

SCS ENGINEERS

February 3, 2017
File No. 25211357.32

Mr. Juan Hummel
Indianapolis Power & Light
Harding Street Generating Station
3700 South Harding Street
Indianapolis, IN 46217-3333

Subject: 2016-1 Dike Inspection-Harding Street Generating Station Ash Pond Facilities

Dear Mr. Hummel:

SCS Engineers (SCS) is pleased to submit this dike and pond inspection report for the Indianapolis Power & Light (IPL) Harding Street Generating Station Ash Pond Facilities. Mr. David M. Hendron, PE, of SCS made the inspection and prepared this report. This report presents a Summary of Visual Observations and Conclusions and Recommendations. Mr. Hendron performed the inspection on November 3, 2016.

At the Harding Street Generating Station there are several active ash disposal ponds identified by number. The ash ponds inspected were Pond 1; Ponds 2A and 2B; and Pond 3. The general location of each is given on **Figure 1**. The inspections were performed by Mr. Juan Hummel of IPL and Mr. Hendron. The weather during the inspection was cloudy and cool.

SUMMARY OF VISUAL OBSERVATIONS

The IPL Dike Field Review Checklist form was completed to document the results of the inspection. The completed form is given in **Attachment A** to this letter report. A summary of our visual observations follows.

Flow Pipes Between Ponds

The observations at the time of the inspection and the inventory shows that all flow pipes between the ash ponds are in satisfactory condition. Pond 1 was inactive during this inspection, handling primarily sump water from plant operations. At the time of this inspection, Ponds 2A, 2B, and 3 were handling these flows plus surface water from adjacent areas of the IPL site.

Pond 1

1. Pond 1 is inactive and will remain so for the foreseeable future. The Harding Street Generating Plant has been converted to natural gas and will not process any further ash materials in the future.



2. The low area on the west end of the north dike of Pond 1 that was filled to increase the level of the rest of Pond 1 since the 14-2 inspection appeared to be in good condition.

Ponds 2A and 2B

1. Ponds 2A and 2B were being used for plant sump water processing and for surface water runoff from adjacent areas at the time of the inspection and appear to continue to be in satisfactory condition. Previous repairs to the exterior dikes for these ponds continue to appear to be in satisfactory condition.
2. Ponds 2A and 2B water levels were low at the time of the inspection.
3. There appears to be some significant erosion of the southwest corner of the Perimeter Dike of Ponds 2A/B where the recently excavated surface water flow channel was created. Based on the significant changes in the conditions in this area since the last inspection (Inspection 15-2 in November 2015) it is my recommendation that IPL take immediate actions to repair the erosion that has occurred and undertake actions to design a long-term erosion protection system for this surface water flow stream as soon as practical. IPL reported that a qualified firm has been hired to design repair and protection measures to address the erosion issues identified in this report, and that such activities are underway.

Pond 3

1. Pond 3's location is shown on **Figure 1**. During the inspection, this pond was being actively used as a secondary settling basin for sump water discharge activities at the plant and surface water flow from adjacent areas of the IPL site.
2. There has been a notch cut in the South Perimeter Dike of Pond 3 to provide for surface water flow from the area adjacent to Pond 3. There has been no erosion protection provided for this flow. The present system appears to be temporary. It is recommended that IPL undertake a formal design for erosion protection system for the surface water flow into Pond 3 until closure activities are completed.
3. The completed repairs to the discharge pipe from Pond 3 to Lick Creek continued to appear to be in satisfactory condition.
4. The water level in Pond 3 was significantly below past water levels at the time of the inspection. We understand that the lower water levels will be maintained for the foreseeable future. There was discharge from Pond 3 to Lick Creek at the time of the inspection.
5. It was possible to observe seepage conditions on the downstream slope of the Northern Perimeter Dike of Pond 3. There were no observations of seepage or instability of the area during this inspection.

CONCLUSIONS AND RECOMMENDATIONS

Flow Pipes Between Ponds

The flow of fluids between all active ponds was observed to be occurring on a satisfactory basis during this inspection. We recommend that the flow conditions be a specific observation during all future inspections and that the inventory be updated on an annual basis. If the inspection or inventory indicate flow conditions are damaged or obstructed, we recommend repairs be made immediately.

There have been significant changes to the flow between ponds since the last inspection. Specifically, this includes the surface water flow from areas adjacent to the active ash ponds into Ponds 2A, 2B, and 3. There are observations of erosion and instability in the notch and discharge channel in the southwest corner of Pond 2A. We understand that IPL is in the process of design of repair for erosion observed at the southwest corner of Pond 2A.

It is recommended that immediate repairs be made to all areas of the perimeter dikes of Pond 2A where erosion or instability has been observed. We recommend that these designs and supporting calculations be provided as soon as practical.

Ponds 2A/B

1. There appears to be some erosion of the South Perimeter Dike of Ponds 2A/B where the surface water flow channel was recently excavated. We recommend that this erosion be repaired immediately. IPL reported that a qualified firm has been hired to design repair and protection measures to address the erosion issues identified in this report, and that such activities are underway.

Pond 1

1. There are no recommendations for Pond 1 at this time.

Pond 3

1. The downstream slope of Pond 3 appeared stable at the time of the inspection.

Mr. Juan Hummel
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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,



David M. Hendron, PE
Indiana PE 10000050
SCS ENGINEERS

DMH/lmh

Enclosures: Figure 1 – Site Plan
Attachment A – IPL Dike Field Review Checklist Form

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FIGURE 1

Site Plan

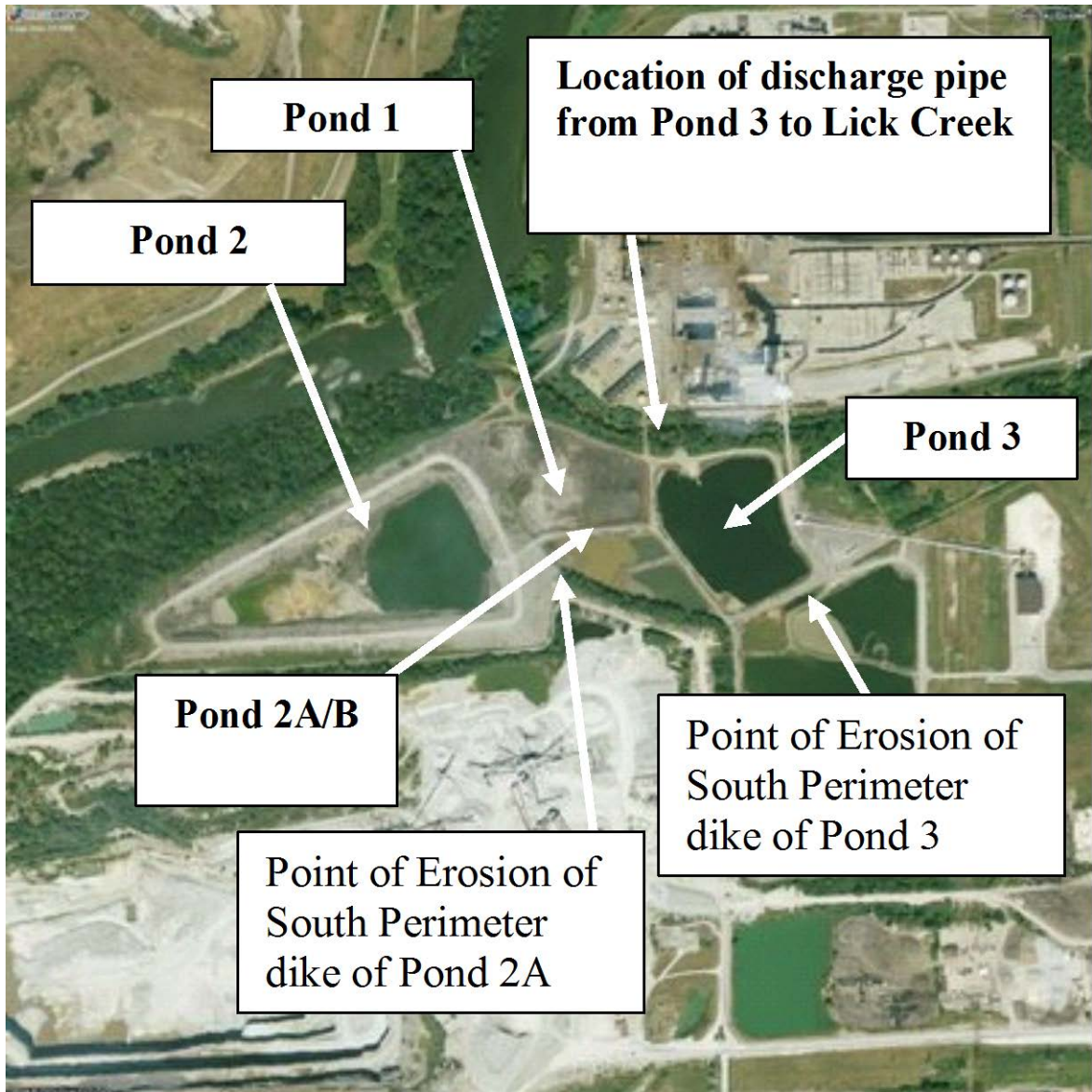


Figure 1. Site Plan

ATTACHMENT A

IPL Dike Field Review Checklist Form

IPL Dike Field Review Checklist– Inspection 16-1 – Harding Street Station

- 1) Complete all Portions of this Section (Pre-review)
Date of Review: **November 3, 2016**
Name of Dike: **Ash Ponds 1, 2A, 2B, and 3** Project Number **25211357.32**

- 2) Review Inventory – Highlight missing information (Pre-review)
Owner(s) Name(s): **Indianapolis Power & Light Company**
Address: **3700 South Harding Street**
City: **Indianapolis** State **Indiana** Zip (+4) **46217-3333**
Telephone (Home): _____ Telephone (Work): **317-261-3603**
Contact Person: **Mr. Juan Hummel**
Designed By: **IPL**
Constructed By: **IPL**
Year Completed: **Various** Plans Available (Yes, No) (Location): **For some of the dikes**
Purpose of Dike: **Processing sump water from plant operations and surface water flows from areas adjacent to ash ponds.**
Age of Dike: **Various**

- 3) General Information
Mowing (times per year): **Twice**
Prior problems (wet areas, erosion, slides): **Specified in previous inspection reports.**
All significant prior problems specified in previous inspection reports have been corrected.

Repair or modification (what & when):

Failure/Incident/Breach (max. pool): **None**

Downstream hazard status (recent changes): **None since last inspection.**

Dike Embankment Material: **These are given for each of the ash ponds in the action plan report submitted in April 2012.**

Slope Erosion Control:

- 4) Field Information (while at site)
Pool Elevation (during review): **Pond water levels for Ponds 1, 2A/B, and Pond 3 significantly below design water levels for these ponds.**
Site Conditions (temp., weather, ground moisture): **Cloudy and cool**

Review Party: **Mr. Dave Hendron and Mr. Juan Hummel. Review party briefed on results of the inspection after completion.**

5) **INSIDE SLOPES** Gradient: Horizontal: Varies from about 2.5 to 3.0 Vertical: 1.0 (est. meas.)

VEGETATION [no problem]

- Trees: Quantity: (<5, sparse, dense) _____
Diameter: (<6", 6-12", >12") _____
Location: _____
Notes: _____
- Brush: Quantity: (sparse, dense) _____
Location: _____
Notes: _____
- Ground Cover: Type: (grass, crown vetch) Other: _____
Quantity: (**bare**, sparse, adequate, dense) _____
Appearance: (too tall, too short, good) _____
Notes: _____

X

SLOPE PROTECTION [no problem, could not inspect thoroughly]

- None
- Riprap: Average Diameter: _____
(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted–yes, no)
Notes: _____
- Wave Berm: _____
Vegetation: (adequate, bare, sparse, improper vegetation) _____
Notes: _____

Other: Slope protection continues present on all of the perimeter inside slopes for all of the ponds where required by the observance of previous active erosion.

Notes:

EROSION [no problem, could not inspect thoroughly]

- Wave Erosion (beaching): Scarp: Length: _____ Height: _____
Location: _____
Notes: _____

- Runoff Erosion (Gullies): Quantity: _____
Depth: 5 ft. Width: 3 to 5 ft. Length: 150 ft. (approx.)
Location: At the outlet of surface water into the southwest corner of Pond 2A.
Notes/Causes: This erosion gully has resulted from surface water flow into Pond 2A. This erosion should be repaired as soon as practical by a formal design for erosion protection system to provide long-term stability in this area.

INSTABILITIES [no problem, could not inspect thoroughly]

- Slides: Transverse Length: 15 ft. Longitudinal Length: 50 ft.
Scarp: Width: _____ Length: _____
Location: At the inlet area for surface water flow into Pond 2A.
- Crack: Width: _____ Depth: _____
Notes/Causes: Surface water flow between Pond 2 and Pond 2A without erosion protection materials designed for the anticipated flow conditions.

- Cracks: Transverse Longitudinal Other
Quantity: _____ Length: _____ Width: _____ Depth: _____
Location: _____

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

None
Monitor
Maintenance
Engineer

Cracks: Transverse Longitudinal Other
Quantity: _____ Length: _____ Width: _____ Depth: _____
Location: _____
Notes/Causes: _____

Bulges Depressions Hummocky
Size: _____ Height: _____ Depth: _____
Location: _____
Notes/Causes: _____

Bulges Depressions Hummocky
Size: _____ Height: _____ Depth: _____
Location: _____
Notes/Causes: _____

OTHER [no problem, could not inspect thoroughly]

Rodent Burrows: (few, numerous) _____
Location: _____
Notes/Causes: _____

Other:
Notes: **NA**

6) CREST Length: _____ Width: _____ (est. meas.)

VEGETATION [no problem]

Trees: Quantity: (<5, sparse, dense) _____
Diameter: (<6", 6-12", >12") _____
Location: _____
Notes: _____

Brush: Quantity: (sparse, dense) _____
Location: _____
Notes: _____

Ground Cover: Type: (grass, crown vetch) Other: _____
Quantity: (bare, sparse, adequate, dense) _____
Appearance: (too tall, too short, good) _____
Notes: _____

EROSION [no problem, could not inspect thoroughly]

Runoff Erosion (Gullies): Quantity: _____ Depth: _____ Width: _____ Length: _____
Location: _____
Notes: _____

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

None
Monitor
Maintenance
Engineer

Required Action
None Monitor Maintenance Engineer

WIDTH [no problem]
 Too Narrow
 Location: _____
 Notes/Causes: _____

INSTABILITIES [no problem, could not inspect thoroughly]
 Cracks: Transverse Longitudinal Other
 Quantity: _____ Length: _____ Width: _____ Depth: _____
 Location: _____
 Notes/Causes: _____

Cracks: Transverse Longitudinal Other
 Quantity: _____ Length: _____ Width: _____ Depth: _____
 Location: _____
 Notes/Causes: _____

Bulges: Depressions Hummocky
 Size: _____ Height: _____ Depth: _____
 Location: _____
 Notes/Causes: _____

OTHER [no problem, could not inspect thoroughly]
 Rodent Burrows: (few, numerous) _____
 Location: _____
 Notes: _____

Other: **Road level on the west side of the north perimeter dike for Pond 1 that has been regraded to provide freeboard for Pond 1 appears satisfactory. Continue to monitor.**
 Notes: **Roadway appeared to be stable at the time of the inspection.**

7) **OUTSIDE SLOPES** Gradient: Horizontal: **2.0 to 3.0** Vertical: **1.0** (est. meas.)

VEGETATION [no problem]
 Trees: Quantity: (<5, sparse, moderate, dense) **Generally been removed.**
 Diameter: (<6", 6-12", >12") _____
 Location: _____
 Notes: **The trees mentioned in previous reports have generally been removed.**

Brush: Quantity: (sparse, dense) _____
 Location: _____
 Notes: _____

Ground Cover: Type: (grass, crown vetch) Other: _____
 Quantity: (bare, sparse, **adequate**, dense) _____
 Appearance: (too tall, too short, **good**) **Ground cover was in great condition throughout the system.**
 Notes: _____

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

None Monitor Maintenance Engineer
Required Action

EROSION [no problem, could not inspect thoroughly]

Runoff Erosion (**Gullies**): Quantity: ____ Depth: ____ Width: ____ Length: ____

Location: _____

Notes/Causes: _____

X

INSTABILITIES [no problem, could not inspect thoroughly]

Slides: Transverse Length: _____ Longitudinal Length: _____

Scarp: Width: _____ Length: _____

Location: _____

Crack: Width: _____ Length: _____

Notes/Causes: _____

X

Cracks: Transverse Longitudinal Other

Quantity: _____ Length: _____ Width: _____ Depth: _____

Location: _____

Notes/Causes: _____

Cracks: Transverse Longitudinal Other

Quantity: _____ Length: _____ Width: _____ Depth: _____

Location: _____

Notes/Causes: _____

Bulges: Depressions Hummocky

Size: _____ Height: _____ Depth: _____

Location: _____

Notes/Causes: _____

OTHER [no problem, could not inspect thoroughly]

Rodent Burrows: (few, numerous) _____

Location: _____

Notes: _____

X

Other: _____

Notes: _____

SEEPAGE [no problem, could not inspect thoroughly]

Wet Area Flow Boil Sinkhole

Flow Rate _____ Size: _____

Location: _____

Aquatic Vegetation None

Rust Colored Deposits None

Sediment in Flow None

Other: _____

Notes/Causes: **Area of downstream slope of Pond 3 was inspected. No**

X

seepage observed. Continue to monitor this area for seepage.

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

Wet Area Flow Boil Sinkhole

Flow Rate _____ Size: _____

Location: _____

Aquatic Vegetation None

Rust Colored Deposits None

Sediment in Flow None

Other: _____

Notes/Causes: _____

8) OUTLET/INLET STRUCTURES

GENERAL INLET [no problem, could not inspect thoroughly]

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 **The inlet conditions into Pond 2A and Pond 3**

have been substantially changed since last inspection. Breaches were excavated at two locations, there does not appear to be adequate erosion protection, and there does not appear to have been hydraulic or hydrologic considerations given to the changes. There have been erosion problems observed at Pond 2A during this inspection. Immediate actions are recommended for the design and construction of erosion protections in both areas.

OUTLET STRUCTURES [no problem, could not inspect thoroughly]

Number of Outlet Structures: **Numerous – Most occur between the individual ponds. All outlet structures appeared stable and in good working condition at the time of this (16-1) inspection.**

Description/Location of Outlet Structures:

Outlet Structures between Ponds :

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

Notes: _____

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

Required
Action
None
Monitor
Maintenance
Engineer

Outlet Structure on the North end of Pond 3

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

Deterioration: (missing section, collapsed, rusted): _____

Erosion at Outlet Structure: (soil piping, seep collar, etc.) _____

Debris: (leaves, trash, logs, ice, etc.) _____

Notes: _____

Outlet Structure 3 Dimensions: _____

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

Deterioration:(missing section, collapsed, rusted): _____

Erosion at Outlet Structure: (soil piping, seep collar, etc.) _____

Debris: (leaves, trash, logs, ice, etc.) _____

Notes: _____

9) **POND DRAIN**

GENERAL

None Found Does not have one

Type of Pond Drain

(isolated control/intake tower, valve vault w/outlet conduit, valve in riser/drop inlet, siphon)

Notes: **The outlet pipe from Pond 3 is available for drainage of pond fluids.**

Operated During Inspection (yes, **no**)

Notes: **This valve is operated on a frequent basis as part of normal IPL**

operations of Pond 3 and appears to be in good working condition.

ACCESS TO VALVE/SLUICE GATE [no problem, could not inspect thoroughly]

Type (not accessible, from shore, boat, walkway, other) _____

Notes: _____

Walkway/Platform: _____

Concrete Deterioration Cracks (platform, piers, end supports, railing)

Location: _____

Notes: _____

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

None
Monitor
Maintenance
Engineer
Required
Action

Wood Deterioration
Notes: _____

Metal Deterioration (minor, moderate, extensive, other)
Notes: _____

POND DRAIN COMPONENTS [no problem, could not inspect thoroughly]

Concrete Structure
Locations: _____
Description: (deterioration, misalignment, cracks): _____
Notes/Causes: _____

Valve Control (Operating Device)
 No Operating Device No Stem Bent/Broken Stem Other
Notes/Operability: _____

Metal Deterioration: (surface rust, minor, moderate, extensive, other)
Location: _____
Flow Rate: _____
Notes/Causes: _____

Mis-alignment
Notes/Causes: _____

Leakage – Flow Rate:
Notes/Causes: _____

Outlet Conduit
 Metal: (loss of coating/paint, surface rust, corrosion (pitting, scaling), rusted out)
Location: _____
Notes/Causes: _____

Concrete (bug holes, hairline crack, efflorescence)
(spalling, popouts, honeycombing, scaling, craze/map cracks)
(isolated crack, exposed rebar, disintegration, other)
Dimensions/Location: _____
Notes/Causes: _____

Plastic: (deterioration, cracking) _____
Location: _____
Notes/Causes: _____

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

Required
Action

None
Monitor
Maintenance
Engineer

Conduit Deformation Mis-Alignment:
 Location: _____
 Notes/Causes: _____

Separated Joint Loss of Joint Material
 Location/Description: _____
 Notes/Causes: _____

Undermining
 Location/Description: _____
 Notes/Causes: _____

Vegetation (trees, brush)
 Notes: _____

Other
 Notes: _____

Discharge Outlet
 Type (pipe outlet, concrete channel, rock-lined channel, none)
 Notes: _____

Riprap: Average Diameter:
 (adequate, sparse, displaced, weathered, vegetation) bedding/fabric noted – yes, no))
 Notes: _____

Concrete (bug holes, hairline crack, efflorescence)
 (spalling, popouts, honeycombing, scaling, craze/map cracks)
 (isolated crack, exposed rebar, disintegration, other)
 Dimensions/Location: _____
 Notes/Causes: _____

Mis-alignment
 Location/Description: _____
 Notes/Causes: _____

Separated Joint Loss of Joint Material
 Location/Description: _____
 Notes/Causes: _____

Undermining
 Location/Description: _____
 Notes/Causes: _____

Other
 Notes: _____

None
Monitor
Maintenance
Engineer

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

Required
Action