STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

VERIFIED PETITION OF INDIANAPOLIS POWER & LIGHT COMPANY D/B/A AES INDIANA ("AES INDIANA") FOR (1) ISSUANCE OF CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO REPOWER PETERSBURG GENERATING UNITS 3 & 4 TO OPERATE ON NATURAL GAS ("PETERSBURG REPOWERING PROJECT"); (2) APPROVAL OF PETERSBURG REPOWERING PROJECT AS A CLEAN ENERGY PROJECT; AND (3) ASSOCIATED ACCOUNTING AND RATEMAKING, INCLUDING RECOVERY OF PROJECT COSTS, PROJECT DEVELOPMENT COSTS, FGD DEWATERING AND RELATED COSTS, THE REMAINING NET BOOK VALUE OF PETERSBURG UNITS 3 AND 4 RETIRED ASSETS, AND CERTAIN MATERIALS AND SUPPLIES INVENTORY.	**CAUSE NO. 46022**

PETITIONER'S SUBMISSION OF DIRECT TESTIMONY OF ANGELIQUE COLLIER

Indianapolis Power & Light Company d/b/a AES Indiana ("AES Indiana" or "Petitioner"), by counsel, hereby submits the direct testimony and attachment of Angelique Collier.

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing was served this 11th day of March, 2024, by email transmission, hand delivery or United States Mail, first class, postage prepaid to:

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VERIFIED DIRECT TESTIMONY

OF

ANGELIQUE COLLIER

ON BEHALF OF

INDIANAPOLIS POWER & LIGHT COMPANY

D/B/A AES INDIANA

VERIFIED DIRECT TESTIMONY OF ANGELIQUE COLLIER
ON BEHALF OF AES INDIANA

1. INTRODUCTION

Q1. Please state your name, employer, and business address.

A1. My name is Angelique Collier. I am employed by AES U.S. Services, LLC ("AES"), One Monument Circle, Indianapolis, Indiana 46204.

Q2. On whose behalf are you submitting this direct testimony?

A2. I am submitting this testimony on behalf of Indianapolis Power & Light Company d/b/a AES Indiana ("AES Indiana" or "Company").

Q3. What is your position with AES?

A3. I am Director of Global Environmental Affairs for AES.

Q4. Please describe your duties as Director of Environmental Affairs for AES.

A4. As Director of Global Environmental Affairs, I am responsible for supporting compliance with all environmental regulatory programs at AES's U.S. generating plants and within AES's U.S. power delivery operations. In this capacity, I oversee my team's monitoring and participation in the development of regulations at the federal, state, and local levels. Further, my team supports environmental permitting for new and existing operations. I also provide support to and promote collaboration on environmental matters among the global businesses. Finally, I participate in and oversee the processes associated with developing written standards, procedures and policies, developing employee training, compliance tools, and conducting audits to help ensure compliance with environmental requirements and regulations.

Q5. Please summarize your previous work experience with AES Indiana and AES.

A5. Prior to accepting my current position in February of 2018, I began employment with AES Indiana on May 5, 2008. During my tenure with AES Indiana, I worked as an Environmental Coordinator and as a Senior Environmental Coordinator within AES Indiana's corporate offices, and the Director of Environmental Policy for the U.S. Strategic Business Unit ("SBU").

Q6. Please summarize your education, professional qualifications, and prior work experience.

A6. I obtained a Bachelor of Science Degree in Physics, with a specialty in Atmospheric Science from Purdue University in West Lafayette, Indiana in 2001. In addition, I obtained a Master of Science Degree in Environmental Pollution Control from the Pennsylvania State University in State College, Pennsylvania in 2002. Prior to joining AES Indiana, I worked for four years with the air permitting agencies in Indiana. I worked for two years at the Indianapolis Office of Environmental Services as an air permit writer, where I drafted, amended, modified, and renewed air permits for industries in Marion County. I then worked for two years at the Indiana Department of Environmental Management ("IDEM") as a Senior Environmental Manager, providing guidance and assistance as a mentor to permit writers, including review of permits for industries in Indiana. Finally, I worked for a local environmental consulting firm, Keramida, where I assisted clients in various industry sectors in obtaining environmental permits and complying with permit requirements and environmental regulations.

Q7. Have you previously testified before this Commission?

A7. Yes, I testified in IURC Cause No. 44242 regarding AES Indiana's Environmental Compliance Project, in Cause IURC No. 44399 regarding AES Indiana's Eagle Valley ("EV") Combined Cycle Gas Turbine and Harding Street Unit 5 & 6 Refueling Project, in IURC Cause No. 44540 regarding AES Indiana's National Pollutant Discharge Elimination System ("NPDES") compliance filing, and in IURC Cause No. 44794 regarding AES Indiana's National Ambient Air Quality Standards ("NAAQS") and Coal Combustion Residuals ("CCR") compliance filing. I submitted testimony in AES Indiana's semi-annual Environmental Compliance Cost Recovery Adjustment ("ECCRA") proceedings, beginning with IURC Cause No. 42170 ECR-20. I also submitted rebuttal testimony in AES Indiana's Petersburg Units 1 and 2 accounting treatment filing in Cause No. 45502.

Q8. What is the purpose of your testimony?

A8. The purpose of my testimony is to describe the environmental benefits that will be realized with the repowering of Petersburg Units 3 and 4. I also discuss the environmental permits required to repower Petersburg Units 3 and 4 to operate using natural gas and environmental requirements that prohibit the discharge of flue gas desulfurization ("FGD") wastewater. Finally, I describe the relevant environmental regulations and the effect of the repowering of Petersburg Units 3 and 4 on compliance.

Q9. Are you sponsoring any attachments?

A9. Yes. My testimony includes the following attachments:

Petitioner's Attachment AC-1, which is a list of acronyms used in my testimony.

Q10. Are you sponsoring any workpapers?

A10. No.

2. PROJECT ENVIRONMENAL BENEFITS

Q11. Please describe the environmental benefits associated with AES Indiana's repowering Petersburg Units 3 and 4 to use natural gas.

A11. Substantial reductions in most air emissions will result from the repowering of the existing coal-fired units with natural gas as indicated in the table below.

Pollutant	Limited Potential to Emit (lb/MMBtu)		% Reduction *(% increase)*
	Current Coal-Fired Units	Repowered Natural gas fired Units	
NO_x	0.700	0.100	85.7%
CO	0.036	0.185	*(417%)*
VOCs	0.004	0.005	*(43.8%)*
SO_2	0.280	0.001	99.8%
PM_{10}	1.581	0.007	99.5%
$PM_{2.5}$	0.412	0.007	98.2%
Mercury	1.20e-6	2.55e-7	78.8%
CO_2	206	117	43.1%

Additionally, the repowering of Units 3 and 4 eliminates future production of coal combustion residuals associated with the burning coal.

3. PROJECT ENVIRONMENTAL PERMITS

Q12. Please describe the permits that AES Indiana must obtain in connection with the repowering of Petersburg Units 3 and 4 to use natural gas.

A12. AES Indiana must obtain a modified Title V Air Permit from IDEM for the repowering of Petersburg Units 3 and 4 to natural gas. Other permits required may include Storm Water Pollution Prevention Plan associated with construction activities, DNR Construction in a Floodway, and Corps of Engineers Section 404 permit, and modifications to the National Pollutant Discharge Elimination Systems (NPDES) permit.

Q13. Please discuss the process and timeline for AES Indiana to obtain the permits you identified.

A13. AES Indiana submitted an air permit application to IDEM in March 2023 for the modification and operation of Units 3 and 4 on natural gas. The source modification (construction approval) was issued on November 13, 2023. The permit modification (operating approval) was issued on December 5, 2023. The air permit incorporates applicable air regulations and requirements, including the requirements of the 2021 Consent Decree which resolved purported violations of the Clean Air Act ("CAA") with respect to the coal-fired generation units at AES Indiana's Petersburg location. In addition to the air permit, AES Indiana is currently evaluating engineering information to assess all other environmental permitting requirements and gather necessary permit application information and will continue to do so as additional project details become available. AES Indiana will continue to work diligently to ensure that permits will be obtained in a timely manner.

4. FGD WASTEWATER

Q14. Please describe the FGD system.

A14. FGD is an air pollution control process used to control certain air pollutants, including sulfur dioxide, that result from the combustion of coal. Petersburg employs wet limestone FGD systems on Units 3 and 4 which use a limestone slurry to control air emissions that result from coal combustion. Petersburg uses a FGD wastewater treatment system to treat and recycle FGD wastewaters back into the FGD system process.

Q15. Please explain why Petersburg may not discharge FGD wastewater.

A15. As described in my testimony in Cause No. 44540, IDEM issued a NPDES permit to Petersburg in 2012 with new effluent limits for which Petersburg was required to comply by September 29, 2017. As described by Witness Fink in Cause No. 44540, a zero liquid discharge FGD wastewater treatment system with a recycle system was determined to be the recommended compliance plan to meet these new limits for FGD wastewater. IDEM issued a NPDES permit renewal to Petersburg, effective October 1, 2017, which required Petersburg to eliminate FGD wastewaters prior to November 1, 2018[1]. As such, Petersburg is not authorized to discharge FGD wastewaters.

Q16. How is this relevant to the repowering of Petersburg Units 3 and 4?

A16. When Petersburg ceases combustion of coal the associated FGD system process will no longer be operated, eliminating the opportunity to recycle any remaining wastewaters contained in the FGD wastewater treatment system. Because these FGD wastewaters may not be discharged, additional costs could be required to manage or dispose of wastewaters remaining in the FGD wastewater treatment system after the FGD system ceases operation. However, the same situation would occur if Units 3 and 4 were to be fully retired now or at any point in the future (rather than repowered to natural gas) because any such additional costs are associated with the retirement of the FGD, not the repowering of Units 3 and 4. AES Indiana witness Bigalbal (Q/A 47) provides the cost estimate for the FGD wastewater disposal. AES Indiana witness Rogers (Section 4) presents the Company's ratemaking and accounting proposal to recover the costs AES Indiana incurs for the FGD wastewater disposal.

[1] Part I, Condition A.1 [13].

5. EXISTING AND FUTURE ENVIRONMENTAL REGULATIONS

Q17. Are there environmental regulations potentially affecting Petersburg Units 3 and 4?

A17. Yes, there are a number of additional environmental rules – either proposed or final that have the potential to affect these units. These rules, including subsequent revisions thereto, include but are not limited to the National Ambient Air Quality Standards ("NAAQS"), Cross State Air Pollution Rule ("CSAPR"), Cooling Water Intake Structures Rule, Effluent Limitations Guidelines ("ELG") Rule, Water Quality Standards ("WQS"), Coal Combustion Residuals ("CCR") rule, and Greenhouse Gas New Source Performance Standards.

Q18. What are the NAAQS?

A18. NAAQS are established for criteria pollutants as defined in the CAA: carbon monoxide, lead, nitrogen dioxide, ozone, particle pollution, and SO_2. The NAAQS that typically may affect electric generating units ("EGUs") are ozone, particulates, and SO_2. This is because NO_x is a precursor to ozone, meaning that it is an air pollutant that contributes to ambient ozone. And, NO_x and SO_2 are precursors to particulates. Repowering of Units 3 and 4 to natural gas results in reductions in both NO_x and SO_2.

Section 109 of the CAA requires the U.S. Environmental Protection Agency ("EPA") to review NAAQS and the science on which they are based on a five-year basis. Areas meeting the NAAQS are designated attainment areas while those that do not meet the NAAQS are considered nonattainment areas. Each state is required by Section 110 of the CAA to develop a plan to bring nonattainment areas into compliance with the NAAQS, which may include imposing operating or emissions limits on individual units or plants. Pike County is currently designated as attainment for all NAAQS.

Q19. Please describe CSAPR and any subsequent revisions potentially affecting AES Indiana Petersburg.

A19. In August 2011, the EPA issued the CSAPR, which became effective in 2015, to address interstate transport of SO_2 and NO_x. The CSAPR Rule addresses upwind states' contributions to downwind states' ability to achieve NAAQS ("good neighbor" obligations) and is implemented, in part, through a market-based program under which compliance may be achieved through the acquisition and use of emissions allowances created by the EPA.

In October 2016, EPA issued the CSAPR Update Rule to address interstate air quality impacts with respect to the 2008 Ozone NAAQS. The CSAPR Update Rule went into effect for the 2017 Ozone Season. Following legal challenges to the CSAPR Update Rule, on April 30, 2021, EPA finalized the Revised CSAPR Update Rule which resulted in allowance allocation reductions for AES Indiana by placing Indiana, along with numerous other states, in Group 3 for NO_x OS allowances beginning in the 2021 NO_x OS.

On June 5, 2023, EPA published the final 2015 Ozone NAAQS Federal Implementation Plan ("FIP"). The rule establishes a revised CSAPR NOx Ozone Season Group 3 trading program for 22 states, including Indiana, and became effective during the 2023 ozone season. The FIP also includes enhancements in the revised Group 3 trading program, which include a dynamic budget setting process beginning in 2026, annual recalibration of the allowance bank to reflect changes to affected sources, a daily backstop emissions rate limit for coal-fired EGUs equipped with selective catalytic reduction beginning in 2024, and other enhancements.

Q20. How does repowering Units 3 and 4 to natural gas affect AES Indiana Petersburg's ability to comply with CSAPR?

A20. AES Indiana Petersburg has complied with CSAPR through its operations, purchase of allowances, and the use of emissions controls for SO_2 and NO_x. These emissions controls have included flue gas desulfurization ("FGD") for SO_2 for both Units 3 and 4, and selective catalytic reduction ("SCR") for NO_x for Unit 3. The repowering of Units 3 and 4 significantly reduces air emissions regulated by CSAPR, namely SO_2 and NO_x. While certain emission allocations for future years are uncertain, reductions in emissions of SO_2 and NO_x will facilitate AES Indiana Petersburg's ability to continue to comply with CSAPR. Additionally, Unit 3 plans to maintain its existing SCR as a voluntary emissions control device.

Q21. Please describe the Cooling Water Intake Structures Rule.

A21. Section 316(b) of the Clean Water Act ("CWA") requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available ("BTA") for minimizing adverse environmental impact and is intended to reduce the impacts to aquatic organisms through impingement and entrainment due to the withdrawal of cooling water by facilities from waters of the United States. In 2014, EPA's final CWA 316(b) standards went into effect which require certain facilities to choose amongst seven BTA options to reduce fish impingement and to conduct studies to assist permitting authorities to determine whether and what site-specific controls, if any, would be required, which could result in the need to install closed-cycle cooling systems, modified traveling screens with fish handling and return system, and/or other technologies.

Q22. How does repowering Units 3 and 4 to natural gas affect AES Indiana Petersburg's ability to comply with the Cooling Water Intake Structures Rule?

A22. Petersburg Units 3 and 4 are already equipped with a closed cycle cooling system. Additionally, a reduction in through screen velocity achieved through a reduction in existing pump capacity may be required. The repowering of Units 3 and 4 is not expected to affect the ability to comply with the requirements of the Cooling Water Intake Structures Rule as repowering does not impact the amount of cooling water withdrawn.

Q23. Please describe the CCR Rule.

A23. Utilities generate ash and other CCR from the burning of coal and associated activities. Some of the CCR are beneficially used in products, such as concrete and wallboard, while some are generally treated in on-site ash ponds or disposed in on-site landfills. On April 17, 2015, EPA published the final CCR Rule, which regulates CCR as non-hazardous waste under Subtitle D of the Resource Conservation and Recovery Act ("RCRA"). The CCR Rule established national minimum criteria for existing CCR surface impoundments (ash ponds), including location restrictions, structural integrity, design and operating criteria, groundwater monitoring and corrective action, closure requirements and post closure care. Since EPA's 2015 CCR Rule, EPA has issued proposed and final revisions to the rule and has indicated that they will implement a phased approach to amending the CCR Rule, which is ongoing.

Q24. How does repowering Units 3 and 4 to natural gas affect AES Indiana Petersburg's ability to comply with the CCR Rule?

A24. While the repowering of Units 3 and 4 does eliminate future production of coal combustion residuals, it does not affect AES Indiana Petersburg's compliance obligations associated

with the existing CCR Units (i.e., CCR surface impoundments and CCR landfill) at Petersburg Generating Station, including those related to groundwater monitoring and corrective action, closure requirements and post closure care.

AES Indiana Petersburg's existing CCR Units are not currently in service. As described in IURC Cause No. 44794, AES Indiana removed the ash ponds from service and installed a closed-loop bottom ash handling system to dewater bottom ash which would otherwise be sluiced to the ponds.

Q25. Please describe the 2015 and 2020 ELG Rules.

A25. The ELG regulations are designed to eliminate certain pollutants discharged into waterways for steam-electric power plants through technology applications. In November 2015, EPA finalized a rule establishing ELG requirements for FGD wastewater, fly ash transport water, bottom ash transport water ("BATW"), flue gas mercury control wastewater, gasification wastewater, combustion residual leachate, and legacy wastewater for steam electric power plants. Following legal issues with the 2015 ELG Rule, in October 2020, EPA published the final ELG reconsideration rule revising the 2015 limitations for FGD wastewater and BATW.

Q26. How does repowering Units 3 and 4 to natural gas affect AES Indiana Petersburg's ability to comply with the 2015 and 2020 ELG Rules?

A26. Petersburg Generating Station's coal-fired operation would comply using dry fly ash handling and zero liquid discharge FGD systems as a result of the wastewater treatment project described in IURC Cause No. 44540 and the closed-loop bottom ash handling project described in IURC Cause No. 44794. Petersburg's natural gas-fired operation will

not produce the wastewaters regulated by these ELG Rules. As such, the repowering of Units 3 and 4 does not require compliance with these ELG Rules.

Q27. Please describe the Water Quality Standards ("WQS") for Selenium.

A27. In June 2016, EPA published the final revised chronic aquatic life criterion for the pollutant selenium in freshwater in accordance with Section 304(a) of the CWA. In August 2021, IDEM finalized revisions to Indiana's Aquatic Life and Human Health Ambient Water Quality Criteria for Metals. This rule included the incorporation of final federal selenium water quality criteria.

Q28. How does repowering Units 3 and 4 to natural gas affect AES Indiana Petersburg's ability to comply with selenium WQS?

A28. AES Indiana Petersburg has already eliminated fly ash, bottom ash, and FGD wastewaters (prior to repowering). As such, repowering does not affect Petersburg's compliance obligations with applicable WQS requirements, including the revised selenium WQS.

Q29. Please describe the current status and potential impact of greenhouse gas regulations potentially affecting Petersburg Generating Station.

A29. On May 23, 2023, EPA published a proposed Greenhouse Gas New Source Performance Standards under CAA Section 111(d) which would establish emissions guidelines in the form of CO_2 emissions limitations for certain existing EGUs. This is EPA's third version of a CAA Section 111(d) regulation, following the 2015 Clean Power Plan and the 2019 Affordable Clean Energy Rule, neither of which were ultimately implemented. The 2023 proposed rule would require states to develop State Plans that establish standards of performance for such EGUs that are at least as stringent as EPA's emissions guidelines.

Depending on various EGU-specific factors, the bases of proposed emissions guidelines range from routine methods of operations to carbon capture and sequestration or co-firing with low-greenhouse gas hydrogen starting in 2030s.

The proposed emissions guidelines for coal-fired EGUs would depend on capacity factor and timeframe for ceasing operation. EGUs that continue operation on coal after January 1, 2032 could be required to meet emissions limits based on 40% co-firing with natural gas or full carbon capture and sequestration, depending on the timeframe in which the EGU would cease coal combustion.

Upon repowering to natural gas, Petersburg Units 3 and 4 would be existing natural gas-fired EGUs under the proposed rule. As such, based on the proposed rule, the repowered Units 3 and 4 would be subject to an emissions limit based on routine methods of operation and maintenance.

The requirements of a final CAA Section 111(d) rule, and the results of any associated legal challenges, remain uncertain. EPA may issue a final rule in early 2024.

6. CONCLUSION

Q30. Please summarize your testimony.

A30. AES Indiana plans to repower Petersburg Units 3 and 4 to natural gas, resulting in environmental benefits. This will require environmental permitting and AES Indiana is working diligently to ensure that all required permitting is completed in a timely manner. There are a number of environmental regulations – either proposed or final – which have the potential to affect Petersburg Units 3 and 4. AES Indiana is mindful of these environmental requirements and the repowering of Petersburg Units 3 and 4 will not affect the ability to comply with these requirements.

Q31. Does this conclude your pre-filed rebuttal testimony?

A31. Yes.

VERIFICATION

I, Angelique Collier, Director of Global Environmental Affairs, AES U.S. Services, LLC, affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information and belief.

Dated March 11, 2024

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Angelique Collier

List of Acronyms and Formulas

BATW – Bottom Ash Transport Water
BTA – Best Technology Available
CAA – Clean Air Act
CCR – Coal Combustion Residuals
CO – Carbon Monoxide
CO_2 – Carbon Dioxide
CSAPR - Cross State Air Pollution Rule
CWA – Clean Water Act
ECCRA - Environmental Compliance Cost Recovery Adjustment
EGUs – Electric Generating Units
ELG – Effluent Limitations Guidelines
EPA – Environmental Protection Agency
FIP – Federal Implementation Plan
FGD – Flue Gas Desulfurization
IDEM – Indiana Department of Environmental Management
NAAQS – National Ambient Air Quality Standards
NO_x – Oxides of nitrogen
NPDES – National Pollutant Discharge Elimination System
PM_{10} – Particulate Matter less than 10 microns in diameter
$PM_{2.5}$ – Particulate Matter less than 2.5 microns in diamater
RCRA - Resource Conservation and Recovery Act
SCR – Selective Catalytic Reduction
SO_2 – Sulfur Dioxide
WQS – Water Quality Standard