Prepared for

DTE Electric Company
One Energy Plaza
Detroit, Michigan 48226

2020 ANNUAL INSPECTION REPORT
ASH BASIN EMBANKMENT

MONROE POWER PLANT

Monroe, Michigan

Prepared by

Geosyntec consultants

engineers | scientists | innovators

3520 Green Court, Suite 275
Ann Arbor, Michigan 48105

CHE8242V

January 2021

TABLE OF CONTENTS

LIST OF APPENDICES

1. INTRODUCTION

1.1 Overview

The 2020 Annual Inspection Report (AIR) was prepared by Geosyntec Consultants (Geosyntec) for the DTE Electric Company (DTE) to summarize the results of the annual inspection of the Monroe Ash Basin (Ash Basin). The annual inspection is a part of the Inspection Monitoring and Maintenance (IMM) program for the Ash Basin. The IMM program was prepared to comply with the United States Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule (CCR Rule) published on April 17, 2015 (40 CFR 257.73). Under the CCR Rule, the Ash Basin is an "existing surface impoundment" and must be inspected by a qualified professional engineer on a periodic basis, not to exceed one year.

The site 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.

The Ash Basin was constructed in the early 1970s to contain a 410-acre ash basin to hold sluiced ash. The Ash Basin is constructed with a 3-1/2-mile long embankment using on-site fine-grained (clay) soils that were excavated from within the footprint of the Ash Basin. Ash and water are pumped to the Ash Basin using four, above grade pipelines consisting of steel and high-density polyethylene pipes. After treatment in the Ash Basin, water flows out from the Ash Basin through a discharge structure in accordance with the facility's National Pollutant Discharge Elimination System (NPDES) permit #MI0001848.

1.2 Purpose

Inspection, monitoring, and maintenance of the embankment are performed by DTE pursuant to the combined monitoring and maintenance program described in IMM program (MONPP – 1301 – Rev.C) and the CCR Rule. The objective of the IMM program is to detect indications of potential slope instability in time to allow planning, design, and implementation of appropriate mitigation measures. Further, the purpose of the inspection under the CCR Rule is "…to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards." (40 CFR 257.83(b)(1)).

The purpose is accomplished through periodic visual inspection (and photo-documentation) of the embankment, monitoring of instrumentation intended to detect movement of the embankment, and review of construction and operating records since the last annual inspection.

1.3 Report Organization

The remainder of this report is organized as follows:

- Section 2 - Review of available information: a summary of various historical documents that were reviewed as part of this inspection.
- Section 3 - Inspection Results: a summary of visual observations recorded during inspections of the Ash Basin.
- Section 4 - Instrumentation Monitoring and Survey Results: a presentation of the data from subsurface instrumentation monitoring and bathymetry survey of the Ash Basin.
- Section 5 - Maintenance Activities: a description of the maintenance activities performed since the 2019 annual inspection.
- Section 6 - Evaluation: an evaluation of the results of the visual inspection and instrumentation monitoring.
- Section 7 - Conclusion: the overall conclusions of the annual inspection.

1.4 Terms of Reference

The annual visual inspection was performed by Mr. Omer Bozok, P.E[1]. and Mr. Dan Chambers of Geosyntec, with assistance from DTE's qualified personnel.

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

This report was prepared by Mr. Omer Bozok, P.E., and reviewed by Mr. John Seymour, P.E. of Geosyntec.

---

[1] Omer Bozok, P.E. of Geosyntec is the qualified professional engineer per the requirements of §257.53 of the CCR Rule. He has been involved with Monroe Ash Basin since 2009 when the design efforts for the mitigation of the embankment started and has extensive knowledge of the site. His resume is provided in Appendix B.

[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, summarized in Table 1, below.

Table 1: Documents Reviewed

Title	Prepared by	Year	Content
Monroe Fly Ash Disposal Basin Technical Report	DTE	1977	Design, construction and operational information.
Inspection, Monitoring and Maintenance Manual	Geosyntec	2018	Procedures for inspection, monitoring and maintenance of various facility structures.
Safety Factor Assessment	Geosyntec	2016	Safety factor assessment per the CCR Rule.
Hydraulic Capacity Assessment	Geosyntec	2016	Hydraulic capacity assessment per the CCR Rule.
Fill Plan Alternatives – Rev. B	Geosyntec	2015	Pros and cons of various fill plan alternatives for the remaining life of the ash basin.
Potential Failure Mode Analysis Results – Rev. 3	Geosyntec	2015	Results of potential failure mode analysis.
Geotechnical Site Characterization Report	Geosyntec	2012	Summary of data from various site investigation studies conducted around the perimeter of the embankment.
Monroe Ash Basin Closure Plan	Geosyntec	2016	Closure plan.

Title	Prepared by	Year	Content
2014 Annual Inspection Report	Geosyntec	2015	Summary of quarterly inspection results for 2014.
2015 through 2019 Annual Inspection Reports	Geosyntec	2016 through 2019	Summary of annual inspection results from 2015 to 2019.
Overliner Construction, Phase 1- Construction Quality Assurance Report	Golder	2015	Construction completion document.
Dust Control Plan	DTE	2019	Summarizes dust control measures and assessment of its effectiveness.
Annual Dust Report	DTE	2019	Summarizes dust control actions taken during the year and documents if there are any citizen complaints.
Groundwater Statistical Evaluation Plan	TRC	2017	Basis for statistical evaluation for groundwater monitoring events
Annual Groundwater Monitoring Report	TRC	2020	Summary of annual groundwater monitoring results for 2019
Location Restrictions Demonstration	TRC	2018	Provides information on location restriction demonstration per CCR Rule.
Bathymetric Survey	DTE	2020	Bathymetry survey of the ash basin.

3. VISUAL INSPECTION RESULTS

DTE and Geosyntec performed the following visual inspections in 2020:

- Annual inspection by Geosyntec on May 20, 2020 (provided in Appendix A); and
- Weekly inspections by DTE – ongoing.

DTE's visual inspection for the annual and weekly inspections included the embankment crest, exterior slopes of the embankment, ash discharge point, discharge structure, and discharge pipes through the embankment. Photographs of observed conditions during the annual inspection were taken by Geosyntec and are discussed in this section and Attachment A.

In addition to the annual and weekly inspections, the general condition of the site and embankment is visually inspected daily by DTE.

The embankment has been flattened from a slope of 2H:1V to 3H:1V from Station ~110+00 to ~139+00 since the last annual inspection.

Overall, the embankment surface was visible and observed to be in good condition. Similarly, the discharge structure, discharge pipes and aerators appear to be in good condition and there are no immediate concerns for the safe operation or stability of the Ash Basin.

4. INSTRUMENTATION MONITORING AND BATHYMETRY SURVEY RESULTS

4.1 Slope Inclinometers

4.1.1 Slope Inclinometer Monitoring Procedures

Ten slope inclinometers (SIs) are currently being monitored at the embankment. The SI casings were installed from the crest of the embankment to depths of approximately 45 to 50 feet below the crest. The purpose of the SIs is to provide a means of measuring the displacement of the ground around the casing. The SI readings provide values of horizontal displacement at discrete depths (at 1.6-ft 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 SI casing at the time of the reading.

The orientations of the A-axis and B-axis are unique to the individual SI casing. The positive A-axis corresponds to a direction oriented outward from the basin and approximately perpendicular to the embankment crest station baseline. The B-axis is oriented parallel to the embankment crest station baseline.

SIs were installed in late 2015, and baseline readings were taken on January 1, 2016. These SIs continuously record measurements and were installed to replace the decommissioned SIs that required manual recording.

4.1.2 Characterization of Displacement versus Depth Profile Plots

The horizontal displacement versus depth profiles is summarized below for the readings from the time of the annual inspection (May 2020). These conditions do not represent an immediate concern for the safe operation or stability of the ash basin embankment, as discussed in Section 6.

4.1.2.1 *Station 11+50 Slope Inclinometer*

- A-axis direction
  - Maximum cumulative displacement magnitude and direction: +0.40 inches (northward) at four feet below ground surface.
- B-axis direction
  - Maximum cumulative displacement magnitude and direction: -0.14 inches (eastward) at six feet below ground surface.

4.1.2.2 *Station 34+00 Slope Inclinometer*

- A-axis direction

    - Maximum cumulative displacement magnitude and direction: +0.16 inches (towards northwest) at seventeen feet below ground surface.
- B-axis direction
    - Maximum cumulative displacement magnitude and direction: -0.10 inches (towards southwest) at two feet below ground surface.

4.1.2.3 ***Station 56+00 Slope Inclinometer***

- A-axis direction
    - Maximum cumulative displacement magnitude and direction: +0.17 inches (northward) at twelve feet below ground surface.
- B-axis direction
    - Maximum cumulative displacement magnitude and direction: -0.31 inches (eastward) at six feet below ground surface.

4.1.2.4 ***Station 65+50 Slope Inclinometer***

- A-axis direction
    - Maximum cumulative displacement magnitude and direction: +0.15 inches (northward) twenty-three feet below the ground surface.
- B-axis direction
    - Maximum cumulative displacement magnitude and direction: +0.24 inches (westward) twenty-three feet below the ground surface.

4.1.2.5 ***Station 77+00 Slope Inclinometer***

- A-axis direction
    - Maximum cumulative displacement magnitude and direction: +0.20 inches (westward) at five feet below ground surface.
- B-axis direction
    - Maximum cumulative displacement magnitude and direction: -0.14 inches (northward) at twelve below ground surface.

4.1.2.6 ***Station 118+00 Slope Inclinometer***

- A-axis direction
    - Maximum cumulative displacement magnitude and direction: +0.70 inches (southward) at six feet below ground surface.
- B-axis direction

- Maximum cumulative displacement magnitude and direction: -0.10 inches (westward) at the ground surface.

4.1.2.7 ***Station 133+00 Slope Inclinometer***

- A-axis direction
  - Maximum cumulative displacement magnitude and direction: +2.50 inches (southward) at five feet below ground surface.
- B-axis direction
  - Maximum cumulative displacement magnitude and direction: -0.46 inches (westward) at seventeen feet below ground surface.

4.1.2.8 ***Station 142+00 Slope Inclinometer***

- A-axis direction
  - Maximum cumulative displacement magnitude and direction: +0.17 inches (towards southeast) at six feet below ground surface.
- B-axis direction
  - Maximum cumulative displacement magnitude and direction: -0.22 inches (towards southwest) at ten feet below the ground surface.

4.1.2.9 ***Station 162+50 Slope Inclinometer***

- A-axis direction
  - Maximum cumulative displacement magnitude and direction: +1.42 inches (eastward) at six feet below ground surface.
- B-axis direction
  - Maximum cumulative displacement magnitude and direction: -0.10 inches (southward) at six feet below the ground surface.

4.1.2.10 ***Station 178+00 Slope Inclinometer***

- A-axis direction
  - Maximum cumulative displacement magnitude and direction: +0.24 inches (eastward) at three feet below the ground surface.
- B-axis direction
  - Maximum cumulative displacement magnitude and direction: -0.22 inches (southward) at twenty-five feet the ground surface.

4.2 Bathymetric Survey Results

The bathymetric survey of the Ash Basin was performed by DTE survey crew in June of 2020. The following were measured, observed or estimated based on the survey results.

1) The water level at the time of the survey was at elevation 608.4 ft[3], which is lower than the maximum operation water level of 609 ft.

2) Approximately 73 percent of the Ash Basin footprint is filled with ash above the water level.

3) The maximum water depth is approximately 36 ft. The top of ash at this location is at approximate elevation 572.4 ft.

4) The maximum ash thickness is approximately 50 ft, measured from the top of ash at approximate elevation 613 ft to the bottom of the Ash Basin, which is at approximate elevation 563.4 ft. The minimum thickness of ash is approximately 9 ft.

5) At the time of the bathymetry measurements:

    a. the remaining storage capacity of the Ash Basin is approximately 2.9 million cubic yards.

    b. approximately 25.4 million cubic yards of ash is deposited in the Ash Basin.

    c. approximately 590 million gallons of water is impounded in the Ash Basin.

[3] Elevations referred to in this report are based on National Geodetic Vertical Datum of 1929 (NGVD29).

5. MAINTENANCE ACTIVITIES

The following maintenance activities were performed since the last annual inspection:

- Performed regular maintenance on the continuous monitoring system;
- Regrading and shallowing of the southern embankment slope; and
- Restored vegetation at the southern embankment and in the construction equipment laydown area at the southwest corner of the Ash Basin.
- Repaired downchutes at Stations 32 and 133.
- Sprayed woody vegetation on the embankment.

6. EVALUATION

6.1 Visual Inspection

The embankment, discharge structure, discharge pipes and aerators are in good condition, and there are no immediate concerns for the safe operation or stability of the Ash Basin.

6.2 Inclinometer Monitoring

The maximum cumulative displacement for all the inclinometers is 2.50 inches at the ground surface at Station 133+00. There is no evidence of movement of the embankment at the monitored locations that would suggest a global instability of the Ash Basin embankment. The embankment at Station 133+00 was flattened as part of the 2019 construction activities.

7. CONCLUSION AND CERTIFICATION

The annual visual inspection did not identify evidence of structural weakness or instability.

Based on the annual inspection results and review of the available data, the Monroe Ash Basin facility was designed, constructed, operated, and maintained with generally accepted good engineering standards.

Certified by:

______________________ Date 1/9/2021

Omer Bozok, P.E. Michigan License Number 6201062700
Project Engineer

APPENDIX A

2020 ANNUAL INSPECTION FORMS AND PHOTOS

MONROE ASH BASIN 2020 ANNUAL INSPECTION

Name of Surface Impoundment: Monroe Power Plant Ash Basin
Surface Impoundment ID Number:
Owner: DTE Electric Company
Operator:
Site Conditions: Dry

Qualified Professional Engineer: **Omer Bozok P.E.**
Date: 5/20/2020 **Time:** 8 am to 1 pm
Weather: Sunny, 70s
Precipitation (since previous weekly inspection): 3.8 in.

I. Crest

1. Are there any appearances of actual or potential structural weaknesses (ruts, holes, erosion, cracking, slides, depressions, undesired vegetation etc.)? Provide approximate size and location.)

   Overall, the crest is in good condition, no cracks were observed. There are some ruts and potholes observed on the crest around the perimeter.

2. Are there any significant changes since last inspection? None.

II. Embankment Slopes

1. Are there any appearances of actual or potential structural weaknesses (ruts, holes, erosion, cracking, sloughs, depressions, bulges, undesired vegetation etc.)? (Provide approximate size and location/station.

   There are bushes scattered around the ash basin embankment slopes.

2. Are there any visible wet areas on the downstream slope? None.

3. Are there any significant changes since the last inspection? The southern embankment from stations ~ 110 to 139 were flattened from 2H:1V to 3H:1V.

III. Surface Impoundment Conditions

1. Is the in-flow piping to the surface impoundment flowing freely to open water? X Yes ___ No

   If 'No', describe (type of debris, reason for obstruction, etc.)

   Line 1, 3, 5 and 6 were inspected.

2. What is the water level in the surface impoundment today?

   Maximum Pool Level / Datum 609 ft / NGVD29 Pool Level is 608.4 ft

3. Is there excessive CCR build-up above the water surface that could lead to overtopping?

   There is CCR above the water level; however, discharge Lines 1, 3, 5 and 6 directly discharge into open water. Therefore, overtopping is considered unlikely.

4. Are there any significant changes since the last inspection? None.

MONROE ASH BASIN 2020 ANNUAL INSPECTION

IV. Discharge Structure and Channel

1. Are there any cracks or breaks in concrete or steel parts of the discharge structure, or obstructions to water flow (If 'Yes' report the location and severity).

No.

2. Are there signs of slope distress or seepage on the slope between the inlet and outlet structures or turbidity in the outflow?

None.

3. Is the weir at the downstream of discharge channel in working condition? *If 'No', describe the issue.*

Yes.

VI. Slurry Piping

1. Are there any breaks or leaks along the embankment? ____ Yes X No

If 'Yes', describe (the line #, location, severity, etc.)

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 three months, and "Not Urgent" for maintenance that can be conducted in a year. X Yes ____ No

No "Urgent" maintenance items were identified. Other maintenance items have been identified and reported to DTE.

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			
11			
12			
13			
14			
15			
16			
17			

GEOSYNTEC CONSULTANTS
Photographic Record

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Ash Basin	**Site Location: Monroe, MI**

Photograph 1

Date: 20 May 2020

Direction: NE

Comments: Photo taken at Station ~145+00. The Perimeter road appears to be in good, working condition.

Photograph 2

Date: 20 May 2020

Direction: SE

Comments: Photo taken at Station ~15+00. The embankment appears to have uniform slopes without signs of distress.

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Ash Basin	**Site Location: Monroe, MI**

Photograph 3

Date: 20 May 2020

Direction: SE

Comments: Photo taken at Station ~18+00. The embankment appears to have uniform slopes without signs of distress. The midslope ditch appears to be in functioning condition.

Photograph 4

Date: 20 May 2020

Direction: SW

Comments: Photo taken at Station ~72+00. The Perimeter road appears to be in good, working condition.

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Ash Basin	**Site Location: Monroe, MI**

Photograph 5

Date: 20 May 2020

Direction: SW

Comments: Photo taken at Station ~106+00. The embankment appears to have uniform slopes without signs of distress.

Photograph 6

Date: 20 May 2020

Direction: NE

Comments: Photo taken at Station ~162+00. The embankment appears to have uniform slopes without signs of distress.

GEOSYNTEC CONSULTANTS
Photographic Record

Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Ash Basin	**Site Location: Monroe, MI**

Photograph 7

Date: 20 May 2020

Direction: SW

Comments: Photo taken at Station ~168+00. The embankment appears to have uniform slopes without signs of distress.

Photograph 8

Date: 20 May 2020

Direction: NE

Comments: Photo taken at the outlet of the discharge structure. Water coming out of the aerators appears to be clear.

GEOSYNTEC CONSULTANTS **Photographic Record**	
Client: DTE Electric Company	**Project Number: CHE8242**
Site Name: Monroe Power Plant Ash Basin	**Site Location: Monroe, MI**

Photograph 9	
Date: 20 May 2020	
Direction: NW	
Comments: Photo taken at the discharge structure. The structure appeared to be in satisfactory working condition.	

Photograph 10	
Date: 20 May 2020	
Direction: NE	
Comments: Photo taken at Station ~145+00. The embankment appears to have uniform slopes without signs of distress.	

APPENDIX B

RESUME OF OMER BOZOK, P.E. (QUALIFIED PROFESSIONAL ENGINEER)

Geosyntec consultants

OMER BOZOK, P.E.

Specialties

- CCR Engineering
- Geotechnical Engineering
- Construction Quality Assurance

Education

M.S., Geotechnical Engineering, University of Missouri, Columbia, Columbia, Missouri, 2009

B.S., Geological Engineering, Hacettepe University, Ankara, Turkey, 2007

Registrations and Certifications

P.E. in Michigan and Ohio

CAREER SUMMARY

Mr. Bozok is a project engineer and responsible for managing large-scale civil projects, reviewing engineering data, writing technical reports, generating/reviewing drawings, performing geotechnical analyses and design, and managing construction quality assurance (CQA) activities.

He is experienced in design, inspection, instrumentation/monitoring, and operations of coal ash facilities. Mr. Bozok managed design of four large-scale civil projects: involving (i) mitigation of a 3.5-mile long embankment, encompassing 400-acre ash basin; (ii) closure of a 300-acre ash basin and lowering of a 100-ft tall dam; (iii) closure of a 50-acre ash basin; and (iv) remediation of a 50-acre existing Superfund landfill.

KEY PROJECT EXPERIENCE

Wood River West Ash Complex Closure, Vistra Energy, East Alton, Illinois. Mr. Bozok is the project manager and the lead civil design engineer for the project that involves closure of an existing 50-acre fly ash pond, detailed dewatering design and relocation of plant discharge pipes. The project requires approximately one million CY of earthwork. The scale of the project, availability of limited on-site materials, nature of loose ash, and extent of groundwater makes it a challenging project.

Embankment Mitigation for Fly Ash Basin and CQA, DTE Energy, Monroe, Michigan. Mr. Bozok served as the project manager and the lead civil design engineer for the project that involved design and mitigation of an existing fly ash basin embankment. The embankment is 3.5-miles long and 40-ft high. Mainly, mitigation measures included flattening of the existing slopes from 2 horizontal to 1 vertical (2H:1V) slopes to 2.5H:1V with a mid-slope stormwater conveyance channel. The project was completed in five construction seasons (2009 through 2013). Mr. Bozok managed CQA activities during construction.

The project won DTE's "Best Large Project Award" under their Major Enterprise Project group. The five-year project was completed under budget, within schedule and with no safety incidents.

Settling Pond Fly Ash Removal and CQA, City of Escanaba, Escanaba, Michigan. Project included removal of fly ash from a settling pond and adjacent areas that required excavation and re-grading. Settling pond was utilized by City of Escanaba Generating Station to dispose its coal combustion residuals. Mr. Bozok designed the cleanout, assisted with contractor bids and selection, managed onsite CQA personnel on a day to day basis, reviewed daily reports, the contractor's submittals, responded to the contractor's and the owner's requests in a timely manner for the orderly execution of the work.

CQA of Plate Load Test on Slurried Fly Ash, Electric Power Research Institute, Central City, Kentucky. Mr. Bozok documented construction and testing of a plate load test on slurried fly ash at a power plant ash disposal basin. The test was performed by applying load on a stiffened 5-ft by 5-ft test plate. The load was resisted by four micropiles drilled into bedrock. In addition, Mr. Bozok provided oversight for the field investigation that included CPTu testing, shear wave testing and soil borings.

MIG/DeWane Superfund Site Remedial Design and Construction CQA, Republic Services, Belvidere, Illinois. Mr. Bozok was the lead design engineer for closure of a Superfund site, and managed CQA activities during construction. The project involved preparing remedial design construction drawings for an existing approximately 50-acre Superfund site to upgrade an interim cap that had been installed in 1990s. Design included: (i) construction of leachate and gas collection system consisting of approximately 4,000-ft long leachate and gas collection system trench, and underground and above ground storage tanks; (ii) augmentation of the existing clay fill cover by compacting additional clay fill; and (iii) implementation of stormwater management system.

Probabilistic Slope Stability Analysis for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok served as the lead geotechnical engineer for the project. The client was considering mitigating a portion of a 3.5-miles long and 40-ft high the embankment to improve slope stability safety factor. Mr. Bozok performed probabilistic slope stability analysis to assess the global stability and recommend mitigation measures, if necessary. Mr. Bozok provided the client with a probability of failure information for the embankment and the client decided that mitigation was not necessary. This provided the client with approximately 5-million-dollar savings.

Emergency Action Plan for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok prepared an Emergency Action Plan (EAP) for a 400-acre ash basin that has 3.5-miles long, 40-ft high embankment. The Ash Basin is critically bounded on the east by Lake Erie, on the west by Interstate Highway 75 (I-75), on the north by Plum Creek, and on the south by an agricultural field. Mr. Bozok evaluated four failure scenarios at critical locations around the perimeter embankment and developed the EAP based on Federal Emergency Management Agency Guidelines for Dam Safety.

Potential Failure Mode Analysis for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok worked with the client to identify potential failure modes for a 400-acre ash basin that could cause ash release, resulting in environmental impact and potential for human life loss. Mr. Bozok facilitated meetings with client's staff including personnel from operations, maintenance, engineering and environmental group, to rank and categorize potential failure modes. Upon, identifying medium and high-risk failure modes, Mr. Bozok worked with the client to design and implement mitigation measures to lower risk levels.

Operations Plan for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok, prepared a set of operations plan drawings along with the inspection, monitoring and maintenance manual for a 400-acre fly ash basin facility. Project involved installation of a continuous monitoring and alarm system for the ash basin embankment inclinometers. Mr. Bozok directed a group of field staff and instrumentation engineers to implement the program. The operations plan provides guidelines on how to safely operate the fly ash basin, structures, provides communication procedures, and provides action criteria for surface and subsurface instrumentation.

Seep Investigation Study for Fly Ash Basin, DTE Energy, Monroe, Michigan. Mr. Bozok prepared a seep investigation report for the Monroe Ash Basin embankment. The purpose of the study was to find the origin of water observed in slope indicator casings and standing water along the toe of the embankment and to recommend a mitigation approach. Mr. Bozok reviewed and evaluated the field data (including water level readings from the casings, pore pressure data from piezometers and precipitation data) and groundwater and fly ash chemical analysis results.

Stingy Run Fly Ash Reservoir Closure, American Electric Power, Cheshire, Ohio. Mr. Bozok is the project manager and the lead civil design engineer for the project that involves closure of an existing 300-acre fly ash pond and lowering of 100-ft tall dam. The project requires approximately 4 million CY of earthwork. The scale of the project, nature of loose ash, lowering of the dam, nearby highwalls, wetlands and streams make it a challenging design project and involves collaboration between different disciplines.

Use of Instrumented Test Fill to Assess Static Liquefaction of Impounded Fly Ash for Cardinal Landfill, American Electric Power, Brilliant, Ohio. Mr. Bozok assessed the potential for a fly ash subgrade to undergo static liquefaction using results from an instrumented test fill. Mr. Bozok performed time-rate settlement analyses for a flue gas desulfurization (FGD) waste landfill to be constructed over an existing fly ash pond. He evaluated the coefficient of consolidation of ash by interpreting CPTu dissipation tests and compared it against the values in the literature. Mr. Bozok used the software program SAF-TR to model the effect of ramp loading on excess pore pressure and compared it to results from a full-scale test.

Sibley Quarry CCR Landfill Fill Plan, DTE Energy, Trenton, Michigan. Mr. Bozok was the lead civil design engineer assisting the client with phasing of landfill operations. The existing operations, site conditions and the need for landfilling 16 MCY of CCR made it a challenging project.

Engineering Correlations for Geotechnical Parameters for Ponded Fly Ash, EPRI, Palo Alto, California. Mr. Bozok was one of the principal investigators and managed the field investigation activities. The project involved performing a field plate load test at an ash basin site and preparing a report summarizing findings of the study.

Evaluation of Fly Ash Diagenesis Potential, EPRI, Palo Alto, California. Mr. Bozok was the lead principal investigator for this project. The project involved: (i) establishing a method for creating a pluviated specimen in a lab environment that reasonably represents in-situ conditions; and (ii) studying diagenesis potential of Class F fly ash and its impact on engineering characteristics.

Annual Inspection of Ash Impoundments and Landfills, DTE Energy, various locations. Mr. Bozok inspected Sibley Quarry Landfill and Monroe Ash Basin and prepared annual inspection reports per the requirements of USEPA CCR rules.

Review of Safety Factor Assessments for Various Sites, Dynegy, various locations. Mr. Bozok was a key member of a team, which reviewed safety factor assessments for various high-risk sites that were prepared by another consulting firm. The documents were prepared to meet the requirements of USEPA CCR rules and required diligent review before made available to the public.

Documentation for USEPA CCR Rules, DTE Energy, Monroe, Michigan. Mr. Bozok assisted client with meeting the documentation requirements of USEPA CCR rules. The rule requires various documentation regarding the history of construction, operations and design of various structures. He directed hydraulic capacity and safety factor assessments.

Guidance Documents for USEPA Coal Combustion Residual Rules, Electric Power Research Institute, Palo Alto, California. Mr. Bozok was a key member of the team and prepared various templates for EPRI members. Project involved preparing a series of guidance documents for utility companies that manage coal combustion residuals to meet USEPA CCR Rules. Mr. Bozok prepared templates for emergency action plans, onsite inspections and training module for inspectors.