



Indianapolis Power & Light Company  
Harding Street Generating Station

CCR Surface Impoundment Closure Plan

Prepared by



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## 1 INTRODUCTION & PURPOSE

### **Federal CCR Rule Reference: 40 CFR 257.102(b)**

Pursuant to 40 CFR 257.102(b), this document provides the written closure plan for the following existing coal combustion residuals (CCR) surface impoundments at Indianapolis Power & Light Company's (IPL) Harding Street Generating Station:

- Pond 1,
- Pond 2A/2B, and
- Pond 3.

IPL intends to close these existing CCR surface impoundments in accordance with the requirements of 40 CFR 257.102(d) by leaving the CCR in place and installing a final cover system.

## 2 CLOSURE PLAN NARRATIVE DESCRIPTION

### **Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(i) & 257.102(d)(1)**

Prior to closure, IPL will divert any low volume waste and/or storm water streams to the appropriate facilities and will remove process piping feeding into the existing CCR surface impoundments. At the time of closure, each existing CCR surface impoundment and the *in situ* CCR therein will be sufficiently dewatered and stabilized. Then, the stored CCR in each existing CCR surface impoundment and, if required, any general fill will be graded to designed contours. A protective final cover system will subsequently be installed over the collective footprints of the aforementioned CCR surface impoundments to minimize infiltration and prevent storm water contact with the CCR. Materials for the final cover system will be placed and compacted to limit erosion, settling, and future maintenance, and to maintain positive drainage. As the final cover system is installed, soil properties, compaction, permeability, and thickness testing will be performed to confirm compliance with the closure plan and federal and state regulations in effect at the time of closure.

## 3 FINAL COVER SYSTEM DESCRIPTION

### **Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(iii) & 257.102(d)(1)**

Pursuant to the closure performance standards prescribed in 40 CFR 257.102(d)(1), the final cover system encapsulating the CCR surface impoundments will:

1. Minimize the post-closure infiltration of liquid into the CCR,
2. Minimize the risk of release of CCR or contaminated run-off to the ground or surface waters, or to the atmosphere,
3. Preclude the probability of future impoundment of water, sediment, or slurry,
4. Provide major slope stability to prevent sloughing of the final cover system during the post-closure care period,
5. Minimize future maintenance, and
6. Allow closure activities to be completed as quickly as practical consistent with recognized and generally accepted good engineering practices.

### **3.1 ESTABLISH GRADE & SUPPORT FOR FINAL COVER SYSTEM**

#### **Federal CCR Rule Reference: 40 CFR 257.102(d)(1)(ii), 257.102(d)(1)(iii), & 257.102(d)(3)(i)(D)**

To accomplish the closure goals promulgated by 40 CFR 257, the upper surface of the stored CCR, or possibly general fill if sufficient quantities of CCR are not available, will be graded to form an inverted drainage system. A swale traversing across the collective footprint of the existing CCR surface impoundments in the east-west direction will collect storm water run-off from high-point ridges established along the northern and southern sides of that footprint. This trough-like drainage system will generally be graded in the north-south direction with slopes between 2% and 12%, inclusive. However, for erosion control, slopes inducing channelized flow will be graded at approximately 1%. The aforementioned swale will convey storm water to a drainage ditch located along the eastern boundary of the final cover system's footprint. The slopes of the final cover system will be designed to be globally stable from a geotechnical basis. In addition, these slopes will be designed to accommodate settling and subsidence while maintaining this positive drainage strategy.

### **3.2 INFILTRATION LAYER**

#### **Federal CCR Rule Reference: 40 CFR 257.102(d)(1)(i) & 257.102(d)(3)(ii)(A)**

Using the nomenclature in 40 CFR 257, an alternate infiltration layer will be placed on top of the graded CCR to minimize the infiltration of liquids through the closed CCR surface impoundments. Specifically, the alternate infiltration layer will consist of, in order of increasing proximity from the graded CCR, a nonwoven geotextile, a geomembrane, a sand drainage layer, and a compacted cohesive soil layer.

The geomembrane will consist of 40-mil-thick, linear low-density polyethylene (LLDPE), which has a minimal hydraulic conductivity that is less than the permeability of any of the natural subsoils underlying the unlined existing CCR surface impoundments. The installation of the geomembrane will be subjected to a quality assurance and control program. A nonwoven geotextile will be placed directly over the geomembrane to prevent damage to the latter during the placement of the remainder of the infiltration layer.

The sand and the compacted cohesive soil layers will protect the geosynthetics from mechanical and environmental disturbances and will provide additional control against the infiltration of liquids into the residual CCR. Furthermore, the sand layer will (1) promote drainage of any liquids that have percolated to the soil-geomembrane interface and (2) preclude damage to the geomembrane.

### **3.3 EROSION LAYER**

#### **Federal CCR Rule Reference: 40 CFR 257.102(d)(3)(ii)(B)**

Continuing with the nomenclature in 40 CFR 257, an erosion layer consisting of topsoil capable of sustaining native plant growth will be provided above the infiltration layer to minimize erosion of the final cover system. Specifically, the erosion layer will consist of at least six inches of topsoil. The entire surface of the final cover system will be seeded with a suitable seed mixture compliant with the 2016 Indiana Department of Transportation's Standard Specifications, and regular maintenance of the seeding

will take place until a vegetative cover is established and self-sustaining. The storm water run-off management strategy described in Section 3.1 further minimizes erosion of the final cover system.

## 4 ESTIMATED MAXIMUM INVENTORIES OF CCR

### Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(iv)

The estimated maximum inventory of CCR that will be contained within Ponds 1, 2A/2B, and 3 at any point over their active lives is approximately 300 acre-ft in total.

## 5 ESTIMATED COVER SURFACE AREA

### Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(v)

As previously discussed, the final cover system will encapsulate the collective footprint of the Station's existing CCR surface impoundments, which is approximately 26 acres. It is estimated that this area represents the largest surface area that will ever require a final cover at any point over the ponds' active lives.

## 6 CLOSURE SCHEDULE

### Federal CCR Rule Reference: 40 CFR 257.102(b)(1)(vi)

Table 1 lists the major milestones necessary to close the Station's existing CCR surface impoundments with an estimated duration and year of completion for each milestone. IPL estimates that all closure activities for the existing CCR surface impoundments at the Harding Street Generating Station will be completed by the year 2021.

**Table 1: Planning Level Schedule for Closure of Existing CCR Surface Impoundments**

Task Description	Estimated Duration	Estimated Completion Year <sup>1</sup>
Cease Discharging Low Volume Waste Streams to Ponds 1, 2A/2B, & 3	14 Months	2017
Notify Indiana Department of Environmental Management (IDEM) of Intent to Close	1 Month	2017
Obtain Necessary Approvals & Permits	12 Months	2018
Remove Critical Sections of Ash Sluicing Pipes	1 Month	2018
Dewatering & Consolidation of Ponds 1, 2A/2B, & 3	6 Months	2019
Install Final Cover System	9 Months	2020
Certify Closure of Ponds 1, 2A/2B, & 3 in Accordance with Closure Plan	1 Month	2021
Notify IDEM of Closure of Ponds 1, 2A/2B, & 3	1 Month	2021

<sup>1</sup> These dates are based on a preliminary schedule for demonstrative purposes and are subject to change.

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## 7 AMENDMENTS TO CLOSURE PLAN

### **Federal CCR Rule Reference: 40 CFR 257.102(b)(3)**

IPL will amend this plan prior to a change in the operation of any of the existing CCR surface impoundments that would substantially affect this plan or after an unanticipated event necessitates a revision to this plan. If this plan is revised, IPL will retain an independent, qualified professional engineer licensed in the State of Indiana to provide written certification that any and all amendments to this plan meet the requirements of 40 CFR 257.102(b).

## 8 COMPLETION OF CLOSURE ACTIVITIES

### **Federal CCR Rule Reference: 40 CFR 257.102(f)(3)**

Upon completion of closure of the existing CCR surface impoundments, IPL will obtain a certification from an independent, qualified professional engineer licensed in the State of Indiana verifying that the surface impoundments have been closed in accordance with the closure plan in effect at the time of closure.

## 9 CERTIFICATION

**Federal CCR Rule Reference: 40 CFR 257.102(b)(4)**

This document meets the requirements for a written closure plan pursuant to 40 CFR 257.102(b).

I certify that this document was prepared by me or under my supervision and that I am a registered professional engineer under the laws of the State of Indiana.

Certified By: 

Date: 10-14-2016

Seal:



10-14-2016

EXP 7-31-2018