Prepared for

Dynegy Midwest Generation, LLC
1500 Eastport Plaza Drive
Collinsville, Illinois 62234

INITIAL CCR INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

VERMILION POWER PLANT
OLD EAST ASH POND AREA
NORTH ASH POND AREA
OAKWOOD, ILLINOIS

Prepared by

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1. INTRODUCTION

Dynegy Midwest Generation, LLC (Dynegy) is the owner of the inactive coal-fired Vermilion Power Plant (VPP), also referred to as Vermilion Power Station, located approximately 13-miles Northwest of Danville, Illinois. The Old East Ash Pond Area (OEAP) and North Ash Pond Area (NAP) are two (2) overlapping areas that make up one inactive surface impoundment storing coal combustion residuals (CCR) and will herein referred to as "OEAP/NAP".

Both the OEAP and NAP were individually designed as surface water impoundments to allow suspended solids within the surface water (CCR, soil, etc.) to settle out to the bottom surface of the impoundment. However, the OEAP has been filled with CCR and soil, and no longer impounds surface water. There is an existing surface water impoundment near the northern end of NAP.

Due to the existing impoundment within the NAP, the OEAP/NAP is an existing CCR surface impoundment as defined in *35 Ill. Admin. Code (IAC) 845, Standards for the Disposal of CCR in Surface Impoundments, Part 845.120.*

Therefore, OEAP/NAP must meet the requirements of *35 Ill. Admin. Code (IAC) 845, Standards for the Disposal of CCR in Surface Impoundments* (herein referred to as "*Section 845*").This Inflow Design Flood Control System Plan addresses the requirements of Section 845.510(c) for the OEAP/NAP.

1.1. Facility Information

Facility:	Vermilion Power Plant 10188 East 2150 North Rd Oakwood, IL 61858
Owner/Operator:	Dynegy Midwest Generation, LLC 1500 Eastport Plaza Drive Collinsville, IL 62234

2. INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

Section 845.510(c)(1): Content of the Plan. The owner or operator must prepare initial and annual inflow design flood control system plans for the CCR surface impoundment. 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.

Section 845.510(c)(2): Amendment of the Plan. The owner or operator of the CCR surface impoundment may amend the written inflow design flood control system plan at any time. The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

Hydrologic and hydraulic analyses were completed for the OEAP/NAP initial inflow design flood control system plan. The approach and corresponding results of the analyses are presented in the following subsections. Input data utilized for the analyses was obtained from spillway information shown on design drawings, construction information, topographic surveys, along with information about operational and maintenance procedures provided by Dynegy.

As discussed in **Section 1**, the OEAP has been filled with CCR and soil, and no longer impounds surface water. The OEAP is graded to route storm water surface run-off to the NAP surface water impoundment and spillway system. The OEAP does not have a surface water impoundment or spillway to evaluate.

Therefore, the following subsections pertain only to the evaluation of the NAP in accordance with *Section 845.510,* "*inflow design flood control system plan criteria".*

2.1. Initial Inflow Design Flood Control Systems (Section 845.510(a))

Section 845.510(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 subsections (a)(1) and (2).

1. The inflow design flood control system must adequately manage flow into the CCR surface impoundment during and following the peak discharge of the inflow design flood specified in subsection (a)(3).

2. The inflow design flood control system must adequately manage flow from the CCR surface impoundment to collect and control the peak discharge resulting from the inflow design flood specified in subsection (a)(3).

3. The inflow design flood, at a minimum, is:

A. For a Class 1 CCR surface impoundment, as determined under Section 845.440(a), the probable maximum flood;

B. For a Class 2 CCR surface impoundment, as determined under Section 845.440(a), the 1000-year flood; or

C. For an incised CCR surface impoundment, the 25-year flood.

The NAP is a Class 2 CCR surface impoundement based on the certified documentation of initial hazard potential classification (Luminant, October 2021), in accordance with *Section 845.440*.

An initial inflow design flood control system plan, supported by a hydraulic and hydrologic analysis, was developed for the NAP by evaluating the effects of a 24-hour duration design storm for the 1,000-year Inflow Design Flood (IDF) using a hydrologic HEC-HMS (Version 4.8) computer model and a starting water surface elevation of 585.0 feet (NAVD 88).

In accordance with the June 22, 2021 Illinois Attorney General (IAG) Interim Order (Order), *II. Interim Injunction Relief (2)(b); Within forty-five (45) days of the entry of this Order, Defendant shall submit to Illinois EPA, for it review and approval, a written scope of work for the removal of free water and dewatering of the Ponds at the Site, including a proposed schedule for implementation.* Therefore, the starting water surface elevation was set at the bottom elevation of the NAP (585.0 feet) when evaluating the 1,000-year IDF as the IAG Order requires removal of free water from NAP as part of its normal operating condition.

The computer model evaluated the NAP ability to collect and control the 1,000-year IDF under IAG IO mandatory conditions. Rainfall data for the 1,000-year IDF was obtained from the National Oceanic and Atmosheric Administration (NOAA) Precipitation Frequency Distribution Server (PFDS), which is an online interactive map that provides NOAA Atlas 14 rainfall data for a selected location. The NOAA Atlas 14 rainfall depth is 10.5 inches at NAP per the PFDS for the 1,000-year, 24-hour rainfall event.

The HEC-HMS model results for the NAP indicate that the CCR unit has sufficient storage capacity and spillway structures to adequately manage (1) flow into the CCR unit during and following the peak discharge of the 1,000-year IDF and (2) flow from the CCR unit to collect and control the peak discharge resulting from the 1,000-year IDF. The peak water surcharge elevation

is 602.2 feet (NAVD 88), and the minimum crest elevation of the NAP dike is 604.0 feet (NAVD 88). Therefore, overtopping of the NAP dike is not expected during the evaluated 1,000-year IDF.

Based on this evaluation, the NAP meets the requirements in *Section 845.510(a)*.

2.2. Discharge from the CCR Surface Impoundment (Section 845.510(b))

> *Section 845.510(a): Discharge from the CCR surace impoundment must be handled in accordance with the surface water requirements in Section 845.110(b)(3) and 35 Ill. Adm. Code Subtitle C.*
>
> *Section 845.110(b): Any CCR surface impoundment or lateral expansion of a CCR surface impoundment is subject to the following requirements:*
>
> 3. *Rivers, Lakes and Streams Act [615 ILCS 5/23 and 23(a)] and 17 Ill. Adm. Code 3702.*

The handling of discharge was evaluated by reviewing design drawings, operational and maintenance procedures, and the inflow design flood control system plan developed per *Section 845.510(a)*.

Based on this evaluation, outflow from the NAP is ultimately routed through a NPDES-permitted discharge into the Middle Fork Vermilion River via its secondary settling pond non-CCR surface impoundment. Hydraulic and hydrologic analyses performed as part of the initial inflow design flood control system plan found that the NAP adequately manages flow during the 1,000-year IDF, as overtopping of the NAP is not expected during the evaluated 1,000-year IDF.

Therefore, discharge of pollutants in violation of the NPDES permit is not expected during normal and IDF conditions as all discharge is routed through the existing spillway system and NPDES-permitted outfall.

Based on this evaluation, the NAP meets the requirements in *Section 845.510(b)*.

3. CERTIFICATION

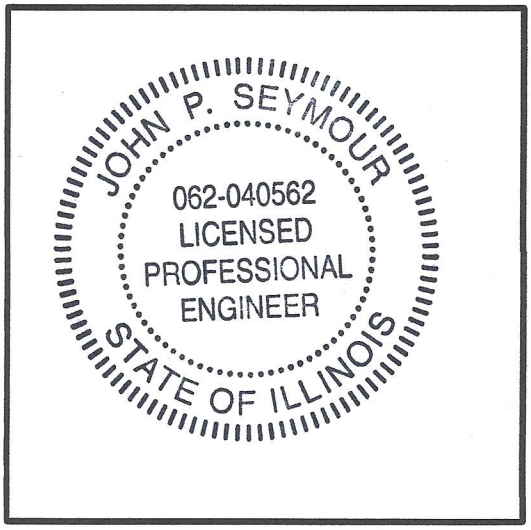
CCR Unit: Dynegy Midwest Generation, LLC; Vermilion Power Plant, Old East Ash Pond Area and North Ash Pond Area

I, John Seymour, being a Registered Professional Engineer in good standing in the State of Illinois, do hereby certify in accordance with Section 845.510(c)(3) to the best of my knowledge, information, and belief, that the information contained in this plan has been prepared in accordance with the accepted practice of engineering and that, for the above referenced CCR Unit, this initial inflow design flood control system plan meets the requirements of *Section 845.510*.

John Seymour
Printed Name

John Seymour 10/22/2021
Signature Date

062.040562 Illinois 30 November 2021
Registration Number State Expiration Date



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