DTE Energy Monroe Power Plant

Bottom Ash Impoundment
CCR Rule Compliance Project

Annual Inspection Report - 2022

Project Number: 60689329

September 2, 2022

Prepared by:

AECOM

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Table of Contents

Appendices

1. Introduction

1.1 Introduction

The 2022 Annual Inspection Report (AIR) was prepared by AECOM for the DTE Electric Company (DTE) to summarize the results of the annual inspection of the Monroe Power Plant Bottom Ash Impoundment. This annual inspection complies with the United States Environmental Protection Agency Coal Combustion Residuals Rule (40 CFR 257.83). Under the CCR Rule, the Bottom Ash Impoundment is an "inactive surface impoundment" and must be inspected by a qualified professional engineer on a periodic basis, not to exceed one year.

1.2 Background Information

The Bottom Ash Impoundment area was constructed in the late 1960's by building a perimeter dike to surround a low area of the adjacent Lake Erie; the area south of the plant was removed from the Waters of the United States by an Act of Congress prior to plant construction. CCR materials have been placed and allowed to drain into the pond from the north end of the pond; these materials currently form a delta that extends about 1/3 of the way into the pond. Wastewater flow into the pond ceased on October 21, 2020.

1.3 Personnel

The annual inspection was performed by Mr. Scott G. Hutsell, P.E., with assistance from DTE personnel. Weekly inspections have been and continue to be performed by DTE's plant personnel.

2. Annual Inspection Results

2.1 2021/2022 Inspections

DTE performed the following visual inspections in 2022:

- The annual inspection on July 21, 2022 (provided in Appendix A)
- Weekly inspections during 2021 and 2022

Prior to the physical inspection on July 21, AECOM reviewed the updated available information about the condition of the Bottom Ash Impoundment

The annual and weekly inspections included the embankment crest, exterior slopes of the embankment, discharge structures, and discrete observations of the interior of the basins based on accessibility.

No sign of vegetative distress or structural issues were observed during the annual inspection on the embankment crest, exterior slopes of the embankment and discharge structure. These structures appeared to be in good condition. No changes to the exterior geometry of the impoundment have occurred since the last inspection, however closure construction continues after starting in March 2021 as described below. Instrumentation related to geotechnical monitoring of the impoundment slopes is not present at the impoundment.

The water elevation of the pond is approximately ~575 MSL (mean sea level) as noted in the inspection report in Appendix A. Water depth ranges from zero along the northern shore to 3 feet along the eastern and southern perimeter and up to 25 feet in depth near the weir. The storage capacity of the impoundment has been estimated to be 15.8M cubic feet ("CCR Impoundment Inflow Design Flood Control System Plan: Bottom Ash Impoundment, Monroe Power Plant", AECOM revised August 30, 2021). CCR materials have not been placed in the impoundment since 2015.

Closure construction in the Bottom Ash Impoundment commenced in March 2021. As of July 21, 2022, approximately 50% of the volume of CCR residuals in the pond has been removed through wet excavation and transported off-site. The northern third of the impoundment has been regraded to accommodate the construction contractor's equipment, access roads, settling basins, and a geotube (sediment dewatering geosynthetic bags) field.

Noteworthy observations are listed below; these conditions do not represent an immediate concern for the safe operation or stability of the Bottom Ash Impoundment and will be addressed through the closure of the Bottom Ash Impoundment.

- The downslope sides of portions of the Impoundment (especially the western side) are heavily vegetated and/or below the water surface. A thorough inspection of the entire surface perimeter of the impoundment is not practical.

3. Maintenance Activities in 2022

3.1 Maintenance Activities

Site access roads have been repaired/improved as part of the ongoing closure construction.

4. Conclusion and Certification

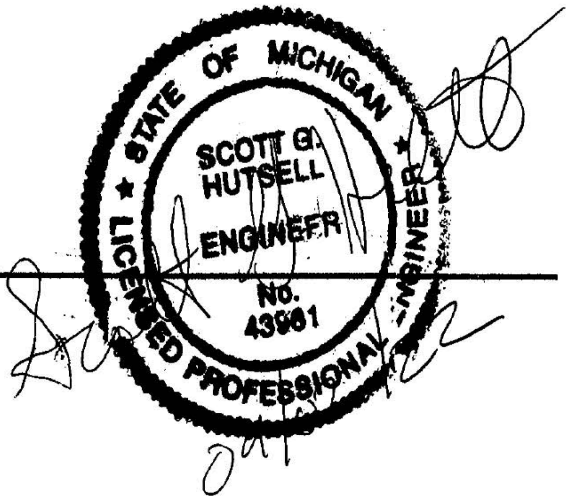
4.1 Conclusion

The annual inspection did not identify any evidence of structural weakness or instability in the Bottom Ash Impoundment at DTE's Monroe Power Plant. Observations included continued inspections of the perimeter of the impoundment as well as a review of closure construction that began in March 2021.

Based on the annual inspection results and review of available data (including design documents and weekly inspection documentation) the Bottom Ash Impoundment was designed and constructed with generally accepted good engineering standards. Additionally, the Bottom Ash Impoundment is operated and maintained using generally accepted good engineering practice.

4.2 Certification

Certified by:



Scott G. Hutsell, P.E. Michigan License #43961

Senior Project Manager

CCR Impoundment Inspection Report

Station/Owner	County	State
Monroe Bottom Ash Impoundment / DTE Energy	Monroe	Michigan

Inspected By	Date	Phone No.
Scott G. Hutsell, P.E.	07/21/2022	517-505-1301

Type of Impoundment	Type of Inspection	Weather
☐ Concrete Gravity ☒ Embankment ☐ Concrete Arch ☐ Stone Masonry ☐ Concrete Buttress ☐ Other	☐ Initial ☒ Periodic ☐ Follow up ☐ Other	☐ Wet ☒ Dry ☐ Snow Cover ☐ Other

Hazard Description
The Bottom Ash Impoundment is a CCR surface impoundment; the northern half is deposited sluiced ash while the southern half contains 3 to 25 ft of water and sluiced ash surrounded by embankments/berms.

Condition Assessment
☒ Satisfactory ☐ Unsatisfactory ☐ Poor ☐ Not rated ☐ Fair

Remarks:
Closure Construction for the impoundment continues; approx. 50% of the residuals by volume have been removed. No issues were found during the inspection; AECOM recommends continued monitoring, and maintenance and minor repairs as necessary.

Actions
☐ None
☒ Maintenance
☒ Monitoring
☒ Minor Repair
☐ Engineering

Recommendations
☒ Inspection letter
☐ Deficiency letter
☐ EOR notice
☐ Engineering study
☐ Inspection by EOR

Pool Level (ft)	Total Precipitation since last inspection
~575 ft MSL	n/a

UPSTREAM SLOPE/FACE

Problems

☐ 1. None	☐ 7. Wave Erosion	☐ 13. Scarps	☐ 19. Exposed reinforcement
☒ 2. Vegetation >2" dia.	☐ 8. Slides	☐ 14. Sloughing	☐ 20. Veg. or sediment in rip rap
☒ 3. Veg. height >6"	☐ 9. Depressions	☐ 15. Holes	☐ 21. Displaced rip rap
☒ 4. High bushes	☐ 10. Bulges	☐ 16. Undermining	☐ 22. Sparse rip rap
☐ 5. Animal Burrows	☐ 11. Cracks	☐ 17. Displaced joints	☐ 23. Other Erosion
☐ 6. Livestock damage	☐ 12. Spalling	☐ 18. Deteriorated joints	☐ 24. Other

COVER:
☐ Vegetation
☒ Rip rap
☐ Concrete
☐ Asphalt
☐ Other

Comments /Action Items
The embankments surrounding the Bottom Ash Impoundment are typically 20' wide at the crest – while the access road is made up of crushed rock and rip-rap. The interior side slopes, especially on the western side of the pond are heavily vegetated. The southern embankment is a rip-rap separation berm built in 2015 – this berm was upgraded in 2021 to raise the elevation 1' to 1.5 feet across the length of the berm.

Actions ☒ None ☐ Maintenance ☐ Monitoring ☐ Minor Repair ☐ Engineering

TOP OF DAM/CREST

PROBLEMS

☐ 1. None	☐ 7. Ruts	☐ 12. Cracks	☐ 17. Scarps
☐ 2. Vegetation >2" dia.	☐ 8. Depressions	☐ 13. Deteriorated joints	☐ 18. Spalling
☒ 3. Veg. height >6"	☐ 9. Unlevel	☐ 14. Displaced joints	☐ 19. Sinkholes
☒ 4. High bushes	☐ 10. Misalignment	☐ 15. Exposed reinforcement	☐ 20. Puddles
☐ 5. Animal Burrows	☐ 11. Signs of overtopping	☐ 16. Settlement	☐ 21. Other
☐ 6. Livestock damage			

COVER:
☒ Vegetation
☒ Rip rap
☐ Concrete
☐ Asphalt
☐ Other

Comments /Action Items
The embankments surrounding the Bottom Ash Impoundment are typically 20' wide at the crest; the access road is made up of crushed rock and rip-rap. The southern embankment is a rip-rap separation berm built in 2015 and upgraded in 2020 and 2021.

Actions ☒ None ☐ Maintenance ☐ Monitoring ☐ Minor Repair ☐ Engineering

CCR Impoundment Inspection Report

DOWNSTREAM SLOPE/FACE

PROBLEMS				COVER:
☐1. None ☒2. Vegetation >2" dia.\ ☒3. Veg. height >6" ☒4. High bushes ☐5. Poor grass cover ☐6. Animal Burrows ☐7. Livestock damage	☐8. Wetness ☐9. Seepage ☐10. Boils ☐11. Puddles ☐12. Erosion ☐13. Slope instability ☐14. Scarps	☐15. Sloughs/bulges ☐16. Depressions ☐17. Undercutting ☐18. Rutting/rills ☐19. Cracks ☐20. Scour ☐21. Spalling	☐22. Displaced joints ☐23. Deteriorated joints ☐24. Exposed reinforcement ☒25. Riprap needs attention ☒26. Veg. or sediment in rip rap ☐27. Other	☒Vegetation ☒Rip rap ☐Concrete ☐Asphalt ☐Other

28. Does standing water or seepage contain sediment?	☐Yes ☒No ☐NA
29. Is there natural hillside seepage in in embankment area?	☐Yes ☒No ☐NA

Describe seepage with regard to quantity and clarity (turbidity). Note changes:

None

Comments /Action Items

Along the outside embankment large trees (1-2' in diameter) are visible. The southern embankment is a rip-rap separation berm built in 2015. Some minor sloughing was previously corrected along western perimeter along the discharge canal – AECOM recommends DTE continue to monitor the area on a weekly basis.

Actions ☐None ☐Maintenance ☒Monitoring ☐Minor Repair ☐Engineering

TOE CONTACT

PROBLEMS				COVER:
☐1. None ☒2. Vegetation >2" dia. ☐3. Veg. height >6" ☒4. High bushes ☐5. Poor grass cover ☐6. Animal Burrows ☐7. Livestock damage	☐8. Wetness ☐9. Seepage ☐10. Boils ☐11. Puddles ☐12. Erosion ☐13. Slope instability ☐14. Scarps	☐15. Sloughs/bulges ☐16. Depressions ☐17. Undercutting ☐18. Rutting/rills ☐19. Cracks ☐20. Scour ☐21. Spalling	☐22. Displaced joints ☐23. Deteriorated joints ☐24. Exposed reinforcement ☐25. Riprap needs attention ☐26. Veg. or sediment in rip rap ☐27. Other	☒Vegetation ☐Rip rap ☐Concrete ☐Asphalt ☐Other

28. Does standing water or seepage contain sediment?	☐Yes ☒No ☐NA

Describe seepage with regard to quantity and clarity (turbidity). Note changes:

None

Comments /Action Items

Toe is inaccessible for direct inspection due to heavy construction activities along the northern boundaries. Toe is inaccessible along the western and eastern perimeter due to the water surface. Portions of the toe of slope that are visible from the south bank and other slopes look to be in good condition.

Actions ☒None ☐Maintenance ☐Monitoring ☐Minor Repair ☐Engineering

ABUTMENT CONTACTS

PROBLEMS				COVER:
☐1. None ☐2. Vegetation >2" dia. ☐3. Veg. height >6" ☐4. High bushes ☐5. Poor grass cover ☐6. Animal Burrows ☐7. Livestock damage	☐8. Wetness ☐9. Seepage ☐10. Boils ☐11. Puddles ☐12. Erosion ☐13. Slope instability ☐14. Scarps	☐15. Sloughs/bulges ☐16. Depressions ☐17. Undercutting ☐18. Rutting/rills ☐19. Cracks ☐20. Scour ☐21. Spalling	☐22. Displaced joints ☐23. Deteriorated joints ☐24. Exposed reinforcement ☐25. Riprap needs attention ☐26. Veg. or sediment in rip rap ☐27. Other	☐Vegetation ☐Rip rap ☐Concrete ☐Asphalt ☐Other

Comments /Action Items

Not applicable

Actions ☒None ☐Maintenance ☐Monitoring ☐Minor Repair ☐Engineering

CCR Impoundment Inspection Report

PRINCIPAL SPILLWAY

OBSERVATIONS

☐ No Spillway

Is spillway control system operating properly? ☒ **Yes** ☐ **No**

PROBLEMS				CHANNEL LINING
☐ 1. None ☐ 2. Trashguard ☒ 3. Debris ☒ 4. Obstructed ☐ 5. Plugged/Clogged ☐ 6. Gates Damaged ☐ 7. Gates leaking ☐ 8. Gates Rusted	☐ 9. Misalignment ☐ 10. Joints leaking ☐ 11. Joint deterioration ☐ 12. Joint displacement ☐ 13. Conduit collapsed ☐ 14. Exposed reinforcement ☐ 15. Erosion	☐ 16. Undermining ☐ 17. Voids ☐ 18. Cracks ☐ 19. Holes ☐ 20. Spalling ☐ 21. Slides ☐ 22. Outlet undercutting	☐ 23. Sloughing ☐ 24. Scarps ☐ 25. Deteriorated lining ☐ 26. Boils ☐ 27. Outlet erosion ☐ 28. Displaced rip rap ☐ 29. Sparse rip rap ☐ 30. Other	☒ Vegetation ☐ Rip rap ☐ Concrete ☐ Asphalt ☐ Other

Comments /Action Items

Spillway appears to be in good repair – water levels in the pond and discharge canal are lower than in 2021. There are no control systems so the spillway acts as both principal and emergency. Outfall of spillway is overgrown with vegetation that has created preferential flow pathways across the discharge.

Actions ☒ None ☐ Maintenance ☐ Monitoring ☐ Minor Repair ☐ Engineering

EMERGENCY SPILLWAY

OBSERVATIONS

☐ No emergency spillway ☒ Same as primary spillway

PROBLEMS				CHANNEL LINING
☐ 1. None ☐ 2. Debris in channel ☐ 3. Gates ☐ 4. Misalignment	☐ 5. Joint deterioration ☐ 6. Joint displacement ☐ 7. Exposed reinforcement ☐ 8. Erosion	☐ 9. Undermining ☐ 10. Voids ☐ 11. Cracks ☐ 12. Holes ☐ 13. Outlet erosion	☐ 14. Displaced rip rap ☐ 15. Sparse rip rap ☐ 16. Outlet undercutting ☐ 17.Inadequate capacity ☐ 18. Other	☐ Vegetation ☐ Rip rap ☐ Concrete ☐ Asphalt ☐ Other

Comments /Action Items

See Principal Spillway Above

Actions ☒ None ☐ Maintenance ☐ Monitoring ☐ Minor Repair ☐ Engineering

DRAINS/OUTLET STRUCTURE

Observations

1.	Is discharge system operating properly?	☒ **Yes**	☐ **No** ☐ **N/A**
2.	Valves and operators in good condition?	☐ **Yes**	☐ **No** ☒ **N/A**
3.	Walkway in good condition?	☒ **Yes**	☐ **No** ☐ **N/A**
4.	Is there any turbidity observed at the outlet?	☐ **Yes**	☒ **No** ☐ **N/A**
5.	Seepage at pipe outlet	☐ **Yes**	☐ **No** ☒ **N/A**
6.	No Bottom Drain	☐ **Yes**	☐ **No** ☒ **N/A**
7.	Bottom Drain Operable	☐ **Yes**	☐ **No** ☒ **N/A**
8.	Subsurface Drain Dry	☐ **Yes**	☐ **No** ☒ **N/A**
9.	Subsurface drain muddy flow	☐ **Yes**	☐ **No** ☒ **N/A**
10.	Subsurface drain obstructed	☐ **Yes**	☐ **No** ☒ **N/A**
11.	Animal guard	☐ **Yes**	☐ **No** ☒ **N/A**
12.	other	☐ **Yes**	☐ **No** ☐ **N/A**

Comments /Action Items

DTE raised the weir height in 2021.

Actions ☒ None ☐ Maintenance ☐ Monitoring ☐ Minor Repair ☐ Engineering

CCR Impoundment Inspection Report

RESERVIOR/POOL

OBSERVATION					
Has there been a sudden drop in the content level of the Impoundment					☐Yes ☒No
PROBLEMS					
☒1. None ☐2. Inadequate freeboard	☐3. Skimmer ☐4. Depressions	☐5. Whirlpools	☐6. Sinkholes	☒7. Unwanted growth in pond water	
Comments /Action Items **Pool level has been relatively steady since observations were first begun by this inspector in late 2015; however, with the cessation of non-ccr wastewater inflow to the pond in October 2020 the water level has dropped 4.5". The surrounding waters (Lake Erie, Discharge Canal) were observed to be lower than documented in the 2021 inspection.**					
Actions ☒None ☐Maintenance ☐Monitoring ☐Minor Repair ☐Engineering					

OTHER

OBSERVATIONS	
1. leachate/stormwater (RCP; CMP) drain pipes that pass through or under an ash basin intact?	☐**Yes** ☐**No** ☒**N/A**
2. Drainage/ diversion ditches/riprap-lined channels in good condition?	☐**Yes** ☐**No** ☒**N/A**
3. Other steel structures/steel reinforcement in concrete structures in good condition?	☐**Yes** ☐**No** ☒**N/A**
4. Other concrete structures in good condition?	☐**Yes** ☐**No** ☒**N/A**
5. Overflow pipes and flap gates on filter dam/ drain pipe filter zone in good condition?	☐**Yes** ☐**No** ☒**N/A**
6. Howell Bunger Valves in good condition?	☐**Yes** ☐**No** ☒**N/A**
7. Weirs in good condition?	☐**Yes** ☐**No** ☒**N/A**
8. Perimeter Fences and Gates in good condition?	☒**Yes** ☐**No** ☐**N/A**
9. Security devices in good condition	☐**Yes** ☐**No** ☒**N/A**
10. Signs in good condition	☐**Yes** ☐**No** ☒**N/A**
11. Instrumentation in good condition	☐**Yes** ☐**No** ☒**N/A**
12. Reference monuments/Survey Monuments in good condition	☐**Yes** ☐**No** ☒**N/A**
13. other	☐**Yes** ☐**No** ☒**N/A**
Comments /Action Items	
Actions ☒None ☐Maintenance ☐Monitoring ☐Minor Repair ☐Engineering	

Are there any other abnormal conditions at the Impoundment that could pose a risk to public health, safety or welfare; the environment or natural resources ☐Yes ☒No

Inspector Signature Scott G. Hutsell

Date: 07/21/22

Photo 1: Looking south at discharge weir; heavily vegetated and water levels continue to decrease along the discharge canal

Photo 2: Area of previous sloughing along discharge canal that was augmented by rip-rap placement in previous years. Slope looks stable; DTE personnel monitor suspect areas without rip-rap on a weekly basis

Photo 3: The south separation berm – while the area of upgraded stone placement (12-18” inches) has experienced some sloughing the berm continues to be stable at lower depths.

Photo 4: Another view of the southern separation berm showing the additional stone placement and sloughing along with the stable inboard slopes

Photo 5: Looking north at dredging and closure construction from the south separation berm

Photo 6: Looking northeast from the eastern end of the south separation berm

Photo 7: Looking north from the south separation berm at the waste water ditch (center) and the impoundment (to the left).

Photo 8: Heavy rip-rap along the eastern shore of the perimeter dike facing Lake Erie. No changes are noted in this area.