STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

VERIFIED PETITION OF INDIANAPOLIS POWER & LIGHT COMPANY ("IPL"), AN INDIANA CORPORATION, FOR (1) CERTIFICATES THAT PUBLIC CONVENIENCE AND NECESSITY ("CPCN") WILL BE SERVED BY COMPLIANCE PROJECTS TO ALLOW IPL TO COMPLY WITH FEDERALLY MANDATED REQUIREMENTS AT PETERSBURG GENERATING STATION; (2) APPROVAL OF ASSOCIATED ACCOUNTING AND RATEMAKING TREATMENT, INCLUDING COST RECOVERY IN ACCORDANCE WITH IND. CODE § 8-1-8.4-7 AND AUTHORITY TO DEFER COSTS UNTIL SUCH COSTS ARE REFLECTED IN RATES; AND 3) TO THE EXTENT NECESSARY OR APPROPRIATE ISSUANCE OR MODIFICATION OF CPCN FOR THE USE OF CLEAN COAL TECHNOLOGY PURSUANT TO IND. CODE CH. § 8-1-8.7	)	**CAUSE NO. 44794**

OUCC PREFILED TESTIMONY

OF

EDWARD T. RUTTER – PUBLIC EXHIBIT #1

ON BEHALF OF THE

INDIANA OFFICE OF UTILITY CONSUMER COUNSELOR

Respectfully Submitted,

INDIANA OFFICE OF UTILITY CONSUMER COUNSELOR

Lorraine Hitz-Bradley

Lorraine Hitz-Bradley, Atty. No. 18006-29
Deputy Consumer Counselor

CERTIFICATE OF SERVICE

This is to certify that a copy of the foregoing ***Indiana Office of Utility Consumer Prefile Testimony of Edward T. Rutter*** has been served upon the following counsel of record in the captioned proceeding by electronic service and/or by depositing a copy of same in the United States mail, first class postage prepaid, on October 04, 2016.

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TESTIMONY OF OUCC WITNESS EDWARD T. RUTTER
CAUSE NO. 44794
INDIANAPOLIS POWER & LIGHT COMPANY

I. INTRODUCTION

Q: Please state your name, employer, current position and business address.

A: My name is Edward T. Rutter. I am employed by the Indiana Office of Utility Consumer Counselor ("OUCC") as a Chief Technical Advisor in the Resource Planning and Communications Division. My business address is 115 West Washington St., Suite 1500 South Tower, Indianapolis, Indiana 46204. My educational background and professional experience is detailed in Appendix ETR-1 attached to this testimony.

Q: What is the purpose of your direct testimony?

A: My testimony reviews and analyzes the modeling results provided by Indianapolis Power & Light Company ("IPL") witness Ms. Joan Soller in her prefiled direct testimony and accompanying attachments JMS-1 through JMS-7. Ms. Soller presents the results of the economic analysis and modeling undertaken to evaluate IPL's options to comply with the National Ambient Air Quality Standard for Sulfur Dioxide Emissions ("NAAQS-SO_2") State Implementation Plan requirements and Coal Combustion Residuals ("CCR") Rule to cease sluicing to ash ponds.

In furtherance of my analysis, I compare the estimated costs to continue operating Petersburg Units 1-4 through the planned retirement dates to the estimated costs of a complete shutdown of Petersburg Units 1-4 in 2017.

I discuss the business risks inherent for each of the two options and explain why it

is important not to take action in this proceeding until IPL's 2016 Integrated Resource Plan ("IRP") has been filed, and all parties in this proceeding have had an opportunity to review and analyze the details.

I also discuss the risk to ratepayers of higher rates inherent in the decision to approve IPL's petition to meet the NAAQS-SO_2 and CCR requirements. If IPL's proposed plan is modified or abandoned at a later date, I discuss how the business risk is shifted to the ratepayer. Such a scenario would be similar to what occurred in Cause No. 44540, where costs were passed onto ratepayers after IPL decided to refuel Harding Street Unit 7 to natural gas after IPL had already incurred significant costs to retrofit the coal unit for MATS compliance. The shifting of the business risk to the ratepayer is not a direct action proposed by either IPL or the Commission, but it could be the result of the action ultimately decided in this proceeding. All parties to this proceeding are faced with attempting to arrive at certainty for future actions where there is uncertainty around important inputs, such as load growth or lack thereof, impact of energy efficiency measures adopted and their sustainability, fuel source availability and price, as well as changing environmental rules and regulations that will face legal challenge.

My analysis and review does not address the necessity or lack of necessity for the proposed changes to meet the NAAQS-SO_2 and CCR requirements. Those issues are discussed by OUCC witnesses Ms. Cynthia Armstrong and Mr. Anthony Alvarez.

Q: Who else will be testifying on behalf of the Public in this proceeding?

A: Below is a brief summary of the witnesses and the corresponding subject matter:

- The testimony of Mr. Anthony A. Alvarez, Utility Analyst for the Resource Planning and Communications Division. Mr. Alvarez presents his analysis of the NAAQS "Emergency" projects, the CCR dry bottom ash handling system, and the technical and cost support of these projects provided in IPL's case-in-chief.
- The testimony of Mr. Wes R. Blakley, Senior Utility Analyst in the Electric Division. Mr. Blakley renders an opinion on IPL's request for ratemaking and accounting treatment for the proposed Compliance Projects and recovery through its Environmental Compliance Cost Recovery Adjustment ("ECCRA").
- The testimony of Ms. Cynthia Armstrong, Senior Utility Analyst in the Electric Division. Ms. Armstrong presents the OUCC's review of IPL's proposed environmental compliance plans to meet the CCR Rule and the NAAQS-SO_2 requirements. Ms. Armstrong also describes future environmental regulations that may impact the Petersburg Generating Facility.

II. REVIEW OF IPL'S MODELING RESULTS

Q. Did you review the modeling of the various options IPL evaluated in addressing the four Petersburg Units' impending NAAQS-SO_2 and the CCR requirements?

A. Yes. IPL used the ABB Strategic Planning software model to evaluate both the NAAQS-SO_2 and the CCR compliance projects. Because the OUCC does not have access to the ABB Strategic Planning software model, my analysis has reviewed all model inputs for overall reasonableness and analyzed the model results. IPL based its compliance plan on what it believes is a reasonable least

cost basis by modeling the least cost of each option and scenario. This methodology is represented by the present value of revenue requirements ("PVRR") of a particular option and scenario. The least cost option has been used historically to evaluate the efficacy of various utility options in developing a course of action. IPL faces risk to comply with NAAQS-SO_2 and CCR regulations, which requires making decisions based on uncertain key inputs in any decision tree used in the analysis. However, when IPL is faced with an uncertain and developing environmental landscape, a more rigorous analysis of the risks associated with each alternative is important.

My analysis of IPL's proposal centers on whether or not the results are interpreted and adopted appropriately. My analysis developed two scenarios: 1) the estimated cost to continue operating Petersburg Units 1 through 4, and 2) the estimated cost to discontinue operation of Petersburg Units 1 through 4. The data for each was developed from both the testimony filed and the Commission's final Order in IPL's most recent base rate case, Cause No. 44576; publicly available information related to the cost of a variety of new generation types; the estimated cost of purchased power; and the estimated capital and operation and maintenance cost for new generation facilities.

Q. What are the model run results IPL provided supporting its NAAQS-SO_2 compliance plan?

A. The model run results for NAAQS-SO_2 compliance compared three primary actions on a least cost approach:[1] 1) retrofit the existing four Petersburg units; 2)

[1] Petitioner's Witness Ms. Joan M. Soller Direct Testimony, page 4, lines 14 – 19.

refuel the four Petersburg units to burn natural gas; or 3) replace the four Petersburg units with a Combined Cycle Gas Turbine ("CCGT"). Petitioner's Exhibit JMS-2 presents the NAAQS-SO_2 modeling on a per unit basis. I have prepared ETR Attachment 1, which summarizes the IPL NAAQS-SO_2 modeling results for each Petersburg unit under the three primary actions noted above.

Q. Do the modeling results IPL provided definitively support its NAAQS-SO_2 compliance plan?

A. No. As shown in ETR Attachment 1, not all model runs for the individual Petersburg units support the retrofit option as the least cost option. The same holds true for modeling run results when viewed in aggregate.

Looking at the bar graphs provided to demonstrate the variance between the various options provided in Petitioner's JMS–2, I noticed that the difference portrayed by the resultant bars in the graph is not as varied as I might conclude when I look to the y-axis. The graphs make small differences appear larger because IPL did not use the same scale for each graph. When examined in detail, the numerical differences in the least cost results are not significant enough to abandon any of the alternatives modeled and accept the retrofit option without further analysis.

Q. What are the model run results IPL provided in support of its CCR compliance plan?

A. As with the model runs pertaining to IPL's NAAQS-SO_2 plan, the model run results for CCR compliance compared three primary actions on a least cost approach: 1) retrofit the existing four Petersburg units; 2) refuel the four Petersburg units to burn natural gas; or 3) replace the four Petersburg units with a

Combined Cycle Gas Turbine ("CCGT"). The CCR modeling that IPL presented for Petersburg was on both a per-unit and total plant basis and is presented on Petitioner's Exhibit JMS-3, attached as ETR Attachment– 2. ETR Attachment - 1 summarizes the results of the IPL CCR modeling for each of the Petersburg units and the total Petersburg plant under the three primary actions noted above.

Q. Does IPL's modeling results definitively support its CCR compliance plan?

A. No. ETR Attachment 2 shows that not all model runs for the individual Petersburg units support the retrofit option as the least cost option. The same holds true for the total Petersburg Plant, Units 1 through 4. Again, the numerical differences in the least cost results are not significant enough to abandon any of the alternatives modeled and accept the retrofit option without further analysis.

Q. What further analysis should be undertaken before you would recommend the Commission adopt IPL's proposed NAAQS-SO_2 and CCR compliance plans?

A. The use of a least cost analysis should be viewed in light of the risks, uncertainties, availability of regional resources, existing and reasonably anticipated environmental regulations, projected fuel costs and availability, load growth economic factors and technological changes faced by each option modeled. If the magnitude of the differences between a model run's selected option and the alternatives is not significant, the result could be impacted by minor adjustments to the inputs. As pointed out previously in my testimony, the various models run by IPL do not always select the retrofit option as the least cost option. There is the risk that the reasonableness of basic inputs which IPL and stakeholders may believe are valid could change rapidly, impacting some

previously acceptable results. For example, the probability of more (or less) environmental rules requiring more (or less) capital and operating and maintenance expense can materially impact a decision to retrofit a specific generating unit. In selecting a refuel or replacement option with natural gas, there are inherent risks, such as the fact that the market will drive the price of natural gas along with the availability of supply. Recent efforts to curtail or eliminate hydraulic fracturing or "fracking" could impact the future supply and price of natural gas.

In addition, new pipelines are required as utilities' demand for natural gas increases. However, it is becoming more difficult for pipelines to come online as a result of environmentalists opposing specific routes. These issues would be critical if IPL were required or decided to use natural gas as the main source of fuel for generating electricity.

The loss of fuel diversity is a risk that must be acknowledged and addressed in any modeling process. If IPL were to refuel or replace the Petersburg units with a gas burning facility, IPL would become reliant on natural gas for almost 98% of its generation capacity.

In my review and analysis of the proposed compliance plan, I was unable to determine what, if any, risk assessment was performed by IPL that addresses fuel source diversity or fuel source availability. I was also unable to determine whether IPL included any probability analysis addressing potential environmental rule changes.

Q. In addition to the analysis discussed above, is there anything further that should also be reviewed?

A. Yes. Anytime there is a proposal that may impact future generation availability or the nature of new or changed generation availability, that proposal should be consistent with the most recent IRP. The results of the varying model runs presented by IPL are so close and the risk factors under each of the primary options potentially impactful that any decision made here needs to be thoroughly vetted, thought through objectively, and based on the most recent available information. For IPL, the most recent IRP was filed in 2014. However, IPL is currently in the process of preparing its 2016 IRP, with stakeholder involvement. It is important that the proposed NAAQS-SO_2 and CCR compliance plans be consistent with the 2016 IRP.

The OUCC believes that it would be imprudent for the Commission to approve the proposed NAAQS-SO_2 and CCR compliance plans prior to IPL filing its 2016 IRP. Interested stakeholders in this proceeding should be provided sufficient time to thoroughly review, evaluate and comment on how the 2016 IRP may or may not impact the proposed NAAQS-SO_2 and CCR compliance plans and allow IPL to modify its Compliance Plan within this Cause. Deferring a decision regarding the compliance projects until this time will also give an opportunity for the interested parties to review the final structural stability assessments of Petersburg's ash ponds due in mid-October, as discussed in Ms. Armstrong's testimony.

III. COMPARATIVE COST ANALYSIS

Q. Did you prepare any independent analysis to determine the potential revenue requirement impact for continued operation of Petersburg Units 1 through 4 through a retrofit versus a complete shutdown and replacing of coal generation with renewables or natural gas?

A. Yes. I prepared ETR Attachment – 3 to determine if an independent analysis, utilizing publicly available information, would provide additional insight into whether the Petersburg Units 1 through 4 should be retrofitted to comply with NAAQS-SO_2 and CCR requirements or collectively be shut down. The data represents continued operation of the Petersburg facility through 2042, with scheduled retirement of each unit as currently anticipated, and the same 25 year period for the shutdown scenario.

ETR Attachment – 3 was designed to determine whether the results indicated in the various PVRR modeling runs produce a significant variant from a simple cost analysis. It is a simulation of projected costs based on publicly available information, and provides a simple contrast between the retrofit and one example of the extreme option of shutting down the Petersburg units in 2017.

The data used for the analysis of the ongoing operation of Petersburg Units 1 through 4 is based on information provided by IPL and approved by the Commission in Cause No. 44576, including the fixed and variable operation and maintenance expenses; coal costs; estimated decommissioning costs; and depreciation rates. This data was included in IPL witnesses Mr. Reed's, Ms. Guletsky's and Mr. Spanos's direct testimony and exhibits in Cause No. 44576. I

adopted the rate of return and the income tax factors approved by the Commission in its Order.

Q: What other information did you use?

I relied upon the following publicly available information to develop the fixed and variable operation and maintenance costs, fuel costs and the capital cost to provide 300 MW wind facility and two 600 MW CCGT facilities.

- "Cost of New Entry Estimates for Combustion-Turbine and Combined-Cycle Plants in PJM", The Brattle Group, August 24, 2011.
- "Updated Capital Cost Estimates for Utility Scale Electricity Plant", U.S. Department of Energy, April 2013.
- "Cost of New Entry Estimates for Combustion Turbine and Combined Cycle Plants in PJM" with June 1, 2018 Online Date, May 15, 2014.
- "Lazard's Levelized Cost of Energy Analysis-Version 9.0" November 2015.
- "Levelized Cost of New Electricity Generating Technologies", Institute for Energy Research, based on 2013 EIA Report.

In developing the depreciation expense and net plant in service for each of the aforementioned generation replacement facilities, I used a composite 2.5% annual depreciation rate. I adopted the rate of return authorized by the Commission in Cause No. 44576 for the overall rate of return. In addition, I utilized an average cost of purchased power filed in this Cause derived from IPL's Confidential

Attachment DC-1, page 2 of 3 and the indicated capacity shortfall provided by OUCC Witness Mr. Alvarez.

Q. How did your analysis in Attachment ETR-3 support your recommendations regarding IPL's proposed compliance with the NAAQS-SO_2 and CCR requirements?

A. The analysis performed and included on Attachment ETR - 3 was created as an independent exercise to derive data needed for my recommendations to the Commission in this Cause.

ETR Attachment - 3-3[2] shows an estimated operation and maintenance cost for the continued operation of Petersburg Units 1 through 4 at $18,137,721,645 and the operation and maintenance cost of replacement of Petersburg Units 1 through 4 of $14,773,607,731. This variance indicates it would be cheaper to operate and maintain replacement facilities for the next 25 years. However, the capital cost for continuing to operate all of the Petersburg units through their expected useful life is only $100,044,000, opposed to the capital cost of replacement generation of $2,114,280,000. The difference is between the cost to continue to operate all of the Petersburg units until full retirement versus a complete shutdown of all Petersburg units in 2017 and replacing the generation with purchased power, a 300 MW renewable facility and two 600 MW CCGT facilities. The cost to continue to operate Petersburg is $1,349,877,914 more than the complete shutdown option over the same period. The "continued to operate" option result in an additional annual cost of $53,995,117 over the 25 year period.

[2] See ETR Attachment – 3, page 1 of 18.

Q: What is your conclusion?

I utilized data provided in Cause No. 44576 and relied on publicly available information to develop replacement generation operation and maintenance, fuel and capital costs with varying dates. The resulting difference between the cost of the continued operation option and the complete shutdown option is not significant enough to suggest adoption of the retrofit option over a refuel or replace option utilizing natural gas.

IV. RECOMMENDATIONS

Q. What is the OUCC recommending in this proceeding?

A. The OUCC recommends the Commission:

- Defer a recommendation on IPL's proposal until ninety (90) days after IPL files its 2016 IRP.
- Allow IPL the opportunity to submit additional modeling runs that encompass the risk resulting from a lack of fuel diversity and the risk and probability of changing environmental requirements through supplemental testimony.
- During the deferral period, allow the parties to this proceeding develop testimony that addresses the IRP results and how those results might impact the proposed IPL compliance plans.
- Require IPL to work with parties to this proceeding to provide viable alternative scenarios suggested by the stakeholders to evaluate the continued operation of the Petersburg Units.

Q. Does this conclude your testimony?

A: Yes.

APPENDIX TO TESTIMONY OF
OUCC WITNESS EDWARD T. RUTTER

Q: Please describe your educational background and experience.

A: I am a graduate of Drexel University in Philadelphia, PA, with a Bachelor of Science degree in Business Administration**.** I was employed by South Jersey Gas Company as an accountant responsible for coordinating annual budgets, preparing preliminary monthly, quarterly, annual and historical financial statements, assisting in preparation of annual reports to shareholders, all SEC filings, state and local tax filings, all FPC/FERC reporting, plant accounting, accounts payable, depreciation schedules and payroll. Once the public utility holding company was formed, South Jersey Industries, Inc., I continued to be responsible for accounting as well as for developing the consolidated financial statements and those of the various subsidiary companies including South Jersey Gas Company, Southern Counties Land Company, Jessie S. Morie Industrial Sand Company, and SJI LNG Company.

I left South Jersey Industries, Inc. and took a position with Associated Utility Services Inc. (AUS), a consulting firm specializing in utility rate regulation including rate of return, revenue requirement, purchased gas adjustment clauses, fuel adjustment clauses, revenue requirement development and valuation of regulated entities.

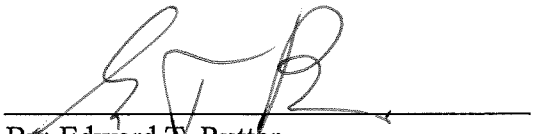
On leaving AUS, I worked as an independent consultant in the public utility area as well as telecommunications including cable television (CATV). I joined the OUCC in December 2012 as a utility analyst.

Q: Have you previously testified before the Indiana Utility Regulatory Commission?

A: I have previously testified before the Indiana Utility Regulatory Commission (Commission) in Cause Nos. 44311, 44331, 44339, 44363, 44370, 44418, 44429, 44446, 44478, 44486, 44495, 44497, 44526, 44540, 44542, 44576, 44602, 44403, 44634, 44645, 44688, plus 43827 and 43955 DSM dockets and several sub-dockets.. I have also testified before the regulatory commissions in the states of New Jersey, Delaware, Maryland, Pennsylvania, New York, Connecticut, Georgia, Florida, North Carolina, Ohio, Oklahoma, Virginia and Wisconsin. In addition to the states mentioned, I submitted testimony before the utility regulatory commissions in the Commonwealth of Puerto Rico and the U.S. Virgin Islands. I have also testified as an independent consultant on behalf of the U.S. Internal Revenue Service in Federal Tax Court, New York jurisdiction.

AFFIRMATION

I affirm, under the penalties for perjury, that the foregoing representations are true.



By: Edward T. Rutter
Indiana Office of
Utility Consumer Counselor

10/4/2016
Date:

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1-4
SUMMARY OF WEIGHTED PROBABILISTIC PVRR
PETITIONER'S ATTACHMENT JMS-2

DESCRIPTION	PVRR LOW CO2- BASE GAS $ MILLIONS	PVRR LOW CO2-LOW GAS LOW GAS $ MILLIONS	PVRR LOW CO2- HIGH GAS $ MILLIONS	PVRR MOD CO2 EPA BASE GAS $ MILLIONS	PVRR MOD CO2 EPA LOW GAS $ MILLIONS	PVRR MOD CO2 EPA HIGH GAS $ MILLIONS	PVRR MOD CO2 EPA BASE GAS $ MILLIONS	PVRR MOD CO2 EPA BASE GAS $ MILLIONS
PETERSBURG UNIT # - 1:								
REFUEL	$16,098.77	$14,266.04	$18,045.99	$16,366.50	$14,533.76	$18,313.71	$17,931.26	$21,140.07
CCGT	15,993.35	14,119.83	17,959.07	16,261.07	14,387.56	18,226.79	17,819.41	20,957.96
RETROFIT	15,978.60	14,135.39	17,776.08	16,260.93	14,403.11	18,105.84	17,817.91	20,957.14
PETERSBURG UNIT # - 2:								
REFUEL	16,032.11	14,035.28	18,160.68	16,260.35	14,263.51	18,388.91	17,798.51	20,849.15
CCGT	15,972.43	13,897.12	18,134.85	16,200.67	14,125.35	18,363.08	17,724.21	20,638.99
RETROFIT	15,944.26	13,940.34	17,721.00	16,213.13	14,168.57	18,050.78	17,734.48	20,650.64
PETERSBURG UNIT # - 3:								
REFUEL	16,313.44	13,996.12	18,817.71	16,559.50	14,242.17	19,063.76	17,985.76	20,760.13
CCGT	16,343.22	13,907.81	18,887.59	16,589.28	14,153.87	19,133.65	18,002.95	20,440.92
RETROFIT	15,922.54	13,890.33	17,698.99	16,252.32	14,136.39	18,028.76	17,825.48	20,367.64
PETERSBURG UNIT # - 4:								
REFUEL	16,210.63	13,918.32	18,728.25	16,457.94	14,165.64	18,975.56	17,877.02	20,851.57
CCGT	16,217.83	13,813.91	18,772.39	16,465.14	14,061.22	19,019.70	17,870.61	20,511.69
RETROFIT	15,990.52	13,828.98	17,768.05	16,320.30	14,076.30	18,097.83	17,826.48	20,478.28
PETERSBURG UNIT # 1 - 4:								
REFUEL	64,654.95	56,215.76	73,752.63	65,644.29	57,205.08	74,741.94	71,592.55	83,600.92
CCGT	64,526.83	55,738.67	73,753.90	65,516.16	56,728.00	74,743.22	71,417.18	82,549.56
RETROFIT	63,835.92	55,795.04	70,964.12	65,046.68	56,784.37	72,283.21	71,204.35	82,453.70

Derived from Petitioner's Attachment JMS-2, pages 12 of 12

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
RESULTS OF PROBABILISTIC DECISION TREE
PVRR
DIRECT TESTIMONY OF MS. JOAN SOLER

DESCRIPTION	PVRR 2016 - 2052 $ MILLIONS
PETERSBURG UNIT # - 1:	
REFUEL	$17,471
CCGT	17,350
RETROFIT	17,330
PETERSBURG UNIT # - 2:	
REFUEL	17,345
CCGT	17,253
RETROFIT	17,217
PETERSBURG UNIT # - 3:	
REFUEL	17,552
CCGT	17,517
RETROFIT	17,195
PETERSBURG UNIT # - 4:	
REFUEL	17,481
CCGT	17,424
RETROFIT	17,235
PETERSBURG UNIT # 1 - 4:	
REFUEL	69,849
CCGT	69,544
RETROFIT	68,977
Derived from direct tesimony of Ms. Joan Soler, Figure 7, 8, 9, 10	

ETR Attachment – 2

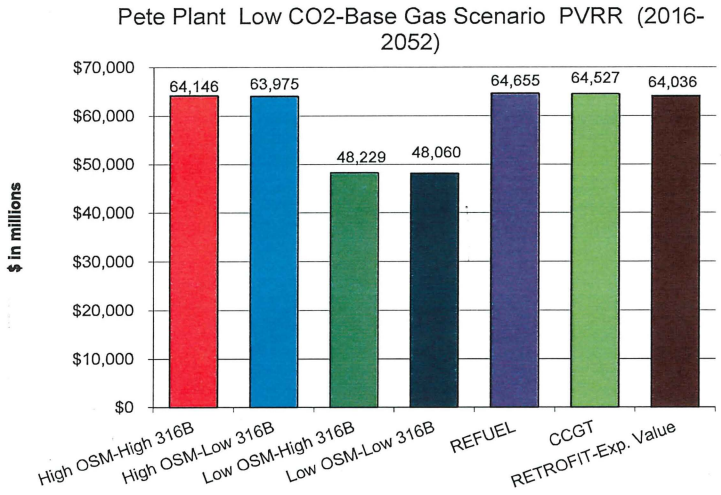
(Consisting of 4 pages)

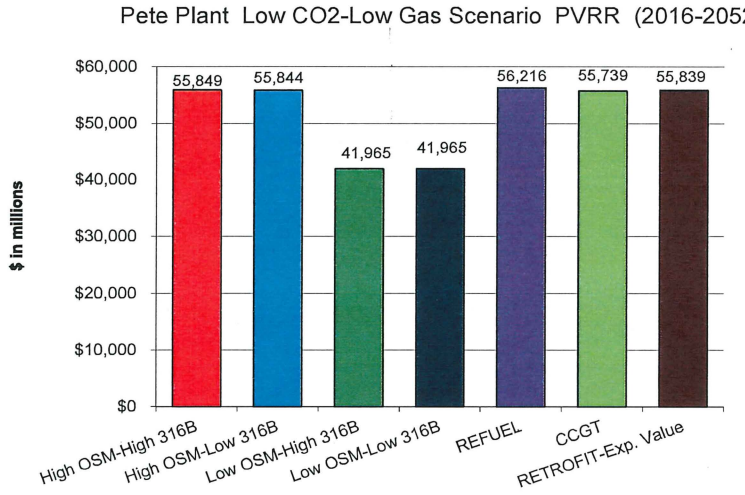
Indianapolis Power & Light Company
Cause No. 44794
Petitioner's Attachment JMS-3

CCR-Bottom Ash Economic Results

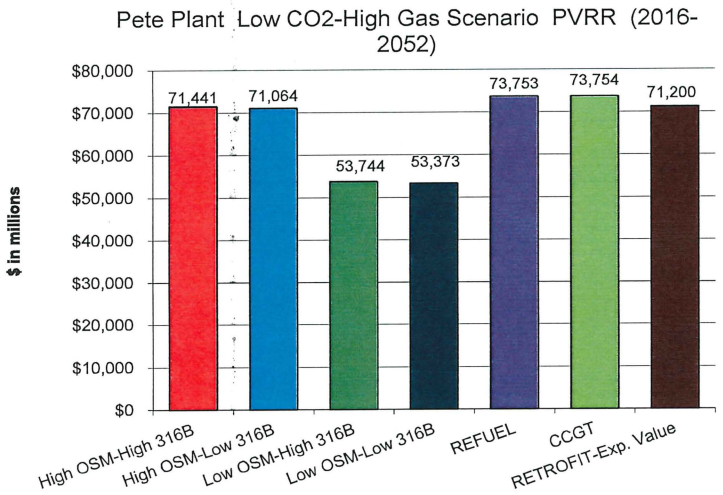
PETE PLANT Results

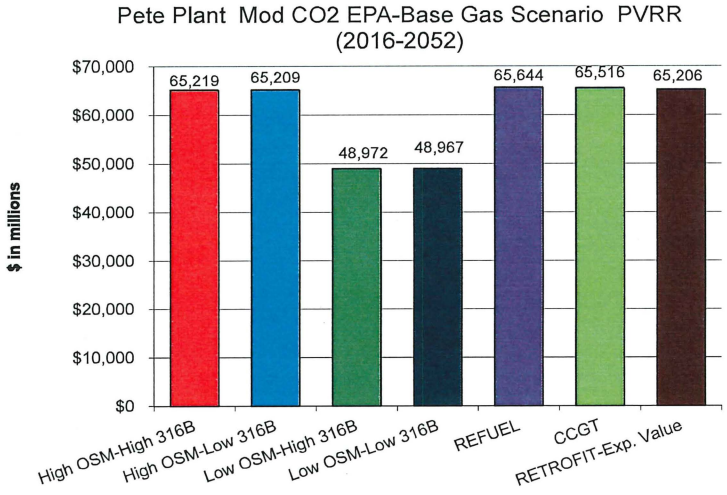
PVRR in $ Millions (2016-2052)								
	Low CO2-Base Gas	Low CO2-Low Gas	Low CO2-High Gas	ModCO2 EPA-Base Gas	ModCO2 EPA Low Gas	ModCO2 EPA High Gas	Mod CO2 EPA/ICF	High CO2
High OSM-High 316B	64,146.07	55,848.82	71,440.72	65,219.11	56,838.14	72,759.82	71,271.76	82,507.46
High OSM-Low 316B	63,974.98	55,843.89	71,063.76	65,208.70	56,833.21	72,382.86	71,265.73	82,502.53
Low OSM-High 316B	48,229.14	41,964.57	53,743.63	48,972.41	42,707.84	54,732.96	53,451.90	62,145.91
Low OSM-Low 316B	48,060.34	41,964.57	53,372.67	48,966.99	42,707.84	54,362.00	53,451.90	62,145.91
REFUEL	64,654.96	56,215.76	73,752.63	65,644.29	57,205.09	74,741.95	71,592.54	83,600.93
CCGT	64,526.83	55,738.67	73,753.90	65,516.16	56,728.00	74,743.23	71,417.17	82,549.56
RETROFIT-Exp. Value	64,035.59	55,838.97	71,199.98	65,205.94	56,828.30	72,519.09	71,261.15	82,497.62

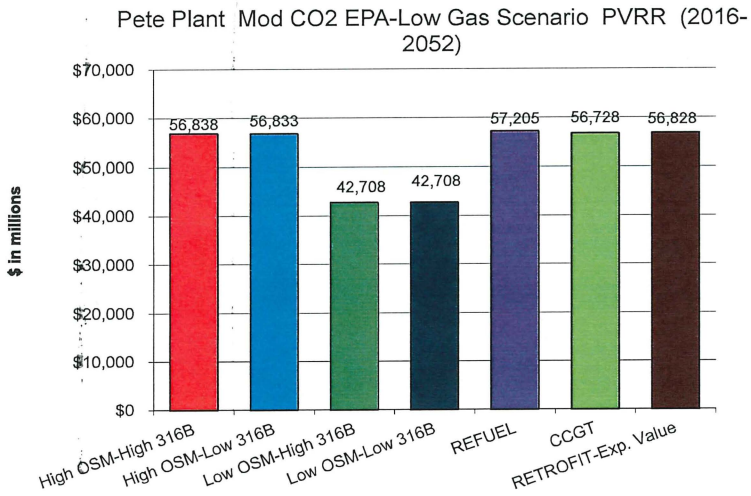


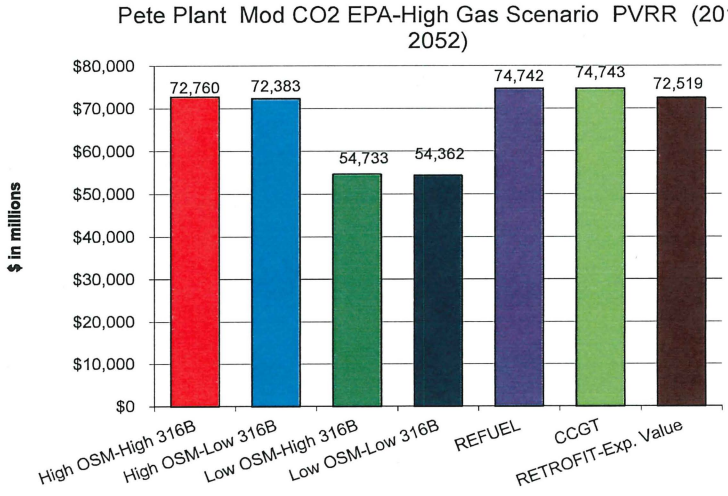


Indianapolis Power & Light Company
Cause No. 44794
Petitioner's Attachment JMS-3
Page 2 of 3









Indianapolis Power & Light Company
Cause No. 44794
Petitioner's Attachment JMS-3
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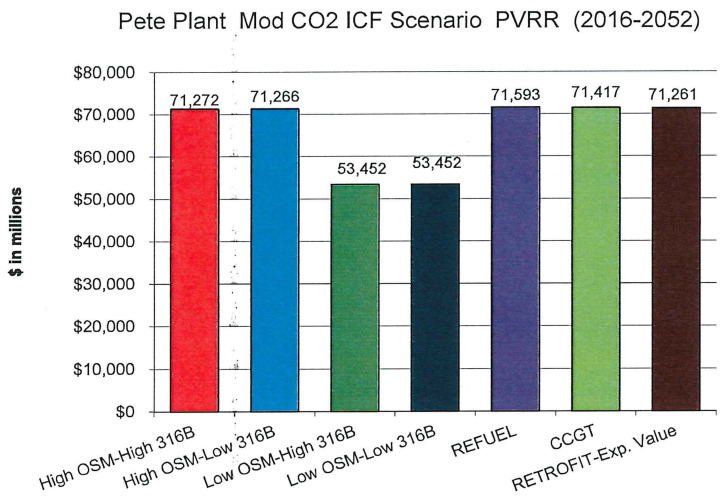

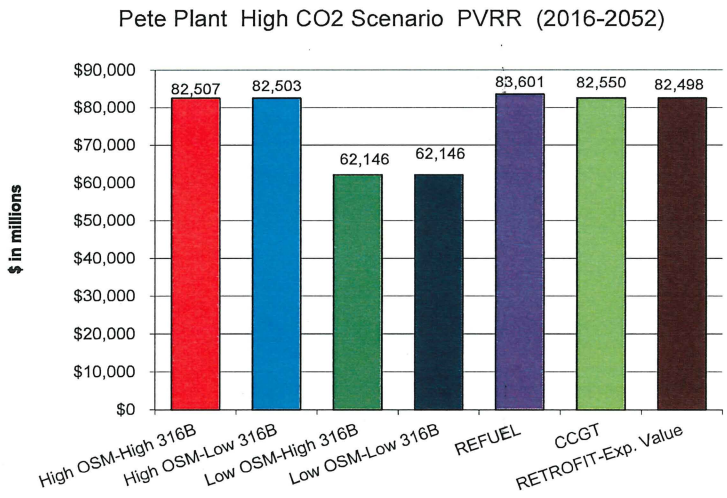

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
COMPARISION OF OVERALL COSTS
CONTINUED OPERATION vs. COMPLETE SHUTDOWN

DESCRIPTION	PETERSBURG UNITS # 1 - 4 CONTINUED OPERATION ESTIMATED O & M COSTS $	PETERSBURG UNITS # 1 - 4 CONTINUED OPERATION ESTIMATED CAPITAL COSTS $	PETERSBURG UNITS # 1 - 4 COMPLETE SHUTDOWN ESTIMATED O & M COSTS $	PETERSBURG UNITS # 1 - 4 COMPLETE SHUTDOWN ESTIMATED CAPITAL COSTS $
PETERSBURG UNITS # 1 - 4				
CONTINUED OPERATION:				
OPERATING AND MAINTENANCE COST	$16,472,670,000	$0		
CAPITAL COSTS	0	100,044,000		
ASH POND DEMOLITION COSTS	29,150,866	0		
NET SITE DEMOLITION COSTS	35,356,244	0		
NET DEMOLITION COSTS W/O ASH POND	2,383,900	0		
DEPRECIATION EXPENSE	1,082,490,807	0		
RETURN COMPONENT	515,669,828	0		
TOTAL COST OF CONTINUED OPERATION	$18,137,721,645	$100,044,000		
COMPLETE SHUTDOWN:				
STRANDED COSTS			$824,073,464	
ASH POND CLOSURE			46,900,000	
DEMOLITION COSTS			153,278,198	
CAPACITY REPLACEMENT COSTS				
PPA			1,814,691,816	
NEW GENERATION (CAPITAL COST)				
CCGT # 1 (600 MW)			0	684,000,000
CCGT # 2 (600 MW)			0	766,080,000
RENEWABLE (300 MW)			0	664,200,000
NEW GENERATION (O&M COSTS ANNUAL)				
CCGT #1 (600 MW)			605,550,720	
CCGT # 2 (600 MW)			543,140,352	
RENEWABLE (300 MW)			569,530,080	
COST OF NATURAL GAS			4,436,484,480	
DEPRECIATION			861,499,088	
RETURN COMPONENT			2,804,179,533	
TOTAL COSTS OF SHUTDOWN			$14,773,607,731	$2,114,280,000

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
DEVEOPMENT OF CAPACITY REPLACEMENT
COMPLETE SHUTDOWN OF PETERSBURG UNITS # 1 -4

YEAR	DESCRIPTION	RENEWABLE WIND $	CCGT NO. 1 $	CCGT NO. 2 $	TOTAL
2018	NEEDED CAPACITY (MW)	300			
	GENERATED (MWh)	919,800			
	COST PER kW	$2,214			
	CAPITAL COST	$664,200,000			$664,200,000
2022	NEEDED CAPACITY (MW)		600		
	GENERATED (MWh)		3,153,600		
	COST PER kW		$1,140		
	CAPITAL COST		684,000,000		684,000,000
2026	NEEDED CAPACITY (MW)			600	
	GENERATED(MWh)			3,153,600	
	COST PER kW			$1,277	
	CAPITAL COST			$766,080,000	766,080,000
	TOTAL	$664,200,000	$684,000,000	$766,080,000	$2,114,280,000

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
DEVELOPMENT OF OPERATION AND MAINTENANCE COST
COMPLETE SHUTDOWN

YEAR	DESCRIPTION	RENEWABLE WIND $	CCGT NO. 1 $	CCGT NO. 2 $	TOTAL
2018	NEEDED CAPCITY (MW)	300			
	FIXED O&M ($/Kw YEAR)	$284,760,000			
	VARIABLE O&M ($/Kw YEAR)	0			
	AVERAGE NON-FUEL OPERATING COSTS ($/MWh)	284,770,080			
2022	NEEDED CAPCITY (MW)		600		
	FIXED O&M ($/Kw YEAR)		$164,880,000		
	VARIABLE O&M ($/Kw YEAR)		45,840,000		
	AVERAGE NON-FUEL OPERATING COSTS ($/MWh)		394,830,720		
	FUEL COSTS		2,339,971,200		
2026	NEEDED CAPCITY (MW)			600	
	FIXED O&M ($/Kw YEAR)			$147,840,000	
	VARIABLE O&M ($/Kw YEAR)			41,088,000	
	AVERAGE NON-FUEL OPERATING COSTS ($/mwH)			354,212,352	
	FUEL COSTS			2,096,513,280	
	TOTAL	$569,530,080	$2,945,521,920	$2,639,653,632	$6,154,705,632

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
DEVELOPMENT OF DEPRECIATION AND RETURN COMPONENT
COMPLETE SHUTDOWN

YEAR	NET ADDITIONAL GENERATING ASSETS $	COMPOSITE DEPRECIATION RATE %	ESTIMATED DEPRECIATION EXPENSE $	CAUSE NO. 44576 AUTHORIZED RATE OF RETURN %	ESTIMATED RETURN COMPONENT $
2017	$0	2.50%	$0	6.51%	$0
2018	664,200,000	2.50%	16,605,000	6.51%	54,049,275
2019	647,595,000	2.50%	16,189,875	6.51%	52,698,043
2020	631,405,125	2.50%	15,785,128	6.51%	51,380,592
2021	615,619,997	2.50%	15,390,500	6.51%	50,096,077
2022	1,284,229,497	2.50%	32,105,737	6.51%	104,504,175
2023	1,252,123,760	2.50%	31,303,094	6.51%	101,891,571
2024	1,220,820,666	2.50%	30,520,517	6.51%	99,344,282
2025	1,190,300,149	2.50%	29,757,504	6.51%	96,860,675
2026	1,926,622,645	2.50%	48,165,566	6.51%	156,778,918
2027	1,878,457,079	2.50%	46,961,427	6.51%	152,859,445
2028	1,831,495,652	2.50%	45,787,391	6.51%	149,037,959
2029	1,785,708,261	2.50%	44,642,707	6.51%	145,312,010
2030	1,741,065,554	2.50%	43,526,639	6.51%	141,679,209
2031	1,697,538,915	2.50%	42,438,473	6.51%	138,137,229
2032	1,655,100,443	2.50%	41,377,511	6.51%	134,683,799
2033	1,613,722,931	2.50%	40,343,073	6.51%	131,316,704
2034	1,573,379,858	2.50%	39,334,496	6.51%	128,033,786
2035	1,534,045,362	2.50%	38,351,134	6.51%	124,832,941
2036	1,495,694,228	2.50%	37,392,356	6.51%	121,712,118
2037	1,458,301,872	2.50%	36,457,547	6.51%	118,669,315
2038	1,421,844,325	2.50%	35,546,108	6.51%	115,702,582
2039	1,386,298,217	2.50%	34,657,455	6.51%	112,810,017
2040	1,351,640,762	2.50%	33,791,019	6.51%	109,989,767
2041	1,317,849,743	2.50%	32,946,244	6.51%	107,240,023
2042	1,284,903,499	2.50%	32,122,587	6.51%	104,559,022
	$16,639,605,010		$861,499,088		$2,804,179,533

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1- 4
DEVELOPMENT OF ESTIMATED PURCHASED POWER COSTS
COMPLETE UNIT SHUTDOWN

YEAR	CAPACITY POSITION (DEFICIT) MW	CAPACITY POSITION (DEFICIT) MWh	CAPACITY PURCHASE PER MWh $	ESTIMATED CAPACITY PURCHASE COST $
2017	(1,280.80)	(7,853,865.60)	$45.00	$353,423,952
2018	(970.50)	(5,951,106.00)	$45.00	267,799,770
2019	(961.40)	(5,895,304.80)	$45.00	265,288,716
2020	(965.00)	(5,917,380.00)	$45.00	266,282,100
2021	(955.70)	(5,860,352.40)	$45.00	263,715,858
2022	(354.50)	(2,173,794.00)	$45.00	97,820,730
2023	(358.00)	(2,195,256.00)	$45.00	98,786,520
2024	(365.30)	(2,240,019.60)	$45.00	100,800,882
2025	(365.20)	(2,239,406.40)	$45.00	100,773,288
2026	0.00	0.00	$45.00	0
2027	0.00	0.00	$45.00	0
2028	0.00	0.00	$45.00	0
2029	0.00	0.00	$45.00	0
2030	0.00	0.00	$45.00	0
2031	0.00	0.00	$45.00	0
2032	0.00	0.00	$45.00	0
2033	0.00	0.00	$45.00	0
2034	0.00	0.00	$45.00	0
2035	0.00	0.00	$45.00	0
2036	0.00	0.00	$45.00	0
2037	0.00	0.00	$45.00	0
2038	0.00	0.00	$45.00	0
2039	0.00	0.00	$45.00	0
2040	0.00	0.00	$45.00	0
2041	0.00	0.00	$45.00	0
2042	0.00	0.00	$45.00	0
TOTAL				$1,814,691,816

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
TOTAL COSTS OF CONTINUED OPERATION

YEAR	UNITS # 1-4 OVERALL TOTAL $	UNITS # 1-4 DEPRECIATION EXPENSE $	UNITS # 1-4 RETURN COMPONENT $	UNITS # 1-4 TOTAL REVENUE REQUIRED $
2017	$414,140,000	$68,125,138	$68,144,903	$550,410,041
2018	534,784,000	68,125,138	70,507,418	673,416,556
2019	450,960,000	68,125,138	61,025,937	580,111,075
2020	523,970,000	68,125,138	55,128,813	647,223,951
2021	541,840,000	68,125,138	49,231,689	659,196,827
2022	558,790,000	68,125,138	43,334,564	670,249,702
2023	582,670,000	68,125,138	37,437,440	688,232,578
2024	599,720,000	68,125,138	31,540,316	699,385,454
2025	627,040,000	50,944,593	26,352,403	704,336,996
2026	648,750,000	45,301,292	22,106,656	716,157,948
2027	670,430,000	45,268,569	18,095,216	733,793,785
2028	692,590,000	45,192,216	14,088,277	751,870,493
2029	725,180,000	44,023,821	10,132,722	779,336,543
2030	755,620,000	44,023,821	6,225,398	805,869,219
2031	787,190,000	44,023,821	2,318,074	833,531,895
2032	827,870,000	44,023,821	0	871,893,821
2033	749,890,287	44,023,821	0	793,914,108
2034	790,200,000	42,229,550	0	832,429,550
2035	584,810,846	36,073,937	0	620,884,783
2036	596,520,000	24,467,146	0	620,987,146
2037	611,800,000	10,416,098	0	622,216,098
2038	628,910,000	10,416,098	0	639,326,098
2039	644,320,000	7,061,098	0	651,381,098
2040	659,650,000	0	0	659,650,000
2041	674,790,000	0	0	674,790,000
2042	757,169,877	0	0	757,169,877
	$16,639,605,010	$1,082,490,807	$515,669,828	$18,237,765,644

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
DEPRECIATION EXPENSE

YEAR	FERC ACCOUNT NUMBER 311	FERC ACCOUNT NUMBER 311.01	FERC ACCOUNT NUMBER 312	FERC ACCOUNT NUMBER 312.01	FERC ACCOUNT NUMBER 312.3	FERC ACCOUNT NUMBER 312.4	FERC ACCOUNT NUMBER 314	FERC ACCOUNT NUMBER 315	FERC ACCOUNT NUMBER 315.01	FERC ACCOUNT NUMBER 316	FERC ACCOUNT NUMBER 316.01	FERC ACCOUNT NUMBER 344	CAUSE NO. 44794 NAAQS & CCR ADDITIONS	TOTAL
2017	$4,563,200	$1,168,395	$22,526,732	$20,666,783	$2,990,451	$422,340	$7,084,904	$2,549,534	$2,157,063	$583,296	$109,076	$0	$3,303,364	$68,125,138
2018	4,563,200	1,168,395	22,526,732	20,666,783	2,990,451	422,340	7,084,904	2,549,534	2,157,063	583,296	109,076	0	3,303,364	68,125,138
2019	4,563,200	1,168,395	22,526,732	20,666,783	2,990,451	422,340	7,084,904	2,549,534	2,157,063	583,296	109,076	0	3,303,364	68,125,138
2020	4,563,200	1,168,395	22,526,732	20,666,783	2,990,451	422,340	7,084,904	2,549,534	2,157,063	583,296	109,076	0	3,303,364	68,125,138
2021	4,563,200	1,168,395	22,526,732	20,666,783	2,990,451	422,340	7,084,904	2,549,534	2,157,063	583,296	109,076	0	3,303,364	68,125,138
2022	4,563,200	1,168,395	22,526,732	20,666,783	2,990,451	422,340	7,084,904	2,549,534	2,157,063	583,296	109,076	0	3,303,364	68,125,138
2023	4,563,200	1,168,395	22,526,732	20,666,783	2,990,451	422,340	7,084,904	2,549,534	2,157,063	583,296	109,076	0	3,303,364	68,125,138
2024	4,563,200	1,168,395	22,526,732	20,666,783	2,990,451	422,340	7,084,904	2,549,534	2,157,063	583,296	109,076	0	3,303,364	68,125,138
2025	4,563,200	1,168,395	22,526,732	4,133,357	2,990,451	422,340	7,084,904	2,549,534	1,509,944	583,296	109,076	0	3,303,364	50,944,593
2026	4,563,200	1,168,395	22,526,732	0	2,990,451	422,340	7,084,904	2,549,534	0	583,296	109,076	0	3,303,364	45,301,292
2027	4,563,200	1,168,395	22,526,732	0	2,990,451	422,340	7,084,904	2,549,534	0	583,296	76,353	0	3,303,364	45,268,569
2028	4,563,200	1,168,395	22,526,732	0	2,990,451	422,340	7,084,904	2,549,534	0	583,296	0	0	3,303,364	45,192,216
2029	4,563,200	0	22,526,732	0	2,990,451	422,340	7,084,904	2,549,534	0	583,296	0	0	3,303,364	44,023,821
2030	4,563,200	0	22,526,732	0	2,990,451	422,340	7,084,904	2,549,534	0	583,296	0	0	3,303,364	44,023,821
2031	4,563,200	0	22,526,732	0	2,990,451	422,340	7,084,904	2,549,534	0	583,296	0	0	3,303,364	44,023,821
2032	4,563,200	0	22,526,732	0	2,990,451	422,340	7,084,904	2,549,534	0	583,296	0	0	3,303,364	44,023,821
2033	4,563,200	0	22,526,732	0	2,990,451	422,340	7,084,904	2,549,534	0	583,296	0	0	3,303,364	44,023,821
2034	4,563,200	0	22,526,732	0	1,196,180	422,340	7,084,904	2,549,534	0	583,296	0	0	3,303,364	42,229,550
2035	4,563,200	0	22,526,732	0	0	422,340	2,125,471	2,549,534	0	583,296	0	0	3,303,364	36,073,937
2036	4,563,200	0	13,516,039	0	0	126,702	0	2,549,534	0	408,307	0	0	3,303,364	24,467,146
2037	4,563,200	0	0	0	0	0	0	2,549,534	0	0	0	0	3,303,364	10,416,098
2038	4,563,200	0	0	0	0	0	0	2,549,534	0	0	0	0	3,303,364	10,416,098
2039	2,737,920	0	0	0	0	0	0	1,019,814	0	0	0	0	3,303,364	7,061,098
2040	0	0	0	0	0	0	0	0	0	0	0	0		0
2041	0	0	0	0	0	0	0	0	0	0	0	0		0
2042	0	0	0	0	0	0	0	0	0	0	0	0		0
	$103,128,631	$14,020,740	$441,523,947	$169,467,621	$52,033,847	$8,151,162	$129,653,743	$57,109,562	$18,766,448	$11,490,931	$1,167,113	$0		$1,082,490,807

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
DEVELOPMENT OF DEPRECIATION EXPENSE

FERC ACCOUNT NUMBER	ORIGINAL COST 12/31/2013 $	BOOK DEPRECIATION RESERVE 12/31/2013 $	NET NET ORIGINAL COST 12/31/2013 $	CALCULATED ANNUAL ACCRUAL RATE %	COMPOSITE REMAINING LIFE YEARS	CALCULATED ANNUAL ACCRUAL $	COMPOSITE REMAINING LIFE POST 2016
311	$183,743,810	$94,533,496	$89,210,314	2.48%	25.6	$4,563,200	22.6
311.01	16,236,135	1,147,510	15,088,625	7.20%	15.0	1,168,395	12
312	780,657,956	388,227,086	392,430,870	2.89%	22.6	22,526,732	19.6
312.01	271,204,372	79,990,900	191,213,472	7.62%	11.2	20,666,783	8.2
312.3	100,567,673	54,584,562	45,983,111	2.97%	20.4	2,990,451	17.4
312.4	10,877,153	3,084,759	7,792,394	3.88%	22.3	422,340	19.3
314	218,262,497	100,376,861	117,885,636	3.25%	21.3	7,084,904	18.3
315	127,753,801	82,111,732	45,642,069	2.00%	25.4	2,549,534	22.4
315.01	28,708,150	7,699,235	21,008,915	7.51%	11.7	2,157,063	8.7
316	21,089,846	10,996,856	10,092,990	2.77%	22.7	583,296	19.7
316.01	1,473,995	240,337	1,233,658	7.40%	13.3	109,076	10.3
344	931,147	1,080,130	(148,983)	0.00%	0.0	0	0
NAAQS (44794)	49,414,000	0	49,414,000	2.31%	43.3	1,141,463	43.3
CCR (44794)	50,630,000	0	50,630,000	4.27%	23.4	2,161,901	23.4
TOTAL	$1,861,550,535	$824,073,464	$1,037,477,071			$68,125,138	

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
RETURN COMPONENT

YEAR	UNITS 1 - 4 NET ORIGINAL COST $	CAUSE No. 44794 NAAQS & CCR NET ORIGINAL COST	CAUSE NO. 44576 AUTHORIZED RATE OF RETURN %	CAUSE NO. 44576 AUTHORIZED RETURN $	CAUSE NO. 44576 REVENUE REQUIREMENT $
2017	$833,101,657	$100,044,000	6.51%	$53,733,562	$68,144,903
2018	678,145,978	96,740,636	6.51%	55,596,450	70,507,418
2019	610,020,840	93,437,272	6.51%	48,120,121	61,025,937
2020	541,895,702	90,133,908	6.51%	43,470,125	55,128,813
2021	473,770,564	86,830,544	6.51%	38,820,130	49,231,689
2022	405,645,426	83,527,180	6.51%	34,170,134	43,334,564
2023	337,520,288	80,223,816	6.51%	29,520,139	37,437,440
2024	269,395,150	76,920,452	6.51%	24,870,143	31,540,316
2025	218,450,557	73,617,088	6.51%	20,779,375	26,352,403
2026	173,149,265	70,313,724	6.51%	17,431,522	22,106,656
2027	127,880,696	67,010,360	6.51%	14,268,424	18,095,216
2028	82,688,480	63,706,996	6.51%	11,108,877	14,088,277
2029	38,664,659	60,403,632	6.51%	7,989,846	10,132,722
2030	(5,359,162)	57,100,268	6.51%	4,908,846	6,225,398
2031	(49,382,983)	53,796,904	6.51%	1,827,846	2,318,074
2032	(93,406,804)	50,493,540	6.51%	0	0
2033	(137,430,625)	47,190,176	6.51%	0	0
2034	(179,660,175)	43,886,812	6.51%	0	0
2035	(215,734,113)	40,583,448	6.51%	0	0
2036	(240,201,259)	37,280,084	6.51%	0	0
2037	(250,617,357)	33,976,720	6.51%	0	0
2038	(261,033,455)	30,673,356	6.51%	0	0
2039	(268,094,553)	27,369,992	6.51%	0	0
2040	(268,094,553)	24,066,628	6.51%	0	0
2041	(268,094,553)	20,763,264	6.51%	0	0
2042	(268,094,553)	17,459,900	6.51%	0	0
TOTAL				$406,615,540	$515,669,828

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1 - 4
ONGOING COSTS

YEAR	TOTAL O&M COSTS $	UNITS # 1-4 316b CAPITAL COSTS $	UNITS # 1-4 CCR CAPITAL COSTS $	UNITS # 1-4 NAAQS NOX CAPITAL COSTS $	UNITS # 1-4 ASH POND DEMOLITION COSTS $	UNITS # 1-4 NET SITE COMMON DEMOLITION COSTS $	UNITS # 1-4 NET DEMOLITION COSTS W/O ASH POND $	UNITS # 1-4 OVERALL TOTAL $
2017	$414,140,000	$0	$0	$0	$0	$0	$0	$414,140,000
2018	434,740,000	0	50,630,000	49,414,000	0	0	0	534,784,000
2019	450,960,000	0	0	0	0	0	0	450,960,000
2020	523,970,000	0	0	0	0	0	0	523,970,000
2021	541,840,000	0	0	0	0	0	0	541,840,000
2022	558,790,000	0	0	0	0	0	0	558,790,000
2023	582,670,000	0	0	0	0	0	0	582,670,000
2024	599,720,000	0	0	0	0	0	0	599,720,000
2025	627,040,000	0	0	0	0	0	0	627,040,000
2026	648,750,000	0	0	0	0	0	0	648,750,000
2027	670,430,000	0	0	0	0	0	0	670,430,000
2028	692,590,000	0	0	0	0	0	0	692,590,000
2029	725,180,000	0	0	0	0	0	0	725,180,000
2030	755,620,000	0	0	0	0	0	0	755,620,000
2031	787,190,000	0	0	0	0	0	0	787,190,000
2032	827,870,000	0	0	0	0	0	0	827,870,000
2033	748,740,000	0	0	0	0	0	1,150,287	749,890,287
2034	790,200,000	0	0	0	0	0	0	790,200,000
2035	584,150,000	0	0	0	0	0	660,846	584,810,846
2036	596,520,000	0	0	0	0	0	0	596,520,000
2037	611,800,000	0	0	0	0	0	0	611,800,000
2038	628,910,000	0	0	0	0	0	0	628,910,000
2039	644,320,000	0	0	0	0	0	0	644,320,000
2040	659,650,000	0	0	0	0	0	0	659,650,000
2041	674,790,000	0	0	0	0	0	0	674,790,000
2042	692,090,000	0	0	0	29,150,866	35,356,244	572,767	757,169,877
	$16,472,670,000	$0	$50,630,000	$49,414,000	$29,150,866	$35,356,244	$2,383,900	$16,639,605,010

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNITS # 1-4
OPERATING AND MAINTENANCE COST ESTIMATE

YEAR	O & M FIXED COSTS $	O & M VARIABLE COSTS $	FUEL COAL COST $	EMISSIONS CO2 COST $	EMISSIONS NO2 COST $	EMISSIONS SO2 COST $	TOTAL OVERALL COSTS $
2017	$92,880,000	$48,850,000	$272,020,000	$0	$390,000	$0	$414,140,000
2018	$96,420,000	$54,700,000	$283,220,000	$0	$400,000	$0	434,740,000
2019	$99,370,000	$57,360,000	$293,800,000	$0	$430,000	$0	450,960,000
2020	$102,950,000	$54,090,000	$275,630,000	$90,910,000	$390,000	$0	523,970,000
2021	$105,520,000	$55,910,000	$284,370,000	$95,630,000	$410,000	$0	541,840,000
2022	$108,170,000	$57,550,000	$292,800,000	$99,840,000	$430,000	$0	558,790,000
2023	$110,860,000	$60,070,000	$305,920,000	$105,380,000	$440,000	$0	582,670,000
2024	$113,640,000	$61,790,000	$310,830,000	$113,020,000	$440,000	$0	599,720,000
2025	$116,480,000	$63,970,000	$324,840,000	$121,280,000	$470,000	$0	627,040,000
2026	$119,390,000	$66,430,000	$332,260,000	$130,180,000	$490,000	$0	648,750,000
2027	$122,380,000	$68,430,000	$340,810,000	$138,320,000	$490,000	$0	670,430,000
2028	$125,440,000	$69,940,000	$351,300,000	$145,400,000	$510,000	$0	692,590,000
2029	$128,570,000	$72,920,000	$368,360,000	$154,810,000	$520,000	$0	725,180,000
2030	$131,790,000	$75,600,000	$383,420,000	$164,270,000	$540,000	$0	755,620,000
2031	$135,080,000	$78,210,000	$397,230,000	$176,100,000	$570,000	$0	787,190,000
2032	$138,460,000	$81,870,000	$416,680,000	$190,270,000	$590,000	$0	827,870,000
2023	$111,690,000	$75,230,000	$382,390,000	$178,950,000	$480,000	$0	748,740,000
2034	$114,480,000	$78,430,000	$404,490,000	$192,300,000	$500,000	$0	790,200,000
2035	$79,920,000	$63,820,000	$298,210,000	$141,770,000	$430,000	$0	584,150,000
2036	$81,920,000	$65,090,000	$304,360,000	$144,700,000	$450,000	$0	596,520,000
2037	$83,970,000	$66,770,000	$312,190,000	$148,410,000	$460,000	$0	611,800,000
2038	$86,070,000	$68,690,000	$321,050,000	$152,630,000	$470,000	$0	628,910,000
2039	$88,210,000	$70,360,000	$328,900,000	$156,360,000	$490,000	$0	644,320,000
2040	$90,420,000	$71,990,000	$336,690,000	$160,060,000	$490,000	$0	659,650,000
2041	$92,680,000	$73,620,000	$344,300,000	$163,690,000	$500,000	$0	674,790,000
2042	$95,000,000	$75,530,000	$353,160,000	$167,890,000	$510,000	$0	692,090,000
	$2,771,760,000	$1,737,220,000	$8,619,230,000	$3,332,170,000	$12,290,000	$0	$16,472,670,000

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNIT # 1
OPERATING AND MAINTENANCE COST ESTIMATE

YEAR	O & M FIXED COSTS $	O & M VARIABLE COSTS $	FUEL COAL COST $	EMISSIONS CO2 COST $	EMISSIONS NO2 COST $	EMISSIONS SO2 COST $	TOTAL O&M COSTS $
2017	$18,920,000	$6,280,000	$36,380,000	$0	$ 90,000	$0	$61,670,000
2018	19,630,000	7,290,000	37,820,000	0	90,000	0	64,830,000
2019	20,490,000	7,570,000	39,000,000	0	100,000	0	67,160,000
2020	21,930,000	7,300,000	37,250,000	12,290,000	90,000	0	78,860,000
2021	22,480,000	7,430,000	37,880,000	12,740,000	90,000	0	80,620,000
2022	23,050,000	7,720,000	39,360,000	13,420,000	100,000	0	83,650,000
2023	23,620,000	7,930,000	40,540,000	13,970,000	100,000	0	86,160,000
2024	24,210,000	8,160,000	41,160,000	14,970,000	100,000	0	88,600,000
2025	24,820,000	8,400,000	42,820,000	15,990,000	110,000	0	92,140,000
2026	25,440,000	8,760,000	43,980,000	17,230,000	110,000	0	95,520,000
2027	26,070,000	8,970,000	44,890,000	18,220,000	110,000	0	98,260,000
2028	26,730,000	9,070,000	45,850,000	18,980,000	120,000	0	100,750,000
2029	27,390,000	9,450,000	48,130,000	20,230,000	120,000	0	105,320,000
2030	28,080,000	9,780,000	49,960,000	21,410,000	120,000	0	109,350,000
2031	28,780,000	10,060,000	51,540,000	22,850,000	130,000	0	113,360,000
2032	29,500,000	10,450,000	53,660,000	24,500,000	130,000	0	118,240,000
2033	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0
2036	0	0	0	0	0	0	0
2037	0	0	0	0	0	0	0
2038	0	0	0	0	0	0	0
2039	0	0	0	0	0	0	0
2040	0	0	0	0	0	0	0
2041	0	0	0	0	0	0	0
2042	0	0	0	0	0	0	0
	$391,140,000	$134,620,000	$690,220,000	$226,800,000	$1,710,000	$0	$1,444,490,000

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNIT # 2
OPERATING AND MAINTENANCE COST ESTIMATE

YEAR	O & M FIXED COSTS $	O & M VARIABLE COSTS $	FUEL COAL COST $	EMISSIONS CO2 COST $	EMISSIONS NO2 COST $	EMISSIONS SO2 COST $	TOTAL O&M COSTS $
2017	$23,880,000	$9,990,000	$66,440,000	$0	$40,000	$0	$100,350,000
2018	24,480,000	10,280,000	68,390,000	0	50,000	0	103,200,000
2019	25,210,000	10,600,000	70,330,000	0	50,000	0	106,190,000
2020	25,840,000	10,210,000	68,400,000	22,560,000	50,000	0	127,060,000
2021	26,480,000	10,540,000	70,490,000	23,710,000	50,000	0	131,270,000
2022	27,140,000	10,750,000	72,060,000	24,570,000	50,000	0	134,570,000
2023	27,820,000	11,230,000	75,420,000	25,980,000	50,000	0	140,500,000
2024	28,520,000	11,510,000	76,270,000	27,730,000	50,000	0	144,080,000
2025	29,230,000	12,000,000	80,220,000	29,950,000	60,000	0	151,460,000
2026	29,960,000	12,250,000	80,830,000	31,670,000	60,000	0	154,770,000
2027	30,710,000	12,680,000	83,130,000	33,740,000	60,000	0	160,320,000
2028	31,480,000	13,100,000	86,450,000	35,780,000	60,000	0	166,870,000
2029	32,270,000	13,460,000	89,660,000	37,680,000	60,000	0	173,130,000
2030	33,070,000	13,900,000	92,900,000	39,800,000	60,000	0	179,730,000
2031	33,900,000	14,450,000	96,780,000	42,900,000	70,000	0	188,100,000
2032	34,750,000	15,120,000	101,480,000	46,340,000	70,000	0	197,760,000
2033	35,620,000	15,650,000	105,600,000	49,420,000	70,000	0	206,360,000
2034	36,510,000	16,130,000	110,100,000	52,340,000	70,000	0	215,150,000
2035	0	0	0	0	0	0	0
2036	0	0	0	0	0	0	0
2037	0	0	0	0	0	0	0
2038	0	0	0	0	0	0	0
2039	0	0	0	0	0	0	0
2040	0	0	0	0	0	0	0
2041	0	0	0	0	0	0	0
2042	0	0	0	0	0	0	0
	$536,870,000	$223,850,000	$1,494,950,000	$524,170,000	$1,030,000	$0	$2,780,870,000

INDIANAPOLIS POWER AND LIGHT COMPANY
PERTERSBURG UNIT # 3
OPERATING AND MAINTENANCE COST ESTIMATE

YEAR	O & M FIXED COSTS $	O & M VARIABLE COSTS $	FUEL COAL COST $	EMISSIONS CO2 COST $	EMISSIONS NO2 COST $	EMISSIONS SO2 COST $	TOTAL O&M COSTS $
2017	$26,700,000	$14,950,000	$87,750,000	$0	$60,000	$0	$129,460,000
2018	27,740,000	16,770,000	91,400,000	0	60,000	0	135,970,000
2019	28,430,000	17,530,000	95,230,000	0	70,000	0	141,260,000
2020	29,140,000	16,360,000	90,210,000	29,750,000	60,000	0	165,520,000
2021	29,870,000	16,980,000	93,440,000	31,420,000	70,000	0	171,780,000
2022	30,620,000	17,480,000	96,110,000	32,770,000	70,000	0	177,050,000
2023	31,380,000	18,260,000	100,430,000	34,590,000	70,000	0	184,730,000
2024	32,160,000	19,160,000	103,720,000	37,710,000	70,000	0	192,820,000
2025	32,970,000	19,620,000	107,400,000	40,100,000	70,000	0	200,160,000
2026	33,790,000	20,550,000	110,630,000	43,350,000	80,000	0	208,400,000
2027	34,640,000	21,290,000	113,920,000	46,230,000	80,000	0	216,160,000
2028	35,500,000	21,620,000	116,750,000	48,320,000	80,000	0	222,270,000
2029	36,390,000	22,380,000	121,880,000	51,220,000	80,000	0	231,950,000
2030	37,300,000	23,720,000	129,150,000	55,330,000	90,000	0	245,590,000
2031	38,230,000	24,200,000	132,240,000	58,630,000	90,000	0	253,390,000
2032	39,190,000	25,510,000	139,490,000	63,700,000	100,000	0	267,990,000
2033	40,170,000	26,470,000	145,400,000	68,040,000	100,000	0	280,180,000
2034	41,170,000	26,470,000	151,550,000	72,050,000	100,000	0	291,340,000
2035	42,200,000	28,040,000	155,560,000	73,950,000	100,000	0	299,850,000
2036	43,260,000	28,640,000	158,930,000	75,560,000	110,000	0	306,500,000
2037	44,340,000	29,390,000	163,090,000	77,530,000	110,000	0	314,460,000
2038	45,450,000	30,210,000	167,570,000	79,670,000	110,000	0	323,010,000
2039	46,580,000	30,970,000	171,810,000	81,680,000	120,000	0	331,160,000
2040	47,750,000	31,770,000	176,220,000	83,770,000	120,000	0	339,630,000
2041	48,940,000	32,400,000	179,820,000	85,490,000	120,000	0	346,770,000
2042	50,170,000	33,230,000	184,410,000	87,670,000	120,000	0	355,600,000
	$974,080,000	$613,970,000	$3,384,110,000	$1,358,530,000	$2,310,000	$0	$6,333,000,000

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNIT # 4
OPERATING AND MAINTENANCE COST ESTIMATE

YEAR	O & M FIXED COSTS $	O & M VARIABLE COSTS $	FUEL COAL COST $	EMISSIONS CO2 COST $	EMISSIONS NO2 COST $	EMISSIONS SO2 COST $	TOTAL O&M COSTS $
2017	$23,380,000	$17,630,000	$81,450,000	$0	$200,000	$0	$122,660,000
2018	24,570,000	20,360,000	85,610,000	0	200,000	0	130,740,000
2019	25,240,000	21,660,000	89,240,000	0	210,000	0	136,350,000
2020	26,040,000	20,220,000	79,770,000	26,310,000	190,000	0	152,530,000
2021	26,690,000	20,960,000	82,560,000	27,760,000	200,000	0	158,170,000
2022	27,360,000	21,600,000	85,270,000	29,080,000	210,000	0	163,520,000
2023	28,040,000	22,650,000	89,530,000	30,840,000	220,000	0	171,280,000
2024	28,750,000	22,960,000	89,680,000	32,610,000	220,000	0	174,220,000
2025	29,460,000	23,950,000	94,400,000	35,240,000	230,000	0	183,280,000
2026	30,200,000	24,870,000	96,820,000	37,930,000	240,000	0	190,060,000
2027	30,960,000	25,490,000	98,870,000	40,130,000	240,000	0	195,690,000
2028	31,730,000	26,150,000	102,250,000	42,320,000	250,000	0	202,700,000
2029	32,520,000	27,630,000	108,690,000	45,680,000	260,000	0	214,780,000
2030	33,340,000	28,200,000	111,410,000	47,730,000	270,000	0	220,950,000
2031	34,170,000	29,500,000	116,670,000	51,720,000	280,000	0	232,340,000
2032	35,020,000	30,790,000	122,050,000	55,730,000	290,000	0	243,880,000
2033	35,900,000	33,110,000	131,390,000	61,490,000	310,000	0	262,200,000
2034	36,800,000	35,830,000	142,840,000	67,910,000	330,000	0	283,710,000
2035	37,720,000	35,780,000	142,650,000	67,820,000	330,000	0	284,300,000
2036	38,660,000	36,450,000	145,430,000	69,140,000	340,000	0	290,020,000
2037	39,630,000	37,380,000	149,100,000	70,880,000	350,000	0	297,340,000
2038	40,620,000	38,480,000	153,480,000	72,960,000	360,000	0	305,900,000
2039	41,630,000	39,390,000	157,090,000	74,680,000	370,000	0	313,160,000
2040	42,670,000	40,220,000	160,470,000	76,290,000	370,000	0	320,020,000
2041	43,740,000	41,220,000	164,480,000	78,200,000	380,000	0	328,020,000
2042	44,830,000	42,300,000	168,750,000	80,220,000	390,000	0	336,490,000
	$869,670,000	$764,780,000	$3,049,950,000	$1,222,670,000	$7,240,000	$0	$5,914,310,000

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNIT # 1
ONGOING COSTS

YEAR	TOTAL O&M COSTS $	UNIT # 1 316b CAPITAL COSTS $	UNIT 1 CCR CAPITAL COSTS $	UNIT 1 NAAQS NOX CAPITAL COSTS $	UNIT 1 ASH POND DEMOLITION COSTS $	UNIT 1 NET DEMOLITION COSTS W/O ASH POND $	UNIT 1 OVERALL TOTAL $
2017	$61,670,000	$0	$0	$0	$0	$0	$61,670,000
2018	64,830,000	0	0	0	0	0	64,830,000
2019	67,160,000	0	0	9,390,000	0	0	76,550,000
2020	78,860,000	0	0	0	0	0	78,860,000
2021	80,620,000	0	0	0	0	0	80,620,000
2022	83,650,000	0	0	0	0	0	83,650,000
2023	86,160,000	0	0	0	0	0	86,160,000
2024	88,600,000	0	0	0	0	0	88,600,000
2025	92,140,000	0	0	0	0	0	92,140,000
2026	95,520,000	0	0	0	0	0	95,520,000
2027	98,260,000	0	0	0	0	0	98,260,000
2028	100,750,000	0	0	0	0	0	100,750,000
2029	105,320,000	0	0	0	0	0	105,320,000
2030	109,350,000	0	0	0	0	0	109,350,000
2031	113,360,000	0	0	0	0	0	113,360,000
2032	118,240,000	0	0	0	0	0	118,240,000
2033	0	0	0	0	0	1,150,287	1,150,287
2034	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0
2036	0	0	0	0	0	0	0
2037	0	0	0	0	0	0	0
2038	0	0	0	0	0	0	0
2039	0	0	0	0	0	0	0
2040	0	0	0	0	0	0	0
2041	0	0	0	0	0	0	0
2042	0	0	0	0	0	0	0
	$1,444,490,000	$0	$0	$9,390,000	$0	$1,150,287	$1,455,030,287

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNIT # 2
ONGOING COSTS

YEAR	TOTAL O&M COSTS $	UNIT # 2 316b CAPITAL COSTS $	UNIT # 2 CCR CAPITAL COSTS $	UNIT # 2 NAAQS NOX CAPITAL COSTS $	UNIT # 2 ASH POND DEMOLITION COSTS $	UNIT # 2 NET DEMOLITION COSTS W/O ASH POND $	UNIT # 2 OVERALL TOTAL $
2017	$100,350,000	$0	$0	$0	$0	$0	$100,350,000
2018	103,200,000	0	0	0	0	0	103,200,000
2019	106,190,000	0	0	0	0	0	106,190,000
2020	127,060,000	0	0	0	0	0	127,060,000
2021	131,270,000	0	0	0	0	0	131,270,000
2022	134,570,000	0	0	0	0	0	134,570,000
2023	140,500,000	0	0	0	0	0	140,500,000
2024	144,080,000	0	0	0	0	0	144,080,000
2025	151,460,000	0	0	0	0	0	151,460,000
2026	154,770,000	0	0	0	0	0	154,770,000
2027	160,320,000	0	0	0	0	0	160,320,000
2028	166,870,000	0	0	0	0	0	166,870,000
2029	173,130,000	0	0	0	0	0	173,130,000
2030	179,730,000	0	0	0	0	0	179,730,000
2031	188,100,000	0	0	0	0	0	188,100,000
2032	197,760,000	0	0	0	0	0	197,760,000
2033	206,360,000	0	0	0	0	0	206,360,000
2034	215,150,000	0	0	0	0	0	215,150,000
2035	0	0	0	0	0	660,846	660,846
2036	0	0	0	0	0	0	0
2037	0	0	0	0	0	0	0
2038	0	0	0	0	0	0	0
2039	0	0	0	0	0	0	0
2040	0	0	0	0	0	0	0
2041	0	0	0	0	0	0	0
2042	0	0	0	0	0	0	0
	$2,780,870,000	$0	$0	$0	$0	$660,846	$2,781,530,846

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNIT # 3
ONGOING COSTS

YEAR	TOTAL O&M COSTS $	UNIT # 3 316b CAPITAL COSTS $	UNIT # 3 CCR CAPITAL COSTS $	UNIT # 3 NAAQS NOX CAPITAL COSTS $	UNIT # 3 ASH POND DEMOLITION COSTS $	UNIT # 3 DEMOLITION COSTS W/O ASH POND $	UNIT # 3 OVERALL TOTAL $
2017	$129,460,000	$0	$0	$0	$0	$0	$129,460,000
2018	135,970,000	0	0	0	0	0	135,970,000
2019	141,260,000	0	0	0	0	0	141,260,000
2020	165,520,000	0	0	0	0	0	165,520,000
2021	171,780,000	0	0	0	0	0	171,780,000
2022	177,050,000	0	0	0	0	0	177,050,000
2023	184,730,000	0	0	0	0	0	184,730,000
2024	192,820,000	0	0	0	0	0	192,820,000
2025	200,160,000	0	0	0	0	0	200,160,000
2026	208,400,000	0	0	0	0	0	208,400,000
2027	216,160,000	0	0	0	0	0	216,160,000
2028	222,270,000	0	0	0	0	0	222,270,000
2029	231,950,000	0	0	0	0	0	231,950,000
2030	245,590,000	0	0	0	0	0	245,590,000
2031	253,390,000	0	0	0	0	0	253,390,000
2032	267,990,000	0	0	0	0	0	267,990,000
2033	280,180,000	0	0	0	0	0	280,180,000
2034	291,340,000	0	0	0	0	0	291,340,000
2035	299,850,000	0	0	0	0	0	299,850,000
2036	306,500,000	0	0	0	0	0	306,500,000
2037	314,460,000	0	0	0	0	0	314,460,000
2038	323,010,000	0	0	0	0	0	323,010,000
2039	331,160,000	0	0	0	0	0	331,160,000
2040	339,630,000	0	0	0	0	0	339,630,000
2041	346,770,000	0	0	0	0	0	346,770,000
2042	355,600,000	0	0	0	0	253,595	355,853,595
	$6,333,000,000	$0	$0	$0	$0	$253,595	$6,333,253,595

INDIANAPOLIS POWER AND LIGHT COMPANY
PETERSBURG UNIT # 4
ONGOING COSTS

YEAR	TOTAL O&M COSTS $	UNIT # 4 316b CAPITAL COSTS $	UNIT # 4 CCR CAPITAL COSTS $	UNIT # 4 NAAQS NOX CAPITAL COSTS $	UNIT # 4 ASH POND DEMOLITION COSTS $	UNIT # 4 NET DEMOLITION COSTS W/O ASH POND $	UNIT # 4 OVERALL TOTAL $
2017	$122,660,000	$0	$0	$0	$0	$0	$122,660,000
2018	130,740,000	0	0	0	0	0	130,740,000
2019	136,350,000	0	0	0	0	0	136,350,000
2020	152,530,000	0	0	0	0	0	152,530,000
2021	158,170,000	0	0	0	0	0	158,170,000
2022	163,520,000	0	0	0	0	0	163,520,000
2023	171,280,000	0	0	0	0	0	171,280,000
2024	174,220,000	0	0	0	0	0	174,220,000
2025	183,280,000	0	0	0	0	0	183,280,000
2026	190,060,000	0	0	0	0	0	190,060,000
2027	195,690,000	0	0	0	0	0	195,690,000
2028	202,700,000	0	0	0	0	0	202,700,000
2029	214,780,000	0	0	0	0	0	214,780,000
2030	220,950,000	0	0	0	0	0	220,950,000
2031	232,340,000	0	0	0	0	0	232,340,000
2032	243,880,000	0	0	0	0	0	243,880,000
2033	262,200,000	0	0	0	0	0	262,200,000
2034	283,710,000	0	0	0	0	0	283,710,000
2035	284,300,000	0	0	0	0	0	284,300,000
2036	290,020,000	0	0	0	0	0	290,020,000
2037	297,340,000	0	0	0	0	0	297,340,000
2038	305,900,000	0	0	0	0	0	305,900,000
2039	313,160,000	0	0	0	0	0	313,160,000
2040	320,020,000	0	0	0	0	0	320,020,000
2041	328,020,000	0	0	0	0	0	328,020,000
2042	336,490,000	0	0	0	0	319,172	336,809,172
	$5,914,310,000	$0	$0	$0	$0	$319,172	$5,914,629,172