

HOLLOW ROCK FACILITY

CLOSURE AND POST-CLOSURE PLAN

Prepared for



FirstEnergy Generation LLC
76 S. Main Street
Akron, Ohio, 44308

October 10, 2016

Prepared by



Certification Statement 40 CFR § 257.102 (b)(4), Initial Written Closure Plan for a CCR Surface Impoundment or Landfill and 40 CFR § 257.104 (d)(4), Initial Written Post-Closure Plan for a CCR Surface Impoundment of Landfill

CCR Unit: FirstEnergy Generation Corp.; W. H. Sammis Plant; Hollow Rock Residual Solid Waste Disposal Facility

I, Michael J. Stepic, being a Registered Professional Engineer in good standing in the State of Ohio, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above referenced CCR Unit, that the information contained in the initial written Closure and Post-Closure plan (dated October 10, 2016) meets the requirements of 40 CFR § 257.102 and § 257.104.

MICHAEL J STEPIC

Printed Name

10-10-16

Date

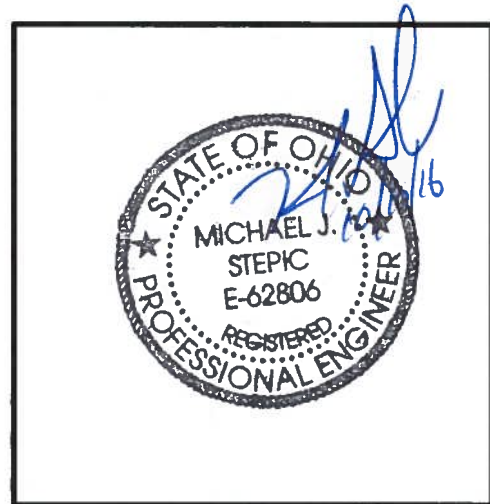


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This closure plan is intended to meet the requirements of 40 CFR 257 but can be amended at any time [pursuant to §257.102(b)(3)] due to a number of factors, including but not limited to: specified provisions in 40 CFR 257, federal or state regulatory changes, and unanticipated closure activity changes.

1.1 INTRODUCTION

This Closure and Post-Closure Plan (Plan) was prepared for FirstEnergy Generation, LLC's (FirstEnergy) W. H. Sammis Plant-Hollow Rock Residual Solid Waste Disposal Facility (HRF) located in Jefferson County, Ohio. The plan was prepared in accordance with 40 CFR Part 257, specifically, addressing the requirements under Subpart D, §257.102(b)(1) and 257.104(d)(1) of the Coal Combustion Residuals (CCR) Final Rule. It is noted that the HRF is an existing facility operating under a Permit to Install (PTI) approved by the Ohio Environmental Protection Agency (EPA) on March 28, 2008, which is in accordance with regulatory standards generally equivalent to those included in the CCR Final Rule. Consequently, closure and post-closure requirements for the HRF meet or exceed those of the CCR Final Rule. Where discrepancies exist, the plan has been updated to comply with both Ohio regulations and the CCR Final Rule.

As stipulated in § 257.102 of the CCR Final Rule, closure of a CCR landfill must be completed by installing a final cover system if CCR will be left in place. This section describes the closure activities that will be completed at the HRF.

2.1 DESCRIPTION OF CLOSURE ACTIVITIES - § 257.102(b)(1)(i)

This Plan applies to an existing landfill that currently receives CCR waste consisting of gypsum and purge stream solids. Closure will be accomplished by leaving CCR in place and installing a final cover system. The limit of waste proposed for the HRF will cover a disposal area of approximately 142 acres divided into seven (7) overall development phases constructed sequentially, with each new development phase being constructed and certified prior to completion of filling operations in the current development phase. Each cell will have its own leachate management system. CCR waste will be deposited to the maximum disposal grade and elevation as permitted. Given the nature of the waste, daily cover material is not required. Waste grades that have achieved final development grades along the outer slopes of the landfill will ultimately receive the final cap and cover, while other slopes or areas where no active filling is expected within 180 days will receive intermediate cover consisting of twelve (12) inches of cover soil.

To date, Cell numbers 1 and 2 have reached their design capacity and are inactive. Waste is currently being placed in active cells 3 and 4. Based on current projections of waste generation, cell number 5 is expected to begin receiving materials in 2017 and cell numbers 6 through 8 are expected to begin receiving material by 2020. In total, 14 cells are anticipated.

2.2 FINAL COVER SYSTEM - § 257.102(b)(1)(iii) AND § 257.102(d)(3)

The final cover system will consist of a 40 mil liner low density polyethylene (LLDPE) geomembrane, overlain by a geocomposite drainage layer, also overlain by thirty (30) inches of protective cover soil. The permeability of the cover system will not exceed 1×10^{-5} cm/sec. The top six (6) inches of this protective cover soil will be disked, fertilized, mulched, and seeded to promote the growth of a vegetative grass cover. The cap system will have a minimum slope of 2% and a maximum slope of 33%.

A detailed stability analysis was completed and confirmed that the final cover system is adequate. The analysis evaluated hydrostatic uplift, deep-seated failure, liquefaction, settlement, shallow transitional failure, and anchor trench design. The detailed stability analysis is presented in Appendix D of the Ohio *Permit to Install Application* (URS, 2007) currently maintained in the HRF operating record. In addition, details of the final cover system, also included in the PTI application, are provided in the drawings listed below.

All design drawings referenced in this Plan were reviewed by a qualified professional engineer, and a certification statement provided in **Appendix A** verifies that the design of the final cover system meets the requirements of § 257.102(d)(3)(i).

Item	Drawing No.
Horizontal limits and top elevations of waste	Plan sheet #4D
Horizontal limits and top elevations of the cap system	Plan sheet #4E
Detail drawing of cap system	Plan sheet #7B & 7D

2.2.1 Estimate of Maximum Inventory of CCR Left in Place - § 257.102(b)(1)(iv)

It is estimated that 26,498,811 cubic yards of waste residuals will be left in place if the landfill is closed at its permitted capacity.

2.2.2 Estimate of Largest Area Requiring a Final Cover - § 257.102(b)(1)(v)

At full permitted capacity, it is estimated that just shy of 142 acres will require a final cover system.

2.2.3 Erosion Control Measures - § 257.102(d)(1)

Erosion control measures for the final cover system may include the use of erosion mats, straw bales, silt fences, various types of mulch, and rock channel protection. Calculations demonstrate that the maximum projected soil erosion rate will be less than 5 tons per acre per year, at a proposed final capping slope of 3:1 (33%). Soil erosion calculation details are provided in Appendix H of the Ohio *Permit to Install Application* (URS, 2007) maintained in the HRF operating record. In addition, to monitor erosion, the site will be inspected quarterly after seeding and annually after vegetation is established.

2.2.4 Surface Water Run-on/Run-off Controls - § 257.102(d)(1)

Surface water will be directed away from the final cover through stormwater diversion terraces and rock channel letdowns. Perimeter ditches will direct runoff to one of five sedimentation ponds, each containing a National Pollutant Discharge Elimination System (NPDES) permitted outfall. The ponds will serve to settle out suspended solids prior to discharge to either Hollow Rock Run or Carter Run.

Details of the run-on/run-off controls are provided in the drawings listed below included in the HRF Ohio *Permit to Install Application* (URS, 2007).

Item	Drawing No.
Surface water control structures	Plan sheet #4F
Sedimentation ponds	Plan sheet #4F
Detail drawings of surface water drainage structures	Plan sheet #7B & 7D
Detail drawings of sediment ponds and discharge structures	Plan sheet #7H & 7I
Detail drawings of run-on and run-off control structures	Plan sheet #7B & 7D

2.3 CLOSURE SCHEDULE- § 257.102(b)(1)(vi) AND § 257.102(f)

Closure of the HRF will be completed within six (6) months of commencing closure activities. Closure activities will be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices. A closure schedule is provided in **Appendix B** of this Plan.

The schedule included in Appendix B is based upon FirstEnergy's operational plan as of the date of this document. Operational needs may arise that may require this schedule to be adjusted. If such an adjustment is made this document as well as the Ohio EPA Permit to Install for the facility will be revised accordingly. Section § 257.102(f) of the CCR Final Rule includes a provision for extending the closure timeframe when it is not feasible to complete closure activities in six (6) months.

Owners and operators of CCR landfills who are subject to the closure criteria under § 257.102, are also subject to the post-closure requirements of § 257.104. A description of post-closure activities is provided below, as required by paragraph (d) of § 257.104.

3.1 DESCRIPTION OF MONITORING & MAINTENANCE ACTIVITIES - § 257.104(d)(1)(i)

3.1.1 Final Cover - § 257.104(b)(1)

The cap system will be inspected quarterly and maintained for a minimum of 30 years following final closure of the HRF landfill.

The integrity and effectiveness of the cap system will be maintained, which includes making repairs to the cap system as necessary to correct the potential effects of significant settling, dead vegetation, subsidence, erosion, leachate outbreaks, or other events, and preventing run-on and run-off from eroding or otherwise significantly damaging the cap system. Maintenance will include, but will not necessarily be limited to the items below.

- Mowing at least once per year to maintain a healthy vegetative cover and limit the growth of deep-rooting plants.
- Fertilizing and reseeding as needed to maintain a dense, healthy, vegetative cover.
- Replacing eroded materials and reseeding the eroded areas. Areas habitually subjected to erosion will be treated with erosion control mats or, if erosion is extreme, rock channel protection.
- Addition of cover soil to fill settled areas as needed. If differential settlement threatens the integrity of the cap system or impairs the performance of the drainage layer, the cap system will be exhumed and repaired as needed.

3.1.2 Leachate System - § 257.104(b)(2)

During the post-closure care period, an annual report will be prepared and submitted to Ohio EPA and the Jefferson County Board of Health. The report will provide a monthly estimate of leachate collected for treatment and disposal and the location of the system, and analytical results of leachate testing. If an outbreak of leachate occurs, the outbreak will be promptly repaired and addressed.

3.1.3 Groundwater Monitoring System - § 257.104(b)(3)

An extensive groundwater monitoring network exists at the HRF. Currently, FE has developed a groundwater monitoring and corrective action program in accordance with the requirements of § 257.90 through § 257.98. The ground water monitoring system will be inspected quarterly and repairs will be made as needed.

3.2 POST-CLOSURE CARE PERIOD - § 257.104(c)

Post-closure care of the HRF will be conducted for 30 years.

If at the end of the post-closure care period the HRF is operating under assessment monitoring in accordance with § 257.95, post-closure care will continue until the facility returns to detection monitoring in accordance with § 257.95.

3.3 POST-CLOSURE FACILITY CONTACT - § 257.104(d)(1)(ii)

The following is the current point of contact for closure and post-closure activities. Should this contact be modified, Ohio EPA and the Jefferson County Board of Health will be notified by the landfill Owner:

FirstEnergy Environmental Department
800 Cabin Hill Drive
Greensburg, PA 15601
(724) 837-3000

An email address is not provided due to the potential employee turnover over the 30-year post closure period.

3.4 USE OF THE PROPERTY DURING POST-CLOSURE PERIOD - § 257.104(d)(1)(iii)

It is anticipated that the property will not be used during the post-closure period and will generally be left as an undisturbed area; a meadow for natural flora and fauna. The area will be regularly inspected to insure that animal burrows do not compromise the structural integrity of the facility. Post-closure use of the property will not disturb the integrity of the final cover, liner, or any other component of the containment system, or the function of the monitoring systems unless necessary to comply with post-closure requirements.

In the event that a disturbance is allowed (unrelated to post-closure activities) FirstEnergy will provide a demonstration that disturbance of the final cover, liner, or other component of the containment system, including any removal of CCR, will not increase the potential threat to human health or the environment. The demonstration will be certified by a qualified professional engineer.

APPENDIX A
PLAN DRAWINGS CERTIFICATION

Certification Statement 40 CFR § 257.102 (d)(3)(iii) – Initial Closure Plan Drawings for a CCR Surface Impoundment or Landfill, Final Cover System

CCR Unit: FirstEnergy Generation Corp.; W. H. Sammis Plant; Hollow Rock Residual Solid Waste Disposal Facility

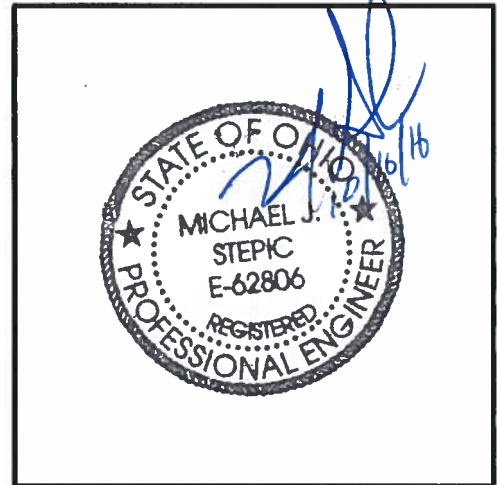
I, Michael J. Stepic, being a Registered Professional Engineer in good standing in the State of Ohio, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above referenced CCR Unit, that the design of the final cover system contained in the initial closure plan (dated October 10, 2016) meets the requirements of 40 CFR § 257.102.

MICHAEL J STEPIC

Printed Name

10-10-2016

Date



APPENDIX B
CLOSURE SCHEDULE

FirstEnergy Hollow Rock Facility Closure Schedule

Final Capping Installation Event	Installation Schedule	Year	Acres Closed
1	During operation of cells 10 and 11	2036	29
2	After commencement of operation in cells 12, 13, and 14	2044	34
3	During operation of cells 12, 13, and 14	2054	5
4	After reaching final grades in cells 12, 13 and 14	2063	74

Notes:

1. The schedule reflected above is based upon FirstEnergy's operational plan as of the date of this document. Operational needs may arise that may require this schedule to be adjusted. If such an adjustment is made this document as well as the Ohio EPA Permit to Install for the facility will be revised accordingly.

2. This schedule does not include the installation of temporary intermediate cover.

3. It is noted that § 257.102(f) of the CCR Final Rule includes a provision for extending the closure timeframe when it is not feasible to complete closure activities in six (6) months.