

POST CLOSURE PLAN

CCR 257.104(d)

Stingy Run Flyash Pond

Gavin Plant
Cheshire, Ohio

October, 2016

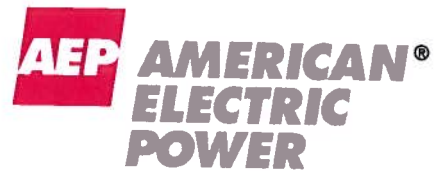
Prepared for: AEP Generation Resources - Gavin Plant

Cheshire, Ohio

Prepared by: American Electric Power Service Corporation

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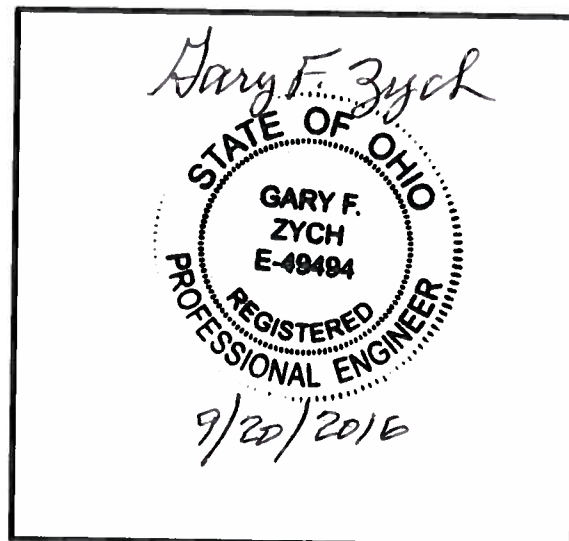
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POST CLOSURE PLAN
CCR 257.104(d)
GAVIN PLANT
STINGY RUN FLYASH POND

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I certify to the best of my knowledge, information, and belief that the information contained in this post closure plan meets the requirements of 40 CFR § 257.104

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1.0 OBJECTIVE

This report was prepared by AEP- Geotechnical Engineering Services (GES) section to fulfill requirements of CCR 257.104(d) for Post Closure Plans of CCR units.

2.0 DESCRIPTION OF THE CCR IMPOUNDMENT

The fly ash dam is located approximately 2.5 miles northwest of the plant on Stingy Run which is a tributary to Kyger Creek. Kyger Creek empties into the Ohio River 3.0 miles downstream of the power plant.

The dam was constructed to retain the fly ash produced by the burning of pulverized coal at the General James M. Gavin Power Plant. The fly ash dam is an earthfill zoned embankment 145 feet high. The crest of the dam varies but is a minimum elevation of 735 feet. Reservoir levels are regulated by the 100-foot high intake tower of the principal spillway.

Although originally constructed for settling fly ash, plant operations changed with the installation of scrubbers, so that the plant ceased all fly ash slurry discharges into the reservoir in 1994. Since that time, only direct precipitation, storm water runoff from upstream areas, and acid mine drainage from mined areas enter the reservoir.

AEP has started pond closure project in 2015 and plan to close the pond with a cover system combined with series of channel for water management. At the end of the project the entire flyash pond will be capped and covered with a cover system.

3.0 DESCRIPTION OF POST CLOSURE PLAN 257.104(d)(1)(i)

[A description of the monitoring and maintenance activities required in paragraph (b) of this section for the CCR unit, and the frequency at which these activities will be performed.]

3.1 SECTION 257.104(b)(1)

[Maintaining the integrity and effectiveness of the final cover system including making repairs to the final cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover.]

Inspections are performed for the items noted below. The inspection frequencies are scheduled to properly detect any issues so that repairs can be performed before significant harm occurs.

- **Embankment**: The entire waste embankment, including top surface and side-slopes, will be inspected for slides, settlement, subsidence, displacement, and cover condition (see below).
- **Soil Dike**: The soil dike will be inspected for slides, displacement, seepage, and erosion.
- **Cover**: The final cover will be inspected for erosion and for the condition of the vegetated cover and riprap, i.e., gaps in vegetation or presence of undesirable trees or brush. The integrity of the cover drainage system will also be inspected.
- **Final Cover Surface**: The Final Cover surface will be inspected for any ponding of water or flat areas. Due to the design contours required to achieve the final cap grade, special

attention will be focused to ensure that no settlement, subsidence, erosion, depressions or flat areas exist and that no water is allowed to pond above the cap system.

- **Surface Drainage System**: The surface drainage system, including channels, culverts, slope drains, etc., will be inspected for erosion, integrity of channel lining, ponding, and accumulated sediment.

Maintenance during the post-closure care period will be performed as discussed below, based upon the facility inspections described above.

- **Erosion Damage Repair**: Any areas exhibiting erosion will be repaired by replacing and compacting the material in-kind to design grade/specifications, and reseeded the area to the specifications. Applications of additional fertilizer, selective herbicides, rodent control measures, etc. will be implemented as necessary. In the selection of fertilizers and herbicides, ensure their use will not impact the groundwater negatively. Follow-up monitoring of the repaired area will be conducted to ascertain the integrity of the repair.
- **Settlement, Subsidence, Displacement**: Any areas at the closed site exhibiting evidence of settlement, subsidence, or displacement will be examined to determine the cause of the movement. If backfilling or placing additional fill material is needed to maintain the integrity of the closed structure, it will be performed in accordance with the site/closure specifications, including seeding. If the condition reoccurs or persists, or if the severity of the condition initially is judged to warrant it, a detailed investigation of the cause will be performed and remedial action will be performed. Similarly, any areas of the soil dike exhibiting sliding, displacement, or seepage will be investigated. Repairs will be made as necessary. Follow-up monitoring of the area will be performed to ascertain that the problem has been corrected.
- **Closure Cap Surface**: Any areas that show signs of ponding water or flat contours will be examined and rectified. Due to the design contours required to achieve the final cap grade, special attention will be focused on the cap surface to ensure that any areas that hold water are re-graded to promote drainage, re-seeded to promote vegetative growth, and maintained to ensure that the ponding of water does not persist.
- **Surface Water Drainage System**: The channel linings are designed to withstand the design velocities. Maintenance of the surface water drainage system will consist of removing sediment and/or undesirable vegetation from the surface water runoff control system (channels and culverts) as required. Eroded areas will be repaired by back-filling and reseeded according to the specifications. Damage to culverts will be repaired; structure replacement will be performed if needed.
- **Seepage**: The dike slopes will be inspected for any seepage. Seepage from the dike will be inspected, investigated, monitored, or repaired as deemed necessary.

The post closure care plan is included in Attachment A. This plan was submitted as part of the Permit-To-Install (PTI) for the Flyash Pond Closure and has been approved by the OEPA.

3.1 SECTION 257.104(b)(3)

[Maintaining the groundwater monitoring system and monitoring the groundwater in accordance with the requirements of §§257.90 through 257.98.]

The groundwater monitoring system will be inspected for the general integrity of the wells, well casings and well protective casings. Any damaged portions of the monitoring wells and/or their protective casings will be replaced in-kind.

Monitoring the groundwater will be in accordance with the groundwater monitoring plan for this facility and in accordance with the requirements of §§257.90 through 257.98.

4.0 POST-CLOSURE CONTACT 257.104 (d)(1)(ii)

[The name, address, telephone number and email address of the person or office to contact about the facility during the post-closure care period.]

The name, address, and telephone number of the person to contact about the Facility during the post-closure period shall be provided upon notice of closure.

5.0 POST-CLOSURE PLANNED USE 257.104 (d)(1)(iii)

[A description of the planned uses of the property during the post-closure period. Post-closure use of the property shall not disturb the integrity of the final cover, liner(s), or any other component of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements in this subpart...]

The post-closure use of the property will be undisturbed vacant land space. The only activities occurring on the closed CCR unit will be related to the Post-Closure care activities. All other activities will be prohibited.

Attachment A

Post-Closure Care Plan

Closure Plan Appendix I

PERMIT-TO-INSTALL APPLICATION REPORT STINGY RUN FLY ASH RESERVOIR CLOSURE

Submitted to

Ohio Environmental Protection Agency

Submitted and Owned by

Ohio Power Company
Cheshire, Ohio

Prepared by

American Electric Power Service Corporation
1 Riverside Plaza, Columbus Ohio 43215

and

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October 16, 2015

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1. INTRODUCTION

This Post-Closure Care Plan (PCCP), which is **Appendix I** of the Stingy Run Fly Ash Reservoir (FAR) Closure Plan, was prepared by Geosyntec Consultants (Geosyntec) for American Electric Power Service Corporation (AEP) to document the FAR post-closure care program.

The FAR is part of the General James M. Gavin Power Plant (Gavin Plant) complex, which generally includes the associated the Fly Ash Dam (FAD), the power plant, and the adjacent residual waste landfill (RWL). The approximately 300-acre FAR is comprised of three valleys, designated the North Valley, the Middle Valley, and the South Valley.

This plan was prepared to be similar to the Post-Closure Care Plan submitted with the adjacent Residual Waste Landfill permit to install application. Further, the PCCP meets the requirements of 40 Code of Federal Regulations Section 257.104, which became in effect on October 19, 2015.

FAR post-closure care will be conducted for a period of 30 years and consists of conducting groundwater monitoring and maintaining the integrity and effectiveness of the closure components.

This Post-Closure Care Plan includes: (i) the post-closure care objectives; (ii) the post-closure care period contacts; (iii) a summary of the FAR closure components; (iv) a summary of post-closure care activities; (v) a generalized post-closure care schedule; (vi) record keeping and reporting; and (vii) a brief discussion of post-closure use.

2. POST-CLOSURE CARE OBJECTIVES

The primary objectives of the FAR post-closure care program include the following:

- Maintaining the integrity and effectiveness of the final cover system;
- Maintaining the integrity and effectiveness of the final cover stormwater management, acid mine drainage (AMD) management, and subsurface drainage systems; and
- Maintaining the groundwater monitoring system and monitoring groundwater in accordance with the Groundwater Monitoring Plan.

The specific objectives for groundwater monitoring are included in the Groundwater Monitoring Plan, provided as **Appendix J** to the Closure Plan.

3. POST-CLOSURE CARE PERIOD CONTACTS

The contacts for the FAR post-closure care period are as follows:

American Electric Power/Ohio Power Company
Land, Environment and Remediation Services Manager
1 Riverside Plaza
Columbus, Ohio 43215
614.716.1266

or

American Electric Power/Ohio Power Company
Gavin Plant
Doug Workman
Landfill Operations Supervisor
7397 North State Route 7
Cheshire, Ohio 45620-0271
740.925.3000 ext. 3135
deworkman@aepes.com

4. SUMMARY OF CLOSURE COMPONENTS

The FAR closure will generally consist of: (i) installation of an AMD management system; (ii) removal of ponded water; (iii) construction of a final cover system and an associated final cover stormwater management system; (iv) modification/lowering of the FAD; and (v) post-closure care and groundwater monitoring. Closure will be completed in multiple construction events over a four- to six-year period as summarized in Section 5.4.1. The following is a summary description of the FAR closure components:

- ***Installation of an AMD management system.*** This system will be installed to treat surface water prior to entering the FAR construction area and the subsequent final cover area to maintain compliance with current NPDES discharge limits. The AMD drainage management system will be constructed prior to removal of the existing FAR pH adjustment unit. Back up temporary water treatment (pH adjustment) will be provided during construction.
- ***Draining of FAR ponded water.*** The cover will be designed to have no permanent ponded surface water behind the FAD post closure and the cover grading design and the outfall structure will be modified to maintain that condition.
- ***Construction of a final cover system and associated cover stormwater management system.*** The geomembrane cover option that was proposed in the previous PTI application has been selected as the main cover option. The following summarizes the elements of cover system:
 - ✓ Over the footprint of ash, the cover system will consist of a minimum 6-inch thick vegetative support soil layer over an 18-inch thick protective layer, a geotextile cushion, and a 30 mil polyvinyl chloride (PVC) or 40 mil linear low-density polyethylene (LLDPE) geomembrane. This cover system will be called the “Geomembrane Cover System”. In the areas outside of the ash boundary, the cover will consist of 6-inch thick vegetative support soil layer over contouring fill.
 - ✓ The cover system upstream of the FAD will include a subsurface drainage layer (SDL) to relieve hydrostatic uplift pressures and/or drain consolidation waters under the cover system adjacent to the FAD. SDL outlet pipes will be installed through the FAD and an internal drainage pond and conveyance channel to Stingy Run will be constructed on the downgradient side of the FAD.
 - ✓ Contouring fill will be placed to raise the grade from the top of fly ash to the bottom of the cover system or bottom of the SDL.

- ✓ The final cover grades will generally restore the valley surface water drainage patterns on top of the final cover.
- **Modification/lowering of the FAD.** The FAD will be lowered in two or more phases in accordance with additional ODNR requirements.

Post-closure care. Post closure care and groundwater monitoring will be conducted for a period of 30 years post closure.

5. POST-CLOSURE CARE ACTIVITIES

5.1 Groundwater Monitoring

Groundwater monitoring will be conducted in accordance with the Groundwater Monitoring Plan, provided as **Appendix J** to the Closure Plan. The FAR post-closure groundwater monitoring network consists of 21 groundwater monitoring wells screened within the upper aquifer system to evaluate the quality of groundwater passing beyond the waste boundary.

5.2 Inspection, Maintenance and Corrective Action

The following constructed FAR closure systems will be routinely inspected during the post-closure care period: (i) final cover system; (ii) final cover stormwater management system; (iii) acid mine drainage management system; (iv) subsurface drainage system internal drainage pond and associated piping, (v) concrete spillway and energy dissipater downstream of the FAD, (vi) FAD, and (vii) groundwater monitoring well network. Inspection, maintenance and repair of these systems will be performed throughout the post-closure care period to maintain their integrity and function. Site access control will also be assessed during the post-closure care period.

If corrective measures are required, they will conform as closely as possible to the QA/QC Plan and drawings. If a condition reoccurs or persists, an investigation will be conducted to determine if a more permanent corrective measure is warranted.

5.2.1 Final Cover System

The final cover system will be inspected for evidence of the following:

- Settlement of the cover surface;
- Stormwater ponding;
- Erosion of cover soils;
- Vegetative cover bare spots;
- Presence of invasive woody species;
- Damage caused by burrowing animals; and
- Any other conditions that compromise the integrity of the cover.

Cover system areas observed to be impacted during the inspection will be repaired by replacing the materials and restoring the final cover grade. Corrective measures may include soil augmentation, surface scarification, reseeding, spot herbicide application, or other corrective actions as appropriate to maintain the integrity and effectiveness of the cover.

Routine preventative maintenance will be evaluated based on the inspection findings. Routine maintenance may include mowing of the vegetative cover, removal of woody plants and seedlings, and reseedling. The need for, and frequency of, maintenance mowing will be evaluated based on the need to control woody plant growth and to maintain the health of the vegetation. If necessary, mowing will likely occur annually at a time when the final cover system is reasonably dry.

5.2.2 Stormwater Management System

The final cover stormwater management system will be inspected for evidence of the following:

- Erosion and gullyng;
- Depressions and ponding;
- Dislodgment of riprap channel lining;
- Flow blockage;
- Sediment accumulation;
- Vegetation buildup; and
- Other evidence of reduced effectiveness.

Routine maintenance of the final cover stormwater management system will likely include removing sediment accumulation and any other blockages, filling eroded or depressed areas, or repairing other disturbances. Areas that exhibit excessive erosion may require placement of erosion control material or enhancement of existing erosion control measures. Any woody plants or seedlings will be removed to prevent sediment buildup and damage caused by roots.

5.2.3 Acid Mine Drainage Management System

AMD treatment vertical flow ponds, bell siphon and sedimentation ponds will be inspected for evidence of erosion, flow blockage, sediment accumulation, vegetation buildup and other evidence of reduced effectiveness. The conveyance channels upstream of the vertical flow ponds will also be periodically visually monitored to identify signs of soil erosion that could adversely impact the effectiveness of the vertical flow ponds.

Routine maintenance of the vertical flow ponds may include removing flow blockages, removal of accumulated sediment and stabilizing eroded areas. The ponds will be maintained throughout closure until it is determined they are no longer needed.

5.2.4 Subsurface Drainage System

The subsurface drainage system discharge, internal drainage pond and conveyance piping and channels will be inspected, maintained and repaired similar to the final cover stormwater management system. It is anticipated that maintenance and corrective measures may involve addressing: erosion and gulying, depressions and ponding, sediment accumulation, vegetation buildup, blockage of flow, and other conditions that cause reduced effectiveness.

5.2.4 Fly Ash Dam and New Concrete-Lined Spillway

AEP operates an ongoing Dam Inspection and Maintenance Program (DIMP) for water and ash impounding embankments throughout the AEP System. The FAD is part of the DIMP. AEP will continue to inspect and maintain the FAD in accordance with the Operation, Maintenance and Inspection Manual for Stingy Fly Ash Dam and Bottom Ash Complex (Burgess & Niple, 2010) during the post-closure care period.

5.2.5 Groundwater Monitoring Well Network

Groundwater monitoring wells will be inspected during each groundwater monitoring event. The inspection will note the condition of the monitoring well ground surface seal and any indication of well or surrounding ground surface settlement; well components, including protective casings and wellhead covers, caps and locks; and well identification markings. Dedicated groundwater pumps and sample tubing, if used, will also be inspected during each monitoring event. Groundwater monitoring well maintenance/repair will be performed on an as-needed basis. Access to all wells will be maintained.

5.2.6 Access Control

The property will not be enclosed in a security fence. The property will have “NO TRESPASSING” signs posted. These signs will be inspected for damage and conditions that obscure the visibility of the signs. Maintenance/repair will be performed on an as-needed basis. In addition, evidence of unauthorized entry will be noted during the inspections.

6. POST-CLOSURE CARE SCHEDULE

Post-closure care activities will be conducted during the 30-year post-closure period according to the following schedule:

Post-Closure Care Activity	Frequency
Groundwater monitoring	semi-annually
Final cover system inspection	quarterly for two years and annually thereafter
Final cover stormwater management system inspection	quarterly for two years and annually thereafter
Acid mine drainage management system inspection	quarterly for two years and annually thereafter
Subsurface drainage system inspection	quarterly for two years and annually thereafter
Groundwater monitoring well network inspection	semi-annually (during each groundwater monitoring event)
FAD and new concrete-lined spillway	quarterly per Operation, Maintenance and Inspection Manual
Access control inspection	quarterly
Routine preventive maintenance	frequency to be established based on inspection findings
Corrective measures	as necessary, based on inspection findings

It is anticipated that the inspection frequency will be periodically re-evaluated.

7. RECORD KEEPING AND REPORTING

7.1 Inspection and Monitoring Reports

A written summary of each post-closure care inspection event will be prepared. It is anticipated that an inspection checklist will be developed and used in documenting inspection observations. The inspection report will generally include the following:

- Completed inspection checklist;
- Description and photographs depicting nature and extent of any issues identified;
- Preventive maintenance and corrective measures completed since previous summary report was submitted; and
- Estimated starting and completion date for required corrective measures to be taken based on inspection.

The inspection reports will be submitted to the OEPA within thirty (30) days of conducting the inspection and filed within the operating record at the Gavin Plant for at least five years following the occurrence of the inspection report. The State Director (OEPA) will also be notified once the an inspection report is placed in the operating record.

A groundwater monitoring and corrective action report will be completed and placed in the Gavin Plant operating record on an annual basis in accordance with the Groundwater Monitoring Plan, provided as **Appendix J** to the Closure Plan.

7.2 Plan Modification/Amendment

Modifications or amendments to this Post-Closure Care Plan must be completed and placed in the Plant's operating record at least sixty (60) days prior to the planned change and no later than 60 days after an unanticipated event that requires a modification or amendment to the Plan. The State Director (OEPA) will also be notified once the modification or amendment has been placed in the operating record. It is anticipated that the following conditions may trigger a need to modify this plan:

- Change in points of contact;
- Changes in post-closure inspection or maintenance activities;
- Change in inspection frequency;
- Change in site or surrounding land use; or
- Temporary suspension or permanent deletion of one or more post-closure care activities.

7.3 Deed Notation and Post-Closure Care Certification

Following closure, a notation will be made to the property deed to notify any potential purchaser that the property has been used as a FAR and that use is restricted. The State Director (OEPA) will be notified that the notation has been recorded and a copy has been placed in the operating record.

No later than 60 days following the completion of the post-closure care period, a written notification report will be prepared and submitted to the OEPA with supporting documentation that all post-closure care activities have been completed in accordance with the Post-Closure Care Plan. The notification report will be signed and sealed by a qualified professional engineer registered in Ohio. Upon completion, the notification report will be placed in the Plant's operating record and the State Director (OEPA) will be notified in accordance with 257.105(i)(13).

8. POST-CLOSURE USE

The cover will be a native habitat suitable for local wildlife. The post-closure use of the FAR is being evaluated by AEP. It is currently anticipated that the closed FAR may be utilized for casual recreational use such as hiking and hunting by permission of AEP.