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RE: Supplemental Comments on the Cayuga Generating Station Ash Pond System Modified Closure & Post-Closure Plan

Dear Mr. Kreke,

The undersigned organizations are submitting supplemental comments on the Duke Energy Indiana, LLC ("Duke Energy") Modified Closure & Post-Closure Plan for the ash pond system at the Cayuga Generating Station ("Closure Plan"). The signatories submitted initial comments on the Closure Plan on July 24, 2017 ("2017 Comments"). In those comments, the signatories argued among other points that Duke Energy's plan to leave coal ash permanently sitting in groundwater at Cayuga violates the federal closure standard incorporated into Indiana law. *See* 2017 Comments at 6-9; 40 C.F.R. § 257.102(d) ("Closure Performance Standard"). Last December, IDEM sent a Request for Additional Information ("RAI") to Duke Energy reflecting that it agrees that it "cannot approve a closure plan that would leave CCR in place without a description of how the plan controls, minimizes, or eliminates post-closure infiltration and releases 'to the maximum extent feasible.'" RAI at 1.

IDEM is correct. At Cayuga, Duke cannot provide any such description precisely because closing in place the ash lagoons—ash lagoons that are sitting in groundwater—does not and cannot "control[], minimize[], or eliminate[]" post-closure infiltration and releases, as required by federal and Indiana law. *See* 40 C.F.R. § 257.102(d)(1)(i); 329 I.A.C. 10-9-1(b).[1] The Closure Plan also does not, and cannot, meet the requirements to prevent future impoundment of water and eliminate free liquids from the ash prior to closure. We submit these supplemental comments to rebut Duke Energy's meritless arguments to the contrary in its response to the RAI dated February 15, 2019. We focus on the legal arguments Duke Energy presents in Attachment 1 to its response ("Duke Memorandum"). None of Duke's arguments can overcome the plain text of the Closure Performance Standard: leaving ash in the water table after closure is illegal.

[1] 40 C.F.R. Part 257, Subpart D (the "Coal Ash Rule") was originally promulgated in 2015. *See* 80 Fed. Reg. 21,302 (Apr. 17, 2015). Indiana incorporated the Coal Ash Rule by reference "for the operations *and closure*" of coal ash impoundments on December 7, 2016. *See* 20161207-IR-329160217FRA (Dec. 7, 2016) (codified at 329 I.A.C. 10-3-1; 10-9-1) (emphasis added). As a result, Indiana now has "the authority to ensure compliance and take enforcement action if necessary to ensure protection of human health and the environment." *See* 20160601-IR-329160217FDA (June 1, 2016).

I. The coal ash impoundments at Cayuga Generating Station sit below the water table and will continue to contaminate groundwater indefinitely if left in place.

Duke Energy's Cayuga Generating Station ("Cayuga") has produced millions of tons of toxic coal ash over its nearly fifty-year operating life. For all those decades, Duke Energy has been dumping coal ash generated at Cayuga into large, unlined water-filled pits, resulting in approximately 10.7 million cubic yards of ash at the site.[2]

The coal ash lagoons at Cayuga – including the Lined Ash Disposal Area, the Primary Ash Settling Basin, and the Secondary Ash Settling Basin – were carved into the earth right next to the Wabash River, an iconic river of great importance to Indiana. As a result, the ash lagoons at Cayuga are sitting in groundwater year-round. As Anthony Fleming, licensed professional geologist in Indiana, stated in a letter-report attached to signatories' 2017 Comments ("Fleming Letter"): "even under the most optimistic scenarios . . . the normal water table level will stand as much as 15 feet above the base of the [coal ash] in about half of the landfilled [coal ash]." *Id.* at 5. The water table fluctuations that saturate, dry, and then re-saturate much of the coal ash at Cayuga generate an "ongoing source" of leachate that is transported by the "large-scale" lateral flow of groundwater to the Wabash River and other parts of the sand and gravel aquifer underlying the ash ponds. *Id.* at 2.

The Cayuga ash ponds also sit on top of bedrock that is likely permeable, as evidenced in part by the fact that the town of Newport, just two miles downstream, has developed drinking water wells in the same bedrock formation. *See* Fleming Letter at 9-10. If the bedrock underlying Cayuga is indeed permeable, that means that the toxic contaminants leaching into the groundwater at the site may be transported not only into the sand and gravel aquifer immediately beneath the ash ponds, but also into that underlying bedrock.

Given the demonstrated and pervasive contact between the coal ash and the uppermost aquifer, groundwater contamination at Cayuga is inevitable and ongoing. The signatories to these comments presented evidence of the widespread contamination along with their 2017 Comments, *see* 2017 Comments at 2-3, and the latest data reinforce the extent of contamination. The federal groundwater monitoring reports for calendar years 2017 and 2018, neither of which were available at the time of the 2017 Comments, both provide further evidence of the releases of coal ash constituents into the groundwater at Cayuga. The reports are attached as exhibits to these comments.[3]

In 2017, multiple contaminants exceeded the federal groundwater protection standards. Molybdenum, in particular, registered as high as 2000 µg/L in a February 2017 sampling,[4] twenty times

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[2] Closure Plan at 8.

[3] *See* ATC, CCR Annual Groundwater Monitoring and Corrective Action Report: Ash Pond System: Cayuga Generating Station (Jan. 21, 2019) ("2018 Impoundments Report") (attached as Ex. 1); ATC, CCR Annual Groundwater Monitoring and Corrective Action Report: Lined Ash Disposal Area: Cayuga Generating Station (Dec. 27, 2017) (attached as Ex. 2); ATC, CCR Annual Groundwater Monitoring and Corrective Action Report: Primary Ash Settling Pond: Cayuga Generating Station (Dec. 28, 2017) ("2017 Primary Pond Report") (attached as Ex. 3); ATC, CCR Annual Groundwater Monitoring and Corrective Action Report: Secondary Ash Settling Pond: Cayuga Generating Station (Dec. 28, 2017) (attached as Ex. 4).

[4] 2017 Primary Pond Report at 620.

higher than the federal standard of 100 µg/L.[5] As part of a nationwide analysis of 2017 utility groundwater data, the Environmental Integrity Project concluded that Cayuga's impoundments showed levels of antimony, arsenic, boron, cobalt, lithium, molybdenum, and sulfate well in excess of health-based EPA standards and advisories.[6] The data in Duke's 2018 groundwater monitoring report tell a similar story. This past year, Duke found exceedances of the groundwater protection standard of 10 µg/L for arsenic at two wells, with well A-22 showing an astounding 240 µg/L.[7] Molybdenum registered exceedances at a total of four wells.[8] Boron levels also exceeded the EPA health-based standard of 3 mg/L,[9] while well A-22 registered lead levels as high as 270 µg/L, almost twenty times above the federal standard of 15 µg/L.[10]

In the October 2018 sampling, which was not included in the 2018 Impoundments Report,[11] Duke detected statistically significant exceedances of groundwater protection standards for a slew of toxic pollutants, including arsenic, cadmium, chromium, cobalt, lead, lithium, molybdenum, selenium, thallium, and radium at one or more Cayuga disposal units,[12] and now must conduct an assessment of corrective measures to clean up that widespread pollution.[13] In short, there is abundant evidence that contact with the uppermost aquifer is causing releases of coal ash constituents into the groundwater at Cayuga.

II. The plain text of the Closure Performance Standard compels the interpretation adopted by IDEM and the signatories.

Coal ash ponds at Cayuga may only be closed in compliance with the federal Closure Performance Standard, incorporated by reference into Indiana law. As explained below, at least three separate provisions of the standard prohibit leaving coal ash in place where it will continue to be inundated with groundwater after closure. Duke Energy's attempts to distort the plain meaning of these provisions fail.

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[5] 40 C.F.R. § 257.95(h)(2)(iv).
[6] Environmental Integrity Project, *Coal's Poisonous Legacy: Groundwater Contaminated by Coal Ash Across the U.S.* (Mar. 4, 2019) (attached as Ex. 5), at 56.
[7] 2018 Impoundments Report at 40.
[8] *See id.* at 35, 47 (wells A-25, A-27, A-28, and A-29).
[9] U.S. EPA, 2018 Edition of the Drinking Water Standards and Health Advisories Tables (March, 2018) (showing a Child Health Advisory of 3 mg/L for boron), https://www.epa.gov/sites/production/files/2018-03/documents/dwtable2018.pdf; *see* 2018 Impoundments Report at 39 (well A-23 exceedance).
[10] *See id.* at 41.
[11] *See id.* at 1.
[12] *See* Notice of Groundwater Protection Standard Exceedance: Lined Ash Disposal Area (attached as Ex. 6); Notice of Groundwater Protection Standard Exceedance: Primary Ash Settling Pond (attached as Ex. 7); Notice of Groundwater Protection Standard Exceedance: Secondary Ash Settling Pond (attached as Ex. 8).
[13] *See* Notice of Initiation of Assessment of Corrective Measures: Lined Ash Disposal Area (attached as Ex. 9); Notice of Initiation of Assessment of Corrective Measures: Primary Ash Settling Pond (attached as Ex. 10); Notice of Initiation of Assessment of Corrective Measures: Secondary Ash Settling Pond (attached as Ex. 11).

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A. *The Requirement to Control Infiltration and Releases*

The first provision of the Closure Performance Standard requires operators to "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." 40 C.F.R. § 257.102(d)(1). Before examining the individual requirements this provision creates, it is important to observe two overall aspects that Duke seeks to distort.

First, the language of the provision embraces all aspects of closure, not merely the construction of the final cover. The regulatory text uses the inclusive phrase "closed in a manner that." The plain meaning of "in a manner" comprises everything about how an operator chooses to close a coal ash dump. Nevertheless, Duke Energy argues repeatedly that this entire provision—indeed, the entire Closure Performance Standard—addresses only "the design, installation, and performance of the cap, not what happens underneath it or groundwater contamination." Duke Memorandum at 3. Because this position lacks any textual support, Duke Energy resorts to adding words to the regulations in italicized font: "paragraph (d)(1) sets out general requirements to address: (i) infiltration of liquids *through the cap*; (ii) impoundment of liquids *on top of the cap*." *Id.* (emphasis in original). Yet neither of these italicized phrases appears in the regulations, despite Duke's insistence otherwise. The text of the Closure Performance Standard does not support any limitation to the performance of the final cover alone.

Second, the provision requires a closure plan to "[c]ontrol, minimize, or eliminate, to the maximum extent feasible" both "infiltration" and "releases" as two freestanding requirements. Duke seeks to avoid this point and elide the two requirements, again through misquoting the regulations: "[40 C.F.R. § 102(d)(1)(i)] speaks to preventing 'to the maximum extent feasible,' the post-closure infiltration of liquids into the waste <u>(*i.e.*, through the final cover system) to</u> prevent releases of CCR or contaminated runoff 'to the ground or surface waters or the atmosphere.'" Duke Memorandum at 5 (emphasis added). None of the underlined text appears in the Coal Ash Rule. Duke replaces the original *and* with the preposition *to* in an apparent attempt to pull a David Copperfield on the limits on "releases" and make them disappear. Duke has no magic wand. In reality, both infiltration and releases must be controlled, minimized or eliminated. Duke Energy's Closure Plan will not prevent either because groundwater will continue to pass freely through the ash after closure.

1. <u>"Post-Closure Infiltration of Liquids into the Waste"</u>

The horizontal movement of groundwater into the waste after an impoundment has been capped in place constitutes post-closure infiltration of liquids. Infiltration is the noun derived from "to infiltrate," which means "to enter, permeate, or pass through a substance or area by filtering or by insinuating gradually."[14] As in statutory interpretation, "the plain words of the regulation" are the first interpretive source, followed by "any relevant interpretations of the [agency.]" *Bowles v. Seminole Rock & Sand Co.*, 325 U.S. 410, 414 (1945). Absent evidence to the contrary within the regulation itself, it is safe to assume that words take their ordinary, colloquial meaning—not some different technical

[14] Merriam-Webster, https://www.merriam-webster.com/dictionary/infiltration.

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meaning. *Cf. F.D.I.C. v. Meyer*, 510 U.S. 471, 476 (1994) ("In the absence of [a statutory] definition, we construe a statutory term in accordance with its ordinary or natural meaning.").[15]

On its face, the language of the Closure Performance Standard does not suggest any limit on where liquids infiltrate from. In particular, the standard does not restrict itself to water coming from above through the post-closure cover, nor does it suggest that "liquids" excludes groundwater. Notably, EPA does not define the term "infiltration" in 40 C.F.R. § 257.53 or the more general definitions section at *id.* § 257.2. IDEM concluded correctly, then, that "'infiltration' can come from any direction, and it is not limited to liquids that pass through the final cover system." RAI at 1. This straightforward argument is fatal to Duke Energy's position.

In addition, specific regulatory history of the provision in question supports a broad understanding of "infiltration" that includes groundwater. The direct precursor to the first provision of the Closure Performance Standard is 40 C.F.R. § 265.111(b), the closure performance standard for interim status hazardous waste units. As EPA stated in the preamble to the Coal Ash Rule, the Closure Performance Standard "is modeled after the closure performance standard applicable to interim status hazardous waste units under § 265.111." 80 Fed. Reg. at 21,413. In 1996, EPA issued a site-specific variance under this provision and used the words "infiltrate" and "infiltration" in reference to groundwater:

> It is not clear to EPA that leaving the sludge in the Surge Pond at CITGO is a technically feasible alternative, due in particular to the volume of standing water in the impoundment, plus the fact that the water table at the site is high and so may *infiltrate* into the unit. Nevertheless, EPA cannot now rule out the possibility that leaving some or all of the untreated sludge in the Surge Pond could be allowed through some combination of draining all liquids, using chemical treatment to stabilize sludge so that a cap could be supported, and *building some type of below-ground barrier to prevent infiltration*.

61 Fed. Reg. 55,718, 55,723 (Oct. 28, 1996) (emphasis added). EPA clearly understood "infiltration" to embrace the horizontal movement of groundwater.

Duke Energy, disregarding both the plain meaning and this specific regulatory history, turns to a series of external sources to argue that "infiltration" has a technical meaning that excludes groundwater. First, Duke points to two passages of the 2014 Risk Assessment that discuss "infiltration" in terms of the vertical movement of liquids. *See* Duke Memorandum at 7. Duke is cherry-picking. Although "infiltration" is sometimes used in that sense, there are many other places in the Risk Assessment where "infiltration" refers generally to migration of water out of surface impoundments into the groundwater. *See* Risk Assessment at 2-3, 4-1, 4-6, 4-8. In other words, the Risk Assessment did not use a consistent technical definition of the term. Moreover, the examples Duke identifies come from a discussion of

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[15] *See also Carmichael v. The Payment Ctr., Inc.*, 336 F.3d 636, 640 (7th Cir. 2003) ("Without a statutory definition, we construe the term 'in accordance with its ordinary or natural meaning,' a meaning which may be supplied by a dictionary.").

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hydrogeological modeling buried deep in the appendices. They do not reveal much about the intent of the Coal Ash Rule's drafters.

Even less probative is the grab bag of other documents from outside the RCRA context that Duke Energy cites next. Canvassing the entire universe of hydrogeological research, Duke found four documents where "infiltration" is defined to mean vertical movement of liquids. *See* Duke Memorandum at 10. The documents include a 1998 EPA report on how to model "infiltration rate in the vadose zone," a FEMA report on modeling for flood insurance purposes, and two technical treatises produced by third-party authors. *Id.* Duke provides no evidence that EPA was attempting to reference these documents when it wrote the Coal Ash Rule.

Finally, Duke turns to a passage from the preamble to the Coal Ash Rule where EPA discusses how the Closure Performance Standard applies to the design of the final cover: "Under this performance standard, if the cover system results in liquids infiltration or releases of leachate from the CCR unit, the final cover would not be an appropriate cover." Duke Memorandum at 6 (quoting 80 Fed. Reg. at 21,413). This statement, however, does not imply that the Closure Performance Standard relates *exclusively* to the final cover. A simpler explanation for why the rule's preamble focused largely on the final cover, and one that does not conflict with the regulatory text, is that commenters on the proposed rule focused their attention on the specific cover requirements rather than the general performance standard. As EPA stated, "EPA received no significant comments on the proposed performance standards." 80 Fed. Reg. at 21,414. All the commenters' focus was on what became 40.C.F.R. § 257.102(d)(3), the technical requirements for the final cover.[16] It makes no sense to interpret the scope of the Closure Performance Standard based on which aspects of it provoked the most controversy during the comment period.

2. "Releases of CCR, Leachate, or Contaminated Run-Off to the Ground or Surface Waters or to the Atmosphere"

The plain text of the Closure Performance Standard also makes clear that it governs releases of coal ash and coal ash leachate to groundwater: The Closure Plan as a whole must control, minimize, or eliminate "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)(i). "Releases of leachate" unambiguously includes migration of leachate into groundwater, including groundwater that is inundating coal ash. As discussed above, *see supra* Section I, it is indisputable that such releases are pervasive and ongoing at Cayuga as a result of the contact between coal ash and groundwater.

Extensive regulatory history supports this interpretation. Again, EPA based this provision on the interim status hazardous waste regulations at 40 C.F.R. § 265.111. That provision prohibits the "post-closure *escape* of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere." *Id.* § 265.111(b) (emphasis added). The language of these two provisions is practically identical, the sole difference being

[16] *See* 10 EPA, Comment Summary and Response Document: Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities; Proposed Rule: Closure and Post-Closure Care (Dec. 2014) (attached as Ex. 12).

the Closure Performance Standard's use of "releases" rather than "escape." As a result, IDEM can look to past interpretations of § 265.111 to understand whether coal ash may be left sitting in groundwater.

In fact, EPA has consistently interpreted § 265.111 to ban the closure-in-place of hazardous waste in groundwater. In a February 8, 1988, memorandum, the Director of the Office of Solid Waste approved regulatory action to prevent a closure-in-place pursuant to § 265.111. An official in Region V described the situation at the impoundment:

> We do not believe that [the facility] can adequately demonstrate that they can minimize or eliminate the post-closure escape of hazardous constituents to the groundwater (as required by the Closure Performance Standard) simply due to the expectation that *the stabilized wastes will lie within the aquifer after closure* has been completed.

Regulatory Interpretation of the Closure Performance Standard, OSWER Directive No. 9476.00-13, Haz. Waste & Haz. Subst. Compl. ¶ 504 (C.C.H), 2015 WL 7710403 (emphasis added). The Director agreed, stating: "the 264.111/265.111 performance standard can be invoked to require additional actions." *Id.* Thus, EPA has already applied the language in question to prevent waste from sitting in groundwater. In a 1989 technical guidance document, EPA explained that a cover is not effective on its own if the waste is sitting in groundwater: "*Where the waste mass lies entirely above the zone of ground-water saturation*, a properly designed and maintained cover can prevent, for all practical purposes, the entry of water into the closed unit . . . ." EPA Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments, EPA Report No. 530-SW-89-047, at 5 (July 1989). Conversely, if the waste is inundated by groundwater, a cover on its own would not control releases.

Duke Energy does not even mention § 265.111 let alone address the preceding history in its response. Duke instead relies on a misreading the phrase "to the ground or surface waters or to the atmosphere." Duke literally rewrites this passage in paraphrase to read "to the ground, surface waters, or the atmosphere." Duke Memorandum at 5. Armed with this misquotation, Duke then argues that EPA "does not mention groundwater" and that the provision only prohibits releases to the ground. *Id.*

This reading is implausible. First, as set forth above, EPA has already read the same language in § 265.111 to prohibit "the post-closure escape of hazardous constituents to the *groundwater*." 2015 WL 7710403 (emphasis added). Moreover, Duke Energy misunderstands or ignores basic English syntax. The phrase EPA used—"to the ground or surface waters or to the atmosphere"—is a disjunction of two items: "ground or surface waters" and "atmosphere." In the first item, "ground" modifies "waters" to create "groundwater." In contrast, in a list of three items—as Duke would have it—standard usage dictates an "X, Y, or Z" construction. Tellingly, this is the construction Duke Energy used when it misquoted the regulation. *See* Duke Memorandum at 5. Furthermore, EPA's use of the preposition "to" only twice, not three times, underlines that the regulation identifies two items, not three. Duke Energy cannot rewrite the Coal Ash Rule as it pleases. The regulation applies to releases to groundwater, and it cannot be met when waste is left sitting in groundwater.

3. "To the Maximum Extent Feasible"

EPA's use of the phrase "to the maximum extent feasible" emphasizes that coal ash must be removed from groundwater to prevent infiltration and releases. Feasibility in this context refers exclusively to physical possibility without any consideration of cost. EPA's own language in the preamble to the Coal Ash Rule uses "feasible" interchangeably with "possible." For example, EPA explains that "while it is *possible* to transport dry ash off-site to [an] alternate disposal facility[,] that simply is not *feasible* for wet-generated CCR. . . . As noted previously, the law cannot compel actions that are *physically impossible* . . . ." 80 Fed. Reg. at 21,423.

Moreover, incorporating cost considerations into the regulatory standard would likely violate the Resource Conservation and Recovery Act, 42 U.S.C. § 6901 *et seq*. RCRA was designed as a risk-based statute, unlike other major environmental laws, such as the Clean Air Act, that were primarily technology-based and included cost in the statutory mandate. *See, e.g.*, *Chem. Mfrs. Ass'n v. U.S. EPA*, 217 F.3d 861, 862 (D.C. Cir. 2000) ("The Clean Air Act . . . , foregoing RCRA's risk-based approach in favor of technology-based regulation, directs EPA to establish emission standards for hazardous air pollutants based on the 'maximum achievable control technology' . . . ."). The D.C. Circuit recently reiterated this holding in *Util. Solid Waste Activities Grp. v. Envtl. Prot. Agency*, 901 F.3d 414 (D.C. Cir. 2018). One of industry's claims in that litigation was that the Coal Ash Rule's "alternative closure" exemption is unlawful because it considers only whether normal closure is physically impossible, as opposed to costly or inconvenient. *Id.* at 448. The court rejected the challenge because "[u]nder any reasonable reading of RCRA, there is no textual commitment of authority to the EPA to consider costs in the open-dump standards." *Id.* at 448-49.

"To the maximum extent feasible" refers only to physical possibility. Because it is possible for Duke Energy to excavate its ash from groundwater, it must do so in order to comply with the Closure Performance Standard.

B. The Requirement to Preclude Future Impoundment of Water

The fact that coal ash would remain saturated in groundwater also means that Duke Energy cannot comply with the requirement to "[p]reclude the probability of future impoundment of water, sediment, or slurry." 40 C.F.R. § 257.102(d)(1)(ii). The future impoundment of water is not only a "probability" but in fact a certainty because the bases of the Cayuga impoundments sit below the water table.

Nevertheless, Duke Energy argues that this provision refers only to "the impoundment of water, sediment, and slurry *on top of* the final cover system, not underneath it." Duke Memorandum at 4 (emphasis in original). But the plain meaning of "preclude," not limited in the regulatory text to surface water, prohibits all impoundment at whatever location. Again, italicizing words does not make them part of the regulatory text, however fervently Duke might repeat them. Duke's other argument, that "sediment" and "slurry" only occur above ground and constrain the meaning of "water," also fails. First, EPA frequently uses the term "CCR slurry" to refer to a mixture of coal ash and water below the ground surface, such as that present in the Cayuga ash dumps when they are soaked with groundwater. *See* 80 Fed. Reg. at 21,327, 21,361, 21,374, 21,452. Moreover, "water" is not a vague term in need of clarification or limitation to be practicable. "Water" embraces all water, including groundwater.

C. The Requirement to Eliminate Free Liquids and Ensure Stability

Duke Energy's plan to leave coal ash sitting in groundwater indefinitely also violates the requirements that "prior to installing the final cover system": "(i) Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues," and "(ii) Remaining wastes must be stabilized sufficient to support the final cover system." 40 C.F.R. § 257.102(d)(2). Although Duke Energy quotes this language a handful of times in passing, nowhere in its memorandum does Duke analyze what these provisions of the Closure Performance Standard require.

The elimination of free liquids necessarily requires removing ash from groundwater. The Coal Ash Rule defines "free liquids" as "liquids that readily separate from the solid portion of a waste under ambient temperature and pressure." *Id.* § 257.53. By way of comparison, EPA distinguishes wet CCR from "conditioned CCR." The agency explains that conditioning CCR "means wetting CCR with water to a moisture content that will prevent wind dispersal, but will not result in free liquids." *See id.* § 257.80(b)(2). Thus, coal ash that is merely damp does not contain free liquids, but coal ash inundated with groundwater does. The Closure Performance Standard does not permit Duke Energy to install a final cover before eliminating these free liquids.

Nor does the Closure Plan ensure that the "remaining wastes" will be "stabilized sufficient to support the final cover system." As EPA has observed, wet ash is structurally unstable. In the preamble to the Coal Ash Rule, EPA highlighted the instability of wet coal ash with regard to the practice of siting new coal ash landfills on top of existing coal ash impoundments, known as "overfills." EPA explained that the Coal Ash Rule would prohibit this practice, specifically citing the risk of building atop wet ash:

> A foundation composed of unconsolidated materials, such as CCR that is susceptible to slip-plane failure, is an unstable area (man-made) and, under provisions of this rule, is therefore a prohibited location for new CCR units. The TVA Kingston ash fill failure was at least partly attributable to *slip-plane failure of saturated CCR* that made up the subgrade and foundation beneath the unit.

80 Fed. Reg. at 21,373 (emphasis added); *see also* 40 C.F.R. § 257.70(a)(2) (requiring complete closure of underlying impoundment in accordance with the closure performance standards before construction of an overfill landfill.

In fact, the prohibition on building atop surface impoundments unless they have closed in accordance with the Closure Performance Standard implies that leaving saturated ash in place *per se* violates the Closure Performance Standard. EPA has found, as quoted above, that wet ash is unstable and thus landfills must not be built on top of wet ash. *See* 80 Fed. Reg. at 21,373; *see also* 40 C.F.R. § 257.64(a) (prohibiting the construction of new landfills in unstable areas). If the Closure Performance Standard allowed saturated ash, then it would be permissible to construct new landfills on top of saturated ash. *See id.* § 257.70(a)(2). But, as EPA explicitly stated, it did not intend this result. Thus, EPA must have understood the Closure Performance Standard to mandate stable, dry ash upon closure.

At Cayuga, Duke Energy's consultants have recognized the risk of post-closure instability in noting that there is "potential for liquefaction of the sluiced ash deposits underlying the dikes" of the so-

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called "lined ash disposal area."[17] Indeed, Duke Energy essentially admits this structural deficiency in its Closure Plan: "It is anticipated that the ponded ash will settle in some areas under the weight of the structural fill . . . as well as the final cover itself."[18] A final cover would be at significant risk of sagging, dislodging, or cracking if the subsurface ash gave way. Because the proposal calls for saturated ash to be left in place, the Closure Plan does not meet the stabilization requirements. Duke Energy does not address this danger in its response.

III. The structure of the Coal Ash Rule as a whole bolsters the plain meaning of the Closure Performance Standard.

The Closure Performance Standard works in concert with other provisions of the Coal Ash Rule to ensure that groundwater does not remain in contact with coal ash. Most notably, the uppermost aquifer location restriction requires operators of existing surface impoundments to "demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table)." 40 C.F.R. § 257.60(a). Operators of existing surface impoundments were required to make such a demonstration by October 17, 2018.[19] At Cayuga, both the Primary and Secondary Ash Settling Ponds failed to meet the aquifer separation requirement.[20] An existing impoundment that fails to demonstrate compliance with the five-foot aquifer separation must close by October 31, 2020 "in accordance with the requirements of § 257.102," that is, the Closure Performance Standard. *Id.* § 257.101(b)(1).[21]

It would be illogical if an impoundment were required to close because of its proximity to groundwater, but then the Closure Performance Standard allowed it to remain in contact with groundwater indefinitely. EPA's description in the preamble of "the conditions . . . that [the aquifer] location criterion was designed to prevent" highlights this contradiction:

> [W]here the groundwater elevation is high enough to intersect the base of the waste management unit . . . this hydraulic connection can enhance the transport of contaminants of concern from the CCR unit into groundwater.
> . . .
>
> In some recent damage cases, placement of large volumes of CCR into highly permeable strata in the disposal area promoted CCR-water

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[17] Initial Structural Stability Assessment for the Lined Ash Disposal Area (signed Oct. 30, 2016) (attached as Ex. 13), at 2.
[18] Closure Plan at 27.
[19] CCR units that submitted closure notices by December 17, 2015 have until April 16, 2020 to comply. 40 C.F.R. § 257.100(e)(2)(i)(A).
[20] *See* Placement Above the Uppermost Aquifer: Primary Ash Settling Pond (Sept. 28, 2018) (attached as Ex. 14); Placement Above the Uppermost Aquifer: Secondary Ash Settling Pond (Sept. 28, 2018) (attached as Ex. 15).
[21] Note that this deadline was extended to the October 31, 2020 date by the Phase I, Part 1 revisions to the Coal Ash Rule. *See* 83 Fed. Reg. 36,435, 36,440-41 (July 30, 2018). The original deadline was six months after the failure to demonstrate compliance.

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> interactions. . . . Placement of CCR into un-engineered, unlined units in permeable strata has plainly led to adverse impacts to groundwater.

80 Fed. Reg. at 21,362. "Closing" coal ash impoundments while allowing coal ash to remain in groundwater would do nothing to alleviate these dangerous conditions. The existence and purpose of the aquifer location restriction leave little choice but to conclude that the Closure Performance Standard bans leaving coal ash in groundwater.

The Closure Performance Standard also complements the corrective action requirements set forth at 40 C.F.R. §§ 257.96-.98 to ensure groundwater protection. Under the original Coal Ash Rule, when an unlined impoundment contaminated groundwater to a statistically significant level, it had not only to initiate corrective action but also to close, either by removal or in accordance with the Closure Performance Standard.[22] The regulations explicitly state that the two requirements supplement each other—neither displaces the other:

> If an assessment of corrective measures is required . . . and if the CCR unit is an existing unlined CCR surface impoundment as determined by § 257.71(a), then the CCR unit is subject to the *closure requirements* under § 257.101(a) to retrofit or close. *In addition*, the owner or operator must prepare a notification stating that an assessment of corrective measures has been initiated.

40 C.F.R. § 257.95(g)(5) (emphasis added). Thus, EPA intended both closure and corrective action requirements to apply to unlined, leaking impoundments.

Duke Energy, ignoring this additive structure, argues that the corrective action requirements displace the Closure Performance Standard: "These provisions, which protect groundwater, including any groundwater that may come into contact with ash, would be superfluous if the CCR rule precluded groundwater from touching ash following closure." Duke Memorandum at 6.

Duke's argument has a number of problems. First, EPA made clear in the regulatory text cited above that it intended *both* standards to apply in situations where corrective action is triggered at unlined impoundments. EPA made this point in the preamble as well: "in addition to complying with all of the corrective action requirements—i.e., initiating an assessment of corrective measures, followed by selection of a remedy and implementation of a corrective action program—if the unit is an unlined surface impoundment, it must either retrofit or initiate closure." 80 Fed. Reg. at 21,406.

EPA's position makes sense because, contrary to Duke's argument, the corrective action provisions would not be "superfluous" if the Closure Performance Standard precluded contact with water. Duke ignores the many situations where corrective action would be required but not closure, and vice-versa. Units must close for reasons other than contaminating the groundwater, whether because they violate a location restriction, fail to meet structural stability requirements, or simply have stopped receiving wastes. *See* 40 C.F.R. § 257.101. Conversely, a landfill or lined impoundment that

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[22] In the wake of the D.C. Circuit's decision in *USWAG v. EPA*, not only leaking impoundments but all unlined impoundments will be required to close. *See* 901 F.3d at 430.

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contaminates groundwater but meets location and stability standards must conduct corrective action, but need not close. *See id.* § 257.101(d).

Moreover, even where both closure and corrective action requirements apply—i.e., unlined surface impoundments—the standards are not coterminous. Corrective action requirements are more numerous and broader than both the Closure Performance Standard and the closure standard for closure by removal. For example, while removal is complete when "groundwater monitoring concentrations do not exceed the groundwater protection standard" for Appendix IV (assessment monitoring) constituents, *id.* § 257.102(c), under the corrective action requirements, operators must assess measures "to prevent further releases, to remediate any releases and to restore affected area to *original conditions*." *Id.* § 257.96(a) (emphasis added). Corrective action, in some circumstances, may force greater clean-up than closure by removal. Because the corrective action provisions may apply when closure requirements do not and include broader mandates than the closure standards, they are not "superfluous" to the closure standards, nor do they demand an interpretation of the Closure Performance Standard that is contrary to its plain language and purpose.

Besides being legally incorrect, Duke Energy's argument that selection of a closure method chronologically precedes consideration of corrective action makes no practical sense. *See* Duke Memorandum at 8 (arguing that an operator must first "close the CCR unit" and "then, if groundwater is contaminated . . . implement corrective action"). The closure plan and corrective action must be evaluated in tandem, not in succession, because they are interconnected. Duke's proposed sequence would cause operators to incur costs capping their impoundments only to have to excavate them later to achieve source control. EPA has made this exact point in the hazardous waste context:

> It is also important that the closure process is consistent with any corrective action process that may be required in the future. In the case of these two surface impoundments, your memorandum indicates that releases are currently occurring and that these releases would not be minimized if closure were performed with significant amounts of waste in place. Corrective action to address such releases could necessitate removal of the waste. If this occurred after capping, *the action would be seriously complicated and substantial resources would have been wasted on the cap.*

2015 WL 7710403 (emphasis added). As EPA has observed before, closure and corrective action are interrelated and mutually reinforcing, not duplicative or redundant.

IV. Duke Energy's argument that closure by removal is not "feasible" after groundwater has been contaminated is belied by statements by EPA and Duke and by Duke's conduct.

Duke Energy's final argument relies on a faulty analogy to the hazardous waste context and is belied by Duke's own conduct. As set forth above, EPA's primary model regulation for the Closure Performance Standard was the interim status hazardous waste performance standard codified at 40 C.F.R. § 265.111. *See* 80 Fed. Reg. at 21,413 ("[40 C.F.R. § 257.102(d)] is modeled after the closure performance standard applicable to interim status hazardous waste units under § 265.111."). The regulatory history of this provision conclusively demonstrates that leaving waste sitting in groundwater after closure is not permissible under that closure-in-place standard. Neither, therefore, is it legal under the Coal Ash Rule.

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Entirely ignoring § 265.111, Duke instead attempts to analogize from § 264.228 and § 265.228, hazardous waste closure performance standards specific to surface impoundments that were never mentioned, let alone cited, in the preamble to the Coal Ash Rule. *See* Duke Memorandum at 11-12. Like the Coal Ash Rule, these provisions provide standards for both closure-in-place and closure-by-removal, also known as "clean closure." The standard for clean closure of hazardous waste impoundments is difficult to meet. Under § 264.228(c), if an operator attempts removal, but then "waste residues or contaminated materials" prove impossible to remove in their entirety, the operator must at that point convert to closure-in-place and undertake post-closure care. *See id.* Duke accurately quotes an EPA memorandum regarding § 265.228 in which the agency stated that, if "ground-water contamination is evident," then "clean closure is probably not a feasible option." Duke Memo at 12 (quoting Letter from Marcia E. Williams, Office of Solid Waste, to Robert E. Greaves, Waste Management Branch, Region III (Jan. 1, 1987), 1987 WL 417185). Even in such a scenario, however, an operator would still need to make "all reasonable efforts to comply with [the] closure plan and to remove or decontaminate all residues and contaminated subsoils." *See* 47 Fed. Reg. 32,274, 32,320-21 (July 26, 1982).

Duke Energy then makes the unjustified leap that clean closure is similarly impracticable or unlawful for *coal ash* impoundments where groundwater contamination is evident. *See* Duke Memorandum at 12. Duke argues that because *some* coal ash contaminants may remain even after removal, it has no obligation to remove *any* coal ash at closure. As stated above, that is not the rule—even for hazardous waste impoundments. The fact that an operator will need to undertake post-closure care of a hazardous waste unit does not obviate its responsibility to remove hazardous waste.

Moreover, Duke Energy's purported analogy relies on a basic legal error. Under the Coal Ash Rule, closure by removal is lawful for coal ash impoundments, even if groundwater has been contaminated, as long as concentrations after removal "do not exceed the groundwater protection standard." 40 C.F.R. § 257.102(c) (setting forth the closure performance standard for closure by removal). In the preamble to the Coal Ash Rule, EPA expressly permitted some lingering contamination as long as it would not cause exceedances of groundwater protection standards:

> As part of attaining this standard, facility owners and operators will need to document that any contaminants left in the subsoils (*i.e., contaminated groundwater left in soils below the former landfill or impoundment*) will not impact any environmental media including groundwater, surface water, or the atmosphere in excess of Agency-recommended limits or factors.

80 Fed. Reg. at 21,412 (emphasis added). It is permissible to leave some coal ash residues as long as their impacts are negligible. This differential treatment of hazardous waste and coal ash fatally undermines Duke's argument on this point.

In fact, in a separate part of its legal memorandum, Duke Energy is eager to make this very argument about the Coal Ash Rule's relatively lax standard for closure by removal. Citing the passage of the preamble quoted above, Duke argues that "contaminated subsoils and groundwater may remain after the CCR and all contaminated liners have been removed from the closing unit" and that "EPA determined that it was not appropriate to require owners and operators to clean up soils to background levels to meet the closure-by-removal performance standard." Duke Memorandum attach. at 2 (PDF page 18). Duke cannot have it both ways; only Duke's second position is correct. Closure by removal of

coal ash impoundments is feasible and permissible even where there has been some groundwater contamination.

Not only has Duke made inconsistent statements on this subject, but also Duke's conduct flatly contradicts its argument that closure-in-place is the only "feasible option" when coal ash is "in contact with groundwater." Duke Memorandum at 12. Although Duke is claiming today that it cannot legally remove ash if groundwater is contaminated, Duke is actively planning to remove ash at many sites where it admits there is contamination. At Cayuga, for instance, Duke proposes to close the Secondary Ash Settling Pond by removal. *See* Closure Plan at 4, 21, 24. Duke also admits that releases from the Secondary Ash Settling Pond have caused violations of the groundwater protection standards in downgradient wells.[23] Nationwide, Duke Energy plans to close by removal at least twenty unlined impoundments where groundwater contamination is present. They are presented in the table below.[24]

Duke Energy Plant	**State**	**CCR Unit(s)**
Cayuga Generating Station	IN	Secondary Ash Settling Pond
Gallagher Generating Station	IN	Ash Pond A
Gibson Generating Station	IN	North Settling Basin
Wabash River Generating Station	IN	Ash Pond A, Secondary Settling Pond
Asheville Steam Electric Plant	NC	1982 Ash Basin, 1964 Ash Basin
Buck Steam Station	NC	Additional Primary Pond (Ash Basin 1), Primary Pond (Ash Basin 2), Secondary Pond (Ash Basin 3)
Cliffside Steam Station	NC	Inactive Units 1 - 4 Basin
Dan River Steam Station	NC	Primary Ash Basin, Secondary Ash Basin
H.F. Lee Energy Complex	NC	Active Ash Basin
L.V. Sutton Energy Complex	NC	1971 Ash Basin, 1984 Ash Basin
W.H. Weatherspoon Power Plant	NC	1979 Ash Basin
H.B. Robinson Steam Electric Plant	SC	Ash Basin
W.S. Lee Steam Station	SC	Primary Ash Basin, Secondary Ash Basin

Duke Energy apparently does not believe its own argument as to the infeasibility of removal when ash is in contact with groundwater.

V. Conclusion

None of the arguments that Duke Energy presents in its legal memorandum rebuts the plain meaning of the Closure Performance Standard. IDEM has correctly interpreted the Closure Performance Standard to prohibit leaving coal ash in place where groundwater will continue to infiltrate and

[23] *See* Exs. 8, 11.

[24] The signatories assembled this information by examining the closure plans and groundwater monitoring notices available on Duke's publicly accessible Internet site: https://www.duke-energy.com/our-company/environment/compliance-and-reporting/ccr-rule-compliance-data. Duke announced its plans to conduct closure by removal at thirty-four ash basins nationwide in a press release and accompanying factsheet dated November 11, 2016. *See* Duke Energy, *Safe Basin Closure Update: Duke Energy Posts Coal Ash Basin Closure Plans* (Nov. 11, 2016), https://news.duke-energy.com/releases/safe-basin-closure-update:-duke-energy-posts-coal-ash-basin-closure-plans, https://www.duke-energy.com/_/media/pdfs/our-company/ash-management/safebasintable.pdf.

contaminants will continue to release into the groundwater. In addition, leaving ash in groundwater violates the requirements to prevent future impoundment of water and eliminate free liquids from the ash. Because the ash ponds at Cayuga sit below the water table, these standards are not attainable under Duke Energy's current Closure Plan. Based on the foregoing analysis, the undersigned reiterate their position that Duke Energy's Closure Plan for the Cayuga Generating Station violates both state and federal law.

Sincerely,

Kerwin Olson
Executive Director
Citizens Action Coalition

Jesse Kharbanda
Executive Director
Hoosier Environmental Council

Jenny Cassel
Henry Weaver
Coal Program Attorneys
Earthjustice

Exhibits (via disc)

Cc (via e-mail): Rebecca Holwerda, Policy Director for Energy and Environment, Office of the Governor
Bruno Pigott, Commissioner, IDEM
Peggy Dorsey, Assistant Commissioner, OLQ
Corey Webb, Deputy Assistant Commissioner, OLQ
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