STATE OF INDIANA

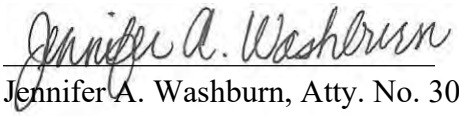
INDIANA UTILITY REGULATORY COMMISSION

PETITION OF DUKE ENERGY INDIANA, LLC, PURSUANT TO INDIANA CODE 8-1-8.4, REQUESTING (1) A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR FEDERALLY MANDATED COAL COMBUSTION RESIDUALS ("CCR") RULE COMPLIANCE PROJECTS AND COSTS; (2) APPROVAL OF ESTIMATED COSTS OF ITS FEDERALLY MANDATED COMPLIANCE PROJECTS; (3) AUTHORITY TO REFLECT COSTS AND CREDITS INCURRED FOR THE FEDERALLY MANDATED PROJECTS THROUGH ITS EXISTING STANDARD CONTRACT RIDER NO. 62; (4) RECOVERY OF 80% OF THE FEDERALLY MANDATED COSTS ON A TIMELY BASIS AND APPROVAL OF THE USE OF A REGULATORY ASSET TO ACCRUE SUCH COSTS, WITH FINANCING COSTS, UNTIL THE COSTS ARE REFLECTED IN PETITIONER'S RATES; (5) AUTHORITY TO ACCRUE A REGULATORY ASSET FOR THE DEFERRAL OF 20% OF THE FEDERALLY MANDATED COSTS ON AN INTERIM BASIS, WITH CARRYING COSTS, UNTIL THE APPLICABLE COSTS ARE REFLECTED IN PETITIONER'S BASE RETAIL ELECTRIC RATES; AND (6) AUTHORITY TO DEFER FUTURE ENVIRONMENTAL COMPLIANCE AND RETIREMENT-RELATED DEVELOPMENT, ENGINEERING, TESTING AND PRE-CONSTRUCTION COSTS.	)	**CAUSE NO. 45749**

SUBMISSION OF CAC'S PUBLIC DIRECT TESTIMONY

Citizens Action Coalition of Indiana, Inc. ("CAC") respectfully submits the Direct Testimony and Attachments on Benjamin Inskeep ("CAC Exhibit 1") in the above-referenced Cause to the Indiana Utility Regulatory Commission.

Respectfully submitted,



Jennifer A. Washburn, Atty. No. 30462-49
Citizens Action Coalition of Indiana, Inc.
1915 W. 18th Street, Suite C
Indianapolis, Indiana 46202
Phone: (317) 735-7764
Fax: (317) 290-3700
jwashburn@citact.org

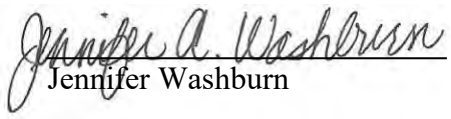
CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing was served by electronic mail or U.S. Mail, first class postage prepaid, this 13th day of October, 2022, to the following:

Liane K. Steffes
Elizabeth Heneghan
Duke Energy Business Services LLC
1000 East Main Street
Plainfield, IN 46168
liane.steffes@duke-energy.com
beth.heneghan@duke-energy.com

Anne E. Becker
Nucor Steel- Indiana
One American Square, Suite 2500
Indianapolis, IN 46282
abecker@lewis-kappes.com

Randy Helmen
Kelly Earls
Indiana Office of Utility Consumer Counselor
115 W. Washington Street, Suite 1500 South
Indianapolis, Indiana 46204
rhelmen@oucc.IN.gov
keearls@oucc.in.gov
infomgt@oucc.IN.gov


Jennifer Washburn

CAC Exhibit 1

STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

PETITION OF DUKE ENERGY INDIANA, LLC, PURSUANT TO INDIANA CODE 8-1-8.4, REQUESTING (1) A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR FEDERALLY MANDATED COAL COMBUSTION RESIDUALS ("CCR") RULE COMPLIANCE PROJECTS AND COSTS; (2) APPROVAL OF ESTIMATED COSTS OF ITS FEDERALLY MANDATED COMPLIANCE PROJECTS; (3) AUTHORITY TO REFLECT COSTS AND CREDITS INCURRED FOR THE FEDERALLY MANDATED PROJECTS THROUGH ITS EXISTING STANDARD CONTRACT RIDER NO. 62; (4) RECOVERY OF 80% OF THE FEDERALLY MANDATED COSTS ON A TIMELY BASIS AND APPROVAL OF THE USE OF A REGULATORY ASSET TO ACCRUE SUCH COSTS, WITH FINANCING COSTS, UNTIL THE COSTS ARE REFLECTED IN PETITIONER'S RATES; (5) AUTHORITY TO ACCRUE A REGULATORY ASSET FOR THE DEFERRAL OF 20% OF THE FEDERALLY MANDATED COSTS ON AN INTERIM BASIS, WITH CARRYING COSTS, UNTIL THE APPLICABLE COSTS ARE REFLECTED IN PETITIONER'S BASE RETAIL ELECTRIC RATES; AND (6) AUTHORITY TO DEFER FUTURE ENVIRONMENTAL COMPLIANCE AND RETIREMENT-RELATED DEVELOPMENT, ENGINEERING, TESTING AND PRE-CONSTRUCTION COSTS.	)	**CAUSE NO. 45749**

DIRECT TESTIMONY OF BENJAMIN INSKEEP ON BEHALF OF

CITIZENS ACTION COALITION OF INDIANA

OCTOBER 13, 2022

I. INTRODUCTION

Q. Please state your name, position and business address.

A. My name is Ben Inskeep, and I am the Program Director at Citizens Action Coalition of Indiana, Inc. ("CAC"). My business address is 1915 West 18th Street, Suite C, Indianapolis, Indiana 46202.

Q. Please describe your current responsibilities.

A. I have served as CAC's Program Director since March 2022. In that role, I work to advance CAC's policy and programmatic priorities related to energy, utilities, and consumer affordability and protection.

Q. Please briefly summarize your prior employment and educational background.

A. I have more than a decade of experience working on energy and utility issues. My prior employment includes working as a policy analyst at the North Carolina Clean Energy Technology Center at North Carolina State University (2014-2016), where I co-created and served as lead author and editor of *The 50 States of Solar*, a quarterly report series tracking distributed solar policy developments in U.S. states. I also conducted policy research and contributed to the *Database of State Incentives for Renewables and Efficiency (DSIRE)* project and provided technical support, analysis, and workshops for state and local governments through the U.S. Department of Energy's SunShot Solar Outreach Partnership.

I also worked for EQ Research LLC, a clean energy policy consulting firm, from 2016-2022. I managed EQ Research's general rate case subscription service, contributed as a researcher and analyst to other policy service offerings, such as a legislative and regulatory tracking services, and performed customized research and analysis for clients.

In addition, I helped clients with their participation in state utility regulatory proceedings, including serving as an expert witness on ratemaking and energy policy issues.

I earned a Bachelor of Science in Psychology from Indiana University in 2009 and both a Master of Science in Environmental Science and a Master of Public Affairs from the O'Neill School of Public and Environmental Affairs at Indiana University in 2012.

Q. Have you previously filed testimony before the Indiana Utility Regulatory Commission ("IURC" or "Commission")?

A. Yes. I previously testified before the IURC in Cause Nos. 45504, 45505, 45506, and 45508 addressing the excess distributed generation tariffs of AES Indiana, Northern Indiana Public Service Co., Indiana Michigan Power ("I&M"), and Duke Energy Indiana ("Duke"), respectively, as well as in Cause No. 45700 regarding NIPSCO's coal ash compliance project, Cause No. 45701 addressing I&M's demand-side management plan, Cause No. 45722 regarding CenterPoint's securitization pilot program, and Cause No. 45740 regarding Duke Energy Indiana and International Paper's steam contract.

I have also previously testified before the Kentucky Public Service Commission in Case Nos. 2020-00174 (Kentucky Power's 2020 rate case), 2020-00349 (Kentucky Utilities' 2020 rate case), and 2020-00350 (Louisville Gas & Electric's 2020 rate case).

Q. On whose behalf are you testifying?

A. I am testifying on behalf of CAC.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to highlight CAC's concerns with Duke's Coal Ash Compliance Project proposal.

Q. How is your testimony organized?

A. My testimony is organized as follows:

- **Section II** discusses the federal CCR Rule and state implementation in the context of Duke's Coal Ash Compliance Project.
- **Section III** summarizes the specific CCR units that are part of Duke's Coal Ash Compliance Project and additional concerns I have regarding certain CCR units.
- **Section IV** addresses cost allocation of the Ash Pond Compliance Project and explains why using an energy allocator instead of the 4CP demand allocator is appropriate.
- **Section V** discusses Duke's proposed revenue requirement for its Coal Ash Compliance Project and my concerns with costs that are being passed on to captive ratepayers.
- **Section VI** addresses Indiana's statutory prohibitions on retroactive ratemaking and how that applies to this proceeding.
- **Section VII** provides my recommendations.

II. FEDERAL CCR RULE AND STATE IMPLEMENTATION

Q. Please describe the relevant federal CCR standards applicable here.

A. Duke's CCR units that are subject to the federal CCR Rule must meet federally required closure performance standards. These federal performance standards directly impact the cost-effectiveness and long-term protectiveness of closing Duke's CCR units with ash remaining in place. Federal CCR regulations require that CCR surface impoundments must close if they are unlined or cannot meet federal location or structural integrity standards. The federal regulation offers two options for closure: (1) closure-in-place or (2) closure by removing CCR and decontamination of areas affected by releases from the CCR unit. Either option can be used as long as the owner/operator can meet the performance standards in the federal rule for the selected closure option.

The federal performance standards for closure-in-place require a CCR unit to close in a manner that will control, minimize, or eliminate, **to the maximum extent feasible**, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere.[1] **The EPA has interpreted these closure performance standards to prohibit closure-in-place where groundwater is in actual or likely contact with the CCR unless effective engineering measures can be installed to control, minimize, or eliminate such conditions.**[2] The closure-in-place performance standards also include structural stability and long-term maintenance requirements.

[1] 40 CFR 257.102(d).
[2] U.S. Environmental Protection Agency Region 5, Letter to Duke Energy (included as Attachment BI-2).

Q. Please describe your overarching concerns with Duke's Coal Ash Compliance Project.

A. Duke is proposing significant costs to be recovered from captive ratepayers related to its Coal Ash Compliance Project, yet the coal ash closure plans associated with this project do not fully comply with the federal CCR Rule nor do they adequately protect human health and the environment, subjecting Duke customers and Hoosiers more broadly to tremendous risk. **In my opinion, based on the specific characteristics of Duke's CCR units, closure by removal of all or the vast majority of the CCR is the only closure option that can reliably and cost-effectively meet the federal CCR closure performance standards.**

At a high level, Duke is proposing to leave large quantities of toxic coal ash in place along the shores of the Ohio, Wabash, and White Rivers. Groundwater monitoring conducted by Duke indicates that pollution from these coal ash units is seeping into groundwater, with numerous harmful contaminants such as arsenic exceeding established standards. Duke is only proposing closure by removal at two of the smaller coal ash units, **leaving 94% of the total coal ash that is part of the Coal Ash Compliance Project in place in perpetuity**.[3] As described further below, IDEM stated in its approval of these closure-by-removal plans that they do not actually meet the federal definition of closure by removal. Furthermore, Duke is undertaking additional measures at CCR units it concedes are regulated under the federal CCR Rule, while holding its other CCR units to a lower standard (e.g., placing a cap over the coal ash, but failing to adopt measures that would prevent coal ash from coming into contact with groundwater). However, many of the proposed measures at the CCR units Duke concedes are subject to the federal CCR Rule

[3] Petitioner's Exhibit No. 2, Tables 1 and 2.

are not themselves permanent solutions for coal ash, meaning ratepayers could be asked to pay for additional cleanup costs in the future. Finally, in contradiction to federal law, Duke has failed to identify and begin implementing groundwater corrective measures at many of its CCR units.[4]

Q. How does this approach differ from coal ash remediation in other states and in Indiana for other utilities?

A. As I detail elsewhere in this testimony, in many cases coal ash impoundments in other states including where Duke operates in other jurisdictions—and even other utilities in Indiana—are being excavated and the ash moved to dry, lined disposal sites or recycled for encapsulated forms of reuse, such as in concrete. There is no meaningful difference in the on-the-ground circumstances between Duke Energy's coal ash ponds in Indiana and elsewhere where utilities, including Duke affiliate utilities in other jurisdiction, have decided to pursue closure by removal at CCR units.

Duke Energy's approach to closure is markedly different between states in which it has one or more vertically owned utilities. Most of its Indiana ash ponds, including those in the Coal Ash Compliance Project, are slated to be closed in place, leaving the possibility that toxic coal ash could remain in, or come into, contact with groundwater, including if its proposed technological solutions fail, do not perform as anticipated, or are not maintained and continuously operated by Duke after 30 years. The result is that Indiana residents are receiving substantially less protection from the risks posed by Duke's coal ash than the residents of states like North Carolina, and there is no principled technical, scientific, or policy basis for this unequal outcome.

[4] DEI Response to OUCC Data Request 2.10 (included in Attachment BI-1).

Q. Is Duke's Coal Ash Compliance Project consistent with the plain language of the CCR Rule standards for closure by removal, for those units which are proposing to close by that method?

A. No, it is not. **The federal CCR Rule's standard for closure by removal is 40 C.F.R. § 257.102(c), which requires that, in addition to removing the ash disposed of in the CCR unit, a utility must also "decontaminat[e] all areas affected by releases from the unit."** Section 257.102(c) further provides that, in order to complete a closure-by-removal, **the utility must remove CCR constituents from "any areas affected by releases from the CCR unit" and must further demonstrate that groundwater monitoring does not indicate any exceedance of groundwater protection standards (i.e., the groundwater is no longer contaminated).**

Duke has characterized its closure plans for the Gibson North Settling Basin and Wabash River Pond B as "closure by removal," yet IDEM's approval of these plans expressly states that "removal" as contemplated in the plans "does not mean closure as contemplated by 40 CFR 257.102(c)," which is the section of the federal CCR Rule that identifies the federal closure by removal standard.[5] In other words, **Duke is claiming it is doing closure by removal as required by a federal mandate, yet IDEM's approvals** expressly find **that the claimed "closure by removal" does not actually comply with all of the federal requirements**. In particular, Duke's proposed closure by removal does not appear to comply with the requirements of Section 257.102(c) quoted above that Duke must decontaminate and remove CCR constituents from all areas affected by releases from

[5] Petitioner's Exhibit No. 2, Attachment 2-G (TSH), p. 5 of 31, footnote 1 and Attachment 2-D (TSH), p. 4 of 30.

the unit, as well as demonstrate that there are no further exceedances of groundwater protection standards. Duke is not allowed to request cost recovery under the FMCA for expenditures that do not comply with the federal mandate at hand.

Q. Please describe the "federally mandated requirements" that Duke contends are at issue.

A. Duke testifies that the federal Resource Conservation and Recovery Act ("RCRA") applies to all of the coal ash units that are part of its Coal Ash Compliance Project, but that EPA regulations of Coal Combustion Residuals (known as the "CCR Rule," 40 C.F.R. Part 257) only apply to four of the seven CCR units.

Q. Does the CCR Rule require Duke to close its CCR units that are subject to the CCR Rule?

A. Yes. The CCR Rule requires any of the coal ash ponds that are subject to the CCR Rule to close in accordance with the requirements of 40 C.F.R. § 257.102. Thus, according to Duke's designations, this would close at least four of the seven CCR units.

Q. For the IDEM-required projects that Duke contends are not subject to the federal CCR Rule, is Duke still asking for recovery of the costs associated with these projects under the Indiana FMCA?

A. Yes. The Commission should deny Duke's request for recovery as such. As stated herein, CAC strongly believes that this is not a lawful or appropriate use of ratepayer money, especially since it is likely ratepayers will eventually have to pay for additional closure or corrective action projects at these sites in the future.

Q. For these IDEM-required projects that Duke contends are not subject to the federal CCR rule but are subject to RCRA requirements, does RCRA require those ponds to close?

A. No, RCRA does not. *See* RCRA Section 6924(u). While RCRA Section 3004(u) requires corrective action for any "releases of hazardous waste or constituents from any solid waste management unit," Duke does not appear to concede that any of the IDEM-required projects have released hazardous waste or constituents to the environment that require corrective action. And, Duke has not pointed to any specific provision of RCRA or federal regulations that requires the closure of the CCR units that they contend are not subject to the federal CCR Rule.

Q. Does IDEM's approval of Duke's closure plans for some of the CCR units that are part of the Coal Ash Compliance Project render it compliant with the federal CCR Rule?

A. Although I am not an attorney, I have been informed by counsel that IDEM as a state agency does not have the authority to rewrite federal regulatory requirements. Further, it is my understanding that the CCR Rule is enforceable by EPA and citizens (through federal court citizen suits); either the EPA or citizens could challenge the legal validity of Duke's chosen closure method, notwithstanding IDEM's approval of it. Finally, despite IDEM's initial approval of Duke's closure plans for Gallagher North Ash Pond and Primary Pond Ash Fill Area, EPA subsequently determined the CCR units must comply with the federal CCR Rule, necessitating the withdrawal and future refiling of the plans. One of the key issues for compliance with the CCR Rule for Duke is that ash closed in place cannot be subject to ongoing infiltration by groundwater, per 40 CFR sec. 257.102(d).

Q. Even assuming *arguendo* that IDEM's approval of Duke's closure plan renders it compliant with the CCR Rule, would this be sufficient to absolve Duke of responsibility for ensuring that the groundwater is cleaned up?

A. No. Separate provisions of the CCR Rule, 40 C.F.R. §§ 257.90-257.98, require utilities to monitor groundwater and take corrective action to clean up releases of contaminants from CCR units. These requirements apply independent of the method of closure Duke selects.

Q. Did Duke take into consideration the cost of future groundwater corrective action?

A. No. Even after caps are in place, the leaching of coal ash contaminants into groundwater can continue if there is ongoing groundwater infiltration, especially at sites such as Duke's where groundwater levels rise and fall as the water level in neighboring rivers fluctuates (including during flood events). **Duke has not comprehensively evaluated cost estimates associated with corrective action measures it will need to undertake in the future that will be significantly more likely under closure in place relative to closure by removal**.

Q. What cost implications could there by if corrective action for groundwater under the federal CCR Rule is ultimately necessary for those ponds where Duke is just doing closure in place?

A. Corrective action for groundwater under the federal CCR Rule could last for decades, potentially resulting in a significant difference in the total closure and post-closure costs for the Coal Ash Compliance Project. If those risks and costs are taken into account, closure in place is not likely to be the most prudent and cost-effective approach. In contrast, clean closure where coal ash is removed and placed into dry, lined storage or recycled into concrete, stops the coal ash contamination from the units, significantly reducing the likelihood that corrective action will be needed (or the extent and cost of the corrective

action, if it is needed). This is the most protective closure option for groundwater and the Ohio, Wabash, and White Rivers, and may be the most cost-effective approach in the long run. From this more holistic view, closure in place is a risky and myopic method of addressing toxic coal ash.

Q. Could the CCR Rule be modified in the future?

A. Yes. The EPA has already made modifications to the federal CCR Rule and is contemplating additional changes, which would make closure by removal even more appealing. For example, EPA is contemplating regulations for inactive surface impoundments at power plant facilities that ceased operation prior to the 2015 effective date of the CCR Rule, pursuant to a court ruling from the DC Circuit Court of Appeals.[6] As part of this "legacy" coal ash rulemaking, EPA is also "considering proposing corrective action requirements for all CCR contamination (regardless of how or when that CCR was placed) on site of a regulated facility."[7] If adopted, this could include additional corrective action requirements for "legacy" coal ash landfill areas, including those areas that Duke refers to as "historic coal ash management units." Both generally, as well as specifically to CCR, federal environmental regulations have become more stringent across time. In my opinion, this trend is highly likely to continue in the future, including for coal ash, again which would make closure by removal even more appealing from a cost standpoint so ratepayers do not have to pay for an ineffective cleanup solution once, just to pay again later for an effective cleanup solution.

[6] 85 Federal Register 65015 (October 14, 2020).
[7] Office of Information & Regulatory Affairs, White House Office of Management & Budget, Spring 2022 Unified Regulatory Agenda, RIN 2050-AH14, https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202204&RIN=2050-AH14.

Q. Has the Commission acknowledged the benefits of closure by removal?

A. Yes. The Commission has previously recognized the significant benefits of closure by removal in a CenterPoint case:

> We recognize the economic and environmental advantages of the CBR [closure-by-removal] approach to achieving CCR compliance. The record sets forth the many benefits of CBR with Beneficial Reuse in this particular circumstance compared to a CIP [closure-in-place] project, including long-term mitigation of risk to the extent a CIP approach would expose Petitioner to future additional remediation requirements at the pond.[8]

Q. Have other jurisdictions recognized the benefits of closure by removal compared to closure in place?

A. Yes. When other utilities and states have faced the same problem on whether to leave coal ash in place, they have often come to the conclusion that the risk is too large. For example, Virginia passed legislation requiring the removal of coal ash from multiple impoundments in its watersheds.[9] North Carolina decided that "'excavation [is] the only way to protect public health and the environment'" for many coal ash ponds in the state.[10] Subsequently, a North Carolina court approved a Consent Order that provides for closure by removal, spanning thousands of acres and containing more than 85,000,000 tons of coal ash.[11] Finally, Montana's Department of Environmental Quality has repeatedly made it clear to

[8] Order, Verified Pet. Southern Indiana Gas & Elec. Co. re "Brown County Pond," IURC, Case No. 45280 (May 13, 2020), p. 17.
[9] Senate Bill 1355, 2019 Gen. Assemb. (Va. 2019) and H.R. 443, 2020 Gen. Assemb. (Va. 2020).
[10] NCDEQ, *DEQ Orders Duke Energy to Excavate Coal Ash at Six Remaining Sites* (Apr. 1, 2019) (also stating that, "[a]fter conducting a rigorous scientific review of Duke Energy's proposals for Allen, Belew's, Cliffside/Rogers, Marshall, Mayo and Roxboro facilities, and conducting public listening sessions in impacted communities," the North Carolina Department of Environmental Quality "has determined excavation of all six sites is the only closure option that meets the requirements of [the] Coal Ash Management Act to best protect public health").
[11] Consent Order, North Carolina ex rel. North Carolina Dep't of Envtl. Div. of Water Resources v. Roanoke River Basin Ass'n, Case No. 13-CVS-11032 (Feb. 5, 2020) at 6-9.

owners of coal ash ponds that it "will not accept a remedy that leaves a long-term source in place if it is in contact with groundwater."[12]

Q. What position has Duke Energy Indiana affiliate Duke Energy Progress taken in South Carolina?

A. In South Carolina, Duke Energy Progress's expert witness filed extensive testimony[13] demonstrating the prudency of closure by removal rather than closure in place for North Carolina and South Carolina coal ash ponds. In summary, Duke Energy Progress's expert found that "closure by removal of all or the vast majority of the CCR is the only closure approach that can reliably and cost-effectively meet the federal CCR closure performance standards."[14]

Q. Please elaborate on the recommendations made by Duke Energy Progress's coal ash expert in South Carolina.

A. Duke's expert summarized the benefits of closure by removal over closure in place as follows:

> **Even when closure-in-place can be engineered to comply with the federal closure performance standards, closure by excavation is often prudent and more cost-effective than leaving CCR in place because it can reduce future post-closure costs and potential future cleanup liability associated with unexpected releases from the closed CCR unit**. Closure by excavation can also be preferable because it allows the land, often a limited commodity at power plants, to be reused for other purposes

[12] Joint Testimony of Scott M. Payne & Ian Magruder, *In re: Standard for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New 35 Ill. Admin. Code 845*, Docket No. PCB 2020-019 (Ill. Pollution Control Bd. filed Aug. 27, 2020), at 32-33 ("Other states such as Montana (Montana DEQ 2019, Montana DEQ 2020) have required owner/operators to remove CCR that is in contact with groundwater where it is causing exceedances of water quality standards and the owner/operator has not provided an alternative remedy capable of eliminating long-term leaching of the CCR."). Attachment BI-3.
[13] South Carolina Public Service Commission, Docket No. 2022-254-E, Direct Testimony of Marcia E. Williams for Duke Energy Progress, LLC, September 1, 2022. Attachment BI-4.
[14] *Id.*, pp. 42.

> or to be sold. Closure-in-place requires long-term access to, as well as long-term operation and maintenance of, all engineered structures including the closed unit cap, restricting future use of this land.[15]

(Emphasis added.) The testimony also made compelling points on the need to take into consideration the general public's concerns about coal ash, as well as the legal risks, when evaluating coal in place:

> The public often views leaving CCR in place unfavorably and the public's input plays an important and defined role in making closure determinations…. In the preamble to the final rule, EPA discussed the importance of public participation for regulations promulgated under RCRA. Also, to the extent citizens do not believe the documentation provided by regulated CCR owners and operators meet the federal rule requirements, citizens can participate directly through lawsuits under RCRA Section 7002. **CCR units that fail to comply with the self-implementing requirements or that result in an imminent and substantial endangerment to public health or the environment face a risk of being subject to successful citizen suits**.[16]

(Emphasis added).

Q. What are some of the long term land use implications of closure in place that were highlighted by Duke Energy Progress's expert?

A. With respect to the negative long-term land-use implications, Duke Energy Progress's expert went on to point out additional long-term drawbacks of closure in place; ultimately, these could negatively impact ratepayers:

> …[C]losure-in-place may preclude the use of the land for other purposes. Closure-in-place requires the construction of a final cover system as well as post-closure requirements (e.g., ensuring the integrity of the final cover system, maintaining the integrity of leachate collection and removal systems, if required, and groundwater monitoring) for 30 years after the closure. This may prohibit the owner or operator of the utility from utilizing the land for either new waste management units or for expansions to other plant facilities.[17]

[15] *Id.*, pp. 16-17.
[16] *Id.*, p. 38. Footnotes are omitted.
[17] *Id.*, pp. 39-40. Footnotes are omitted.

Closure in place can create property restrictions, which can ultimately harm ratepayers by depriving them the benefits of the utility being able to fully utilize land paid for by ratepayers:

> Additionally, closure-in-place requires the owner/operator to record a notation on the property deed in perpetuity that the land was used for a CCR unit. This affects both the current owner/operator and any future landowners. EPA recognized the burden of the indefinite land restrictions and post-closure care obligations associated with closure-in-place and noted that **this should create a further incentive for closure by removal**...[18]

Q. What does Duke's witness in South Carolina say about whether closure in place methods are sufficient to guarantee there will not be future releases that cause contamination?

A. Duke's witness in South Carolina points out that closure in place creates substantial uncertainty about future costs the utility may need to incur to address the coal ash, which ultimately could be borne by captive ratepayers:

> **In addition, leaving the CCR in place, even when meeting the required performance standards for closure-in-place at the time of closure, does not avoid the possibility of future releases from the surface impoundment during the post-closure period that could trigger the need to perform additional groundwater investigation and corrective action if future releases exceed protective standards.** The cost of corrective action, including extensive groundwater evaluation, is always uncertain and dependent upon site-specific facts such as the hydrogeologic conditions at the site and the types of contaminants. These costs are made even more uncertain by the potential for new, emerging contaminants that can drive unexpected cleanup costs or the possibility that more stringent risk-based contaminant standards can evolve over time. Therefore, companies may factor the uncertainty of future releases into the comparative prudence of their closure choices. Based on site-specific factors, additional upfront costs associated with excavation can be offset by lower post-closure costs and reduced future liability associated with the possibility of future releases requiring corrective action.[19]

[18] *Id.*, p. 40 (emphasis added). Footnotes are omitted.
[19] *Id.*, p. 46.

(Emphasis added.)

Q. Did Duke Energy Progress's expert in South Carolina also conclude there is a risk of future federal environmental regulations that make closure-by-removal a more attractive approach?

A. Yes. As I point out above, environmental regulations are more likely than not to be strengthened in the future based on historical trends and general scientific advancement of the understanding of risk to human health of various coal ash constituents. Duke's expert summarized the issue as follows:

> …[I]t is not uncommon for environmental regulations and requirements to increase in stringency as time passes. There is no guarantee that additional closure or post-closure requirements will not be put in place if a closure is conducted later in time, thereby increasing costs. Delaying closure can also increase the probability of corrective action requirements and costs, depending upon site-specific factors.[20]

Q. Do you believe the same concerns you identified from Duke Energy Progress's expert apply to Duke Energy Indiana's Coal Ash Compliance Project?

A. Yes. Many of Duke Energy Indiana's Coal Ash Compliance Project surface impoundments are in contact with groundwater. Duke Energy Indiana's plan to close these surface impoundments in place requires extensive and costly engineering controls to prevent contact between ash and groundwater and to eliminate, to the maximum extent feasible, future releases of CCR or leachate. Even with these engineering controls, the cost of continuing to meet the performance standards during the post-closure period will remain uncertain.

[20] *Id.*, p. 48.

III. COAL ASH COMPLIANCE PROJECT

Q. Please describe the Coal Ash Compliance Project at issue in this proceeding.

A. Duke seeks recovery for coal ash management and closure costs previously incurred or to be incurred between 2019 and 2030 at its Cayuga and Gibson generating stations, as well as at its retired Edwardsport, Gallagher, and Wabash River generating stations. Altogether, Duke seeks cost recovery for $238.1 million in closure costs and $35.2 million in coal ash management costs associated with the Coal Ash Compliance Project for 2019-2030.[21] Table 1 provides a high-level summary of the closure plans included in the Coal Ash Compliance Project. Table 2 compares the quantity of coal ash that will be subject to closure by removal and closure in place, showing that only 6% of the total coal ash covered by the Coal Ash Compliance Project is covered by a plan that Duke characterizes as closure by removal.

Table 1: Summary of Coal Ash Compliance Project Closure Plans[22]

Station	Assset Name	Closure Plan Footprint (Acres)	Closure Plan Volume (Cu. Yards)	Closure Method	Impacted Water Body	IDEM / CCR Requirement
Gallagher	Primary Pond	10.1	401,085	Close in Place	Ohio River	CCR & IDEM
Gibson	North Pond	134.7	4,342,450	Close in Place	Wabash River	CCR & IDEM
Gibson	North Settling Basin	24.1	116,770	Close by Removal	Wabash River	CCR & IDEM
Wabash River	Pond B	21.1	738,170	Close by Removal	Wabash River	CCR & IDEM
Wabash River	North Pond	43.1	1,592,470	Close in Place	Wabash River	IDEM Only
Gibson	South Ash Fill Area	188.5	6,855,785	Close in Place	Wabash River	IDEM Only
Edwardsport	Ash Mgmt Area	15	765,000	Close in Place	White River	IDEM Only

[21] Confidential Attachment 2-K (TSH).
[22] Based on information included in Petitioner's Exhibit No. 2.

Table 2: Summary of Closure Methods in Coal Ash Compliance Project

Closure Method	Closure Plan Volume (Cu. Yards)	Proportion
Close in Place	13,956,790	94%
Close by Removal	854,940	6%
Total	14,811,730	100%

A. Gallagher

Q. Please describe the Coal Ash Compliance Project with respect to the Gallagher Generating Station.

A. At the Gallagher Generating Station, Duke proposes closure in place, including installing a slurry wall that will encircle the North Ash Pond, the Primary Pond Ash Fill Area, and the Primary Pond, which are contiguous and were previously operated as a single CCR unit (Figure 1). However, IDEM has only approved the closure plan for the Primary Pond, which is the only pond of the three that is part of the Coal Ash Compliance Project.

Although IDEM initially approved Duke's closure plans for the North Ash Pond and the Primary Ash Pond Fill Area, EPA found Duke's closure plans that allowed CCR materials to remain in contact with groundwater at these CCR units were not compliant with the plain language of the federal CCR Rule. Duke therefore intends to file revised closure plans for the North Ash Pond and the Primary Ash Pond Fill Area in November 2022.[23]

[23] Petitioner's Exhibit No. 2, p. 10.

Figure 1: Map of Gallagher Coal Ash Units[24]

Q. Do you have any concerns about the proposed slurry wall?

A. Yes. The closure-in-place plan for the Primary Pond depends on the effectiveness *in perpetuity* of the slurry wall and continued leachate extraction to prevent contaminated groundwater from seeping through the wall and moving away from the Primary Pond footprint and toward the Ohio River. After the 30-year post-closure period, it is possible that the slurry wall inspection and maintenance and leachate pumping could end. Therefore, Duke's closure in place plan would only provide **temporary** protection of groundwater at best. Finally, the slurry wall system appears to transfer coal ash contamination from groundwater to the surface water, significantly eroding any long-term benefit from the slurry wall.

Q. Do you have any additional concerns about Duke's cost recovery request for the slurry wall?

[24] Petitioner's Exhibit No. 2, Attachment 2-A (TSH).

A. Yes. Even though it has not filed its updated North Ash Pond and Primary Ash Pond Fill Area closure plans with IDEM nor received approvals for such plans yet, Duke is moving ahead with its cost recovery request in this proceeding with respect to the Primary Pond that includes the slurry wall that would encompass all three coal ash units. Duke stated in response to an OUCC data request that, "Upon approval of the closure plans by IDEM, costs will be apportioned to these basins based on the perimeter coverage of the slurry wall. Duke plans to update the Commission in a future proceeding with additional detail."[25] However, Duke also objected to and refused to answer the OUCC's question on how Duke's plans for the slurry wall would be affected if Duke's draft closure plans for the North Pond or Primary Pond Ash Fill Area are not approved or are successfully appealed.[26] **This puts stakeholders and the Commission in the impossible position of evaluating the prudency of making ratepayers pay for an expensive slurry wall that would only be operated for a limited period of time and before this technology has been fully evaluated and approved by IDEM for this location**. To the extent the Commission approves the slurry wall in this proceeding, it should clarify through its Order in this proceeding that cost recovery is only approved for the portion of the slurry wall associated with the Primary Pond based on its share of the perimeter cover, and that cost recovery for the remaining portion of the slurry wall will be subject to the outcome of a future proceeding in which the closure plans of North Ash Pond and the Primary Ash Pond Fill Area will be addressed.

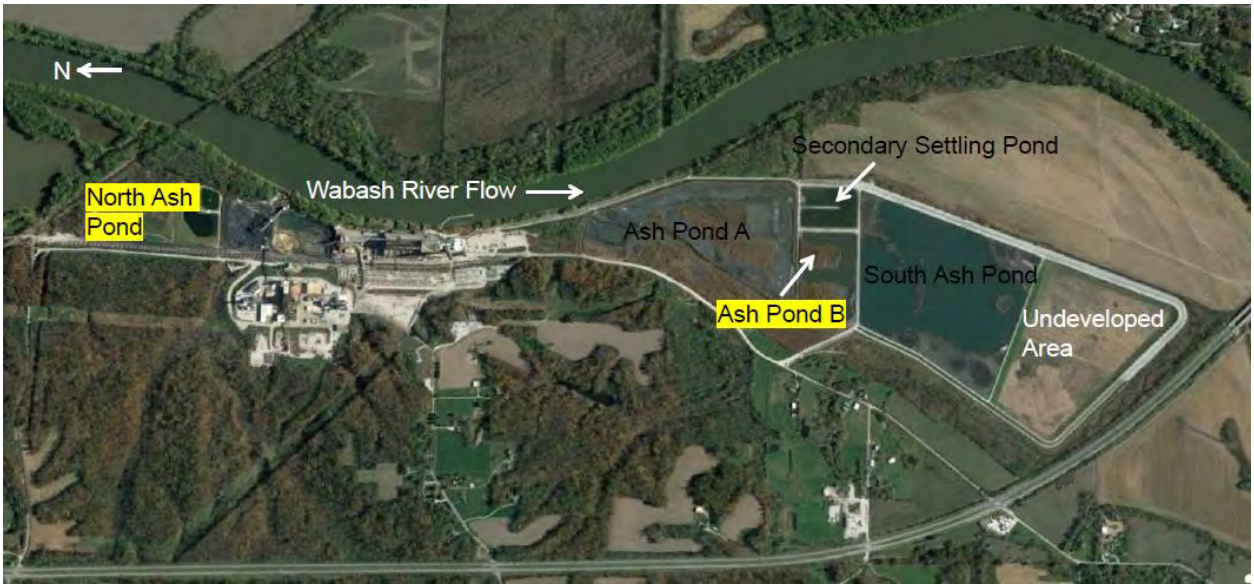
[25] Duke Response to OUCC Data Request 3.4(a) (included in Attachment BI-1).
[26] Duke Response to OUCC Data Request 3.4(b) (included in Attachment BI-1).

B. Wabash River

Q. Please describe the Coal Ash Compliance Project with respect to the Wabash River Generating Station.

A. Duke is requesting cost recovery for closure projects at Wabash River Ash Pond B and North Ash Pond (Figure 2). North Ash Pond will be closed in place, and Ash Pond B will be closed by removal of all CCR materials into lined South Pond.

Figure 2: Map of Wabash River Coal Ash Units[27]



Q. Has Duke measured any concentrations above groundwater protection standards for CCR units at this site that are included in the Coal Ash Compliance Project?

A. Yes. Duke's groundwater monitoring has already detected statistically significant increased concentrations over groundwater protection standards of arsenic, lithium and molybdenum.[28]

[27] Petitioner's Exhibit No. 2, Attachment 2-A (TSH).
[28] Duke Energy Indiana, CCR Annual Groundwater Monitoring and Corrective Action Report: Ash Pond System, January 4, 2022.

Q. Do you have any other concerns with Duke's closure plans at Wabash Valley?

A. Yes. For example, Duke plans to remove CCR material and one additional foot of the underlying soil at Ash Pond B does not appear to test for and remediate any contamination that may be present at Ash Pond B after the CCR and one foot of soil are removed. In addition, Duke's plan for closure in place at North Pond B also puts Hoosiers at risk of potential coal ash contamination occurring in the future. For instance, the shifting in the course of the Wabash River over time could erode the North Pond cap causing a release of the ash.

C. Gibson

Q. Please describe the Coal Ash Compliance Project with respect to the Gibson Generating Station.

A. At Gibson Generating Station, Duke is requesting cost recovery for closure plans at North Ash Pond, North Settling Basin, and the South Ash Fill Area (Figure 3). The North Ash Pond will be closed in place using in-situ-stabilization ("ISS"), which will "solidify portions of the ash that are in contact with groundwater to create an impermeable barrier."[29] A "stability wall" will also be installed using a "deep material mixing" process that supposedly will ensure stability in the event of a seismic event such as an earthquake.

The North Settling Basin will supposedly be closed by removal. The South Ash Fill Area will be closed in place by grading the top area to promote stormwater drainage using fixated material from the station.

[29] Petitioner's Exhibit No. 2, p. 15, lines 5-6.

Figure 3: Map of Gibson Coal Ash Units[30]

1 **Q. Has Duke measured any concentrations above groundwater protection standards for**
2 **CCR units at this site that are included in the Coal Ash Compliance Project?**

3 **A.** Yes. Duke's groundwater monitoring at the North Ash Pond and North Settling Basin has
4 already detected statistically significant increased concentrations over groundwater
5 protection standards of lithium and molybdenum,[31] and at the South Ash Fill it has detected
6 statistically significant increased concentrations over groundwater protection standards of
7 arsenic, lithium, cobalt, and molybdenum.[32]

8 **Q. Do you have any concerns with the Gibson closure plan?**

9 **A.** The presence and extent of contamination at this site in unsurprising, given that coal ash
10 from the plant has been sitting in groundwater, in unlined lagoons, for decades, but this is

[30] Petitioner's Exhibit No. 2, Attachment 2-A (TSH).
[31] Duke Energy Indiana, CCR Annual Groundwater Monitoring and Corrective Action Report: North Ash Basin System, January 19, 2022; Duke Energy Indiana, CCR Annual Groundwater Monitoring and Corrective Action Report: North Ash Basin System, January 19, 2022.
[32] Duke Energy Indiana, CCR Annual Groundwater Monitoring and Corrective Action Report: North Ash Basin System, January 19, 2022; Duke Energy Indiana, CCR Annual Groundwater Monitoring and Corrective Action Report: RWS TYPE I SOUTH LANDFILL FP# 26-06, January 19, 2022.

not a justification for failing to take action now that would fully address this source of contamination by conducting clean closure.

In addition, the Closure Plan's provisions related to use of CCR as structural fill to form the subgrade of the final cover fails to comply with the 40 CFR 257. More specifically, this use of CCR constitutes "overfill" as defined by 40 CFR 257.53, which must meet the location restrictions and design requirements for new CCR landfills pursuant to 40 CFR 257.60 and 257.70. The proposed use of CCR as overfill in the Closure Plan does not comply with these requirements.

D. Edwardsport

Q. Please describe the Coal Ash Compliance Project with respect to the Edwardsport Generating Station.

A. At Edwardsport, Duke is proposing to merely excavate a portion of the coal ash at the site and consolidate it into one, unlined pile at the site, and to cover it up with some dirt and vegetation (Figure 4).[33]

[33] Petitioner's Exhibit No. 2, pp. 17-18.

Figure 4: Map of Edwardsport Coal Ash Fill Area[34]

Q. Has the Edwardsport closure plan been approved by IDEM?

A. No. The Edwardsport plan has not yet been approved by IDEM.

Q. Is it reasonable for the Commission to approve cost recovery for a CCR closure plan that has not been approved by IDEM?

A. No. Closure plans that have not been approved by IDEM are still subject to significant changes in the future that could materially alter the costs of completing the plan. In my opinion, given this, the Edwardsport component of the Coal Ash Compliance Project is not ripe for the Commission to make a determination. Even if the plan were to be approved in the future during the pendency of this proceeding, parties would have been deprived the opportunity to review and comment on IDEM's determination in the context of the issues in this case. Essentially, the Commission is being asked to approve cost recovery for a project that is not yet certain to move forward and whose costs could materially change.

[34] Petitioner's Exhibit No. 2, Attachment 2-A (TSH).

Q. Do you have any other concerns with the Edwardsport closure plan?

A. Yes. Of the 765,000 cubic yards of coal ash at the site identified by Duke, its closure plan states that only 53,500 cubic yards will be removed from the West Historic Ash Placement Area ("HAPA") and placed in the Consolidated Ash Management Area ("CMA"), and 110,000 cubic yards of coal ash will be removed from the East HAPA and placed in the CMA.[35] This means only 163,500 cubic yards total, or 21.4% of the coal ash on site, will be removed from its current disposal area, leaving the vast majority of coal ash in place. **The modest quantity of coal ash that Duke proposes to remove will not be properly disposed, as it would be consolidated into a pile that has no liner to protect groundwater from coming into contact with the coal ash or prevent contamination from the coal ash from migrating into groundwater.**[36]

The Edwardsport site is located directly adjacent to the White River, creating a significant risk of future contamination. The eastern portion of the site is located within the floodplain and floodway of the West Fork of the White River.[37] Duke has proposed a flood protection berm with a crest elevation that is 3 feet above the 100-year flood elevation.[38] A berm is an insufficient method of protection human health and environment, as it would not provide long-term protection against significant changes in the course of the White River, extreme weather events that could damage the berm, or the potential for flooding from the sides.

[35] Petitioner's Exhibit No. 2, Attachment 2-J (TSH), p. 25 of 1119.
[36] Duke Response to CAC Data Request 1.05(k)(iv) (included in Attachment BI-1).
[37] Petitioner's Exhibit No. 2, Attachment 2-J (TSH), p. 11 of 1119.
[38] Petitioner's Exhibit No. 2, Attachment 2-J (TSH), p. 26 of 1119.

Furthermore, portions of the site are above an abandoned coal mine, with the closure plan stating that "all areas above the underground mine are at high risk for sag-type subsidence,"[39] including the southwestern portion of the CMA.[40] This further exacerbates the risks and challenges of the draft closure plan.

Finally, coal ash contamination at the site includes coal ash fill in areas that currently have infrastructure that is pertinent to the operations of the Edwardsport IGCC facility, and Duke Energy does not plan to close this area until plant decommissioning,[41] which could be decades in the future. It is unreasonable to delay the full cleanup of this site especially given the ash that has been accumulating there from the retired coal plant.

E. Cayuga

Q. Please describe the Coal Ash Compliance Project with respect to the Cayuga Generating Station.

A. Duke is requesting $10 million for coal ash costs at its Cayuga Generating Station (Figure 5).[42] These are costs to close the on-site landfill when Cayuga Station is currently assumed to retire. Activities include placement of fill material and a CCR Rule compliant cover system.

[39] Petitioner's Exhibit No. 2, Attachment 2-J (TSH), p. 17 of 1119.
[40] Petitioner's Exhibit No. 2, Attachment 2-J (TSH), p. 26 of 1119
[41] Petitioner's Exhibit No. 2, Attachment 2-J (TSH), p. 24 of 1119.
[42] Petitioner's Exhibit No. 2, p. 20.

Figure 5: Map of Cayuga Coal Ash Units[43]

[43] Petitioner's Exhibit No. 2, Attachment 2-A (TSH).

IV. COST ALLOCATION

Q. What is Duke's proposal for allocating the costs of its Coal Ash Compliance Project?

A. Duke is proposing to allocate costs associated with its Coal Ash Compliance Project using the four coincident peak demand ("4CP") demand allocation method adopted for production plant-related costs in its 2019 rate case.[44] Duke's 4CP methodology is based on the months of June, August, September, and January (i.e., three summer months and one winter month).[45]

Q. Do you have any concerns with Duke's proposed allocation of cost recovery among ratepayers?

A. Yes. CAC is extremely concerned about Duke's proposed cost allocation for its Coal Ash Compliance Project, in which costs would be allocated based on demand allocators despite these clearly being energy-related costs that should be allocated using Duke's energy allocators.

Q. Why is it more appropriate to use energy allocators than demand allocators when allocating the costs of cleaning up coal ash ponds and landfills?

A. Coal ash is produced from burning coal to generate electricity. In other words, coal ash is generated as a function of energy generation: the more coal that is burned to generate electricity, the more coal ash that is created, which in turn results in incremental coal ash disposal costs. In contrast, the quantity of coal ash generated, and therefore the costs associated with its disposal, is neither related to capacity nor for meeting Duke's capacity obligations. The use of demand allocators is more appropriate for capacity-based

[44] Petitioner's Exhibit No. 3, p. 13.
[45] Cause No. 45253, Petitioner's Exhibit No. 7, p. 27.

investments, like the power plant's initial construction costs, and not the cleanup of coal ash that was created as a function of burning coal to generate electricity.

To illustrate this concept in another way, consider the simple scenario of a utility that owns two identical coal units, "Unit 1" and "Unit 2," each sized 500 MW, and each providing the exact same capacity value to ratepayers. However, assume that Unit 1 is frequently dispatched by MISO, such that it has a 75% capacity factor, and Unit 2 is rarely dispatched by MISO, such that it has a 25% capacity factor. In this scenario, Unit 1 will generate approximately three times the amount of coal ash as Unit 2, while at the same time it provides approximately three times as much electricity to the benefit of ratepayers. Extending this simplistic example further, assume there are two customers of this utility, Customer 1 and Customer 2. Customer 1 and 2 purchase exactly the same amount of electricity each year, and thus each have an energy allocator of 50%. However, Customer 2 uses relatively more electricity during on-peak periods, resulting in demand allocators of 75% for Customer 2 compared to only 25% for Customer 1. Even though both Customer 1 and 2 use the same amount of electricity, and "cause" the same amount of coal ash costs to the utility, under a demand allocator, Customer 2 would be assigned *three times* the amount of coal ash costs as Customer 1, whereas the two customers would receive identical allocations if energy allocators were used instead. As can be understood intuitively from this example, it is more appropriate to allocate the coal ash costs in proportion to the amount of electricity used by the rate class.

Q. Are other energy-related costs allocated using energy allocators?

A. Yes. For example, the purchase of coal to fuel the power plant are correctly based on energy allocators, as the more coal that is burned, the more electricity that is generated. Likewise,

consumables such as those that are utilized as components to operating environmental pollution control technologies are also allocated on the basis of energy, not demand, because these costs are related to the amount of electricity generation, and not to meet a utility's capacity obligations. Finally, the cost of pollution allowances, such as NOx allowances, that vary in relation to electricity generation and not to coincident peak demand, and are allocated using energy allocators. **Coal ash costs that are related to the amount of electricity generation should be allocated in the same manner as other energy-related costs.**

Arguments that attempt to connect coal ash costs to the fact that it is stored in ponds or landfills at a production plant site, and therefore should be subject to the same cost allocation as the production plant (coal plant facility) itself, are not compelling. The principle of cost causation means costs are recognized as being caused by a service if the costs are brought into existence as a direct result of providing the service or the costs are avoided if the service is not provided. Finally, simply because a utility has shirked its responsibility to safely dispose of toxic coal ash that was generated as a byproduct of generating electricity for many decades and now must undertake a comprehensive cleanup at its disposal sites does not magically transform these energy-related costs into production plant costs. **Simply put, there is no rational basis that can withstand any depth of scrutiny for allocating coal ash disposal costs—produced as a byproduct of electricity generation—using demand allocators.**

The 4CP methodology is particularly egregious and inappropriate in this instance because coal ash is generated in all months of the year in proportion to the amount of electricity that is generated by the plant. The 4CP methodology, however, only considers

a customer class's contribution to the peak demand in four months when allocating costs to customer classes. So in addition to allocating costs based on the wrong metric (contribution to peak demand), the 4CP methodology completely ignores which customer class "caused" coal ash costs in eight months in the year. **The 4CP methodology for this proposal produces unjust and unreasonable rates that harm some customer classes, including residential customers, and create windfall rate subsidies to other customer classes, who used the electricity associated with the coal ash but are no paying for their share of the costs to clean up that same proportion of coal ash.**

Q. What is the impact to customer classes of using demand allocators instead of energy allocators?

A. As quantified below, the use of demand allocators instead of energy allocators would create a large, undesirable cross-subsidy in rates primarily benefitting HLF industrial customers and resulting in higher rates to certain other customer classes, including residential customers who are already struggling to afford high bills.

Q. Please describe how you calculated the customer class impacts of using demand allocators compared to using energy allocators.

A. To calculate the impact to customer classes of allocating Coal Ash Compliance Project costs based on Duke's proposed cost allocation (demand allocators) compared to CAC's proposed cost allocation (energy allocators), I used Duke's estimated total revenue requirement of the Coal Ash Compliance Project costs ($184,729,303) and allocated these costs to each customer class based on the demand and energy allocators, respectively, provided by Duke.[46] I note that my results based on these figures are estimates, as the final

[46] Duke Response to CAC Data Request 1-06(f)(i) and (ii) (included in Attachment BI-1).

Ash Pond Compliance Project costs incurred could vary from the initial estimate provided by Duke.

Q. What are the results of your analysis?

A. Figure 6 presents the results of my analysis, with detailed information on the cost allocator and associated revenue requirement presented in Table 3. **Under Duke's proposal to use demand allocators, HLF customers would receive a windfall cross-subsidy of approximately $14.2 million in reduced revenue requirements over 2024-2030—the costs of which would be shifted to other rate classes—compared to using Duke's energy allocators**. Residential customers (rate class RS) would have a revenue requirement that is $15.3 million higher under demand allocators relative to CAC's proposal to use energy allocators. These unfair cross-subsidies would persist into the 2030s, but Duke refused to provide its forecasted annual revenue requirement for 2031-2038,[47] so I was only able to quantify the cross-subsidies for the 2024-2030 period. To state the results in another way, Duke's cost proposal would unfairly allocate approximately $77.8 million (42.1%) of the total $184.7 million in costs to residential customers, when these customers should have only been allocated approximately $62.5 million (33.8%) of the costs based on the proportion of energy used by the customer class (and, by extension, the proportion of coal ash costs caused to serve those customers).

[47] Duke Response to CAC Data Request 1-06(h) (included in Attachment BI-1).

Figure 6: Cost Allocation of Coal Ash Compliance Project, 2024-2030

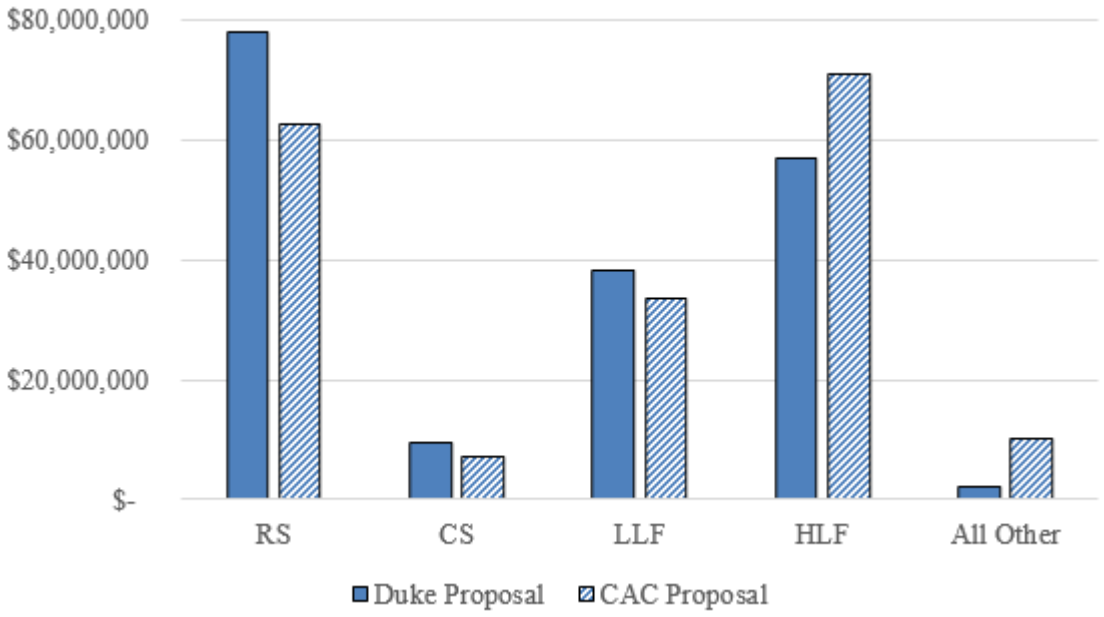


Table 3: Cost Allocation of Coal Ash Compliance Project, 2024-2030

	Duke Energy Indiana Proposal		CAC Proposal		
Rate Class	Demand Allocator	Revenue Requirement	Energy Allocator	Revenue Requirement	Difference
RS	42.1%	$ 77,826,455	33.8%	$ 62,512,396	$ (15,314,059)
CS	5.2%	$ 9,550,504	3.9%	$ 7,219,221	$ (2,331,283)
LLF	20.7%	$ 38,275,911	18.2%	$ 33,689,083	$ (4,586,828)
HLF	30.8%	$ 56,841,207	38.5%	$ 71,032,112	$ 14,190,905
All Other	1.2%	$ 2,235,226	5.6%	$ 10,276,491	$ 8,041,265
Total	100.0%	$ 184,729,303	100.0%	$ 184,729,303	$ (0)

As I discuss further below, the Coal Ash Compliance Project costs are not the only coal ash cleanup costs Duke plans to pass on to its customers. If Duke allocates the costs from these future anticipated projects in the same manner as its proposes to allocate costs for its Coal Ash Compliance Project, then the negative impact of its 4CP demand allocator to residential customers and other customers classes relative to HLF customers will be further magnified.

Q. How does Duke plan for resource adequacy?

A. Duke Energy Indiana is a load-serving entity ("LSE") member of the Midcontinent Independent System Operator ("MISO") and must therefore demonstrate compliance with its Planning Reserve Margin Requirement. Historically, these requirements have been based on meeting the systemwide peak that occurred during the summer. Arguably, there previously was some basis for utilizing the 4CP methodology based primarily on demand in summer months for determining demand allocators. For example, in the Commission's order approving the 4CP cost allocation methodology in Duke's 2019 rate case, it noted that:

> At the time DEI received an order in its last rate case, MISO [Midcontinent Independent System Operator] had only recently been formed and approved by FERC [Federal Energy Regulatory Commission] as an RTO [Regional Transmission Operator]. Currently, MISO establishes capacity requirements for its member utilities based on peak demand and reserve criteria. Consequently, DEI's capacity needs are now determined by its contribution to the MISO system's peak, which occurs consistently in the summer period.[48]

In 2021, MISO proposed significant changes to its resource adequacy construct. MISO stated that generation resource retirements, increased reliance on intermittent resources, significant weather events with correlated generator outages, and declining excess reserve margins will profoundly impact future grid reliability, and that <u>all industry participants have a shared responsibility to plan for these impacts and implement new policies and practices to ensure the continued reliability of the grid</u>," (emphasis added).[49] MISO stated that its current resource adequacy construct, which focuses on the procurement of capacity for an entire 12-month Planning Year to meet demand during one

[48] Order, p. 119.
[49] Order Accepting Proposed Tariff Revisions Subject to Revision re Midcontinent Independent System Operator, Inc. under ER22-495, FERC Docket No. ER22-495, August 31, 2022.

peak day of the Summer Season, was not designed to address the trends currently facing the MISO Region. MISO explained that reliability risks associated with resource adequacy have shifted from "Summer only" to a year-round concern. Accordingly, in August 2022 FERC approved MISO's proposal to replace its single annual resource adequacy requirement based on meeting summer peak demand with four seasonal resource adequacy requirements.[50] In other words, LSEs like Duke are no longer planning for capacity resources to meet just the summer system peak demand, or just the summer and winter peaks, as implied by Duke's 4CP methodology. MISO utilities including Duke now must plan to have sufficient resources in all four seasons, seriously calling into question the relevance of the 4CP methodology going forward.

Q. Shouldn't this issue be addressed in Duke's next rate case instead of this proceeding?

A. Duke went approximately 17 years – from 2002[51] to 2019 – in between its last base rate case filings, hardly setting a precedent for rate cases being a regular forum where such issues could be addressed in a timely manner. Currently, Duke does not have to file a new rate case until 2028.[52] Using a known fatally flawed cost allocation methodology for years as we wait for Duke to file its next rate case to address this issue would not produce just and reasonable rates for customers today, and for the years to come. Even if a demand allocator is appropriate to use—a position with which I strongly disagree—the proposed 4CP demand allocator is now a relic of the past that no longer aligns with Duke's capacity requirements or planning going forward.

[50] Order Accepting Proposed Tariff Revisions Subject to Revision re Midcontinent Independent System Operator, Inc. under ER22-495, pp. 3-5.
[51] Cause No. 42359.
[52] Duke Supplemental Response 10-3-2022 to CAC Data Request 1.06(c)(iii) (included in Attachment BI-1).

Q. What do you recommend?

A. I recommend that, to the extent the Commission grants cost recovery for all or a portion of the requested Coal Ash Compliance Project, these costs be allocated using Duke's energy allocator. The Commission should reject the use of the 4CP methodology for allocating costs of the Coal Ash Compliance Project.

V. REVENUE REQUIREMENTS

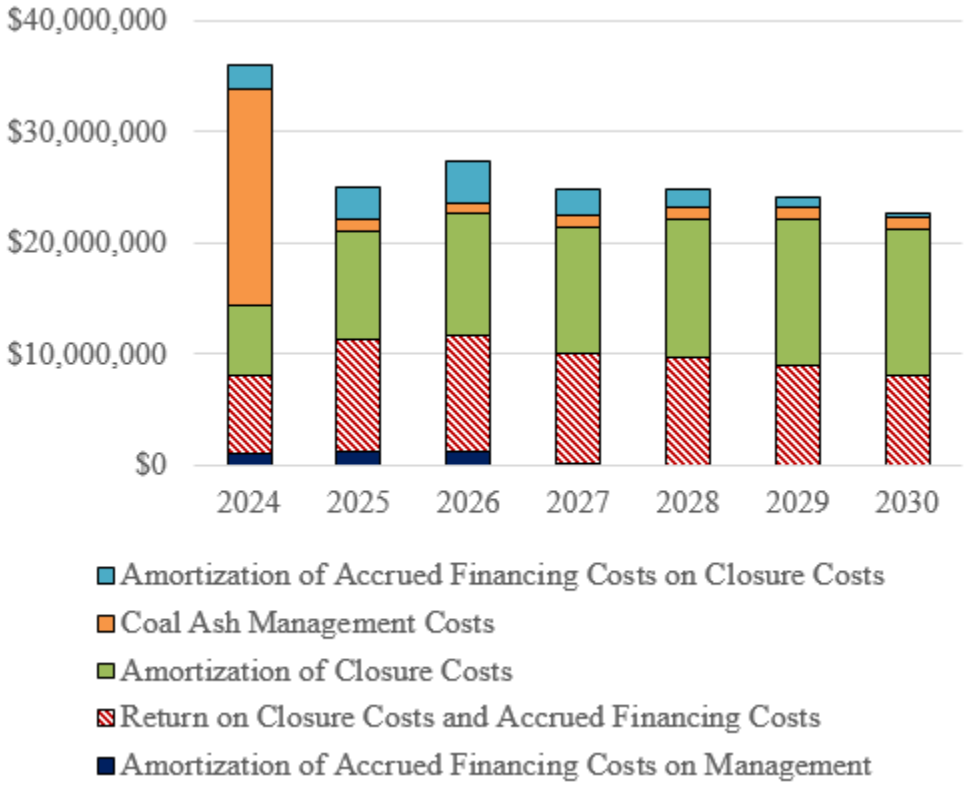
Q. What is the overall annual revenue requirement requested by Duke for its Coal Ash Compliance Project?

A. As shown in Figure 7, Duke is requesting an annual revenue requirement of $36.0 million in 2024, with an overall revenue requirement for the years 2024-2030 totaling $184.7 million.[53] This will result in the average monthly residential bill increasing by an estimated $1.64 in 2024, and falling gradually to $1.03 by 2030.[54] Overall, Duke's Coal Ash Compliance Project will cost $238 million (escalated) in CCR closure costs and $35.2 million in CCR management costs (escalated), or $273.3 million in total costs.[55] Duke proposes to amortize Coal Ash Compliance Project costs through 2038.[56]

[53] Petitioner's Attachment 3-A (BPD).
[54] Duke Response to CAC Data Request 2.16 (included in Attachment BI-1).
[55] Confidential Attachment 2-K (TSH), although note that counsel for Duke has agreed to make the numbers used in this testimony public. CAC notes that this attachment describes the $238 million figure as "escalated" in contrast to Duke's direct testimony (Petitioner's Exhibit No. 2, p. 21) that characterized it as "unescalated and after subtracting cost of removal". In the same testimony, Duke also claimed the management costs were "approximately $34 million (unescalated)" whereas Confidential Attachment 2-K (TSH) identified those costs as actually being approximately $33.4 million (unescalated).
[56] Petitioner's Exhibit No. 3, p. 11.

It should be noted that the Coal Ash Compliance Project is only a fraction of the anticipated coal ash compliance projects and costs Duke plans to incur. The Commission has previously approved other Duke coal ash closure-related projects. In addition, Duke estimates that future closure projects not covered in this proceeding, including 30 years post closure maintenance, is estimated to cost another approximately $150 million (not escalated), and it has requested authority to defer these costs so that it can include them in rates in a future proceeding.[57]

Figure 7: Annual Revenue Requirements for Coal Ash Compliance Project[58]



Q. Would Duke earn a return on its Coal Ash Compliance Project?

[57] Petitioner's Exhibit No. 2, p. 22.
[58] Based on data from Petitioner's Attachment 3-A (BPD).

A. Yes, as depicted in Figure 7, Duke is requesting a return on closure costs and accrued financing that totals $63.8 million in over the 2024-2030 period. This amount is based on its weighted average cost of capital of 5.66%, which is based in part on its return on equity of 9.70%. In other words, Duke would not only be recovering actual costs of coal ash closure and management, but would also be earning a sizable profit on its Coal Ash Compliance Project, with these costs comprising a sizeable portion of Duke's annual revenue requirement.

Q. Is it reasonable for Duke to charge ratepayers higher rates specifically so that it can earn a profit on its Coal Ash Compliance Project?

A. No. Coal ash closure and management costs that are prudently incurred to protect public health and the environment pursuant to environmental regulations are more appropriately delineated as operations and management (O&M") costs—allowing a return "of" but not a return "on" costs—rather than capital costs. Allowing utilities like Duke to recover toxic coal ash removal and remediation costs as a capital investment subject to a return creates a perverse incentive to not address waste concerns earlier, when they would be treated as O&M costs not subject to a rate of return, or through more cost-effective options that are not capital intensive.

Given the challenges Hoosiers currently face regarding the affordability of basic needs such as food, fuel, housing, and utilities due to recent high inflation and skyrocketing energy commodity costs, CCR closure costs should be recovered in a manner resulting in the smallest impact to customers' bills.

Q. What do you recommend with respect to Duke's ability to earn a profit on the Coal Ash Compliance Project?

A. In my opinion, Duke should not be profiting off the backs of its customers for its work to clean up the coal ash messes it created over decades and has delayed addressing until now. The Commission should disallow Duke's ability to earn a return on Coal Ash Compliance Project costs.

Q. Has Duke been transparent about the extent to which this proceeding could impacts costs in the future?

A. No. Duke has disguised the full amount of its request in this proceeding by only providing detailed coal ash closure and management cost information through 2030. **Yet, the Coal Ash Compliance Project will result in costs for decades, if not in perpetuity, for Duke's captive customers, or it would require more expensive clean-up in the future to address the coal ash problems it is quite literally trying to cover up today**.

Duke has proposed to amortize capital expenditures related to the Coal Ash Compliance Project through 2038. Yet, when asked by CAC in a Data Request to provide information on its cost recovery associated with the Coal Ash Compliance Project through the 2038 amortization period, Duke objected and stated they had not compiled such information.[59] Duke's case-in-chief, by limiting discussion to the 2024-2030 period, therefore provides insufficient information and discussion on future costs, for determining the prudency of the Coal Ash Compliance Project. The Commission cannot make a decision approving Duke's plans that will impact ratepayers for decades to come based

[59] Duke Response to CAC Data Request 1.06(h) (asking "Refer to Attachment 3-A (BPD). i. Please provide the same information out through 2038 (the amortization period identified by Duke Energy Indiana as applying to Coal Ash Compliance Project costs). ii. What is the estimated total revenue requirement associated with the Coal Ash Compliance Project for the 2031-2038 period?" to which Duke Energy objected, stating "Duke Energy Indiana further objects to subpart h as seeking a study or compilation the Company has not performed and to which it objects performing.") (included in Attachment BI-1).

only on a presentation of the impacts for an initial seven-year period, when the course of action selected by Duke will directly impact costs to ratepayers for decades to come.

Q. Should ratepayers be responsible for all of the costs associated with cleaning up Duke's coal ash?

A. In my opinion, **Duke shareholders should bear at least some of the financial burden of addressing the utility's toxic coal ash that it has failed to safely and properly dispose in a manner that protects human health and the environment**. As a result of the utility's failure to operate in a safe and reliable manner, it now must undertake costly clean-up and remediation actions to address the harms of its imprudent plant operations.

CAC urges the Commission to ensure all coal ash is cleaned up the right way and to leverage every tool at their disposal to mitigate the bill impacts to ratepayers, many of whom are already under enormous financial strain both due to sharply increasing energy bills specifically, as well as inflationary pressures more generally that have resulted in significant price increases for many consumer goods and services.

Q. Is amortizing Coal Ash Compliance Project costs through 2038 reasonable?

A. No. Duke said it selected 2038 "to ensure costs will be recovered by the time the Company's last operating coal unit at Gibson Station is retired in 2038, based on the retirement dates included in the depreciation study in the most recent base rate case."[60] However, the 2038 date identified by Duke conflicts both with its Integrated Resource Plan and its own public commitments to retire coal generation more quickly than 2038. In February 2022, Duke Energy announced a public commitment to "fully exit coal by 2035

[60] Petitioner's Exhibit No. 3, pp. 11-12.

as part of the largest planned coal fleet retirement in the industry."[61] Likewise, Duke Energy Indiana's 2021 IRP stated that it would be "retiring all coal fired power generation by 2035."[62]

Accordingly, to the extent the Commission approves all or a portion of the Coal Ash Compliance Project, amortization through 2035 would be the most appropriate timeframe to align with Duke Energy Indiana's aim that Coal Ash Compliance Project Costs "will be recovered primarily from the customers who are benefitting while coal units are still operating,"[63] while still limiting the overall bill impact to customers by spreading the Coal Ash Compliance Project costs out over a significant period. I also encourage Duke to consider the benefits of potential changes to Indiana's securitization statute that could provide a significant benefit to ratepayers if securitization was expanded to all utilities and included cost of coal ash closure and management.

Q. Do the costs that Duke is seeking to recover in this proceeding include any dues for membership in lobbying or advocacy organizations?

A. Yes, Duke acknowledged in response to CAC's discovery that the company is seeking $16,651.31 to cover the cost of membership in the Utility Solid Waste Activities Group ("USWAG").[64] USWAG is a membership organization that lobbies and advocates for the interests of utility shareholders for less stringent and less costly EPA regulations of coal ash and other solid wastes, primarily by hiring attorneys to advocate before EPA and litigate legal challenges to EPA rules. USWAG also provides information to utilities on

[61] Duke Energy expands clean energy action plan, https://news.duke-energy.com/releases/duke-energy-expands-clean-energy-action-plan.
[62] Duke Energy Indiana, 2021 Integrated Resource Plan, p. 5.
[63] Petitioner's Exhibit No. 3, p. 12.
[64] Duke Response to CAC Data Request 2.06 (included in Attachment BI-1).

less costly (which typically means, less protective of human health and the environment) ways to comply with EPA regulations.

Q. Does Duke's membership in USWAG benefit Duke's ratepayers?

A. Not necessarily. USWAG engages in legislative lobbying, advocates for regulatory policy changes, and provides utilities with "strategic advice" on how to take advantage of regulatory loopholes that may not align with ratepayers' interests. First and foremost, any legislative lobbying engaged in by USWAG is not an appropriate expenditure of ratepayer funds. Second, even for USWAG's regulatory advocacy that does not constitute lobbying, USWAG is still seeking regulatory changes and interpretations that would be good for short-term utility bottom lines (and thus, beneficial to utility shareholders) without necessarily benefitting the long-term interests of ratepayers in cost-effective compliance strategies that are protective of human health and the environment and minimize costs and risks over the long term.

Q. Did Duke provide any evidence in its case-in-chief that its payment of USWAG membership dues serves the public convenience and necessity and is in the best interest of Duke's ratepayers?

A. No, Duke did not provide any evidence of this in its case-in-chief. Duke did not even acknowledge in its testimony that a portion of the coal ash closure costs it is seeking in this proceeding were to cover the cost of USWAG membership dues, let alone explain why these costs should be approved by the Commission in this proceeding. It was only when directly asked in discovery that Duke disclosed this information. Duke has therefore not carried its burden of proof to demonstrate that its payments to a legislative lobbying and regulatory advocacy organization are appropriate and serve the public convenience and

necessity. It is unclear if there are membership dues to other organizations engaged in legislative lobbying or regulatory advocacy that are included in Duke's cost recovery request.

Q. Do you have a recommendation concerning Duke's request for recovery of its USWAG membership dues?

A. Yes, I recommend that the Commission deny Duke's request for recovery of $16,651.31 in USWAG membership dues, because Duke has not demonstrated that its payment of these dues serves the public convenience and necessity. To the extent there are any other membership dues included in Duke's request to other similar organizations, the Commission should also deny cost recovery for those as well.

VI. RETROACTIVE RATEMAKING

Q. What is Indiana's statutory prohibition against retroactive ratemaking?

A. Ind. Code § 8-1-2-68 provides that, "Whenever ... the commission shall find any rates ... to be unjust, unreasonable, [or] insufficient ..., the commission shall determine and by order fix just and reasonable rates ... to be imposed, observed, and followed **in the future**" (emphasis added).

Likewise, other applicable statutes pertaining to utility ratemaking, such as the Federal Mandates Statute that is at issue in the instant proceeding, use future-tense phrasing, the plain language of which would suggest cost recovery under the statute pertains to future costs incurred by the utility and that retroactive ratemaking is not allowed.

Q. Please identify which provisions of the Federal Mandates Statute include future tense phrasing.

A. Indiana Code Sections 8-1-8.4-6(a), 6(b), 6(b)(1), 7(b)(1), and 7(b)(2) all use future-tense phrasing. For instance, I.C. § 8-1-8.4-6(a) provides that:

> Except as provided in subsection (c), or unless an energy utility has elected to file for: (1) a certificate of public convenience and necessity; or (2) the recovery of costs; under another statute, an energy utility that seeks to recover federally mandated costs under section 7(c) of this chapter must obtain from the commission a certificate that states that public convenience and necessity **will be served** by a compliance project proposed by the energy utility.

(Emphasis added.) Although I am not an attorney, the plain language of the future-tense usage indicates to me that the federally mandated projects are to provide future benefits.

In addition, I.C. § 8-1-8.4-6(b) says, in pertinent part, that, "The commission shall issue a certificate of public convenience and necessity under section 7(b) of this chapter if the commission finds that the proposed compliance project **will allow** the energy utility to comply directly or indirectly with one (1) or more federally mandated requirements." (Emphasis added). The statute does not say "has allowed."

Finally, I.C. § 8-1-8.4-6(b)(1)(B) requires that the Commission examine "[a] description of the **projected** federally mandated costs associated with the proposed compliance project, including costs that are allocated to the energy utility…" (emphasis added). Projected costs are the estimated or forecasted costs in the future. In contrast, past costs incurred would be known, actual amounts that would not need to be "projected."

Q. Do you see any language in the Federal Mandates Statute that authorizes a utility to recover past costs incurred that were not previously approved by the Commission?

A. No.

Q. Please summarize the Indiana Supreme Court's recent decision on retroactive ratemaking.

A. In a recent case, the Indiana Supreme Court issued an opinion addressing Duke's coal ash cost recovery.[65] In its 2019 rate case, Duke requested cost recovery for $212 million for coal ash closure, remediation, and financing costs that it had incurred during the 2010-2018 period and expected to incur during 2019 and 2020. The Court held that the Commission's order that granted Duke permission to recover past costs violated the statutory prohibition against retroactive ratemaking. The Court's order pertains only to coal ash costs incurred prior to the Commission's June 2020 order.

Q. Did the Indiana Supreme Court interpret the Federal Mandates Statute?

A. While the Court did not interpret the Federal Mandates Statute in the case, it did suggest that the Federal Mandate Statute's use of future tense also likely implied that it barred retroactive ratemaking:

> For instance, had Duke properly sought recourse under Indiana's federal mandate statute, I.C. ch. 8-1-8.4, the result may have been different, at least for the costs Duke incurred to comply with the EPA's 2015 rulemaking. This statute permits utilities to recover costs incurred due to changes in federal regulations. Although we have not yet interpreted the statute, we note it is framed in the future tense and speaks of "projected" costs for "proposed" projects, see id. §§ 8-1-8.4-6(a), 6(b), 6(b)(1), 7(b)(1), 7(b)(2), which would seem to require commission approval **before** a utility incurs the cost. [emphasis original]

Q. Has Duke incurred costs related to the Coal Ash Compliance Project for which it has not previously received Commission approval?

[65] *Indiana Office of Utility Consumer Counselor v. Duke Energy Indiana, LLC, et al.*, 183 N.E.3d 266 (2022).

A. Yes. Duke has been incurring costs related to the Coal Ash Compliance Project since 2019 for which it has not previously received Commission approval.[66]

Q. What do you recommend?

A. I recommend that the Commission deny cost recovery for any costs incurred prior to the Commission's final order in this proceeding to avoid contravening statutory requirements and the Indiana Supreme Court's interpretation of retroactive ratemaking.

VII. CONCLUSION

Q. What are your recommendations?

A. I recommend that the Commission:

- Reject cost recovery through the FMCA for Coal Ash Compliance Project costs that are either not required by a federal mandate or not compliant with all provisions of the relevant federal mandate.
- Reject cost recovery on Coal Ash Compliance Project costs associated with coal ash closure plans that have not been approved by IDEM, as they are not yet ripe for consideration at this time.
- Reject Duke's request to earn a return on Coal Ash Compliance Project costs.
- Disallow cost recovery on any Coal Ash Compliance Project costs that are incurred prior to the Commission's order in this case pursuant to the statutory prohibition on retroactive ratemaking.

[66] Duke Response to CAC Data Request 1.05(h)(i) and (ii) and 1.06(a)(i) (included in Attachment BI-1).

- Reject the use of demand allocators and direct Duke to allocate any Coal Ash Compliance Project costs approved in this proceeding using energy allocators.
- Allocate some of the financial burden of the Coal Ash Compliance Project to Duke's shareholders.
- Amortize Coal Ash Compliance Project costs approved in this proceeding through 2035 instead of through 2038 to align with the time period Duke plans to operate coal-fired generation.
- Deny Duke's request for cost recovery of USWAG membership dues.

Q. Does this conclude your testimony?

A. Yes, at this time. I may need to supplement my testimony in the future given certain issues with discovery.

VERIFICATION

I, Ben Inskeep, affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information and belief.

Ben Inskeep

October 13, 2022

ATTACHMENT BI-1

Citizens Action Coalition of Indiana, Inc.
IURC Cause No. 45749
Data Request Set No. 1
Received: September 7, 2022

CAC 1.05

Request:

Refer to Petitioner's Exhibit 2.

a. Refer to p. 3, line 20, through p. 4, line 2. Please provide a copy of each closure plan that Duke Energy Indiana has submitted to IDEM and each IDEM approval letter received by Duke Energy Indiana associated with its CCR units to the extent such a plan or approval has not already been provided in this proceeding.
b. Refer to Tables 1 and 2. For the CCR units that Duke Energy Indiana identified as "Close in Place," has Duke Energy Indiana estimated the cost of alternatively selecting "Close by Removal"? If so, please provide the cost estimates for selecting "Close by Removal."
c. Refer to p. 9, lines 7-9. Please provide a copy of the June 3, 2021 HEC Petition Seeking Judicial Review.
d. Refer to p. 9, lines 10-13 and the January 11, 2022 EPA Letter cited therein. Does Duke Energy Indiana have any other units storing coal ash, such as impoundments or landfills, beyond Gallagher Station North Ash Pond and Primary Pond Ash Fill, where groundwater is in contact with CCR materials but that Duke Energy Indiana and/or IDEM determined were exempt from Closure by Removal or Closure in Place requirements under the CCR Rule? Please explain.
e. Refer to p. 9, lines 17-21. Are Duke Energy Indiana, its parent company, and/or any of its affiliates members of USWAG? If so, is Duke Energy Indiana recovering any costs related to being a member of Utility Solid Waste Activities Group ("USWAG"), or related to the USWAG Petition cited therein, through customer rates? Please explain.
f. Refer to p. 10, lines 13-14. Please confirm or deny with detailed explanation that Duke Energy Indiana is proposing in this proceeding to recover costs associated with the North Ash Pond and Primary Pond Ash Fill at the Gallagher site despite neither having filed its revised closure plans with IDEM, nor receiving IDEM approval for the revised plan. If confirmed, please explain how the prudence of such a revised plan and the reasonableness of the associated costs can be evaluated in this proceeding.
g. Refer to p. 12, lines 11-13. Why did IDEM only grant Duke Energy Indiana "partial" approval for Ash Pond B and North Ash Pond? What, if any, changes did Duke Energy Indiana make to its closure plans in response to not receiving full IDEM approval? Please explain.
h. Refer to p. 15, line 1, through p. 16, line 7, which includes descriptions of closure costs that have already been incurred by Duke Energy Indiana.
    i. Did Duke Energy Indiana previously receive approval from the Commission to incur any of the closure costs described? Please explain.

ii. How much in closure costs have been incurred for these items to date? Please provide a detailed breakdown of closure costs that have been incurred to date and closure costs that will be incurred in the future.

i. Refer to p. 16, line 5. Will the cover system be compliant with all federal CCR rules in addition to being IDEM-approved? Please explain.

j. Refer to p. 16, line 18, identifying coal-ash related obligations under Indiana's Solid Waste Regulations. Does Duke Energy Indiana believe costs related to these obligations are "federally mandated" notwithstanding its citation to state regulations? Please explain and identify any federal statutes or regulations that Duke Energy Indiana is relying on to determine that these costs are "federally mandated."

k. Refer to p. 17, line 21, through p. 18, line 7.
   i. Is Duke Energy Indiana proposing to excavate all coal ash at the Edwardsport site for consolidation into one pile? Please explain.
   ii. Where will the consolidated pile be located?
   iii. Would the new consolidated pile of coal ash be subject to regulation under the federal CCR Rule? Please explain.
   iv. Is Duke Energy Indiana proposing to install a liner underneath the consolidated coal ash pile at the site? If so, would such a liner system meet the standards required for liner systems that are applicable for new CCR landfills under the federal CCR Rule? Please explain.
   v. Do any federal regulations or laws require Duke Energy Indiana to excavate and consolidate coal ash at this site, as proposed by Duke Energy Indiana? Please explain and identify any such federal regulations or laws.

l. Refer to p. 21, line 4 and line 9. What are "unescalated" costs? Please explain.

m. Refer to p. 23, lines 8-9. Aren't Duke Energy Indiana's costs related to environmental compliance planning and evaluation already the type of costs that are included in its base rates? Please explain.

Objection:

Duke Energy Indiana objects to subpart a of this request as overly broad and unduly burdensome and to the extent it seeks information regarding basins and ash management areas not included in this proceeding, Duke Energy Indiana also objects as not reasonably calculated to lead to admissible evidence in this proceeding. Duke Energy Indiana objects to subpart c of this request on the grounds that it seeks information that is publicly available. Duke Energy Indiana objects to subparts d, e and m as not reasonably calculated to lead to admissible evidence in this proceeding. Duke Energy Indiana objects to subpart f of this request as argumentative and assuming facts not in evidence, namely that the Gallagher North Ash Pond and Primary Ash Fill Area are included in this proceeding.

Response:

Subject to and without waiving or limiting its objections, Duke Energy Indiana responds as follows:

a. Please refer to Petitioner's Public Attachments 2-B, 2-D, 2-E, 2-G, 2-H (TSH). These are the respective IDEM approval letters for all basins and ash management areas included in this proceeding. These letters reference all related documents via virtual file cabinet hyperlinks, including the original submitted closure plans and subsequent revisions. For Edwardsport, refer to Petitioner's Public Attachment 2-J (TSH).

b. Duke Energy Indiana used ATC Group Services to perform an option analysis for each site. These reports outlined options considered, factors included in the analysis including the estimated cost, as well as a score for each. Please also see Duke Energy Indiana's response to OUCC 1.3. Edwardsport's options analysis report did not contain a Closure by Removal option.

c. See objection. In the spirit of cooperation, please see Attachment CAC 1.5-A. The exhibits to the Petition are publicly available at mycase.IN.gov.

d. See objection.

e. See objection. Answering further, Mr. Hill's testimony specifically states that Duke Energy Indiana is a member of USWAG.

f. Deny. Duke Energy Indiana has not proposed to recover costs associated with the Gallagher North Ash Pond or Primary Pond Ash Fill.

g. For Ash Pond B, IDEM granted partial approval based on the additional requirements outlined in the approval letter. These also state the changes Duke Energy Indiana is required to make to the plan.

   For the North Ash Pond, approval was conditional based on the plan not addressing the closure of Pet Coke Pile Area or the Wabash Valley Resources gray water (process water) pond contained within the former limits of the decommissioned North Ash Pond. These will be addressed at a later date.

h. (i) Duke Energy Indiana first sought recovery of these expenses in Cause No. 45253, but the Commission removed future expenses from the rate case – leading to Cause No. 45253 S1 and this proceeding. Duke Energy Indiana began engineering, planning, and select field activities for these basins / ash management areas, to ensure that regulatory deadlines could be met while leveraging the cost savings associated with bundling multiple work scopes and leveraging on-site contractors to avoid mobilization and other costs.
   (ii) See Confidential Workpaper 15-TSH, tabs "GIB-AAGBNAP", "GIB-AAGNSB", and "GIB-AAGBSAFA-1"

i. Yes, Duke Energy Indiana expects that the final cover system complies with current state and federal regulations.

j. Yes. Please refer to Petitioner's Exhibit 1, page 11, lines 3-5.

k. (i) No. Some CCR material will remain that is underneath infrastructure that supports the IGCC plant. Reference Petitioner's Attachment 2-J (TSH) page 133.
(ii) South of the switchyard and immediately north of the IGCC plant's final settling pond. Reference Petitioner's Attachment 2-J (TSH) page 133.
(iii) No. The ash management areas at Edwardsport are not subject to the requirements of the CCR Rule.
(iv) The submitted closure plan does not include a liner underneath the consolidated pile.
(v) See direct testimony of witness Schwartz, Petitioner's Exhibit 1, page 11, lines 3 - 17.

l. "Unescalated" costs is a reference to estimates in today's dollars – not escalated for inflation.

m. To the extent there are future environmental rules or regulations, the Company is seeking approval to defer planning costs specific to those rules or regulations while project(s) are being developed before such project(s) are presented to the Commission for recovery. These planning costs are separate and distinct from general environmental planning costs that are in the Company's base rates.

Witness: Tim Hill (parts a,b,f,h) / Owen Schwartz (parts d,e,g,i-k) / Brian Davey (e,l,m)

Citizens Action Coalition of Indiana, Inc.
IURC Cause No. 45749
Data Request Set No. 1
Received: September 7, 2022

CAC 1.06

Request:

Refer to Petitioner's Exhibit 3.

a. Refer to p. 5, line 18, through p. 6, line 5.
   i. Please identify the "closure projects incurred" to date that are part of the Coal Ash Compliance Project. Which costs have already been incurred, and for what components of the Coal Ash Compliance Project?
   ii. Please identify the closure projects "to be incurred" in the future that are part of the Coal Ash Compliance Project. Which costs have not already been incurred, and for what components of the Coal Ash Compliance Project?
   iii. What are "non-basin closure costs" (p. 6, line 4)? Please explain.
b. Refer to p. 6, lines 8-10.
   i. Are all of the Coal Ash Compliance Project costs required by EPA's CCR Rule or Resource Conservation and Recovery Act ("RCRA")? Please explain.
   ii. Are there any elements of the Coal Ash Compliance Project for the purpose of complying with a state law or regulation that are not also an express requirement of a federal law or regulation?
   iii. If there are any costs associated with the Coal Ash Compliance Project that are not explicitly required by the EPA's CCR Rule or RCRA, but are required under IDEM's solid waste management rules, please explain and identify those costs.
   iv. Is it Duke Energy Indiana's position that compliance with a state regulation constitutes a "federally mandated requirement" if the federal law or regulations merely "authorize[s]" the state regulations as opposed to requiring them? Please explain.
c. Refer to p. 7, lines 11-13.
   i. Please identify Duke Energy's most recently approved weighted average cost of capital ("WACC") and the proceeding in which it was approved by the Commission.
   ii. Does Duke Energy Indiana make adjustments to its WACC approved in its base rate case in any proceedings outside of its base rate cases? Please explain.
   iii. When does Duke Energy Indiana anticipate filing its next base rate case?
   iv. Is Duke Energy Indiana required to file its next base rate case by a date certain? If so, please identify that date.
d. Refer to p. 8, line 22, through p. 10, line 12.
   i. Please identify the projected total dollar amount of the financing costs for the Coal Ash Compliance Project through 2030.
   ii. Please identify the projected annual revenue requirement associated with financing costs for each year of the Coal Ash Project through 2030.

e. Refer to p. 11, line 20, through p. 12, line 2. Please also refer to Duke Energy Indiana's most recent Integrated Resource Plan ("IRP").
    i. Confirm or deny with complete explanation that Duke Energy Indiana is committed to retiring all of its Indiana coal generation by 2035, as reflected in its IRP.
    ii. Confirm or deny with complete explanation that Duke Energy Indiana's most recent IRP shows all of its coal units retiring by 2035 but that Duke Energy Indiana's depreciation study from its most recent rate case uses a 2038 retirement date for Gibson.
    iii. Does Duke Energy Indiana intend on updating its depreciation study for its next rate case to reflect a 2035 retirement date for Gibson? If so, would Duke Energy Indiana also change the Coal Ash Compliance Project amortization period from 2038, as proposed in this case, to 2035? Please explain how the 2038 / 2035 difference will be reconciled and what impact, if any, it would have on the timing of recovery of Coal Ash Compliance Project costs.
f. Please refer to p. 12, lines 5-10.
    i. Please provide an executable file (e.g., Excel file) that identifies the demand allocator for each customer class that will be used to allocate Coal Ash Compliance Project costs.
    ii. Please provide an executable file (e.g., Excel file) that identifies Duke Energy Indiana's current energy allocator for each customer class that is used to allocate energy-related costs.
    iii. Confirm or deny with complete explanation that coal ash that is part of the Coal Ash Compliance Project was only generated to meet peak demand during summer months.
    iv. Confirm or deny with complete explanation that coal ash that is being addressed through the Coal Ash Compliance Project is and was created as a function of the amount of coal that is burned in Duke Energy Indiana's coal plants.
    v. Confirm or deny with complete explanation that Coal Ash Compliance Project costs would be more appropriately allocated based on energy allocators than demand allocators.
    vi. Does Duke Energy Indiana allocate fuel costs using demand allocators or energy allocators? Please explain why such allocation method is appropriate.
g. Refer to p. 17, line 19, through p. 18, line 6.
    i. Please provide Duke Energy Indiana's estimate for the total costs associated with each of the following:
        1. Plan development
        2. Engineering
        3. Financing
        4. Other expected future environmental compliance and retirement-related obligations
    ii. Are these costs part of the $150 million identified on p. 16, line 15? Please explain.
h. Refer to Attachment 3-A (BPD).
    i. Please provide the same information out through 2038 (the amortization period identified by Duke Energy Indiana as applying to Coal Ash Compliance Project costs).
    ii. What is the estimated total revenue requirement associated with the Coal Ash Compliance Project for the 2031-2038 period?

i. Refer to Duke Energy Indiana's workpaper "45749_DEI_Workpaper 1-BPD_071922.xlsx".
   i. Please provide this same workpaper, but with all underlying formulas intact.
   ii. Refer to tab "ROR." Please explain the difference between the "Financial Concept" (Column label (B)) with "Regulatory Concept" (Column label (C)).
   iii. Please explain what the purpose of the "Revenue Requirement Conversion Factor" is and why Duke Energy Indiana is applying it in this case.

Objection:

Duke Energy Indiana objects to subparts c.iii, c.iv, e and f.vi, of this request as not reasonably calculated to lead to admissible evidence in this proceeding. Duke Energy Indiana also objects to subpart e of this request as calling for speculation. Duke Energy Indiana further objects to subpart h as seeking a study or compilation the Company has not performed and to which it objects performing.

Response:

Subject to and without waiving or limiting its objections, Duke Energy Indiana responds as follows:

a.

i. Please see Petitioner's Confidential Workpaper 15-TSH, tab "2-K (TSH)," which lists the specific basin and ash management projects in this proceeding. Costs incurred are 2019-2021, and components can be seen on the basin specific tab which can be traced using the Excel formula in that cell. Use the upper section of this tab "Closure Costs."

ii. Please see Petitioner's Confidential Workpaper 15-TSH, tab "2-K (TSH)," which lists the specific basin and ash management projects in this proceeding. Costs to be incurred are 2022-2028, and components can be seen on the basin specific tab which can be traced using the Excel formula in that cell. Use the upper section of this tab "Closure Costs."

iii. "Non-basin closure costs" refer to costs that cover activities such as groundwater sampling and reporting, monitoring well installations, vegetation management and minor maintenance on the area or basin.

b.

i. As stated in the prefiled testimony in this proceeding, the Coal Ash Compliance Project is proposed in order to ensure direct or indirect compliance with federally mandated requirements.
ii. No.
iii. N/A.
iv. Please see the direct testimony of Mr. Schwartz, as filed in this proceeding.

c.

i. The most recently approved weighted average cost of capital (WACC) of 5.79%, which reflects the WACC as of September 30, 2021, was approved by the Commission in Cause No. 44932 REP 4 on May 25, 2022.
ii. In rider filings, Duke Energy Indiana's WACC is updated to reflect current balances of equity, long-term debt, accumulated deferred income taxes, unamortized investment tax credits, and customer deposits. The WACC is also updated to reflect the current cost rate for long-term debt. The equity cost rate remains the 9.70% approved in Cause No. 45253.
iii. See objection.
iv. See objection.

d.

i. Please see Petitioner's Workpaper 1–BPD, the tab titled "Carrying Cost-Close" and the tab titled "Carrying Cost-Mgt."
ii. Please see Petitioner's Attachment 3-A (BPD), lines 4 and 5 for the annual Revenue Requirement for carrying costs.

e.

i. See objection.
ii. See objection.
iii. See objection.

f.

i. Please see Attachment CAC 1.6-A.
ii. Please see Attachment CAC 1.6-A.
iii. Deny. Coal ash is created from all generation, not just generation to meet peak demand.
iv. Confirm. Coal ash created is a function of the amount of coal burned and is a function of the percent of ash in the coal.
v. – Deny. The Coal Ash Compliance Project costs are associated with the compliance of federal environmental requirements related to the closure of coal ash ponds. Residual end of life costs typically and logically follow the cost of the plant, which is allocated based on demand. This is supported by the fact that end of life costs (removal costs) and salvage values are factored into depreciation rates, and depreciation expenses are also allocated based on demand. Further, if not for ARO accounting requirements, these costs would be included in FERC account 108, which is allocated based on demand.
vi. See objection.

g.

i. These costs are not part of the $150 million identified on p. 16 line 15. Those costs are associated with the ash closure projects listed in Petitioner's Exhibit 2 page 22.

The costs referred to here are discussed in more detail, including the basis for the request, in Petitioner's Exhibit 2, page 23 lines 1 - 20. Since these costs relate to future projects associated with closure of generating stations and environmental requirements, Duke

Energy Indiana cannot provide a detailed estimate, but will do so as they are presented to the Commission in a future proceeding.

ii. Please see the Company's response to subpart g.i above.

h. See objection.

i.

i. Please see Attachment CAC 1.6-B.
ii. The financial concept is the view for financing purposes and includes long-term debt and equity. The regulatory concept includes long-term debt and equity in addition to traditional Indiana regulatory components for accumulated deferred income taxes, unamortized investment tax credits, and customer deposits.
iii. The revenue conversion factor is used to gross up the amount requested for recovery to include the related costs for uncollectible accounts, public utility fee, and state and federal income taxes that the Company will incur.

Witness: Tim Hill / Brian Davey

Citizens Action Coalition of Indiana, Inc.
IURC Cause No. 45749
Data Request Set No. 1
Received: September 7, 2022

SUPPLEMENTAL RESPONSE 10-3-22
SUPPLEMENTAL INFORMATION IS IN BOLD
CAC 1.06

Request:

Refer to Petitioner's Exhibit 3.

a. Refer to p. 5, line 18, through p. 6, line 5.
    i. Please identify the "closure projects incurred" to date that are part of the Coal Ash Compliance Project. Which costs have already been incurred, and for what components of the Coal Ash Compliance Project?
    ii. Please identify the closure projects "to be incurred" in the future that are part of the Coal Ash Compliance Project. Which costs have not already been incurred, and for what components of the Coal Ash Compliance Project?
    iii. What are "non-basin closure costs" (p. 6, line 4)? Please explain.
b. Refer to p. 6, lines 8-10.
    i. Are all of the Coal Ash Compliance Project costs required by EPA's CCR Rule or Resource Conservation and Recovery Act ("RCRA")? Please explain.
    ii. Are there any elements of the Coal Ash Compliance Project for the purpose of complying with a state law or regulation that are not also an express requirement of a federal law or regulation?
    iii. If there are any costs associated with the Coal Ash Compliance Project that are not explicitly required by the EPA's CCR Rule or RCRA, but are required under IDEM's solid waste management rules, please explain and identify those costs.
    iv. Is it Duke Energy Indiana's position that compliance with a state regulation constitutes a "federally mandated requirement" if the federal law or regulations merely "authorize[s]" the state regulations as opposed to requiring them? Please explain.
c. Refer to p. 7, lines 11-13.
    i. Please identify Duke Energy's most recently approved weighted average cost of capital ("WACC") and the proceeding in which it was approved by the Commission.
    ii. Does Duke Energy Indiana make adjustments to its WACC approved in its base rate case in any proceedings outside of its base rate cases? Please explain.
    iii. When does Duke Energy Indiana anticipate filing its next base rate case?
    iv. Is Duke Energy Indiana required to file its next base rate case by a date certain? If so, please identify that date.
d. Refer to p. 8, line 22, through p. 10, line 12.
    i. Please identify the projected total dollar amount of the financing costs for the Coal Ash Compliance Project through 2030.
    ii. Please identify the projected annual revenue requirement associated with financing costs for each year of the Coal Ash Project through 2030.

e. Refer to p. 11, line 20, through p. 12, line 2. Please also refer to Duke Energy Indiana's most recent Integrated Resource Plan ("IRP").
    i. Confirm or deny with complete explanation that Duke Energy Indiana is committed to retiring all of its Indiana coal generation by 2035, as reflected in its IRP.
    ii. Confirm or deny with complete explanation that Duke Energy Indiana's most recent IRP shows all of its coal units retiring by 2035 but that Duke Energy Indiana's depreciation study from its most recent rate case uses a 2038 retirement date for Gibson.
    iii. Does Duke Energy Indiana intend on updating its depreciation study for its next rate case to reflect a 2035 retirement date for Gibson? If so, would Duke Energy Indiana also change the Coal Ash Compliance Project amortization period from 2038, as proposed in this case, to 2035? Please explain how the 2038 / 2035 difference will be reconciled and what impact, if any, it would have on the timing of recovery of Coal Ash Compliance Project costs.
f. Please refer to p. 12, lines 5-10.
    i. Please provide an executable file (e.g., Excel file) that identifies the demand allocator for each customer class that will be used to allocate Coal Ash Compliance Project costs.
    ii. Please provide an executable file (e.g., Excel file) that identifies Duke Energy Indiana's current energy allocator for each customer class that is used to allocate energy-related costs.
    iii. Confirm or deny with complete explanation that coal ash that is part of the Coal Ash Compliance Project was only generated to meet peak demand during summer months.
    iv. Confirm or deny with complete explanation that coal ash that is being addressed through the Coal Ash Compliance Project is and was created as a function of the amount of coal that is burned in Duke Energy Indiana's coal plants.
    v. Confirm or deny with complete explanation that Coal Ash Compliance Project costs would be more appropriately allocated based on energy allocators than demand allocators.
    vi. Does Duke Energy Indiana allocate fuel costs using demand allocators or energy allocators? Please explain why such allocation method is appropriate.
g. Refer to p. 17, line 19, through p. 18, line 6.
    i. Please provide Duke Energy Indiana's estimate for the total costs associated with each of the following:
        1. Plan development
        2. Engineering
        3. Financing
        4. Other expected future environmental compliance and retirement-related obligations
    ii. Are these costs part of the $150 million identified on p. 16, line 15? Please explain.
h. Refer to Attachment 3-A (BPD).
    i. Please provide the same information out through 2038 (the amortization period identified by Duke Energy Indiana as applying to Coal Ash Compliance Project costs).
    ii. What is the estimated total revenue requirement associated with the Coal Ash Compliance Project for the 2031-2038 period?

i. Refer to Duke Energy Indiana's workpaper "45749_DEI_Workpaper 1-BPD_071922.xlsx".
   i. Please provide this same workpaper, but with all underlying formulas intact.
   ii. Refer to tab "ROR." Please explain the difference between the "Financial Concept" (Column label (B)) with "Regulatory Concept" (Column label (C)).
   iii. Please explain what the purpose of the "Revenue Requirement Conversion Factor" is and why Duke Energy Indiana is applying it in this case.

Objection:

Duke Energy Indiana objects to subparts c.iii, c.iv, e and f.vi, of this request as not reasonably calculated to lead to admissible evidence in this proceeding. Duke Energy Indiana also objects to subpart e of this request as calling for speculation. Duke Energy Indiana further objects to subpart h as seeking a study or compilation the Company has not performed and to which it objects performing.

Response:

Subject to and without waiving or limiting its objections, Duke Energy Indiana responds as follows:

a.

i. Please see Petitioner's Confidential Workpaper 15-TSH, tab "2-K (TSH)," which lists the specific basin and ash management projects in this proceeding. Costs incurred are 2019-2021, and components can be seen on the basin specific tab which can be traced using the Excel formula in that cell. Use the upper section of this tab "Closure Costs."

ii. Please see Petitioner's Confidential Workpaper 15-TSH, tab "2-K (TSH)," which lists the specific basin and ash management projects in this proceeding. Costs to be incurred are 2022-2028, and components can be seen on the basin specific tab which can be traced using the Excel formula in that cell. Use the upper section of this tab "Closure Costs."

iii. "Non-basin closure costs" refer to costs that cover activities such as groundwater sampling and reporting, monitoring well installations, vegetation management and minor maintenance on the area or basin.

b.

i. As stated in the prefiled testimony in this proceeding, the Coal Ash Compliance Project is proposed in order to ensure direct or indirect compliance with federally mandated requirements.
ii. No.
iii. N/A.
iv. Please see the direct testimony of Mr. Schwartz, as filed in this proceeding.

c.

i. The most recently approved weighted average cost of capital (WACC) of 5.79%, which reflects the WACC as of September 30, 2021, was approved by the Commission in Cause No. 44932 REP 4 on May 25, 2022.
ii. In rider filings, Duke Energy Indiana's WACC is updated to reflect current balances of equity, long-term debt, accumulated deferred income taxes, unamortized investment tax credits, and customer deposits. The WACC is also updated to reflect the current cost rate for long-term debt. The equity cost rate remains the 9.70% approved in Cause No. 45253.
iii. See objection.
iv. See objection.

d.

i. Please see Petitioner's Workpaper 1–BPD, the tab titled "Carrying Cost-Close" and the tab titled "Carrying Cost-Mgt."
ii. Please see Petitioner's Attachment 3-A (BPD), lines 4 and 5 for the annual Revenue Requirement for carrying costs.

e.

i. See objection.
ii. See objection.
iii. See objection.

f.

i. Please see Attachment CAC 1.6-A.
ii. Please see Attachment CAC 1.6-A.
iii. Deny. Coal ash is created from all generation, not just generation to meet peak demand.
iv. Confirm. Coal ash created is a function of the amount of coal burned and is a function of the percent of ash in the coal.
v. – Deny. The Coal Ash Compliance Project costs are associated with the compliance of federal environmental requirements related to the closure of coal ash ponds. Residual end of life costs typically and logically follow the cost of the plant, which is allocated based on demand. This is supported by the fact that end of life costs (removal costs) and salvage values are factored into depreciation rates, and depreciation expenses are also allocated based on demand. Further, if not for ARO accounting requirements, these costs would be included in FERC account 108, which is allocated based on demand.
vi. See objection.

g.

i. These costs are not part of the $150 million identified on p. 16 line 15. Those costs are associated with the ash closure projects listed in Petitioner's Exhibit 2 page 22.

The costs referred to here are discussed in more detail, including the basis for the request, in Petitioner's Exhibit 2, page 23 lines 1 - 20. Since these costs relate to future projects associated with closure of generating stations and environmental requirements, Duke

Energy Indiana cannot provide a detailed estimate, but will do so as they are presented to the Commission in a future proceeding.

ii. Please see the Company's response to subpart g.i above.

h. See objection.

i.

i. Please see Attachment CAC 1.6-B.
ii. The financial concept is the view for financing purposes and includes long-term debt and equity. The regulatory concept includes long-term debt and equity in addition to traditional Indiana regulatory components for accumulated deferred income taxes, unamortized investment tax credits, and customer deposits.
iii. The revenue conversion factor is used to gross up the amount requested for recovery to include the related costs for uncollectible accounts, public utility fee, and state and federal income taxes that the Company will incur.

SUPPLEMENTAL RESPONSE 10-3-22:

After communication with counsel for CAC, the Company is providing the following supplemental information:

c.iii. Pursuant to Indiana Code 8-1-39-9(e), Duke Energy Indiana must "petition the commission for review and approval of the public utility's basic rates and charges" "before the expiration of the public utility's approved TDSIC plan." Therefore, Duke Energy Indiana must file a petition for a base rate case no later than 2028, the last year of its TDSIC 2.0 plan.

c.iv. See the Company's supplemental response to c.iii. above.

e.i. As described in the Commission's IRP rules, the Company's 2021 Integrated Resource Plan includes the then-expected retirements on its system. Duke Energy Indiana will be performing another Integrated Resource Plan in 2024 and the retirements expected in 2021 will be re-evaluated at that time.

e.ii. The depreciation study from Cause No. 45253 included estimated retirement dates for the Gibson Station units of between 2026-2038. The Company's 2021 Integrated Resource Plan included estimated retirement dates for the Gibson Station units of between 2025-2035.

e.iii. See objection. Duke Energy Indiana cannot at this time speculate on what changes, if any, it may make to its most recent depreciation study, as approved in Cause No. 45253.

Witness: Tim Hill / Brian Davey

ALLOCATED SHARE OF SYSTEM PEAK DEMAND FOR RETAIL CUSTOMERS BY RATE GROUP EXPRESSED AS A PERCENTAGE OF THE COMPANY'S TOTAL RETAIL SYSTEM PEAK DEMAND AS DEVELOPED FOR COST OF SERVICE PURPOSES IN CAUSE NO. 45253

Line No.	Rate Groups	KW Share of System Peak (4CP) Per Cause No. 45253 (A)	Percent Share Of System Peak (B)	Line No.
1	Rate RS	2,102,591	42.114%	1
2	Rates CS and FOC	258,053	5.169%	2
3	Rate LLF	1,034,546	20.722%	3
4	Rate HLF	1,536,449	30.774%	4
5	Customer L	14,800	0.296%	5
6	Customer O	18,584	0.372%	6
7	Rate WP	20,717	0.415%	7
8	Rate SL	79	0.002%	8
9	Rate MHLS	15	0.000%	9
10	Rates MOLS and UOLS	5,633	0.113%	10
11	Rates TS, FS and MS	1,141	0.023%	11
12	TOTAL RETAIL	4,992,608	100.000%	12

ALLOCATED SHARE OF MWH PLANT OUTPUT FOR RETAIL CUSTOMERS BY RATE GROUP EXPRESSED AS A PERCENTAGE OF THE COMPANY'S TOTAL RETAIL AS DEVELOPED FOR COST OF SERVICE PURPOSES IN CAUSE NO. 45253

Line No.	Rate Groups	MWH Plant Output Cause No. 45253 (A)	Percent Share Of System Peak (B)	Line No.
1	Rate RS	10,075,608	33.840%	1
2	Rates CS and FOC	1,163,496	3.908%	2
3	Rate LLF	5,429,725	18.237%	3
4	Rate HLF	11,448,504	38.452%	4
5	Customer L	119,082	0.400%	5
6	Customer O	1,197,276	4.021%	6
7	Rate WP	162,351	0.545%	7
8	Rate SL	42,814	0.144%	8
9	Rate MHLS	6,095	0.020%	9
10	Rates MOLS and UOLS	118,444	0.398%	10
11	Rates TS, FS and MS	10,457	0.035%	11
12	TOTAL RETAIL	29,773,852	100.000%	12

Citizens Action Coalition of Indiana, Inc.
IURC Cause No. 45749
Data Request Set No. 2
Received: September 30, 2022

CAC 2.06

Request:

Refer to Petitioner's Exhibit No. 2, p. 9. Do Duke Energy Indiana's ratepayers pay for the cost of Duke Energy Indiana's membership in the Utilities Solid Waste Activities Group? If yes, please identify the annual revenue requirement associated with this membership.

Response:

Yes, membership fees are allocated across all Duke Energy Indiana closure projects. USWAG represents over 130 utilities, supporting industry efforts to comply with federal environmental regulations related to waste, byproduct and chemical management and transportation issues on behalf of the utility industry; protect the environment; and serve their customers. As part of that effort, USWAG engages in regulatory advocacy, regulatory analysis, compliance assistance, and information exchange pertaining to CERCLA, RCRA, TSCA, and HMTA. For the CCR units in this proceeding, the membership fee for 2022 is $16,651.31.

Witness: Timothy S. Hill / Owen Schwartz

Citizens Action Coalition of Indiana, Inc.
IURC Cause No. 45749
Data Request Set No. 2
Received: September 30, 2022

CAC 2.16

Request:

Please identify the forecasted monthly bill impact ($/month) to the average residential customer for each year 2024-2030 if the Coal Ash Compliance Project is approved by the Commission as filed.

Response:

Adjustment Factor on the bill of a typical residential Customer using 1,000 KWHs:

Year	Increase
2024	$1.64
2025	$1.14
2026	$1.25
2027	$1.13
2028	$1.13
2029	$1.09
2030	$1.03

Per Attachment 3-A (BPD), page 2, line 2 – the annual revenue requirement for residential divided by 12 months ended December 2021 KWH (per ECR 37) of 9,266,038,436 *1000.

Witness: Brian P. Davey

Office of Utility Consumer Counselor
IURC Cause No. 45749
Data Request Set No. 2
Received: September 6, 2022

OUCC 2.10

Request:

Please identify each project contained in the Coal Ash Compliance Plan DEI seeks approval for in this Cause that result from or is associated with corrective action required under the Resource Conservation and Recovery Act (RCRA).

Objection:

Duke Energy Indiana objects to this request as vague and ambiguous, particularly the reference to projects "associated with corrective action required under" RCRA without additional explanation or definition.

Response:

Subject to and without waiving or limiting its objections, Duke Energy Indiana responds as follows: The Coal Ash Compliance Projects are closure related. The purpose of closure is to minimize future issues from the waste, including releases of the waste itself and impact to groundwater from the waste. Whether through excavation or consolidation and capping with a final cover system, the Coal Ash Compliance Projects accomplish this objective. Corrective action is often associated with groundwater impacts and the closure projects will reduce the release of constituents to groundwater. The federal CCR rule has groundwater corrective measure requirements that are separate from closure requirements. The method of groundwater corrective measures continue to be evaluated.

Witness: Owen Schwartz

OUCC
IURC Cause No. 45749
Data Request Set No. 3
Received: September 16, 2022

OUCC 3.4

Request:

Please refer to the Gallagher Primary Pond Closure Plan.

a. DEI's current closure plan for the Primary Pond includes a slurry wall that will also encircle the North Ash Pond and Primary Pond Ash Fill Area. Since DEI is only seeking recovery of costs for the Primary Pond, has DEI apportioned the costs for the slurry wall among the three ponds in any way? If so, please explain DEI's methodology for allocating these costs.
b. How will DEI's plans for the slurry wall be affected if DEI's draft closure plans for the North Pond or Primary Pond Ash Fill Area are not approved or are successfully appealed?

Objection:

Duke Energy Indiana objects to subpart b of this request as calling for speculation.

Response:

Subject to and without waiving or limiting its objections, Duke Energy Indiana responds as follows:

a) Upon approval of the closure plans by IDEM, costs will be apportioned to these basins based on the perimeter coverage of the slurry wall. Duke Energy Indiana plans to update the Commission in a future proceeding with additional detail.
b) See objection.

Witness: Tim Hill

ATTACHMENT BI-2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
L-17J

Mr. Owen R. Schwartz
Duke Energy
1000 East Main Street
Plainfield, Indiana 46168

Dear Mr. Schwartz,

This letter provides written confirmation of the discussion between the Environmental Protection Agency (EPA) and Duke Energy Gallagher staff during our conference calls on August 27 and September 17, 2021 regarding the history of the site and the closure of Coal Combustion Residuals (CCR) surface impoundments at Duke Energy's Gallagher Generating Station in New Albany, Indiana. This letter also serves to notify you that, based on the information provided in those telephone conversations, EPA has concluded that the North Ash Pond and the Primary Pond Ash Fill Area are subject to the requirements of 40 C.F.R. Part 257 Subpart D ("the CCR Regulations").

On the August 27 conference call, Duke Energy stated that two impoundments (i.e., North Ash Pond, Primary Pond Ash Fill Area) were removed from service, drained of ponded surface water, and subsequently covered with soil and grass in 1989. Further, EPA's understanding is that Duke has taken no engineering measures to remove any of the groundwater from either unit and both of these unlined units are sitting in approximately 20 feet of groundwater.

As an initial matter, we disagree with Duke Energy's argument that neither of these units are CCR surface impoundments within the meaning of the CCR Regulations. We understand that you interpret the definition of a CCR surface impoundment to exclude units such as the North Ash Pond, where liquid remains in the unit because the base of the unit intersects with groundwater. You argue that such units do not "hold" liquid because groundwater flows through the unit (instead of staying within the unit). EPA disagrees with your interpretation. The definition of a CCR surface impoundment does not require that the unit prevent groundwater from flowing through the unit, but merely requires that the unit be "designed to hold an accumulation of CCR and liquid." 40 C.F.R. § 257.53. Following your interpretation would lead to the incongruous result that impoundments where contaminants can migrate out in the groundwater would not be regulated by the CCR Regulations, while those that prevent that type of migration would be regulated.

Primary Pond Ash Fill Area

The Primary Pond Ash Fill Area is not an existing CCR surface impoundment because (to EPA's knowledge) it has not received CCR after October 19, 2015. However, because it still contains CCR and liquids, it meets the definition of an inactive CCR surface impoundment. An inactive CCR surface impoundment is one "that no longer receives CCR on or after October 19, 2015 and still contains both CCR and liquids on or after October 19, 2015." EPA interprets the word "contains" to mean "to have or hold (someone or something) within" based on the ordinary meaning of the word. (e.g., Oxford English Dictionary, Merriam-Webster). Accordingly, an impoundment "contains" liquid if there is liquid in the impoundment, even if the impoundment does not prevent the liquid from migrating out of the impoundment. This means that if a CCR surface impoundment contains liquid because its base (or any part of its base) is in contact with groundwater, it would meet the definition of an inactive CCR surface impoundment. Under both the regulatory and dictionary definitions of the term, groundwater (or water) falls within the plain meaning of a "liquid." See 40 C.F.R. 257.53. Therefore, because the Primary Pond Ash Fill Area is sitting in approximately 20 feet of groundwater, it holds or contains liquids and is an inactive surface impoundment.

As an inactive CCR surface impoundment, the Primary Pond Ash Fill Area is regulated pursuant to 40 C.F.R. § 257.50(c), which specifies that "[t]his subpart also applies to inactive CCR surface impoundments at active electric utilities or independent power producers, regardless of the fuel currently used at the facility to produce electricity."

North Ash Pond

On the September call, Duke Energy confirmed that the North Ash Pond has received CCR after the October 19, 2015 effective date of the CCR Rule. Therefore, that pond meets the definition of an existing CCR surface impoundment. An existing CCR surface impoundment is one that "receives CCR both before and after October 19, 2015." 40 C.F.R. § 257.53. Accordingly, the North Ash Pond falls within the ambit of 40 C.F.R. § 257.50(b), which specifies that "[t]his subpart applies to owners and operators of…existing CCR surface impoundments…that dispose or otherwise engage in solid waste management of CCR." Even if the North Ash Pond had not received CCR after October 19, 2015, it would be an inactive CCR surface impoundment for the same reasons that the Primary Pond Ash Fill Area is an inactive CCR surface impoundment and would fall within the ambit of 40 C.F.R. § 257.50(c).

Applicability of the Closure Requirements to these Impoundments

For the reasons set out in the discussion above, the North Ash Pond and Primary Pond Ash Fill Area are regulated under 40 C.F.R. Part 257 Subpart D and Duke Energy will need to take action to bring these ponds into compliance by meeting all the requirements of the regulations. Significant among these is the requirement to close, because the North Ash Pond and the Primary Pond Ash Fill Area are unlined CCR surface impoundments. See, 40 C.F.R. § 257.101(a).

The applicable closure regulations are those that address closing with waste in place (assuming EPA's understanding is correct that Duke Energy's plan is to close both impoundments with waste in place). The Part 257 requirements applicable to impoundments closing with waste in place include general performance standards and specific technical standards that set forth individual engineering requirements related to the drainage and stabilization of the waste and to the final cover system. The general performance standards and the technical standards complement each other, and both must be met at every site. The general performance standards

under 40 C.F.R. § 257.102(d)(1) require that the owner or operator of a CCR unit "ensure that, at a minimum, the CCR unit is closed in a manner that will: (i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere; and (ii) Preclude the probability of future impoundment of water, sediment, or slurry." The specific technical standards related to the drainage of the waste in the unit require that "free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues" prior to installing the final cover system. 40 C.F.R. § 257.102(d)(2)(i).

If Duke Energy plans to close with waste in place and the base of the impoundment does, in fact, intersect with groundwater, Duke Energy will need to implement engineering measures to remove groundwater from the unit prior to the start of installing the final cover system, as required by 40 C.F.R. § 257.102(d)(2)(i). This provision applies both to the free-standing liquid in the impoundment and to all separable porewater in the impoundment, whether the porewater was derived from sluiced water or groundwater that intersects the impoundment. The definition of free liquids in 40 C.F.R. § 257.53 encompasses all "liquids that readily separate from the solid portion of a waste under ambient temperature and pressure," regardless of whether the source of the liquids is from sluiced water or groundwater. The regulation does not differentiate between the sources of the liquid in the impoundment (e.g., surface water infiltration, sluice water intentionally added, groundwater intrusion). Furthermore, the performance standard at 40 C.F.R. § 257.102(d)(2)(i) was modeled on the regulations that apply to interim status hazardous waste surface impoundments, which are codified at 40 C.F.R. § 265.228(a)(2)(i). Guidance on these interim status regulations clarifies that these regulations require both the removal of free-standing liquids in the impoundment as well as sediment dewatering. See US EPA publication titled "Closure of Hazardous Waste Surface Impoundments," publication number SW-873, September 1982.

Similarly, Duke Energy will need to ensure that the impoundments are closed in a manner that will "control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere." 40 C.F.R. § 257.102(d)(1). EPA views the word "infiltration" as a general term that refers to any kind of movement of liquids into a CCR unit. That would include, for example, any liquid passing into or through the CCR unit by filtering or permeating from any direction, including the sides and bottom of the unit. This is consistent with the plain meaning of the term. For example, Merriam-Webster defines infiltration to mean "to pass into or through (a substance) by filtering or permeating" or "to cause (something, such as a liquid) to permeate something by penetrating its pores or interstices." Neither definition limits the source or direction by which the infiltration occurs. In situations where the groundwater intersects the CCR unit, water may infiltrate into the unit from the sides and/or bottom of the unit because the base of the unit is below the water table. This contact between the waste and groundwater provides a potential for waste constituents to be dissolved and to migrate out of (or away from) the closed unit that is similar to infiltration from above. In this case, the performance standard requires the facility to take measures, such as engineering controls that will "control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste" as well as "post-closure releases to the groundwater" from the sides and bottom of the unit.

Finally, because the North Ash Pond and the Primary Pond Ash Fill Area must close pursuant to 40 C.F.R. § 257.101(a), any further receipt of CCR into those units is prohibited. EPA also made this clear in the preamble to the March 15, 2018 proposed rule (83 FR 11605) where EPA stated:

> The current CCR rules require that certain units must close for cause, as laid forth in § 257.101(a)–(c). As written, the regulation expressly prohibits ''placing CCR'' in any units required to close for-cause pursuant to § 257.101.…Note that the rule does not distinguish between placement that might be considered beneficial use and placement that might be considered disposal. All further placement of CCR into the unit is prohibited once the provisions of § 257.101 are triggered.

If you have any questions about the information provided in this letter or if you have additional information that you would like EPA to consider, you may contact Angela Mullins at mullins.angela@epa.gov. Alternatively, Duke Energy counsel can contact Laurel Celeste at celeste.laurel@epa.gov in EPA's Office of General Counsel for any questions on the Agency's position set forth in the letter.

Sincerely,

EDWARD NAM

Digitally signed by EDWARD NAM
Date: 2022.01.11 09:58:54 -06'00'

Edward Nam
Director
Land, Chemicals and Redevelopment Division

cc: Peggy Dorsey,
Assistant Commissioner
Office of Land Quality
Indiana Department of Environmental Management

ATTACHMENT BI-3

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

In the Matter of:	)	
STANDARD FOR THE DISPOSAL OF COAL COMBUSTION RESIDUALS IN SURFACE IMPOUNDMENTS: PROPOSED NEW 35 ILL. ADMIN. CODE 845	)	PCB 2020-019 (Rulemaking - Water)

JOINT TESTIMONY OF SCOTT M. PAYNE, PhD, PG and IAN MAGRUDER, M.S.

August 24, 2020

1. Introduction

The Illinois Environmental Protection Agency (IEPA) is proposing comprehensive rules regarding the design, construction, operation, corrective action, closure and post-closure care of surface impoundments containing coal combustion residuals (CCR). In this testimony we present recommended rule language based on our professional experience preparing and reviewing groundwater flow and transport models and our experience reviewing past groundwater modeling practices prepared for IEPA in support of Closure Plans for CCR facilities in Illinois.

Section 2 presents our qualifications. Section 3 provides a problem statement describing deficiencies in past groundwater modeling practices prepared for IEPA in support of Closure Plans for CCR facilities in Illinois. Section 4 provides recommended rule language aimed at ensuring that groundwater models prepared in support of corrective action and closure plans for Illinois CCR facilities are properly developed and documented and to address the deficiencies in the models we have reviewed which were used to support past closure planning. The goal of our recommendations is to ensure that future groundwater modeling follows acceptable practices and will result in models that accurately represent current conditions and are capable of making reliable predictions of the long-term effects of closure and corrective actions.

Scott M. Payne, PhD, PG
Principal Scientist
KirK Engineering & Natural Resources, Inc.

Ian Magruder, M.S.
Senior Hydrogeologist
KirK Engineering & Natural Resources, Inc.

Table of Contents

soil, geology/seismic, and climatic conditions which are relevant to site characterization and modeling. It is our professional experience that state natural resource agencies and geologic surveys and researchers at nearby colleges and universities often have the most accurate and in-depth knowledge of these site-specific conditions. Consultants who work for coal plant owner/operators may be from out-of-state and lack this site-specific knowledge. Public review and comment is needed for IEPA to have all available relevant information to ensure local site-specific knowledge is included in model development, sensitive receptors are identified, and models are thoroughly reviewed. Our review supports the need for a regulatory requirement that model documentation provide a complete description of the model development, parameter arrays, boundary attributes, and quantitative calibration assessment. All of this information should be included in the model report. We also recommend that IPCB require IEPA to develop model review guidance such as Reilly and Harbaugh (2004), or at a minimum, a model review checklist specific to modeling Illinois CCR facilities to ensure that models are appropriately developed and include the required elements in the proposed rule language in section 4.

Comment l. Plans which leave CCR in contact with groundwater are likely to result in long-term exceedance of water quality standards and require perpetual plume monitoring and institutional controls

The closure plans for the Hennepin (CEC 2018), Meredosia (Geotechnology 2016b), and Wood River (AECOM, 2016) all propose to leave CCR in place with cover systems designed to limit the infiltration of precipitation into the CCR impoundment. In each case, CCR in unlined impoundments at the facility is inundated by groundwater during some portion of a typical year (see Comment h for further discussion). In each case, the owner/operator of the facility has prepared a closure plan with supporting models that ignore, and descriptive analysis which seeks to discount, the fact that the CCR is periodically inundated with groundwater. In none of these instances have the owner/operators quantitatively evaluated the contribution to the contaminant plume from reoccurring inundation of the CCR by groundwater, nor have they predicted the effects of this into the future. It is our opinion that periodic inundation of the CCR will rewet the CCR leading to perpetual water quality impacts.

The water quality impacts will likely include long-term exceedance of water quality standards in groundwater. Long-term water quality exceedances will require institutional controls such as regular water quality monitoring, groundwater control zones, or other water use restrictions to avoid human consumption of the impacted water. The potential need for long-term institutional controls is not accounted for in the closure plans because they fail to adequately model and predict the periodic inundation of the CCR by groundwater. It is our opinion that the water quality monitoring and institutional control needs will likely long surpass the 30-year post closure timeframe which is planned for. The safest method available to avoid long-term water quality exceedances, risks to human health, and institutional control requirements for CCR impoundments which are regularly in contact with groundwater is to excavate and remove the CCR to a landfill compliant with current federal regulations (40 CFR Subpart D). Other states such as Montana (Montana DEQ 2019, Montana DEQ 2020) have required owner/operators to remove CCR that is in contact with groundwater where it is causing exceedances of water quality

standards and the owner/operator has not provided an alternative remedy capable of eliminating long-term leaching of the CCR.

In the absence of adequate analysis and modeling demonstrating that inundation of CCR by groundwater will not cause water quality exceedances and that no alternative remedy exists to protect CCR left in place from groundwater contact, we recommend that CCR impoundments which have the potential to be regularly in contact with groundwater be excavated and removed to a federal compliant CCR landfill.

Comment m. The State of Illinois would benefit from a specific guidance document for groundwater flow and contaminant transport model development and review.

Illinois is developing new comprehensive rules for design, construction, operation, corrective action, closure and post-closure care of surface impoundments with CCR which include requirements for groundwater modeling. State and Federal agencies generally provide guidance or policy documentation to support work on complex technical requirements, such as groundwater flow and contaminant transport modeling. Rules alone may be insufficient to clearly define acceptable modeling practices. Currently, multiple states, USGS, U.S. EPA, and professional trade groups provide guidance or policy documentation on some or all aspects of groundwater flow and contaminant transport modeling, depending on their technical needs, regulatory requirements, and data quality objectives. There are also other textbooks and guidance useful to support meeting the requirements of the proposed rules which detail best practices. We found that most states and federal agencies opt for developing specific guidance or policy documentation that focuses on the specific technical needs or regulatory frameworks to which the guidance or policy applies versus requiring the use of textbook guidance that is germane to all modeling. Example modeling and policy guidance includes that offered by Georgia's Environmental Protection Division (GEPD 2016). Example model review guidance includes that offered by USGS (Reilly and Harbaugh 2004).

The State of Illinois would benefit from adopting an official groundwater and transport modeling guidance document under the proposed rule. The goal of the guidance would be to more clearly define best practices as they relate to the proposed rule and clarify the Agency's requirements for modelers attempting to meet requirements set by the Agency. The document should also include the procedures by which the Agency will review models developed under the proposed rule. States typically form a committee or authorize the state environmental regulatory agency to develop modeling guidance. IPCB should include in this rulemaking a requirement that a groundwater flow and transport modeling guidance document and model review document be developed that addresses the specific modeling needs relevant to CCR contaminated sites.

ATTACHMENT BI-4

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NO. 2022-254-E

In the Matter of:	)	
	)	**DIRECT TESTIMONY OF**
Application of Duke Energy Progress, LLC	)	**MARCIA E. WILLIAMS**
for Authority to Adjust and Increase its Electric	)	**FOR DUKE ENERGY**
Rates and Charges	)	**PROGRESS, LLC**

Q. PLEASE STATE YOUR NAME, AFFILIATION, AND BUSINESS ADDRESS.

A. My name is Marcia E. Williams. I am a Principal at Gnarus Advisors LLC, a nationwide consulting firm, where I specialize in environmental, health, and safety matters. My business address is 2029 Century Park East, Suite 400, Los Angeles, California 90067.

Q. ON WHOSE BEHALF ARE YOU SUBMITTING YOUR TESTIMONY?

A. I am submitting this testimony before the South Carolina Public Service Commission ("Commission") on behalf of Duke Energy Progress, LLC (the "Company" or "DEP").

Q. ARE YOU PROVIDING ANY EXHIBITS WITH YOUR TESTIMONY?

A. Yes. I have included Williams Exhibit 1, which summarizes my professional and educational background, including a list of my expert testimony.

Q. WAS WILLIAMS EXHIBIT 1 PREPARED BY YOU OR UNDER YOUR DIRECTION AND SUPERVISION?

A. Yes.

Q. PLEASE SUMMARIZE YOUR EDUCATION QUALIFICATIONS.

A. I graduated from Dickinson College, Carlisle, Pennsylvania with a B.S. in Math and Physics in 1968. I graduated summa cum laude and was a member of Phi Beta Kappa. I subsequently performed graduate work in physics at the University of Maryland.

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE.

A. I have had a 50-year career centered on environmental protection and regulation, spanning government service with the United States Environmental Protection Agency ("EPA," or the "Agency") (over 17 years), a senior management position in the waste management industry (approximately 3 years), and consulting work (over 30 years) in which I have been a consultant to both private industry and government agencies on a wide range of environmental matters, with a particular focus on compliance with the Resource Conservation and Recovery Act ("RCRA"), the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA," commonly known as Superfund), the Clean Water Act, and the Toxic Substances Control Act ("TSCA"), as well as their state equivalents. I have also served on the Board of Directors of a Fortune 500 recycling company.

Q. PLEASE SUMMARIZE RELEVANT ASPECTS OF YOUR EPA EXPERIENCE.

A. My EPA service began from the Agency's inception in 1970 and continued through February 1988. I held numerous positions at EPA and was a charter member of the Senior Executive Service, beginning in 1979. Senior management positions, in reverse chronological order, were Director, Office of Solid Waste ("OSW") with national responsibility for EPA's solid and hazardous waste program; Deputy Assistant Administrator, Office of Pesticides and Toxic Substances ("OPTS"); Acting Director and Deputy Director, Office of Toxic Substances ("OTS"); and Division Director, Office of Special

Pesticide Review, Office of Pesticide Programs ("OPP"). Earlier positions included Chief, Statistical Evaluation Staff; Special Assignment to the Senate Public Works Committee; and various management and technical positions within the Office of Mobile Source Air Pollution Control and the Office of Research and Development. The following paragraphs describe some of my EPA experience that is relevant for this matter in more detail.

In my position as Chief, Statistical Evaluation Staff, Office of Planning and Evaluation, which I held from March 1978 through April 1979, I developed and led a new EPA office responsible for reviewing all major EPA regulations to ensure these regulations were adequately supported with data. My office played a core role in EPA's implementation of Executive Order 12044, *Improving Government Regulations*. The office also provided statistical consulting support to other EPA program offices, including consulting support on developing Clean Water Act water quality criteria, consulting support on the design of PCB enforcement strategies, and participation in the early development of EPA's risk assessment and risk management methodologies.

From May 1979 through September 1985, I held senior management positions in the Office of Pesticides and Toxic Substances. This office evaluated whether the risks associated with the uses of individual pesticides and toxic substances exceeded the benefits of use. Where information was inadequate to make necessary determinations, EPA collected additional data. Where data demonstrated that risks of use exceeded benefits of use, EPA took actions to control the risks. During my tenure in these positions, I participated in the

development of EPA's first groundwater protection strategy. EPA used its full range of available statutory authorities to develop and implement a national groundwater protection strategy.

Starting in September 1985, I served as OSW Director, a position I held until I left the Agency in February 1988. As OSW Director, I led EPA's 250-person, $40 million annual program to implement RCRA and the 1984 amendments to RCRA, also known as the Hazardous and Solid Waste Amendments ("HSWA"). These Amendments fundamentally restructured and strengthened the federal hazardous and solid waste management programs.

During this period, my office developed and issued over 40 proposed and final rules relating to solid and hazardous waste. These regulations included the "land disposal restrictions," a set of new requirements that significantly curtailed the amount and types of untreated hazardous waste which could be disposed of in land-based management units such as landfills, waste piles, and surface impoundments. These regulations also expanded the definition of hazardous waste and addressed waste management requirements for waste generators, transporters, certain recyclers, and entities that managed waste in treatment, storage, or disposal facilities ("TSDFs"). These new regulations enhanced controls for various hazardous waste management units including surface impoundment, landfills, and tanks. The new regulations also strengthened solid waste management standards for certain types of units including municipal landfills.

OSW provided national leadership and oversight for the RCRA permitting program (both operating and post-closure permits) at over 5,000 individual hazardous waste facilities nationwide as well as the facility-wide corrective action cleanup program at those facilities, a Superfund-like remedial program that was imposed under the 1984 HSWA amendments to RCRA and developed under my leadership. We also oversaw the delegation of the RCRA program to state agencies and oversaw state agency performance.

As the national program manager for RCRA, my office developed detailed guidance documents on many of the complex issues covered by the RCRA regulations including groundwater monitoring, permitting, and technical design issues associated with operating and closing hazardous waste units. The guidance documents provided EPA regions, states, regulated entities, and other interested parties with further detail as to how EPA intended that affected parties implement EPA's waste regulations.

Also, during my tenure as its Director, OSW worked on completing the various reports to Congress on "special wastes" required by amendments to RCRA that were enacted in 1980, including the Bevill Amendment. Among other things, the Bevill Amendment exempted fossil fuel combustion waste from the "hazardous waste" category pending further study by the Agency and required EPA to submit a formal report to Congress regarding its findings. The 1988 Report to Congress entitled Wastes from the Combustion of Coal by Electric Utility Power Plants was finalized and published by EPA at the end of my tenure as OSW Director. During my tenure we were also completing a multi-

year effort to characterize the almost 200,000 non-hazardous waste surface impoundments and over 15,000 landfills in the U.S. from the perspective of environmental design and operational controls. This 1988 Report on Solid Waste Disposal in the United States, which summarized the work performed by the Agency over the previous four years, was issued shortly after I left EPA. During this time my office also worked on federal procurement policies, as required by RCRA, which strongly encouraged the use of byproduct materials such as coal ash.

While at EPA, I had considerable direct interaction with Congress. In 1976, while employed with EPA, I undertook a special assignment to the Senate Public Works Committee during a time when several major environmental laws, including RCRA, were being debated and finalized. In my senior management positions at EPA, I was generally responsible for tracking legislative developments within Congress and monitoring how new legislation might affect existing EPA programs I was managing. I also routinely provided EPA input to Congress on specific legislative issues. In my senior management capacity, I was also responsible for meeting with congressional aides to inform them of the status of the implementation of congressional mandates and addressing congressional concerns. These meetings often involved discussions of congressional intent. I testified on numerous occasions before House and Senate committees and subcommittees. After leaving EPA, I continued to provide testimony at congressional hearings at the invitation of congressional subcommittees, including testimony on RCRA and CERCLA.

Q. PLEASE SUMMARIZE ASPECTS OF YOUR EXPERIENCE AFTER YOUR TENURE WITH EPA.

A. In March 1988, I became the Divisional Vice President - Environmental Policy and Planning for Browning-Ferris Industries ("BFI"), a position I held until I left BFI in August 1991. In that role, I established an environmental regulatory and legislative program for the company on issues such as waste compliance, interstate movement of waste, rate regulation of the waste industry, state solid waste planning, recycling programs and legislation, and disposal fees. I was responsible for analyzing and forecasting environmental trends affecting the commercial waste industry and for assisting operating managers in resolving environmental issues in relation to permit hearings, siting decisions, regulatory interpretations, and enforcement actions.

During 1988 and 1989, I also held the position of Vice President of Environmental Compliance for CECOS, BFI's hazardous waste subsidiary. In that capacity, I addressed numerous issues associated with the proper characterization of solid and hazardous waste, the proper management of these wastes, the permitting of hazardous waste and TSCA PCB waste facilities, groundwater monitoring at hazardous waste sites, and the closure and remediation of waste sites. My staff was responsible for auditing the company's existing hazardous waste facilities, performing due diligence on new business acquisitions, obtaining needed facility RCRA and non-RCRA environmental permits, and managing facility cleanups and closures.

Following my tenure at BFI I started my own consulting company, assisting both private sector and governmental clients[1] on a wide range of environmental matters. After six years, I integrated my consulting firm into a larger firm. I have helped entities evaluate and strengthen their compliance and risk management programs. I have also helped regulated entities resolve ongoing compliance issues and incorporate environmental considerations into future business planning.

As a consultant I have advised on numerous projects related to remedial actions under both RCRA and CERCLA and state-equivalent statutes, including engagements where I was asked to consult on the application of federal and state waste regulations and both voluntary and mandatory state remedial programs. I have also been engaged to consult on the historical evolution of environmental information and regulations in order to evaluate the environmental performance and compliance of regulated entities in a historical context.

In addition to consulting work, I have been engaged to provide expert opinions and testimony related to the evolving knowledge and regulations applicable to waste, chemical management, and environmental remediation across a range of industrial sectors. I have provided expert testimony at

[1] Government clients have included U.S. Department of Energy, Bonneville Power Administration, State of Illinois, City of Los Angeles, City of Phoenix, King County Washington, government of Mexico, and government of Canada. Private sector clients have covered a wide range of industries including the aerospace industry, the petroleum industry, the aluminum industry, the automotive industry, the tanning industry, the semi-conductor and electronics industry, the telecommunications industry, the paper products industry, the chemical industry, the electric utility industry, the waste industry, and the general manufacturing industry.

deposition and at trial. Areas of testimony include – the federal regulatory development process, risk assessment and risk management frameworks applied to environmental decision-making, standard of care applied to various environmental practices and remedial activities over different time frames, evolution of knowledge with regard to chemical and waste handling practices, evolution and role of environmental management systems, application of federal waste and chemical regulations to fact-specific situations, and consistency of remedial actions when compared against the federal National Contingency Plan.

A recap of my professional and educational background, including a list of my testimony in prior cases, is included as Exhibit 1 to my testimony.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION OR OTHER STATE PUBLIC UTILITY COMMISSIONS?

A. I have not previously testified before this Commission. However, I did testify before the North Carolina Utilities Commission on behalf of Duke Energy Progress, LLC (Docket No. E-2, Sub 1219) and Duke Energy Carolinas, LLC (Docket No. E-7, Sub 1214).

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to provide important regulatory context that supports the Company's recovery of costs associated with the closure of its coal

ash basins[2] in South Carolina and North Carolina. The Company either currently operates, or in the past did operate, a number of coal-fired electric generating plants, each of which has one or more units constructed to manage coal ash, or coal combustion residuals ("CCR"), a by-product of burning coal to produce electricity. A number of these CCR management units are coal ash basins, constructed during the past decades to handle coal ash in a "wet" environment, which was standard industry practice at the time.

The Company is seeking in this rate case (and sought in its previous rate case, Docket No. 2018-318-E) costs associated with the closure of certain of its CCR management units. It is my understanding that in the previous case the Commission disallowed a portion of ash basin closure costs incurred by the Company, finding that those costs were incurred pursuant to a North Carolina statute (the Coal Ash Management Act, as amended ("CAMA")); by contrast, the Commission allowed recovery of closure costs incurred pursuant to the federal CCR rule, originally promulgated by EPA in 2015.[3] As further detailed in my testimony, I conclude that even in the absence of state-specific regulation, such as CAMA, closure of the Company's federally regulated ash basins must meet closure performance standards mandated by the CCR Rule. Given the fact-specific locations of the Company's South Carolina and North Carolina coal ash basins, those federal performance standards directly impact the cost-

[2] Throughout this report, I use the terms ash or coal ash ponds, ash basins, and surface impoundments interchangeably.

[3] 80 Federal Register 21302 (April 17, 2015). EPA has amended this rule since its 2015 promulgation, as discussed in my testimony, and, as amended it is referred to in my testimony as the CCR Rule.

effectiveness and long-term protectiveness of closing these CCR units with ash remaining in place.

The coal ash basins I have been asked to address in this matter are located at the following current and former coal-fired power plants: Robinson Steam Station ("Robinson"), located in South Carolina; and Roxboro Steam Station ("Roxboro"), Mayo Steam Station ("Mayo"), Weatherspoon Steam Station, ("Weatherspoon"), H.F. Lee Steam Station ("H.F. Lee") – specifically, what is known as the "Active Ash Basin"[4] at that plant, Asheville Steam Station ("Asheville"), and Sutton Steam Station ("Sutton"), all of which are located in North Carolina.[5]

My testimony complements the testimony of Company witness Jessica L. Bednarcik, who provides site-specific information concerning the CCR units for which the Company is seeking cost recovery. My testimony approaches the issues in this case from a more global perspective, concentrating on applicable federal regulation and discussing the relationship between federal and state CCR regulation as it applies to the CCR surface impoundments I reviewed for this matter. My testimony highlights the importance of considering site-specific

[4] Although called "the Active Ash Basin," this ash pond is not currently receiving waste streams and is in the process of being closed.

[5] The Company also is in the process of closing CCR units at its Cape Fear Steam Station and taking additional actions at several closed units that are known in the Company as the Inactive Ash Basins at the H.F. Lee Steam Station. I understand that these units are not currently covered under the federal CCR Rule and that the Company is not seeking cost recovery for those historical CCR units in this case. As a result, my testimony does not address those units. My testimony also does not address non-constructed historical ash disposal areas at Robinson, H.F. Lee, and Sutton, used decades ago but not after October 2015, each of which is known as a lay of land area ("LOLA"). The LOLAs are not CCR surface impoundments and are not regulated under the federal CCR Rule or under CAMA.

facts when implementing federal performance standards that are applicable during CCR unit closure.[6] My testimony also explains the federal government's view as to the environmental benefits associated with beneficial reuse of CCR, including during CCR unit closure activities.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. My testimony is organized into five primary sections. In Section I, I provide an overview of federal regulation of CCR. In Section II, I provide additional explanation concerning the federal/state relationship in implementing environmental laws generally and the federal CCR regulation in particular. In Section III, I provide a detailed description of CCR unit closure under the federal CCR regulation.

These three sections of my testimony provide the background information necessary to understand the principal opinion I present in this case, in Section IV – that even in the absence of state-specific regulation, closure of the Company's ash basins that are subject to the CCR Rule must meet *federally required* closure performance standards. Given the fact-specific locations of the Company's South Carolina and North Carolina CCR units, those federal performance standards directly impact the cost-effectiveness and long-term protectiveness of closing these CCR units with ash remaining in place.

[6] As EPA explains in guidance regarding the performance standards for closure of units under the CCR Rule: "Whether any particular unit or facility can meet the performance standards is a fact and site-specific determination that will depend on a number of factual and engineering considerations, such as the hydrogeology of the site, the engineering of the unit, and the kinds of engineering measures available." *See* Closure Requirements at https://www.epa.gov/coalash/relationship-between-resource-conservation-and-recovery-acts-coal-combustion-residuals-rule (last accessed on August 2, 2022).

Finally, in Section V, I discuss EPA's position on the beneficial reuse of CCR. As part of the federal CCR rulemaking process, EPA spent considerable time defining the types of activities that qualify as beneficial reuse and the environmental and economic benefits of that CCR management approach. EPA continues to strongly encourage states and coal-fired power producers to engage in CCR beneficial reuse.

Q. PLEASE PROVIDE AN OVERVIEW OF YOUR TESTIMONY.

A. With the CCR Rule, EPA finalized a comprehensive federal framework establishing minimum requirements to ensure CCR units were protectively managed throughout the United States. Prior to the CCR Rule's promulgation in 2015, states took the lead in evaluating the protectiveness of individual CCR management units. States relied upon a range of available state authorities. Today, EPA has established a broad set of minimum federal requirements applicable to facilities managing CCR. While states continue to regulate CCR units under existing state authorities, owners and operators of these units must now comply with both state and federal requirements.

Currently, the federal CCR regulations are self-implementing, but EPA has established requirements to promote the meaningful participation of states and citizens in the effective implementation of these self-implementing federal CCR requirements. EPA also allows interested states to receive federal approval to implement the federal CCR requirements in lieu of the self-implementing federal regulations. Interested states apply to EPA for such approval and demonstrate they meet the required EPA approval conditions.

States can only receive EPA approval if they demonstrate their state program is at least as protective as the federal CCR regulations and that the state has a CCR permit program meeting EPA-specified requirements.

Until such time that a state receives federal approval to administer a CCR program in lieu of the federal CCR requirements, owners and operators of CCR units must meet state CCR requirements as well as federal CCR regulations. At the present time, only a few states have received federal approval for their CCR programs and South Carolina and North Carolina are not yet approved to implement the federal CCR program. Therefore, owners and operators of CCR units, including DEP, must meet both the federal requirements and the state requirements imposed in South Carolina and North Carolina respectively.

The federal regulations require that CCR surface impoundments must close if they are unlined or cannot meet federal location or structural integrity standards. The federal regulation offers two options for closure: (1) closure-in-place or (2) closure by removing CCR and decontamination of areas affected by releases from the CCR unit.[7] The federal regulation does not promote one closure option over the other. Either option can be used as long as the owner/operator can meet the performance standards in the federal rule for the selected closure option.

[7] In certain cases, a hybrid approach can also be utilized. Throughout my testimony, I use the terms "closure by removal" and "closure by excavation" interchangeably.

Each of the DEP surface impoundments I have reviewed, whether located in South Carolina or North Carolina, are required to close under the federal CCR regulation because the units are unlined and/or fail to meet one or more federal location standards. To comply with federal regulations, DEP must ensure that each of these CCR units closes in a manner that meets the federal closure performance standards set out in the regulations.

The federal performance standards for closure-in-place require a CCR unit to close in a manner that will control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere. Effectively, these closure performance standards prohibit closure-in-place where groundwater is in actual or likely contact with the CCR unless effective engineering measures can be installed to control, minimize, or eliminate such conditions. Additionally, the closure-in-place performance standards include structural stability and long-term maintenance requirements that can be difficult to meet cost-effectively for CCR units located in floodplains, wetlands, and seismic or unstable areas. Based on the site-specific conditions outlined in the testimony of Witness Bednarcik, closure by removal of all or the vast majority of the CCR is the only closure option that can reliably and cost-effectively meet the federal CCR closure performance standards.

Even when closure-in-place can be engineered to comply with the federal closure performance standards, closure by excavation is often prudent

and more cost-effective than leaving CCR in place because it can reduce future post-closure costs and potential future cleanup liability associated with unexpected releases from the closed CCR unit. Closure by excavation can also be preferable because it allows the land, often a limited commodity at power plants, to be reused for other purposes or to be sold. Closure-in-place requires long-term access to, as well as long-term operation and maintenance of, all engineered structures including the closed unit cap, restricting future use of this land.

Finally, while the EPA regulations do not explicitly require beneficial use of CCR, EPA has long been a proponent of beneficial use and has structured the CCR regulatory program to encourage it. Congress also continuously emphasized the importance of resource conservation as one of the fundamental tenets of the 1976 RCRA statute.

SECTION I – <u>BACKGROUND ON FEDERAL CCR REGULATION</u>

Q. PLEASE PROVIDE AN OVERVIEW OF THE FEDERAL REGULATION OF CCR PRIOR TO THE PASSAGE OF THE 1976 FEDERAL RCRA STATUTE.

A. Prior to the passage of RCRA, there was no federal regulatory program for CCR. States, not the federal government, were the primary regulators of CCR ponds and landfills, as well as other types of industrial waste disposal. Many states, including South Carolina and North Carolina, regulated CCR ash ponds under water quality laws, with a particular focus on discharges from the ponds to surface water, such as streams, rivers, and lakes. States typically regulated

CCR landfills under state solid waste laws. State solid waste laws became common by the 1960s.

Q. CAN YOU PROVIDE AN OVERVIEW OF THE FEDERAL REGULATION OF CCR PRIOR TO THE PROMULGATION OF THE CCR RULE IN 2015?

A. Yes. Congress passed RCRA in 1976. Congress defined the objectives for RCRA as promoting "the protection of health and the environment and to conserve valuable material and energy resources . . ."[8] The law required EPA to establish a comprehensive "cradle-to-grave" federal regulatory program for the management of wastes designated as hazardous. Once those detailed requirements were completed, EPA authorized individual states to administer the hazardous waste program in lieu of the federal hazardous waste program as long as the state permit and enforcement programs were at least as stringent as the detailed federal requirements. While the original RCRA statute did not exempt CCR from classification as a hazardous waste if it otherwise met EPA's hazardous waste classification, Congress promulgated RCRA amendments in 1980 that prohibited such an outcome until EPA completed a detailed study and presented the study results to Congress. EPA completed this detailed study on coal combustion residuals from electric utilities and independent power

[8] 42 U.S.C. §6902.

producers in 1988 and in 1993, EPA made a formal determination not to regulate these wastes as RCRA hazardous waste.[9]

Congress, in RCRA, also directed EPA to develop minimum national criteria for the protective management of non-hazardous, "solid wastes." EPA finalized minimum protective criteria for solid non-hazardous waste facilities in 1979.[10] These criteria were applicable to both municipal and non-municipal non-hazardous waste disposal units, including all types of units that accepted CCR. Any solid waste management unit that failed to meet these criteria was classified as an "open dump" and prohibited under the 1976 RCRA statute. These criteria were relatively general and their application and enforcement was left to the states and to private citizens.

In 2000, EPA decided to reconsider the need for national regulations applicable to CCR and associated low-volume waste co-managed with the CCR when these wastes were generated by the electric utility industry and independent power producers. At this time, EPA began the process of developing such regulations.[11] EPA issued a proposed rule in 2010 that included several options for regulating CCR units.[12] EPA published its final CCR rule on April 17, 2015.[13] The rule's effective date was October 19, 2015.

[9] 58 Federal Register 42466 (August 9, 1993); *See also* U.S. Environmental Protection Agency, Report to Congress: Wastes from the Combustion of Coal by Electric Utility Power Plants (February 1988), which provided the basis for EPA's decision.

[10] 44 Federal Register 53438 (September 13, 1979).

[11] 65 Federal Register 32214, 32216 (May 22, 2000).

[12] 75 Federal Register 35128, 35223 (June 21, 2010).

[13] 80 Federal Register 21302 (April 17, 2015).

Q. HAS EPA MADE CHANGES TO THE 2015 FEDERAL CCR RULE?

A. Yes. Both environmental groups and industry groups filed litigation after EPA issued its 2015 final CCR rule.[14] As a result of court decisions and EPA actions, there have been a number of important modifications to the rule and EPA continues to consider additional changes to the rule.[15] One such important change that remains in progress is how EPA will regulate inactive surface impoundments at power plant facilities that ceased operation prior to the 2015 effective date of the CCR Rule, such as the surface impoundments as DEP's Cape Fear facility. Pursuant to a court ruling from the DC Circuit Court of Appeals, EPA has initiated a regulatory process to address these "legacy" impoundments.[16] EPA also continues to work on finalizing regulations that will implement a federal permit program for CCR units, as authorized by the 2016 WIIN Act, discussed in more detail later in my testimony.

Q. PLEASE PROVIDE AN OVERVIEW OF THE CURRENT FEDERAL CCR RULE.

A. The rule establishes national requirements that are implemented under the non-hazardous RCRA Subtitle D program. It requires all new surface impoundments and landfills to have composite liners, meet specified location criteria, and

[14] Utility Solid Waste Activities Group, et. al. v. Environmental Protection Agency (No. 15-1219).

[15] 81 Federal Register 51802 (August 5, 2016); 83 Federal Register 11584 (March 15, 2018); 83 Federal Register 36435 (July 30, 2018); 84 Federal Register 40353 (August 14, 2019); 84 Federal Register 65941 (December 2, 2019); 85 Federal Register 53516 (August 28, 2020); 85 Federal Register 12456 (March 3, 2020); 85 Federal Register 65015 (October 14, 2020); 85 Federal Register 72506 (November 12, 2020).

[16] See 85 Federal Register 65015 (October 14, 2020). This advanced notice of proposed rulemaking provided different potential definitions for legacy CCR surface impoundments.

comply with other design and operating requirements. The rule includes closure and post-closure requirements specifying the steps, time frames, and options for completing the closure of a surface impoundment, or other CCR unit, and for post-closure activities, including monitoring.

The final rule also requires the installation of groundwater monitoring systems that meet specified performance standards[17] and mandates groundwater assessment and corrective action to clean up contamination above groundwater protection standards unless the contamination can be shown to be caused by an alternate source and not by the CCR unit.

The rule also requires existing CCR ponds to close in compliance with regulatory timelines and closure performance standards if the unit is unlined or clay-lined, cannot meet the location criteria, or cannot meet the structural integrity standards.[18] The federal rule also applies the rule's closure and post-closure requirements to inactive surface impoundments (i.e., impoundments not

[17] The set of constituents covered by the groundwater monitoring requirement are listed in Appendix III and Appendix IV of 40 CFR Part 257. The groundwater protection standard is the federal maximum contaminant level ("MCL") or a risk-based standard defined by EPA.

[18] The 2015 final CCR rule allowed existing surface impoundments to continue to operate without a composite liner if they met certain location standards, groundwater monitoring requirements and standards, and structural stability requirements. Therefore, initially, the final rule allowed a subset of surface impoundments without liners, or with only clay liners, to continue to operate. This was subsequently challenged during litigation and vacated by the DC Circuit Court of Appeals in 2018. Thus, the current federal CCR Rule no longer allows unlined or clay-lined surface impoundments to continue to operate past closure dates specified in the current federal rule, regardless of the whether groundwater has or has not been adversely impacted by the CCR unit. In a November 12, 2020 modification to the CCR Rule, EPA did establish a procedure that allowed certain regulated ash ponds and landfills to request approval to operate an existing surface impoundment if they could meet protectiveness requirements utilizing an alternative liner design. Very few facilities submitted an alternative liner demonstration package. EPA continues to review those submissions. *See* CCR Part B Implementation, EPA's Review of Submitted Demonstrations at https://www.epa.gov/coalash/coal-combustion-residuals-ccr-part-b-implementation (last accessed on August 2, 2022).

receiving CCR after the effective date of the CCR Rule but still containing liquids) at active electric power generation facilities (i.e., facilities that are actively generating electricity irrespective of the fuel used).

Q. YOU MENTIONED THE WIIN ACT. WHAT IS THE WIIN ACT?

A. The WIIN Act is the Water Infrastructure Improvements for the Nation Act. It was passed by Congress in December 2016 after EPA finalized its 2015 CCR Rule. The law included provisions that modified the Solid Waste Disposal Act and RCRA, requiring that the federal coal ash regulations be implemented through a permit program.[19] In those states that apply to EPA to implement the federal CCR program in lieu of federal rule implementation, this provision requires state applicants to demonstrate to EPA that they have a CCR regulatory program that is at least as protective as the federal CCR Rule as well as a permit program to implement the rule provisions at individual facilities. The law also requires EPA, if appropriations are available, to implement a federal permit program in those states that do not apply to EPA for approval to implement their own state CCR permit programs.

In August 2017, EPA issued an interim final guidance document to provide details on the process and procedures EPA will use to review and approve state CCR programs.[20] The guidance document notes that:

[19] Public Law 114-322 (December 16, 2016).

[20] U.S. Environmental Protection Agency, Coal Combustion Residuals State Permit Program Guidance Document; Interim Final (August 2017). Importantly, the guidance makes clear that even in states with approved permit programs, citizens may file suit under RCRA Section 7002 to enforce compliance with the federal regulations. In addition, the guidance confirms that enforcement under RCRA Sections 3007 and 3008 against "open dumping" can also be pursued and that any CCR unit that is not in compliance

> EPA intends to provide as much flexibility to the State programs as possible, consistent with the WIIN Act's standard for approval of State programs; that State programs require each coal combustion residuals unit located in the State to achieve compliance with either: (1) the Federal CCR requirements at 40 CFR part 257; or (2) other State criteria that the Administrator, after consultation with the State, determines to be at least as protective as the Federal requirements.

EPA also issued a proposed rule in February 2020 to establish a federal CCR permitting program in accordance with the WIIN Act for states that have not received EPA approval for their CCR programs.[21] In drafting this proposal, EPA relied on elements of existing permitting programs (i.e., RCRA hazardous waste permitting and permitting under the Clean Water Act, Safe Drinking Water Act, and Clean Air Act). The permit requirements would apply during any stage of operation including units that are actively accepting CCR and units that are closing or are in post-closure care. The proposal also establishes processes for public input that are common in many other federal and state permit programs, including issuing public notices, inviting public comments on draft permits, and holding public hearings.

Q. HOW MANY STATES HAVE RECEIVED EPA APPROVAL TO IMPLEMENT THE FEDERAL CCR RULE?

A. Very few. As of April 2022, only three states have received full or partial federal approval to implement the state CCR regulations and permit program in

with the CCR regulations, or with a permit issued by the State or EPA, can be considered an open dump. (p. 1-14).

[21] 85 Federal Register 9940 (February 20, 2020).

lieu of EPA's federal CCR regulations. Other states are in the process of working with EPA to receive federal approval for their state CCR programs.

Q. HOW IS EPA IMPLEMENTING THE FEDERAL CCR RULE TODAY IN UNAPPROVED STATES?

A. The requirements of the federal CCR Rule, at the time it was first effective in October 2015, were designed to be self-implementing. At that time, EPA's authorities under RCRA Subtitle D did not provide EPA with a direct role in implementation of the CCR rule or its enforcement. However, EPA enhanced the protectiveness of individual CCR requirements by requiring owners and operators of covered CCR units to provide compliance certifications by qualified engineers for numerous rule provisions, provide notifications to state regulatory officials and the public, and post key information on a publicly accessible website maintained by each covered facility. EPA summarized its approach in the preamble to the final 2015 CCR Rule as follows:

> These regulations, promulgated under subtitle D of RCRA, constitute national minimum criteria with which facilities must comply without oversight or intervention by a federal or state authority. To address concerns about the absence of regulatory oversight under a subtitle D regulation, EPA has developed a combination of mechanisms, including recordkeeping, notification, and maintaining a publicly accessible Internet site. The increased transparency resulting from these requirements will minimize the potential for owners or operators to abuse the self-implementing system established in this rule. In addition, these requirements provide interested parties the information necessary to determine whether the owner or operator is operating in compliance with the requirements of the rule and thus will facilitate enforcement by States and private citizens. EPA has consolidated the recordkeeping, notification, and Internet posting requirements into a single section of the regulations

> in an effort to make these requirements easier to follow. It is important to note that EPA will not be collecting any information under this rule—instead, facilities must keep records, notify the state, and post information on a publicly available Web site.[22]

EPA further strengthened these requirements in August 2020 by expanding the content of certain information required to be posted to each company's public website. This included additional specificity on the nature and format of annual groundwater monitoring and corrective action report information.[23]

With the passage of the WIIN Act in late 2016, EPA was given authority to require submission of additional information by regulated CCR entities and utilize certain RCRA enforcement authorities under RCRA Sections 3007 and 3008.[24] EPA was also given the authority to implement a federal permit program in states that were not approved to implement the federal CCR requirements. EPA proposed the general framework for this permit program in 2020 but has not yet finalized it. Thus, at the present time, the federal CCR Rule remains self-implementing, as discussed above, in non-approved states. Once a federal permit program is in place, EPA has stated that federal permits will be required in non-approved states, and a facility generating and managing CCR may no longer operate under the self-implementing regulations in place today. In the recently proposed federal permit rule, EPA said it would consider the

[22] 80 Federal Register 21302, 21462 (April 17, 2015).

[23] 85 Federal Register 53516 (August 28, 2020).

[24] 85 Federal Register 9940, 9942 (February 20, 2020). Previously, these authorities applied to hazardous waste and hazardous waste facilities but not to CCR waste.

views of unapproved states when it moves forward with implementation of a federal CCR permitting process.[25]

SECTION II: FEDERAL-STATE RELATIONSHIP IN IMPLEMENTING THE FEDERAL CCR RULE

Q. WHAT IS THE STATE ROLE TODAY IN IMPLEMENTING THE FEDERAL CCR REGULATIONS IN UNAPPROVED STATES?

A. The federal CCR regulatory program, like many federal environmental regulatory programs, recognizes the benefits of a federal/state partnership, essentially a form of "cooperative federalism."[26] This partnership is inherent in the federal CCR Rule framework as well as the WIIN Act and the guidance and proposed regulations developed to implement the WIIN Act.

The preamble to the final CCR rule, issued before the passage of the 2016 WIIN Act, describes this relationship as follows:

> The federal role is to establish the overall regulatory direction, by providing minimum nationwide standards that will protect human health and the environment, and to provide technical assistance to states for planning and developing their own environmentally sound waste management practices. The actual planning and any direct implementation of solid waste programs under RCRA subtitle D, however, remains a state and local function, and

[25] For example, states would participate in review of federal permits and major permit modifications.

[26] In the cooperative federalism framework, the federal government sets minimum requirements that are protective, but the individual states are the primary implementers of these federal laws and regulations. The framework also enables individual states to implement their own laws and regulations, which must be at least as protective as the minimum federal standards, so as to take into account site- and state-specific considerations. This federal/state cooperation ensures that the states' own unique ecological conditions (be they wetlands, floodplain zones, seismic zones, or something else altogether) are woven into the nation's environmental protection standards.

> [RCRA] envisions that states will devise programs to deal with state-specific conditions and needs.[27]

EPA also stated the following in the 2015 CCR rule preamble:

> Moreover, EPA recognizes the critical role that our state partners play in implementation and ensuring compliance with environmental regulations. This is particularly important in complex situations, such as presented by CCR landfills and surface impoundments that involve corrective action and requirements and timelines for closure of units. EPA expects that states will be active partners in overseeing the regulation of CCR landfills and CCR surface impoundments, and has adopted a number of provisions to ensure that States have the information necessary to undertake this role.[28]

In most other areas of the RCRA's Subtitle D program, such as the program for municipal solid waste landfills, the federal government has no direct role in the day-to-day implementation of the federal standards and instead provides incentives for states to implement and enforce the requirements. Relatively quickly after EPA's finalization of those Subtitle D regulations, most states received approval from EPA to operate their state programs in lieu of the federal regulations. That ensured that regulated parties were only required to comply with a single set of municipal solid waste regulations, and states were allowed to incorporate certain site-specific flexibility in aspects of the regulatory program providing the federal baseline protectiveness requirements remained in place. Most states already had permit programs in place specifically covering municipal solid waste landfills and those permit programs

[27] 80 Federal Register 21310 (April 17, 2015).

[28] 80 Federal Register 21430 (April 17, 2015).

covered the scope of requirements in EPA's federal municipal solid waste landfill rule. In contrast, at the time EPA finalized its 2015 CCR Rule, many states did not have CCR-specific permit programs in place for both CCR surface impoundments and CCR landfills and some state permit programs did not cover the full scope of the federal CCR requirements.

Under the WIIN Act, a state CCR permit program became a key condition for EPA approval of a state CCR program that would operate in lieu of the federal CCR requirements. For a state permitting program to be approved by EPA, it does not have to be identical to the federal CCR Rule, but it must be "at least as protective as" the federal minimum criteria (i.e., the CCR Rule).[29] This allows states some flexibility in the design and implementation of their CCR programs while putting EPA in the position of evaluating those programs to ensure that if they do differ from the federal requirements, the approved program provides the equivalent or better environmental protection.[30]

As noted above, if a state does not submit a program for approval, or the state program is determined not to be satisfactory, then the WIIN Act requires EPA to function as the federal implementing agency with development of a federal permit program where funds are available to do so. The WIIN Act also provides EPA with enforcement authority to enforce compliance with the federal CCR regulations under Sections 3007 and 3008 of RCRA. Therefore, in

[29] WIIN Act of 2016, Section 2301.

[30] To date, three states have received full or partial approval to implement their state program in lieu of the federal CCR Rule: Oklahoma, Georgia, and Texas. Certain other states have adopted the federal CCR regulations but have not yet received federal implementation approval.

a state that does not receive EPA approval to administer a state CCR program in lieu of the federal CCR Rule, EPA enforces the federal standards, including the closure and corrective action requirements, in those states.

Importantly, whether the federal government implements the federal program in a state without an approved program or a state implements the federal program following EPA approval, site-specific conditions as well as input from the public play an important role in determining how the requirements will be applied, particularly for closure and corrective action decisions. In the preamble to its proposed rule for the development of the federal permitting program, EPA states:

> An individual permit can be tailored to the site-specific conditions at the facility (i.e., by establishing unique terms and conditions to require compliance with the applicable requirements of subpart D, based on site-specific approaches, which may be proposed in the permit application or otherwise developed in the permit writing process).[31]

Therefore, it is the site-specific conditions at a particular electric utility location, combined with public and state input, which will drive most decisions regarding operations, closure, and corrective action as long as those site-specific decisions meet the minimum federal performance standards.

[31] 85 Federal Register 9940, 9948 (February 20, 2020)

Q. HOW DID THE FEDERAL REGULATIONS ADDRESS THE FACT THAT SOME STATES HAD EXISTING CCR PROGRAMS AT THE TIME THE FEDERAL RULES WERE ADOPTED?

A. Virtually all states were regulating CCR under their state water and/or solid waste programs. These state programs made site-specific determinations and implemented those determinations through site-specific permits or enforcement actions. EPA also understood that some states, like North Carolina, had existing CCR statutes or regulations in place. But EPA also recognized that other states, like South Carolina, used available permit and enforcement mechanisms, rather than CCR-tailored mechanisms, to ensure individual CCR units were protectively managed.

EPA acknowledged the existence of these variable state programs in the preamble to the final federal CCR Rule:

> EPA has made every effort to ensure that the final rule does not establish any requirements that truly conflict with existing state programs. To clarify, this does not mean that the requirements are necessarily the same, but rather that it is possible to comply with both federal and state requirements simultaneously. Or in other words, compliance with the more stringent standard—whether federal or state—will ensure compliance with the less stringent. Based on the comments received, EPA is aware of no example of a situation in which truly conflicting requirements will exist.[32]

Thus, EPA did not view existing state programs as conflicting with or supplemental to the federal requirements, but rather as part of an overall

[32] 80 Federal Register 21334 (April 17, 2015).

national program establishing protective baseline standards while allowing and encouraging site-specific decisions in each state where appropriate.

SECTION III: <u>POND CLOSURE UNDER THE FEDERAL CCR RULE</u>

Q. WHEN MUST AN OWNER OR OPERATOR CLOSE A CCR UNIT UNDER THE CCR RULE?

A. The CCR Rule includes location restrictions and technical standards for existing CCR surface impoundments and CCR landfills. If existing surface impoundments cannot meet these requirements, they are required to close. The rules require that existing CCR surface impoundments be "constructed with a base that is located no less than 1.52 meters (five feet) above the uppermost aquifer or make a technical demonstration that there will not be a hydraulic connection between the base of the CCR unit and the uppermost aquifer.[33] The rule also includes location restrictions for existing CCR impoundments related to wetlands, fault areas, seismic impact zones, and unstable areas.[34] In each case, an existing surface impoundment that cannot satisfy each location standard is required to close.

Existing surface impoundments must also meet the liner design criteria in the rule and have either a composite liner or an alternative liner that meets certain technical criteria and these units must meet structural integrity requirements.[35] The federal CCR Rule requires that the owner or operator of

[33] 40 CFR 257.60.

[34] 40 CFR 257.61 – 257.64.

[35] 40 CFR 257.71; 40 CFR 257.74.

an existing unlined CCR surface impoundment cease placing CCR in the impoundment by April 11, 2021, and either retrofit the surface impoundment or initiate the closure process.[36] The regulations allow a specified time to complete closure although certain extensions can be approved.

Q. WHAT IS REQUIRED UNDER THE RULE FOR CLOSING A CCR SURFACE IMPOUNDMENT?

A. The CCR Rule provides two options for closing a CCR surface impoundment. The first option is "closure-in-place" where the CCR is left in place and a final engineered cover system is placed over the unit to prevent liquid infiltration. The second option requires the removal of the CCR from the unit and decontamination of areas affected by releases from the CCR unit. This approach is sometimes referred to as "excavation" or "clean closure" or "closure by removal."[37]

[36] 40 CFR 257.101. The rules allow owners and operators to continue placing CCR in unlined surface impoundments past the April 11, 2021, deadline (up until EPA-specified maximum time deadlines) if they can demonstrate to EPA that it is technically infeasible to provide alternative disposal capacity for the CCR (40 CFR 257.103(f)(1)). To receive such an extension, the owner or operator was required to submit documentation by November 30, 2021 demonstrating why capacity is not available, the schedule for making capacity available, and that the CCR surface impoundment is in compliance with other provisions of the rule (e.g., groundwater monitoring and corrective action provisions, structural stability, closure plans). EPA allowed ongoing use of the surface impoundment until the Agency determined that the demonstration was not complete or that the required conditions for the demonstration were not met.

Owners and operators could also seek approval to continue operating an unlined CCR surface impoundment beyond the April 11, 2021, deadline if the facility had a date certain when it would cease operation of its coal-fired boiler(s) (40 CFR 257.103(f)(2)).

[37] 40 CFR 257.102.

Q. CAN AN OWNER OR OPERATOR CHOOSE EITHER OF THESE CLOSURE OPTIONS?

A. Yes, provided the owner or operator can meet EPA's closure-in-place performance standards, an entity can close using closure-in-place or closure by removal. However, when site-specific facts are considered, closure-in-place is not always able to meet the EPA-defined performance standards cost-effectively or with a high degree of certainty. In those cases, closure by removal becomes the most prudent closure option.[38] Also, site-specific facts may identify locations where the entity can meet the closure-in-place performance standards but leaving ash in place can conflict with longer term company business needs. In my experience, the choice of the prudent closure option is highly dependent on site-specific facts.

Q. WHAT ARE THE CLOSURE-IN-PLACE PERFORMANCE STANDARDS?

A. The applicable federal closure performance standards for owners or operators that select a closure-in-place approach are found in 40 CFR 257.102(d). This section identifies five closure-in-place performance standards as follows: (1) closed units must control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR,

[38] Where the waste unit is located in areas where the CCR is in contact with groundwater, EPA requires the use of special engineering controls to ensure closure-in-place is environmentally protective. In these situations, the costs can be much higher and more uncertain than for a typical closure-in-place, including for long-term operation and maintenance of the final cover system and installed engineering controls. Based on site-specific circumstances, engineering controls can also be necessary for closure-in-place at units that do not meet other CCR Rule location standards such as seismic impact zones. Any analysis of the need for such engineering controls is necessarily site-specific.

leachate, or contaminated run-off to the ground or surface waters or to the atmosphere; (2) closed units must preclude the possibility of future impoundment of water, sediments, or slurry; (3) closed units must include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system throughout the closure and post-closure period; (4) owners and operators must minimize the need for further maintenance of the closed CCR unit; and (5) owners or operators must complete the closure in the shortest time that is consistent with generally accepted good engineering practices.

Q. HAS EPA PROVIDED ANY GUIDANCE ON HOW IT IS INTERPRETING THE FIRST CLOSURE IN-PLACE PERFORMANCE STANDARD WITH RESPECT TO UNITS WHERE WASTE IS IN CONTACT WITH GROUNDWATER?

A. Yes. In January 2022, EPA provided further interpretation on how it views the first closure-in-place performance standard for facilities that have CCR in contact with groundwater:

> EPA views the word "infiltration" as a general term that refers to any kind of movement of liquids into a CCR unit. That would include, for example, any liquid passing into or through the CCR unit by filtering or permeating from any direction, including the top, sides, and bottom of the unit. This is consistent with the plain meaning of the term. For example, Merriam-Webster defines infiltration to mean "to pass into or through (a substance) by filtering or permeating" or "to cause (something, such as a liquid) to permeate something by penetrating its pores or interstices." Neither definition limits the source or direction by which the infiltration occurs. In situations where the groundwater intersects the CCR unit, water may infiltrate into the unit

> from the sides and/or bottom of the unit because the base of the unit is below the water table. In this scenario, the CCR will be in continuous contact with water. This contact between the waste and groundwater provides a potential for waste constituents to be dissolved and to migrate out of (or away from) the closed unit.[39]

In evaluating its determination denying a closure extension request for Gavin Power, LLC's General James M. Gavin Plant in Ohio, EPA found that because the base of the impoundment intersects with groundwater, the closure plan would need to "have discussed the engineering measures taken to ensure that the groundwater had been removed from the unit prior to the start of installing the final cover system as required by 40 C.F.R §257.102(d)(2)(i)."[40] EPA further stated that "this provision applies both to the freestanding liquid in the impoundment and all separable porewater in the impoundment, whether the porewater was derived from sluiced water or groundwater that intersects the impoundment." EPA has stated this same position in its review of closure-in-place plans associated with closure extension requests for other plants where EPA contends the CCR is in contact with groundwater.[41]

Thus, in cases where ash in the CCR unit is in contact with the uppermost groundwater aquifer or is hydraulically connected to that

[39] U.S. Environmental Protection Agency, Proposed Denial of Alternative Closure Deadline for General James M Gavin Plant (January 11, 2022).

[40] Ibid.

[41] EPA has provided its site-specific analysis for a number of closure plans where the Agency has concluded that CCR is or is likely in contact with groundwater at https://www.epa.gov/coalash/coal-combustion-residuals-ccr-part-implementation (last accessed on August 2, 2022). The Clifty Creek plant in Indiana and the Ottumwa plant in Iowa are two additional examples. EPA emphasizes that closure-in-place plans for CCR units in contact with groundwater need to include appropriate engineering controls.

groundwater, significant engineering controls would need to be implemented to allow closure-in-place to comply with the 257.102(d)(1) closure-in-place performance standard. The feasibility and cost of these engineering measures is highly dependent on site-specific characteristics. For many of these units, these engineering solutions could result in uncertain effectiveness over the long post-closure period (i.e., decades) or could require cost expenditures that exceed those associated with closure by removal.

Q. CAN YOU DISCUSS WHETHER FAILURE TO MEET OTHER EPA LOCATION STANDARDS CAN ALSO RESULT IN THE NEED FOR ENGINEERING CONTROLS IN ORDER TO MEET THE CLOSURE-IN-PLACE PERFORMANCE STANDARDS?

A. It is certainly possible, but that determination would require a site-specific analysis. As an example, EPA provides significant detail in the April 2015 final rule preamble regarding the type of damage that can occur in seismic impact areas. That damage includes adverse impacts to engineered features including caps, dikes, slope integrity, liners, and leachate collection systems. Seismic motion can also adversely impact foundation soils. These types of impacts can also adversely impact closed CCR units, resulting in the inability of the unit to comply with the first closure-in-place performance standard to "control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere" without installation of engineering controls. Slope stability throughout the closure and post-closure

period is another specific closure-in-place standard as is prevention of movement of the final cover system. CCR units that fail to meet one or more location standards would need to ensure that each of these performance standards could be met, either with or without the installation of engineering controls.[42]

As another example, EPA provides detailed discussion in the CCR Rule preamble about the potential for adverse impacts of operational CCR units in wetlands. The Agency notes that these areas are "deserving of special protection because of their ecologic significance. Wetlands are very important, fragile ecosystems that must be protected, and EPA has long identified wetlands protection as a high priority."[43] EPA also discusses adverse impacts that can occur when closed units remain in wetlands. These types of impacts can include hydrologic alterations in the wetlands, drainage pattern changes that disrupt the sensitive wetlands environment, or erosion or migration of native wetland soils or muds that support the CCR unit. Again, a site-specific analysis is necessary to evaluate whether closure-in-place standards can be met in a reliable and cost-effective manner in a sensitive wetlands environment using appropriate engineering controls.

[42] In its preamble to the 2015 CCR Rule, EPA stated that for existing surface impoundments in seismic areas, "the Agency has been unable to find any way to retrofit or engineer the unit to be protective." (80 Federal Register 21302, 21365) This statement suggests challenges in meeting closure-in-place performance standards for closing CCR surface impoundment units in these locations.

[43] 80 Federal Register 21302, 21363.

Q. BASED ON YOUR EXPERIENCE, ARE THERE ANY OTHER REASONS THAT CLOSURE-IN-PLACE WOULD NOT BE A PRUDENT OPTION?

A. Decisions about closure are not made in a vacuum. The public often views leaving CCR in place unfavorably and the public's input plays an important and defined role in making closure determinations. Today, owners and operators must self-implement the provisions of the federal CCR Rule, including the provisions regarding public notice and posting of key rulemaking determinations.

In the preamble to the final rule, EPA discussed the importance of public participation for regulations promulgated under RCRA.[44] Also, to the extent citizens do not believe the documentation provided by regulated CCR owners and operators meet the federal rule requirements, citizens can participate directly through lawsuits under RCRA Section 7002. CCR units that fail to comply with the self-implementing requirements or that result in an imminent and substantial endangerment to public health or the environment face a risk of being subject to successful citizen suits. This provision encourages regulated entities to carefully consider public input as part of the self-implementing CCR regulations.

[44] 80 Federal Register 21302, 21310 (April 17, 2015). EPA cites to Section 6974(b) of RCRA noting that "public participation in the …implementation and enforcement of any regulation under this chapter shall be provided for, encourage, and assisted by the Administrator." In the CCR final rule preamble, EPA discusses the importance of state solid waste management planning for CCR and the role of public participation in developing those state plans under 40 CFR Part 256 RCRA regulations.

Public participation will also be incorporated into state and federal CCR permits.[45] EPA's interim guidance for state CCR permitting programs notes that "public participation plays an integral role in a state permitting program. A good public participation program will create an inclusive dialogue, allowing interesting parties to talk openly and frankly with one another about issues and search for mutually agreeable solutions to differences."[46] EPA further notes that this public participation should ensure that: (1) documents for permit determinations are made available for public review and comment; (2) final determinations on permit applications are made known to the public; and (3) public comments on permit determinations are considered.[47]

Both the public's preference for removal of CCR from older surface impoundments and the required public participation in CCR closure decisions makes closure-in-place a less viable option in some situations, including those where there is significant public concern about groundwater or surface water contamination or impacts on sensitive locations such as wetlands.

In addition to the public preference for excavation, closure-in-place may preclude the use of the land for other purposes. Closure-in-place requires the construction of a final cover system as well as post-closure requirements (e.g., ensuring the integrity of the final cover system, maintaining the integrity of

[45] EPA discusses its anticipated public participation program for federal CCR permits in its February 20, 2020 proposed regulation.

[46] U.S. Environmental Protection Agency, Coal Combustion Residuals State Permit Program Guidance Document: Interim Final (August 2017), p. 1-7.

[47] Ibid, p. 2-3.

leachate collection and removal systems, if required, and groundwater monitoring) for 30 years after the closure.[48] This may prohibit the owner or operator of the utility from utilizing the land for either new waste management units or for expansions to other plant facilities.

Additionally, closure-in-place requires the owner/operator to record a notation on the property deed in perpetuity that the land was used for a CCR unit.[49] This affects both the current owner/operator and any future landowners. EPA recognized the burden of the indefinite land restrictions and post-closure care obligations associated with closure-in-place and noted that this should create a further incentive for closure by removal, explaining its views on this topic in the 2015 federal CCR Rule preamble:

> Upon completion [of closure by removal], the unit is exempt from the groundwater monitoring and any other post-closure care requirements. In addition, the final rule adopts the proposal to allow the owner or operator to remove the deed notation required under § 257.102(i)(4), upon certification that clean closure has been completed. EPA proposed this option to create a further incentive for clean closure, and it is clear from the commenters, who uniformly supported this option, that it does so.[50]

[48] 40 CFR 257.104.

[49] 40 CFR 257.102(i).

[50] 80 Federal Register, 21302, 21412, April 17, 2015. I note that to complete closure by removal under the existing federal rule, the owner operator must demonstrate that groundwater monitoring concentrations do not exceed the groundwater protection standards in appendix IV of the rule (see 40 CFR 257.102). EPA has proposed to amend the existing rule and allow owners and operators to complete closure by removal and demonstrate the groundwater protection standard is met during a post-closure period (see 85 Federal Register 12456, March 3, 2020).

SECTION IV: APPLICATION OF FEDERAL CCR RULE CLOSURE REQUIREMENTS TO DEP FACILITIES

Q. IN YOUR OPINION, IF DEP'S CCR ASH PONDS WERE ONLY REQUIRED TO COMPLY WITH THE FEDERAL REGULATIONS, WOULD CLOSURE BY EXCAVATION BE REQUIRED OR BE THE MOST PRUDENT CLOSURE APPROACH?

A. Each of the surface impoundments that I was asked to evaluate is required to close under federal regulations separate and apart from the closure requirements imposed by South Carolina or North Carolina. DEP has developed closure plans for these units as required to comply with the federal regulations, which are currently self-implementing. Each of these impoundments do not meet federal liner requirements for existing CCR units and the units are not allowed to continue to operate. In addition, the surface impoundments do not meet one or more of the location standards under the federal regulations, again resulting in required closure. All of the CCR ash ponds I was asked to review are located within five feet of groundwater and several do not comply with other federal location restrictions that prohibit existing units from operating in wetlands, seismic impact areas, or unstable areas.[51]

While the federal regulations offer two options for closure, as discussed in the previous section of my testimony, certain performance standards must be met for an owner or operator to utilize the closure-in-place option. The analysis

[51] *See* reports at Duke Energy CCR Rule Compliance Data & Information, available at https://www.duke-energy.com/our-company/environment/compliance-and-reporting/ccr-rule-compliance-data (last accessed on August 2, 2022).

of whether a CCR unit can comply with the closure-in-place standards is a site-specific one. Many of the DEP CCR units have ash in contact with groundwater and cannot meet the first closure-in-place performance standard without extensive site-specific engineering. Others are located in seismic or unstable areas or in wetlands, each of which can create significant challenges for meeting one or more of the closure-in-place performance standards.

My review of the federal regulations, including the closure-in-place performance standards, in combination with the site-specific conditions and analysis outlined in the testimony of Witness Bednarcik, demonstrate that closure by removal of all or the vast majority of the CCR is the only closure approach that can reliably and cost-effectively meet the federal CCR closure performance standards.

As I have already discussed, the regulations require that for a closure-in-place, the unit be closed in a manner that will "control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of fluids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere."[52] EPA has interpreted this closure-in-place performance standard to preclude direct contact between the CCR and groundwater without the use of effective engineering controls.

All of the DEP surface impoundments I reviewed are less than five feet from groundwater and for most or all, some of the ash is in contact with

[52] 40 CFR 257.102(d)(1)(i).

groundwater. To close these site-specific surface impoundments in place would require extensive and costly engineering to prevent contact between ash and groundwater and to eliminate, to the maximum extent feasible, future releases of CCR or leachate. Even with these engineering controls, the cost of continuing to meet the performance standards during the post-closure period would remain uncertain.

Additionally, CCR units at the Sutton and Weatherspoon facilities are located in areas that present significant seismic impact and instability concerns that again create long-term engineering challenges that are costly and that may impose challenges for long-term cost-effective compliance with closure-in-place standards. The active ash basin at H. F. Lee is located in wetlands and in the 100-year floodplain, which can also result in long-term stability issues during major storms. This issue was specifically discussed in Witness Bednarcik's testimony with a discussion of recent hurricane impacts at this facility and the projections for increasing severity of storm events.

Witness Bednarcik has applied the site-specific facts to each of these CCR unit closures in her testimony. Based on my knowledge of the federal CCR requirements in conjunction with the site-specific analyses provided by Witness Bednarcik, closure by removal is a reasonable and prudent closure approach for the Company's ash ponds. The site-specific analyses demonstrate that closure-in-place would not be able to meet the federal closure performance standards over the decades-long post-closure period in an equally cost-effective and reliable manner.

Q. WHAT INFORMATION DID YOU RELY UPON TO REACH YOUR CONCLUSIONS THAT CLOSURE BY REMOVAL WAS A REASONABLE AND PRUDENT APPROACH FOR CLOSURE OF DEP'S SURFACE IMPOUNDMENTS?

I reviewed the technical reports prepared by the Company and the certifications from qualified professional engineers confirming whether or not each of the Company's CCR units met each of the federal location standards. [53] These location standards are an important input into my closure analysis because units that fail to meet location standards for environmentally protective continued unit operation can also require significant engineering controls to meet closure-in-place performance standards. I also reviewed the cost and feasibility analysis performed by Burns & McDonnell, an analysis that identified the types of engineering controls and other closure activities and associated costs necessary should the Company want to close each unit in place.[54] Additionally, I am aware of the strong public sentiment for closure by removal in both South Carolina and North Carolina, sentiment that has been fully embraced by regulatory agencies in each of these states as well as other states.[55] I also reviewed the Company's groundwater monitoring and corrective

[53] See reports at Duke Energy CCR Rule Compliance Data & Information, https://www.duke-energy.com/our-company/environment/compliance-and-reporting/ccr-rule-compliance-data (last accessed on August 2, 2022).

[54] Burns & McDonnell, Conceptual CCR Closure Cost Estimates Summary Report, August 2022. This report further supports my opinions regarding the nature and significant costs of the engineering controls required for closure-in-place at the ash ponds at issue in this matter.

[55] I also note that Virginia, a state that has adopted the federal CCR Rule, has required numerous CCR units to close by removal as has Georgia. In fact, Georgia, one of the first states to obtain EPA approval to implement the federal CCR program has required Georgia Power to close 19 surface impoundments

action reports for individual CCR units as well as the detailed site-specific closure analyses presented by Witness Bednarcik.

Q. IF DEP'S SURFACE IMPOUNDMENTS WERE CLOSED USING CLOSURE-IN-PLACE INSTEAD OF EXCAVATION, WOULD THE COSTS HAVE BEEN LESS?

A. For units closing in areas meeting all of EPA's location standards, closure-in-place can often be less expensive than closure by excavation. However, that situation does not describe the Company's closing CCR units. Thus, any cost comparison of closure options requires a site-specific comparative analysis.

For units that close in areas not meeting EPA's location standards, closure-in-place can be more expensive than closure by removal due to the costs of engineering controls required to meet closure-in-place performance standards. Also, for units that close with ash in place, this closure approach needs to consider the costs of post-closure care. Post-closure care includes costs over at least a 30-year period for maintaining the integrity of the final cover system, including any required maintenance, as well as the cost of operating and maintaining a compliant groundwater monitoring system. It also includes the operational and maintenance costs for any other engineering controls that

by excavation. Many of these are unlined impoundments that cannot meet the location restrictions, similar to DEP's surface impoundments. (*See* https://www.georgiapower.com/content/dam/georgia-power/pdfs/company-pdfs/AshPondClosures_072221.pdf (last accessed on August 2, 2022)). Similarly, Texas, which is also approved to implement the federal CCR program has required closure of a pond at the Calaveras Power Station that has less than five feet separation between the waste and the uppermost aquifer. (*See* CCR Unit Closure and Post-Closure Plan, CPS Energy, Calveras Power Station, prepared by ERM (October 14, 2016, Amended December 14, 2020); Location Restrictions Demonstration – CCR Rule 40 CFR §257.60-64, prepared by ERM, (October 2018). Thus, impoundment closure decisions mandating closure by excavation are being made by states approved to implement the federal CCR rule.

are needed to meet the closure-in-place performance standards (e.g., slurry walls, groundwater pump and treat systems).

In addition, leaving the CCR in place, even when meeting the required performance standards for closure-in-place at the time of closure, does not avoid the possibility of future releases from the surface impoundment during the post-closure period that could trigger the need to perform additional groundwater investigation and corrective action if future releases exceed protective standards. The cost of corrective action, including extensive groundwater evaluation, is always uncertain and dependent upon site-specific facts such as the hydrogeologic conditions at the site and the types of contaminants.

These costs are made even more uncertain by the potential for new, emerging contaminants that can drive unexpected cleanup costs or the possibility that more stringent risk-based contaminant standards can evolve over time. Therefore, companies may factor the uncertainty of future releases into the comparative prudence of their closure choices. Based on site-specific factors, additional upfront costs associated with excavation can be offset by lower post-closure costs and reduced future liability associated with the possibility of future releases requiring corrective action.

In fact, owners and operators of CCR impoundments are choosing to close by removal even in site-specific situations where the CCR impoundment meets all the location restrictions and could potentially be closed in place. In the example I provided earlier from Texas, the Calaveras Power Station has

other impoundments that were found to meet the location restrictions but are being closed by removal.[56] Based on preliminary compliance data submitted under the CCR Rule, at least 207 surface impoundments located outside of South Carolina and North Carolina are closing (or planning to close) by ash removal.[57] A significant number of these surface impoundments were determined by their owners/operators to meet the EPA surface impoundment location standards. Therefore, the closure by removal appears to be a choice made by those owners/operators that in many site-specific situations, closure by removal was the more prudent approach.

The Company had Burns & McDonnell perform a comparative cost and feasibility analysis for closure-in-place versus closure by removal using site-specific information at the individual CCR units at this in this matter. The results of that evaluation support my opinion that closure by removal can frequently be less expensive once engineering controls necessary to meet a closure-in-place performance standard are included in the cost estimates. Importantly, one must perform a probabilistic analysis to incorporate the potential for significant groundwater corrective action costs resulting from site-specific factors that could adversely impact the long-term effectiveness of selected engineering controls.

[56] CCR Unit Closure and Post-Closure Plan, CPS Energy, Calveras Power Station, prepared by ERM (October 14, 2016, Amended December 14, 2020); Location Restrictions Demonstration – CCR Rule 40 CFR §257.60-64, prepared by ERM, (October 2018).

[57] See https://earthjustice.org/features/coal-ash-contaminated-sites-map (last accessed on August 2, 2022). These data were last updated as of October 2020 according to the website.

Q. HAVE YOU CONSIDERED THE FACT THAT THE FEDERAL CCR RULE MAY HAVE GIVEN THE COMPANY ADDITIONAL TIME TO COMPLETE CLOSURE OVER THE CLOSURE TIME FRAMES SELECTED BY THE COMPANY? IF TRUE, WOULDN'T THAT HAVE REDUCED THE COMPANY'S CLOSURE COSTS?

A. While the Company has proceeded with some CCR unit closures in advance of federally mandated closure dates, one cannot conclude that earlier closure completion equates to more expensive closure costs. While there are potential savings in closing later because the money would have been expended later and therefore discounted due to the time value of money, there are other factors that could more than offset this discount. As an example, work completed prior to 2022 was not subject to the significant inflation that is present today.

Another key factor is the availability and cost of engineers and contractors to perform the work. As the federal regulations trigger closures under a set of specified deadlines, the demand for closure services will inevitably increase and the corresponding cost is likely to increase as well. In addition, it is not uncommon for environmental regulations and requirements to increase in stringency as time passes. There is no guarantee that additional closure or post-closure requirements will not be put in place if a closure is conducted later in time, thereby increasing costs. Delaying closure can also increase the probability of corrective action requirements and costs, depending upon site-specific factors.

SECTION V: BENEFICIAL REUSE OF CCR

Q. PLEASE DESCRIBE BENEFICIAL USE OF CCR.

A. Beneficial use of CCR includes the reuse of CCR in various applications, including as a raw material in cement manufacturing, in manufacturing wallboard, or as structural fill meeting certain EPA-issued requirements. Beneficial use can reduce the amount of CCR being stored in ash ponds and can create alternatives to the disposal of CCR during ash pond closure. Since the 1980s, EPA has been a proponent of beneficial coal ash reuse because the practice can reduce the use of virgin resources, lower greenhouse gas emissions, reduce the cost of coal ash disposal, and add improved strength and durability to product materials.

Q. HAS EPA SUPPORTED BENEFICIAL USE OF CCR?

A. EPA has consistently supported the reuse of all types of wastes when done in an environmentally safe manner. The safe reuse of wastes replaces the use of virgin materials including the environmental impact of extracting and processing these virgin materials. EPA often refers to this as "sustainable materials management," noting that:

> How our society uses materials is fundamental to our economic and environmental future. Global competition for finite resources will intensify as world population and economies grow. More productive and less impactful use of materials helps our society remain economically competitive, contributes to our prosperity and protects the environment in a resource-constrained future.[58]

[58] See https://www.epa.gov/smm/sustainable-materials-management-basics (last accessed on August 2, 2022).

With respect to the beneficial use of CCR, EPA has emphasized these same benefits in the preamble to the final 2015 CCR Rule:

> CCR can be substituted for many virgin materials that would otherwise have to be mined and processed for use. These virgin materials include limestone to make cement and Portland cement to make concrete; mined gypsum to make wallboard, and aggregate, such as stone and gravel for uses in concrete and road bed. Using virgin materials for these applications requires mining and processing, which can impair wildlife habitats and disturb otherwise undeveloped land. It is beneficial to use secondary materials – provided it is done in an environmentally sound manner – that would otherwise be disposed of, rather than to mine and process virgin materials, while simultaneously reducing waste and environmental footprints. Reducing mining, processing and transport of virgin materials also conserves energy, avoids GHG emissions and reduces impacts on communities.[59]

EPA, in fact, quantified the benefits of the beneficial use of CCR at the time of the final federal rule (2015) and estimated that it resulted in: (1) 53,054,246 MMBtu per year in energy savings; (2) 1,661,900 million gallons per year in water savings; (3) 11,571,116 tons per year in greenhouse gases (i.e., carbon dioxide and methane) emissions reductions; and (4) 45,770 tons of criteria air pollutant (i.e., nitrogen oxides, sulfur dioxide, particulate matter, and carbon monoxide) emissions reductions.[60]

EPA also noted the benefits from reducing the amount of CCR that must be disposed of in landfills: "Beneficially using CCR instead of disposing of it

[59] 80 Federal Register 21329 (April 17, 2015).

[60] Ibid.

in landfills and surface impoundments also reduces the need for additional landfill space and any risks associated with their disposal."[61]

Q. HOW DID EPA ADDRESS BENEFICIAL REUSE IN THE CCR RULE?

A. EPA has always viewed the reuse of materials as an important objective of RCRA. The conservation of materials is inherent in the name of the statute itself (Resource Conservation and Recovery Act), and Congress quite clearly articulated this objective when it passed RCRA:

> (c) Materials. The Congress finds with respect to materials that -- (1) millions of tons of recoverable material which could be used are needlessly buried each year; (2) methods are available to separate usable materials from solid wastes; and (3) the recovery and conservation of such materials can reduce the dependence of the United States on foreign resources and reduce the deficit in its balance of payments.[62]

In adopting regulations under RCRA, including those addressing CCR, EPA has always kept this objective in mind to be applied in conjunction with the protection of human health and the environment from the management of waste materials.

Consistent with this objective under RCRA, prior to the issuance of the CCR Rule, EPA had made a regulatory determination in 2000 that the federal regulation of the beneficial use of coal combustion was not warranted and therefore EPA exempted beneficial use from regulation.

> The Agency has concluded that no additional regulations are warranted for coal combustion wastes that are used

[61] Ibid.

[62] 42 U.S.C. §6901(c). The statute defined "Resource conservation" as the "reduction of the amounts of solid waste that are generated, reduction of overall resource consumption, and utilization of recovered resources" and "Resource recovery" as "the recovery of material or energy from solid waste."

> beneficially (other than for minefilling) and for oil and gas combustion wastes. We do not wish to place any unnecessary barriers on the beneficial use of fossil fuel combustion wastes so that they can be used in applications that conserve natural resources and reduce disposal costs. [63]

In adopting the final CCR rule, EPA reconfirmed its determination that regulation of beneficial use is not warranted for most uses but did restrict the use of unencapsulated CCR (i.e., CCR that is not bound to a solid matrix, like concrete) when placed on the ground in large quantities.[64] In making this decision, EPA again confirmed the benefits of beneficial use:

> Finally, EPA does not wish to inhibit or eliminate the measurable environmental and economic benefits derived from the use of this valuable material given the current lack of evidence affirmatively demonstrating an environmental or health risk.[65]

While EPA rules do not mandate the beneficial reuse of CCR, they recognize and encourage that under the oversight of state authorities, beneficial reuse projects can and should be pursued. EPA has a current website on coal ash reuse that summarizes the Agency's support for it. On that website, EPA states:

[63] 65 Federal Register 32214, 32221 (May 22, 2000).

[64] 40 CFR §257.53. EPA specified that beneficial use of CCR must meet the following conditions to be exempt from federal regulation: (1) The CCR must provide a functional benefit; (2) The CCR must substitute for the use of a virgin material, conserving natural resources that would otherwise need to be obtained through practices, such as extraction; (3) The use of the CCR must meet relevant product specifications, regulatory standards or design standards when available, and when such standards are not available, the CCR is not used in excess quantities; and (4) When unencapsulated use of CCR involving placement on the land of 12,400 tons or more in non-roadway applications, the user must demonstrate and keep records, and provide such documentation upon request, that environmental releases to groundwater, surface water, soil and air are comparable to or lower than those from analogous products made without CCR, or that environmental releases to groundwater, surface water, soil and air will be at or below relevant regulatory and health-based benchmarks for human and ecological receptors during use.

[65] 80 Federal Register 21330 (April 17, 2015).

"The Agency is working to provide tools to assist states and beneficial users with their beneficial use evaluations."[66]

Additionally, EPA provided an explicit incentive for entities to beneficially use CCR as a key management approach as part of unit closure by delaying the commencement of CCR unit closure for those units incorporating a significant beneficial use component in their closure plan. EPA explained the importance of beneficial reuse and its rationale in the preamble to the 2015 CCR Rule:

> The Agency also agrees with those commenters that supported delaying the commencement of closure of a CCR unit if substantial quantities of CCR are removed from the CCR unit for the beneficial use of the waste. This could include, for example, removal of CCR from a CCR unit followed by its use as a partial replacement for Portland cement. As discussed in Unit IV.B of this preamble, EPA has identified significant benefits from reducing the disposal volumes of CCR in CCR landfills and CCR surface impoundments, including the reduced risks associated with the practice of CCR disposal, benefits from reducing the need to mine and process virgin materials, and energy and greenhouse gas benefits. EPA finds these potential benefits compelling and is therefore revising the closure requirements in the rule to accommodate the removal and beneficial use of CCR. EPA has therefore revised the rule to provide that closure of an otherwise idled CCR unit is not immediately triggered, as long as the owner or operator is removing substantial quantities of CCR from the unit. However, once removal of CCR for beneficial use is no longer taking place, the rule would require the owner or operator to initiate closure of the CCR unit.[67]

[66] *See* Coal Ash Reuse | US EPA; - Frequent Questions about the Beneficial Use of Coal Ash | US EPA (last accessed on August 2, 2022).

[67] 80 Federal Register 21302, 21416, April 17, 2015. The rule language is in 40 CFR 257.102(e)(1) and (e)(2).

Q. IN THE EPA STATEMENT YOU CITED, EPA MENTIONS THE ECONOMIC BENEFITS ASSOCIATED WITH BENEFICIAL USE. PLEASE ELABORATE ON THESE ECONOMIC BENEFITS.

A. While I am not an expert on the market demands for the beneficial use of CCR or the costs associate with beneficial reuse projects, I do know that EPA has long understood that there are real economic benefits. These benefits are perhaps best illustrated by the amount of CCR beneficially reused today as it is an indication of the robust market for beneficial use and the financial opportunities associated with beneficial reuse projects. In the 2015 final CCR Rule, EPA estimated that 40 percent of all CCR was beneficially used.[68] As such beneficial reuse is typically not mandated by regulation, this robust market indicates that power companies realize financial benefits from beneficial reuse.

The American Coal Ash Association ("ACAA") estimated that the percentage of CCR beneficially reused increased even further and reached a record 64 percent in 2017. ACAA estimated that over 71 million tons of CCR was beneficially reused in 2017, including over 24 million tons of fly ash and over 4 million tons of bottom ash.[69] This market may grow even further as new

[68] 80 Federal Register 21302, 21303 (April 17, 2015).

[69] See National Association of Regulatory Utility Commissioners, A Comprehensive Survey of Coal Ash Law and Commercialization (January 2020), which includes a summary of the ACAA survey data and discussion on coal ash beneficial reuse, including continued government work on expanding future beneficial uses (pp. 54 to 62). Also see ACAA, An American Recycling Success Story: Beneficial Use of Coal Combustion Products, available at 21-ACAA-Brochure.pdf (acaa-usa.org). Also see Appendix C of an October 2021 paper by Eric Dixon. The Appendix deals with coal ash reuse, repairing-the-damage-coal-ash-reuse-appendix.pdf (ucsusa.org). Figure 2 includes coal ash reuse for different reuse categories between 2009 and 2019. Encapsulated uses have increased significantly while unencapsulated uses have decreased.

uses for CCR are commercialized. Therefore, beneficial use is a financially viable option for CCR management and can be a preferable approach consistent with the joint material conservation and environmental protection goals of RCRA.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.