DTE Energy Monroe Power Plant

Inactive Bottom Ash Impoundment
CCR Rule Compliance Project

Annual Inspection Report - 2021

Project Number: 60662907

September 3, 2021

Prepared by:

AECOM

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1. Introduction

1.1 Introduction

The 2021 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 Inactive 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 Inactive Bottom Ash Impoundment is an "existing 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 Inactive 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 2020/2021 Inspections

DTE performed the following visual inspections in 2021:

- The annual inspection on July 23, 2021 (provided in Appendix A)
- Weekly inspections during 2020 and 2021

Prior to the physical inspection on July 23, 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. In addition to the annual and weekly inspections, the general condition of the site and embankment was visually inspected by DTE daily.

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 began 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 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: Inactive Bottom Ash Impoundment, Monroe Power Plant", AECOM revised August 30, 2019). 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 23, approximately 5% of the volume of the pond in the northeast quarter 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 field.

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

- The downslope sides of the Impoundment 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 2021

3.1 Maintenance Activities

DTE installed additional stone materials along the southern berm; raising the top crest elevation 12 to 18 inches. Site access roads have also been improved as part of the ongoing closure construction.

4. Conclusion and Certification

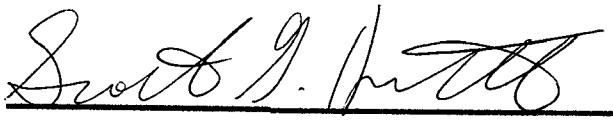
4.1 Conclusion

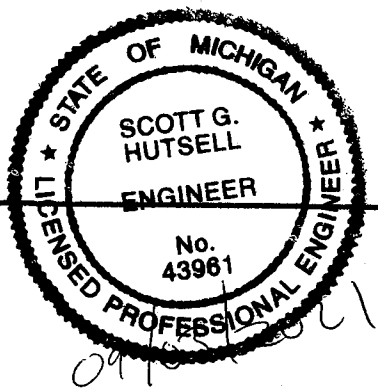
The annual inspection did not identify any evidence of structural weakness or instability in the Inactive Bottom Ash Impoundment at DTE's Monroe Power Plant. Observations included continued inspections of the perimeter of the impoundment as well as a review of closure construction that began in March 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 Inactive 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.	07/23/2021	517-505-1301

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

Hazard Description	**Condition Assessment**
The Bottom Ash Impoundment is an inactive surface impoundment; the northern half is deposited sluiced ash while the southern half contains from 3 to 25 ft of water surrounded by embankments/berms.	☒ Satisfactory ☐ Unsatisfactory ☐ Poor ☐ Not rated ☐ Fair

Remarks:	**Actions**	**Recommendations**
Closure Construction for the impoundment is underway.	☐ None ☒ Maintenance ☒ Monitoring ☒ Minor Repair ☐ Engineering	☒ Inspection letter ☐ ☐ Deficiency letter ☐ ☐ EOR notice ☐ ☐ Engineering study ☐ Inspection by EOR ☐ Other reinspection

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

UPSTREAM SLOPE/FACE

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

Comments /Action Items

The embankments surrounding the Inactive 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 sideslopes, 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 has been upgraded since the last inspection 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				**COVER:**
☐ 1. None ☐ 2. Vegetation >2" dia. ☒ 3. Veg. height >6" ☒ 4. High bushes ☐ 5. Animal Burrows ☐ 6. Livestock damage	☐ 7. Ruts ☐ 8. Depressions ☐ 9. Unlevel ☐ 10. Misalignment ☐ 11. Signs of overtopping	☐ 12. Cracks ☐ 13. Deteriorated joints ☐ 14. Displaced joints ☐ 15. Exposed reinforcement ☐ 16. Settlement	☐ 17. Scarps ☐ 18. Spalling ☐ 19. Sinkholes ☐ 20. Puddles ☐ 21. Other	☒ Vegetation ☒ Rip rap ☐ Concrete ☐ Asphalt ☐ Other

CCR Impoundment Inspection Report

Comments /Action Items

The embankments surrounding the Inactive 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

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 apparent along western perimeter along the discharge canal – suspect areas are currently being monitored by DTE personnel 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 to direct inspection due to heavy vegetation along the northern water surface. 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

A B

PROBLEMS **COVER:**

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	☐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

PRINCIPAL SPILLWAY	**OBSERVATIONS**				
	☐No Spillway				
	Is spillway control system operating properly?				☒**Yes** ☐**No**
	PROBLEMS				**CHANNEL LINING**
	☐1. None ☐2. Trash guard ☒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 2020. There are no control systems so the spillway acts as both principal and emergency.**				
	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	**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**	

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

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 waste water inflow to the pond in October 2020 the water level has dropped 4.5" and stabilized. The surrounding waters (Lake Erie, Discharge Canal) were observed to be lower than documented in the 2020 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: 07/23/21

Photo 1: Looking south at discharge weir with additional turbidity curtains installed to protect during closure construction

Photo 2: Weir – water levels in the discharge canal are lower than in 2020.

Photo 3: Looking east along the south separation berm – the berm has been raised 1 to 1.5' since the last annual inspection

Photo 4: Area along the west berm repaired with additional rip-rap in previous years. Slope looks stable; DTE personnel monitor suspect areas without rip-rap protection on a weekly basis.

Photo 5: Vegetated slope and large rip-rap along the eastern perimeter.

Photo 6: Looking north from access road at closure construction in progress; dredge is clearly visible along with additional turbidity curtains installed as protection

Photo 7: Discharge 'path' from weir to the discharge canal; water level has decreased in both the pond and the discharge canal to make this the primary discharge point between the two water bodies.