

SCS ENGINEERS

January 27, 2017
File No. 25211357.31

Mr. John Terrell
Indianapolis Power & Light
Eagle Valley Generating Station
4040 Bluff Road
Martinsville, IN 46151-7887

Subject: 2016-1 Dike Inspection-Eagle Valley Generating Station
Ponds A, B, and C Ash Ponds

Dear Mr. Terrell:

SCS Engineers (SCS) is pleased to submit this dike and basin inspection report for the Indianapolis Power & Light Company (IPL) Eagle Valley Generating Station Ponds A, B, and C Ash Ponds. This report was prepared by Mr. David M. Hendron, PE. The report presents a Summary of Visual Observations, and Conclusions and Recommendations. The inspection was performed on November 2, 2016, by Mr. Hendron and Mr. John Terrell. A presentation of the preliminary findings was given to Mr. Terrell at the conclusion of the inspection. The weather at the time of this inspection was clear and cool.

For this inspection, we filled out the IPL Dike Field Review Checklist form to document the results of the inspection. The completed form is given in **Attachment A** to this letter report. Documentation of the visual conditions of the dikes and ponds during this inspection is presented in the text of this report and shown in the photographs taken during the inspection. Photographs taken during this inspection are shown in **Attachment B**.

SUMMARY OF VISUAL OBSERVATIONS

IPL's Eagle Valley Plant has discontinued operation. Use of Ponds A through C will continue to handle small amounts of water from plant sumps until the existing generating facilities are demolished in the future. Ponds A through C are not expected to retain full hydraulic heads to handle these fluids.

In general, conditions at the ash ponds continue to appear satisfactory. Water levels in Ash Ponds A, B, and C were significantly below the invert of discharge structures for each pond. There were no visual indications of seepage flow occurring anywhere on the downstream slope of any of the ponds. The vegetation on the downstream slopes of all the ash ponds was in good condition. IPL mowed the vegetation on the downstream slopes just prior to the inspection. There was no visible damage to the slopes by the mowing operations.



The following observations are noted.

Ash Ponds A, B, and C

The layouts of the Ponds A, B, and C facility are shown on **Figure 1**. At the time of the inspection, IPL was not operating the Eagle Valley Plant. Photographs taken during the inspection of Ponds A, B, and C are presented in **Attachment B** to this letter.

Results of the visual inspection performed on November 2, 2016, for Ponds A, B, and C are summarized below.

1. The freeboard in Pond A appeared to remain adequate.
2. There was no discharge occurring from any of the ponds at the time of the inspection.
3. The vegetation on all exterior slopes appeared to be in good condition. These slopes were mowed prior to the inspection. The slopes appeared to be in good condition.
4. The interior slopes of Pond C at the time of the inspection continued to appear to be in good condition. Pond C contained no evidence of water at the time of the inspection.
5. The exterior slopes of Ponds A, B, and C continue to appear stable and well-vegetated with no visual evidence of seepage along the dike toes at the time of the inspection.
6. The visible portions of the inside slope of the exterior dikes of Ponds A and B continued to appear in good condition.
7. There were no areas of softening or rutting noted during this inspection.
8. IPL previously placed the material excavated from the interior of Pond A along the downstream slope of the intermediate dike between Pond A and Pond B as shown on **Figure 1**. No instabilities of the berm material were observed during placement, and the completed berm appeared stable during the inspection.

CONCLUSIONS AND RECOMMENDATIONS

Based on the observations made during the inspection, we conclude that conditions in Ponds A, B, and C are satisfactory at this time, and these basins show no visible signs of significant erosion or instability.

Recommendations for Ash Ponds A, B, and C

We make the following recommendations for Ponds A, B, and C.

1. Recommend that all interior slopes of perimeter dikes for Ponds A, B, and C be continued to be monitored for erosion and that rip-rap be placed on the interior slopes if and when erosion activities are significant.

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

DH/lmh

Enclosures: Figure 1 – Location Plan of Basin and Ponds
Attachment A – IPL Dike Field Review Checklist Form
Attachment B – Photographs

FIGURE 1

Location Plan of Basin and Ponds



Figure 1 – Location Plan of Basin and Ponds

ATTACHMENT A

IPL Dike Field Review Checklist Form

Attachment A - IPL Dike Field Review Checklist – Inspection 16-1
Eagle Valley Station

- 1) Complete all Portions of this Section (Pre-review) – Inspection 16-1
Date of Review: **November 2, 2016**
Name of Dike: **Eagle Valley Basins A, B, and C** Project Number **25211357.31**
- 2) Review Inventory – Highlight missing information (Pre-review)
Owner(s) Name(s): **Indianapolis Power and Light Company**
Address: **4040 Blue Bluff Road**
City: **Martinsville** State **Indiana** Zip (+4) **46151-7887**
Telephone (Home): _____ Telephone (Work): **765-349-3401**
Contact Persons: **Mr. John Terrell**
Designed By: **IPL**
Constructed By: **IPL contractors and sub-contractors**
Year Completed: **Unknown** Plans Available (Yes, No) (Location): **Not complete for all ponds.**
Purpose of Dike: **Form basins for Ash Ponds A, B, and C at the Eagle Valley Facility**
Age of Dike: _____
- 3) General Information
Mowing (times per year): **Once or twice**
Prior problems (wet areas, erosion, slides): **See previous inspection reports.**
Repair or modification (what & when): **IPL has continued to make periodic monitoring and inspection of the dikes since last inspection. IPL has ceased operation of the coal-fired generating plant and does not use any of the ponds to process ash materials. Water levels in Ponds A, B, and C were essentially dry at the time of the inspection. There was no discharge from Pond C at the time of the inspection.**
Failure/Incident/Breach (max. pool): **None since the last inspection.**
Downstream hazard status (recent changes): **No changes**
- Dike Embankment Material: **Primarily ash materials with well-vegetated downstream slope erosion protection. Vegetation in good condition as a result of recent rainfall amounts. Downstream slopes recently mowed.**
- Slope Erosion Control: **Interior – rip-rap along most slopes. Only remaining interior slopes without rip-rap protection in the west and north of Pond C. Continue to recommend placing rip-rap in this area if erosion of the slopes is observed to occur. No significant erosion at the time of the inspection.**
- 4) Field Information (while at site)
Pool Elevation (during review): **Water levels in all active Ponds were essentially dry at the time of the inspection. There will be no further use of any of the ponds for ash processing operations at the site.**
Site Conditions (temp., weather, ground moisture): **Clear and cool**
Review Party: **Dave Hendron, PE, and Mr. John Terrell. Mr. Terrell briefed after the inspection with a summary of findings.**

None
Monitor
Maintenance
Engineer

5) **INSIDE SLOPE**

Gradient: Horizontal: **Unknown**

Vertical: (est. meas.)

VEGETATION [no problem]

Trees: Quantity: (<5, sparse, dense) **None**
Diameter: (<6", 6-12", >12") _____
Location: _____
Notes: _____

Brush: Quantity: (sparse, dense) **None to sparse**
Location: **See photos in Attachment B**
Notes: _____

Ground Cover: Type: (grass, crown vetch) Other: _____
quantity: (bare, sparse, adequate, dense) **Poor where rip-rap not present in Pond C.**
Appearance: (too tall, too short, good) **Lush**
Notes: **Continue to monitor Pond C and add rip-rap if erosion is observed.**

SLOPE PROTECTION [no problem, could not inspect thoroughly]

None
 Riprap: Average Diameter: **Approximately 5 to 6 inches where present**
(adequate, sparse, displaced, weathered, vegetation) (bedding/fabric noted=yes, no)
Notes: **Rip-rap placed in most areas except for west and north interior slope of Pond C. Continue to recommend that rip-rap be placed as recommended in previous section of this report.**

Wave Berm: _____
Vegetation: (adequate, bare, sparse, improper vegetation) _____
Notes: _____
 Other: _____
Notes: _____

EROSION [no problem, could not inspect thoroughly]

Wave Erosion (beaching): Scarp: Length: _____ Height: _____
Location: **Minor erosion noted on west and north interior slopes of Pond C.**
Notes: **Recommend to place rip-rap in these areas if erosion continues or if the water level in the basin impinges on exterior slope and erosion is observed.**

Runoff Erosion (Gullies): Quantity: **Some minor erosion noted on interior slopes of Pond C as noted previously in this inspection report.**
Depth: _____ Width: _____
Length: _____
Location: _____
Notes/Causes: _____

INSTABILITIES [no problem, could not inspect thoroughly]

Slides: Transverse Length: _____ Longitudinal Length: _____
Scarp: Width: _____ Length: _____
Location: _____
Crack: Width: _____ Depth: _____
Notes/Causes: _____

Cracks: Transverse Longitudinal Other
Quantity: _____ Length: _____ Width: _____ Depth: _____
Location: _____
Notes/Causes: _____
{**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) No animal activity noted.
Location: _____
Notes/Causes: _____

Other: _____
Notes: _____

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: Stone roadway continues in good condition in all areas of the ash ponds.

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: _____

Required Action
None Monitor Maintenance Engineer

x **WIDTH [no problem]**

Too Narrow
Location: _____
Notes/Causes: _____

X

x **INSTABILITIES [no problem, could not inspect thoroughly]**

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

X

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

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

X **OTHER [no problem, could not inspect thoroughly]**

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

X

X Other:
Notes: _____

X

7) OUTSIDE SLOPE Gradient: Horizontal: **3.0** Vertical: **1.0** (est. meas.)

x **VEGETATION [no problem]**

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

X

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: **Vegetation was mowed just prior to the inspection. Vegetation appeared to be in good condition throughout.**

X

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

None Monitor Maintenance Engineer
Required Action

Required
Action
None
Monitor
Maintenance
Engineer

EROSION [no problem, could not inspect thoroughly]

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

INSTABILITIES [no problem, could not inspect thoroughly]

Slides: Transverse Length: _____ Longitudinal Length: _____
 Scarp: Width: _____ Length: _____
 Location: _____
 Crack: Width: _____ Length: _____
 Notes/Causes: _____

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: **No evidence of new rutting or seepage on any exterior slope during this inspection.**

OTHER [no problem, could not inspect thoroughly]

Rodent Burrows: (few, numerous) **None observed**
 Other: _____

SEEPAGE [no problem, could not inspect thoroughly]

Wet Area Flow Boil Sinkhole
 Flow Rate: _____
 Location: _____ Aquatic Vegetation
 Rust Colored Deposits None
 Sediment in Flow None
 Other: _____
 Notes/Causes: _____

Required
Action
None
Monitor
Maintenance
Engineer

{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: **About 10 inches** (adequate, too small)
- Type: (steel, concrete, aluminum, stainless steel, corrugated metal wood, other): **Steel** _____
- Location: _____
- Deterioration: (missing sections, rusted, collapsed) _____
- In Use: (Yes, **No**) _____
- Pond Erosion at Inlet: (Describe) **None observed**
- Other – _____

OUTLET STRUCTURES [no problem, could not inspect thoroughly]

- Number of Outlet Structures: **Three** _____
- Description/Location of Outlet Structures: **All outlet structures visible at the time of the inspection. All appeared to be in good condition. Water level in ash Ponds A, B, and C was below the invert elevation of all discharge pipes.**

Outlet Structure 1: **Basin A to B**

- 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: **No discharge occurring at the time of the inspection.**

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

Outlet Structure 2 **Basin B to Basin C**

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: **No discharge at the time of the inspection.**

Outlet Structure 3 **Basin C to the river**

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: **No discharge occurring at the time of the inspection.**

Outlet Structure 4

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: **No discharge occurring at the time of the inspection.**

9) **POND DRAIN**

GENERAL

None Found Does not have one

Type of Pond Drain **Drainage provided by Outlet 3 to the river**

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

Notes: _____

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

Notes: **No discharge occurring at the time of the inspection**

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: **Northwest corner of Pond C**

Notes: **Appeared to be In satisfactory condition. Valve operation not tested.**

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

Required
Action
None
Monitor
Maintenance
Engineer

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

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

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

X

- Valve Control (Operating Device)
 No Operating Device No Stem Bent/Broken Stem Other
Notes/Operability: **Not tested at this inspection**

- 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**}

None
Monitor
Maintenance
Engineer
Required
Action

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

ATTACHMENT B

Photographs

IPL Eagle Valley Station – Ponds A-C – 16-1 Inspection
Martinsville, Indiana
SCS Engineers Project #25211357.31



Photo 1: East Perimeter Dike of Pond A, looking south.



Photo 2: Same as Photo 1, looking west.



Photo 3: Same as Photo 1, looking northwest.



Photo 4: Condition of the top of Pond A. Looking west from the northeast corner of Pond A.

IPL Eagle Valley Station – Ponds A-C – 16-1 Inspection
Martinsville, Indiana
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Photo 5: Same as Photo 4, looking south.



Photo 6: Pond A, looking west from the top of the southeast corner of Pond A. Pond A was dry at the time of the inspection.



Photo 7: Same, looking northwest from the southeast corner of Pond A.



Photo 8: Same, looking north.

IPL Eagle Valley Station – Ponds A-C – 16-1 Inspection
Martinsville, Indiana
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Photo 9: Discharge pipes from Pond A to Pond B, looking east. Pond A was dry at the time of the inspection.



Photo 10: Same as Photo 9, looking southeast.



Photo 11: Pond B, looking north from the southwest corner of Pond B.



Photo 12: Same, looking east along the intermediate dike between Pond A and Pond B.

IPL Eagle Valley Station – Ponds A-C – 16-1 Inspection
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Photo 13: Pond B, looking northeast from the southwest corner of Pond B.



Photo 14: Same, looking north. Some residual ponded water in Pond B at the time of the inspection.



Photo 15: Same, looking west.



Photo 16: Discharge structure at the northwest corner of Pond C. Pond C was dry at the time of the inspection.

IPL Eagle Valley Station – Ponds A-C – 16-1 Inspection
Martinsville, Indiana
SCS Engineers Project #25211357.31



Photo 17: Pond C, looking southeast from the northwest corner of Pond C.



Photo 18: Typical condition of the crest of the West Perimeter Dike of Pond C.