Indianapolis Power & Light -Eagle Valley Generating Station Report Comments

EPA: None

State: None

Company: See attached letter dated August 19, 2010

And: see attached Hazard Potential Rating Discussion.

August 19, 2010

Mr. Stephen Hoffman
US Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: June 4, 2010, Draft Report of Assessment of Dam Safety of Coal Combustion Surface Impoundments Indianapolis Power & Light Company Eagle Valley Generating Station

Dear Mr. Hoffman:

On behalf of Indianapolis Power & Light Company ("IPL"), this letter provides comments on the above-referenced draft report. The draft report contains very detailed information and IPL has reviewed the report to the extent possible within the 44 days allotted, but reserves its rights to submit further comments if new information arises. IPL appreciates the opportunity to provide comments on this draft report.[1]

IPL provides the following comments:

1. IPL believes that Ash Pond D should not be designated as "high" hazard, but should be listed as "significant" hazard, at most. The actual basis for the hazard classifications as set forth in Section 4.1 conflicts with the criteria set out in EPA Form xxxx-xxx, Jan 09. That form states that a dam has a "high" hazard potential "where failure or misoperation will *probably* cause loss of human life." The basis set forth in Section 4.1 states that "a breach or misoperation could cause a loss of life at the plant." IPL believes that a low probability of loss of human life associated with Pond D is a reasonable assessment based on a worst case breach of the pond. BT SQUARED has opined that any breach associated with Pond D will flow towards the discharge

[1] IPL intends to undertake EPA's recommendations. However, nothing in this letter is intended to be a waiver of any legal arguments IPL may have and/or an admission of any liability whatsoever.

canal containing the release to the White River. Moreover, placing a "high hazard" label on this pond is misleading because it falsely implies that an event or release of ash is imminent and such release has a high likelihood to cause loss of life. This is not the case with respect to this ash pond at the Eagle Valley Station.

Furthermore, the draft report provides no rational basis for these classifications. For example, the draft report identifies no criteria such as distance, flow rates, or other evidence that would support a finding that a breach would probably result in loss of human life. Without clear definition and examples, a hazard rating determination is subjective. Applying hazard ratings in a subjective manner has resulted in inconsistent hazard rating assessments by EPA contractors. To support this conclusion, IPL provides the following examples where EPA contractors have inconsistently applied the hazard ratings:

- EPA's evaluation of other facilities such as Alabama Power Company; William Crawford Gorgas Electric Generating Plant; and AEP – Philip Sporn Generating Plant.

Reclassification of Pond D at the Eagle Valley Station to a rating other than a high hazard is consistent with what EPA has done in its evaluations of other facilities.

As a final point, it is important to note that the Eagle Valley units are ponds that are used as part of a wastewater treatment facility. The embankments have not been designated as dams per the Indiana Department of Natural Resources and thus have not been subject to Indiana Code 14-27-7.5 and 312 IAC 10.5.

2. IPL objects to the characterization of Ponds A, B, and C as "POOR" on the basis that there is a "lack of documentation relative to the design and construction of these facilities." A lack of documentation does not provide any basis to designate a pond's condition. Such a determination should be made based on the observations of the ponds and not based on the existence or lack of existence of design criteria/documentation. EPA is arbitrarily assessing a "POOR" rating without regard to the actual condition of the dikes simply because documentation was not complete. As noted, lack of documentation does not logically suggest poor dike

condition. The definition of "POOR" provided by EPA is not clear in regards to what is considered an acceptable amount of documentation needed to render a rating better than "POOR" and is very subjective. EPA contractors have inconsistently determined what is considered an acceptable amount of documentation. Other utilities inspected by EPA lacked documentation but were rated as fair even though the EPA contractor recommended studies similar to what is recommended for Eagle Valley (e.g., Duke Energy – Miami Fort Generating Station; Big Sandy Electric Corp. – Coleman Generating Station; AEP – Big Sandy Generating Station; and AEP – Coneville Generating Station). In order to be consistent, IPL has assessed the stability of our ponds by utilizing the IDNR dam guidelines. Per the IDNR classification system, these ponds would be rated as "Fair" (see attached).

IPL objects to the characterization of Ponds D and E as "POOR" due to incomplete breach repair and the "need for additional studies or investigations to confirm that other potential safety deficiencies do not exist." First, repairs are ongoing as CDM observed, so CDM should either not have assigned any condition ratings until the repairs are completed or assigned a conditional rating assuming (and contingent on) the repairs being completed as proposed by IPL. In addition, the report does not identify what the "other potential safety deficiencies" may be or what studies or investigations are needed to confirm that the unidentified potential safety issues do not exist. Unidentified potential safety issues cannot form the basis for assigning a "POOR" rating to Ponds D and E.

3. Regarding the draft report' "recommendations," IPL has the following comments:

a. IPL performs routine internal inspections of its ponds and employs an outside-qualified professional (BT SQUARED) to perform independent inspections twice a year. Some of the comments provided in the draft report conflict with the recommendations of IPL's outside consultant. For example, the draft report recommends "vegetation be cut on a regular basis." BT SQUARED has opined that limited cutting of vegetation will minimize storm water run off and potential unnecessary damage to exterior slopes. IPL agrees to continue to mow the exterior slopes of the ash ponds prior to the semi-annual inspections. IPL believes that reasonable

engineers can differ and intends to continue to follow BT SQUARED's recommendations on issues such as this.

b. Regarding erosion rills and ground cover loss observed on embankment slopes of Ponds A through E, and the recommendation to fill all rills and re-seeding these areas, repair of erosion rills and reseeding are, and will, be addressed as part of IPL's normal maintenance practices. Moreover, and as stated in the draft report, the large erosion features on the west exterior slope of Pond E are scheduled to be backfilled as part of the remedial work.

c. Regarding the recommendation that IPL perform a complete study to confirm the conclusion that there is enough storage capacity at the current operating pool levels to safely store precipitation from rainfall events, and update the study if operating levels of the pond change in the future, IPL agrees to perform this study. The details associated with such study will be specified in a scope of work ("SOW") to be submitted to EPA for review within 45 days of receipt of the final EPA dam assessment report. IPL will complete work as detailed in the SOW, within 12 months of receipt of final EPA approved SOW.

d. Regarding the recommendation that detailed stability analyses be performed for Pond A, Pond B, and Pond C embankments, that the stability analyses for each pond should include a subsurface investigation to evaluate existing soil parameters in the embankments and foundation soils and the installation of piezometers to measure the current phreatic surface and should consider all appropriate operating and loading conditions including rapid drawdown if applicable, and seismic events, IPL agrees to perform such analyses and install additional piezometers at selected locations. The details associated with such analyses and installation of additional piezometers will be specified in a scope of work ("SOW") to be submitted to EPA for review within 45 days of receipt of the final EPA dam assessment report. IPL will complete work as detailed in the SOW, within 12 months of receipt of final EPA approved SOW.

e. Regarding the recommendation that other critical cross-sections and loading conditions be evaluated relative to slope stability for Ponds D and E, IPL believes such

an evaluation is not needed for Pond E because it is filled. With regard to Pond D, IPL performed a static stability analysis in 2008. IPL agrees to supplement the existing stability analysis. The details associated with such supplemental analysis will be specified in a scope of work ("SOW") to be submitted to EPA for review within 45 days of receipt of the final EPA dam assessment report. IPL will complete work as detailed in the SOW, within 12 months of receipt of final EPA approved SOW.

f. Repairs, excluding normal maintenance activities associated with operating the ash pond facilities, such as filling erosion rills/ruts, will be designed by a registered professional engineer experienced with earthen dam and/or ash pond design.

g. Regarding the recommendation that IPL use a filter diaphragms to control potential seepage along pipes in lieu of anti-seep collars, IPL does not understand the basis for the recommendation and will follow the recommendation of its outside- qualified professional, BT SQUARED. Seepage collars have been successfully used as a standard of practice for decades. They were designed for the reconstruction of Pond D and have been put in place. We intend to test the reconstruction with a first filling in Sept 2010 and observe the performance of the seepage collars. We expect the performance to be acceptable.

h. IPL will review its current inspection procedures and revise, if necessary. IPL will submit a revised bi-weekly inspection form, if necessary, within 45 days of receipt of the final EPA dam assessment report.

i. Regarding the recommendation that inspection procedures should include the recording of data from existing piezometers on Pond D and Pond E, that a staff gage should be installed at outlet structures to record water levels in the impoundments, if applicable, and that inspections should be made following heavy rainfall and/or high water events on the White River, and the occurrence of these events should be documented, IPL does not object to this recommendation and will install and operate staff gauges and additional piezometers as specified in a detailed scope of work ("SOW") to be submitted to EPA for review within 45 days of receipt

of the final EPA dam assessment report. IPL will complete work as detailed in the SOW, within 12 months of receipt of final EPA approved SOW.

Attached are IPL's administrative comments that address specific issues with the information in the draft report.

IPL recommends that it meet with EPA to discuss these comments prior to finalization of the report. Please contact Nysa Hogue at 317-261-5473 at your earliest convenience to arrange such a meeting and/or if you have any questions.

Sincerely,

Dewayne Boyer

Dewayne Boyer
Plant Manager
Indianapolis Power & Light Company
Eagle Valley Generating Station

Administrative Comments

June 4, 2010, Draft Report
Assessment of Dam Safety of Coal Combustion Surface Impoundments
Indianapolis Power & Light Company
Eagle Valley Generating Station

Section 1.1 Revise the second paragraph as follows

The EV Generating Station is located north of the Town of Martinsville, Morgan County, Indiana as shown on Figure 1. The state boundary with Illinois and Kentucky is approximately 60 miles west and 92 miles south of the site, respectively. The Town of Martinsville, Indiana is approximately five miles downstream (south) of the site as shown on Figure 2.

Revise J. Kyle Noah's title as follows: "J. Kyle Noah, Principle Scientist,

Section 1.4.1 Revise as follows:

The EV Generating Station began operation about February 1949. The CCW is generated by Unit 3 (on line since 1949), Units 4 and 5 (on line since 1953), and Unit 6 (online since 1956). Approximately 1,900 tons of coal is burned daily producing approximately 190 tons of CCW.

The original CCW impoundment was commissioned in 1949 at El. 607. The impoundment was constructed in the vicinity of the footprint of current Ponds A, B and C to the west of the Indiana Southern Railroad tracks. A typical cross-section of the embankment is presented in Figure 3. The original embankment was constructed with native site soils to approximately 4 to 5 fee above existing grades to a crest elevation of approximately El. 608. The embankment had a 10-foot-wide crest and 1.5 Horizontal:1 Vertical (1.5H:1V) side slopes

In 1956, an impoundment was commissioned east of the railroad in the current footprint of Ponds D and E....

* * *

In about 1991, the west impoundments were reconfigured to create the current footprint of Ponds A, B and C. In about 1979/1980, the west pond was established within the existing footprint and the crest was raised to approximately elevation El. 610. In about 1980/1981, the crest was raised to elevation El. 619 around the perimeter using compacted ash. The embankment had a 10-foot-wide crest and 2H:1V side slopes on the interior and 3H:1V side slopes on the exterior. Based on plans provided to CDM, a 6-foot-thick clay core was constructed in the middle of the embankment. The depth of the clay core is unknown. In 1981, as part of the construction, a diversion embankment was also constructed in the area of the current Pond A/C divider embankment.

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In about 1991, the current configuration of Ponds A, B and C was commissioned.

In 2000, the east impoundment (Pond D) was reactivated. The embankment around the pond was regarded from the toe up with 3H:1V side slopes, and the crest was raised to elevation El. 633 using compacted ash. The embankment crest was 20 feet wide and the interior slope was 3H:1V. In 2003, Pond D was reconfigured to form Ponds D and E by creating an internal divider embankment (which runs east to west). The modifications were constructed with a 20-foot-wide crest and 3H:1V side slopes using compacted ash. In 2005, the embankment around the perimeter of Pond D was raised to elevation El. 643 using compacted ash. A typical cross-section of the embankment is presented in Figure 4. The embankment has a 20-foot-wide crest with 3H:1V slide slopes.

In February 2007, the internal divider embankment between Ponds D and E failed causing the north embankment of Pond E to overtop. Following the failure, Ponds D and E were repaired and brought back in service by December 2007. In January 2008, the internal divider embankment failed again in a similar manner to the first failure causing the embankment of Pond E to overtop. Ponds D and E are currently being repaired. The two failures, repair, and proposed configuration and operation of Ponds D and E are discussed below.

Section 1.4.2 The first paragraph on page 1-4 should be revised as follows:

- Plant sumps
- Floor drains;
- Stormwater runoff;
- Water treatment wastes;
- Metal cleaning wastes;
- River dredging;
- Laboratory and sampling streams
- Service water; and
- Demineralized water.

The last paragraph on page 1-4 and top of page 1-5 should be revised as follows:

Pond C used as a final settling pond before water is discharged into the discharge canal at outfall 103 (Photo 66). Water from Pond B and Pond E is conveyed to Pond C. A 36-inch-diameter pipeline carries flow from an inlet structure located in the northwest corner of Pond E to an outlet located in Pond C. Similar to Ponds A and B, floating brooms were installed in Pond C to increase the settling time in the pond prior to discharge. Similar to Ponds A and B, floating booms were installed in Pond C to increase the settling time in the pond prior to discharge. [This description is for Pond B.] Three telephone poles were also installed in front of the inlet structure in Pond C to reduce the potential for surface debris from entering the structure. The outlet structure in Pond C consists of a concrete box structure with stoplogs at the inlet to control flow (Photo 54). The outlet structure discharges into a 24-inch-diameter conduit. A butterfly valve

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located at the outlet structure catwalk can also be used to control flow. The butterfly valve appeared to be maintained and could be operated with little effort.

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The second paragraph on page 1-4 should be revised as follows and IPL provides the following response:

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> The east impoundments consist of Pond D and Pond E. Pond D and Pond E are approximately 16 and 4 acres in size respectively. The crest elevation of the two impoundments is approximately El. 643 and El. 633, respectively. Currently Ponds D and E are dry and repairs are under construction. The proposed water level in Pond D after the repairs are completed is elevation El. 626. IPL has contractors filling Pond E with compacted ash but is not officially closing the pond under any state or federal regulations. The ash will be graded up from elevation El. 633 to El. 643, as shown in Figure 4. The repair plans indicate that the compacted ash will be covered with a 12-inch-thick layer of compacted clay and a 4-inch-thick topsoil layer. A conduit consisting of 30-inch-diameter HDPE pipe with 8-foot-square anti-seep collars at 50-feet on center will be constructed through the compacted ash in Pond E to the existing inlet structure in the northwest corner of the pond. Water from Pond D will be diverted through the conduit to the outlet structure and into Pond C. IPL staff stated upon completion of the repair, Pond D is anticipated to be used on an "emergency" basis, i.e. when plan operating conditions make it absolutely necessary, or when Pond A and Pond B need to be taken offline for maintenance. A butterfly valve located at the outlet structure catwalk in Pond E can be used to control flow from Pond D to Pond C. The butterfly valve appeared to be maintained and could be operated with little effort.

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Not closing Pond E, reinforcing internal dike D/E. IPL may reactivate Pond E in the future.

Section 1.5.1 This section should be revised as follows:

> On February 14, 2007, the internal divider embankment between Pond D and Pond E failed. No documentation of this failure was available for review. Based on the Causal Analysis report prepared by BT SQUARED, dated October 15, 2008, the water level in Pond D was probably at the invert of the outlet pipes (El. 639.5) that were constructed through divider embankment D/E. BT SQUARED reported that the failure appeared to occur at the eastern reach of divider embankment D/E resulting in a semi-circular bowl shaped feature. [Incorrect description; sentences should be deleted.] Subsequently, the north embankment of Pond E breached resulting in an uncontrolled release of 30 million gallons of water into the discharge canal. BT SQUARED attributed the failure of divider embankment D/E to slope instability combined with piping erosion of the flyash at the north toe of divider embankment D/E.

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Section 1.5.2 The first paragraph in this section should be revised as follows:

IPL began repairs and reconstruction of the divider embankment D/E and the north embankment of Pond E in the summer of 2007. Construction was completed by November 2007, and the facility was put back in service. Pond D was filled with water to elevation El. 639.5 by the end of December 2007, and flow of water through the outlet pipes into Pond E began to occur. On January 30, 2008, the internal divider embankment D/E failed for a second time. The failure of the internal divider embankment D/E caused the north and west embankments of Pond E to be overtopped....

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Section 2.2.1 IPL has the following comments to the fourth, sixth and seventh paragraphs on pages 2-2 and 2-3:

One repair on the northeast corner of the east embankment was observed (Photos 1, 3 and 4). [This is a repair due to an ash sluice line leak located in the NE corner of Pond A.] The repair consists of an erosion control blanket. The erosion control blanket did not appear to be installed consistent with typical manufacturer's recommendations. Stakes did not appear to be installed properly, and the blankets were not overtopped or keyed into an anchor trench in the slope. Approximately 1- to 3-inch gaps were observed below the blanket. [Another erosion rill was observed on the west embankment (Photo 26). Some crushed stone was placed near the crest of the embankment in an effort to reduce further erosion.] Move the last two sentences to Pond B as these are Pond B descriptions. This erosion was caused due to heavy rains in Summer of 2008 and was repaired in June 2008.

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A possible former seep area was observed at the toe of the east embankment (Photo 12). [Not a seep: was the result of ash sluice line leak.] A possible former seep was also observed in a soft spongy area long the toe of the south embankment (Photo 21). No active seepage was observed during the site visit. However, active seepage in these areas has been noted in previous inspection reports.

The exterior slopes on the divider embankments A/B and A/C were generally protected with riprap or crushed stone armor. Some areas were not armored and were covered with vegetative protection. Some erosion features, surface depressions, and minor sloughing were observed on the slope (Photos 32, 35, 36, 37, and 38). Some of the larger surface erosion areas appeared to have been recently filled with riprap or stone (Photos 38, 40, 41, and 42). [Erosion due to heavy rains in Summer 2008 and was repaired in June 2008.] There was also some brush and small trees growing at the toe of the divider embankment in Pond C (Photo 42).

Section 2.2.2 This section should be revised as follows:

The crest of the Pond A embankments appeared to generally be in fair condition (Photos 2, 8, 14, 16, 19, 22, 24, 27, 30, 34, 43, and 44). The crest was

approximately 15 feet wide with exception of the truck turn around area where the crest was significantly wider. The crest consists of a compacted gravel access road around the perimeter. Three low spots were observed in the crest (Photos 2, 14, and 28). Two of the low spots appear to be from recent truck traffic rutting the crest. The low spot on the east embankment observed on 4/28/10 was filled in by an IPL contractor for road traffic purposes. IPL indicated that the low spot on the divider embankment near the outlet pipes (Photo 28) is an overflow spillway. There are no records in the information provided to CDM to indicate this was a design feature. There were no deficiencies observed in this area.

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Section 2.3.1 The first and second paragraphs of this section should be revised as follows:

The exterior slopes of the Pond B embankments appear to be in fair condition. The exterior slope of the west embankments ranged from approximately 2.5H:1V to 3H:1V (Photos 59, 61 and 64).

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The west embankment was generally covered with a grass approximately 12 to 48 inches tall. Riprap was recently placed on the exterior slope based on previous inspection reports and IPL personnel. Riprap was placed on the exterior slope on November 4, 2009.

Section 2.3.3 This paragraph should be revised as follows:

The interior slope of the Pond B embankments appeared to be generally in fair condition (Photos 31, 39, 58, 60 and 62). The interior slopes were approximately 2H:1V. Riprap was placed on the interior slope on November 4, 2009 to repair significant erosion that had occurred based on information contained in previous inspection repots and discussions with IPL personnel.... [Erosion due to heavy rains in Summer 2008 and was repaired in June 2008.]

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Section 2.5.1 IPL has the following comment to paragraph 3, page 2-5, of this section:

The upper portion of the north and west divider embankment D/E had a vegetative cover. On the north divider embankment at approximately El. 630 there was a 19-foot-wide by 5-foot-high buttress berm. The buttress berm was covered with riprap over a filter fabric (Photo 99 and 103). Washout from the breach and excavated material from the repair work was observed on the riprap. [Internal dike D/E is in the process of being repaired. Repair work initiated 4/21/2010.]

Section D.5.3 IPL has the following comment to the second paragraph of this section:

Some erosion rills were observed on the interior slope of divider embankment D/E (Photo 93 and 94). [This is in the process of being repaired and is scheduled to be complete by end of Fall 2010.]

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Section D.6.1 IPL has the following comment to this section:

The exterior slopes of the Pond E embankments appear to be in poor condition. The exterior slopes on the north and west embankments were approximately 3H:1V (Photos 105, 111 and 114). The embankment was generally covered with a grass approximately 12 to 48 inches tall. There were significant erosion features on the west and north embankment exterior slope from the overtopping on January 30, 2008 (Photos 106, 107, 112, 113, and 119). [This is in the process of being repaired and is scheduled to be completed by end of Fall 2010.]

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HAZARD CLASSIFICATION FOR DAMS

DAMAGE TO:	AREA AFFECTED BY DAM BREACH		
	LOW	SIGNIFICANT	HIGH
LOCATION	***Rural or Agricultural*** Damage would be minimal and would mostly occur on dam owner's property. No building, road, railroad, utility, or individual significantly affected. Damage is limited to farm buildings, agricultural land, and local roads.	***Predominantly Rural or Agricultural*** but roads, buildings, utilities or railroads may be damaged.	***Developing or Urban*** Where individuals could be seriously injured or killed. Buildings, roads, railroads or utilities seriously damaged.
POTENTIAL LOSS OF LIFE Flood depths greater than 1 foot in occupied quarters. Potential of loss of human life may occur.	***No***	***No***	***Yes***
ROADS County roads, state two-lane highways. or U.S. highways Serving as the only access to a community. Multilane divided state or US highway, including an interstate highway.	***No Damage***	***May Damage*** Interruption of service for not more than 1 day.	***Serious Damage*** Interruption of service for more than 1 day.
RAILROADS Operating Railroads	***No Damage***	***May Damage*** Interruption of service for not more than 1 day.	***Serious Damage*** Interruption of service for more than 1 day.
OCCUPIED QUARTERS Homes-Single family residences, apartments, nursing homes, motels and hospitals	***No Damage***	***May Damage*** Damage that would not render the structure unusable	***Serious Damage*** Damage where the flow velocity at the building compromises the integrity of the structure for human occupation.
UTILITIES	***No Damage***	***May Damage*** Damage may occur to important utilities where service would not be interrupted for more than 1 day but either of the following may occur: 1) buried lines can be exposed by erosion, or 2) towers, poles and above ground lines can be damaged by undermining or debris loading.	***Serious Damage*** Interruption of service to interstate and intrastate utility, power or communication lines serving towns, communities or significant military and commercial facilities in which disruption of power and communication would adversely affect the economy, safety, and general well-being of the area for more than 1 day.

IPL's Eagle Valley Plant Hazard Rating Discussion:

Discussants:

Nysa L Hogue
Senior Environmental Coordinator, IPL

Michael L. Schumaker, P.E.
Senior Geotechnical Engineer
CDM (Contractor to EPA)

IPL:

Shouldn't CDM consider an inundation study as part of an engineering assessment. It is my understanding that an inundation study is necessary in order to determine the flow path associated with a release (DNR utilizes this method). Currently, their report has no analysis to support their assessment. Inundation maps indicate where roadways, streets, buildings, airports, etc., are likely to be impacted by flood waters. CDM considered the inundation studies performed for Harding Street.

CDM Response:

With respect to Eagle Valley, the BT Squared assessment assumed that there will never be wet ash on the east side of the impoundment again based on their current operations plan. A breach of the east side of the impoundment could endanger the plant.

IPL has not specifically indicated that the east side of the impoundment will be abandoned and officially closed. The east side of the impoundment retains the ability to impound water and wet ash. Therefore, we did not change the hazard rating due to the potential impact to the plant. Our reasoning is laid out in the report (see excerpt below from report table):

Pond D High Hazard

- A breach could result in the failure of Pond E.
- A breach would have an environmental impact on the White River, Discharge Canal, and downstream area.
- A breach could damage a transmission tower.
- A breach could damage the railroad.
- Considering that the east portion of the pond may be utilized to store ash slurry in the future, a breach of the east embankment, for which no slope stability analyses has been

completed, will probably cause loss of life at the plant due to the close proximity of the plant to the east embankment.

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IPL:

We have an Agreed Order with IDEM which will not allow IPL to fill the pond up to a maximum design level. The Agreed Order was a result of two previous breaches which occurred in 2007 and 2008, respectively. This information was provided to CDM.

CDM Response:

I understand what they are saying. We did consider the inundation study. It appears that the door is still open for IPL to place water and/or wet ash on the east side of the pond in the future because it is not being officially closed and abandoned. Right now, they are not storing water or wet ash on that side based on current operating procedures. To the best of my knowledge it is not being capped or graded to prevent storage of surface water although there is little volume available. If procedures change and the east side of the impoundment is utilized for water or wet ash storage again at some point in the future and it were to fail it could endanger the plant and personnel. That is why we still consider it to be high hazard.

>>>

IPL:

Please see attached information provided to IDEM as part of Agreed Order. [See below/attached.]

CDM Response:

It seems that the sticking point is potential future use. It is my impression that they are neglecting 1/2 of an active pond in their inundation study because they aren't currently storing water or wet ash in it. If they are allowed to removed ash from it and pump water/wet ash into it, there is a potential a high hazard type of risk even if they are not allowed to store water and ash to the maximum design elevation as Nysa points out. If the east side fails the result could flood the plant and yard. In a nutshell, the unit in question can still potentially pose a risk if used for storage. Are they allowed to dredge the east side and store water or wet ash on that side in the

future? If there is a document that indicates that the east side is closed to all future water and wet ash storage, we could revisit our hazard rating.

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The feasibility analysis completed by BT^2 indicates that IPL wants to maintain the ability to use Pond D for future processing of ash. Their currently proposed operating procedures will limit water and wet ash storage to the western portion of the impoundment. An inundation study considering the western portion of the impoundment supports a reduced hazard rating for that portion of the impoundment from what is presented in our report. However, the inundation study neglects the east half of the impoundment.

It is our understanding that Pond D and particularly the east half of Pond D is not being closed. It is our understanding that the east side of Pond D is currently nearly filled with ash. The east embankment has not been evaluated relative to slope stability and the disposition of the currently stored ash in this area relative to its present state, i.e. is it sufficiently dewatered to behave like a solid, has not been established. If the east side of the embankment fails the plant and yard could potentially be flooded as a result of a release. Pond D is not being officially closed, there is potentially wet ash stored in it, and there is potential to store wet ash or water in the east half of Pond D in the future. As such, it is our opinion that the hazard rating should remain high. If the east side of Pond D is officially closed and it is demonstrated that there is no potential for the release of wet ash or water, the hazard rating can be reduced. In our opinion it is not appropriate to reduce the hazard rating until that occurs.

BARNES & THORNBURG LLP

11 South Meridian Street
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December 19, 2008

Mark W. Stanifer, Section Chief
Indiana Department of Environmental Management
Water Enforcement Section
Office of Enforcement, Mail Code 60-02
100 North Senate Avenue, IGCN 1315
Indianapolis, Indiana 46204-2251

Re: ***IDEM v. Indianapolis Power & Light Company***
Case Nos. 2007-16780-W and 2008-17693-W

Dear Mark:

In accordance with the approved Agreed Order for the above-referenced matter dated April 22, 2008, enclosed please find the detailed study performed by BT^2 Inc., and completed prior to October 21, 2008. Regarding the results and recommendations of the study, I have also enclosed a Feasibility Analysis for Use of D-Pond for Future Processing of Ash Slurry, dated December 18, 2008.

Regarding the Agreed Order requirement that IPL "implement any recommendations that are necessary to achieve the study's objective," note that IPL has not placed the D and E ponds in service and currently has Pond D available strictly for emergency uses only. To implement the goals of the Agreed Order, IPL is considering the possibility of filling the present Pond E to the elevation of the exterior E-Pond dike with ash to buttress the existing D-E levee that previously failed. This approach is supported by the December 18, 2008 feasibility analysis from BT^2 and would provide operational capability to the company. We would like to convene a meeting with you and any other necessary IDEM staff to discuss this plan, perhaps in the second or third week of January. Along those lines, please email to me your dates and availability during that time period. In the meantime, IPL will continue to not place Ponds D or E in service unless required to do so by absolute emergency.

IPL considers the enclosures to this letter to be business confidential and requests that your agency maintain these documents as business confidential.

If you have any questions, please call. Thank you.

Sincerely,

Anthony C. Sullivan

ACS:naw
Via Hand Delivery

PERMANENT FILE COPY

bcc: Mr. Dwayne Burke
Ms. Nysa Hogue
Mr. Kyle Noah
Guinn P. Doyle, Esquire

PERMANENT FILE COPY

December 18, 2008

Mr. Rick Jacobs
Indianapolis Power & Light Company
4040 Blue Bluff Road
Martinsville, IN 46151

SUBJECT: Feasibility Analysis for Use of D-Pond for Future Processing of Ash Slurry
Indianapolis Power & Light - Eagle Valley Plant
Martinsville, Indiana

Dear Mr. Jacobs:

At your request, Mr. David M. Hendron, P.E. of BT^2, Inc., made an analysis of the feasibility of the use of D-Pond at the Indianapolis Power & Light (IPL) Eagle Valley Plant (EVP) for future use in processing of ash slurry from the plant operations. This letter presents results of the feasibility analysis. We understand that IPL intends to fill the present E-Pond to the elevation of the exterior E-Pond dike with ash to buttress the existing D/E levee that previously failed. IPL will maintain the continuity of the conduit that exists between the E-Pond and the C-Pond so that it can be used to convey the overflow fluids from D Pond to maintain that the fluid levels in D-Pond will not exceed elevation (elev.) 620 as discussed in Section 2 of this letter report.

Our feasibility analysis included the following:

1. **Stage/Storage Volume Calculations for D-Pond**
2. **Stability Analyses of D-Pond for Various Storage Scenarios**
3. **Summary Conclusion of Feasibility**

A discussion of each follows.

1. Stage/Storage Volume Calculations for D-Pond

We understand that IPL wants to have the ability to use D-Pond for future processing of ash slurry. IPL requested BT^2 make a feasibility study of this option.

The first step in the feasibility analysis was to calculate the available storage volume in the D-Pond for the range of water elevations in the D-Pond. We were provided a topographic map of the D-Pond and the adjacent E-Pond by IPL. This topographic map, dated January 15, 2008, is given on **Figure 1**. We assume that the present contours of the configuration of D-Pond are reasonably consistent with the contours shown in this topographic map.

We used the topographic map to prepare a Stage/Storage (S/S) curve for D-Pond. This curve is shown on **Figure 2**. In effect, the S/S curve shows the available storage volume in D-Pond below each elevation that fluid could be stored in the pond. In order to prepare this curve, we assumed that there was no fluid in the pond. To determine the stage that the additional ash slurry volume will result in when it is used for plant operation, the fluid stage in the pond at the beginning of surge storage operation, defined as the antecedent water elevation, must be determined.

2. Stability Analyses of D-Pond for Various Storage Scenarios

The second step in the feasibility analysis was to perform stability analyses for the exterior dikes that form D-Pond. We first back-calculated the Frictional Shear Strength (FSS) parameter for the ash based on previous performance of the exterior dikes. The exterior dikes for D-Pond were shown to be stable when the fluid level in the pond was at elev. 639.5. We assumed that the exterior dike had a Factor of Safety (FS) of 1.0 when the water level was elev. 639.5. Our back calculations show that the FSS for the ash was 26 degrees. Based on this result, we assumed a FSS value for the ash material forming the perimeter dikes of 26 degrees.

Using a FSS value of 26 degrees for the ash material in the perimeter dikes, we performed calculations to determine the water level (also referred to as stage) in D-Pond corresponding to a FS of 1.4. We used a value of 1.4 to be consistent with minimum short-term design factor of safety for this type of geotechnical structure that considers short-term effects such as the effects of waves and other transient loads on the perimiter dikes during normal operation of the pond. In summary, a FS of 1.4 is obtained in D-Pond at a stage of elev. 622. This will be defined as the short-term, Maximum Allowable Water Elevation (MAWE) for the use of D-Pond for future ash slurry processing purposes.

We recommend that the Maximum Operating Water Elevation (MOWE) for use of D-Pond for surge storage be 2 feet below the MAWE to provide for steady state operation of the pond for future ash processing. Consequently, our stability calculations indicate that the MOWE for use of D-Pond for surge storage of ash slurry is elev. 620. At this elevation, based on the topographic information available for this study, the pond will provide at least 3,000,000 gallons of capacity for surge storage for all antecedent fluid level conditions below elev. 617. At a water level elev. 620, the FS for the D-Pond dikes is 1.5. This FS is consistent with the Standard Practice for FS for this type of water retention structure.

Given the results of our stability analyses, we recommend that a spillway overflow be provided at some point in the D-Pond with an invert elevation of 620. The spillway should be sized to handle a flow equal to the plant flow rate plus rainfall equivalent to at least a 100-year return frequency. We understand that the flow from this spillway can and will be connected via a closed conduit to the existing conduit between E-Pond and C-Pond.

3. Summary Conclusion of Feasibility of Use of D-Pond for Future Processing of Ash Slurry

In summary, our analyses indicate that use of D-Pond for future processing of ash slurry is feasible given that IPL implements the recommendations outlined in this letter report. Specifically, the recommendations include the following items:

a) The breach in the existing D/E levee will be repaired by placement and compaction of ash to the lines and grades of the original D/E levee to the elevation of the MAWL (elev. 622).

b) The E-Pond will be filled with ash obtained from site ash ponds. The exterior of the original E-Pond levees will be dressed up to repair past damage to these levees.

c) The D-Pond will be provided with a spillway connected to the C-Pond with an invert elevation of elev. 620 and a capacity of conveying maximum fluid output from the plant plus the flow resulting from a 100-year return frequency (1% chance of a return in any year) rainfall event.

d) IPL will prepare a set of engineering documents for the design of modification of D-Pond for the intended usage for future ash slurry processing.

Sincerely,
BT^2, Inc.

David M. Hendron, P.E.
Senior Manager

Enclosures: Figure 1 - January 15, 2008 Topographic Map
Figure 2 - Stage / Storage Curve

DH/lmh
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{VOLUMES FOR SETTLING POND E }
{ FILL VOLUMES = FILLTO LIMITS }

Volumes by Triangulation (Prisms) 1/11/2008 11:06
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_E.tin
Final Surface: Elevation of 627.00 feet

Area in Cut : 64,272.0 S.F., 1.48 Acres
Area in Fill: 100,859.4 S.F., 2.32 Acres
Average Cut Depth: 7.00 feet
Average Fill Depth: 10.09 feet
Total inclusion area: 165,131.4 S.F., 3.79 Acres

Cut to Fill ratio: 0.44
Cut (C.Y.) / Area (acres): 4394.61
Fill (C.Y.) / Area (acres): 9943.51
Cut volume: 449,806.6 C.F., 16,659.51 C.Y.
Fill volume: 1,017,759.9 C.F., 37,694.81 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:07
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_E.tin
Final Surface: Elevation of 629.00 feet

Area in Cut : 53,706.8 S.F., 1.23 Acres
Area in Fill: 111,424.6 S.F., 2.56 Acres
Average Cut Depth: 6.18 feet
Average Fill Depth: 11.04 feet
Total inclusion area: 165,131.4 S.F., 3.79 Acres

Cut to Fill ratio: 0.27
Cut (C.Y.) / Area (acres): 3240.69
Fill (C.Y.) / Area (acres): 12016.26
Cut volume: 331,698.1 C.F., 12,285.12 C.Y.
Fill volume: 1,229,914.3 C.F., 45,552.38 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:08
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_E.tin
Final Surface: Elevation of 631.00 feet

Area in Cut : 42,204.0 S.F., 0.97 Acres
Area in Fill: 122,927.4 S.F., 2.82 Acres
Average Cut Depth: 5.58 feet
Average Fill Depth: 11.91 feet
Total inclusion area: 165,131.4 S.F., 3.79 Acres

Cut to Fill ratio: 0.16
Cut (C.Y.) / Area (acres): 2301.27
Fill (C.Y.) / Area (acres): 14303.51
Cut volume: 235,544.9 C.F., 8,723.88 C.Y.
Fill volume: 1,464,023.9 C.F., 54,223.11 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:09
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_E.tin
Final Surface: Elevation of 633.00 feet

Area in Cut : 31,439.4 S.F., 0.72 Acres
Area in Fill: 133,692.0 S.F., 3.07 Acres
Average Cut Depth: 5.17 feet
Average Fill Depth: 12.88 feet
Total inclusion area: 165,131.4 S.F., 3.79 Acres

Cut to Fill ratio: 0.09
Cut (C.Y.) / Area (acres): 1589.51
Fill (C.Y.) / Area (acres): 16818.41
Cut volume: 162,692.9 C.F., 6,025.66 C.Y.
Fill volume: 1,721,434.8 C.F., 63,756.85 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:09
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_E.tin
Final Surface: Elevation of 635.00 feet

Area in Cut : 25,330.5 S.F., 0.58 Acres
Area in Fill: 139,800.9 S.F., 3.21 Acres
Average Cut Depth: 4.18 feet
Average Fill Depth: 14.27 feet
Total inclusion area: 165,131.4 S.F., 3.79 Acres

Cut to Fill ratio: 0.05
Cut (C.Y.) / Area (acres): 1035.18
Fill (C.Y.) / Area (acres): 19490.75
Cut volume: 105,955.4 C.F., 3,924.27 C.Y.
Fill volume: 1,994,960.2 C.F., 73,887.41 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:10
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_E.tin
Final Surface: Elevation of 641.00 feet

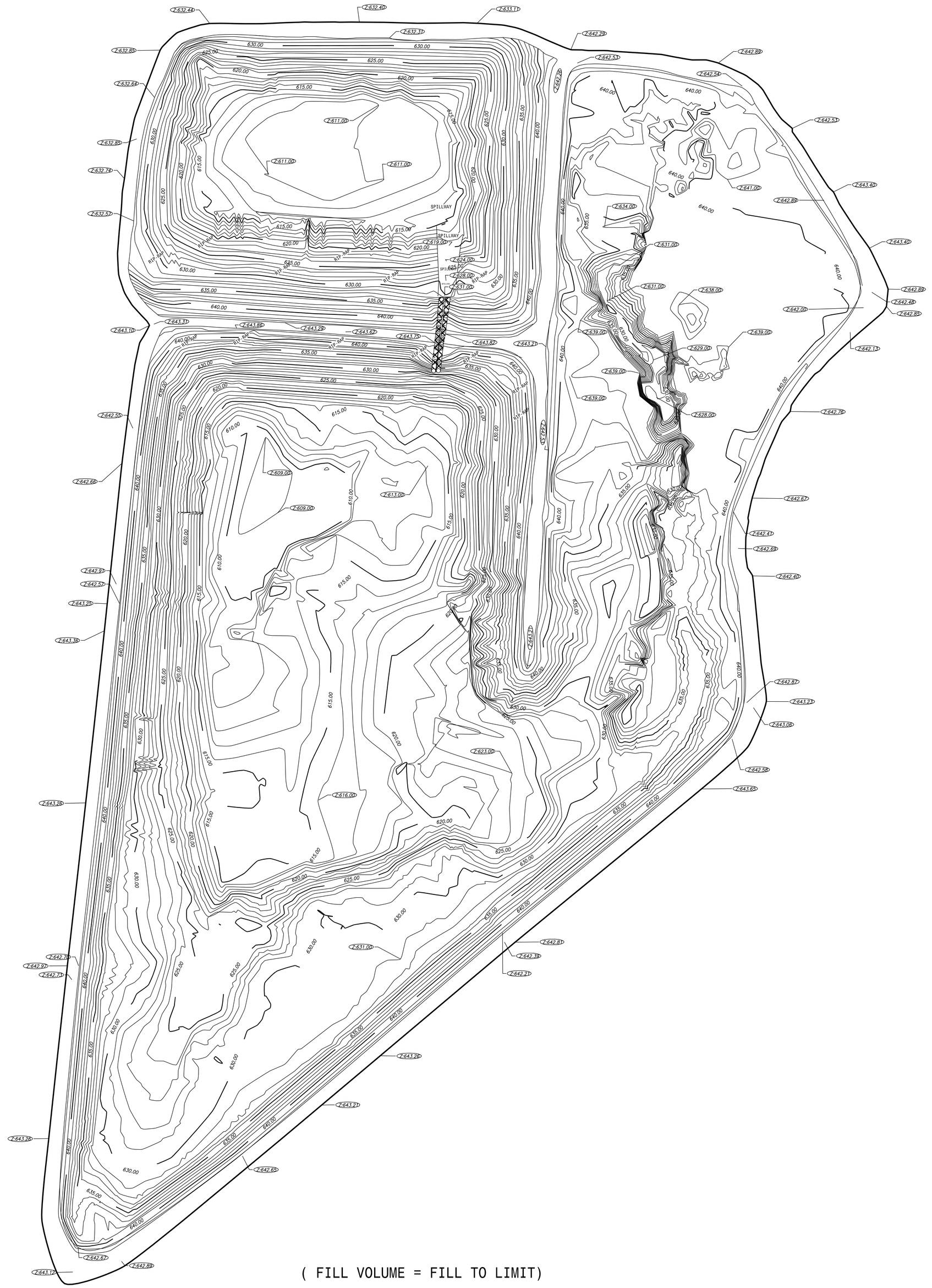
Area in Cut : 7,173.1 S.F., 0.16 Acres
Area in Fill: 157,958.3 S.F., 3.63 Acres
Average Cut Depth: 1.17 feet
Average Fill Depth: 18.28 feet
Total inclusion area: 165,131.4 S.F., 3.79 Acres

Cut to Fill ratio: 0.00
Cut (C.Y.) / Area (acres): 81.80
Fill (C.Y.) / Area (acres): 28217.37
Cut volume: 8,372.7 C.F., 310.10 C.Y.
Fill volume: 2,888,166.2 C.F., 106,969.12 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:11
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_E.tin
Final Surface: Elevation of 643.00 feet

Area in Cut : 1,039.8 S.F., 0.02 Acres
Area in Fill: 164,091.6 S.F., 3.77 Acres
Average Cut Depth: 0.28 feet
Average Fill Depth: 19.56 feet
Total inclusion area: 165,131.4 S.F., 3.79 Acres

Cut to Fill ratio: 0.00
Cut (C.Y.) / Area (acres): 2.88
Fill (C.Y.) / Area (acres): 31365.11
Cut volume: 294.3 C.F., 10.90 C.Y.
Fill volume: 3,210,350.6 C.F., 118,901.88 C.Y.



(FILL VOLUME = FILL TO LIMIT)

{VOLUMES FOR SETTLING POND D }
{ FILL VOLUMES = FILLTO LIMITS }

Volumes by Triangulation (Prisms) 1/11/2008 11:13
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_D.tin
Final Surface: Elevation of 627.00 feet

Area in Cut : 445,409.4 S.F., 10.23 Acres
Area in Fill: 268,782.4 S.F., 6.17 Acres
Average Cut Depth: 8.49 feet
Average Fill Depth: 9.23 feet
Total inclusion area: 714,191.8 S.F., 16.40 Acres

Cut to Fill ratio: 1.52
Cut (C.Y.) / Area (acres): 8542.33
Fill (C.Y.) / Area (acres): 5603.54
Cut volume: 3,781,525.4 C.F., 140,056.50 C.Y.
Fill volume: 2,480,581.6 C.F., 91,873.39 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:13
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_D.tin
Final Surface: Elevation of 629.00 feet

Area in Cut : 407,471.0 S.F., 9.35 Acres
Area in Fill: 306,720.8 S.F., 7.04 Acres
Average Cut Depth: 7.18 feet
Average Fill Depth: 9.96 feet
Total inclusion area: 714,191.8 S.F., 16.40 Acres

Cut to Fill ratio: 0.96
Cut (C.Y.) / Area (acres): 6611.92
Fill (C.Y.) / Area (acres): 6899.80
Cut volume: 2,926,970.3 C.F., 108,406.31 C.Y.
Fill volume: 3,054,410.1 C.F., 113,126.30 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:14
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_D.tin
Final Surface: Elevation of 631.00 feet

Area in Cut : 334,166.5 S.F., 7.67 Acres
Area in Fill: 380,025.3 S.F., 8.72 Acres
Average Cut Depth: 6.52 feet
Average Fill Depth: 9.83 feet
Total inclusion area: 714,191.8 S.F., 16.40 Acres

Cut to Fill ratio: 0.58
Cut (C.Y.) / Area (acres): 4920.64
Fill (C.Y.) / Area (acres): 8435.19
Cut volume: 2,178,272.3 C.F., 80,676.75 C.Y.
Fill volume: 3,734,095.7 C.F., 138,299.84 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:14
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_D.tin
Final Surface: Elevation of 633.00 feet

Area in Cut : 288,272.2 S.F., 6.62 Acres
Area in Fill: 425,919.5 S.F., 9.78 Acres
Average Cut Depth: 5.41 feet
Average Fill Depth: 10.67 feet
Total inclusion area: 714,191.8 S.F., 16.40 Acres

Cut to Fill ratio: 0.34
Cut (C.Y.) / Area (acres): 3524.89
Fill (C.Y.) / Area (acres): 10266.10
Cut volume: 1,560,400.6 C.F., 57,792.61 C.Y.
Fill volume: 4,544,607.5 C.F., 168,318.80 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:15
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_D.tin
Final Surface: Elevation of 635.00 feet

Area in Cut : 252,613.1 S.F., 5.80 Acres
Area in Fill: 461,578.6 S.F., 10.60 Acres
Average Cut Depth: 4.04 feet
Average Fill Depth: 11.77 feet
Total inclusion area: 714,191.8 S.F., 16.40 Acres

Cut to Fill ratio: 0.19
Cut (C.Y.) / Area (acres): 2303.26
Fill (C.Y.) / Area (acres): 12271.14
Cut volume: 1,019,608.8 C.F., 37,763.29 C.Y.
Fill volume: 5,432,199.3 C.F., 201,192.57 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:16
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_D.tin
Final Surface: Elevation of 637.00 feet

Area in Cut : 207,871.9 S.F., 4.77 Acres
Area in Fill: 506,319.9 S.F., 11.62 Acres
Average Cut Depth: 2.68 feet
Average Fill Depth: 12.63 feet
Total inclusion area: 714,191.8 S.F., 16.40 Acres

Cut to Fill ratio: 0.09
Cut (C.Y.) / Area (acres): 1256.83
Fill (C.Y.) / Area (acres): 14451.38
Cut volume: 556,375.2 C.F., 20,606.49 C.Y.
Fill volume: 6,397,349.3 C.F., 236,938.86 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:16
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_D.tin
Final Surface: Elevation of 639.00 feet

Area in Cut : 149,730.9 S.F., 3.44 Acres
Area in Fill: 564,460.8 S.F., 12.96 Acres
Average Cut Depth: 1.31 feet
Average Fill Depth: 13.23 feet
Total inclusion area: 714,191.8 S.F., 16.40 Acres

Cut to Fill ratio: 0.03
Cut (C.Y.) / Area (acres): 442.64
Fill (C.Y.) / Area (acres): 16863.86
Cut volume: 195,949.5 C.F., 7,257.39 C.Y.
Fill volume: 7,465,307.1 C.F., 276,492.86 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:17
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_D.tin
Final Surface: Elevation of 641.00 feet

Area in Cut : 35,856.4 S.F., 0.82 Acres
Area in Fill: 678,335.4 S.F., 15.57 Acres
Average Cut Depth: 0.89 feet
Average Fill Depth: 12.87 feet
Total inclusion area: 714,191.8 S.F., 16.40 Acres

Cut to Fill ratio: 0.00
Cut (C.Y.) / Area (acres): 72.17
Fill (C.Y.) / Area (acres): 19720.05
Cut volume: 31,949.6 C.F., 1,183.32 C.Y.
Fill volume: 8,729,690.9 C.F., 323,321.88 C.Y.

Volumes by Triangulation (Prisms) 1/11/2008 11:17
Original Surface: L:\DWG\Jle\EV_P_PLANT\EV_ASH_VOL_07\REVISED_07EPV_D.tin
Final Surface: Elevation of 643.00 feet

Area in Cut : 1,572.3 S.F., 0.04 Acres
Area in Fill: 712,619.4 S.F., 16.36 Acres
Average Cut Depth: 0.28 feet
Average Fill Depth: 14.21 feet
Total inclusion area: 714,191.8 S.F., 16.40 Acres

Cut to Fill ratio: 0.00
Cut (C.Y.) / Area (acres): 1.01
Fill (C.Y.) / Area (acres): 22875.56
Cut volume: 446.7 C.F., 16.55 C.Y.
Fill volume: 10,126,571.5 C.F., 375,058.20 C.Y.

One inch = 50 feet
25 0 50 100

INDIANAPOLIS POWER & LIGHT COMPANY
REAL ESTATE SERVICES – LAND SURVEY SECTION

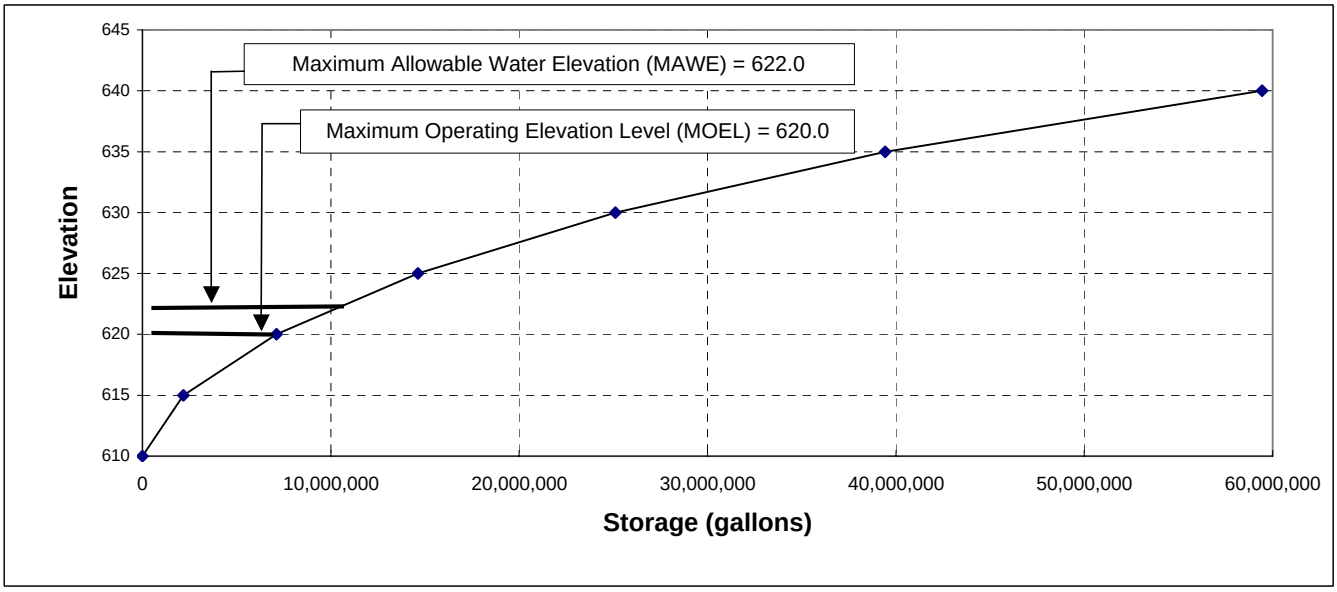
EAGLE VALLEY POWER PLANT
ASH PONDS D & E
VOLUME SURVEY

SCALE: 1" = 50'	SHEET 1 OF 1	MAP:
BY: JL ELLISON	DATE: 7:57am, Jan 15, 2008	

FILE: L:\DWG\Gen\Eagle Valley Coal\EV ASH\EV_12_03_07_PERIMETER\EAST_POND_07

Figure 2
Pond D Stage/Storage Calculation
Indianapolis Power & Light Company
Eagle Valley Power Plant

Elevation	Area (ft^2)	Average Area (ft^2)	Volume (ft^3)	Cumulative Volume (ft^3)	Cumulative Volume (gal)
610	16,476			0	0
		57,916	289,580		
615	99,356			289,580	2,166,058
		132,558	662,790		
620	165,760			952,370	7,123,728
		200,585	1,002,925		
625	235,410			1,955,295	14,625,607
		280,221	1,401,103		
630	325,031			3,356,398	25,105,853
		383,073	1,915,363		
635	441,114			5,271,760	39,432,765
		535,104	2,675,518		
640	629,093			7,947,278	59,445,636



Note: Volumes calculated using areas obtained from drawing titled: Eagle Valley Power Plant, Ash Ponds D & E, Volume Survey, dated January 15, 2008.

KRG/krg/DH
I:\3573\Tables-General\[Pond D volume.xls]Sheet1