SOUTH CAROLINA ELECTRIC & GAS

SCANA®
POWER FOR LIVING

INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

FOR THE

WATEREE STATION ASH POND

RICHLAND COUNTY, SOUTH CAROLINA

JULY 2016

SOUTH CAROLINA
GARRETT AND MOORE, INC.
No. C3371
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
22411
8/23/16
J. STEFAN BRAY

GARRETT & MOORE
Engineering for the Power and Waste Industries

1 OVERVIEW

The EPA Administrator, Gina McCarthy, signed the Disposal of Coal Combustion Residuals from Electric Utilities final rule on December 19, 2014, and it was published in the Federal Register (FR) on April 17, 2015. The regulations provide a comprehensive set of requirements for the safe disposal of coal combustion residuals (CCRs), commonly known as coal ash, from coal-fired power plants. The rule will be administered as part of the Resource Conservation and Recovery Act [RCRA, 42 United States Code (U.S.C.) §6901 et seq.], using the Subtitle D approach.

South Carolina Electric & Gas (SCE&G) is subject to the CCR Rule. Based on SCE&G's review of the rule, the **Ash Pond** at **SCE&G Wateree Station** has been determined to be an existing CCR surface impoundment subject to the CCR rule requirements.

2 PURPOSE

The purpose of this report is to document that the Wateree Station Ash Pond Inflow Design Flood Control System Plan meets the requirements of CCR rule §257.82 – *Hydrologic and Hydraulic Capacity Requirements.*

3 APPLICABLE REGULATIONS

CCR rule §257.82 – *Hydrologic and Hydraulic Capacity Requirements* states the following:

> (a) The owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.
>
> (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 specified in paragraph (a)(3) of this section.
>
> (2) The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.
>
> (3) The inflow design flood is:
>
> (i) For a high hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the probable maximum flood;
>
> (ii) For a significant hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 1,000-year flood;
>
> (iii) For a low hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 100-year flood; or
>
> (iv) For an incised CCR surface impoundment, the 25-year flood.

(b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under § 257.3–3.

(c) Inflow design flood control system plan—(1) Content of the plan. The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

40 CFR Rule § 257.3-3 Surface Water states the following:

(a) For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES) under section 402 of the Clean Water Act, as amended.

(b) For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of dredged material or fill material to waters of the United States that is in violation of the requirements under section 404 of the Clean Water Act, as amended.

(c) A facility or practice shall not cause non-point source pollution of waters of the United States that violates applicable legal requirements implementing an areawide or Statewide water quality management plan that has been approved by the Administrator under section 208 of the Clean Water Act, as amended.

4 ASH POND DESCRIPTION

Wateree Station is coal-fired electric generation plant located in Eastover, Richland County, South Carolina. The Ash Pond is an approximate 80-acre surface impoundment used for the management of sluiced fly and bottom ash material, as well as other low volume plant wastewaters.

A Closure Plan was prepared for the Ash Pond in 2013 which includes the excavation and removal of all CCR materials. The Closure Plan, entitled *Close Out Plan for the Wateree Station Ash Pond* dated January 2013, was approved by the South Carolina Department of Health and Environmental Control (SCDHEC) in February 2013 (LOA-004214). In preparation for closure activities, SCE&G has been excavating and removing CCR materials from the pond for the past several years. The closure of the Ash Pond is scheduled to be begin in 2017 and be complete by the end of 2020.

Based on SCE&G's review of the rule, the Ash Pond at Wateree Station is an incised CCR surface impoundment.

5 FLOW INTO THE POND

Given the Ash Pond is considered an incised CCR surface impoundment, in accordance with 257.82 (a)(1) and 257.82 (a)(3), the Ash Pond's inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the 25-year flood.

The Ash Pond receives no inflow from the plant. Therefore, inflow into Ash Pond is limited to stormwater. No other sources contribute inflow to the Ash Pond.

Figure 1 (Attachment 1) illustrates the location of Ash Pond and the surrounding vicinity. Figure 1 also identifies the drainage area that flows to the Ash Pond, as well as engineering calculations identify the peak inflow from the 25-year, 24-hour rainfall event and the available storage the Ash Pond provides. As presented on Figure 1, the flow into the Ash Pond resulting from the 25-year, 24-hour rainfall event is 2,075,849 cubic feet (see Hydrograph Summary Report), and the current available storage provided by Ash Pond is over 22,000,000 cubic feet (see Surface Depression/Excavation Volume Report). Therefore, flow into the Ash Pond during and following the peak discharge of the 25-year flood can be adequately managed via containment and storage in the pond.

6 FLOW FROM THE POND

Given the Ash Pond is considered an incised CCR surface impoundment, in accordance with 257.82 (a)(2) and 257.82 (a)(3), the pond's inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the 25-year flood.

As discussed above, the Ash Pond contains approximately 22,000,000 cubic feet of flood storage. The 25-year flood from the Ash Pond drainage area contributes approximately 2,000,000 cubic feet of stormwater. Therefore, the Ash Pond contains sufficient storage to collect and control the peak discharge resulting from the 25-year flood without discharging. Dewatering of the 25-year flood from the Ash Pod, if necessary, will be accomplished by either evapotranspiration, controlled pumping to a downstream receiving management unit using construction dewatering equipment or a combination thereof. Therefore, the existing facilities can adequately collect and control the peak discharge from the Ash Pond resulting from the 25-year flood.

7 DISCHARGE FROM THE POND

§257.82 (b) requires discharge from the Ash Pond must be handled in accordance with the surface water requirements under § 257.3–3.

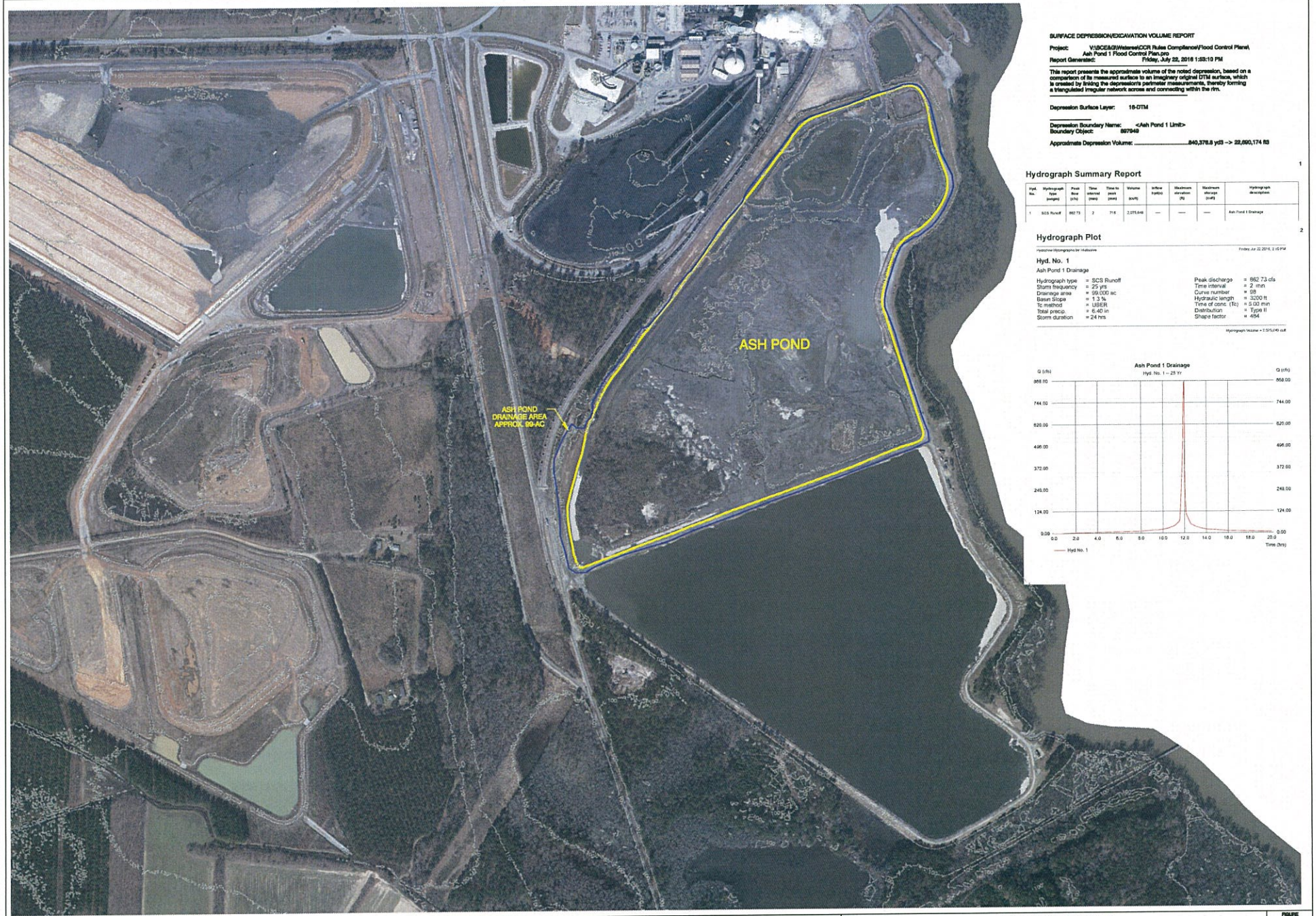
As previously mentioned, discharge from the Ash Pond is regulated in accordance with a National Pollutant Discharge Elimination System (NPDES) permit issued by the SCDHEC. The NPDES permit grants Wateree Station permission to discharge from the facility to the Wateree River in accordance with effluent limitations, monitoring requirements and other conditions. The NPDES permit is issued in accordance with the provisions of the Federal Clean Water Act. Therefore, by complying with the NPDES permit, the discharge from the Ash Pond is being handled in accordance with the surface water requirements under § 257.3-3.

As noted above, the Ash Pond contains sufficient storage to collect and control the peak discharge resulting from the 25-year flood without discharging.

8 CONCLUSION

The Wateree Station Ash Pond is not susceptible to inflow from the 25-year flood. The Ash Pond receives no inflow from the plant. The Ash Pond is capable of receiving and adequately managing and storing direct rainfall from the 25-year, 24-hour storm. Flow from the pond from the 25-year flood is accomplished by either evapotranspiration, controlled pumping to a downstream receiving management unit using construction dewatering equipment or a combination thereof. The discharge from the Ash Pond is permitted under a NPDES permit is issued in accordance with the provisions of the Federal Clean Water Act. Based on the discussions above, the Wateree Station Ash Pond Inflow Design Flood Control System Plan meets the requirements of CCR rule §257.82 – *Hydrologic and Hydraulic Capacity Requirements.*

ATTACHMENT 1



SURFACE DEPRESSION/EXCAVATION VOLUME REPORT

Project: V:\SCE&G\Wateree\CCR Rules Compliance\Flood Control Plans\Ash Pond 1 Flood Control Plan.pro
Report Generated: Friday, July 22, 2016 1:33:10 PM

This report presents the approximate volume of the noted depression, based on a comparison of its measured surface to an imaginary original DTM surface, which is created by linking the depression's perimeter measurements, thereby forming a triangulated irregular network across and connecting within the rim.

Depression Surface Layer: 16-DTM

Depression Boundary Name: <Ash Pond 1 Limit>
Boundary Object: 857949

Approximate Depression Volume: .....840,376.8 yd3 --> 22,690,174 ft3

1

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	SCS Runoff	862.73	2	716	2,075,848	---	---	---	Ash Pond 1 Drainage

2

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve — Friday, Jul 22 2016, 2:10 PM

Hyd. No. 1
Ash Pond 1 Drainage

Hydrograph type	= SCS Runoff	Peak discharge	= 862.73 cfs
Storm frequency	= 25 yrs	Time interval	= 2 min
Drainage area	= 99.000 ac	Curve number	= 98
Basin Slope	= 1.3 %	Hydraulic length	= 3200 ft
Tc method	= USER	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2,075,848 cuft

REVISION	DATE
1)	
2)	
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WATEREE STATION

ASH POND VICINITY AND DRAINAGE AREA

FIGURE 1

Path: V:\SCE&G\Wateree\CCR Rules Compliance\Flood Control Plans\Ash Pond 1 Flood Control Plan.pro Plot Date/Time: Fri Jul 22 2016 / 16:04:36