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CCR Rule Post-Closure Plan

Dominion Energy Virginia
Curley Hollow Solid Waste Management Facility
To Support the Virginia City Hybrid Energy Center
Wise County, Virginia

GAI Project Number: C160523.00

October 2017

Updated February 2019



Prepared by: GAI Consultants
Murrysville Office
4200 Triangle Lane
Export, Pennsylvania 15632-1358

Prepared for: Dominion Energy Virginia
5000 Dominion Boulevard
Glen Allen, Virginia 23060

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Table of Contents

Certification/Statement of Professional Opinion	ii
Acronyms.....	iii
1.0 Post-Closure Plan	1
1.1 Post-Closure Period	1
1.2 Post-Closure Contact	1
1.3 Security	1
1.4 Inspection Plan	1
1.5 Maintenance Plan.....	3
1.6 Monitoring Plan.....	3
1.7 Post-Closure Uses	4
1.8 Training	4
1.9 Post-Closure Care Cost Estimate	4
1.10 Post-Closure Care Termination.....	4
2.0 References Used to Develop CCR Rule Post Closure Plan	5

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Certification/Statement of Professional Opinion

The Coal Combustion Residuals Closure and Post-Closure (Plan) for the Curley Hollow Solid Waste Management Facility was prepared by GAI Consultants (GAI). The Plan was based on certain information that, other than for information GAI originally prepared, GAI has relied on but not independently verified. This Certification/Statement of Professional Opinion is therefore limited to the information available to GAI at the time the Plan was written. On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the Commonwealth of Virginia that the Plan has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances, and at the same time and in the same locale. It is my professional opinion that the Plan meets the requirements of the United States Environmental Protection Agency's "Disposal of Coal Combustion Residuals From Electric Utilities," published in the Federal Register on April 17, 2015 with an effective date of October 19, 2015.

The use of the words "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not be interpreted or construed as a guarantee, warranty or legal opinion.

GAI Consultants


James F. Shields, P.E.
Assistant Manager, Engineering

Date 2/12/2019



Acronyms

AASHTO	American Association of State Highway and Transportation Officials
CCR	Coal Combustion Residuals
CCR Rule	"Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments" 40 CFR § 257 (2015)
CFR	Code of Federal Regulations
CHSWMF	Curley Hollow Solid Waste Management Facility
Dominion	Virginia Electric and Power Company d/b/a Dominion Energy Virginia
EPA	United States Environmental Protection Agency
FFP	Fossil Fuel Combustion Product
FML	Flexible Membrane Liner
GAI	GAI Consultants
GDN	Geocomposite Drainage Net
HDPE	High Density Polyethylene
HELP	Hydrologic Evaluation of Landfill Performance
LCS	Leachate Collection System
Plan	Post-Closure Plan
PVC	Poly Vinyl Chloride
VCHEC	Virginia City Hybrid Energy Center
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation

1.0 Post-Closure Plan

This Post-Closure Care Plan (Plan) was prepared on behalf of Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion) by GAI Consultants. This Plan was prepared to describe the post-closure operations and maintenance of the Curley Hollow Solid Waste Management Facility (CHSWMF) located at the Virginia City Hybrid Energy Center (VCHEC) in Wise County, Virginia..

This Post-Closure Care Plan is for the CHSWMF, which will be closed in place by constructing an engineered cover system over the facility as described in the Closure Plan. The information provided in this report follows the format guidelines for Solid Waste Disposal Facilities as described in Submission Instruction No. 6, provided by the Virginia (VA) Department of Environmental Quality (VDEQ) in 2012 and fulfills the requirements for the Code of Federal Regulations (CFR) Title 40 Part 257 Subpart D, "Disposal of Coal Combustion Residuals From Electric Utilities," published in the Federal Register on April 17, 2015 with an effective date of October 19, 2015 (CCR Rule), § 257.104.

1.1 Post-Closure Period

The VA Solid Waste Management Regulations (VSWMR) and CCR Rules require post-closure care for a 30-year period after completion of closure of CCR landfills. Post-closure care for CHSWMF will commence after closure is complete.

1.2 Post-Closure Contact

The post-closure contact will be:

Mr. Jason E. Williams
Director - Environmental
Dominion Energy Services
5000 Dominion Boulevard
Glen Allen, Virginia 23060
jason.e.williams@dominionenergy.com
(804) 273-2646

1.3 Security

Access to the closed solid waste management facility will be controlled by fencing, natural borders consisting of trees, and several manned security posts. No wastes will remain exposed upon completion of closure. Access to the closed site will not pose a health hazard.

1.4 Inspection Plan

Per the CCR Rule, post-closure care will be conducted for 30 years after the date of closure completion. Inspections during the post-closure care period will be performed for the items listed in Table 1, below. Inspections are scheduled so that any potential impacts that occur between inspections will be detected and repairs performed before conditions and impacts create a significant harm.

**Table 1.
 Inspection Schedule.**

System Type	Item	Frequency
Landfill	Erosion of closure cover	Quarterly or more frequently as necessary
	Deterioration of vegetative cover	
	Trash, litter	
	Damage to erosion control facilities	
	Settlement (by topographic survey)	Annually for first five years after closure
Groundwater monitoring system	Condition of monitoring wells	Semi-annually coinciding with sampling events
Leachate collection system	Leachate level and sedimentation buildup	Quarterly or more frequently as necessary
Leachate pond	Erosion of embankment	Quarterly or more frequently as necessary
	Deterioration of protective cover/liner	
	Trash, litter	
	Damage to dewatering and monitoring equipment	
	Sediment accumulation	
Stormwater and leachate conveyance channels	Erosion of channel soils	Quarterly or more frequently as necessary
	Deterioration of channel lining	
	Trash, litter	
	Sediment accumulation	

- **Security Control Devices:** The serviceability of the locking gate will be inspected during regular inspections.
- **Embankment:** The entire waste embankment, including top surface and side slopes, will be inspected for slides, settlement, subsidence, and displacement, and cover condition (see below).
- **Pond Dikes:** The soil dikes of all ponds 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, i.e., gaps in vegetation or presence of undesirable trees or brush. The integrity of the cover drainage system will also be inspected.
- **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.
- **Leachate Collection System (LCS):** The discharge pipes of the LCS at the leachate collection pond will be inspected for clogging or damage. Other exposed portions of the LCS including cleanouts will be inspected for damage. Similarly, the leachate collection pond will be inspected for general damage to the pond and perimeter berms, and for accumulation of sediment in the pond.
- **Groundwater Monitoring System:** The groundwater monitoring system will be inspected for the general integrity of the wells, well casings and protective casings.
- **Benchmark:** The benchmark will be inspected for general damage.

1.5 Maintenance Plan

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

- **Security Control Devices:** Any portions of the locking gate(s) which might be damaged will be repaired or replaced in-kind.
- **Erosion Damage Repair:** Any areas exhibiting erosion will be repaired by replacing and compacting the material in-kind to design grade/specifications, and reseeding the area to the specifications. Application of additional fertilizer, selective herbicides, and rodent control measures will be implemented as necessary. Follow-up monitoring of the repaired area will be conducted.
- **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. Any damage to the cover system will be repaired in-kind. 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. Follow-up monitoring of the area will be performed.
- **Surface Water Drainage System:** The channel linings are designed to withstand erosive 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). Eroded areas will be repaired by back-filling and reseeding according to the specifications. Damage to culverts or structures will be repaired or replaced if needed.
- **Leachate Collection System:** Maintenance of the leachate collection system will consist of repairing or replacing in-kind any damaged or eroded portions of the system and pond; cleaning pipes; and removing sediment from the pond.
- **Groundwater Monitoring Wells:** Any damaged portions of the monitoring wells or their protective casings will be replaced in-kind. The protective casings are steel casings with locking covers to minimize tampering or damage due to vandalism.
- **Mowing:** The cover system will be mowed a minimum of once per year or as necessary to deter the growth of woody vegetation, deter habitation by vectors, and to allow inspection and access to the landfill cap features and landfill related structures (e.g., wells and stormwater channels).

1.6 Monitoring Plan

The post-closure monitoring plan operations are described below:

- Groundwater monitoring is described in the Station's Groundwater Monitoring and Sampling and Analysis Plan. Groundwater monitoring throughout the post-closure period shall be performed semi-annually and comply with requirements outlined in 40 CFR 257.90-98 and in the Station's *Groundwater Monitoring Plan*.
- Leachate collection and disposal as described in the Part B Permit documentation.

- Gas collection and venting: a plan to monitor gas collection and venting is not appropriate for the operations at CHSWMF as there is negligible potential for gases formed at FFP landfills.
- Dewatering: dewatering of the subsurface of the landfill area is accomplished via the installation of spring drains (underdrains) as the site was developed. The underdrain installation is in accordance with the technical specifications and drawings in the Part B Permit documentation. Monitoring of the underdrain system will be consistent with the Station's Underdrain Monitoring Plan.

1.7 Post-Closure Uses

There are no current plans to develop the site, which will remain closed to the general public. The anticipated post-closure use is open space. The site will be revegetated to create an herbaceous rangeland habitat.

1.8 Training

Personnel responsible for conduction maintenance, inspection, and monitoring tasks will be competent individuals trained to perform their assigned tasks. Updated training will be performed as necessary.

1.9 Post-Closure Care Cost Estimate

The estimated annual cost for post-closure care is \$367,000 in 2016 U.S. dollars.

1.10 Post-Closure Care Termination

The VSWMR and CCR Rule requires a post-closure care period of at least 30 years. At the end of the 30-year period, Dominion may submit a request for termination of post-closure care activities. VDEQ may extend the post-closure care in accordance with the provisions of the VSWMR. Upon approved termination of post-closure care activities, the proper notifications will be made in accordance with applicable parts of the VSWMR and CCR Rule.

2.0 References Used to Develop CCR Rule Post Closure Plan

GAI Consultants. *Module X - Groundwater Monitoring and Sampling and Analysis Plan, Part B Permit Application*, December 2014.

GAI Consultants. *Module XII - Closure Plan, Part B Permit Application*, September 2008.

GAI Consultants. *Module II - Operations Plan, Part B Permit Application*, February 2009.

GAI Consultants. *Construction Stormwater Pollution Prevention and Erosion and Sediment Control Plan*, April 2016.

3.0 Appendix A: Post Closure Inspection Form



QUARTERLY CLOSED CCR LANDFILL/POND INSPECTION CHECKLIST

Site Name		Inspected By		
Date of Inspection		Rain in Last 2-3 days? Circle One	Yes	No

Conditions Present	No Action Required	Investigate	Request Repair	Prompt Action Required	Comments (Include information on corrective actions/routine maintenance procedures that will be implemented to address the condition and any status updates)
	Place <u>X</u> in Box				
Inactive/Closed Area					
Animal Burrows					
Areas of Erosion					
Erosion control features					
Drains and drain systems					
Slide, slough, bulges, seeps					
Vegetative cover damage					
Vegetative mowing needed					
Leachate and Stormwater Pond Area					
Animal Burrows					
Areas of Erosion					
Leachate System Operation					
Visible liner damage					
Outlet operation					
Vegetative mowing or removal needed					

Conditions Present	No Action Required	Investigate	Request Repair	Prompt Action Required	Comments (Include information on corrective actions/routine maintenance procedures that will be implemented to address the condition and any status updates)
	Place <u>X</u> in Box				
Other Areas					
Groundwater wells					
Evidence of spills					
Security/Access					
Trash and Debris					

Previous Conditions for "Request Repair" or "Prompt Action Required" items have been addressed and the condition has returned to "No Action Required"? If no, provide date for completion in Comments box below.	Yes	No

Definitions

No Action Required	Observation indicates that landfill is operating in a normal safe condition protective of the environment. No further action is necessary.
Investigate	Observation indicates a condition that has changed from a "no action required" condition and requires investigation to determine whether condition is unsafe or not protective of the environment. Inspector will notify Operations, Engineering, or Environmental Services to investigate and/or evaluate condition further.
Request Repair	Observation indicates a condition that requires a near term repair to ensure that condition does not worsen and become a serious concern. Inspector will submit a repair ticket through their internal work order system or make contact with responsible party for repair.
Prompt Action Required	Observation indicates a condition that must be addressed immediately to ensure the safety of the surface impoundment, related facilities, or public or protection of the environment. Inspector will contact responsible site and/or corporate personnel to initiate an immediate evaluation and corrective measure, as necessary.

General Comments [Document any unusual events or conditions]:

Note: Completed inspection forms must be saved into the facility operating record and Environmental Documentum.