MWG

Midwest Generation, LLC
Powerton Generating Station

Bypass Basin Preliminary Retrofit Plan

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1.0 INTRODUCTION & PURPOSE

Illinois CCR Rule Reference: 35 Ill. Adm. Code 845.770(a)(3)

Pursuant to 35 Ill. Adm. Code 845.770(a)(3), this document provides the written preliminary retrofit plan for the Bypass Basin at Midwest Generation, LLC's (MWG) Powerton Generating Station ("Powerton" or "Station") in Pekin, Illinois. The Bypass Basin is an existing coal combustion residual (CCR) surface impoundment as defined in 35 Ill. Adm. Code 845.120 and 40 CFR 257.53 and is lined with a high-density polyethylene (HDPE) geomembrane liner. The Station used to manage several CCR and non-CCR waste streams in the Bypass Basin, which has a surface area of 0.83 acre and has a storage capacity of approximately 9,000 cubic yards. Because the basin was not constructed with a composite liner or alternative composite liner that meet the requirements of 35 Ill. Adm. Code 845.400(b) or 845.400(c), respectively, MWG intends to retrofit this CCR surface impoundment with a composite liner and a leachate collection and removal system in accordance with 35 Ill. Adm. Code 845.770(a)(1) and 40 CFR 257.102(k). Because the basin has not impacted an existing potable water supply well or impacted groundwater quality within the setback of an existing potable water supply well, is not located in an area of environmental justice concern as determined by the Illinois Environmental Protection Agency (EPA) in 35 Ill. Adm. Code 845.700(g)(6), and is in compliance with the groundwater protection standards in 35 Ill. Adm. Code 845.600, MWG is categorizing the Bypass Basin as a Category 7 closure prioritization pursuant to 35 Ill. Adm. Code 845.700(g). MWG anticipates submitting the construction permit application for retrofitting the Bypass Basin to the Illinois EPA on or before March 31, 2022, which is earlier than the deadline for Category 7 CCR surface impoundments stipulated by 35 Ill. Adm. Code 845.700(h) (August 1, 2023).

This preliminary retrofit plan describes the steps necessary to retrofit the Bypass Basin with a composite liner and a leachate collection and removal system. This preliminary retrofit plan follows the content structure set forth in 35 Ill. Adm. Code 845.770(c) and 40 CFR 257.102(k). However, because the plan is preliminary, it is not the written retrofit plan pursuant to 35 Ill. Adm. Code 845.770(c) and 40 CFR 257.102(k)(2). Similarly, because the plan is preliminary, it may be modified for various reasons, including but not limited to further engineering calculations, available construction materials, and construction rates. The written retrofit plan required by 35 Ill. Adm. Code 845.770(c) and 40 CFR 257.102(k)(2) will contain all of the regulatory requirements and certifications stated in 35 Ill. Adm. Code 845.770(c) and 40 CFR 257.102(k)(2) and will be provided with the corresponding construction permit application submitted to the Illinois EPA for retrofitting the Bypass Basin.

2.0 RETROFIT PLAN NARRATIVE DESCRIPTION

The preliminary retrofit plan for the Bypass Basin is to execute the following sequential steps:

1. Removing the CCR from the basin and transporting the material to a beneficial-use facility or a permitted disposal facility in accordance with current and historic Station maintenance procedures for the Bypass Basin;
2. Obtaining a construction permit from the Illinois EPA for retrofitting the Bypass Basin;
3. Removing the gravel warning and sand cushion layers over the existing geomembrane liner from the basin and transporting the soil materials to a permitted disposal facility;
4. Decontaminating the basin's existing geomembrane liner for re-use as a supplemental liner in the retrofitted basin, including submittal of visual inspection documentation and analytical testing results to demonstrate the existing liner is no longer contaminated with CCR constituents in accordance with 35 Ill. Adm. Code 845.770(a)(4);
5. Decontaminating the basin's appurtenant structures (*e.g.*, inlet troughs, outlet structures, piping);
6. Installing a composite liner system or an alternate composite liner system in accordance with 35 Ill. Adm. Code 845.410 and 40 CFR 257.72 (see Section 2.1);
7. Installing a leachate collection and removal system in accordance with 35 Ill. Adm. Code 845.420 (see Section 2.2);
8. Submitting to the Illinois EPA:
    a. A retrofit completion report (see Section 7.0), and
    b. A certification from a qualified professional engineer licensed in the State of Illinois that the Bypass Basin has been retrofitted in accordance with the activities outlined in the retrofit plan in effect at the time of retrofit and in accordance with the requirements stipulated in 35 Ill. Adm. Code Part 845.

2.1 COMPOSITE LINER SYSTEM

The preliminary retrofit plan for the Bypass Basin is to retrofit it with a composite liner system that meets the requirements of 35 Ill. Adm. Code 845.400(b) and 40 CFR 257.70(b) or with an alternative composite liner system that meets the requirements of 35 Ill. Adm. Code 845.400(c) and 40 CFR 257.70(c). If a composite liner system is selected to retrofit the Bypass Basin, the liner will be installed over the basin's existing geomembrane liner and will consist of a 60-mil HDPE geomembrane over a 2-foot-thick layer of compacted soil with a hydraulic conductivity no more than 1×10^{-7} cm/sec. If an alternative composite liner system is selected to retrofit the Bypass Basin, the liner will be installed over the basin's existing geomembrane liner and will consist of a 60-mil HDPE geomembrane over a lower component that is not a geomembrane and that has a liquid flow rate no more than the liquid flow rate of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

The composite liner system or alternative composite liner system installed in the Bypass Basin will be:

- Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the CCR or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;
- Constructed of materials that provide appropriate shear resistance of the upper and lower component interface to prevent sliding of the upper component, including on slopes; and
- Installed over the basin's existing geomembrane liner which will be re-used as a supplemental liner and will ensure the new liner system is:
    - Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift, and
    - Installed to cover all surrounding earth likely to be in contact with CCR or leachate.

2.2 LEACHATE COLLECTION & REMOVAL SYSTEM

The preliminary retrofit plan for the Bypass Basin is to install a leachate collection and removal system that meets the requirements of 35 Ill. Adm. Code 845.420. This leachate collection and removal system will be placed over the new composite liner system and will be constructed of either granular drainage materials with a hydraulic conductivity of 1×10^{-1} cm/sec or more and a thickness of 24 inches or more above the crowns of leachate collection pipes, or constructed of synthetic drainage materials with a transmissivity of 6×10^{-4} m^2/sec or more. These drainage materials will be chemically resistant to CCR and any non-CCR waste managed in the retrofitted Bypass Basin and the leachate expected to be generated during operation of the retrofitted Bypass Basin. These materials will also be of sufficient strength and thickness to prevent collapse under the pressures exerted by the overlying waste and any waste cover materials and equipment used at the retrofitted Bypass Basin.

Collection pipes will be installed at the base of the drainage materials in the leachate collection and removal system to collect and convey leachate to a sump or multiple sumps to ultimately be pumped out of the retrofitted Bypass Basin. These pipes will be installed with slopes that allow flow from all points within the basin to the sump(s), will be constructed in such a way as to prevent clogging of the leachate collection and removal system with fines during the active life and post-closure care period of the basin, and will be large enough to conduct periodic cleaning. The bottom of the leachate collection and removal system will be sloped towards the collection pipes at a grade of three percent or more.

To prevent CCR and non-CCR sediments from clogging the leachate collection and removal system, a filter layer will be installed over the system's drainage materials; this filter layer will have a hydraulic conductivity

of at least 1×10^{-5} cm/sec. A protective layer or other means of deflecting the force of CCR pumped into the retrofitted Bypass Basin will be installed over this filter layer.

Finally, the retrofitted Bypass Basin's leachate collection and removal system will be operated, at a minimum, to remove free liquids from the basin at the time of closure and during post-closure care.

3.0 CCR REMOVAL & DECONTAMINATION PROCEDURES

The preliminary retrofit plan for the Bypass Basin is to follow the sequential steps outlined in Section 2.0.

MWG will remove the ash stored above the granular protective layers covering the Bypass Basin's existing geomembrane liner in accordance with historical cleaning practices in the Station's maintenance of the Bypass Basin where ash is periodically removed from the basin to recover storage capacity. After removing ash stored in the Bypass Basin per the Station's usual practice, the remaining retrofit work will be performed in accordance with the retrofit plan in effect at the time of the retrofit work and the construction permit issued by the Illinois EPA.

MWG will first remove the granular protective layers covering the basin's existing geomembrane liner: a 6-in.-thick gravel warning layer and a 12-in.-thick sand cushion layer. These soil materials will be loaded onto trucks and transported to a permitted disposal facility. Because these soil materials are likely to contain CCR materials, the trucks transporting the material off-site will carry manifests pursuant to 35 Ill. Adm. Code 845.740(c)(1)(A) and as specified in 35 Ill. Adm. Code 809. In addition, a CCR transportation plan will be prepared in accordance with 35 Ill. Adm. Code 845.740(c)(1)(B) which will include:

- Identification of the transportation method selected;
- The frequency, time of day, and routes of CCR transportation;
- Any measures to minimize noise, traffic, and safety concerns caused by the transportation of the CCR;
- Measures to limit fugitive dust from any transportation of CCR;
- Installation and use of a vehicle washing station;
- A means of covering the CCR for any mode of CCR transportation;
- A requirement that the CCR is transported by a permitted special waste hauler under 35 Ill. Adm. Code 809.201.

On-site fugitive dust control measures will also be implemented as necessary to minimize airborne CCR particulates while CCR and CCR-impacted material are being handled. Pursuant to 35 Ill. Adm. Code 845.740(c)(2)(A), these dust control measures will include a water spray, commercial dust suppressant, or a combination of these.

Prior to the removal of the granular protective layers covering the Bypass Basin's existing geomembrane liner, signage will be posted at the Station's entrance warning of the hazards of CCR dust inhalation in accordance with 35 Ill. Adm. Code 845.740(c)(3)(A). Pursuant to 35 Ill. Adm. Code 845.740(c)(3)(B), a written notice will be issued to each of the local governments through which the CCR-impacted material will be transported. This written notice will include an explanation of the hazards of CCR dust inhalation, the aforementioned CCR transportation plan, and a tentative transportation schedule.

After the granular protective layers in the basin have been removed, MWG will begin decontaminating the existing geomembrane liner to be re-used as a supplemental liner under the new composite liner. The basin's inlet trough, outlet structure, associated piping, *etc*. will also be decontaminated. Decontamination procedures may include pressure washing, scrubbing, flushing, or other generally accepted decontamination methods. Following decontamination, the existing geomembrane liner will be visually inspected to ensure the liner is competent and is no longer contaminated with CCR constituents. Analytical tests will also be conducted in accordance with the construction permit issued by the Illinois EPA at the time of the retrofit work to demonstrate that the liner is no longer contaminated with CCR constituents. The results from the visual inspection and analytical tests will be submitted to the Illinois EPA for approval of re-using the existing geomembrane liner as a supplemental liner under the new composite liner in the retrofitted Bypass Basin.

4.0 ESTIMATED MAXIMUM INVENTORY OF CCR TO BE REMOVED

For the purposes of this preliminary retrofit plan, the maximum amount of CCR that will be removed during the retrofit of the Bypass Basin is conservatively based on the estimated maximum capacity of the basin: 9,000 cubic yards.

5.0 ESTIMATED LARGEST AREA TO BE RETROFITTED

The estimated largest area of the Bypass Basin to be retrofitted is anticipated to be the basin's full surface area: 0.83 acre.

6.0 RETROFIT SCHEDULE

The preliminary retrofit plan estimates that the Bypass Basin will be retrofitted by 2023. Table 1 lists the major milestones necessary for retrofitting the Bypass Basin and the expected duration for completing each milestone. No later than 60 days prior to MWG submitting the construction permit application to the Illinois EPA for retrofitting the Bypass Basin in accordance with 35 Ill. Adm. Code 845.220(b), MWG will prepare a notice of intent to retrofit the Bypass Basin in accordance with 35 Ill. Adm. Code 845.770(d) and 40 CFR 257.102(k)(5).

Table 1 – Planning Level Schedule for Retrofitting the Bypass Basin

Activity	Estimated Duration
Prepare Retrofit Construction Design Documents	6 Months
Obtain Retrofit Construction Permit from Illinois EPA	13 Months
Hire Contractor to Complete Retrofit Activities in Accordance with Illinois EPA Permit	4 Months
Remove Protective Granular Layers Above Existing Liner	1 Week
Decontaminate Existing Liner and Basin Appurtenances (Including Laboratory Testing)	3 Weeks
Obtain Approval from Illinois EPA to Re-Use Existing Liner as Supplemental Liner	3 Months
Install Composite Liner System	1 Week
Install Leachate Collection and Removal System (Including Filter and Protective Layers)	1 Week
Submit Retrofit Completion Report and Certification to Illinois EPA	1 Week
Obtain Approval of Retrofit Completion Report and Certification from Illinois EPA	3 Months
Complete and Certify Retrofit of the Bypass Basin	--

7.0 COMPLETION OF RETROFIT ACTIVITIES

Upon completion of all retrofit activities required by 35 Ill. Adm. Code Part 845 and 40 CFR 257.102(k) and approved by the Illinois EPA in a construction permit, a retrofit completion report and certification will be submitted to the Illinois EPA. The retrofit completion report will include the engineering and hydrogeology reports containing monitoring well completion reports, boring logs, all construction quality assurance (CQA) reports, certifications, designations of CQA officers-in-absentia required by 35 Ill. Adm. Code 845.290; photographs with time, date, and location information of the liner system and leachate collection system; other photographs relied upon for documentation of construction activities; a written summary of the retrofit requirements and completed activities as stated in the construction permit and 35 Ill. Adm. Code 845; and any other information relied upon by the qualified professional engineer for the certification. Pursuant to 35 Ill. Adm. Code 845.770(g)(2) and 40 CFR 257.102(k)(4), the certification will be prepared by an independent, qualified professional engineer licensed in the State of Illinois and will verify that the Bypass Basin has been retrofitted in accordance with the retrofit plan in effect at the time of the retrofit work, the requirements of 35 Ill. Adm. Code Part 845, and the requirements of 40 CFR 257.102(k). Finally, within 30 days of the Illinois EPA approving the retrofit completion report and certification, a notification of completion of retrofit activities will be prepared in accordance with 35 Ill. Adm. Code 845.770(h).