## SCS ENGINEERS

December 21, 2017 File No. 25211357.33

Mr. Jeff Harter Plant Leader-Environmental Indianapolis Power & Light Petersburg Generating Station 6925 N. State Road 57 Petersburg, IN 47567

# Subject: Dike Inspection - Petersburg Generating Station Ash Pond Facilities 2017-1, November 17, 2017

Dear Mr. Harter:

SCS Engineers (SCS) is pleased to submit this dike and basin inspection report for the Indianapolis Power & Light (IPL) Petersburg Generating Station Ash Pond Facilities. Mr. David M. Hendron, PE, has prepared this report. The report presents a Summary of Visual Observations, and Conclusions and Recommendations. Mr. Hendron performed the inspection on November 17, 2017. Mr. Hendron made a presentation summarizing the findings and recommendations contained in this report to Mr. Wil Teague at the conclusion of the inspection.

Following the inspection, Mr. Hendron completed the IPL Dike Field Review Checklist. The completed form is given in **Attachment A** to this report. During the inspection, Mr. Hendron documented conditions observed by the photographs shown in **Attachment B** to this report.

The general layout of the ash ponds at the Petersburg Generating Station is shown on **Figure 1**. At the time of the inspection, IPL was using Pond A and Pond A Discharge for processing bottom ash materials from plant operations. IPL went to dry ash processing in the recent past and will use only Pond A and Pond A Discharge for bottom ash processing only in the future. The present plans are to cease use of all ash ponds in April 2018.

## SUMMARY OF VISUAL OBSERVATIONS

There were no observations of problem areas or areas of instability in the ponds being actively used by IPL during this inspection. Further details of the results of the inspection are presented in the following sections of this report.

Mr. Wil Teague, Environmental Coordinator, was a facility contact for the inspection. Mr. Teague accompanied Mr. Hendron during the inspection. Weather conditions during the inspection were clear and cool. Mr. Jeff Harter December 21, 2017 Page 2

## SUMMARY OF OBSERVATIONS OF THE ASH PONDS

#### 1. General - Operational Status of the Ash Ponds

- a. The only sluicing being done is going to Pond A. Material sluiced to Pond A will remain in Pond A until the cessation of use and closure of Pond A in 2018.
- b. The south portion of Pond A, formerly redesignated as Pond D, is being used for construction of the new waste water treatment plant. This area is not included in the scope of this inspection.
- c. Pond C was used to process wet bottom ash, excavated flyash, and FGD slurry materials from Pond A until September 2017. At that time, closure of Pond C was initiated in the same general manner that Pond B was closed.

#### 2. Pond A

- a. No significant problems were observed during the inspection.
- b. Pond A had limited capacity at the time of this inspection.
- c. There was sluicing of bottom ash and scrubber sludge going on into Pond A at the time of the inspection. This sluicing is scheduled to continue until April 2018 at the present time.
- d. There has been an emergency spillway constructed in the intermediate dike between Pond A and Pond A'. The spillway was recommended and designed by CH2MHill. The spillway was constructed and operational at the time of this inspection.

#### 3. Pond A (Discharge)

- a. No significant problems were observed during the inspection.
- b. Discharge pipe from Pond A Discharge to Lick Creek was visible at the time of this inspection. Rip rap on the downstream slope of Pond A Discharge dike appeared stable. The exposed end of the discharge pipe looked in good condition.
- c. CH2MHill also recommended and designed an emergency spillway on top of the downstream dike for Pond A'. The spillway was constructed and operational at the time of this inspection.

#### 4. Pond C

- a. Pond C was not being used for processing ash slurry materials generated from the excavation activities in Pond A at the time of this inspection.
- b. Pond C is not included in scope of this inspection.

#### 5. General Observations

- a. Overall, the slopes of the ash ponds inspected look to be in satisfactory condition.
- b. IPL has constructed two emergency spillways as identified earlier in these notes. SCS has requested the design drawings for these spillways. SCS has not reviewed the

Mr. Jeff Harter December 21, 2017 Page 3

underlying documents for these facilities but understands that they have been designed and sealed by a registered Indiana professional engineer from CH2MHill.

### CONCLUSIONS AND RECOMMENDATIONS

Based on the visual inspection, the dikes that form Ponds A and C appeared to be in satisfactory condition. SCS has no recommendations for further actions on the part of IPL as a result of this inspection.

SCS appreciates the opportunity to perform this inspection and looks forward to assisting IPL in future inspection of their ash disposal facilities. If you have any questions with regard to this report, please do not hesitate to contact me at (312) 286-9397.

Sincerely yours,

David M. Hendron, PE Indiana PE 10000050 SCS ENGINEERS

DH/lmh

Enclosures: Figure 1 – Site Location Showing Basin Configuration Attachment A – IPL Dike Field Review Checklist Form Attachment B – Photographs

I:\3573\Inspection Reports\Petersburg Station - 17-1 Draft Report\Petersburg Inspection\_Report\_Text -17-1 December 21, 2017.doc

## FIGURE 1

Site Location Showing Basin Configuration

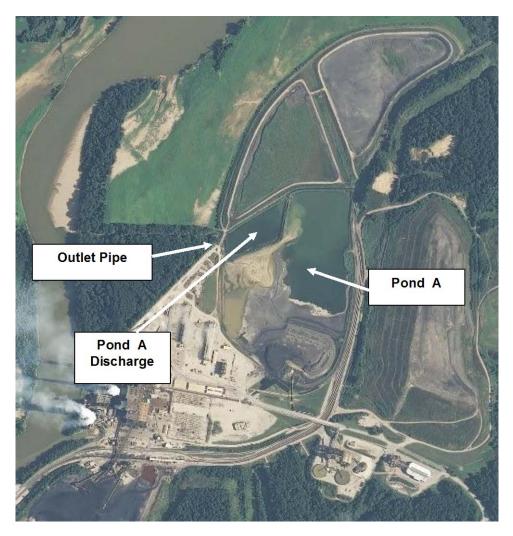


Figure 1. Site Location Showing Basin Configuration

## ATTACHMENT A

IPL Dike Field Review Checklist Form

## <u>Attachment A - IPL Dike Field Review Checklist – 17-1 Inspection Report</u> <u>Petersburg Station</u>

 <u>Complete all Portions of this Section (Pre-review)</u> Date of Review: <u>November 17, 2017</u> Name of Dike: <u>Ash Ponds A, Pond A Discharge</u> Project Number <u>#25211357.33</u>

2) <u>Review Inventory – Highlight missing information (Pre-review)</u> Owner(s) Name(s): <u>Indianapolis Power & Light Company (IPL)</u> Address: <u>6925 N. State Rd 57</u> City: <u>Petersburg</u> State: <u>Indiana</u> Zip (+4) <u>47467</u> Telephone (Home): \_\_\_\_\_ Telephone (Work): <u>812-354-7224</u> Contact Person: <u>Wil Teague</u> Designed By: <u>IPL</u> Constructed By: Year Completed: <u>Various</u> Plans Available (Yes, No) (Location): <u>Partial</u> Purpose of Dike: <u>Ash slurry processing</u> Age of Dike: <u>Various</u>

3) <u>General Information</u>

Mowing (times per year): Once or twice during dry times

Prior problems (wet areas, erosion, slides): <u>See prior inspection reports. Pond A and Pond A</u> <u>Discharge were the ponds being used for ash processing at the time of the inspection. Ponds B</u> <u>and C were in the process of closure construction activities and were not included in this</u> inspection report.

Repair or modification (what & when): Failure/Incident/Breach (max. pool): <u>None</u> Downstream hazard status (recent changes): <u>None</u> Dike Embankment Material: <u>Ponds A and Pond A Discharge – compacted natural soil materials</u>

based on results of borings completed in 2011.

Slope Erosion Control: No problems observed during this inspection.

4) <u>Field Information</u> (while at site)

Pool Elevation (during review): Pond A and Pond A Discharge were essentially full at the time of the inspection and there was discharge into Lick Creek.

Site Conditions (temp., weather, ground moisture): <u>Cool and clear. Heavy rainfall in the days</u> prior to the inspection.

Review Party: David M. Hendron and Wil Teague

{General Information, Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, Pond Drain}

	Require Action ع
INSIDE SLOPE       Gradient: Horizontal:       3.0       Vertical:       1.0       (est. meas.)         x VEGETATION [no problem]	None Monitor Maintenance
<ul> <li>Trees: Quantity: (&lt;5, sparse, dense)</li> <li>Diameter: (&lt;6", 6-12", &gt;12")</li> <li>Location:</li> <li>Notes:</li> </ul>	
<ul> <li>Brush: Quantity: (spare, dense)</li> <li>Location:</li></ul>	
Ground Cover: Type: (grass, crown vetch) Other:	
<ul> <li>x SLOPE PROTECTION [no problem]</li> <li>None</li> <li>Riprap: Average Diameter: (adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted-yes, no) Notes:</li> </ul>	
Wave Berm: Vegetation: (adequate, bare, sparse, improper vegetation) Notes:	
<ul> <li>Other: Notes:</li> <li>x EROSION [no problem, could not inspect thoroughly]</li> <li>Wave Erosion (beaching): Scarp: Length: Height: Location: Notes:</li> </ul>	
Runoff Erosion (Gullies): Quantity: Depth: Location: Notes/Causes:	
x INSTABILITIES [no problem, could not inspect thoroughly] □ Slides: Transverse Length: Longitudinal Length: Scarp: Width: Length: Location: Crack: Width: Depth: Notes/Causes	
<ul> <li>Cracks:</li> <li>Transverse</li> <li>Longitudinal</li> <li>Other</li> <li>Quantity:</li> <li>Length:</li> <li>Width:</li> <li>Depth:</li> <li>Location:</li> <li>Notes/Causes:</li> </ul>	
{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, Pond Drain}	None Monitor Maintenance Engineer

Required Action

	Action
<ul> <li>Cracks: Transverse Longitudinal</li> <li>Quantity: Length: Width: Width: Coation: Notes/Causes:</li> </ul>	Depth: Ž≥≥ 龅 □ □ □ □
□ Bulges □ Depressions □ Hummocky Size: Height: Depth: Location: Notes/Causes:	
□ Bulges □ Depressions □ Hummocky Size: Height: Depth: Location: Notes/Causes:	
<ul> <li>OTHER [no problem could not inspect thoroughly]</li> <li>x Rodent Burrows: (few, numerous) None observe Location: Notes/Causes:</li> <li>x Other: None observed</li> </ul>	<u>d</u>
<ul> <li>6) CREST Length: Width: (est. measurements</li> <li>x□ VEGETATION [no problem]</li> <li>□ Trees: Quantity: (&lt;5, sparse, dense)</li> <li>Diameter: (&lt;6", 6-12", &gt;12")</li> <li>Location:</li> </ul>	
Notes: <ul> <li>Brush: Quantity: (spare, dense)</li> <li>Location:</li></ul>	
<ul> <li>Ground Cover: Type: (grass, crown vetch) Other:</li> <li>Quantity: (bare, sparse, adequate, dense)</li> <li>Appearance: (too tall, too short, good)</li> <li>Notes:</li> </ul>	
x = EROSION [no problem] Runoff Erosion (Gullies): Quantity: Depth: Location: Notes:	

Required

{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, Pond Drain}

	x□ WIDTH [no problem]	None None Monitor Maintenance Engineer
	Too Narrow     Location:	
	Notes/Causes:	
	x INSTABILITIES [no problem] Cracks: Transverse Longitudinal Other Quantity: Length: Vidth: Depth: Location: Notes/Causes:	
	<ul> <li>Cracks: Transverse Longitudinal Other</li> <li>Quantity: Length: Width: Depth: Depth: Location: Notes/Causes:</li> </ul>	
	<ul> <li>Bulges: Depressions Hummocky</li> <li>Size: Height: Depth:</li> <li>Location:</li> <li>Notes/Causes:</li> <li><b>x OTHER</b> [no problem]</li> <li>Rodent Burrows: (few, numerous)</li> <li>Location:</li> <li>Notes:</li> </ul>	
	Other: Notes:	
7)	OUTSIDE SLOPE       Gradient: Horizontal:       3.0       Vertical:       1.0       (est. meas.)         x□       VEGETATION [no problem]       □       Trees:       Quantity: (<5, sparse, dense)	
	<ul> <li>Brush: Quantity: (spare, dense)</li> <li>Location:</li></ul>	
	{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, Pond Drain}	

	None Action Maintenance Engineer
x = EROSION [ no problem] Runoff Erosion (Gullies): Quantity: Depth: Width: Length:	žžžů
x: INSTABILITIES [no problem]         Slides: Transverse Length:       Longitudinal Length:         Scarp: Width:       Length:         Location:	
<ul> <li>Cracks:</li> <li>Transverse</li> <li>Longitudinal</li> <li>Other</li> <li>Quantity:</li> <li>Length:</li> <li>Width:</li> <li>Depth:</li> <li>Location:</li> <li>Notes/Causes:</li> </ul>	
<ul> <li>Cracks:          <ul> <li>Transverse</li> <li>Longitudinal</li> <li>Other</li> <li>Quantity:</li> <li>Length:</li> <li>Width:</li> <li>Depth:</li> <li>Location:</li> <li>Notes/Causes:</li> </ul> </li> </ul>	
<ul> <li>Bulges: Depressions Hummocky</li> <li>Size: Height: Depth: Depth: Location:</li> <li>Notes/Causes:</li> </ul>	
x □ OTHER [no problem x □ Rodent Burrows: (few, numerous) <u>None observed</u> Location: Notes:	
□ Other: Notes: <b>x</b> □ <b>SEEPAGE</b> [no problem] □ Wet Area □ Flow □ Boil □ Sinkhole Flow Rate	
<ul> <li>Aquatic Vegetation –</li> <li>Rust Colored Deposits          <ul> <li>None</li> <li>Sediment in Flow</li> <li>None</li> <li>Other:</li> <li>Notes/Causes:</li> </ul> </li> </ul>	
{Inside Slope, Crest, <b>Outside Slope</b> , Outlet/Inlet Structures, Pond Drain}	
	Required Action

None Monitor Maintenance Engineer

□ Wet Area □ Flow □ Bo	oil 🗆 Sinkho	ble	
Flow Rate	9	Size:	
Location:			
Aquatic Vegetation	None		
Rust Colored Deposits	None		
Sediment in Flow	None		
Other:			
Notes/Causes:			

#### 8) **OUTLET/INLET STRUCTURES**

#### x GENERAL INLET [no problem]

□ Inlet Pipe Dimensions:\_\_\_\_\_ (adequate, too small)

Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other): Location:

Deterioration: (missing sections, rusted, collapsed) In Use: (Yes, No)\_\_\_\_\_

Pond Erosion at Inlet: (Describe)

□ Other

#### x OUTLET STRUCTURES [no problem]

□ Number of Outlet Structures: **One** 

X Description/Location of Outlet Structures: In the northwest portion of Pond A -

#### Discharge.

**x** Outlet Structure 1:

Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other):

Recommended repairs in previous report completed and continue to operate satisfactorily.

Deterioration: (missing section, collapsed, rusted Erosion at Outlet Structure: (soil piping, seep collar, etc.) Debris: (leaves, trash, logs, ice, etc.)

Notes:

{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, Pond Drain}

		None Mainten M
□ Outlet Structure Type: (s	2 teel, concrete, aluminum, stainless steel, corrugated metal wood, other):	
Deterio	ration:(missing section, collapsed, rusted):	
Erosion	at Outlet Structure: (soil piping, seep collar, etc.)	
Debris:	(leaves, trash, logs, ice, etc.)	
Notes:		
	teel, concrete, aluminum, stainless steel, corrugated metal wood, other):	
Deterio	ation:(missing section, collapsed, rusted):	
Erosion	at Outlet Structure: (soil piping, seep collar, etc.)	
	(leaves, trash, logs, ice, etc.)	
9) POND DRAIN		
	und Does not have one	
	d During Inspection (yes, <b>no</b> )	
🗆 Type (no	D VALVE/SLUICE GATE [no problem] t accessible, from shore, boat, walkway, other)	
□ Conc Lc	/Platform: rete Deterioration □ Cracks (platform, piers, end supports, railing) ocation: otes:	

{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, Pond Drain}

	Required Action ଝ			
		None Monitor	Maintenance	Engineer
Wood Deterioration Notes:				
Metal Deterioration (minor, moderate, extensive, other) Notes:	_ _			
x POND DRAIN COMPONENTS [no problem] Concrete Structure Locations: Description: (deterioration, misalignment, cracks): Nateo (Courses):				
<ul> <li>Notes/Causes:</li> <li>Valve Control (Operating Device)</li> <li>No Operating Device</li> <li>No Stem</li> <li>Bent/Broken Stem</li> <li>Other Notes/Operability:</li> </ul>	- - -			
<ul> <li>Metal Deterioration: (surface rust, minor, moderate, extensive, other)</li> <li>Location:</li> <li>Flow Rate:</li> <li>Notes/Causes:</li> </ul>	- -			
□ Mis-alignment Notes/Causes:	- -			
Leakage – Flow Rate: Notes/Causes:				
<ul> <li>Outlet Conduit</li> <li>Metal: (loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out)</li> <li>Location:</li></ul>	-			
<ul> <li>Concrete (bug holes, hairline crack, efflorescence)         (spalling, popouts, honeycombing, scaling, craze/map cracks)         (isolated crack, exposed rebar, disintegration, other)         Dimensions/Location:</li></ul>	_ _			
Plastic: (deterioration, cracking) Location: Notes/Causes:	_			

	Monitor Mainten Adineer Engineer
Conduit Deformation	
Location: Notes/Causes:	_
<ul> <li>Separated Joint</li> <li>Loss of Joint Material</li> <li>Location/Description:</li> <li>Notes/Causes:</li> </ul>	
<ul> <li>Undermining</li> <li>Location/Description:</li> <li>Notes/Causes:</li> </ul>	
Vegetation (trees, brush) Notes:	
□ Other Notes:	
<ul> <li>Discharge Outlet</li> <li>Type (pipe outlet, concrete channel, rock-lined channel, none)</li> <li>Notes:</li> </ul>	
<ul> <li>Riprap: Average Diameter: (adequate, sparse, displaced, weathered, vegetation) bedding/fabric noted – yes, no)) Notes:</li> </ul>	
<ul> <li>Concrete (bug holes, hairline crack, efflorescence)         (spalling, popouts, honeycombing, scaling, craze/map cracks)         (isolated crack, exposed rebar, disintegration, other)         Dimensions/Location:         Notes/Causes:</li> </ul>	
□ Mis-alignment Location/Description: Notes/Causes:	
<ul> <li>Separated Joint <ul> <li>Loss of Joint Material</li> <li>Location/Description:</li> <li>Notes/Causes:</li> </ul> </li></ul>	
<ul> <li>Undermining</li> <li>Location/Description:</li> <li>Notes/Causes:</li> </ul>	
□ Other Notes:	None Monitor Maintenance Engineer
{Inside Slope, Crest, Outside Slope, Outlet/Inlet Structures, <b>Pond Drain</b> }	None None Monitor Maintena

Required

Required Action

## ATTACHMENT B

Photographs





Photo 1: Pond A west dike, looking north

Photo 2: Same as Photo 1, looking south



**Photo 3:** Pond A Discharge, looking north





**Photo 4:** Discharge into Pond A from plant, looking east from south dike of Pond A Discharge

**Photo 5:** Same as Photo 4, looking southwest



**Photo 6:** Same as Photo 4, looking east







**Photo 7:** Pond A, looking southwest from south dike of Pond A Discharge

Photo 8: Same as Photo 7, looking south

Photo 9: Same as Photo 7, looking south.







Photo 10: Same as Photo 7, looking southeast

Photo 11: Same as Photo 7, looking east



Photo 12: South upper lift of perimeter dike of Pond B, looking west

#### SCS ENGINEERS

#### Petersburg Plant – Photos from 17-1 Inspection 2600 State Highway 57 North SCS Engineers Project #25211357.33





Photo 13: Pond B closure activities, looking south from the center of Pond B

Photo 14: Same as Photo 13, looking southeast



Photo 15: Same as Photo 13, looking east





Photo 16: Same as Photo 13, looking northeast

Photo 17: Same as Photo 13, looking north



Photo 18: Same as Photo 13, looking northwest

Photo





Photo 19: Same as Photo 13, looking west

Photo 20: Same as Photo 13, looking southwest

Photo 21: Same as Photo 13, looking south





Photo 22: Typical conditions on the exterior of the west side of the lower dike of Pond B, looking southwest

Photo 23: Same as Photo 22, looking west



Photo 24: Same as Photo 22, looking northwest

#### SCS ENGINEERS

#### Petersburg Plant – Photos from 17-1 Inspection 2600 State Highway 57 North SCS Engineers Project #25211357.33





Photo 25: Closure activities on the top of Pond C, looking south

Photo 26: Same as Photo 25, looking southeast



Photo 27: Same as Photo 25, looking east



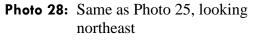




Photo 29: Same as Photo 25, looking north



Photo 30: Same as Photo 25, looking northwest



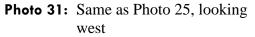


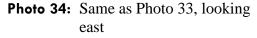


Photo 32: Same as Photo 25, looking southwest



Photo 33: Fluid conditions at the toe of the upper dike of the northeast corner of Pond C. Heavy rainfall occurred in the days prior to the inspection. No active visual seepage occurring at the time of the inspection. Looking west.







**Photo 35:** Typical conditions along west perimeter dike of Pond C, looking south



Photo 36: Fill surface of former Pond D – bottom ash storage area. Area is presently paved with a gravel surface and not being used for ash processing. Looking west.





Photo 37: Same as Photo 36, looking south

Photo 38: Same as Photo 36, looking southeast



Photo 39: Pond A, looking northeast from paved area shown in Photos 35 to 38





Photo 40: Same as Photo 39, looking north

Photo 41: Same as Photo 39, looking northwest



Photo 42: Same as Photo 39, looking west