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November 27, 2017

Ms. Rebecca Joniskan
Office of Land Quality
Indiana Department of Environmental Management
100 N. Senate Avenue
MC 65-45 IGCN 1101
Indianapolis, IN 46204-2251

Subject: EPA Response to CCR Impoundment Closure Questions

Dear Ms. Joniskan:

Duke Energy Indiana, LLC. (DEI) respectfully submits to the Indiana Department of Environmental Management (IDEM) this letter and attachments to address U.S. Environmental Protection Agency (U.S. EPA) responses to questions that relate to DEI CCR impoundment Closure and Post Closure Plans that are being reviewed by IDEM. While the question and answer document was taken off of the U.S. EPA website, DEI would like to provide our interpretation of the CCR Rule with regard to the same issues. DEI appreciates your consideration of this analysis and these important issues as we move through the process to secure approval of our closure plans, which will achieve expeditious basin closure in an environmentally safe manner consistent with the requirements of the CCR rule.

If you have any questions or would like to discuss these issues further, please contact me at Personal Matters / Ex.

Sincerely,
Duke Energy Indiana, LLC

Owen R. Schwartz
Lead Environmental Specialist
EHS CCP Waste & Groundwater Programs

Attachments

In a document titled "Questions from IDEM" ("Q & As") dated October 25, 2017, EPA responds to certain questions Duke Energy understands may have been verbally presented to EPA staff by IDEM earlier that month. On or around November 1, 2017, EPA posted the Q & As to its "Frequent Questions about Groundwater Monitoring and Corrective Action and Implementing the Final Rule Regulating the Disposal of Coal Combustion Residuals (CCR)" Web site, but within a few days, the agency removed them from the site. Although EPA has not explained the reason for this change, we believe this action may have been taken in light of the fact that certain interpretations set out in the Q & As are not in accord with a plain reading of the CCR rule's regulatory text, its preamble, and underlying EPA documents. Duke Energy specifically addresses EPA's responses to questions 1, 3, 4, and 5 in the Q & As.

Question 1

To be sure, although all of the Q & As were taken down from the Web site, some of them were in accord with the CCR rule. For example, Duke Energy concurs with EPA's responses to Q1 regarding the meaning of "retrofit" and whether an owner or operator may construct a new non-CCR surface impoundment in the location of a CCR surface impoundment after all CCR and areas that may have been contaminated by CCR have been removed prior to meeting the groundwater protection standards for all Appendix IV constituents. In fact, EPA's interpretation is consistent with the legal analysis titled "Construction of a New Non-CCR Wastewater Pond within the Footprint of a Former CCR Surface Impoundment" (*see* Attachment "1"), which Duke Energy provided to IDEM on September 8, 2017. *Compare* EPA's conclusion in response "A1(a)" ("[T]he CCR rule does not prohibit the construction of a non-CCR surface impoundment in the location, while closure by removal is progressing. However, . . . the owner/operator must ensure that construction of the new non-CCR unit does not impact the ability to meet the closure requirements for the CCR surface impoundment.") *with* Duke Energy's analysis on pp. 2 and 3 of Attachment "1" ("Nothing in the rule prohibits [constructing a new non-CCR wastewater pond in the location of an excavated unit once the CCR and all liners contaminated with CCR waste and CCR waste leachate have been removed], so long as Duke Energy takes appropriate steps to ensure that construction of the new non-CCR wastewater pond will not hinder or frustrate any measures required to meet the groundwater protection standard.").

Question 3

In the response to Q3, EPA repeats the language of the CCR rule and correctly explains that 40 C.F.R. Part 257 "does not require any particular documentation of soil testing," although a state may require more. In discussing the two closure-by-removal

performance standards, EPA explains on p. 21412 of the preamble that the first standard requires the owner and operator to "remove all wastes from the closing unit, and remove all liners contaminated with CCR waste and CCR waste leachate . . . . [and] to remove and decontaminate all areas affected by releases from the CCR unit." This "would require removal or decontamination of the underlying and surrounding soils." EPA further explains that "[o]nce a facility has removed the waste and any liner, the presumption is that the source of contamination has been removed as well."

The second performance standard, "specifies that closure has been completed when all CCR in the unit and any areas affected by releases from the CCR unit have been removed [*i.e.*, the first performance standard] and groundwater monitoring demonstrates that" Appendix IV constituents do not exceed the groundwater protection standards (*i.e.*, the second performance standard). Critically, EPA explains the following on p. 21412:

> [F]acility 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. *Typically, any metals in these "subsoils" in excess of background levels are allowed to either naturally attenuate, or are removed by flushing.*

(Emphasis added.) The underlined language above clearly evinces EPA's understanding that contaminated subsoils and groundwater may remain after the CCR and all contaminated liners have been removed from the closing unit pursuant to the first performance standard of Section 257.102(c). In such circumstances, as indicated in the italicized language above, the owner or operator must take those actions necessary to meet Section 257.102(c)'s second performance standard. Whether this is monitored natural attenuation or something more, such as groundwater extraction and treatment, will be determined by a site-specific analysis, which must consider, *inter alia*, groundwater monitoring data and the hydrogeology of the site.

As a final matter, it is important to note 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. As EPA explained on p. 21412 of the preamble:

> In practice, EPA does not routinely require complete removal of all contamination (that is, cleanup to 'background') from a closing unit even for hazardous waste units. Requiring CCR units to clean up soils to levels before the site was contaminated, would be more stringent than current hazardous waste policies. There is no basis in the current record to impose provisions for the remediation of

> CCR units that are more stringent than those imposed on hazardous wastes.

In other words, owners and operators of CCR surface impoundments should not be held to a higher closure standard when closing units used to store and treat CCR—a non-hazardous waste—than owners and operators closing hazardous waste units. In order to satisfy the requirements of Section 257.102(c), owners and operators must do two things: (1) satisfy the first performance standard—remove the CCR and contaminated liners, then (2) satisfy the second performance standard—remediate the groundwater, as necessary, to meet the groundwater protection standards for Appendix IV constituents. To the extent any CCR is in contact with groundwater, it will be addressed by the owner or operator under the second performance standard.

Questions 4 and 5

EPA's responses to Q4 are not supported by the CCR rule, and the response to Q5 addressed an issue that was settled this past August when EPA revised that portion of its December 2016 guidance addressing closure in the context of submerged ash in groundwater. In response "A4(a)," EPA indicated that the word "infiltration," as used in Section 257.102(d)(1)(i) "refers to any kind of movement of liquids into the waste unit," including "any liquid passing into or through the CCR unit by filtering or permeating from any direction, including the bottom of the unit." However, the entirety of Section 257.102(d) contains the "[c]losure performance standard when leaving CCR in place," and all of its provisions in paragraphs (d)(1), (2), and (3) are intended to address the design, installation, and performance of the cap, not what happens underneath it.

Specifically, 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; (iii) – stability "of the final cover system"; (iv) – "miniminiz[ation] of the need for further maintenance of the CCR unit"; and (v) – completion of installation "consistent with recognized and generally accepted good engineering practices." Considered together, these five qualitative requirements make clear that the purpose of paragraph (d)(1) is to ensure that the final cover system is properly designed, installed, and maintained to prevent the impoundment of liquids on top of and the infiltration of liquids through the cap.

Paragraph (d)(2) goes further by detailing precisely what actions owners and operators must take "prior to installing the final cover system" to ensure that the final cover system functions properly and maintains its integrity, as required under paragraphs (d)(1)(iii)-(v): (i) eliminate free liquids, and (ii) stabilize the remaining wastes "to support the final cover system."

Finally, paragraph (d)(3) sets out the precise technical requirements that must be met to meet the qualitative requirements set out in paragraphs (d)(1)(i)-(ii). Specifically, (i) contains the design criteria of the final cover system setting out (A) permeability requirements (1×10^{-5} cm/sec), (B) measures to reduce infiltration ($\geq$ 18" of earthen material, (C) measures to reduce erosion ($\geq$ 6" of earthen material), and (D) measures to

maintain the integrity of the final cover system. Thus, consideration of the closure-by-removal performance standards in their entirety makes clear that they are intended to ensure (i) against the infiltration of liquids through the top of the cap and the impoundment of liquids, sediment, and slurry on top of the cap; and (ii) the integrity of the final cover system.

Paragraph (d)(1)(i) of Section 257.102 speaks to preventing "to the maximum extent feasible," the post-closure infiltration of liquids into the waste (*i.e.*, through the final cover system) to prevent releases of CCR or contaminated runoff "to the ground or surface waters or the atmosphere." Again, the performance standard is speaking to the performance of the final cover system, which, as discussed above, is the central feature of the closure-in-place option, and its effectiveness in preventing liquids from infiltrating the cover and causing CCR contained in the closed unit from being released or leaching to the ground, surface waters, or the atmosphere. Critically, the standard does not mention groundwater, or even suggest that it cannot be met if CCR is in contact with groundwater. When the rule refers to the term groundwater elsewhere in the rule, it specifically uses the single word—"groundwater." But in paragraph (d)(1)(i), contrary to the statement in response "A(4b)," the rule's use of the definite article "the" before "ground" underscores that the standard is referring to releases—such as contaminated run-off from the cover system—to the ground or surface waters.

Language in the rule's preamble addressing the closure-in-place performance standard further underscores the fact that the focus of Section 257.102(d) is on the prevention of infiltration of liquids through the cap and the integrity of the final cover system. On p. 21413, EPA states the following:

> [A] facility must ensure that in designing a final cover for a CCR unit they account for any condition that may cause the final cover system not to perform as designed. This could include accounting for site conditions that may increase the likelihood that a cover would be susceptible to desiccation cracking or settlement cracking. 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.

Thus, when referring to the standard concerning the post-closure infiltration of liquids into the waste, EPA speaks directly to site-specific conditions that could cause the final cover system to fail, thereby allowing liquids infiltration or releases of contaminated runoff. The fact that EPA describes these events as occurring in the context of a cracked cover makes clear that the performance standards are intended to address what is occurring on top of and through the cap, not underneath it.

Indeed, a review of EPA's use of the term "infiltration" throughout the preamble reveals that the agency is consistently talking about the passage of liquids through the top of the cover when referring to this term. For example, on p. 21370, EPA explains that the soil component of a composite liner system "serves as a backup in the event of any leakage/infiltration from the geomembrane occurs," while the geomembrane "provides a highly impermeable layer that can . . . minimize infiltration of leachate in a CCR

surface impoundment." Similar usage appears on p. 21370, where EPA explains that uncontrolled storm water run-on "may have significant impacts on the . . . continued safe operation of the CCR landfill, due to such phenomena as erosion and infiltration." And in describing "run-off," EPA explains it is the "portion of rainwater, snowmelt, or other liquid which does not undergo abstraction, such as infiltration, and travels overland." In these and in every other instance of the word "infiltration," EPA is referring to the movement of liquids into the unit from above and never in terms of the horizontal migration of groundwater beneath the unit's cover system.

Likewise, the requirement in Section 257.102(d)(1)(ii) that a closed unit "[p]reclude the probability of future impoundment of water, sediment, or slurry," refers to the impoundment of water, sediment, and slurry on top of the final cover system, not underneath it. Although neither "sediment" nor "slurry" is defined under the CCR rule, the common definition of "sediment" is "[f]inely divided solid material that settles to the bottom of a liquid," and "[t]he deposition of such material onto the surface beneath this water or air." And "slurry" is commonly defined as "[a] thin mixture of a liquid, esp[ecially] water, and any of several finely divided substances, [such] as cement, plaster of Paris, or clay particles." EPA's use of these terms along with the term "water" demonstrates that the standard is intended to preclude the deposition of materials on top of the cap of a closed unit, whether brought by water or other elements. The words indicate that the standard does not address the lateral migration of groundwater underneath the final cover system.

Section VI.M.3.a. of the rule's preamble, addressing closure in place, discusses the final cover system and explains the following:

> To address the commenters' concerns that the final cover system may not function effectively as designed over the long term under certain circumstances, the rule also includes a performance standard that any final cover system must meet. This standard is modeled after the closure performance standard applicable to interim status hazardous waste units under § 265.111. <u>The final rule requires that any final cover system control, minimize or eliminate, to the maximum extent practicable, post-closure infiltration of liquids into the waste and releases of leachate (in addition to CCR or contaminated run-off) to the ground or surface waters.</u>

(Emphasis added.)

The preamble to the proposed rule for interim status hazardous waste units describes the standard in Section 265 .111 (underlined above) as a "general closure performance standard." EPA explains in the proposal that it was proposing to incorporate into the general standard a reference to the specific closure standards included in Section 265.228 (closure and post-closure care for surface impoundments), under which owners and operators of hazardous waste units would have two options for closure: (1) excavate

(similar to under Section 257.102(c) of the CCR rule); or (2) "[c]lose the impoundment and provide post-closure care" (similar to Section 257.102(d) of the CCR rule). Under the second option (closure with waste in place), owners and operators of hazardous waste units must:

- Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues;
- Stabilize remaining wastes to a bearing capacity sufficient to support the final cover; and
- Cover the surface impoundment with a final cover designed and constructed to:
    - provide long-term minimization of the migration of liquids through the closed impoundment;
    - function with minimum maintenance;
    - promote drainage and minimize erosion or abrasion of the cover;
    - accommodate settling and subsidence so that the cover's integrity is maintained; and
    - have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.
- During the post-closure care period:
    - maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events;
    - maintain and monitor the leak detection system;
    - maintain and monitor the groundwater monitoring system; and
    - prevent run-on and run-off from eroding or otherwise damaging the final cover.

All of these requirements—requirements on which the CCR rule's closure performance standards were closely modeled—considered in their totality further support the conclusion that EPA's focus is on the integrity of the cover system and on preventing the migration of liquids through the top of the cap, not underneath it.

In response "A(4c)" of the withdrawn guidance, reference was made to a hypothetical situation where "a CCR surface impoundment . . . extends into the ground water table." However, as in the response to Q5, the guidance reintroduced a concept that EPA fully addressed in an August 2017 revision of its interpretive guidance wherein the agency deleted the language referencing closure of a portion of a unit "submerged in the underlying aquifer." Likely recognizing that, contrary to the plain language and intent of the rule, the earlier guidance from December 2016 incorrectly conflated the rule's closure requirements with its corrective action provisions, EPA deleted the entirety of the example and made clear that

> [b]oth clean closure and closure with waste in place can be equally protective, provided that the requisite performance standards are met. If the performance standards for clean closure and the performance standards for closure with waste in place can be met, an owner or operator may

> determine which alternative is appropriate for their particular unit.

See Attachment "2" for a redlined comparison of EPA's revised guidance.

Indeed, nowhere does the CCR rule address saturated ash as a factor that must be considered when determining the method of basin closure. In fact, the closure-in-place option recognizes that CCR may remain in contact with groundwater upon completion of closure. In preparing its 2014 *Human and Ecological Risk Assessment of Coal Combustion Residuals* in support of the rule, on pp. 5-10 to 5-11, EPA specifically considered the potential implication of groundwater-saturated CCR and concluded that "this uncertainty is unlikely to have an appreciable effect" on the agency's risk assessment. On p. 21440 of the rule's preamble, EPA specifically addresses a commenter's concern over the fact that the risk assessment modeled all disposal sites above the water table and did not take into account that "many surface impoundments and landfills are deep and can come in direct contact with the water table." Stating that it believes "the commenter misunderstood how the sediments were modeled for surface impoundments," EPA explains that the model "can accommodate surface impoundments in direct contact with the water table."

The foregoing makes clear that EPA was well aware that surface impoundments with ash in contact with groundwater existed, yet it chose not to require that they be closed by removal or to establish a set of performance standards specific to those units. That EPA did not intend such a result is reflected in the fact that although it chose, pursuant to Section 257.101(b)(1), to force existing CCR surface impoundments not constructed with a base that is located at least five feet above the upper limit of the uppermost aquifer (or unable 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) to close, it did not set out any separation from aquifer requirements in Section 257.102's closure performance standards. EPA was silent with respect to this issue because it determined that to the extent the CCR surface impoundment extends into the groundwater table, if levels of any Appendix IV constituents are in excess of the groundwater protection standards, this issue will be addressed through natural attenuation or other methods of removal based on groundwater monitoring and other site-specific factors. Surely, when EPA intends to impose a requirement, it knows how to do so. *See e.g.*, § 257.101(b)(1) (requiring that within six months of determining that an existing CCR surface impoundment has not demonstrated compliance with the location standard for placement above the uppermost aquifer, the owner or operator must close the unit). The fact that the closure performance standards under Section 257.102 in no way speaks to the issue of ash being in contact with groundwater indicates that EPA did not intend for this to be a factor when determining the method of closure under the CCR rule.

That EPA did not intend for the existence of ash in contact with groundwater to be a factor when determining the closure method is further borne out by its lack of objection to Tennessee Valley Authority's ("TVA") decision to close the CCR surface impoundments at six of its coal-fired power plants by leaving CCR in place. A review of TVA's June 2016 Final Environmental Impact Statement ("FEIS") makes clear that ash may remain in contact with groundwater after closure of certain of its impoundments

(*see e.g.*, comment 31 and response). Despite this fact, in EPA's June 21, 2016 letter to TVA addressing the FEIS, EPA "concur[red] with TVA's preferred alternative to close identified facilities in place according to the CCR rule."

This is the case because the CCR rule's closure criteria at Section 257.102 are intended to address just that—closure. To the extent groundwater contamination needs to be addressed, such issues are addressed by the rule's post-closure care maintenance requirements at Section 257.104, which require owners and operators to maintain the integrity and effectiveness of the final cover system, maintain the groundwater monitoring system, and monitor the groundwater for a minimum of 30 years, and, if appropriate, implement corrective action measures as required under Sections 257.96–.98. As a result, if CCR in an impoundment that was closed by leaving CCR in place is in contact with groundwater, releases from the unit to groundwater—including any potential releases from CCR contained in groundwater—will be detected by the unit's groundwater monitoring system and will be addressed, as necessary, through the rule's corrective action program.

Importantly, pursuant to Section 257.97(b), any remedy must, among other things; (i) attain the groundwater protection standard; (ii) control the source of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix IV constituents into the environment; and (iii) remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible. And in accordance with Section 257.97(c), the owner or operator must consider, among other things, (i) "the long- and short-term effectiveness and protectiveness of the potential remedy"; and (ii) "the effectiveness of the remedy in controlling the source to reduce further releases." Thus, the CCR rule requires that CCR-contaminated groundwater be cleaned up to a level that meets the applicable groundwater protection standards.

Finally, EPA's introduction of a potential "engineering set of solutions" when discussing the closure-in-place performance standard in the withdrawn guidance also incorrectly conflates the CCR rule's closure requirements with its corrective action provisions. Notably, EPA deleted this precise language regarding the "install[ation of] the necessary engineering measures," when it revised the December 2016 guidance this past August. *See* Attachment "2." The reason for this is precisely the same as the reason that the language regarding submerged ash in the underlying aquifer was deleted from the guidance: the aforementioned conflation problem.

As noted above, the CCR rule does not compel a particular closure option; either method is acceptable, provided the closure performance standard is met. To the extent any ash remains in contact with groundwater after a unit is closed with CCR in place, it will be addressed through post-closure care, including, to the extent required, corrective action, which is protective of human health and the environment; attains the groundwater protection standards; and controls the sources of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of Appendix IV constituents into the environment. EPA's statement on p. 21407 of the rule's preamble that the remedy must be designed and implemented "so that releases to groundwater are addressed without unnecessary delay" indicates that although the agency was well aware there would be some cases in which CCR would remain in contact with the groundwater after

closure, it expected the owner or operator of the unit to address these releases through the rule's corrective action program, which requires a site-specific assessment of, among other factors, the geological and hydrogeological features influencing the movement, chemical, and physical character of any contaminants in the groundwater in order to determine the best method of environmental protection. Until such time the CCR rule's corrective action requirements are triggered and the owner or operator completes the assessment of corrective measures required under Section 257.96, it cannot be known what "engineering set of solutions" will be appropriate for a particular impoundment. Accordingly, EPA's suggestion in response "A(4c)" that a slurry wall and pump-and-treat system may be required to meet the closure performance standards under certain circumstances is purely hypothetical, because until a facility's site-specific factors are examined and the assessment of corrective measures has been completed, it is premature to identify a remedy. The CCR rule prescribes no particular corrective action measures that must be taken and leaves it to owners and operators to determine the appropriate remedy after considering myriad site-specific factors.

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Construction of a New Non-CCR Wastewater Pond within the Footprint of a Former CCR Surface Impoundment

Issue

Whether a new surface impoundment may be constructed within the footprint of a former CCR surface impoundment closed by removal of CCR prior to meeting the groundwater protection standard established pursuant to § 257.95(h) for Appendix IV constituents.

Short Answer

Although the closure-by-removal-of-CCR performance standard requires the owner or operator to demonstrate that groundwater monitoring concentrations for the excavated CCR surface impoundment do not exceed the applicable groundwater protection standard, nothing in the CCR rule prohibits construction of a non-CCR wastewater pond within the footprint of the former unit prior to meeting the groundwater protection standard. Forcing owners and operators to wait until the groundwater protection standard has been met is not supported by CCR rule preamble statements or the regulatory text and would be contrary to EPA's intent behind retaining the closure-by-removal-of-CCR option in the final CCR rule.

Analysis

The CCR rule does not address, much less prohibit, the use of land area previously occupied by a CCR surface impoundment for a non-CCR wastewater unit. The only provisions governing the construction of a new unit in the footprint of a former CCR surface impoundment have to do with the construction of new CCR units. These provisions—which govern "overfills" and "retrofits"—allow construction and operation of the new CCR unit to begin before the groundwater protection standard has been met.[1] It would be illogical to interpret the rule as prohibiting the construction and

[1] Although a retrofitted CCR surface impoundment is not technically a new CCR surface impoundment, which 40 C.F.R. § 257.53 defines as a unit "that first receives CCR or commences construction after October 14, 2015," it is essentially the same as a new unit because "retrofit" means "to remove all CCR and contaminated soils and sediments from the CCR surface impoundment, and to *ensure the unit complies*

operation of a non-CCR unit in the footprint of an impoundment prior to meeting the groundwater protection standard, when the construction and operation of a CCR unit under the same circumstances is expressly allowed.

The regulatory text and preamble language evince EPA's intent that an owner or operator of a CCR unit that has been closed by removal of CCR not wait until after the groundwater protection standard has been met before constructing a new unit within the footprint of an excavated unit. 40 C.F.R. § 257.53 of the CCR rule defines an "overfill" as "a new CCR landfill constructed over a closed CCR surface impoundment."[2] Pursuant to 40 C.F.R. § 257.70(a)(2) (design criteria for new CCR landfills and any lateral expansion of a CCR landfill), "[p]rior to construction of an overfill the underlying surface impoundment must meet the requirements of § 257.102(d)," which sets forth the performance standard when *leaving CCR in place*. This requirement is repeated in the preamble where EPA explains that "overfills cannot be constructed unless the underlying foundation—*i.e.*, the existing CCR surface impoundment has first been dewatered, *capped*, and completely closed." 80 Fed Reg. 21302, 21373 (Apr. 17, 2015) (emphasis added). *See id.* (expounding that the CCR rule "clearly prohibit[s] construction of a CCR landfill over a CCR surface impoundment unless the CCR in the underlying unit has first been dewatered and the unit is *capped* and completely closed") (emphasis added). Importantly, Section 257.70(a)(2) does not refer to the entirety of Section 257.102, nor does it refer to Section 257.102(c); it only speaks to "§ 257.102(d)"(closure performance standard when leaving CCR in place), which includes no requirement that construction and operation of the unit must wait until the groundwater protection standard has been met.

In the case of closure by removal of CCR, once the CCR and all liners contaminated with CCR waste and CCR waste leachate have been removed,[3] that excavated area is no

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with the requirements in § 257.72[.]"—liner design criteria for *new* CCR surface impoundments and any lateral expansion of a CCR surface impoundment. 40 C.F.R. § 257.53 (emphasis added).

[2] Although the definition of "overfill" refers specifically to new CCR landfills, nothing in the CCR rule prohibits other uses on top of closed surface impoundments, provided such future uses do not compromise the closure performance standards set out in 40 C.F.R. § 257.102(d).

[3] EPA explains in the preamble to the CCR Rule that "[o]nce a facility has removed the waste and any liner, the presumption is that the source of contamination has been removed as well." 80 Fed. Reg. at 21412.

longer a CCR surface impoundment but merely land on which an ash basin was formerly located; put simply, the CCR surface impoundment has ceased to exist. Once construction of the new non-CCR wastewater pond has been completed, Duke Energy intends to use it to hold non-CCR wastestreams. Nothing in the rule prohibits such action, so long as Duke Energy takes appropriate steps to ensure that construction of the new non-CCR wastewater pond will not hinder or frustrate any measures required to meet the groundwater protection standard.

The CCR rule's retrofit provisions offer further support for re-use of the land immediately after completion of CCR excavation activities. Pursuant to 40 C.F.R. § 101(a)(1), an unlined CCR surface impoundment that has exceeded a groundwater protection standard and is otherwise subject to the obligation to cease the receipt of CCR and commence closure, may retrofit the unit and continue operating as a new unit, rather than close. Once the existing CCR surface impoundment has been retrofitted in accordance with the requirements of 40 C.F.R. § 257.102(k) (criteria to retrofit an existing CCR surface impoundment), the owner or operator may begin placing CCR and non-CCR wastestreams in the unit. Although 40 C.F.R. § 257.102(k)(1)(iii) makes clear that a CCR surface impoundment undergoing a retrofit remains subject to "the requirement to conduct any necessary corrective action," owners and operators are not required to meet the groundwater protection standard prior to placing CCR (much less materials that are not CCR) in the retrofitted unit. There is no basis for requiring owners and operators to wait until the groundwater protection standard has been met before placing *non-CCR wastestreams* in new wastewater ponds closed by removal of CCR when owners and operators may retrofit CCR surface impoundments and immediately begin placing CCR in those units.

EPA's preamble discussion regarding closure of CCR units through removal and decontamination directly supports immediate use of the land once excavation of the unit has been completed. EPA explained in the proposed CCR rule that it

> included th[e] [closure-by-removal-of-CCR] provision to allow some flexibility in the self-implementing scheme for facilities in their closure options, while providing protection for health and the environment under either option.

> Although EPA anticipates that facilities will mostly likely not clean close their units, given the expense and difficulty of such an operation, *EPA believes that they are generally preferable from the standpoint of land re-use and redevelopment,* and so wishes explicitly to allow for such action in the proposed subtitle D rule.

75 Fed. Reg. 35128, 35208 (June 21, 2010) (emphasis added). Indeed, EPA retained closure by removal of CCR as a closure option in the final CCR rule reiterating that *"[b]ecause clean closure is generally preferable from the standpoint of land re-use and redevelopment,* EPA has explicitly identified this as an acceptable means of closing a CCR unit." 80 Fed Reg. at 21412 (emphasis added). Thus, EPA recognized that although the closure-by-removal-of-CCR method generally would be more costly and burdensome, it was important to preserve it as an option for those owners and operators who needed to reuse land on which CCR surface impoundments formerly existed, whether due to space constraints or otherwise.

It is implausible that EPA would have intended to allow for the construction of overfills immediately after CCR surface impoundments have been capped in place or allow for immediate use of retrofitted units, but require owners and operators closing units by removal of CCR to wait potentially decades until the groundwater protection standard has been met before reusing the land to construct new units. Such an interpretation would have the effect of promoting closure by cap-in-place over closure-by-removal—a result EPA surely did not intend—and be inimical to EPA's stated land re-use goal. Moreover, forcing owners and operators to wait until the groundwater protection standard has been met would lead to absurd results by forcing them to construct new wastewater ponds on greenfield sites, waste valuable resources on new infrastructure construction, and transport CCR significant distances for off-site disposal, thereby increasing environmental impacts.

It is important to stress that despite the fact that Duke Energy's new non-CCR wastewater pond will not be used to store CCR wastestreams, it will be constructed with a composite liner with geomembrane consistent with the liner design criteria requirements for new and retrofitted CCR surface impoundments at 40 C.F.R. § 257.72.

Accordingly, the new pond will be designed and constructed with precisely the same safeguards as new and retrofitted surface impoundments intended to hold CCR.

Pursuant to 40 C.F.R. § 257.102(c), Duke Energy must take necessary and appropriate actions to demonstrate compliance with the groundwater protection standard. In the event the new non-CCR wastewater pond leaks, this would be addressed by the measures Duke Energy is taking to meet the groundwater protection standard. Thus, although construction of the new pond within the footprint of the former CCR surface impoundment will effectively deprive Duke Energy of the ability to demonstrate that any exceedances of the groundwater protection standard are being caused by contamination from the new non-CCR wastewater pond, protection of health and the environment will be ensured.

Relationship Between the Resource Conservation and Recovery Act's Coal Combustion Residuals Rule and the Clean Water Act's National Pollutant Discharge Elimination System Permit Requirements

The Coal Combustion Residuals (CCR) rule, promulgated under the Resource Conservation and Recovery Act (RCRA), and the Clean Water Act (CWA) each address environmental impacts of the various units at coal fired power plants. As a general matter, the Clean Water Act addresses instances in which there are discharges to the jurisdictional waters of the United States ("jurisdictional waters"), while the CCR rule deals with the disposal units themselves (where they are located, specific design and operating criteria, structural stability requirements, groundwater monitoring and corrective action, closure of the units, etc.) and with their impacts or potential impacts to groundwater. The CCR rule establishes minimum national criteria which must be met by all disposal units; the rule additionally recognizes that different factors on a site specific basis are important for determining the best method of environmental protection at individual disposal unit sites and thus provides technical criteria to enable flexibility where appropriate to achieve the requirements of the rule. For example, in some cases, dewatering and leaving CCRs in place with safeguards and monitoring may achieve the necessary environmental protections and in fact offer a significantly lower environmental footprint and cost than removal and disposal off site.

On this page:

Questions Regarding the Relationship Between the CCR Rule and CWA NPDES Permit Requirements

How do the CCR rule and the CWA permit requirements generally work together with respect to landfills and surface impoundments that contain CCRs?

The CCR rule is designed specifically to address releases to groundwater as well as non-groundwater releases from CCR waste disposal units. Implementation of actions to comply with

the CCR rule, such as dewatering of a CCR unit, must be done in compliance with other applicable laws, including the Clean Water Act. Independent of the CCR rule, the CWA prohibits any point source discharge of a pollutant to a water of the United States unless it is authorized by a National Pollutant Discharge Elimination System (NPDES) permit under CWA section 402.

What role does dewatering of CCR units play in compliance with the CCR rule? Is a facility that seeks to dewater a CCR surface impoundment required to obtain a CWA NPDES permit? How does this work and can EPA help to ensure that NDPES permits are granted in a timely manner to allow dewatering and closure to proceed?

Dewatering of CCR units is an important step in the process of closure of CCR units in order to comply with the CCR rule, and may require discharge to a jurisdictional waters. If the facility will need to discharge any of the water from the surface impoundment into a jurisdictional water, then, as required by the Clean Water Act, that facility will need an NPDES permit (or potentially a modification to an existing permit) for that discharge.

The dewatering of a surface impoundment is a necessary first step in ensuring that the eventual closure of the unit will meet the statutory standard under RCRA of "no reasonable probability of adverse effects on human health or the environment." Over the long-term the closure of the CCR unit will substantially reduce the significant health and environmental risks associated with these units--e.g., from the potential catastrophic release, and/or contamination from leaching into groundwater, as well as into any hydrologically connected jurisdictional waters. In the short term the point source discharge will be subject to NPDES permit requirements under CWA section 402 which "restores and maintains the chemical, physical, and biological integrity of the Nation's waters."

EPA encourages the water and waste programs in the states to work together in this area to ensure that closure of the CCR unit can proceed in a timely fashion while at the same time ensuring that NPDES permit conditions are in place to protect the receiving jurisdictional waters.

Can the ground water, corrective action, closure and post closure requirements under RCRA's CCR rule be implemented in a manner consistent with protection of surface water under the CWA? Can the closure in place option in the CCR rule be conducted in a manner consistent with protection of surface water under the CWA?

Yes, the comprehensive requirements of the CCR rule were designed specifically to address all releases to groundwater as well as non-groundwater releases, from CCR disposal units and the impacts of those releases on public health and the environment.

The CCR rule specifically provides a closure in place option, and anticipates that owner/operators would be able to utilize this option in appropriate circumstances. Provided the requirements of the CCR rule as well as the CWA are met, the CCR rule's closure in place

option can be implemented consistent with protection of groundwater and surface water resources. See the closure requirements question below for more detail.

Does the issuance of an NPDES permit covering discharges from a CCR unit exempt the owner/operator from any requirements under the CCR rule?

No, discharges covered by an NPDES permit are not a "solid waste" pursuant to RCRA section 1004(27). The RCRA exclusion only applies to "industrial discharges that are point sources subject to permits," i.e., to the discharges to jurisdictional waters, and not to any activity, including groundwater releases or contaminant migration, that occurs prior to that point. See title 40 of the Code of Federal Regulations (CFR) § 261.4(a)(2)("This exclusion applies only to the actual point source discharge. It does not exclude industrial wastewaters while they are being collected, stored or treated before discharge"). For purposes of the RCRA exclusion, EPA considers the "actual point source discharge" to be the point at which a discharge reaches the jurisdictional waters, and not in the groundwater or otherwise prior to the jurisdictional water. Thus, the issuance of an NPDES permit for discharges from a facility's CCR surface impoundment would not exempt the owner/operator from any requirements under the CCR rule applicable to the disposal unit, such as the requirements to ensure the structural stability of the unit, to clean up all releases to the aquifer, and to meet all closure standards.

Top of Page

Releases and the Requirement to Respond

What is the scope of the requirement to respond to "releases"?

(a) Does the phrase "or immediately upon detection of a release from a CCR unit" in 40 CFR § 257.96(a) apply to both groundwater and non-groundwater releases?

No. Section § 257.96(a) establishes two different standards for triggering corrective action, one for groundwater releases and one for non-groundwater releases. The requirement that a facility commence corrective action "immediately upon detection of a release from a CCR unit" applies only to non-groundwater releases. By contrast EPA interprets the regulation to require corrective action for groundwater releases only upon a determination that contaminants are present in amounts exceeding the groundwater protection standards in § 257.95(h).

Note, however that the regulations include other provisions that address releases from a CCR unit. For example, the inspection requirements for surface impoundments and landfills at §§ 257.83 and 257.84 state that if a deficiency or release is identified during an inspection, the owner or operator must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken. In addition, in the requirements for control of fugitive dust at § 257.80 it states that in the annual report the owner/operator must describe any corrective measures taken in response to citizen complaints.

(b) Is a facility required to initiate corrective action to clean up groundwater contamination, even though the concentration does not exceed the groundwater protection standard?

No, under the CCR rule, a facility is not required to initiate corrective action to clean up groundwater contamination if the contamination is at levels below the groundwater protection standard established in the CCR rule. As noted, EPA interprets the regulation to require corrective action for groundwater releases only upon a determination that contaminants are present in amounts exceeding the groundwater protection standards in § 257.95(h) (that is, a statistically significant increase over background or the maximum contaminant level or MCL).

(c) In settlement of a portion of the lawsuit challenging the CCR rule, EPA agreed to a remand on the issue of defining which non-groundwater releases are subject to the full corrective action process. Please provide guidance on what facilities should do in the interim.

EPA has committed as part of a settlement agreement to revisit the question of whether the *procedures* to be used in cleaning up groundwater releases should apply to all non-groundwater releases. EPA agreed that, in principle, for some non-groundwater releases, it may not make sense to require facilities to follow the full corrective action procedures in §§ 257.96-257.98 in cleaning up or remedying the releases, and agreed to conduct a rulemaking on that narrow issue. However, the requirement to clean up those releases remains unaffected.

It is true, however, that as currently written, the regulations do require compliance with the full corrective action process, whether pursuant to the obligation in section § 257.90(d) or § 257.96. Nevertheless, given the settlement, EPA would recommend that compliance determinations focus primarily on the rapid remediation of detected non-groundwater releases, consistent with §§ 257.90(d), 257.73(d)(2) and 257.83(b)(5) rather than adherence to the specific corrective action procedures in §§ 257.96-257.98.

Top of Page

Use of Groundwater Data Obtained Prior to the CCR Rule

Can groundwater data that were not developed/obtained under the CCR rule (e.g., data that existed prior to publication of the rule) trigger the groundwater release assessment and corrective action requirements under the CCR rule (i.e., 40 CFR 257.90(d), 257.96-.98)?

If the pre-existing data and accompanying data analysis are as scientifically valid and consistent with the data and analysis required and developed under the CCR rule and they provide equivalent confidence that the standard in § 257.96 (a) has been met, such data would trigger the corrective action requirements in §§ 257.96-.98. Whether any pre-existing data are sufficiently credible to trigger the § 257.96 corrective action process will necessarily be determined on a case-by-case basis.

However, as a general matter, if a facility has any data that indicates groundwater contamination may be occurring, the facility should be taking appropriate steps without hesitation to address the issue or potential issues shown by the data or sampling results. Such steps could include additional well installation, sampling or analysis--for example if the data shows contamination but the facility has not established an appropriate background level--or it could include actions to locate and address the potential source of the contamination.

Because the CCR rule was designed to be self-implementing, it contains detailed, prescriptive requirements for establishing a groundwater monitoring system and for sampling and analyzing groundwater. For example, the data collection protocol includes numerous criteria that specify monitoring locations, frequency, and chemical parameters. See §§ 257.91, 257.93-257.95. The data collected are analyzed using specific statistical protocols that provide for comparison with background and Maximum Contaminant Levels. These statistical analyses are conducted for each constituent in each monitoring well, using methodologies that meet specific performance standards. See § 257.93(f), (g). Data that have been developed following such protocols would be considered to be credible, scientifically valid, and suitable for determining whether or not a release has occurred requiring further action under the CCR rule. It is EPA's expectation that facilities will follow this exacting process and use it to determine whether and when corrective action is warranted.

As the regulation is currently structured, the requirement to comply with the corrective action procedures in § 257.96 is predicated on the detection of "any constituent…at a statistically significant level exceeding the groundwater protection standard" (The groundwater protection standard is defined in § 257.95(h) and is either the drinking water maximum contaminant level or the background level of the contaminant). To the extent a facility has scientifically valid/credible data demonstrating that the standard in § 257.96(a) has been met (detection of "any constituent…at a statistically significant level" above a groundwater protection standard) the rule requires them to take action to begin assessing the situation and developing a remedy.

Top of Page

Closure Requirements

What are the options and the performance standards for closure of units under the CCR rule?

Under the CCR rule, closure must be initiated upon the final receipt of waste (for example, where the unit has reached the end of its useful life or the owner/operator has determined that the unit is no longer needed) or in response to a determination that the unit must close "for cause" (i.e., that is the unit does not meet location standards, the unit does not meet structural stability requirements, or the unit is an unlined surface impoundment that is contaminating groundwater). Moreover, all units must prepare closure and post closure care plans by October 17, 2016, and post them to the facility's CCR web site by November 16, 2016.

The CCR rule establishes two options for closure: clean closure or closure with waste in place. The regulations also establish performance standards for each option that must be met. The two standards are described below:

(a) Section 257.102(c) sets out the "clean closure" requirements and states that: an owner or operator may elect to close a CCR unit by removing and decontaminating all areas affected by releases from the CCR unit. CCR removal and decontamination of the CCR unit are complete when constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to § 257.95 (h) for constituents listed in appendix IV to this part.

If a facility "clean closes" a unit, that unit is not subject to post-closure care (that is continued GW monitoring or corrective action) as the site essentially has been "cleaned up."

(b) Section 257.102(d) sets out the requirements/performance standards for closure with waste in place.

i. Paragraph (d)(1) - Must ensure that the CCR unit is closed in a manner that at a minimum 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; preclude the probability of future impoundment of water, sediment, or slurry; include measures that provide for slope stability; minimize the need for future maintenance; and be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices" (emphasis added).

ii. Paragraph (d)(2) - Drainage and stabilization of CCR surface impoundments – before installing a final cover system, free liquids must be eliminated by removing liquid wastes or solidifying the remaining waste and waste residues and remaining wastes must be stabilized sufficient to support the final cover system.

iii. Paragraph (d)(3) - Sets out requirements for the final cover system.

~~In order to close a unit with waste in place, the facility must meet all of the performance standards in § 257.102(d). If~~Both clean closure and closure with waste in place can be equally protective, provided that the requisite performance standards are met. If the performance standards for clean closure and the performance standards for closure with waste in place can be met, an owner or operator may determine which alternative is appropriate for their particular unit. A facility also may choose to clean close a portion of a single unit and close the remainder of that unit with waste in place. The CCR rule does not require an owner or operator to use one closure option over the other in such situations. However, the facility must meet all of the performance standards for the closure option it has selected, and if it cannot meet all of the performance standards for one option, then it must meet all of the performance standards for the other option. For example, if the facility is unable to meet the performance standards for closure with waste in place for a particular unit~~,~~ (or portion of a unit), it must clean close the unit~~.~~ (or that portion). Whether any particular unit or facility can meet the performance standards ~~for~~

~~closure with waste in place is a~~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. ~~For example, if a small corner of a unit is submerged in the underlying aquifer, a facility might be able to meet the performance standard for closure with waste in place for the majority of the unit, by "clean closing" the submerged portion of the unit, and installing the necessary engineering measures to ensure that the rest of the unit meets the performance standards in § 257.102(d).~~ As noted above, the CCR rule does not require an owner or operator to use one closure option over the other if both sets of performance standards can be met.

Overall, dewatering and leaving CCRs in place may offer important environmental safeguards and monitoring. Closure with waste in place may help avoid sizable transportation related impacts by eliminating the significant truck traffic that would accompany off site movement of CCRs. In addition, this option may also allow owners and operators to clean close some units while consolidating all the CCRs in a single on-site unit. On-site CCR consolidation can provide for greater land use options and flexibility. Closure with waste in place may allow owners and operators to focus their long term monitoring, care and cleanup obligations on a single unit rather than many units.

(Revised on August 7, 2017)