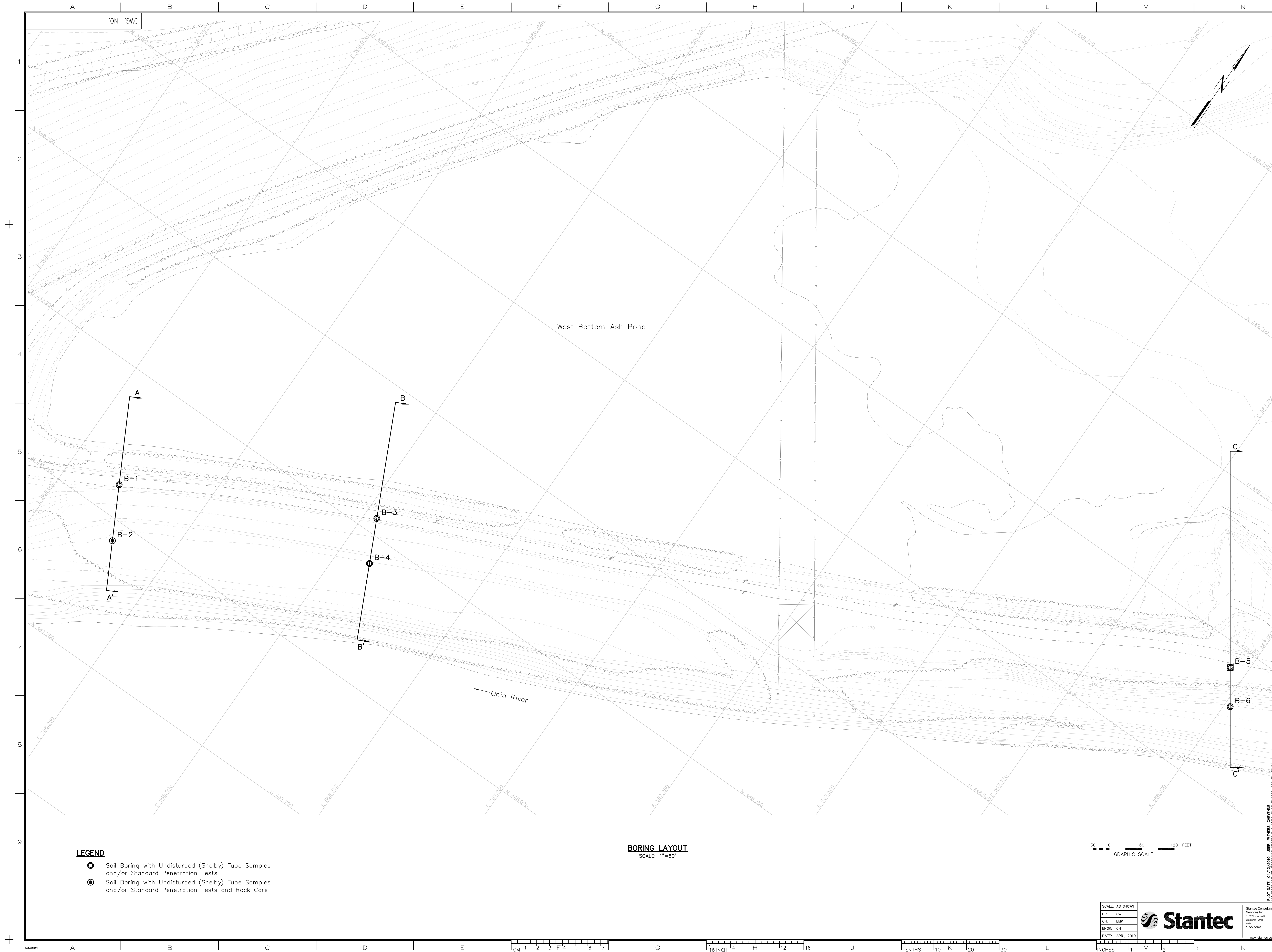
AGES
Applied Geology And Environmental Science, Inc.

2402 Hookstown Grade Road, Suite 200
Clinton, PA 15026
412.264.6453

INDIANA-KENTUCKY ELECTRIC CORPORATION

CLIFTY CREEK STATION
MADISON, INDIANA
WEST BOILER SLAG POND
EXISTING AND INTERIM MONITORING WELL LOCATION MAP

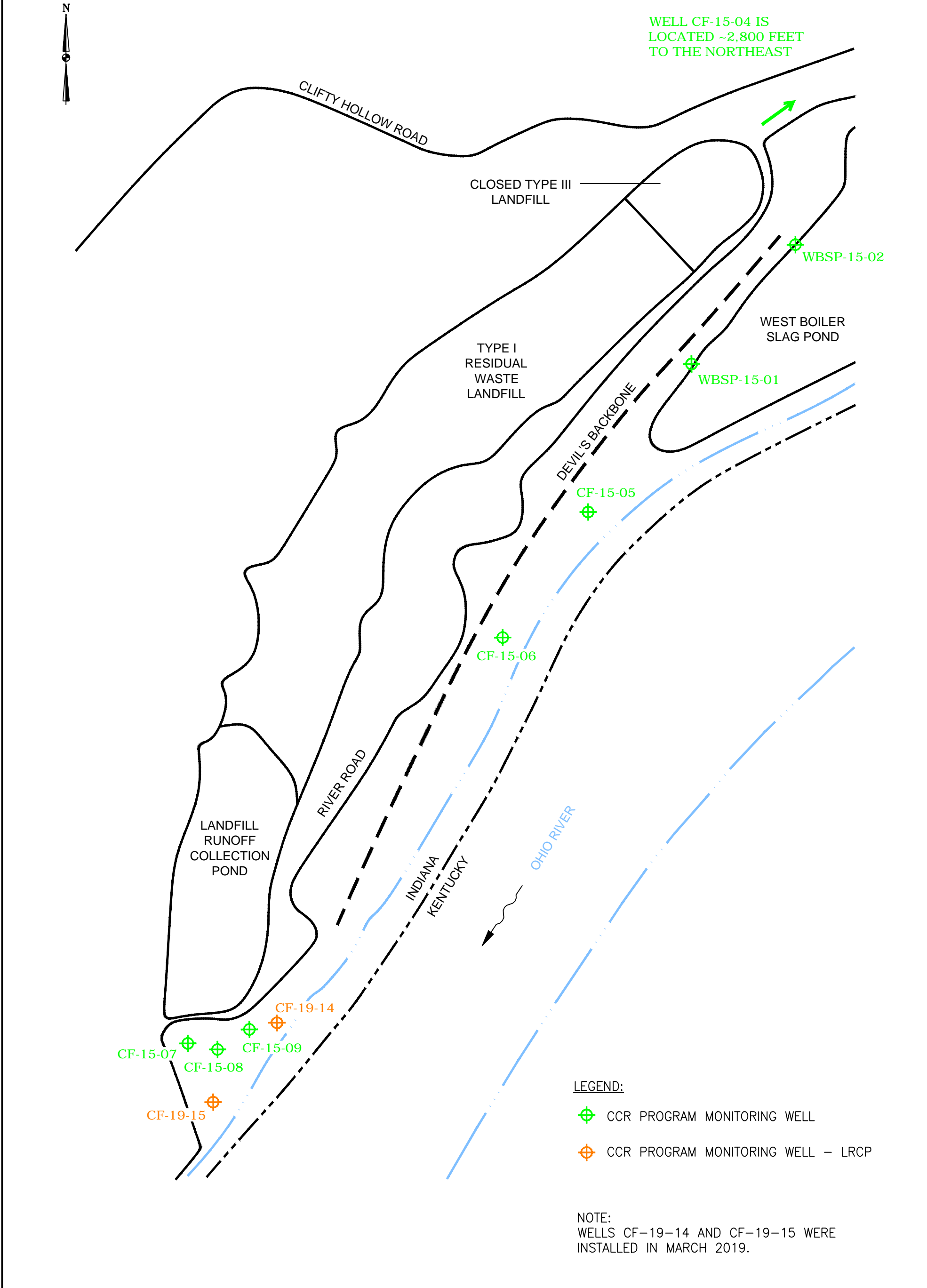
DRAWING NAME	FIGURE 5-2	REV.	0
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NOTES

REFERENCE DRAWINGS

DATE	NO.	DESCRIPTION	APPR.
REVISIONS			
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INDIANA - KENTUCKY ELECTRIC CO. CLIFTY CREEK PLANT MADISON INDIANA			
GEOTECHNICAL EXPLORATION WEST BOTTOM ASH POND BORING LAYOUT			
DWG. NO.			
SCALE:	CIVIL ENGINEERING DIVISION		
DR:	APPROVED BY		
CH:			
ENGR:			
DATE:			
DATE:			
SCALE: AS SHOWN	Stantec		
DR: CW	Stantec Consulting Services Inc. 11855 Lakeside Rd. Cincinnati, Ohio 45241		
CH: EMK	AMERICAN ELECTRIC POWER		
ENGR: CN	AEP SERVICE CORP. 1 RIVERSIDE PLAZA COLUMBUS, OH 43215		
DATE: APR., 2010			



DRAWN BY		JM	<div><div>2402 Hookstown Grade Road, Suite 200 Clinton, PA 15026 412.264.6453</div></div>	INDIANA-KENTUCKY ELECTRIC CORPORATION			
DATE				CLIFTY CREEK STATION MADISON, INDIANA TYPE I RESIDUAL WASTE LANDFILL AND LANDFILL RUNOFF COLLECTION POND MONITORING WELL LOCATION MAP			
CHECKED BY							
JOB NO.		2020010-CLIFTY					
DWG FILE		2_2020_IKEC_Clifty_GW MW LOCs_LANDFILL b01.dwg					
DRAWING SCALE		NOT TO SCALE	DRAWING NAME		FIGURE 2	REV.	0



NOTES

REFERENCE DRAWINGS

DATE	NO.	DESCRIPTION	APPRO.
REVISIONS			
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INDIANA - KENTUCKY ELECTRIC CO. CLIFTY CREEK PLANT MADISON INDIANA GEOTECHNICAL EXPLORATION LANDFILL RUNOFF COLLECTION POND DAM BORING LAYOUT			
DWG. NO.			
SCALE:		CIVIL ENGINEERING DIVISION	
DR:		APPROVED BY	
CH:		DATE:	
ENGR:		DATE:	
DATE: MAY, 2010		AEP SERVICE CORP. 1 RIVERSIDE PLAZA COLUMBUS, OH 43215	

LEGEND

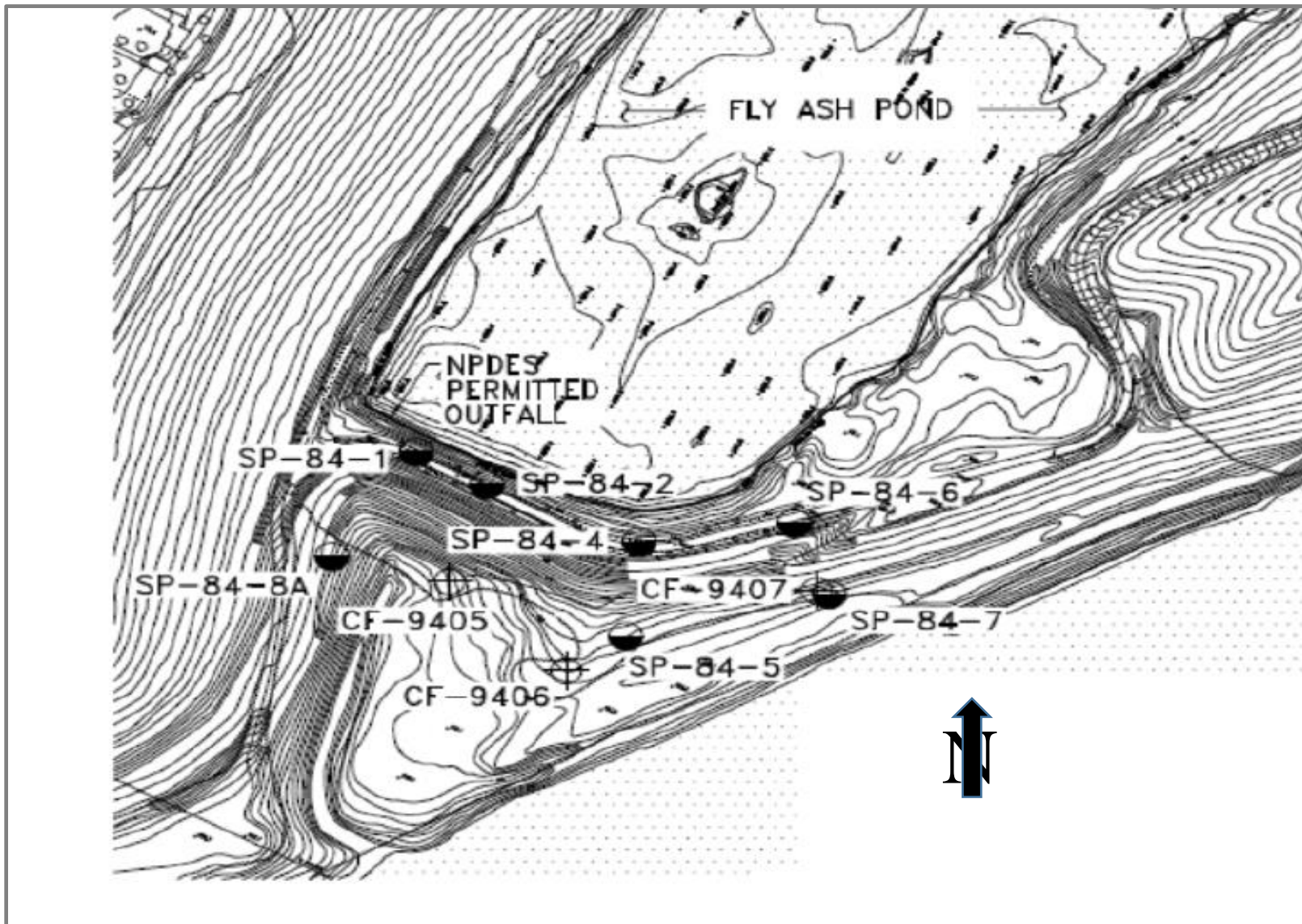
- Soil Boring with Undisturbed (Shelby) Tube Samples and/or Standard Penetration Tests
- Historic Boring

BORING LAYOUT
SCALE: 1"=40'



Stantec Consulting
Services Inc.
11815 Calhoun Rd.
Cincinnati, Ohio
45241
513-442-6500
www.stantec.com

FIGURE 5 - LANDFILL RUNOFF COLLECTION POND PIEZOMETERS LOCATION MAP



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Notes

	ELECTRIC TOWER
PB	ELECTRIC PULLBOX
	TREE/SHRUB
	ELECTRIC POLE
CB	STORM CATCH BASIN
OWE	OVERHEAD ELECTRIC
UGE	UNDERGROUND ELECTRIC
X	FENCE
	GUARDRAIL
	PROPERTY LINE
	RAILROAD TRACKS
ST	STORM SEWER
	EDGE OF WATER
	TREE LINE
450	EXISTING INDEX CONTOUR
	EXISTING INTERMEDIATE CONTOUR
	DITCH / FLOW DIRECTION
	TYPE I LANDFILL WASTE BOUNDARY
	LANDFILL LEACHATE FORECRAIN
	GROUNDWATER MONITORING WELL
	CONTROL MONUMENT
	PHASE BOUNDARY

Permit/Seal

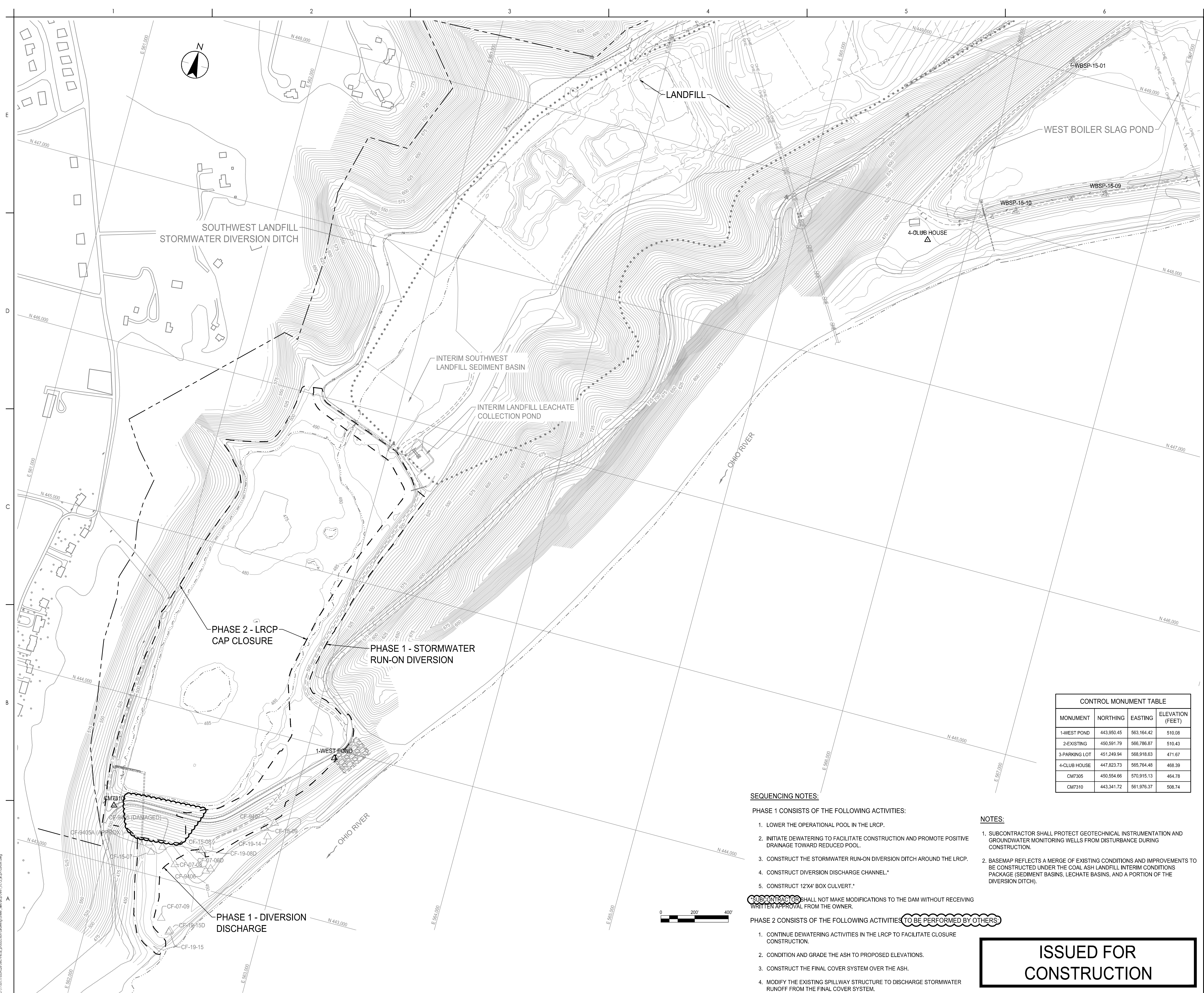
Client/Project Logo



Client/Project
OHIO VALLEY ELECTRIC CORPORATION
INDIANA-KENTUCKY ELECTRIC CORPORATION
POND CLOSURE - LANDFILL RUNOFF
COLLECTION POND, CLIFTY CREEK STATION
MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA

OVERVIEW / SEQUENCING PLAN

Project No. 175539026		Scale AS SHOWN
Revision 1	Sheet 3	Drawing No. LRCP-103-OVR



PHASE 1 CONSISTS OF THE FOLLOWING ACTIVITIES:

- *SUBCONTRACTOR SHALL NOT MAKE MODIFICATIONS TO THE DAM WITHOUT RECEIVING WRITTEN APPROVAL FROM THE OWNER.

1. CONTINUE DEWATERING ACTIVITIES IN THE LRCP TO FACILITATE CLOSURE CONSTRUCTION.
2. CONDITION AND GRADE THE ASH TO PROPOSED ELEVATIONS.
3. CONSTRUCT THE FINAL COVER SYSTEM OVER THE ASH.
4. MODIFY THE EXISTING SPILLWAY STRUCTURE TO DISCHARGE STORMWATER RUNOFF FROM THE FINAL COVER SYSTEM.

1. SUBCONTRACTOR SHALL PROTECT GEOTECHNICAL INSTRUMENTATION AND GROUNDWATER MONITORING WELLS FROM DISTURBANCE DURING CONSTRUCTION.
2. BASEMAP REFLECTS A MERGE OF EXISTING CONDITIONS AND IMPROVEMENTS TO BE CONSTRUCTED UNDER THE COAL ASH LANDFILL INTERIM CONDITIONS PACKAGE (SEDIMENT BASINS, LEACHATE BASINS, AND A PORTION OF THE DIVERSION DITCH).

CONTROL MONUMENT TABLE			
MONUMENT	NORTHING	EASTING	ELEVATION (FEET)
1-WEST POND	443,950.45	563,164.42	510.08
2-EXISTING	450,591.79	566,786.87	510.43
3-PARKING LOT	451,249.94	568,918.63	471.67
4-CLUB HOUSE	447,823.73	565,764.48	468.39
CM7305	450,554.66	570,915.13	464.78
CM7310	443,341.72	561,976.37	508.74

ISSUED FOR
CONSTRUCTION

APPENDIX D

Photographic Log

PHOTOGRAPHIC LOG

West Boiler Slag Pond (WBSP)



Photograph 1 – South dike embankment, upstream side looking east. LVWTS on left.



Photograph 2 – Exterior southwest dike embankment crest, looking west.



Photograph 3 – Exterior southwest dike embankment, looking east.



Photograph 4 – Exterior southeastern dike embankment e looking west beneath the gypsum conveyor.



Photograph 5 – Southern dike embankment downstream side, looking west. Note tall grass.



Photograph 6 – Exterior southern dike embankment looking east at limits of dense vegetation. Ohio River on right.



Photograph 7 – Looking north and west across LVWTS from the southern dike embankment.



Photograph 8 – Outfall structure at southwestern corner of the LVWTS.

PHOTOGRAPHIC LOG

Landfill Runoff Collection Pond (LRCP)



Photograph 1 – West downstream side of LRCP looking east.



Photograph 2 – West upstream side of LRCP looking east.



Photograph 3 – Downstream side of dam, outfall channel to the Ohio River.



Photograph 4 – Western downstream channel showing erosion due to material change and silt fence removal.



Photograph 5 – Outfall 001 outlet structure at toe of dam.



Photograph 6 – Western downstream side where the channel extends along the face and toe of the embankment. Note tall grass along slope.



Photograph 7 – Downstream side of dam. Eastern side, looking east.



Photograph 8 – Crest of dam at the east end, looking north at access road and Phase 1 closure area.



Photograph 9 – Crest of dam near center, looking east. Note tall grass on downstream slope.



Photograph 10 – Upstream side of dam at 12 ft. x 4 ft. culvert.



Photograph 11 – Upstream side of dam at 12 ft. x 4 ft. culvert, looking southwest through the culvert.



Photograph 12 – Downstream side of dam at 12 ft. x 4 ft. culvert.