



March 26, 2018  
File: rpt\_002\_let\_175655041  
Revision 0

Tennessee Valley Authority  
1101 Market Street  
Chattanooga, Tennessee 37402

**RE: Initial Inflow Design Flood Control System Plan  
Bottom Ash Pond  
EPA Final Coal Combustion Residuals (CCR) Rule  
TVA John Sevier Fossil Plant  
Rogersville, Tennessee**

---

## 1.0 PURPOSE

This letter documents Stantec's certification of the initial inflow design flood control system plan for the TVA John Sevier Fossil Plant's Bottom Ash Pond. Based on the assessment, the Bottom Ash Pond complies with the inflow design flood control requirements in the EPA Final CCR Rule at 40 CFR 257.82.

## 2.0 INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

As described in 40 CFR 257.82(c), an inflow design flood control system plan must be prepared to document how the inflow design flood control system has been designed and constructed to manage the design storm required by the hazard classification. Stantec has assigned the Bottom Ash Pond a low hazard potential classification rating. Thus, the inflow design storm event was selected from §257.82(a)(3) as the 100-year flood event based upon a hazard potential classification of "low".

## 3.0 SUMMARY OF FINDINGS

The attached plan summarizes the analysis of the inflow design flood control system for the Bottom Ash Pond. The resulting water surface elevations are shown in the following table. The plan and results show that the impoundment meets the requirements set forth in 40 CFR 257.82(a) and (b).

Plant	Facility	Inflow Design Storm	Water Surface Elevation (feet)	Minimum Roadway Elevation (feet)
JSF	Bottom Ash Pond	100-year storm	1130.9	1134.4
			1124.8	1133.2
			1120.2	1130.0



March 26, 2018

Page 2 of 2

Re: **Initial Inflow Design Flood Control System Plan  
Bottom Ash Pond  
EPA Final Coal Combustion Residuals (CCR) Rule  
TVA John Sevier Fossil Plant  
Rogersville, Tennessee**

#### 4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Don W. Fuller II, being a Professional Engineer in good standing in the State of Tennessee, 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 inflow design flood control system plan for the TVA John Sevier Fossil Plant's Bottom Ash Pond meets the requirements specified in 40 CFR 257.82(a), (b), and (c)(1).

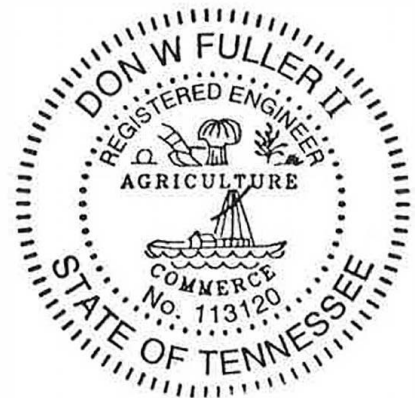
SIGNATURE *Don W. Fuller II*

DATE 03/26/18

ADDRESS: Stantec Consulting Services Inc.  
3052 Beaumont Centre Lane  
Lexington, Kentucky 40513-1703

TELEPHONE: (859) 422-3000

ATTACHMENTS: Inflow Design Flood Control System Plan



## **Initial Inflow Design Flood Control System Plan**

John Sevier – Bottom Ash Pond  
Rogersville, Tennessee



Prepared for:  
Tennessee Valley Authority  
Chattanooga, Tennessee

Prepared by:  
Stantec Consulting Services Inc.  
Lexington, Kentucky

March 26, 2018  
Revision 0

## Table of Contents

<b>1.0</b>	<b>BACKGROUND</b> .....	<b>1</b>
<b>2.0</b>	<b>EXISTING CONDITIONS</b> .....	<b>3</b>
<b>3.0</b>	<b>METHODS / DESIGN CRITERIA</b> .....	<b>4</b>
<b>4.0</b>	<b>CALCULATION RESULTS</b> .....	<b>5</b>
4.1	CAPACITY AND FREEBOARD RESULTS.....	5
<b>5.0</b>	<b>CONCLUSIONS</b> .....	<b>6</b>
<b>6.0</b>	<b>REFERENCES</b> .....	<b>7</b>

### LIST OF TABLES

Table 1	Hydrologic and Hydraulic Modeling Results .....	5
---------	---	---

### LIST OF FIGURES

Figure 1	Bottom Ash Pond Limits .....	2
Figure 2	Hydraulic Structures .....	3

# INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

Background  
March 26, 2018

## 1.0 BACKGROUND

On April 17, 2015, the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities (RIN-2050AE81; FRL-9149-4) (EPA Final CCR Rule) was published in the Federal Register. A Direct Final Rule in response to a partial vacatur became effective on October 4, 2016. This revision eliminated the exemption for inactive surface impoundments to meet the same requirements as active surface impoundments. An extended timeline was given to inactive surface impoundments with an NOI that complied with §257.105(i)(1), §257.106(i)(1) and §257.107(i)(1). Stantec Consulting Services, Inc. (Stantec) was contracted by the Tennessee Valley Authority (TVA) to analyze the inflow design flood for John Sevier Fossil Plant's (JSF) Bottom Ash Pond CCR surface impoundment and evaluate compliance with section §257.82 of the EPA Final CCR Rule.

JSF is a former coal-fired, electric generating plant located in Hawkins County, Tennessee. JSF is approximately 30 miles west of Kingsport, Tennessee. The plant was constructed along the southern bank of the Holston River in the headwaters of Cherokee Lake. TVA ceased operations at JSF at the end of calendar year 2012 and the facility retired its four coal-combustion generating units as of December 31, 2013.

The Bottom Ash Pond is an Inactive CCR Surface Impoundment as defined by the EPA Final CCR Rule that meets the requirements for an extended timeline under the Direct Final Rule and has completed closure activities. As part of the Final Closure Project, ash has been removed from the west end of the Bottom Ash Pond and stacked in the east end. An earthen berm was also constructed to serve as the western boundary of the Stacking Area. A geosynthetic cap system was completed in July 2017. This project has reduced the ash footprint within the Bottom Ash Pond facility to approximately 20 acres. The Bottom Ash Pond closure limits are shown as Figure 1.

# INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

Background  
March 26, 2018

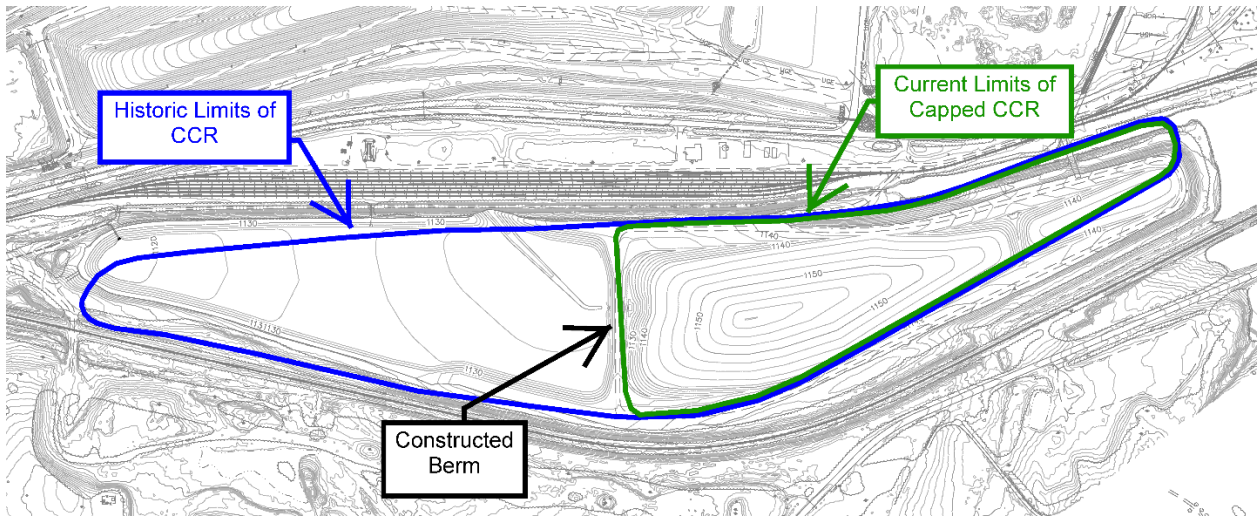


Figure 1 Bottom Ash Pond Limits

# INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

Existing Conditions  
March 26, 2018

## 2.0 EXISTING CONDITIONS

The Bottom Ash Pond has been closed by constructing an engineered cap system over the CCR material within the eastern portion of the pond, and by placing fill to promote positive drainage and establish vegetation across the western portion of the pond.

Stormwater runoff from the capped area on the east portion of the pond drains to a series of perimeter ditches that conveys stormwater to two culverts. One culvert is on the east side of the capped area and flows directly into Polly Branch. A second culvert is on the west side of the capped area and conveys runoff to a riprap ditch in the middle portion of the pond, which also discharges to Polly Branch. Stormwater runoff from the western portion of the pond flows to a third culvert. This culvert consists of a previous spillway pipe that drains to the Holston River.

Figure 2 shows the location of the hydraulic structures for the closed Bottom Ash Pond configuration.

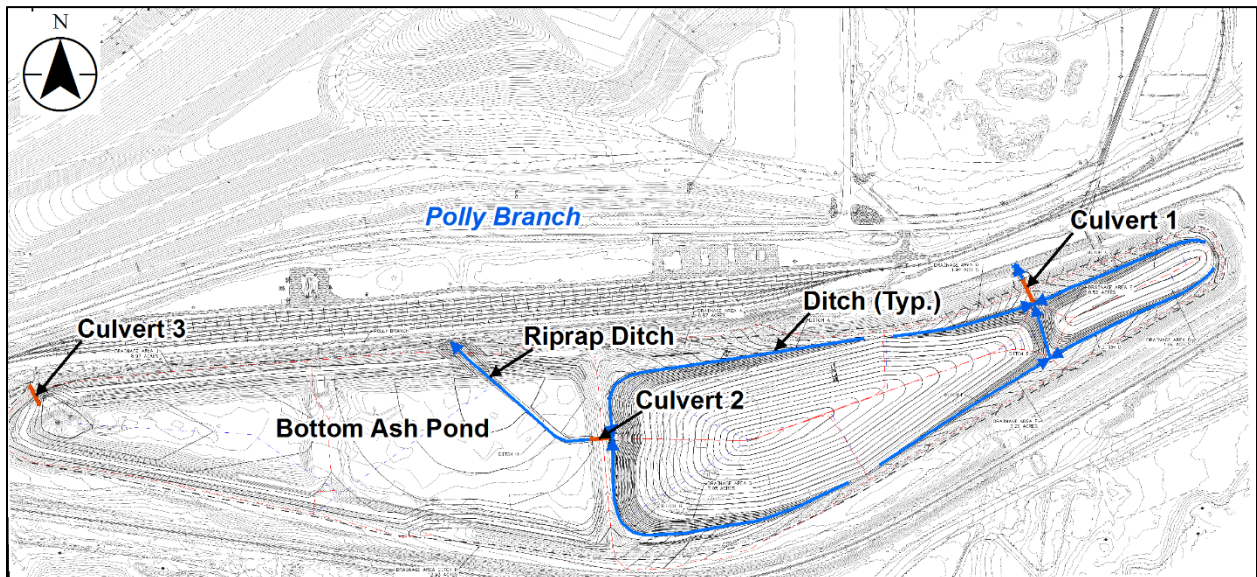


Figure 2 Hydraulic Structures

## INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

Methods / Design Criteria  
March 26, 2018

### 3.0 METHODS / DESIGN CRITERIA

This Inflow Design Flood Control System Plan has been developed to document how the inflow design flood control system has been designed and constructed to meet the requirements of §257.82. The Bottom Ash Pond was classified as a Low Hazard structure in April 2017 based on the report from Stantec to TVA dated April 28, 2017. This plan has been developed based on that classification and the following EPA Final CCR Rule criteria apply:

1. The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood. (Ref. §257.82(a)(1)),
2. The inflow design flood control system must collect and control flow from the CCR unit during and following the peak discharge of the inflow design flood. (Ref. §257.82(a)(2)),
3. The inflow design flood for a low hazard potential CCR surface impoundment is the 100-year flood. (Ref. §257.82(a)(3)(iii)),
4. Discharge from the CCR Unit must be handled in accordance with the surface water requirements under 257.3-3.
5. The owner or operator must prepare an initial inflow design flood control system plan by April 17, 2018. (Ref. §257.100(e)(3)(v)),
6. The plan must be revised every 5 years, and amendments must be made whenever there is a change in condition(s) that would substantially affect the written plan in effect. (Ref. §257.82 (c)(4) & (2)),
7. This plan will be considered complete upon its placement in the facility's operating record. (Ref. §257.82(c)(1)),
8. The owner or operator must obtain a certification from a qualified professional engineer stating that the initial and periodic inflow design flood control system plans meet the requirements of §257.82.

The pond has been closed and is designed not to impound stormwater. Three culverts control discharge through the former impoundment. Hydrological calculations were performed as part of the closure design based on Soil Conservation Service Technical Release 55 (TR-55) methods. The NRCS Win TR-55 software (version 1.00.10) and Dodson Hydrocalc Hydraulics design software were used to analyze the performance of the culverts for the design storm event. A 100-year storm event was used as the design storm event for the closure design and is also the inflow design flood specified by the CCR Rule for low hazard surface impoundments.

Modeling assumptions and hydrologic parameter inputs are described in the Basis of Design Report prepared by Stantec dated December 22, 2016.

# INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

Calculation Results  
March 26, 2018

## 4.0 CALCULATION RESULTS

The hydrologic modeling results from the closure design were used to determine the performance of the Bottom Ash Pond for the 100-year, 24-hour storm.

### 4.1 CAPACITY AND FREEBOARD RESULTS

The peak headwater elevation and outflow is summarized in Table 1. The results show that the Bottom Ash Pond can safely pass the flow from the 100-year 24-hour storm through the designated culverts without overtopping the roadway crests.

**Table 1 Hydrologic and Hydraulic Modeling Results**

Culvert	Storm	Peak Water Surface Elevation (feet)	Peak Outflow (cubic feet per second)	Minimum Roadway Elevation (feet)	Freeboard (feet)
1	100-year, 24-hour SCS Type II	1130.9	31.2	1134.4	3.5
2		1124.8	46.4	1133.2	8.4
3		1120.2	19.4	1130.0	9.8

## INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

Conclusions  
March 26, 2018

### 5.0 CONCLUSIONS

The calculations included in this report demonstrate that the inflow design flood control system adequately manages flow into and from the closed CCR Unit during and following the peak discharge of the inflow design flood (100-year flood). In addition, the closed CCR Unit discharges to permitted stormwater outfalls, and is therefore handled in accordance with the surface water requirements under §257.3-3. Therefore, the Bottom Ash Pond at JSF meets the requirements of Section §257.82 of the EPA Final CCR Rule.

## INITIAL INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

References  
March 26, 2018

### 6.0 REFERENCES

1. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities (RIN-2050-AE81; FRL-9149-4) (EPA Final CCR Rule) April 2015.
2. Stantec Consulting Services Inc., "Basis of Design Report (Rev. 0) Bottom Ash Pond Final Closure John Sevier Fossil Plant", December 22, 2016.
3. Stantec Consulting Services Inc., "Initial, Hazard Potential Classification Assessment – Bottom Ash Pond", April 28, 2017.