



Closure Plan
for CCR Surface Impoundments
Clover Power Station
Clover, Virginia

November 2016

Prepared For
Virginia Electric and Power Company

A handwritten signature in blue ink, appearing to read "R. Kent Nilsson", written over a horizontal line.

R. Kent Nilsson, P.E.
Senior Engineer

A handwritten signature in blue ink, appearing to read "Nakia W. Addison", written over a horizontal line.

Nakia W. Addison
Project Manager

TRC Environmental Corporation | Virginia Electric and Power Company
Closure Plan for CCR Surface Impoundments
Clover Power Station, Clover, Virginia
Final

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Section 1

Introduction

This Closure Plan (Plan) was prepared on behalf of Virginia Electric and Power Company d/b/a Dominion Virginia Power (Dominion) by TRC Environmental Corporation (TRC). This Plan describes the closure process for two Coal Combustion Residual (CCR) Surface Impoundments (North and South Sludge Sedimentation Basins; basins) located at Clover Power Station¹ (Station), which are being retrofitted in accordance with the United States Environmental Protection Agency's (USEPA) Coal Combustion Residuals (CCR) rule. These CCR basins are also subject to the Virginia Solid Waste Management Regulations (VSWMR), and this Plan also meets the requirements of those regulations.

1.1 Regulatory Background

The Clover Power Station currently operates two Sludge Sedimentation Basins (North and South Basins; basins). Those basins will be retrofitted in 2017 and 2018 and become lined CCR surface impoundments, subject to EPA's CCR rule and the VSWMR. In accordance with those regulations, a closure plan for the retrofitted CCR surface impoundments is required. This Closure Plan has been prepared in accordance with the VSWMR and Virginia Department of Environmental Quality (VDEQ) Submission Instruction No. 6 as well as 40 CFR 257.102.

1.2 Site Information

The Station is located on the Staunton River in Halifax County, Virginia near the town of Clover at approximately latitude 36°52'11.79"N, longitude 78°42'6.47"W. The Station has two coal-fired units that produce CCR, including flue gas desulfurization (FGD) sludge. There are currently two basins located at the Station, which cover a total area of approximately 4 acres as shown on the Closure Design Plan in Appendix A. The basins are located on the eastern side of the Station and receive plant wastewaters and wet FGD sludge when there is an upset in the FGD process and are therefore considered existing CCR surface impoundments. The basins typically operate in sequence where one basin is actively receiving materials while the other is offline. Water stored in the basins is reused in the Station scrubbers and is not discharged. As a basin becomes full, it is taken offline, dewatered into the adjacent basin, and the solids are removed and transported to the Station's landfill. Each basin has a design maximum depth of approximately 9 feet. A gravel-surfaced road extends along the top of the berm along the east, south, and north sides of the impoundments, with downward-sloping ramps on the east side provide heavy equipment access to each basin interior for removal of accumulated solids.

¹ The Clover Power Station and associated landfills are jointly and equally owned by Dominion Virginia Power and Old Dominion Electric Cooperative (ODEC).

As part of the retrofitting process, the basins will be lined with a composite liner system consisting of a high-density polyethylene (HDPE) geomembrane overlying a 24-inch thick layer of compacted clay. The liner system will be protected from operational dredging and cleaning by a layer of concrete on the bottom and interior slopes.

The basins also include appurtenances located on the berm separating the North and South impoundments, such as a flow splitter box and a concrete pump structure with their associated electrical feed, controls, and piping.

The combined volume capacity of the North and South is approximately 38,000 cubic yards.

1.3 Closure Description

The retrofitted North and South basins will be closed through removal of CCR in accordance with 40 CFR 257.102(c) of the CCR Rule and will comply with applicable provisions of 9VAC20-81-370(A)(1). To accomplish this, CCR will be mechanically dredged or excavated from the North and South impoundments such that no residual materials remain visible and will be disposed at Dominion's on-site permitted landfill (Solid Waste Permit No. 556). Following completion of CCR material dredging and removal operations, the impoundments' liner system components and liner protection materials (consisting of concrete, geotextile, HDPE geomembrane, and clay) will be demolished and disposed at an off-site permitted disposal facility. Additionally, subsurface soils of the basins' footprint will be over-excavated by approximately 6 inches. Finally, all structures and equipment (*i.e.*, pumps, vaults, piping, etc.) will be decommissioned and dispositioned at an off-site permitted disposal facility. After closure, the areas will be backfilled with earthen fill to an elevation compatible with the adjacent existing grades and subsequently stabilized with natural vegetation. The final grading for the filled basins following closure by CCR removal is shown on the Closure Design Plans provided in Appendix A.

1.4 Closure Timeframes

The retrofit of the basins will be completed in 2018. Upon retrofit completion, the basins will receive CCR in accordance with the facility's standard operating procedures. CCR will periodically be excavated from the impoundments and placed in the on-site landfill. It is anticipated that the basins will continue to operate throughout the life of the Station. Closure will begin within 30 days of receiving the known final receipt of waste or removing the known final volume of CCR from the unit for beneficial reuse and is anticipated to be completed within 6 months of commencing. A closure schedule outlining the timeframes for major closure activities from the date the retrofitted basins stop receiving CCR materials to closure completion is provided in Appendix C.

It is anticipated that closure activities will be completed per the schedule provided in Appendix C and no later than 5 years after commencing closure activities pursuant to 40 CFR 257.102(f)(1)(ii).

Section 2

Closure of Retrofitted Surface Impoundments

The retrofitted basins will be closed through removal of CCR in accordance with 40 CFR 257.102(c) and 9VAC20-81-370(A)(1). The remainder of the document outlines this process. This Closure Plan will be revised and submitted to VDEQ for approval in the event of a change to the closure process.

2.1 Removal

The retrofitted basins will be mechanically dredged and/or excavated to remove CCR materials. This material will be sufficiently dried prior to transporting to Dominion's on-site permitted landfill (Solid Waste Permit No. 556) for disposal. After removal of the CCRs from the basins, the liner and liner protection system will be demolished and these materials will be disposed at an off-site permitted disposal facility.

2.2 Decontamination

The basin liner materials, liner protection materials, and structures will be removed and disposed at an off-site permitted disposal facility as part of the closure operations. In addition, the subsurface will be over-excavated by approximately 6 inches and disposed in the on-site landfill. Equipment used in the removal of CCR materials and impoundment structures will be properly decontaminated of CCR following completion of closure activities and dispositioned off-site in accordance with Federal and State waste regulations.

2.3 Sampling and Testing Program

Following completion of CCR removal and demolition and removal of liner materials, liner protection materials, and associated structures, subsurface soils will be over-excavated by approximately 6 inches. Closure by removal will be conducted in accordance with the requirements of 40 CFR 257.102(c) and 9VAC20-81-370(A)(1) and certified by a registered Professional Engineer.

In addition, groundwater monitoring will occur in accordance with 40 CFR 257.95(h) and follow the Station's Groundwater Monitoring Program. After demonstrating compliance with the groundwater monitoring criteria above, closure through removal will be considered complete.

Section 3

Closure Implementation

3.1 Notification

In accordance with VSWMR Closure Requirements (9 VAC 20-81-360.2.d), Dominion will notify VDEQ of the intent to close at least 180 days prior to beginning closure activities.

In accordance with the CCR Rule (40 CFR 257.102(g)) and 9VAC20-81-160, Dominion will place an Intent to Initiate Closure notice to the operating record prior to initiating closure. A Notification of Closure Completion will be added to the operating record within 30 days of completion of closure activities in accordance with 40 CFR 257.102(h). These notifications will also be sent to the VDEQ and posted to Dominion's publicly accessible website.

3.2 Certification

Within 30 days of completion of closure activities, a professional engineer will certify that the closure was completed in accordance with the requirements of the VSWMR and this Closure Plan. This certification will be submitted to the VDEQ, incorporated in the operating record, and posted to the publicly accessible website. Example certification language is as follows:

"I certify that closure has been completed in accordance with the Closure Plan dated [date on the Closure Plan] for permit number [permit number] issued to Dominion, with the exception of the following discrepancies: [list discrepancies, if any]."

3.3 Post-Closure Use

Following closure of the retrofitted basins, the area will continue to be used as needed for operational purposes (*i.e.*, equipment laydown area, new facility buildings, etc.) until the Station is closed or the property is sold.

Section 4

Closure Cost Estimate

4.1 Closure Cost Estimate

The cost estimate for closing the North and South Basins as described in this Plan is approximately \$8.5M. A detailed closure cost estimate is provided in Appendix B.

4.2 Financial Assurance

As indicated in the Solid Waste Management Permit application for the CCR impoundments, financial assurance will be provided. The closure cost estimate and related Financial Assurance documentation will be updated annually in accordance with the Virginia Financial Assurance Regulations for Solid Waste Management Facilities.

Section 5 Certification

I, the undersigned Virginia Professional Engineer, hereby certify that I am familiar with the technical requirements of 40 CFR 257.102. I also certify that it is my professional opinion that, to the best of my knowledge, information, and belief, that the activities outlined in this closure plan are in accordance with current good and accepted engineering practice(s) and standard(s) appropriate to the nature of the project and the technical requirements of 40 CFR 257.102(c).

For the purpose of this document, "certify" and "certification" shall be interpreted and construed to be a "statement of professional opinion". The certification is understood and intended to be an expression of my professional opinion as a Virginia Licensed Professional Engineer, based upon knowledge, information, and belief. The statement(s) of professional opinion are not and shall not be interpreted or construed to be a guarantee or a warranty of the closure activities.

R. Kent Nilsson

026477

Printed Name of Professional Engineer

Commonwealth of Virginia License Number



November 18, 2016

Signature of Professional Engineer

Date



Appendix A

Closure Design Plan

Appendix B

Closure Cost Estimate



Clover Power Station
Sludge Sedimentation Basins
Closure Cost Estimate

NORTH BASIN	
Engineering and Permitting	\$100,000
Pre-Mobilization Planning	\$25,000
Mobilization, Bonds, Insurance	\$300,000
Site Preparation	\$95,000
CCR Removal (19,000 cy)	\$665,000
CCR Stabilization/T&D (19,000 cy)	\$513,000
Demolish Existing Cover and Liner	\$700,000
Existing Cover and Liner T&D	\$450,000
Subbase Preparation	\$44,000
Place and Compact Fill	\$552,000
Seed and Mulch	\$4,000
Demobilization	\$200,000
North Basin Total:	\$3,648,000
SOUTH BASIN	
Engineering and Permitting	\$100,000
Pre-Mobilization Planning	\$25,000
Mobilization, Bonds, Insurance	\$300,000
Site Preparation	\$95,000
CCR Removal (19,000 cy)	\$665,000
CCR Stabilization/T&D (19,000 cy)	\$513,000
Demolish Existing Cover and Liner	\$700,000
Existing Cover and Liner T&D	\$450,000
Subbase Preparation	\$44,000
Place and Compact Fill	\$552,000
Seed and Mulch	\$4,000
Demobilization	\$200,000
South Basin Total:	\$3,648,000
YARD PIPING	
Remove 8" Carbon Steel Pipe	\$30,000
Remove 8" Welded Fittings	\$6,000
Yard Piping Total:	\$36,000
PUMP STATION	
Demolition	\$30,000
Demolition T&D	\$15,000
Pump Station Total:	\$45,000
FLOW SPLIT BOX	
Demolition	\$5,000
Demolition T&D	\$3,000
Splitter Box Total:	\$8,000
PROJECT MANAGEMENT	
Project Manager	\$540,000
Project Administration	\$216,000
Construction Manager	\$432,000
Project Management Total:	\$1,188,000
PROJECT TOTAL:	\$8,573,000



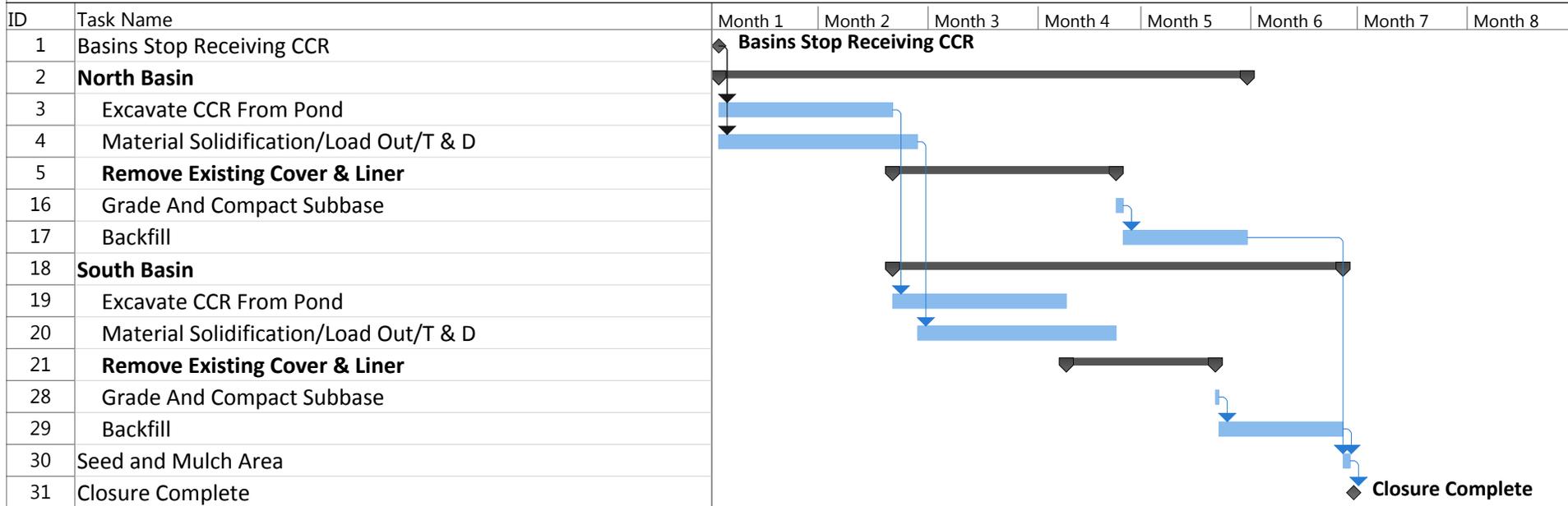
Solid Waste Disposal Facility Cost Estimate Form

Facility Name: Dominion Clover Power Station		Permit No. SWP 622	
Address: 4091 Clover Rd., State Rd. 92			
City: Clover	State: VA	Zip: 24534	
FA Holder: Dominion Resources Services, Inc.			
Estimate Prepared By: Nakia Addison - TRC Environmental			
Indicate the plan versions for which this cost estimate was prepared, identifying the following information for each plan:			
Closure Plan		Post-Closure Care Plan	
Title:	Closure Plan for CCR Surface Impoundments	Title:	Post-Closure Care Plan for CCR Surface Impoundments
Plan Date:	November 2016	Approved:	
Consultant:	TRC Environmental Corporation	Plan Date:	November 2016
		Approved:	
Consultant:	TRC Environmental Corporation	Consultant:	TRC Environmental
Corrective Action Plan		Corrective Action Monitoring Plan	
Title:		Title:	
Plan Date:		Approved:	
Consultant:		Plan Date:	
		Approved:	
Consultant:		Consultant:	
Cost Estimate Summary			
Total Closure Cost:	\$8,573,000		
Total Post-Closure Cost:	\$2,610,000		
Total Corrective Action Cost:	\$		
TOTAL:	\$11,183,000		
References			
Please indicate references used to develop this cost estimate: Clover Power Station Sludge Pond Relining Conceptual Construction Cost Estimate dated May 15, 2015.			
Certification by Preparer:			
This is to certify that the cost estimates pertaining to the engineering features and monitoring requirements of this solid waste management facility have been prepared by me and are representative of the design specified in the facility's approved Closure, Post-Closure and Corrective Action Plans. The estimate is based on the cost of hiring a third party and does not incorporate any salvage value that may be realized by the sale of wastes, facility structures, or equipment, land or other facility assets at the time of partial or final closure. In my professional judgment, the cost estimates are a true, correct, and complete representation of the financial liabilities for closure, post-closure care, and corrective action of the facility and comply with the requirements of 9 VAC 20-70 and all other DEQ rules and statutes of the Commonwealth of Virginia.			
Name:	Nakia Addison	Signature:	<i>Nakia Addison</i>
Title:	Project Manager	Date:	11/18/16
Acknowledgement by Owner/Operator :			
Name:	David A. Craymer	Signature:	<i>David A. Craymer</i>
Title:	V.P. Power Generation	Date:	12/1/16

Appendix C

Closure Schedule

Clover Closure Schedule



Closure Schedule

Task



Milestone ◆

Summary

