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May 8, 2026
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Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

**RE: Initial Structural Stability Assessment
Ash Pond Complex
EPA Legacy Coal Combustion Residuals (CCR) Rule
TVA Widows Creek Fossil Plant
Stevenson, Alabama**

1.0 PURPOSE

This letter documents Stantec's Certification of the initial structural stability assessment for the TVA Widows Creek Fossil Plant (WCF) Ash Pond Complex (APC). Based on this assessment, the APC is in compliance with the structural stability requirements in the United States Environmental Protection Agency (EPA) – Hazardous and Solid Waste Management Systems; Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments – Final Rule (Legacy CCR Rule).

2.0 INITIAL STRUCTURAL STABILITY ASSESSMENT

As described in 40 CFR 257.73(d), documentation is required on how the APC has been designed, constructed, operated, and maintained according to the structural stability requirements listed in the section. The combined capacity of all spillways must also be designed, constructed, operated, and maintained to adequately manage flow from the 100-year storm event based upon a hazard potential classification of low.

3.0 SUMMARY OF FINDINGS

The attached report presents the initial structural stability assessment of the APC. The results show that the impoundment meets the structural stability requirements set forth in 40 CFR 257.73(D)(1)-(2)

**Re: Initial Structural Stability Assessment
Ash Pond Complex
EPA Legacy Coal Combustion Residuals (CCR) Rule
TVA Widows Creek Fossil Plant
Stevenson, Alabama**

4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Robert Fuller, being a Professional Engineer in good standing in the State of Alabama, do hereby certify, to the best of my knowledge, information, and belief:

1. that the information contained in this certification is prepared in accordance with the accepted practice of engineering;
2. that the information contained herein is accurate as of the date of my signature below; and
3. that the initial structural stability assessment for the WCF APC meets the requirements specified in 40 CFR 257.82(a), (b), and (c)(1).

SIGNATURE *Robert D. Fuller*

DATE 5/8/2026

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ATTACHMENTS: Initial Structural Stability Assessment Report



Initial Structural Stability Assessment

Ash Pond Complex, Widows Creek Fossil Plant, Stevenson, Alabama



Prepared for:
Tennessee Valley Authority

Date:
May 8, 2026

Prepared by:
Stantec Consulting Services Inc.

Project/File:
175578700

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Appendix A Sudden Drawdown Assessment



1 Project Background

The Ash Pond Complex (APC) at the Widows Creek Fossil Plant (WCF) is regulated under 40 CFR § 257 Subpart D as a legacy coal combustion residuals (CCR) surface impoundment. 40 CFR § 257.100(f)(2)(iv) of the EPA Legacy CCR Rule requires that a structural stability assessment be prepared and placed in the facility's operating record by May 8, 2026. All further references to APC within this report infer the inclusion of the Main Ash Pond, Dredge Cell, and Upper/Lower Stilling Ponds.

As required by §257.73 of the EPA Final CCR Rule, an initial structural integrity evaluation must include an initial structural stability assessment for each legacy CCR surface impoundment that meets the conditions of paragraph (b) as follows:

1. Has a height of five feet or more and a storage volume of 20 acre-feet or more, or
2. Has a height of 20 feet or more.

Although the APC is considered a legacy CCR surface impoundment, it is important to note that it is closed, capped, and no longer capable of impounding a pool.

2 Unit Description

The Widows Creek Fossil Plant (WCF) was formerly a coal-fired, electric generating plant. The plant is located in northeastern Alabama along the west bank of the Tennessee River, at the confluence of Widows Creek. More specifically, the plant is located at 2800 Steam Plant Road in Stevenson, Jackson County, Alabama, approximately 40 miles southwest of Chattanooga, Tennessee. The WCF power generating facilities began operations in 1952 and ceased operations in September 2015.

The APC has a total area of approximately 405 acres and is comprised of the Main Ash Pond, Dredge Cell, and Upper/Lower Stilling Ponds. In November 2018, the Dredge Cell and Main Ash Pond portions of the APC were closed in place with a final cover system consisting of a 40-mil Linear Low-Density Polyethylene (LLDPE) geomembrane, a double-sided geocomposite drainage layer, and 18 inches of vegetated cover soil. CCR was removed from the Upper/Lower Stilling Ponds and placed in the Main Ash Pond footprint. The Upper/Lower Stilling Ponds were backfilled with soil and graded to drain via a permitted outfall. The Dredge Cell (DC) comprises the southeastern portion the APC. The APC was historically used to store CCR and to treat process waters associated with transport of fly ash, bottom ash, and minor amounts of gypsum. TVA has determined that the APC is a legacy CCR surface impoundment and therefore subject to certain provisions of the CCR Rule.

The subsections under §257.73(d) address conditions of appurtenances categorized as embankments, spillways, or hydraulic structures. Sections 2.1 through 2.3 below provide descriptions of the individual unit elements that fall within these appurtenance categories. Figure 1 provides an overview of the project site.

Note that all elevations included in this document and appendices are referenced to the National Geodetic Vertical Datum of 1929 (NGVD29).



2.1 Embankments

2.1.1 Perimeter Dike

The perimeter dike system around the outside of the APC is approximately 17,300 feet long. When originally constructed, the dike side slopes ranged from approximately 2.7H:1V to 3H:1V. During closure, side slopes were flattened by placing fill material on the exterior slopes to extend the toe of the slope and achieve slopes of 3H:1V to 4H:1V. The average crest width of the dike is approximately 27 feet.

The construction for the APC began in 1959 when an initial clay perimeter dike (i.e., starter dike) was built in the western portion of the unit. The starter dike was constructed of rolled earth fill, with a crest elevation of 610 feet. Using upstream construction methods, the perimeter dike system was raised periodically. The first dike raising occurred in 1963 for the original unit footprint which was raised to 626 feet. The APC was then expanded to its current footprint in 1973 with construction of a rolled earth dike to an initial elevation of 626 feet, matching the elevation of the perimeter dike of the original unit in the western portion of the APC. The entire dike system was subsequently raised with rolled earth dike to elevation 636 feet. In early 2000s a dike was constructed utilizing bottom ash at the Dredge Cell only to raise the crest elevation to 646 feet. During closure, the perimeter dikes were raised or lowered, as needed, to allow for drainage on the interior of the facility. After final grading for closure, the highest perimeter crest elevation at the APC is approximately 650 feet.





Figure 1. Site Plan

2.2 Spillways

As part of the APC closure project, spillway structures were decommissioned. Closure activities, conducted between May 2016 and November 2018, included abandonment and demolition of spillway systems, removal or grouting of associated pipelines, and regrading of CCR materials to achieve subgrade for capping. The former morning glory spillways were demolished by removing riser structures and grouting outlet pipes in place.

2.3 Hydraulic Structures

Other than the decommissioned spillways described above, hydraulic structures designed and constructed for closure consisted of a network of drainage ditches, flumes, pipes, and box culverts to convey surface runoff. In general, surface runoff is routed off of the final cap to the perimeter, where flumes, pipes, or culverts carry water down the outslopes and into perimeter ditches, process water basins, or creeks.

2.3.1 Stormwater Drainage Ditches

Per the Basis of Design Reports for final closure (Stantec 2016a, 2016b), the APC includes a system of stormwater drainage ditches consisting of both riprap-lined and grass-lined channels with triangular and trapezoidal cross-sections. Riprap-lined ditches include trapezoidal channels with bottom widths ranging from approximately 6 to 20 feet and side slopes of 3H:1V, as well as triangular channels and sections with a 5-foot-wide riprap center. Grass-lined ditches include triangular channels with side slopes of 3H:1V to 4H:1V, including perimeter and diversion features. Longitudinal slopes for the ditches are generally 1.0 percent, while some riprap-lined conveyance sections are reported with slopes of 25.0 percent and 33.3 percent. Channel depths range from approximately 2.0 to 3.0 feet.

2.3.2 Stormwater Culverts

Per the Basis of Design Reports for final closure (Stantec 2016a, 2016b), the APC includes a system of stormwater culverts consisting of both reinforced concrete box culverts and high-density polyethylene (HDPE) pipe culverts, used for flow conveyance beneath access roads and at outfall locations. Concrete box culverts range in size, with dimensions of approximately 2 to 6 feet in depth and 6 to 12 feet in width, with the most common size being 4 feet deep by 8 feet wide. HDPE pipe culverts include 18-inch and 36-inch diameter DR-17 pipes. These culverts are associated with access road crossings and discharge locations, including outlets to downstream conveyance features such as flumes and receiving waters. Reported slopes for the culverts are generally 1.0 percent, with one culvert reported at 0.5 percent.

A geocomposite drain system is also installed above the geocomposite liner. This system consists of an 8-inch or 4-inch perforated HDPE pipe surrounded by a No. 57 stone filter and is routed to the stormwater outfalls for discharge (Stantec 2019a, 2019b).



3 Foundations and Abutments (§257.73(d)(1)(i))

Per §257.73(d)(1)(i), the initial structural stability assessment must document whether the unit has been designed, constructed, operated, and maintained with stable foundations and abutments. The APC has the following features that fall within this requirement:

- Perimeter Dike

Assessment of the foundations and abutments associated with these features was completed considering the following criteria related to the CCR rule:

- Review inspection reports of the facility, considering frequency of inspections, and if the inspections included review and/or assessment of features including cracking, settlement, deformation or erosion of the foundations/abutments. Inspections should indicate that there are no significant signs of tension cracking, settlement, depressions, erosion, and/or deformations at the crest, slope and toe of the structure.
- Confirm that an assessment of seepage conditions of the foundation, with considerations of heave and vertical exit gradient, has been performed. Verify that the seepage assessment follows appropriate methodologies (such as USACE EM 1110-2-1901) and that the foundations exhibit acceptable performance (e.g., factor of safety (FS) against piping greater than or equal to 3.0).

3.1 Perimeter Dike

3.1.1 Background

Based on the history of construction report (Stantec 2026b), the APC is contained within a perimeter dike system constructed in multiple stages.

- 1959: The original Ash Disposal Area (consisting of the Bottom Ash Pond and Main Ash Pond A) perimeter dike for Units 7 and 8 was built to a crest elevation of 610 feet.
- 1963: The Bottom Ash Pond and original footprint of the Main Ash Pond were raised to a crest elevation of 626 feet with a clay perimeter dike constructed of rolled earth fill.
- 1971: The Bottom Ash Pond was filled with ash to an elevation of 625 feet.
- 1973: The APC was expanded to its current footprint with construction of a rolled earth dike to an initial elevation of 626 feet, matching the elevation of the perimeter dike of the original unit in the western portion of the APC. The entire dike system was subsequently raised with rolled earth dike to elevation 636 feet.



Initial Structural Stability Assessment

3 Foundations and Abutments (§257.73(d)(1)(i))

- 1984: A slurry wall, 6,090 feet in length, was constructed through the perimeter embankment encircling the Bottom Ash Pond. The slurry wall was installed to reduce seepage through the perimeter dike system.
- Early 2000s: At the Dredge Cell, a third raised dike was constructed utilizing bottom ash to a crest elevation of 646 feet. This dike was partially removed during closure regrading of the perimeter of the unit.

Based on previous geotechnical study (Stantec 2010), the initial perimeter dike at the APC predominantly consists of fat clay, fat clay with gravel, and lean clay. Foundation soils beneath the perimeter dike include lean to fat clay with sand, residual lean to fat clay with sand and gravel, and occasionally other soil types in lesser amounts.

3.1.2 Assessment

Annual site inspections for the APC were conducted and documented regularly from 1967 to 2026. These inspections include observations related to foundation conditions with respect to observable cracking, settlement, depressions, erosion and deformation. In the 2026 inspection report (Stantec 2026a), no signs of tension cracking, settlement, depressions, erosion, and/or deformations at the crest, slope and toe of the perimeter dike were documented.

In 2010, Stantec conducted a seepage analysis to evaluate potential seepage, piping, and pore water pressure development within the perimeter embankment slopes. The analysis indicated that six of ten evaluated cross sections did not meet piping design criteria at seepage exits. As a result, a mitigation project was initiated to design and construct a rock buttress on the outboard slope of the clay starter dikes. Where necessary to control seepage and piping, the riprap buttresses included a graded filter; this was limited to the segments of the buttress along the outboard perimeter of the Main Ash Pond (URS 2011). In 2012 and 2013, TVA completed construction of riprap buttresses and graded filters around the APC perimeter to control seepage and improve slope stability.

The APC can no longer impound water; thus, the potential for deficiencies related to seepage and piping is significantly lower than when a pool was impounded.

3.1.3 Conclusion

Based on the assessment of the foundation and abutments for the Perimeter Dike, the CCR Rule-related criteria listed above have been met.



4 Slope Protection (§257.73(d)(1)(ii))

Per §257.73(d)(1)(ii), the initial structural stability assessment must document whether the unit has been designed, constructed, operated, and maintained with adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown. The APC has the following features that fall within this requirement:

- Perimeter Dike

Assessment of the slope protection associated with these features was completed considering the following criteria related to the CCR rule:

1. Regular (weekly) inspections for erosion. Inspections should show there are no significant signs of deterioration in the slope protection configuration of the feature.
2. Appropriate slope protection shall be provided based on anticipated flow velocities. [Hydrologic / hydraulic calculations of flow velocities on the slope of the item for the appropriate erosive forces. Some common slope protection measures include riprap, gabions, paving (concrete or asphalt), or appropriate vegetative cover.]
3. If slope protection is riprap, filter layer(s) under the riprap shall be designed according to established filter criteria. However, existing riprap cover may be evaluated based on performance and observations during inspections.

4.1 Perimeter dike

4.1.1 Background

Slope protection for the perimeter dike consists of grass or riprap. Through a series of interim risk reduction projects completed in 2012 and 2013, much of the lower portions of the APC perimeter outsoles were stabilized with riprap buttresses of varying geometry (e.g., URS 2011). Some segments (primarily around the Dredge Cell exterior slopes) consisted of riprap, for slope stability purposes. Other segments (primarily around the Main Ash Pond exterior slopes) also incorporated a graded filter beneath the riprap, to address both slope stability and seepage. However, one segment of the APC perimeter, adjacent to the upstream portion of the Process Water Basin (PWB), only has a grass surface; a riprap buttress was not added.

As part of closure design (Stantec 2016a, 2016b), ditches and flumes were sized and ditch armoring materials were selected to meet design criteria for capacity and erosion resistance. Within the limits of the final cap of the APC, the surface is grass (except for access roads and drainage ditches).



Initial Structural Stability Assessment

4 Slope Protection (§257.73(d)(1)(ii))

4.1.2 Assessment

The annual engineering inspection of CCR units and supporting facilities are performed in accordance with relevant requirements of TVA's CCR Structural Stability Program (CCRSSP) and the Environmental Protection Agency's (EPA) CCR Rule. Site inspection reports from 1967 to 2026 document the condition of slope protection features of the dike, and identify maintenance deficiencies (if any) to be addressed.

When deficiencies are identified, each is assigned a tracking number, category, and a priority level. Categories include structural, maintenance, instrument maintenance, or monitor. Priority levels define how quickly the deficiency needs to be addressed/repared, and if the repair has been completed. The status of any previously identified deficiencies is checked as part of subsequent inspections.

As part of January 2026 annual inspection, general observations at the APC included:

- A good stand of grass is maintained on the outer slopes of the perimeter dikes.
- Outlet structures and drainage pipes were in generally good condition, although select structures were observed to exhibit minor settlement and/or be partially obstructed with debris.
- No indication of global slope instability was observed during this inspection.
- Maintenance activities at the facility have generally been performed since the previous Quarterly and Engineering Inspection.

Localized deficiencies in slope protection were identified at select locations along the perimeter dike. At the northeastern and eastern perimeter dike toes adjacent to Widows Creek, erosion and riprap displacement were observed, including areas where dike materials were exposed.

Refer to Section 6.1.2 for information on the vegetative cover for the perimeter dike.

4.1.3 Conclusion

Based on the assessment of the slope protection for the perimeter dike, the CCR Rule-related criteria listed above have been met.



5 Embankment Dike Compaction (§257.73(d)(1)(iii))

Per §257.73(d)(1)(iii), the initial structural stability assessment must document whether the unit has been designed, constructed, operated, and maintained with dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit. The APC has the following features that fall within this requirement:

- Perimeter Dike

Assessment of the dike compaction associated with these features was completed considering the following criteria related to the CCR rule:

1. Documentation showing the dike was mechanically compacted. Acceptable documentation may include construction drawings, field notes, construction photographs, correspondences, or any evidence showing the dike was mechanically compacted during construction.
2. If no construction documentation is available, specific data from geotechnical explorations of dike may be used. Geotechnical borings may be used to assess compaction of the dike. Appropriate methodology correlating blow counts and compaction (density) should be used.

5.1 Perimeter dike

5.1.1 Background

Construction records related to the dike material placement and compaction for the initial perimeter dike were not available during this review. Certain TVA design drawings provide proposed dike construction and compaction methods and were referenced in the assessment discussed below. Subsurface explorations of the dike were also available that provided data used in the assessment.

5.1.2 Assessment

TVA Drawings 10N7400-R5 and 10W7465-01-R5 provide documentation of compaction requirements related to the construction of the Perimeter Dike. Construction criteria related to dike embankment materials and dike compaction as noted on these drawings include:

- *“Dikes are to be constructed of unclassified material placed in layers 12-inch thick and compacted by hauling equipment.*
- *Earthfill compaction shall be at least 95% of the standard minimum dry density as determined by ASTM D-698 procedure. Moisture content of the earthfill shall be within \pm 3% of the optimum, as determined by the Singleton Materials Engineering (SME) laboratory.*



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5 Embankment Dike Compaction (§257.73(d)(1)(iii))

- *When connecting new rolled earthfill to existing earthfill, extreme care shall be used to insure an impervious and stable connection. The existing earthfill shall be stripped of all vegetation, benched, scarified to a minimum depth of 6 inches and compacted so as to form a bond with the new earthfill. Small benches of minimum depth shall be used.*
- *Deposited ash shall be surcharged with unclassified fill, preferably bottom ash, in 6-inch layers and adequately compacted with loaded rubber-tired earth hauling equipment. The unclassified fill shall be built to the elevations shown on the sections so as to form a stable base for the raising dikes with earthfill.*
- *In-place density control tests shall be performed using the ASTM D-1556 or D-2167 procedure. At least one density test shall be taken for each 2,000 cubic yards of fill placed throughout the course of the work. A minimum of one test shall be taken each day fill is placed.”*

Stantec completed geotechnical exploration and seepage/slope stability evaluation of the APC in 2010 and 2026 (Stantec, 2010, 2026c). The subsurface exploration program included drilling and sampling locations around the perimeter dike of the APC. Subsurface investigations included soil borings with Standard Penetration Tests and/or Shelby tube sampling, with some borings extending into rock for coring. Additional investigations included vane shear borings and Cone Penetration Tests. The investigation program also involved extensive laboratory testing and installation of instrumentation.

The geotechnical engineering analyses focused on representative cross sections that modeled the various slope conditions around the perimeter of the subject structures, including seepage and stability analyses of the APC. The strength parameters derived based on the field and laboratory data are summarized in Section 9.1.1.1 and a more in-depth review is found in *Safety Factor Assessment Report* (Stantec, 2026d).

5.1.3 Conclusion

Based on the assessment of the embankment dike compaction for the Perimeter Dike, the CCR Rule-related criteria listed above have been met.



6 Vegetated Slopes (§257.73(d)(1)(iv))

Per §257.73(d)(1)(iv), the initial structural stability assessment must document whether the unit has been designed, constructed, operated, and maintained with vegetated slopes of dikes and surrounding areas, except for slopes which have an alternate form or forms of slope protection.

The APC has the following features that fall within this requirement:

- Perimeter Dike

Assessment of the vegetated slopes associated with these features was completed considering the following criteria related to the CCR rule:

1. Regular inspection records showing vegetative cover sufficient to prevent surface erosion while allowing an unobstructed view to visually inspect the slope.

6.1 Background

The perimeter dike is vegetated along the exterior slope excluding the portions that are armored with riprap. Due to how the APC was capped and closed, the interior slope is no longer exposed and thus not subject to surface erosion. The crest is either vegetated or is protected with crushed stone as part of an access road.

6.1.1 Assessment

Annual site inspections were conducted and documented regularly following construction of the perimeter dike.

Annual inspection reports are available and document the vegetative cover over the dike structures. The vegetative cover of the dike exterior slopes is typically mowed twice annually as reported by TVA maintenance personnel. TVA Engineering performs the annual inspections and prepares reports addressing site conditions and directives for repair and maintenance activities needed. These reports indicate that maintenance has been routinely performed.

During the January 2026 annual inspection, vegetative cover on the exterior slopes of the perimeter dikes was generally well maintained, with no visible signs of global slope instability. Minor vegetation maintenance items were noted during the annual inspection, to be addressed by TVA as part of routine maintenance activities.

6.1.2 Conclusion

Based on the assessment of the vegetated slopes for the APC, the CCR Rule-related criteria listed above have been met.



7 Spillway Condition and Capacity (§257.73(d)(1)(v))

Per §257.73(d)(1)(v), the initial structural stability assessment must document whether the unit has been designed, constructed, operated, and maintained with a single spillway or combination of spillways that meet the condition and capacity requirements as outlined in this section of the CCR Rule. The combined capacity of all spillways are to be designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the event specified in this section.

As part of the APC closure project, spillway structures were decommissioned. Closure activities, conducted between May 2016 and November 2018, included abandonment and demolition of spillway systems, removal or grouting of associated pipelines, and regrading of CCR materials to achieve subgrade for capping. The former morning glory spillways were demolished by removing riser structures and grouting outlet pipes in place. Therefore, an assessment of spillway conditions and capacity is not applicable.



8 Hydraulic Structures Conditions (§257.73(d)(1)(vi))

Per §257.73(d)(1)(vi), the initial structural stability assessment must document whether the unit has been designed, constructed, operated, and maintained with 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. The APC has the following features that fall within this requirement:

- Drainage Ditches
- Culverts

Assessment of the hydraulic structures condition associated with these features was completed considering the following criteria related to the CCR rule:

1. Must be able to manage the required flows. [Estimate size of pipes based on hydraulic analysis for the following flood events: 100-year flood (low hazard potential unit).]
2. Must maintain structural integrity. [Structural integrity may be warranted by periodic inspections of existing conduits. Inspections must show no significant presence of deformation, distortions, cracks, joint separation, etc.]
3. Must be free from significant amounts of obstruction and anomaly which may affect the operation of the hydraulic structure. [Perform periodic pipe inspections to detect deterioration, deformation, distortion, bedding deficiencies, and sediment, and debris accumulations.]

8.1 Stormwater Drainage Ditches

8.1.1 Background

The APC is classified as a low hazard structure, requiring the combined capacity of all spillways be adequate to manage the flow during and following the peak discharge from a 100-year flood. The stormwater drainage ditches were installed in conjunction with the closure plan to convey stormwater runoff from the APC. Details of the ditches are documented in the Basis of Design Reports (Stantec 2016a, 2016b).

8.1.2 Assessment

The *Initial Inflow Design Flood Control System Plan* for the APC (Stantec 2026e) documents the assessment of the APC related to the capacity requirements outlined in §257.73(d)(1)(v) of the CCR Rule. The assessment demonstrates that the stormwater drainage ditches located at the APC do meet the capacity requirements.



Initial Structural Stability Assessment

8 Hydraulic Structures Conditions (§257.73(d)(1)(vi))

The 2026 annual inspection did not indicate any major deficiencies for the stormwater drainage ditches. Minor vegetation maintenance items were noted during the annual inspection, to be addressed by TVA as part of routine maintenance activities.

8.1.3 Conclusion

Based on the assessment of the hydraulic structure condition for the stormwater drainage ditches, the CCR Rule-related criteria have been met.

8.2 Stormwater Culverts

8.2.1 Background

The APC is classified as a low hazard structure, requiring the combined capacity of all spillways be adequate to manage the flow during and following the peak discharge from a 100-year flood. The stormwater culverts were installed in conjunction with the closure plan to convey stormwater runoff from the APC. Details of the culverts are documented in the Basis of Design Reports (Stantec 2016a, 2016b).

8.2.2 Assessment

The *Initial Inflow Design Flood Control System Plan* for the APC (Stantec 2026e) documents the assessment of the APC related to the capacity requirements outlined in §257.73(d)(1)(v) of the CCR Rule. The assessment demonstrates that the stormwater culverts located at the APC do meet the capacity requirements.

The 2026 annual inspection did not indicate any major deficiencies for the stormwater culverts. Outlet structures and drainage pipes were in generally good condition, although select structures were observed to exhibit minor settlement, localized erosion near the outlet, and/or be partially obstructed with debris. Such maintenance items, along with other minor items, were noted during the annual inspection, to be addressed by TVA as part of routine maintenance activities.

8.2.3 Conclusion

Based on the assessment of the hydraulic structure condition for the Stormwater Culverts, the CCR Rule-related criteria have been met.



9 Sudden Drawdown Assessment (§257.73(d)(1)(vii))

Per §257.73(d)(1)(vii), the initial structural stability assessment must document whether the unit has been designed, constructed, operated, and maintained with exterior slopes that can be inundated by an adjacent water body (such as a river, stream, or lake) to determine if structural stability is maintained during low pool or sudden drawdown of the adjacent water body. The APC has the following feature that falls within this requirement:

- Perimeter Dike

Assessment of the sudden drawdown associated with this feature was completed considering the following criteria related to the CCR rule:

- Maintain slope stability during sudden drawdown of adjacent water body.

Guidance provided by the USEPA (2015) described the basis of the CCR Rule's factor of safety criteria and methodology as EM 1110-2-1902 (USACE, 2003) or other appropriate methodologies. Table 3-1 of EM 1110-2-1902 (USACE, 2003) recommends a required minimum factor of safety of 1.1 for maximum surcharge pool under rapid drawdown conditions.

9.1 Perimeter Dike

9.1.1 Background

The APC is adjacent to three, interconnected bodies of water: the Tennessee River to the southeast, Widows Creek to the northeast, and the PWB to the northwest. The PWB is adjacent to Section M-M' at the APC (Figure 2), along the northwestern outboard toe of the slope. During large flood events, water in the Tennessee River creates a backwater effect in both Widows Creek and the PWB, such that they are all at the same water level elevation. For the sudden drawdown analysis, a flood water surface elevation of 608.5 feet was modeled for the elevated pool event. This elevation is the 100-year peak water surface elevation at the confluence of Widows Creek and the Tennessee River, and is assumed to back up water into the PWB.

The PWB water levels are assumed to rapidly return to a normal water surface elevation of 602.5 feet. After closure of the Ash Pond Complex, a concrete weir structure was constructed to regulate the water level in the PWB. The weir crest elevation ranges between 602 and 603 feet. For this analysis, an average value of 602.5 feet was selected as the PWB water elevation.

9.1.1.1 Material Properties

An overview of the subsurface conditions of the perimeter dike at the APC is summarized in Table 1. A more in-depth review is found in Safety Factor Assessment Report (Stantec, 2026d).



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Table 1. Generalized Subsurface Conditions – APC Perimeter Dike

| Material Name | Description |
|-------------------|---|
| Clay Dike Fill | Compacted clay fill, including the starter dike |
| Cover Soil | Compacted soil fill at the surface of the capped portions of the unit |
| Residual Clay | Natural deposits of lean to fat clay soil |
| Fly Ash (Sluiced) | Fly ash sluiced into the footprint of the facility |
| Fly Ash (Stacked) | Fly ash stacked or regraded above the sluiced fly ash |
| Bedrock | Limestone, with dipping beds |

Stantec performed geotechnical explorations and laboratory testing programs consisting of natural moisture content determinations, sieve and hydrometer analyses, Atterberg limits, specific gravity determinations, unit weight, moisture-density (Proctor), shear strength, and permeability tests (Stantec, 2010, 2026c). The strength parameters derived based on the field and laboratory data and used in this sudden drawdown slope stability evaluation are presented in Table 2. The derivation of these material parameter is documented in Stantec (2026d).

Table 2. Strength Parameters for Stability Analysis – APC Perimeter Dike

| Material Name | Unit Weight (pcf) | | Drained Strength Parameters | | Undrained Strength Parameters | |
|-------------------|-------------------------|-----------------------|-----------------------------|-------------------|-------------------------------|------------------|
| | γ_{moist} | γ_{sat} | c' (psf) | ϕ' (degrees) | c (psf) | Φ (degrees) |
| Clay Dike Fill | 125 | 127 | 500 | 25 | 1000 | 10 |
| Cover Soil | 123 | 123 | 0 | 25 | 0 | 25 |
| Residual Clay | 125 | 126 | 0 | 33 | 300 | 20 |
| Fly Ash (Sluiced) | 115 | 115 | 0 | 34 | 0 ¹ | 31 |
| Fly Ash (Stacked) | 113 | 113 | 0 | 35 | 0 | 35 |
| Bedrock | Impenetrable | | | | | |

¹ For computational purposes, a negligible (0.1 psf) amount of undrained cohesion must be applied to this material in the sudden drawdown analysis.



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9.1.1.2 Critical Cross Section Selection

For the sudden drawdown case, the critical cross section must be in a location where the perimeter dike exterior slope becomes at least partially inundated by the flood event. Also, the dike surface must be a material type that is susceptible to sudden drawdown failures. At the APC, the perimeter slopes below the 100-year flood elevation are largely armored with riprap, which has a high shear strength and is free draining. This surfacing material is typically resistant to sudden drawdown loading; thus, the focus is on only the portion of the APC perimeter dike that is not armored with riprap. This geometry only occurs within a portion (approximately 2,150 feet in length) of the northwest perimeter adjacent to the PWB.

Section M as shown below in Figure 2 was identified as the most representative cross section exhibiting this condition and was therefore selected as the critical section for sudden drawdown stability evaluation.



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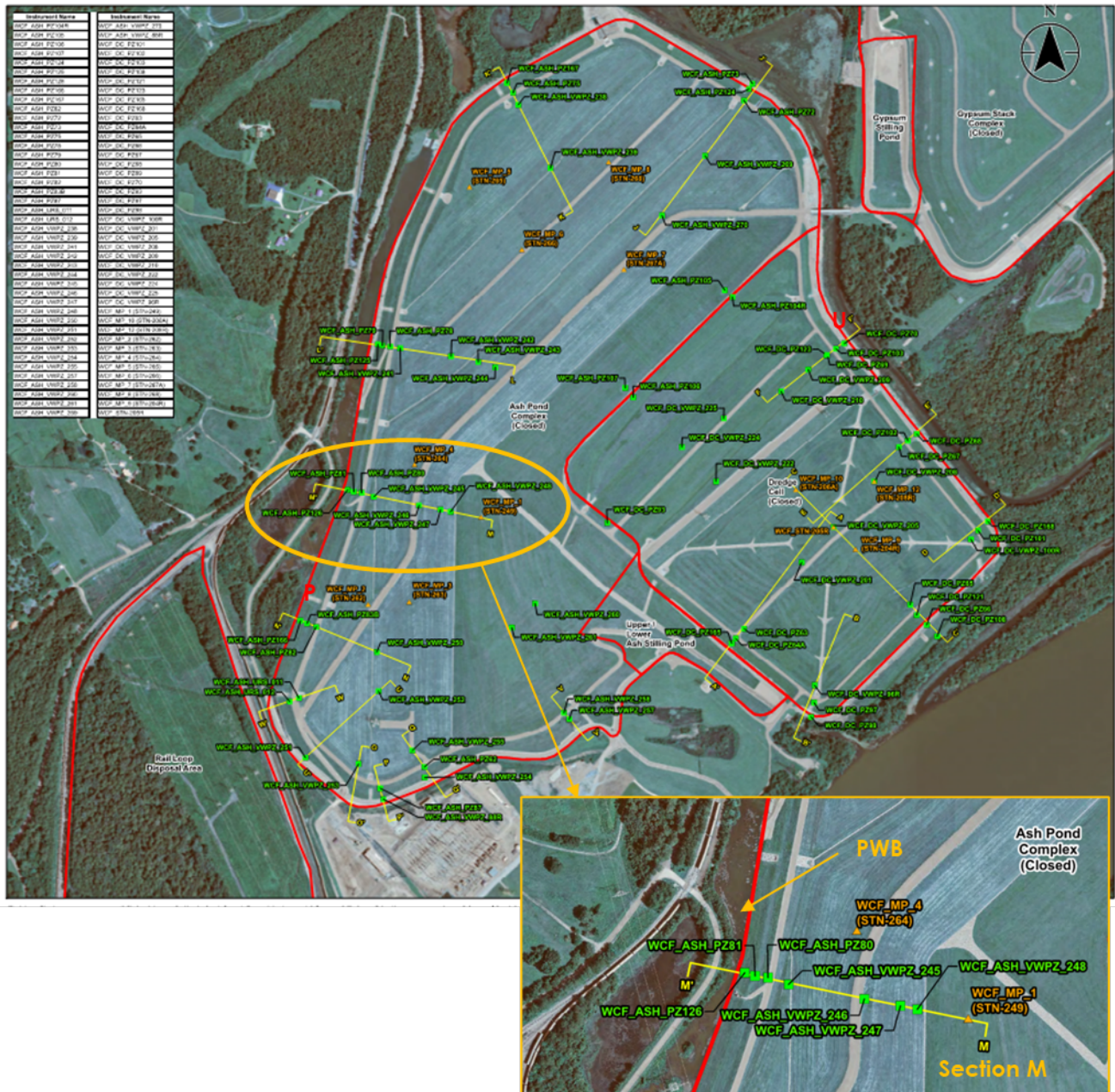


Figure 2. WCF Ash Pond Complex – Plan View of Cross Sections

9.1.1.3 Water Levels

Because there is no impounded pool within the APC and there are no exposed interior slopes, the sudden drawdown load case only applies to the exterior dike slopes. As discussed previously, the elevated pool within the adjacent PWB is assumed to be the 100-year flood water surface elevation of 608.5 feet. The drawdown pool within the PWB is assumed to be the normal water surface elevation of 602.5 feet. The near surface soils (e.g., clay dike fill) in the perimeter dike of the APC are conservatively assumed to be



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saturated up to a phreatic surface elevation of 608.5 feet. Farther inboard, where the normal phreatic surface is already higher than 608.5 feet, no additional increase is assumed.

9.1.1.4 Analysis Methodology

Stantec performed the sudden drawdown slope stability analyses using the GeoStudio 2024.1.0, Version 24.1.0.1406 software package by Bentley Systems. This package includes the SLOPE/W module for slope stability analysis. The analyses were performed in accordance with the recommendations and criteria outlined in the USACE Design Manuals EM 1110-2-1902 "Slope Stability" (USACE, 2003) and in the Stantec (2026d) Safety Factor Assessment Report.

9.1.1.5 Acceptance Criteria

A minimum factor of safety is not explicitly specified within the EPA Final CCR Rule §257.73(d)(1)(vii). In the EPA's preamble (i.e., published commentary) with the CCR Rule, EM 1110-2-1902 (USACE, 2003) is considered the basis for the slope stability analyses. Table 3, Minimum Required Factors of Safety: New Earth and Rock-Fill Dams, requires a factor of safety of 1.1 for a rapid drawdown condition from the maximum surcharge pool (USACE, 2003). This factor of safety criterion is adopted herein.

9.1.1.6 Analysis Results

The slope stability assessments presented in this report are focused on the potential for slope failures of significant mass, which could directly impact potential release of CCR materials from the APC. The search for a critical slip surface in the slope stability assessments is thus restricted to consider only potential surfaces where the depth (measured at the base of at least one slice) is more than five feet vertically below the ground surface. Table 3 and Appendix A summarize the sudden drawdown safety factor evaluation results at the APC.

Table 3. Factor of Safety Assessment Results

| Plant | Facility | Critical Cross Section | EPA Criteria | Recommended Factor of Safety Criteria | Calculated Factor of Safety |
|-------|------------------|------------------------|-----------------|---------------------------------------|-----------------------------|
| WCF | Ash Pond Complex | M-M' | Sudden Drawdown | 1.1 | 2.1 |

9.1.2 Conclusion

Based on the assessment of the sudden drawdown for the APC Perimeter Dike, the CCR Rule-related criteria listed above have been met.



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10 References

10 References

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Appendix A

Sudden Drawdown Assessment

