Prepared for

DTE Electric Company
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Detroit, Michigan 48226

2024 ANNUAL INSPECTION REPORT
FLY ASH BASIN

MONROE POWER PLANT

Monroe, Michigan

Prepared by

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1. INTRODUCTION

1.1 Overview

The 2024 Annual Inspection Report (AIR) was prepared by Geosyntec Consultants of Michigan, Inc. (Geosyntec) to provide the results of the annual inspection of the Monroe Fly Ash Impoundment (Fly Ash Basin) at DTE Electric Company's (DTE) Monroe Power Plant disposal facility. The annual inspection has been prepared to comply with the United States Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule (CCR Rule) published on April 17, 2015, as amended July 30, 2018 (40 CFR Parts 257 and 261), August 28, 2020 (Part A Rule), and November 12, 2020 (Part B Rule). Under the CCR Rule, the Ash Basin is an "existing surface impoundment" per 40 CFR 257.53 and must be inspected by a qualified professional engineer on a periodic basis, not to exceed one year. The annual inspection is also required as part of the Inspection, Monitoring, and Maintenance Manual (IMMM) for the Fly Ash Basin.

The Fly Ash Basin is located about one mile southwest of the Monroe Power Plant near Monroe, Michigan, and is bounded on the east by Lake Erie and the Plant discharge canal, on the west by Interstate Highway 75 (I-75), on the south by an agricultural field, and on the north by residential property and Plum Creek (Figure 1). As of December 29, 2023, DTE ceased receipt of CCR within the Fly Ash Basin. DTE issued a notice of intent (NOI) to close the Fly Ash Basin on January 25, 2024.

1.2 Purpose

Inspection, monitoring, and maintenance of the Fly Ash Basin and embankment are performed by DTE pursuant to the combined monitoring and maintenance program described in the IMMM (MONPP – 1301 – Rev. E) and the CCR Rule. The objective of the inspections that are part of the IMMM is to detect indications of instability in time to allow planning, design, and implementation of appropriate mitigation measures. The purpose of the inspection under the CCR Rule [40 CFR 257.83(b)(1)] is:

"…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 must, at a minimum, include:

(i) A review of the available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of an inspection by a qualified person, and results of previous annual inspections);

(ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit; and

(iii) 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.

The purpose is accomplished through periodic visual inspection (and photo-documentation) of the Fly Ash Basin, review of the previous inspection, review of instrumentation monitoring data, and discussions with site personnel about the history of the site and general operations at the Fly Ash Basin. Observations from the visual inspection, document and instrumentation data review, and discussions are summarized in an inspection report. The inspection report addresses the following under the CCR Rule [40 CFR 257.83(b)(2)]:

(i) Any changes in geometry of the impounding structure since the previous annual inspection;

(ii) The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;

(iii) The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;

(iv) The storage capacity of the impounding structure at the time of the inspection;

(v) The approximate volume of the impounded water and CCR at the time of the inspection;

(vi) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures; and

(vii) Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

1.3 Report Organization

The remainder of this report is organized as follows:

- Section 2 - Review of Available Information: summarizes various historical documents that were reviewed as part of this inspection.
- Section 3 - Facility Description: provides information about the facility.

- Section 4 - Observations from Annual Inspection: summarizes visual observations recorded during the 2024 inspection of the Fly Ash Basin.

- Section 5 - Instrumentation Monitoring and Bathymetric Survey: provides information about the instrumentation monitoring and bathymetry survey of the Fly Ash Basin.

- Section 6 - Current Operations and Maintenance Activities: describes DTE's current operations and maintenance activities performed since the 2023 annual inspection.

- Section 7 - Evaluation of Observations: based on the inspection results, evaluated if the design, construction, operation, and maintenance of the Fly Ash Basin are consistent with recognized and generally accepted good engineering standards.

- Section 8 - Conclusions: provides the overall conclusions of the annual inspection and certification of the AIR.

1.4 Terms of Reference

The annual visual inspection was performed on May 29, 2024, by Dr. Clinton Carlson, Ph.D., P.E. and Dr. Jorge Romaña Giraldo, Ph.D. of Geosyntec[1], with assistance from DTE staff.

The weekly inspections and monitoring of inclinometers are performed by DTE's qualified person[2].

This report was prepared by Dr. Carlson and Dr. Romaña Giraldo and reviewed by Mr. John Seymour, P.E. of Geosyntec.

[1] Clinton Carlson, Ph.D., P.E., is the qualified professional engineer per the requirements of §257.53 of the CCR Rule. He has ten years of experience with coal ash related projects. His resume is provided in Appendix A.

[2] Qualified person means a person or persons trained to recognize specific appearances of structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit by visual observation and, if applicable, to monitor instrumentation.

2. REVIEW OF AVAILABLE INFORMATION

Geosyntec reviewed the following documents for the annual inspection. These documents are summarized in the table below.

Table 1: Available Information Reviewed for Annual Inspection

Title	Prepared by	Date	Content
Monroe Fly Ash Disposal Basin Technical Report	DTE	1977	Design, construction and operational information.
2009 Construction Completion Report	Geosyntec	March 8, 2010	Construction information for the 2009 construction.
2010 Construction Completion Report	Geosyntec	May 4, 2011	Construction information for the 2010 construction.
Geotechnical Site Characterization Report	Geosyntec	September 2012	Summary of data from various site investigation studies conducted around the perimeter of the embankment.
2012 Construction Completion Report	Geosyntec	November 30, 2012	Construction information for the 2012 construction.
2013 Construction Completion Report	Geosyntec	December 13, 2013	Construction information for the 2013 construction.
Potential Failure Mode Analysis Results – Rev. 3	Geosyntec	January 2015	Results of potential failure mode analysis for the Monroe Power Plant. Reassessed certain potential failure modes based on changes in operational procedures prior to the analysis.
Fill Plan Alternatives – Rev. B	Geosyntec	April 22, 2015	Pros and cons of various fill plan alternatives for the remaining life of the ash basin.
Overliner Construction, Phase 1- Construction Quality Assurance Report	Golder	September 16, 2015	Construction completion document.
Groundwater Monitoring System Summary Report	TRC	October 2017	Information on groundwater monitoring system components and details for the Monroe Ash

Table 1: Available Information Reviewed for Annual Inspection

Title	Prepared by	Date	Content
			Basin and Vertical Extension Landfill.
Groundwater Statistical Evaluation Plan	TRC	October 2017	Basis for statistical evaluation for groundwater monitoring events for the Monroe Ash Basin and Vertical Extension Landfill.
Location Restrictions Demonstration	TRC	October 2018	Provides details of location restrictions demonstration for the Ash Basin per CCR Rule.
Structural Stability Assessment	Geosyntec	October 15, 2021	Structural stability assessment per the CCR Rule. Provides a five-year update to the original assessment performed in 2016.
Hydrologic and Hydraulic Capacity Assessment	Geosyntec	October 15, 2021	Hydraulic capacity assessment per the CCR Rule. Provides a five-year update to the original assessment performed in 2016.
Hazard Potential Assessment	Geosyntec	October 15, 2021	An assessment of the hazard potential of the Ash Basin per the CCR Rule. Includes a dam breach analysis.
Fugitive Dust Control Plan	DTE	November 8, 2021	Presents fugitive dust control measures. Added operating license information, updated process for the inactive bottom ash impoundment, and further defined activities for assessing and monitoring effectiveness of dust control measures.
2022 Annual Inspection Report	Geosyntec	January 9, 2023	Provides the results of the 2022 annual inspection.
Safety Factor Assessment – Revised	Geosyntec	February 22, 2023	Safety factor assessment per the CCR Rule. Provides a five-year update to the original assessment performed in 2016. Updated peak horizontal acceleration, horizontal

Table 1: Available Information Reviewed for Annual Inspection

Title	Prepared by	Date	Content
			seismic coefficient, and slope stability analyses.
Final Alternate Liner Demonstration	Geosyntec	April 10, 2023	Details the alternate liner demonstration for the Monroe Fly Ash Basin in accordance with the CCR Rule (Part B) 40 CFR 257.71(d)(ii)(A).
Weekly Inspection Reports	DTE	May 2023 to November 2024	Qualified person inspections from May 2023 through November 2024.
Closure Plan	Burns & McDonnell	October 6, 2023	Documenting how the plan will meet the CCR Rule. Update to October 2016 Closure Plan.
Post-Closure Plan	Burns & McDonnell	October 6, 2023	Documenting how the plan will meet the CCR Rule. Update to October 2016 Post-Closure Plan
2023 Annual Inspection Report	Geosyntec	January 9, 2024	Provides the results of the 2023 annual inspection.
Notice of Intent to Close CCR Unit	DTE	January 25, 2024	Provide details of the closure plan for the Ash Basin and the Vertical Extension Landfill. Completed under 40 CFR 257.102(g).
Request to Withdraw Part B Application- Monroe Power Plant Fly Ash Basin	DTE	January 25, 2024	Details on the withdrawal of the Part B application for the Monroe Power Plant Fly Ash Basin
Annual Groundwater Monitoring Report	TRC	January 31, 2024	Summary of annual groundwater monitoring results for 2023 for the Monroe Ash Basin and Vertical Extension Landfill
Monroe Emergency Action Plan Meeting	DTE	October 31, 2024	Documentation of annual meeting for emergency preparedness table-top study of the Monroe Power Plant. Completed pursuant to 40 CFR 257.73(a)(3)(i)(E).

Table 1: Available Information Reviewed for Annual Inspection

Title	Prepared by	Date	Content
Bathymetric Survey	DTE	November 2024	Bathymetry survey of the Fly Ash Basin.
Annual Fugitive Dust Report	DTE	November 19, 2024	Annual report of dust control actions, any complaints, and corrective actions taken, if any. Completed pursuant to 40 CFR 257.80(c).
Inspection, Monitoring and Maintenance Manual, Rev. E. - Draft	Geosyntec	December 2024	Provides details of operations, monitoring, action levels and items for the Fly Ash Basin. Updated for changes in continuous monitoring system and operations at the Facility.
Emergency Action Plan	DTE	January 2025	Provides the emergency action plan to safeguard lives and reduce the potential for damage to public resources and private property per the CCR Rule 40 CFR 257.73.

3. FACILITY DESCRIPTION

The permitted area for the site is located in Section 16, Township 7 South, Range 9 East, of Monroe Township, Michigan. The facility includes the 331-acre Fly Ash Basin and a 79-acre Vertical Extension Landfill (Landfill) for a total permitted area of 410 acres. The Fly Ash Basin is a coal ash surface impoundment under Michigan Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994, Operating License No. 9579. The Landfill is a coal ash landfill located within the northwest area of the Fly Ash Basin, including the Landfill perimeter berms and swales.

The Fly Ash Basin was constructed in the early 1970s as a 410-acre basin to impound sluiced ash. The Fly Ash Basin includes a 3.5-mile-long embankment constructed of on-site fine grained (clayey) soils that were excavated from within the footprint of the Fly Ash Basin. Ash and water were pumped to the Fly Ash Basin from the Monroe Power Plant using above grade steel and high-density polyethylene pipes. After treatment within the Fly Ash Basin, water would flow out from the Fly Ash Basin through a discharge structure in accordance with the facility National Pollutant Discharge Elimination System (NPDES) permit #MI0001848. DTE ceased receipt of CCR in the Fly Ash Basin as of December 29, 2023, and is in the process of closing the Fly Ash Basin.

4. OBSERVATIONS FROM ANNUAL INSPECTION

The annual visual inspection and DTE's weekly inspections included the perimeter embankment crest, exterior slopes of the embankment, ash discharge points within the Fly Ash Basin, stormwater features, discharge structure and canal, and pipes on the perimeter embankment. Inspection results and photographs from the annual visual inspection are provided in Appendix B. The key observations from the inspection are summarized below.

1. The exterior slopes of the perimeter embankment were generally in satisfactory condition (Photographs #1, #4, #9, #17, #20, #22, #23, #26, #32, #33, #34, #35, #38, #41, #45). All the slopes had well-established grassy vegetation. Specific observations regarding the exterior slopes of the perimeter embankment included the following.

    a. Sloughing/cracking of the exterior slopes and previous repairs that have failed were noted on the perimeter embankment near Station 12+00. The sloughing/cracking was initially observed during the 2022 annual inspection and again in 2023. Each time, the slough/crack was repaired. In 2024, DTE personnel observed the slough/crack again and Geosyntec inspected the area in early May 2024 and then during the annual inspection. The previous repairs had failed, and the crack reopened (Photograph #6). During this year's annual inspection, the largest scarp was observed to have a height of 1.5 feet and length of approximately 45 feet (Photograph #6), and "bunching" of materials at the toe of the embankment was observed (Photograph #5). However, the slope inclinometer at Station 11+50 did not indicate significant ground movements (i.e., less than 1.0 inch of cumulative movement), suggesting that only surficial movement has occurred.

    b. The gravel placed on the perimeter embankment near Station 67+00 has shown signs of erosion from the upper slope to the lower and exposed the high-density polyethylene (HDPE) (Photograph #25).

    c. A previous crack repair near Station 78+00 using a sand-bentonite mix was observed to be in good condition (Photograph #30).

    d. Vegetation was sparser at some locations on the perimeter embankment on the west side near Station 82+00 (Photograph #31). This area was affected by a fire in early 2023 and continues to show signs of regrowth.

    e. Denser vegetation was observed along the southeast side of the perimeter embankment (Stations 139+50 to 149+00) (Photograph #38).

f. Small, mossy areas were observed at a couple locations on the northeast side of the perimeter embankment (Photograph #3). No water was observed flowing out of these areas.

2. The perimeter road atop the perimeter embankment, including the asphalt road leading to the Vertical Extension Landfill, was generally in good condition with no erosion and minimal rutting (Photographs #2, #32, #33, #38, #43, #45). The aggregate access roads to the perimeter road atop the perimeter embankment were also in good condition with no erosion rills observed (Photographs #1, #21, #44).

3. The instrumentation monitoring equipment, which includes the slope inclinometer casings, equipment boxes, solar panels, antennae, and wiring, were in good condition (Photograph #8). The inside of the monitoring equipment boxes had moisture intrusion which rusted the desiccant canisters (Photograph #7). Insects were also observed within the monitoring equipment box at Station 34+00 (Photograph #7).

4. The stormwater features including the SmartDitch® trenches (corrugated HDPE channels used to manage stormwater), SmartDitch outlets, riprap downchutes, perimeter swales, culverts, and pump house were inspected. The following observations were made.

    a. In general, the SmartDitch trenches were in fair condition with some cut vegetation within the ditches and erosion around the edges (Photographs #9, #17, #26, #41).

    b. Significant cut vegetation was observed within the SmartDitch outlets at Stations 18+50, 26+50, 32+50, 70+00, and 139+50 (Photographs #10, #18, #39). The vegetation could impede conveyance of stormwater flows.

    c. Riprap has eroded from below all the SmartDitch outlets into the riprap downchutes (Photos #11, #18, #28, #29, #39, #40, #42). Other observations related to erosion below the SmartDitch outlets include the following.

        i. At Station 18+50, concentrated flow beneath the outlet has eroded over one foot of riprap and resulted in a hole (Photographs #11, #12). No flow into the hole was observed during the inspection. Finer sediments were observed within the riprap downchute of this SmartDitch outlet (Photograph #14).

        ii. Over one foot of riprap has eroded below the SmartDitch outlet at Station 32+50 and exposed and tore the geotextile fabric (Photographs #18, #19).

        iii. The SmartDitch outlets at Stations 32+50, 76+00, 82+00, 139+50, and 151+00 appeared to have been distorted due to settlements resulting from erosion below the outlets (Photographs #18, #28, #29, #39, #40).

d. The riprap downchutes used to convey water from the SmartDitch to the perimeter swales were generally in fair condition. Dense vegetation and some erosion were observed in the downchutes except at Stations 32+50, 64+00, and 157+00 (Photograph #13). Some small, woody vegetation was observed in the riprap downchutes at Stations 70+00, 76+00, and 139+50 (Photographs #27, #39). This vegetation did not appear to affect the functionality of the riprap downchutes.

e. Denser vegetation was observed on the upslope sides of the SmartDitch including small, woody vegetation in some locations (Photograph #23).

f. The covered HDPE pipes connecting sections of the SmartDitch were generally in good condition with minimal sediments and cut vegetation near the outlets and within the pipes (Photographs #15, #16). Minimal erosion was observed in the aggregate covering these pipes for the vehicle crossings. The grate covering the outlet for the HDPE pipe near Station 66+00 was damaged (Photograph #24)

g. The perimeter swales along the perimeter embankment had minimal flow and were in satisfactory condition (Photographs #22, #37, #39).

h. The pump house and access road at the southeast corner of the Fly Ash Basin were in good condition (Photograph #37) The perimeter swales on the east and south sides had some water that was observed flowing towards the pump house. No obstructions were observed in the culverts beneath the access road to the pump house.

5. The asphalt access road by the south entrance was observed to be in good condition (Photograph #34). The stormwater drainage channel and check dams along the road between Stations 104+50 and 112+00, at the toe of the embankment slope were in satisfactory condition. Denser vegetation was observed by the north check dams.

6. Sluicing operations and receipt of CCR at the Fly Ash Basin have stopped as of December 2023. The outlets of the sluice lines were inspected, and no obstructions were observed (Photograph #36).

7. The low point in the perimeter embankment near Station 165+00 for emergency overflow was in good condition (Photograph #43).

8. No structural damage was observed in the concrete, discharge pipes, gates, or stop logs of the discharge structure and no obstructions were observed in the gates and discharge pipes (Photographs #46, #47). The slope between the discharge structure and the discharge canal had no apparent indicators of slope movements (e.g., cracks) (Photograph #48). The outfall

structures and culverts to the discharge canal were in satisfactory condition with no obstructions observed (Photograph #49).

9. The pool level within the Fly Ash Basin at the time of the inspection was approximately 607.7 feet (Photograph #47), which is less than the maximum operating pool level of 609.0 feet and approximately equal to the concrete sill in front of the discharge pipes. As a result of the sluicing operations at the Fly Ash Basin having stopped, water was not flowing over the discharge structure, into the pipes, or out from the outfall structures during the inspection (Photographs #46, #49).

10. The discharge canal leading into Plum Creek and the silt curtain and weir at the end of the canal were in satisfactory condition (Photographs #50, #51). Significant vegetation was observed growing in the discharge canal and some debris was observed at the weir. Sluicing operations to the Fly Ash Basin have stopped, so flow through the discharge canal was minimal and did not appear to be impeded.

5. INSTRUMENTATION MONITORING AND BATHYMETRY SURVEY RESULTS

5.1 Slope Inclinometers

5.1.1 Background and Overview

Ten automated, shape accel array (SAA) slope inclinometers (SIs) have been installed along the Fly Ash Basin perimeter embankment. The purpose of the SAAs is to provide continuous measurements of any outward movements of the perimeter embankment. The automated SAAs were installed in late 2015 to replace the decommissioned manual SIs and baseline readings were taken on January 1, 2016. The SAAs extend from the crest of the embankment to depths of approximately 45 to 50 feet below the crest.

The SAA measurements provide values of horizontal displacement at discrete depths (at 1.6-foot intervals) in two orthogonal directions (A-axis and B-axis). Plots of horizontal displacement versus depth are generated that provide a vertical profile of the horizontal displacement experienced by the SAA at the time of the reading. The orientation of the A-axis and B-axis are unique to each SAA. Displacements in the positive A-axis correspond to an outward displacement of the perimeter embankment from the Fly Ash Basin in an approximately perpendicular direction. The B-axis is oriented parallel to the perimeter embankment.

5.1.2 Displacements

The horizontal displacements at select depths are summarized below for the readings at the approximate time of the annual inspection (May 28, 2024). The selected depths correspond to sensor locations below ground surface where outward movements have historically been more prominent (i.e., approximately 0.2 inches or more) for the given direction. The changes in horizontal displacements since the 2023 annual inspection were observed to be less than 0.2 inches.

5.1.2.1 *Station 11+50 Slope Inclinometer*

- A-axis direction
    - Cumulative displacement magnitude and direction: +0.69 inches at approximately five feet below ground surface.

5.1.2.2 *Station 34+00 Slope Inclinometer*

- A-axis direction
    - Cumulative displacement magnitude and direction: +0.22 inches at approximately six feet below ground surface.

- Cumulative displacement magnitude and direction: +0.22 inches at approximately 25 feet below ground surface.

5.1.2.3 *Station 56+00 Slope Inclinometer*

- A-axis direction
  - Cumulative displacement magnitude and direction: +0.24 inches at approximately six feet below ground surface.
- B-axis direction
  - Cumulative displacement magnitude and direction: -0.43 inches (movement to the east) at approximately six feet below ground surface.

5.1.2.4 *Station 65+50 Slope Inclinometer*

- A-axis direction
  - Cumulative displacement magnitude and direction: +0.03 inches at approximately six feet below ground surface.
  - Cumulative displacement magnitude and direction: +0.05 inches at approximately 29 feet below ground surface.
- B-axis direction
  - Cumulative displacement magnitude and direction: +0.28 inches (movement to the west) at approximately 29 feet below ground surface.

5.1.2.5 *Station 77+00 Slope Inclinometer*

- A-axis direction
  - Cumulative displacement magnitude and direction: +0.22 inches at approximately six feet below ground surface.
- B-axis direction
  - Cumulative displacement magnitude and direction: -0.35 inches (movement to the north) at approximately six feet below ground surface.

5.1.2.6 ***Station 118+00 Slope Inclinometer***

- A-axis direction
    - Cumulative displacement magnitude and direction: +1.24 inches at approximately six feet below ground surface.
- B-axis direction
    - Cumulative displacement magnitude and direction: -0.25 inches (movement to the west) at approximately six feet below ground surface.

5.1.2.7 ***Station 133+00 Slope Inclinometer***

- A-axis direction
    - Cumulative displacement magnitude and direction: +3.03 inches at approximately five feet below ground surface.

5.1.2.8 ***Station 142+00 Slope Inclinometer***

- A-axis direction
    - Cumulative displacement magnitude and direction: +0.24 inches at approximately six feet below ground surface.

5.1.2.9 ***Station 162+50 Slope Inclinometer***

- A-axis direction
    - Cumulative displacement magnitude and direction: +2.24 inches at approximately six feet below ground surface.

5.1.2.10 ***Station 178+00 Slope Inclinometer***

- A-axis direction
    - Cumulative displacement magnitude and direction: +0.29 inches at approximately six feet below ground surface.
- B-axis direction

- Cumulative displacement magnitude and direction: -0.09 inches (movement to the south) at approximately six feet below ground surface.

5.2 Bathymetric Survey Results

The bathymetric survey of the Fly Ash Basin was performed by DTE's surveying services in November 2024. The following were observed or estimated based on the survey results.

1. Water level at the time of survey was at elevation 606.3 feet[3], which is lower than the maximum operation water level of 609 feet. The water level has continued to lower since sluicing operations have stopped at the Fly Ash Basin.

2. Approximately 87 percent of the Fly Ash Basin footprint has CCR above the free water level.

3. The maximum water depth is approximately 34 feet. The top of ash at this location is slightly less than approximate elevation 574 feet.

4. The maximum ash thickness is approximately 50 feet, measured from the top of ash at approximate elevation 613 feet to the bottom of the Fly Ash Basin, which is at approximate elevation 563.4 feet. The minimum thickness of ash is approximately 11 feet.

5. At the time of the bathymetry measurements:

    a. the remaining storage capacity of the Ash Basin is approximately 1.4 million cy;

    b. approximately 28.0 million cy of ash is deposited in the Fly Ash Basin; and

    c. approximately 283 million gallons of water is impounded in the Fly Ash Basin.

As noted, DTE has ceased receipt of CCR at the Fly Ash Basin, stopped sluicing operations, and is in the process of closing the Fly Ash Basin. The impounded water will continue to decrease as the Fly Ash Basin is dewatered for closure, but the remaining storage capacity and amount of deposited ash will not change.

[3] Elevations in this AIR are reported in the National Geodetic Vertical Datum of 1929 (NGVD29).

6. CURRENT OPERATIONS AND MAINTENANCE ACTIVITIES

DTE has ceased receipt of CCR within the Fly Ash Basin, stopped sluicing operations, and is in the process of closing the Fly Ash Basin as of December 2023. However, inspection, monitoring, and maintenance operations will still be active while the Fly Ash Basin is being closed.

6.1 Operations Organization

The Ash Basin is operated by DTE. The responsible personnel include:

- Dan Casey – DTE Energy Supply, Plant Manager, Monroe Site Operations
- Jason Logan and Eric Molnar – DTE Environmental Management and Safety (EM&S), Monroe Power Plant

6.2 Operation Activities

Operation details are provided in the IMMM Rev. E. and Operations Plan Drawings Rev. E. (Geosyntec, 2024). In addition, the following are currently being completed as required by the CCR Rule.

- Weekly inspections by a qualified person.
- Dust control in accordance with the Fugitive Dust Control Plan.
- Annual Fugitive Dust Control Report.
- Annual Groundwater Monitoring and Corrective Action Report.

6.3 Maintenance Activities Since Previous Annual Inspection

The following maintenance activities were performed in addition to general site maintenance between the 2023 and 2024 inspections (Section 4 provides additional details). Additional maintenance activities completed after the visual inspection are discussed in Section 7.

1. Repairs were made to the perimeter embankment slopes near Station 12+00 (slough/crack).

7. EVALUATION OF OBSERVATIONS

The Fly Ash Basin was not observed to have any existing structural weaknesses or conditions that would disrupt the overall operation and/or safety of the Fly Ash Basin. The maximum cumulative displacement observed within the SAA slope inclinometers is 3.03 inches (since 2016) at Station 133+00 and no evidence of movement of the perimeter embankment at the monitored locations that would suggest global instabilities has been observed. However, there are two maintenance conditions that have the potential to develop into structural weaknesses or disrupt the operation and or/safety at the Fly Ash Basin during the closure process if not addressed.

- The slough/crack observed on the perimeter embankment slope near Station 12+00 reopened after repairs made in 2023 failed. The slough/crack was believed to be the result of the freezing and thawing cycle of the surficial soils because no movements were observed in the adjacent instrumentation monitoring. Therefore, the crack was judged not to be indicative of an existing structural weakness in the perimeter embankment. However, additional movements have occurred since the 2023 annual inspection and the crack has reopened, exposing the exterior slopes to surface water infiltration and erosion. Corrective action was taken at the exterior slope near Station 12+00 in September 2024 after the visual inspection (Photograph #52); it was regraded and the sloughing/cracking was filled with a sand-bentonite mix.

- Erosion was observed below all the SmartDitch outlets; multiple locations had over one foot of erosion. At Station 18+50, a hole has formed from water flowing below the SmartDitch outlet and finer sediments were observed downslope within the riprap downchute. The erosion at Station 32+50 has exposed and torn the geotextile fabric below the SmartDitch outlet. The erosion below the SmartDitch outlets at multiple stations have caused the outlets to settle and distort. The erosion at these locations could act as preferential pathways for continued erosion and enlarge these areas and lead to potential structural weaknesses if not addressed. Therefore, the SmartDitch outlets should be repaired: damaged portions of SmartDitch should be removed and damaged geotextile fabric and eroded riprap should be replaced. Geosyntec has been tasked with developing corrective action recommendations for repairs.

There are other maintenance conditions identified during the 2024 annual inspection that should be addressed in accordance with the IMMM. Some of these conditions have already been addressed by DTE after the visual inspection.

1. The exposed HDPE pipe near Station 67+00 should be covered with aggregate and the area should continue to be monitored for additional erosion.

2. Continue to periodically mow and apply approved chemical sprays (for woody vegetation) to facilitate inspection of the perimeter embankment. DTE mowed the exterior slopes of the perimeter embankment in August 2024.

3. Similarly, for the riprap downchutes, approved chemical sprays should be applied to kill the woody vegetation and prevent future growth.

4. Cut vegetation from maintenance operations should be cleared from the SmartDitch outlets to improve the ability of the SmartDitch to convey stormwater to the riprap downchutes.

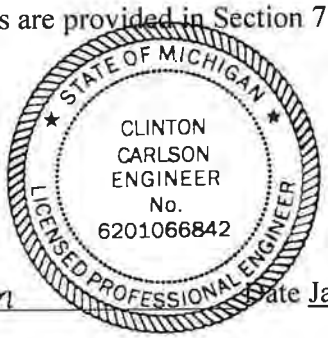
5. The grate covering on the HDPE pipe outlet near Station 67+00 was damaged and should be repaired.

6. The desiccant canisters within the instrumentation monitoring equipment boxes should be replaced. Geosyntec replaced the desiccant canisters and insect traps in the monitoring equipment boxes in August 2024.

8. CONCLUSIONS AND CERTIFICATION

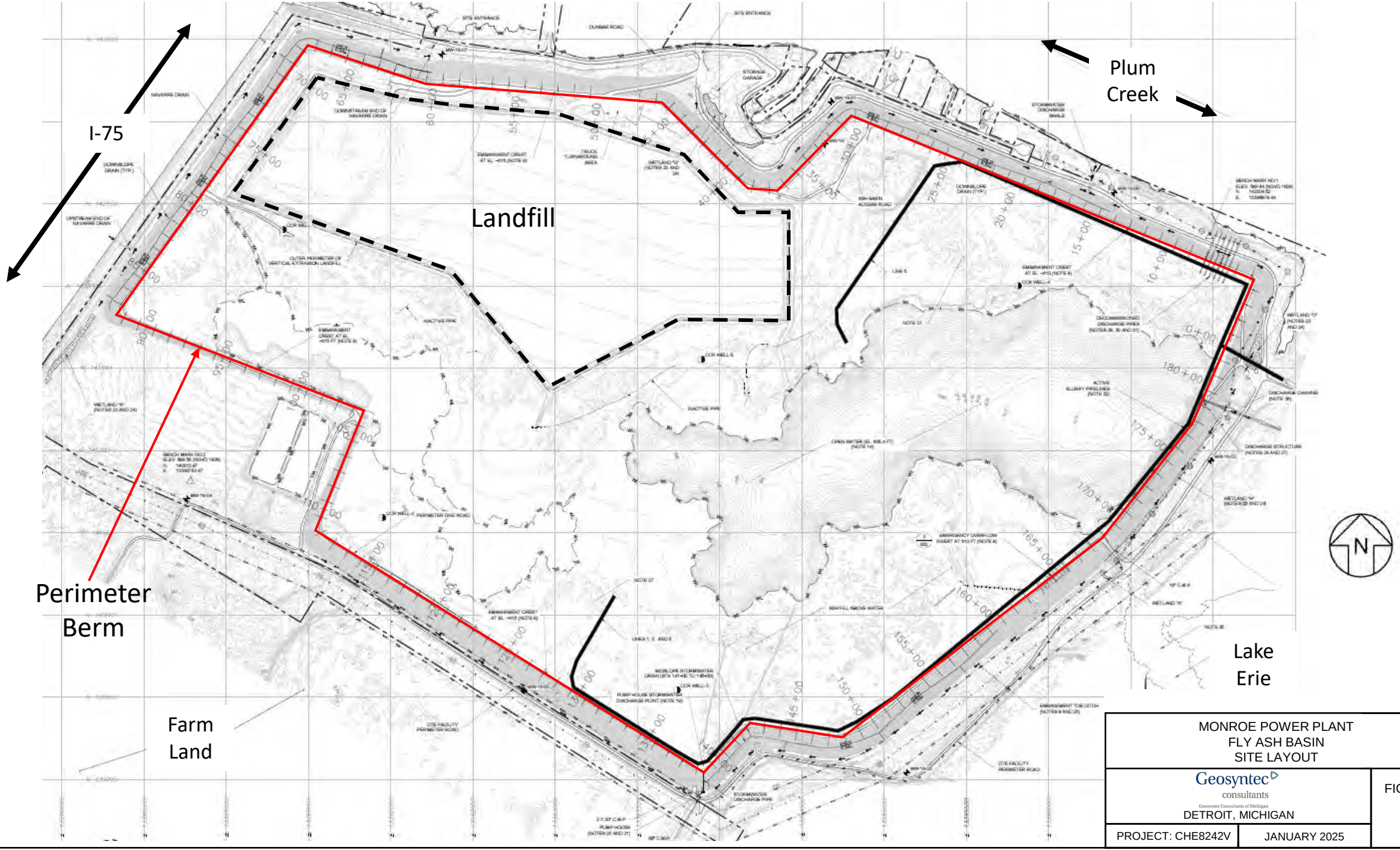
The design, construction, operation, and maintenance of the Fly Ash Basin is generally consistent with recognized and generally accepted good engineering standards in accordance with the CCR Rule [40 CFR 257.84(b)(1)]. DTE ceased sluicing to the Fly Ash Basin in December 2023. Active operations are related to inspection, maintenance, and monitoring while the Fly Ash Basin is being closed. The 2024 annual visual inspection did not identify any existing structural weaknesses or conditions that are disrupting the operation and safety of the Fly Ash Basin. There are two maintenance conditions that could develop into structural weaknesses in the future if not addressed in the next one to two years. Geosyntec identified other conditions that require maintenance in accordance with the IMMM as detailed in Section 7. Recommendations to address the maintenance conditions are provided in Section 7 for DTE's consideration.

Certified by:



Clinton Carlson Date January 9, 2025

Clinton Carlson, Ph.D., P.E.
Michigan P.E. License Number 6201066842
Project Engineer



MONROE POWER PLANT
FLY ASH BASIN
SITE LAYOUT

Geosyntec consultants
DETROIT, MICHIGAN

FIGURE 1

PROJECT: CHE8242V

JANUARY 2025

APPENDIX A

Resume of Clinton Carlson, Ph.D., P.E.
(Qualified Professional Engineer)

Clinton P. Carlson, PhD, PE

Qualifications

Dr. Carlson is a geotechnical engineer with ten years of experience on projects related to design and remediation of landfills and coal combustion residual impoundments, dam safety, and geotechnical instrumentation. He is a Project Engineer with Geosyntec and part of the firm's dams and levees practice area. His work has included managerial responsibilities for project budgets and schedules and has primarily supported federal and power clients for both small and large projects. Clinton has managed and supported projects for risk assessments, slope stability analyses, and instrumentation for landfills and dams.

Specialties

Landfill and CCR Design and Remediation
Dam Safety
Geotechnical Instrumentation

Education

PhD, Civil Engineering, University of Michigan, Ann Arbor, MI, 2014
MSE, Civil Engineering, University of Michigan, Ann Arbor, MI, 2010
BSE, Civil & Environmental Engineering, University of Michigan, Ann Arbor, MI, 2009

Licenses/Certifications

Professional Engineer: IN, MI

Relevant Project Experience

Annual Inspections of CCR Units, Confidential Client, Southeast Michigan | Inspections of CCR units are conducted annually as part of the CCR Rule to identify any site conditions that pose a concern to the safe operation and stability of the CCR units. Project manager in charge of financials and engineer in charge of performing annual inspections for three CCR units for a client in Southeast Michigan. Prepared inspection reports to summarize observed conditions at the three CCR units. Interacted with client representatives to discuss necessary actions to address potential concerns. (Mar. 2022–Present)

Monitoring and Maintenance for CCR Units, Confidential Client, Southeast Michigan | Project manager in charge of financials and engineer in charge of overseeing inspections, monitoring, and maintenance of geotechnical instrumentation system of two CCR units for a client in Southeast Michigan. The geotechnical instrumentation system included multiple monitoring wells, settlement plates, vibrating wire piezometers, manual inclinometers, and ShapeArray inclinometers. Instrumentation data were evaluated to identify near real-time concerns for the safe operation and stability of the CCR units. Provided monthly summary reports to the client representatives and met with them to discuss the monitoring data on a bi-monthly basis. Conducted site inspections of observed conditions posing concerns for the safe operation and stability of the CCR units on at the request of the client. (Mar. 2022–Present)

FERC Part 12D External Audits of Owner's Dam Safety Programs, Multiple Clients, MI and OH | The FERC regulations require dam owners periodically have an external consultant audit the Owner's Dam Safety Program (ODSP), which includes dam safety documents like the Dam Safety Surveillance and Monitoring Plan (DSSMP) and Emergency Action Plan (EAP). The City of Ann Arbor and American Municipal Power, Inc. contracted Geosyntec to perform the audits of the ODSP for their portfolio of dams (two and four, respectively) in 2024. Performed reviews of the dam safety documents, conducted interviews with dam safety personnel to evaluate their understanding of the dam safety program, observed site inspections conducted by personnel as part of the dam safety program, and prepared a report with the findings and conclusions on the content and implementation of the ODSP. Project manager in charge of the project financials and schedule and the point-of-contact with the owners. (Jan. 2024-Dec. 2024)

FERC Part 12D Periodic Inspections for Barton and Superior Dams, City of Ann Arbor, Ann Arbor, MI | The City of Ann Arbor owns and operates the Barton and Superior Hydroelectric Projects (Barton and Superior Dams) in Ann Arbor, Michigan. Barton and Superior Dams are used by the City of Ann Arbor for power generation and thus, are under regulation by the Federal Energy Regulatory Commission (FERC). FERC regulations require dam safety inspections are performed every five years by Independent Consultant (IC) Teams. Geosyntec served as the IC Team for the City of Ann Arbor for the Ninth FERC

Part 12D Periodic Inspections of Barton and Superior Dams performed in 2023. Served as the project manager and point-of-contact with the City of Ann Arbor on behalf of the IC Team. Member of the IC Team (geotechnical engineering support and field inspection team) that performed the document review, developed the Inspection Plans, prepared the Pre-Inspection Preparation Reports, performed the field inspections, and prepared the Periodic Inspection Reports. The Periodic Inspection Reports were completed and submitted to FERC before the December 2023 deadline. (Jan. 2023–Dec. 2023)

Landfill Stability Evaluation, Confidential Client, Southeast US | Contacted by the client to evaluate an instability at an existing landfill including the implementation of instruments to measure and evaluate progression of instability. Project manager in charge of financials and engineer in charge of developing instrumentation plan and evaluating measurements of instrumentation. Conventional surveying stakes and an automated monitoring total station were implemented to measure progression of instability. Evaluation of measurements was used to inform the client on progression of instability and provide recommendations for implementation of mitigation measures. Weekly summary reports of instrumentation measurements were provided to the client while implementing mitigation measures. Additional support was provided to the client in discussions with the state regulator. The monitoring systems were also utilized to provide additional safety measures during the staged temporary removal of a buttress berm in order to tie-in liner systems for new landfill cells to the existing liner system. Monitoring data are currently summarized in monthly reports and provided to the client. (Aug. 2019–Present)

Landfill Design Projects for Power Company, Confidential Client, Southeast US | Engineer in charge of coordinating and performing the geotechnical analyses for the permitting and closure of multiple sites for a power company. Geotechnical analyses performed for the sites included subsurface investigation and geotechnical material properties interpretation, slope stability analyses (including veneer and liner stability), settlement calculations for liner and cover systems, and hydrologic evaluations for liner and cover systems. The computer programs Slide and HELP were used to perform the slope stability analyses and hydrologic evaluations, respectively. (June 2015–Present)

Portsmouth Gaseous Diffusion Plant On-Site Waste Disposal Facility, Fluor-BWXT Portsmouth, Piketon, OH | The Department of Energy's Portsmouth On-Site Waste Disposal Facility is being constructed for the disposal of on-site hazardous waste materials. Engineer that aided geotechnical analyses for the design and construction of the facility. Geotechnical analyses performed during the design phase included slope stability analyses (including veneer and liner stability), settlement calculations for liner and cover systems under variable loads, and foundation design for leachate conveyance systems. During construction, performed slope stability analyses for excavation conditions and geo-structural calculations and reinforcement detailing for reinforced concrete valve houses constructed as part of a leachate transmission system and a footing for an interim transfer ramp. The computer program Slide was used to perform the slope stability analyses. (Apr. 2015–Present)

Inspections and Mitigation for CCR Landfill, Confidential Client, Southeast Michigan | Probabilistic slope stability analyses for a CCR landfill in Southeast Michigan identified unsatisfactory conditions for existing slopes that required mitigation measures. Project manager in charge of project financials and schedule and engineer in charge of developing inspection and construction plans to mitigate unsatisfactory conditions. Developed an inspection plan to identify indicators of slope instabilities and allow for safe operation conditions. The inspection plan was carried out by site personnel prior to and during construction and supported by Geosyntec. Developed a construction plan to regrade the slopes and mitigate the unsatisfactory conditions. Performed site inspections and met with client representatives and contractors during construction to verify safe working conditions and satisfactory slope conditions were achieved. (Feb. 2022–May 2022).

Probabilistic Slope Stability Assessment for CCR Landfill, Confidential Client, Southeast Michigan | Previous site inspections identified potentially unstable slopes at a CCR landfill in Southeast Michigan, so probabilistic slope stability analyses were performed to evaluate the reliability of the slope conditions given limited site information. Engineer that aided in review of probabilistic slope stability analyses and slope stability assessment report. Recommendations were developed and provided to the client to

address unsatisfactory conditions for existing slopes identified in the probabilistic site response analyses. (Nov. 2021–May 2022).

Quantitative Risk Assessment for Dam in Southeast US, Confidential Client, Southeast US | The project further refines estimates of risk developed from previous potential failure mode analyses and semi-quantitative risk analyses performed for an embankment dam and its primary and auxiliary spillways located in the Southeastern U.S. Project manager in charge of financials and schedule for the Quantitative Risk Assessment (QRA) of the dam. The main objectives of the QRA are to estimate the risk, in terms of annual failure probabilities and downstream consequences, for seismic, internal erosion, and spillway hydrologic failure modes and the uncertainties associated with the risks. Actively participated in the expert elicitation process to develop risk models and meetings with the client to present the models and results of the QRA. Prepared calculation packages and reports summarizing the methods used in the QRA and the results for the client. Aided in the ground motion selection, internal erosion evaluation, and evaluation of the erodibility of the embankment soils. (May 2018–Apr. 2022)

Field Investigation of Primary Spillway for Dam in Southeast US, Confidential Client, Southeast US | Field engineer for oversight of a visual inspection and investigation of the foundation of the primary spillway slabs and control structure for a dam in the Southeast U.S. Observations from the field investigation were used to inform a QRA performed for the dam and its spillways. The visual inspection was performed to identify vertical offsets and gaps in the joints between the slabs of the primary spillway. A field investigation consisting of shallow cores through the concrete slabs of the spillway and deep borings into competent rock below the control structure was performed to evaluate the foundation materials of the primary spillway and the presence of voids. (Jan. 2021–May 2021)

Landfill Stability Evaluation, Confidential Client, Southeast US | Contacted by the client to evaluate an instability at an existing landfill including the root cause of the instability. Project manager in charge of financials and engineer in charge of coordinating and performing slope stability analyses. Slope stability analyses were performed to evaluate the root cause of the instability and mitigation measures required to stabilize the landfill. Results of the analyses were used to support the client in discussions with the state regulator and advise the client on a path forward for stabilizing the landfill. A facility-wide stability plan was also developed based on the stability of the landfill for the existing conditions and the final planned conditions. Analyses were also performed for a staged temporary removal of a buttress berm in order to tie-in liner systems for new landfill cells to the existing liner system. Aiding in ongoing annual landfill stability assessments. (Aug. 2019–Dec. 2020)

Onondaga Lake Geotechnical Monitoring, Honeywell, Syracuse, NY | Contaminated sediments were dredged from Onondaga Lake and consolidated within geotextile tubes at an off-site landfill as part of a Superfund project. Geotechnical instrumentation systems were implemented to monitor (i) a sheetpile wall around a portion of the Lake dredged for remediation and (ii) a landfill closure comprised of geotextile tubes filled with sediments dredged from the Lake. Manager in charge of financials and engineer in charge of monitoring the instrumentation data. The monitoring systems included manual and automated inclinometers, settlement cells, vibrating wire piezometers, and surface monitoring points. (Feb. 2015–Oct. 2018)

Stability and Internal Erosion Assessment of Clear Creek Dam and Beaver Creek Dam, Tennessee Valley Authority, Bristol, TN and VA | Static and seismic stability of two earthen embankment dams in the twin cities of Bristol, TN and VA, Clear Creek Dam (BTC) and Beaver Creek Dam (BTB), were assessed along with the internal erosion for potential failure modes identified in the Potential Failure Mode Analyses (PFMA). Engineer in charge of seismic site response analyses and internal erosion evaluations for two earthen embankment dams. Performed seismic response analyses and used the results to perform the liquefaction potential evaluation. The seismic response analysis was performed using the computer program Strata. Internal erosion evaluations were performed for the critical potential failure modes identified by the project team for each dam. (Mar. 2017–Sept. 2017)

APPENDIX B

2024 Annual Inspection Forms and Photos

Monroe Power Plant
Fly Ash Basin
2024 Annual Inspection Report

Name of Surface Impoundment: **Monroe Power Plant Ash Basin**
Surface Impoundment ID Number:
Owner: **DTE Electric Company**
Operator: **DTE Electric Company**
Site Conditions: Mostly dry, water was noted along the perimeter swales and within some sections of the SmartDitch and the outlets.

Qualified Engineer: Clinton Carlson, PhD, PE
Date: 5/29/2024 **Time:** 9:00 am to 2:00 pm
Weather: Light drizzle Rain, 60s, Cloudy
Precipitation (since previous weekly inspection): 0.0 in.

I. Crest

1. Were there any indications of existing structural weaknesses or conditions that have the potential to develop into structural weaknesses (ruts, holes, erosion, cracking, slides, depressions, undesired vegetation etc.)? Provide approximate size and location of any structural weaknesses. Yes ____ No X

The crest and perimeter road atop the perimeter embankment were in generally in good condition with no erosion or cracks and minimal rutting observed (Photos #2, #32, #38, #43, #45). The asphalt access road, Stations 110+00 to 65+00, was also observed to be in good condition (Photos #32 to #34). The access roads to the perimeter road atop the perimeter embankment were in good condition with no erosion rills observed (Photos #1, #21, 44). The low point of the crest used in case of emergency overflow was in good condition (Photograph #43).

2. Were there any significant changes since the last inspection? Yes ____ No X

No significant changes to the crest, perimeter road atop the perimeter embankment, or access roads have occurred since the last inspection.

II. Embankment Slopes

1. Were there any indications of existing structural weaknesses or conditions that have the potential to develop into structural weaknesses on the embankment slopes (ruts, holes, erosion, cracking, sloughs, depressions, bulges, undesired vegetation etc.)? Provide approximate size and location of any structural weaknesses. Yes X No

The exterior slopes on the perimeter embankment slopes were generally in satisfactory condition. A recurring issue was observed on the north side near Station 12+00, where sloughing/cracking has been noted along with "bunching" of materials at the toe of the embankment (Photo #5). Sloughing/cracking occurred in 2022 and 2023 and repairs were made. However, the repairs made in 2023 failed and the crack reopened. The largest scarp had a height of approximately 1.5 feet and length of approximately 45 feet at the time of the inspection (Photograph #6).

Other site conditions that should be addressed include:

-The gravel placed on the perimeter embankment slopes near Station 67+00 has shown some signs of erosion and exposed the slotted HDPE pipe (Photo #25).

-Denser vegetation was observed along the exterior slopes on the southeast side (Photo #38) and upslope of the SmartDitch (Photo #23).

2. Were there any visible wet areas on the embankment slopes? Yes ____ No X

No visible wet areas were observed on the slopes during the inspection. Small, mossy areas were observed at a couple locations on the northeast side of the perimeter embankment (Photo #3), but no water was observed flowing out of these areas.

3. Were there any significant changes since the last inspection? Yes X No ____

The sloughing/cracking near Station 12+00 was repaired with sand-bentonite backfill; however, the repairs had failed and the crack reopened (Photo #5). This area of the exterior slopes was repaired in September 2024 (Photo #52). DTE personnel has continued to monitor these repairs during weekly inspections.

III. Surface Impoundment Conditions

1. Were the sluice lines to the surface impoundment flowing freely to open water? If 'No' describe obstructions. Yes ____ No x

No obstructions were observed at the outlets of the sluice lines (Photo #36); however, sluicing operations at the Fly Ash Basin have stopped, so the lines were not flowing at the time of the inspection.

2. What was the water level in the surface impoundment at the time of the inspection?

Pool Level at Time of Inspection 607.7 ft / NGVD29 Maximum Pool Level / Datum 609.0 ft / NGVD29

3. Was there an excessive amount of CCR above the water surface that could lead to overtopping of the perimeter berm? Yes ____ No X

There is CCR above the water level within the Fly Ash Basin. The CCR above the water surface is mainly due to the pond operating level being lowered several years ago. Generally, the CCR is below the embankment crest elevation. The discharge structure and sluicing operations no longer being active should prevent overtopping of the perimeter berm.

4. Were there any significant changes since the last inspection? Yes x No ____

The Fly Ash Basin ceased receiving CCR materials on December 29, 2023, in preparation for closure in accordance with 40 CFR §257.102(e)(1). Sluicing operations at the Fly Ash Basin have stopped.

Monroe Power Plant
Fly Ash Basin
2024 Annual Inspection Report

IV. Stormwater Feature Conditions

1. Were there any existing or potential conditions (erosion, impediments, etc.) that could affect the function of the stormwater features or the stability of the embankments? Provide approximate size and location of any conditions. Yes X No

A number of potential conditions that could affect the function of the stormwater features were observed.
-Riprap has eroded from below all the SmartDitch outlets (Photos #11, #18, #28, #29, #39, #40, #42). If not addressed and the eroded areas enlarge, potential structural weaknesses could develop in the exterior slopes of the perimeter embankment at these locations.
-At Station 18+50, water has eroded a hole below the SmartDitch outlet (Photos #11, #12). However, flow was not observed during the inspection. Finer sediments were observed within the riprap downchute downslope of this SmartDitch outlet (Photo #14).
-At Station 32+50, the geotextile fabric has been exposed and torn below the SmartDitch outlet (Photos #18, #19).
-The outlets at Stations 32+50, 76+00, 82+00, 139+50, and 151+00 appeared to have been distorted due to settlements (Photos #18, #28, #29, #39, #40).
-Significant cut vegetation was observed within the SmartDitch outlets at Stations 18+50, 26+50, 32+50, 70+00, 139+50 (Photos #10, #11, #18, #39). This could impede conveyance of stormwater flows and lead to overtopping and erosion around the ditches.
-Dense vegetation and some erosion were observed in the riprap downchutes in many downchutes (all except Stations 32+50, 64+00, 157+00) (Photo #13).
Some small, woody vegetation was observed in the riprap downchutes at Stations 70+00, 76+00, 139+50 (Photos #27, #39). The vegetation did not appear to affect the functionality of the downchutes, but could lead to additional erosion or potential structural weaknesses at these locations.

2. Were there any significant changes since the last inspection? Yes No X

No significant changes to the stormwater features (i.e., SmartDitch, riprap downchutes, perimeter swales) have occurred since the last inspection.
Geosyntec has been tasked with developing corrective action recommendations for repairs.

V. Discharge Structure and Canal

1. Are there any cracks or breaks in concrete or steel parts or obstructions to discharge at the discharge structure? If 'Yes' report the location and severity. Yes No X

No structural damage was observed in the concrete, pipes, gates, or stop logs at the discharge structure (Photos #46, #47). Sluicing operations at the Fly Ash Basin have stopped, so no flow was observed during the inspection. No obstructions were observed.

2. Are there signs of slope distress or seepage on the slope between the inlet and outlet structures or turbidity in the outflow? Yes No X

The exterior slopes of the perimeter embankment between the discharge structure and the discharge canal were in satisfactory condition with no apparent indicators of slope movements (e.g., cracks) (Photo #48). Sluicing operations at the Fly Ash Basin have stopped, so there was no flow through the outfall structures and into the discharge canal (Photo #49). The outfall structures and culverts were in satisfactory condition with no obstructions observed.

3. Is the weir at the exit of the discharge canal in working condition? If 'No', describe any issues. Yes X No

The weir (Photo #51) and the silt curtain and discharge canal upstream of the weir (Photo #50) were in satisfactory condition. Significant vegetation was observed in the discharge canal and some debris was observed at the weir. Sluicing operations have stopped, so the minimal flow did not appear to be impeded.

VI. Slurry Piping

1. Were there any breaks or leaks in the sluice lines along the embankment? If 'Yes' describe the line #, location, severity, etc. Yes No X

VII. Repairs, Maintenance, Action Items

2. Has this inspection identified any need for repair or maintenance? If 'Yes', describe and state the urgency of maintenance. "Urgent" for maintenance that should be conducted as soon as possible, "Moderate" for maintenance that should be conducted within approximately two years, and "Not Urgent" for maintenance that should be conducted within approximately five years. Yes X No

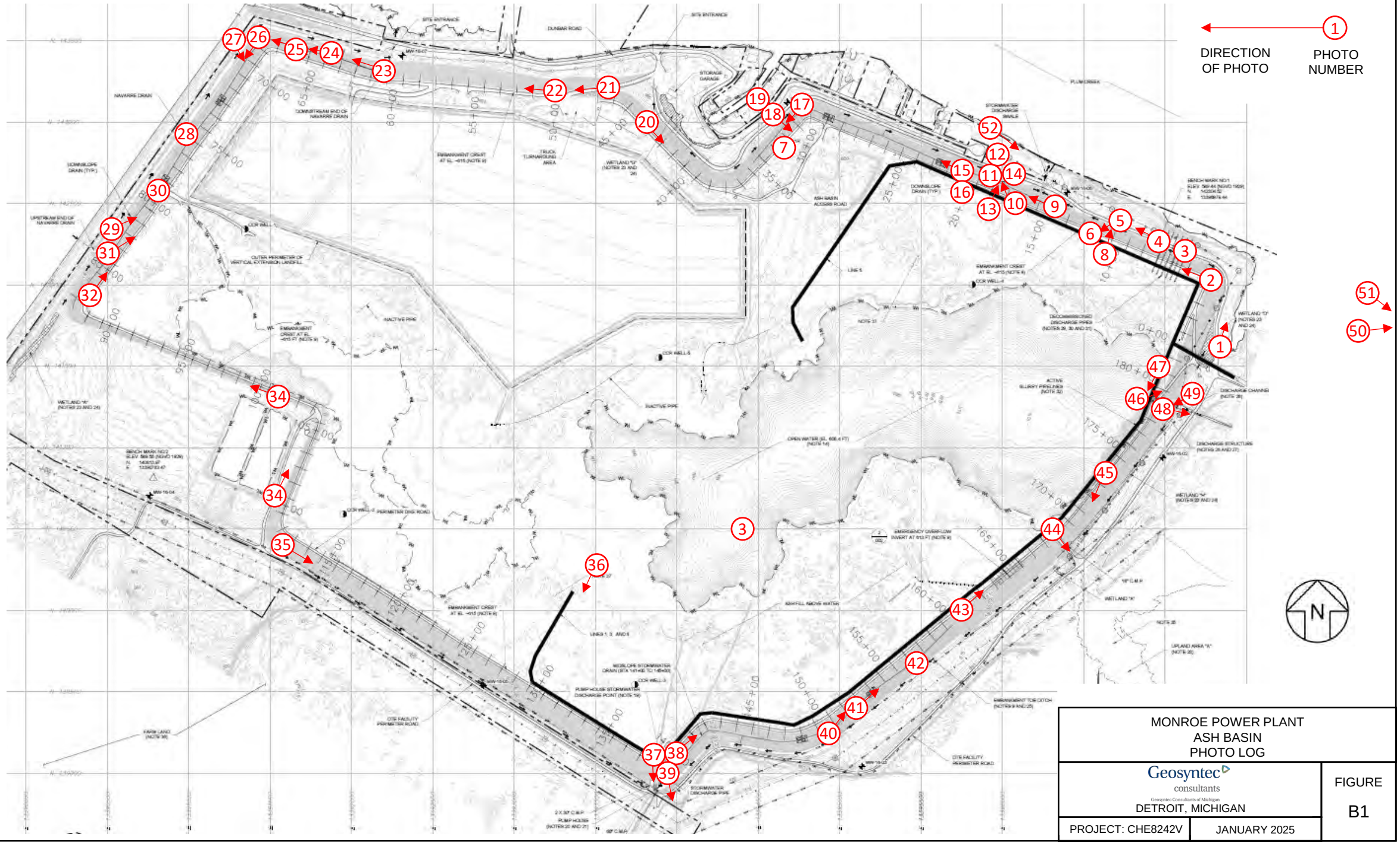
Moderate - Perform additional repairs to the exterior slopes near Station 12+00 experiencing sloughing/cracking. (**Addressed by DTE September 2024**)
Moderate - Repair the areas by the SmartDitch outlets. Replace eroded riprap and damaged geotextile fabric. Damaged portions of SmartDitch should be removed. Geosyntec has been tasked with developing corrective action recommendations for repairs.
Not Urgent - The exposed HDPE pipe near Station 67+00 should be covered with aggregate and the area should continue to be monitored for additional erosion.
Not Urgent - Continue periodically mowing and applying approved chemical sprays to the exterior slopes to facilitate inspection of the perimeter embankment. (**Addressed by DTE August 2024**)
Not Urgent - Apply approved chemical sprays to vegetation within the riprap downchutes.
Not Urgent - Clear cut vegetation from within the SmartDitch.
Not Urgent - Repair the cover grate on the covered HDPE pipe near Station 67+00.
Not Urgent - Replace desiccant canisters and insect traps within the instrumentation monitoring equipment boxes. (**Addressed by DTE August 2024**)
Additional details provided in the Annual Inspection Report.

Monroe Power Plant
Fly Ash Basin
2024 Annual Inspection Report

VIII. Photography

Photographs can be taken of notable features. List of photographs:

	Location	Direction of Photo	Description
1	SEE ATTACHED PHOTO LOG.		
2			
3			
4			
5			
6			
7			
8			
9			
10			



MONROE POWER PLANT
ASH BASIN
PHOTO LOG

Geosyntec consultants
Geosyntec Consultants of Michigan
DETROIT, MICHIGAN

FIGURE
B1

PROJECT: CHE8242V

JANUARY 2025

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 1 **Date:** 5/29/2024 **Direction:** North **Comments:** Exterior slopes of the perimeter embankment on the east side (Stations 0+00 to 5+00) were in satisfactory condition. The access roads near Station 0+00 were in good condition with no erosion rills observed.	
Photograph 2 **Date:** 5/29/2024 **Direction:** West **Comments:** Perimeter road atop the perimeter embankment was generally in good condition with no erosion and minimal rutting observed (typical conditions shown).	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 3

Date: 5/29/2024

Direction: --

Comments: Small, mossy areas were observed at a couple locations on the northeast perimeter embankment slopes (typical conditions shown). No water was observed flowing out of these areas.

Photograph 4

Date: 5/29/2024

Direction: West

Comments: Exterior slopes of the perimeter embankment on the northeast side (Stations 5+00 to 14+00) were generally in satisfactory condition.

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 5 **Date:** 5/29/2024 **Direction:** Southwest **Comments:** Sloughing was observed on the exterior slopes of the perimeter embankment near Station 12+00. Sloughing has caused "bunching" of materials at the toe of the embankment. Sloughing has been observed at this location in 2022 and 2023 and been repaired.	
Photograph 6 **Date:** 5/29/2024 **Direction:** West **Comments:** Close up of one crack/slough on the exterior slopes of the perimeter embankment near Station 12+00. The repairs made in 2023 failed and the crack reopened. The largest scarp had a height of approximately 1.5 feet and length of approximately 45 feet.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 7

Date: 5/29/2024

Direction: --

Comments: The instrumentation monitoring equipment including the equipment boxes and wiring were in satisfactory condition. The desiccant canisters in all equipment boxes were degraded (circled) (typical conditions shown). The equipment box at Station 34+00 (shown in photo) had moisture intrusion and insects.

Photograph 8

Date: 5/29/2024

Direction: Northeast

Comments: The instrumentation monitoring equipment including the slope inclinometer casings, equipment boxes, solar panels, and antennae were in good condition (typical conditions shown).

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 9 **Date:** 5/29/2024 **Direction:** West **Comments:** Exterior slopes of the perimeter embankment on the northeast side (Stations 14+00 to 31+00) were in satisfactory condition. The SmartDitch® system along the slopes was in fair condition with some cut vegetation in the ditches and erosion around the edges.	
Photograph 10 **Date:** 5/29/2024 **Direction:** Northwest **Comments:** Significant cut vegetation was observed within many SmartDitch outlets (Stations 18+50, 26+50, 32+50, 70+00, 139+50), which could impede conveyance of stormwater flows(typical conditions shown).	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 11 **Date:** 5/29/2024 **Direction:** -- **Comments:** Over one foot of riprap has eroded from below the SmartDitch outlet at Station 18+50.	
Photograph 12 **Date:** 5/29/2024 **Direction:** -- **Comments:** Water has eroded a hole below the SmartDitch outlet at Station 18+50. The geotextile fabric below the SmartDitch has been exposed (right side of photo). Water was not observed flowing into the hole at the time of the inspection.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 13 **Date:** 5/29/2024 **Direction:** Northeast **Comments:** The riprap downchutes used to convey water from the SmartDitch to the perimeter swales were generally in fair condition. Dense vegetation and some erosion were observed in many downchutes (all except Stations 32+50, 64+00, 157+00), but did not appear to affect the functionality of the downchutes.	
Photograph 14 **Date:** 5/29/2024 **Direction:** -- **Comments:** Finer sediments were observed within the riprap downchute downslope of the hole below the SmartDitch outlet at Station 18+50.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 15 **Date:** 5/29/2024 **Direction:** West **Comments:** The covered high-density polyethylene (HDPE) drainpipes connecting sections of the SmartDitch were generally in good condition with minimal sediments and cut vegetation near the outlets. Minimal erosion was observed in the aggregate for the vehicle crossing. (typical conditions shown).	
Photograph 16 **Date:** 5/29/2024 **Direction:** -- **Comments:** The covered HDPE drainpipes connecting sections of the SmartDitch had minimal sediments and vegetation within the pipes that are not expected to impede conveyance of stormwater through the pipes (typical conditions shown).	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 17 **Date:** 5/29/2024 **Direction:** Southwest **Comments:** Exterior slopes of the perimeter embankment on the northeast side (Stations 31+00 to 35+50) were in satisfactory condition.	
Photograph 18 **Date:** 5/29/2024 **Direction:** South **Comments:** Over one foot of riprap has eroded from below the SmartDitch outlet at Station 32+50. The outlet appeared to have been distorted due to settlements.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 19

Date: 5/29/2024

Direction: --

Comments: Over one foot of riprap has eroded from below the SmartDitch outlet at Station 32+50. The geotextile fabric below the SmartDitch has been exposed and is torn.

Photograph 20

Date: 5/29/2024

Direction: Southeast

Comments: Exterior slopes of the perimeter embankment by the north entrance (Stations 35+50 to 46+50) were in satisfactory condition.

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 21 **Date:** 5/29/2024 **Direction:** West **Comments:** North access road to the perimeter road atop the perimeter embankment was in good condition with no erosion rills observed.	
Photograph 22 **Date:** 5/29/2024 **Direction:** West **Comments:** Exterior slopes of the perimeter embankment on the northwest side (Stations 46+50 to 66+00) were in satisfactory condition. The perimeter swales had minimal flow and were in satisfactory condition.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 23 **Date:** 5/29/2024 **Direction:** Southeast **Comments:** Denser vegetation was observed on the upslope sides of the SmartDitch (approximate Station 62+00 shown). In some locations, small, woody vegetation was observed.	
Photograph 24 **Date:** 5/29/2024 **Direction:** West **Comments:** The covered HDPE drainpipe connecting sections of the SmartDitch near Station 66+00 was in good condition with some sediments and cut vegetation near the outlets. Minimal erosion was observed in the aggregate for the vehicle crossing. The grate covering the outlet was damaged.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 25 **Date:** 5/29/2024 **Direction:** West **Comments:** Gravel placed on the perimeter embankment slopes near Station 67+00 has shown signs of erosion from the upper slope to the lower. Portions of the slotted HDPE pipe have become exposed as a result. The HDPE pipe and the check ports were in good condition.	
Photograph 26 **Date:** 5/29/2024 **Direction:** West **Comments:** Exterior slopes of the perimeter embankment on the west side (Stations 68+50 to 88+50) were in satisfactory condition.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 27 **Date:** 5/29/2024 **Direction:** Southeast **Comments:** Small, woody vegetation was observed in the riprap downchutes at Station 70+00 (shown) and 76+00.	
Photograph 28 **Date:** 5/29/2024 **Direction:** -- **Comments:** Approximately one foot of riprap has eroded from below the SmartDitch outlet at Station 76+00. The outlet appeared to have been distorted due to settlements.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 29 **Date:** 5/29/2024 **Direction:** Northeast **Comments:** Approximately one foot of riprap has eroded from below the SmartDitch outlet at Station 82+00. The outlet appeared to have been distorted due to settlements.	
Photograph 30 **Date:** 5/29/2024 **Direction:** -- **Comments:** Previous repairs to a crack near Station 78+00 were observed to be in good condition.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 31 **Date:** 5/29/2024 **Direction:** Northeast **Comments:** Vegetation was sparser at some locations on the exterior slopes of the perimeter embankment on the west side (Station 82+00 shown). A fire burned vegetation on the perimeter embankment on the west side in early 2023. The vegetation has improved in this area.	
Photograph 32 **Date:** 5/29/2024 **Direction:** Northeast **Comments:** Perimeter road atop the perimeter embankment and the asphalt access road on the west side were in good condition with no erosion, minimal rutting, and no cracks observed. Exterior slopes of the perimeter embankment on the west side were in satisfactory condition.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 33 **Date:** 5/29/2024 **Direction:** West **Comments:** Exterior slopes of the perimeter embankment on the southwest side (Stations 88+50 to 104+50) were in satisfactory condition. The asphalt access road was in good condition with no cracks observed.	
Photograph 34 **Date:** 5/29/2024 **Direction:** Northeast **Comments:** The asphalt access road to the perimeter road atop the perimeter embankment by the south entrance was in good condition. The stormwater drainage channel and check dams were in satisfactory condition. Denser vegetation was observed by the north check dams. Exterior slopes of the perimeter embankment (Stations 104+50 to 112+00) were in satisfactory condition.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 35 **Date:** 5/29/2024 **Direction:** Southeast **Comments:** Exterior slopes of the perimeter embankment on the south side (Stations 112+00 to 139+50) were in satisfactory condition.	
Photograph 36 **Date:** 5/29/2024 **Direction:** South **Comments:** Sluicing operations at the Fly Ash Basin have stopped. However, no obstructions were observed at the outlets of the sluice lines. Receipt of CCR material at the Fly Ash Basin ceased in December 2023.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 37 **Date:** 5/29/2024 **Direction:** South **Comments:** The pump house and access road at the southeast corner of the Fly Ash Basin were in good condition. The perimeter swales on the east and south sides of the Fly Ash Basin had some water that was observed flowing towards the pump house. The perimeter swales were in satisfactory condition. No obstructions were observed in the culverts.	
Photograph 38 **Date:** 5/29/2024 **Direction:** Northeast **Comments:** Exterior slopes of the perimeter embankment on the southeast side (Stations 139+50 to 149+00) were in satisfactory condition. Denser vegetation was observed along the east side of the perimeter embankment.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 39

Date: 5/29/2024

Direction: South

Comments: Small, woody vegetation was observed in the riprap downchute at Station 139+50. Approximately one foot of riprap has eroded from below the SmartDitch outlet. The outlet appeared to have been distorted due to settlements.

Photograph 40

Date: 5/29/2024

Direction: Northeast

Comments:
Approximately half of a foot of riprap has eroded from below the SmartDitch outlet at Station 151+00. The outlet appeared to have been distorted due to settlements.

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 41

Date: 5/29/2024

Direction: Northeast

Comments: Exterior slopes of the perimeter embankment on the east side (Stations 149+00 to160+50) were in satisfactory condition.

Photograph 42

Date: 5/29/2024

Direction: --

Comments:
Approximately half of a foot of riprap has eroded from below the SmartDitch outlet at Station 157+00.

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 43 **Date:** 5/29/2024 **Direction:** Northeast **Comments:** Perimeter road atop the perimeter embankment was generally in good condition with no erosion and minimal rutting observed. The low point near Station 165+00 (circled) for emergency overflow was in good condition.	
Photograph 44 **Date:** 5/29/2024 **Direction:** Southeast **Comments:** East access road to the perimeter road atop the perimeter embankment was in good condition with no erosion rills observed.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 45 **Date:** 5/29/2024 **Direction:** South **Comments:** Exterior slopes of the perimeter embankment on the east side (Stations 160+50 to 179+00) were in satisfactory condition.	
Photograph 46 **Date:** 5/29/2024 **Direction:** East **Comments:** No structural damage was observed in the concrete or discharge pipes. No obstructions were observed in the discharge pipes. Sluicing operations at the Fly Ash Basin have stopped, and water was not flowing over the discharge structure and into the pipes during the inspection.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 47

Date: 5/29/2024

Direction: South

Comments: The gates and stop logs of the discharge structure were in satisfactory condition with no significant damage or obstructions observed. Sluicing operations at the Fly Ash Basin have stopped, so the water level within the Fly Ash Basin has decreased to approximately 607.7 feet at the time of inspection.

Photograph 48

Date: 5/29/2024

Direction: East

Comments: The exterior slopes of the perimeter embankment between the discharge structure and the discharge canal were in satisfactory condition. No indicators of slope movements (e.g., cracks or sinkholes) were apparent.

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 49 **Date:** 5/29/2024 **Direction:** Southwest **Comments:** Sluicing operations at the Fly Ash Basin have stopped, so no outflow from the discharge structure was observed. The outfall structures and culverts to the discharge canal were in satisfactory condition with no obstructions observed.	
Photograph 50 **Date:** 5/29/2024 **Direction:** West **Comments:** The silt curtain upstream of the weir and the discharge canal were in satisfactory condition. Significant vegetation was observed within the canal. Sluicing operations have stopped at the Fly Ash Basin, so there is minimal flow within the canal that did not appear to be impeded by the vegetation.	

DTE ELECTRIC COMPANY
Photographic Record

Client: DTE Electric Company | **Project Number:** CHE8242V

Site Name: Monroe Power Plant
Fly Ash Basin | **Site Location:** Monroe, MI

Photograph 51 **Date:** 5/29/2024 **Direction:** West **Comments:** The weir outlet for the discharge canal was in satisfactory condition. Some debris was observed but did not appear to impede the discharge of the canal. Minimal discharge was observed as a result the sluicing operations having stopped at the Fly Ash Basin.	
Photograph 52 **Date:** 10/1/2024 **Direction:** East **Comments:** Repairs were made to the crack/slough on the exterior slopes of the perimeter embankment near Station 12+00 by regrading the slopes and filling in the cracks with a sand-bentonite mix. The slopes and repairs were in good condition.