DOMINION ENERGY

PERIODIC STRUCTURAL STABILITY ASSESSMENT

POSSUM POINT POWER STATION INACTIVE CCR SURFACE IMPOUNDMENT: POND E

APRIL 2023

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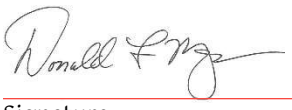
1 CERTIFICATION

This periodic Structural Stability Assessment for the Possum Point Power Station's Pond E was prepared by WSP USA Inc. (WSP; formerly d/b/a Golder Associates USA Inc.). The document and Certification/Statement of Professional Opinion are based on and limited to information that WSP has relied on from Dominion Energy and others, but not independently verified, as well as work products previously produced by Golder.

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 this document 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, at the same time, and in the same locale. It is my professional opinion that the document was prepared consistent with the requirements in 40 CFR §257.73(d) of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015, with an effective date of October 19, 2015 [40 CFR §257.73(d)], as well as with the requirements in 40 CFR §257.100 resulting from the EPA's "Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities: Extension of Compliance Deadlines for Certain Inactive Surface Impoundments; Response to Partial Vacatur" published in the Federal Register on August 5, 2016, with an effective date of October 4, 2016 (40 CFR §257.100).

The use of the word "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.

Donald Mayer, PE	Vice President
Print Name	Title
	4/12/2023
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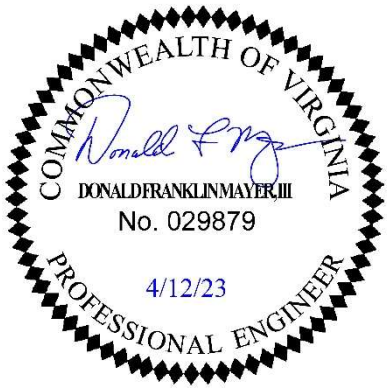

2 INTRODUCTION

This periodic Structural Stability Assessment (Assessment) was prepared for the Possum Point Power Station's (Station) existing Coal Combustion Residuals (CCR) inactive surface impoundment known as Pond E. This periodic Structural Stability Assessment was prepared in accordance with 40 CFR Part §257, Subpart D and is consistent with the requirements of 40 CFR §257.73(d).

The Station, owned and operated by Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion Energy), is located in Prince William County, Virginia, at 19000 Possum Point Road, east of I-95 and bounded to the south and east by Quantico Creek and the Potomac River. The Station includes an existing, inactive CCR surface impoundment, Pond E, as defined by the Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule and Direct Final Rule (40 CFR §257; the CCR Rule). Pond E has historically been regulated as a dam by the Virginia Department of Conservation and Recreation (DCR) with Inventory Number 153021 (DCR Dam Permit).

Dominion Energy performed closure by removal activities in Pond E by removing the stored CCR and over-excavating soil pursuant to its solid waste permit closure plan (SWP 617) and subsequently breaching the impoundment structure. The Virginia Department of Environmental Quality (DEQ) verified removal activities in August 2019. The Pond remains subject to the CCR Rule requirements due to observed groundwater impacts that prevent full closure of the unit under the rule even though the Pond no longer impounds CCR materials.

3 PURPOSE

This periodic Assessment is prepared pursuant to the requirements in the CCR Rule, 40 CFR §257.73(d)(1). The initial Structural Stability Assessment was completed in April 2018 and is required to be updated every five (5) years pursuant to 40 CFR §257.73(f)(3). Pond E remains subject to the CCR Rule requirements, including this periodic structural stability assessment update, even though all CCR materials have been removed.

4 STRUCTURAL STABILITY ASSESSMENT REQUIREMENTS

In accordance with 40 CFR §257.73(d)(1), the owner or operator of a CCR surface impoundment must conduct periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR surface impoundment is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The assessment must, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with:

- Stable foundations and abutments;
- Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown;
- Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit;
- Vegetated slopes of dikes and surrounding areas not to exceed a height of six inches above the slope of the dike, except for slopes which have an alternate form or forms of slope protection;
- A single spillway or a combination of spillways that is designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the 100-year flood;
- All spillways must be either of non-erodible construction and designed to carry sustained flows or earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected;
- Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure; and
- For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes that maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

5 STRUCTURAL STABILITY ASSESSMENT

5.1 FOUNDATION AND ABUTMENTS

The Station lies in a geologically stable area with no active (Holocene) faults, karst (limestone, dolomite, or marble) potential, or other geologic conditions of concern. Pond E was constructed as an embankment across a drainage feature in the rising natural hillside. The natural soils in the hillside area are typical alluvial Coastal Plain soils consisting of sandy loams developed from feldspathic sediments in the Coastal Plain terraces and stratified marine sediments. The predominant soil groups are the Dumfries series and Quantico series, which are well-draining. Prior to site improvements, parts of the site were marshy areas as indicated on historical maps from the United States Geological Service (USGS). Construction drawings for the embankments call for the removal of soft soils under the planned embankments and replacement with suitable soil materials.

Previous subsurface site investigations show the site is underlain by typical alluvial fine-grained and coarse-grained Coastal Plain soils, consistent with the site's proximity to Quantico Creek and the Potomac River. Material properties for the various strata were interpreted based on subsurface data and site reconnaissance taken from previous Dominion Energy investigations, analyses, and reports included in Dominion Energy's 1985 "Ash Pond 'E' Boring Logs and Laboratory Test Data" performed by the Law Engineering Testing Company. Additional information on the geotechnical exploration and sources of material properties are presented in the initial Safety Factor Assessment for Pond E (Golder, 2018).

WSP's assessment of embankment stability in the Periodic Safety Factor Assessment (WSP, 2023b) show that the Pond E meets the minimum factor of safety requirements in the CCR Rule §257.73(e)(1).

Additionally, Pond E has been routinely inspected and monitored by Station and Dominion Energy personnel in accordance with the requirements in the DCR Dam Permit. Areas of concern are evaluated by professional engineers with corrective actions implemented and documented.

5.2 SLOPE PROTECTION

The Pond E dike was built with exterior slopes of 2 horizontal to 1 vertical (2H:1V) and interior slopes of 1.5H:1V. The exterior slope has a good stand of existing, well-maintained grass to protect from erosion. Interior slopes have been excavated to remove CCR materials and were backfilled with clean soil fill to reestablish a minimum 2:1 slope and enhance the existing calculated factor of safety prior to final closure. The vegetation on the dike is maintained to prevent brush, trees, clumping of weeds, etc. that would concentrate flow and lead to the development of erosion rills. The interior and exterior slopes are maintained and protected against surface erosion by regular inspections and maintenance, as required, to prevent small erosion areas from developing into larger problem areas.

Dominion Energy performs annual inspections in accordance with the requirements of the DCR Dam Permit with the most recent inspections on April 27, 2021 (Virginia Electric and Power Company, 2021) and April 20, 2022 (Virginia Electric and Power Company, 2022). Dominion Energy evaluates the vegetation on the slopes of the impoundment embankment as part of the annual inspections. Current operations at Pond E call for grass to be

mowed 2-3 times per year to control vegetation height. Additionally, in accordance with 40 CFR Section §257.83, annual inspections are performed by a qualified professional engineer with the most recent inspection on June 17, 2022 (WSP, 2022).

5.3 COMPACTION OF DIKES

In addition to a review of previous exploratory work by others, a round of Cone Penetrometer Testing (CPT) was conducted in late 2017 by Golder. A total of 7 soundings were made through and near the Pond E dike to assess the material strength in the dike and materials below the dike. Soundings were made to depths up to 101 feet below ground surface (bgs). The dike fill soil contains variations of fine-grained and coarse-grained soils and exhibit sufficient compaction and density to withstand the anticipated range of loading conditions. Information pertaining to the 2017 investigation, including the CPT sounding logs, are included as part of the initial Safety Factor Assessment for Pond E (Golder, 2018).

No visible indications of weakened embankment (e.g., tension cracks, elevated groundwater, groundwater seeps, sinkholes, etc.) have been observed at Pond E over the past five years during routine and annual inspections. Slope stability analyses presented in the Safety Factor Assessment (WSP, 2023b) present the embankment to be stable.

5.4 VEGETATED SLOPES

As required by §257.73(d)(1)(iv), vegetation on slopes and surrounding areas are not to exceed a height of six inches above the slope of the dike. Current operations at Pond E call for grass to be mowed 2-3 times per year to control vegetation height. The vegetated slopes are operated and maintained to be stable and to provide for visual observation of any instability. The 2021 and 2022 annual DCR inspections (Virginia Electric and Power Company, 2021; Virginia Electric and Power Company, 2022) noted that the upstream and downstream slopes of the embankment have been mowed.

5.5 SPILLWAYS

Pond E's previous principal spillway consisting of a concrete riser structure and corrugated metal pipe has been removed. Currently, Pond E has an earthen emergency spillway in the western embankment where a section of the embankment has been lowered to grade.

As shown in the Periodic Inflow Design Flood Control System Plan for Pond E, the pond structure has adequate capacity to store the flow from the design storm event. The analysis of spillway capacity is included in Appendix A of the Periodic Inflow Design Flood Control System Plan for Pond E (WSP, 2023a).

5.6 HYDRAULIC STRUCTURES

Currently, there are no known structures passing through or underlying the base of the pond.

5.7 ADJACENT WATER BODIES

Impacts of rapid drawdown of slopes as described in 40 CFR §257.73(d)(vii) of the CCR Rule were also considered as part of the stability analysis. The mapped (FIRM zone AE) 100-year flood level in the Quantico Creek is elevation 8 feet above mean sea level (ft-amsl). The toe areas of the downstream slopes are generally at elevation 6 ft-amsl or higher; thus, the dikes around Pond E are not expected to be significantly impacted by rapid drawdown. Therefore, additional rapid drawdown analyses are not necessary.

6 CORRECTIVE MEASURES

No structural stability deficiencies were identified, so no corrective measures are required.

7 CONCLUSIONS

Pond E is subject to a periodic structural stability assessment update (due every 5 years from the original assessment performed in April 2018). The Pond remains subject to the CCR Rule requirements due to observed groundwater impacts that prevent full closure of the unit under the rule even though the Pond no longer impounds CCR materials.

Based on known site conditions, review of available information, and the current analyses performed for the Pond E embankment, the Pond E surface impoundment design, construction, operations, and maintenance procedures are consistent with good engineering practices for post-closure activity usage of the unit and meets the requirements of 40 CFR 257.73(d).

REFERENCES

- Golder Associates. Initial Safety Factor Assessment, Possum Point Power Station CCR Surface Impoundment: Pond E. April 2018.
- Law Engineering Testing Company. Ash Pond 'E' Boring Logs and Laboratory Test Data. 1985.
- Virginia DCR Dam Permit, Inventory No. 153021.
- Virginia Electric and Power Company. Annual Inspection Report for Virginia Regulated Impounding Structures, Possum Point Power Station Pond E Dam. April 2021.
- Virginia Electric and Power Company. Annual Inspection Report for Virginia Regulated Impounding Structures, Possum Point Power Station Pond E Dam. April 2022.
- WSP USA Inc. Annual Inspection Report for Existing CCR Surface Impoundment, Possum Point Ash Pond E Dam. July 2022.
- WSP USA Inc. Periodic Inflow Design Flood Control System Plan, Possum Point Power Station Inactive CCR Surface Impoundment: Pond E. April 2023a.
- WSP USA Inc. Periodic Safety Factor Assessment, Possum Point Power Station Inactive CCR Surface Impoundment: Pond E. April 2023b.