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October 13, 2023

U.S. Environmental Protection Agency
EPA Docket Center
Office of Land and Emergency Management (OLEM) Docket
Mail Code 28221T
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

via regulations.gov

RE: Alabama: Denial of State Coal Combustion Residuals Permit Program
Docket ID No. EPA–HQ–OLEM–2022–0903

Dear Ms. Lloyd:

The Alabama Department of Environmental Management (ADEM) appreciates the opportunity to comment on the Federal Register Notice- *Alabama: Denial of State Coal Combustion Residuals Permit Program.*

EPA's unfavorable review of Alabama's Coal Combustion Residuals (CCR) Permit Program and its Proposed Denial is unfounded and incomplete. In the attachment, ADEM addresses each assertion by EPA supporting its proposed denial of Alabama's CCR Program. ADEM maintains that all aspects of its CCR Program are sound, and it meets the standard for approval according to 42 U.S.C. 6945(d)(1)(B). Therefore, EPA should withdraw its proposed denial and approve Alabama's CCR permit program.

Thank you for your consideration. If you have questions concerning this matter, please contact Stephen Cobb, Chief of the ADEM Land Division at 334-271-7732 or via email at sac@adem.alabama.gov.

Sincerely,

Lance R. LeFleur
Director

Attachment

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Comments in Response to Alabama: Denial of State Coal Combustion Residuals Permit Program

Prepared by
Alabama Department of Environmental Management

88 Federal Register 55220 (August 14, 2023)

submitted to
The United States
Environmental Protection Agency
Docket No. EPA-HQ-OLEM-2022-0903

October 13, 2023

INTRODUCTION

On August 14, 2023, the Environmental Protection Agency announced a proposed denial of Alabama's Coal Combustion Residual's (CCR) Permitting Program. This announcement comes after a more than four year effort where ADEM and EPA Region 4 and headquarters (HQ) staff worked cooperatively to build the Alabama Department of Environmental Management's (hereinafter Department or ADEM) CCR Program Approval Application.

The Department's response to EPA's proposal will address four areas.

1. EPA's review of ADEM's program approval application was disjointed, flawed, and quite possibly inappropriately influenced by ex parte analyses not timely provided to ADEM and not known to the general public. EPA provided a misleading portrayal of the review process to the public in the proposed denial.
2. EPA's unfavorable review of ADEM's CCR program relies in large part on an incorrect and novel interpretation of the federal regulations for closure, namely its arbitrary and capricious reinterpretation of the term "infiltration". This error infects the whole proposed action.
3. EPA's new interpretations are inconsistent with the requirements of the 2015 CCR Final Rule and the WIIN Act.
4. EPA's review of ADEM's CCR permits was untimely, unprofessional, incomplete, and deeply flawed.

EPA's DISJOINTED AND FLAWED REVIEW

History Of ADEM CCR Permitting Program

In 2015, EPA issued self-implementing CCR rules after almost a decade of rule development and following multiple decades of sequential re-considerations of the regulatory status of CCR at the behest of various advocacy groups. These rules provided for no agency oversight, either State or federal. Congress acted in 2016 to establish authority for States to establish and provide regulatory oversite of CCR permit programs in lieu of federal implementation of EPA's self-implementing rules. Following Congressional action in 2016, EPA (in 2017) published guidance for the development of State programs. In 2017, ADEM began development of state CCR program regulations, which were first promulgated and effective June 8, 2018.

Between 2018 and 2019, after receiving the initial groundwater monitoring data required by the federal self-implementing regulations (and prior to final promulgation of Alabama's state CCR program rules), ADEM issued substantive enforcement actions against each of the Alabama CCR facilities to expedite assessment, closure and remediation for all Alabama CCR facilities utilizing existing State groundwater protection authorities.

Throughout 2018-2021, ADEM worked closely and cooperatively with EPA Region 4 and EPA HQ regarding the development of the ADEM CCR program approval application. ADEM made recommended adjustments to its program regulations and program approval application

based on EPA's verbal and written recommendations as a part of this coordinated process. As early as April 2021, EPA provided comments indicating that EPA had begun working on the key components of ADEM's program approval documentation (e.g. Technical Support Document, Federal Register notice and Letter of Completion). Specifically, on April 27, 2021, representatives from EPA Headquarters and Region 4 met, via Microsoft Teams, with representatives from ADEM to discuss three aspects of the ADEM CCR Program Approval package that EPA felt they would have difficulty defending during the public comment period. Those aspects included public participation (specifically as it related to permit modifications), endangered species and confusion over placement of Alabama CCR landfill regulations with the other landfill requirements (see Attachment A) within ADEM's Division 13 Solid Waste Program regulations.

On July 29, 2021, representatives from ADEM and EPA again met, via Microsoft Teams, to discuss the current ADEM Program Approval timeline. As noted in the presentation slides (See Docket No. EPA-HQ-OLEM-2022-0903-0046) from that discussion, it is clear that EPA was near the point of determining ADEM's package was complete and that the only remaining issues had to do with public participation and permit modifications.[1] Although ADEM requested that the application be reviewed, as previously submitted, with the assurance that the Alabama CCR regulations were being revised to reflect changes based on EPA's concerns, EPA took the position that the regulations would have to be finalized prior to program approval review (See Docket No. EPA-HQ-OLEM-2022-0903-0060). As a result of these discussions, ADEM initiated the second of two sets of regulatory revisions that became effective December 13, 2021[2].

It was also during this period of intense coordination with EPA that ADEM was actively processing permit applications and bringing all Alabama CCR facilities under direct Departmental oversight for closure, assessment, and remediation. Six Alabama CCR facilities were permitted between December 2020 and August 2021, prior to submittal of ADEM's final program approval application, which is the subject of EPA's proposed denial. Two remaining facility permits were issued in 2022 (see Table 1 below).

TABLE 1

Facility	**Date of Permit Issuance**
James H. Miller Electric Generating Plant	12/18/2020
Greene County Electric Generating Plant	12/18/2020
Gadsden Steam Plant	12/18/2020
E.C. Gaston Electric Generating Plant	5/25/2021
James M. Barry Electric Generating Plant	7/1/2021
Charles R. Lowman Power Plant	8/30/2021
William C. Gorgas Electric Generating Plant	2/28/2022
Tennessee Valley Authority (TVA) Colbert	10/25/2022

[1] As a result of comments received on Texas' CCR Program Approval, EPA informed ADEM that the Program Approval application needed to be revised again. Despite approving Texas' permitting program based on a memorandum, EPA instructed ADEM to modify the regulations pertaining to public participation and permit modifications.

[2] It should be noted that in the April email communications, EPA indicated that the 180-day review clock would begin with the effective date of the December 2021 regulatory revisions. (See Attachment B)

In an email correspondence from EPA on December 7, 2021, EPA stated that the Agency had completed its final review and "both the narrative and side by side are in excellent shape". Minor comments were provided, but the email indicated that there should be no need "for additional drafts prior to submittal of the CCR permit program application" (see Docket No. EPA-HQ-2022-0903-0066). This final submittal came after EPA Region 4 and EPA HQ staff represented to ADEM staff[3] that all components of ADEM's program approval application were complete and ready for expeditious approval by EPA.

EPA Changes Direction

A partially redacted email of January 3, 2022, from Kelly Adams, EPA Region 4, to Richard Huggins, EPA HQ, transmits Alabama's final program approval application for processing (See Docket No. EPA-HQ-OLEM-2022-0903-0029). It's unclear why this email (provided in the docket) is partially redacted. But, based on close communications with EPA Region 4 to this point (summarized above), ADEM had no reason to believe there were any remaining, dispositive concerns with our application.

Beginning with conference calls in May-July 2022, EPA began asking technical questions about the closure strategy, as well as the groundwater monitoring systems and supporting data for plants Green County, Gorgas, and Gadsden[4]. During these calls, ADEM provided a brief overview for each site; however, at the time, EPA did not provide comments and asked very few, if any, follow up questions.

In September 2022, EPA, for the very first time, provided written questions on a draft permit (TVA Colbert) (see Docket No. EPA-HQ-OLEM-2022-0903-0116, hereinafter referred to as "Colbert Letter"). The Colbert Letter was not transmitted to ADEM until after the close of the public comment period on the permit, which EPA indicated was intentional, because it did not want to interfere with the permit public participation process.

Referring back to Table 1, the TVA Colbert facility permit was the final CCR permit to be issued by ADEM.

EPA Has Not Properly Communicated Any Program Deficiencies To ADEM

Throughout the Proposed Denial, EPA asserts that extensive communication was had between the Agency and ADEM, at which time EPA "detailed" their concerns and ADEM "declined" to alter their course by continuing to issue CCR permits. EPA further implies, with notable temerity, that Alabama, by its actions, placed EPA in the position where it had no choice but to proceed to program denial. ADEM disputes these assertions by EPA in the strongest possible terms. As clearly outlined above, ADEM's program approval application was a multi-year development project in very close communication with EPA Region 4 and HQ such that, as clearly indicated by EPA Region 4 review personnel, the final application was complete and approvable upon its submittal on December 29, 2021 and subsequent transmittal to EPA HQ on January 3,

[3] Email from Dee Rogers-Smith, EPA to ADEM, December 7, 2021, Docket No. EPA-HQ-2022-0903-0066
[4] Email from Meredith Anderson, EPA to Scott Story, ADEM. May 27, 2022. EPA Docket No. EPA-HQ-OLEM-2022-0903-0042

2022. At no time leading up to this point in the process, during which EPA was fully aware that ADEM was reviewing and processing CCR permit applications and issuing CCR permits to the Alabama facilities did EPA identify deficiencies or recommend changes to any ADEM CCR permits. Until receipt of the pre-publication copy of EPA's proposed denial of ADEM's CCR program on August 3, 2023, ADEM received no written identification from EPA of any alleged deficiencies in ADEM's CCR program application, or its proposed or issued permits. ADEM did receive several questions regarding specific permits to which ADEM provided EPA detailed verbal and written responses. Subsequently, EPA made no effort to seek any further clarifications and gave no indication that any of its questions remained unanswered. Many of the technical issues discussed during the meetings referenced above reappear in the Proposed Denial and are framed to make it appear ADEM's program is non-compliant. This tactic by EPA is truly disheartening. Overall, the content of EPA's Proposed Denial is clearly an unprofessional, unfounded attempt to discredit and denigrate ADEM's CCR permit program and professional staff.

Furthermore, this approach has left ADEM with no opportunity to correct the perceived deficiencies. EPA has made no direct requests of ADEM to change or modify any of its CCR program components. In fact, EPA expressly admits that the ADEM regulations essentially mirror the federal rules. Going a step further, ADEM permits, now the sole focus of EPA's program approval review, mirror the ADEM rules, which mirror the federal CCR rules. It, thus, remains a mystery exactly what ADEM would modify to bring the program to the level of equivalency that EPA believes to be lacking. The 200+ page Federal Register notice of EPA's proposed Program Denial provides no clarity to this issue.

EPA's Limited Review

In its commentary on the Alabama program, EPA explicitly acknowledges that it has not conducted a complete or detailed review of the facility files or background information used by ADEM to issue its CCR permits. Yet EPA proceeds to draw unfounded conclusions about the reviews and analysis conducted by the State prior to issuing the permits. In doing so, EPA ignores the facts, including the fact that ADEM issued unilateral administrative orders in 2018 and 2019 to each Alabama CCR facility requiring the collection and submission of detailed and voluminous information related to detailed site characterization and assessment for each unit at each facility, detailed information related to site geology and hydrogeology, detailed information related to existing contamination, development of groundwater remediation plans, etc.

EPA also ignored the fact that ADEM required each facility to submit detailed permit applications for each unit/facility including site history, unit construction and operation, planned closure methods and procedures, and planned corrective measures to address groundwater contamination, etc. These applications were subjected to detailed review and evaluation by ADEM's staff of multiple professionally licensed engineers (PEs) and geologists (PGs) with extensive professional experience evaluating environmental assessments, groundwater monitoring systems, environmental permit applications and corrective action systems. Following these extensive reviews, the facilities were required to revise their applications and provide additional information to address identified deficiencies. The perfunctory nature of EPA's review and its numerous flawed conclusions dismiss the dedicated work by these seasoned professionals.

This kind of response is not the standard that is expected and demanded from a seasoned, science-based government agency responsible for protecting human health and the environment through the application of sound science and engineering. To say EPA's actions are disappointing is an understatement!

There Is No Comparable Federal Permit Program

The lack of a federal permitting program is a key weakness in EPA's proposed denial. EPA has made its review of ADEM's CCR permits, brought forth years after many such permits were issued, the central reason for its proposed denial. Yet EPA has no federal program to compare it to nor does EPA have any practical experience developing and issuing CCR permits. EPA provided interim final State permitting program guidance in 2017. ADEM's CCR permit program complies with this guidance, which mentions no requirements upon which EPA has based its proposed denial.

Furthermore, while EPA admits that the ADEM regulations essentially mirror the federal rules, EPA goes further in the document to explain that the permits issued by ADEM merely reiterate ADEM's regulations verbatim but do not require the facility to achieve compliance with those regulations (88 FR 55242, 55254, 55267, Aug. 14, 2023). EPA also contends that once a permit is issued, the permit serves as a "shield" to the regulations and at that point the facility is only responsible for compliance with the permit and the regulations are no longer the governing rules (88 FR 55223, Aug. 14, 2023). However, these assertions by EPA are incorrect. As stated previously, EPA has no CCR permitting program. If ADEM regulations (that mirror the federal regulations) are, in EPA's view, insufficient to require a facility to achieve compliance, how exactly do the federal rules require a facility to achieve compliance in the absence of a federal permit program? As EPA acknowledges, ADEM regulations are equivalent to the federal rules, so inclusion of ADEM regulations in ADEM-issued permits is equivalent to inclusion of federal rules in the permit. Therefore, if EPA considers the current federal rules sufficient to require facilities to "achieve compliance", then the ADEM-issued permits that refer to these rules must also meet the same standard. Otherwise, EPA is attempting to hold ADEM to a higher standard than EPA itself is required to achieve and seeks to punish ADEM for having a permitting program when EPA does not.

At best, it seems premature to move directly to program denial until EPA has, through the traditional, long-standing regulatory development and approval process, promulgated a set of federal permitting standards. When EPA develops new final rules, ADEM CCR regulations and permits will be amended, as necessary, to comply.

EPA's Proposed Denial Is Misleading And Uses ADEM's Review Process Against It

EPA provides many pages of comments and discussion in the Proposed Denial related to the Assessment of Corrective Measures (ACM) documents, a required submittal that outlines possible alternatives to address residual groundwater contamination at CCR facilities, where applicable. Some of these comments are borrowed from ADEM's own reviews that have been communicated to the permittee, while others are further critiques of the ACM documents by EPA. While EPA dives deep into the review, evaluation, and overall discussion of the ACM documents,

it is implied throughout the comments that ADEM has missed critical information and granted approvals without merit. However, EPA never makes clear the fact that ADEM has not approved any ACM documents to date.

It is particularly troubling that EPA would seek to use deficiencies in facility submittals that ADEM has already identified and sought to remedy, as evidence of deficiencies in ADEM's permitting program.

Did EPA Provide An Accurate Docket Regarding The Proposed CCR Program Denial?

As detailed above, ADEM and EPA Region 4 staff worked closely and tirelessly through the years-long development of ADEM's program approval application, leading to its final transmittal at the end of 2021. This process, while extensive, and, at times, exhaustive, can only be described in positive terms, and can only be characterized as collaborative and focused on the common goal of getting ADEM's program approved. However, EPA's posture changed radically sometime in early 2022, as was evident during the May-July conference calls focusing on ADEM's previously issued CCR permits. EPA has never clearly explained what changed between EPA Region 4's redacted transmittal of ADEM's program approval application in January 2022 (EPA-HQ-OLEM-2022-0903-0029) and EPA's renewed interest in permits issued years prior.

ADEM is aware that EPA received a joint letter, dated March 11, 2022, from the Sierra Club and the Southern Environmental Law Center[5]. The letter transmits several extensive technical reports prepared by paid third parties. ADEM only learned of this letter months after EPA received it and had to specifically request a copy of it. The letter seeks to provide EPA with a detailed "outline [of] the legal basis for denying ADEM's state CCR permit program" and includes as attachments several reports contracted for by the groups critiquing various CCR permits issued by the Department. It is unclear what influence this letter had on EPA's decision-making process for Alabama's approval application. But the timing of its receipt by EPA falls directly between the time of EPA's receipt of Alabama's final program approval application, and the May-July conference calls described above. Also, there is a clear similarity between the technical concerns raised in the letter and those raised by EPA in the months following ADEM's final program application. Furthermore, EPA's actions after receiving this letter appear to follow the playbook for agency action promoted by the advocacy groups.

ADEM, and Alabama's citizens, are due an explanation why this letter does not appear in the official EPA docket for the proposed denial.

Why Was ADEM The Last To Know?

In perhaps the most baffling of EPA's behaviors to this point, ADEM learned it was the last entity to be notified by EPA of the impending decision to deny its permitting program. On August 2, Director LeFleur and Land Division Chief Cobb were sent an email giving them 19 minutes notice of a requested conference call with EPA Office of Land and Emergency

[5] The letter can be found in Department's eFile System by searching for "Sierra Club", "SELC", or "ADEM CCR Delegation". (The complete file name is XXX XXX 135 03-11-2022 CORR LTR Sierra Club-SELC Ltr to EPA Re ADEM CCR Delegation)

Management (OLEM) officials for "an urgent call regarding Alabama's application for CCR Program Approval and EPA's announcement tomorrow", which turned out to be OLEM's notification to ADEM that it was proposing denial of the ADEM CCR program, and that the public announcement of this proposed denial would be made the following day. ADEM subsequently learned and confirmed from other parties that had been contacted that EPA had, throughout the day on August 2, already notified numerous other parties and groups [including the Alabama CCR facilities, numerous environmental advocacy groups, Association State and Territorial Solid Waste Management Officials (ASTSWMO), and Environmental Council of States (ECOS)] of the pending announcement, although ADEM, the primarily affected party, had not yet been notified.

EPA Seeks To Penalize ADEM For Proactively Implementing An Effective CCR Program

Since EPA promulgated the 2015 federal regulations and Congress passed its 2016 legislation authorizing State permitting programs, EPA has subsequently issued State permit program guidance in 2017; issued a final rule on alternative performance standards in 2018; issued a final alternate liner demonstrations in 2022; approved or partially approved three State programs [Oklahoma (OK), Georgia (GA), Texas (TX)]; issued two CCR enforcement actions [Comanche facility in Pueblo, Colorado (CO) and Tecumseh Energy facility in Tecumseh, Kansas (KS)]; and denied a "Part A" extension for one facility [Gavin facility in Cheshire, Ohio (OH)]. Although EPA has proposed various other federal actions (including a federal permitting program rule, the recent "legacy impoundments" rule, other proposed "Part A" and "Part B" determinations, and various other rules changes resulting from court decisions), it has done little to otherwise implement or enforce the 2015 federal rules or follow through with the directives from the 2016 Water Infrastructure Improvements for the Nation (WIIN) Act. On the other hand, in that same timeframe, ADEM has issued significant formal enforcement actions against each of the Alabama CCR facilities. It has developed and implemented its entire CCR program, which EPA has determined mirrors the federal requirements. ADEM's CCR program includes a permitting program. It has issued fully enforceable permits covering each of the regulated CCR units existing in the State (including a requirement for groundwater remediation). It has required expedited CCR unit closure, comprehensive groundwater assessment / monitoring, and on-going development of groundwater remediation plans and systems. ADEM's CCR program requires a system of controls to ensure that each CCR unit in the State is appropriately closed, monitored and remediated, with robust public participation and public record availability. From this comparison, it would appear that EPA, not ADEM, is the agency failing to take seriously the Congressional directive to ensure protection of public health and the environment with respect to CCR.

Furthermore, EPA's behavior since January 2022, as previously outlined, can only be described as punitive. EPA's break-neck reversal of its review process of ADEM's application, the opacity of its communications with third party advocates, its failure to notify ADEM of its decision before numerous others, its failure to provide any formal notice of deficiency to which ADEM can respond, and its unprofessional and incredibly late review of ADEM CCR permits, all show a pattern of a program review that is unrecognizable from years of precedent and tradition.

EPA's Proposed Denial Unlawfully Considers Permits

In the Proposed Denial, EPA makes numerous references to 42 USC §6945(d)(1)(B), which wholly reads,

> *Not later than 180 days after the date on which a State submits the evidence described in subparagraph (A), the Administrator, after public notice and an opportunity for public comment, shall approve, in whole or in part, a permit program or other system of prior approval and conditions submitted under subparagraph (A) if the Administrator determines that the program or other system requires each coal combustion residuals unit located in the State to achieve compliance with-*
>
> > *(i) the applicable criteria for coal combustion residuals units under part 257 of title 40, Code of Federal Regulations (or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title); or*
> >
> > *(ii) such other State criteria that the Administrator, after consultation with the State, determines to be at least as protective as the criteria described in clause (i).*

Recall that EPA Region 4 transmitted ADEM's final permit approval application to EPA HQ on January 3, 2022 (See Docket No. EPA-HQ-OLEM-2022-0903-0029), seemingly for the purpose of final processing. In accordance with 42 §USC 6945(d)(1)(B), EPA had until July 2, 2022, to approve ADEM's CCR permit program. Instead, what ensued was a series of discussions and reviews long after the public comment periods and issuance of the CCR permits. EPA has clearly missed the statutorily mandated deadline to approve ADEM's CCR program.

EPA focuses on the "such other State criteria" noted in 42 USC §6945(d)(1)(B)(ii) as the basis to allow it to review issued permits as part of the permit approval record. That approach is illogical on its face when considered in the context of EPA's specific actions in this matter. Hypothetically, ADEM could have chosen to delay issuance of the permits until after submittal of the final program approval application, as other States with approved programs chose to do. At that hypothetical point, EPA would have only ADEM's CCR regulations upon which to review its equivalency to the federal program. EPA has already stated openly and clearly that ADEM's CCR regulations are equivalent to their federal counterparts (88 FR 55225, Aug. 14, 2023). ADEM can only assume that EPA would have then proceeded directly to program approval in this hypothetical scenario. EPA, presumably, would not have waited for ADEM to start issuing permits to observe the way it interprets its rules prior to approval. EPA clearly did not do this during the permitting program approvals for Oklahoma, Georgia, and Texas. If EPA is not requiring other States to issue permits to observe their interpretations of their CCR rules, it is not logical or consistent for EPA to incorporate reviews of ADEM's previously issued permits into its program approval review. Again, this punishes ADEM for its proactive approach to CCR facility management.

EPA has stated that 42 USC §6945(d)(1)(D) authorizes EPA to periodically review approved State programs, including its permits, and initiate program approval withdrawal proceedings if it finds the permits to be inconsistent with federal requirements. Considering this authority, EPA suggests that there is no fundamental difference between it reviewing permits after

approval and concluding program withdrawal is warranted, versus reviewing permits issued prior to approval and determining permit program denial is warranted. In this specific case, the difference is quite clear: EPA had ample opportunity to actively participate in the permit development process, to avail itself of the public review process, and to formally outline its permitting concerns to ADEM prior to permit issuance. Instead, EPA stayed silent about its apparent permitting concerns until after the permits were issued (years after in most cases). Alternatively, EPA's permitting concerns did not arise until after the permits were issued. Either way, EPA did not act in good faith.

Even if ADEM agreed that EPA permit reviews were an appropriate part of the program approval process, we must object, in the strongest possible terms, to EPA's decision to stay silent throughout the permit development process, and the program approval application development process, until months to years after the permits were issued. Doing so makes it difficult for ADEM to respond to EPA's concerns, and we do not believe Congress intended for EPA to approach State permit program approval in this manner.

EPA'S FLAWED INTERPRETATION OF THE CCR CLOSURE PERFORMANCE STANDARD

EPA asserts throughout its proposed denial that ADEM interprets infiltration differently than the "plain language" of the federal regulations, and it is this difference in interpretation which forms much of the basis for EPA's adverse review of ADEM's CCR permits. This is, perhaps, the best example of EPA contriving requirements that simply are not in the federal rules.

According to EPA, infiltration is a "consequence of the groundwater that continues to infiltrate into and be released from the impoundment from the sides and bottom of the unit" (88 FR 55236, Aug. 14, 2023). EPA references 40 CFR §257.102(d)(1)(i), which states that an owner or operator of a CCR unit must ensure that the unit is closed in a manner that will "(c)ontrol, 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". However, this regulatory requirement does not include reference to the "sides and bottom of the unit".

EPA proceeds to conclude that the referenced permits' (TVA Colbert, Plant Greene County, Plant Gorgas and Plant Gadsden), "exclusive reliance on engineering measures related to the consolidation and cap construction is inconsistent with § 257.102(d)(1)(i)" (88 FR 55237, Aug. 14, 2023). However, the only closure performance standard related to infiltration in 40 CFR § 257 is found at 257.103(d)(3), which states that "(i)f a CCR unit is closed by leaving CCR in place, the owner or operator must install a final cover system that is designed to minimize infiltration and erosion". Furthermore, 40 CFR §257.103(d)(3)(i)(B) goes on to state "infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material".

But neither regulation references a standard for infiltration for the bottom or sides of the unit. Part 257.102(d)(3)(i) requires four design parameters for the final cover system:

(A) The permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1 × 10−5 cm/sec, whichever is less.

(B) The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.

(C) The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.

(D) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.

None of these four design parameters address the lateral movement of groundwater through any wastes remaining in place. If infiltration means both vertical and lateral, why do the specific design requirements only address vertical movement of liquids from the surface?

Indeed, the closure requirements of 40 CFR Part 257 are derived from and worded similarly to the closure requirements for hazardous waste units found in 40 CFR Parts 264 and 265. In the 47-year history of the hazardous waste and Superfund programs, EPA has approved, overseen, or itself directed countless closures of hazardous waste surface impoundments, landfills, and similar units where wastes were left in place. At no time did EPA ever take the position that a hazardous waste closure cover system had to incorporate both vertical and lateral migration controls. EPA would have the public believe that closed CCR units, which, as EPA has stated, do not contain hazardous wastes, must have more stringent controls than their hazardous waste counterparts. However, in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities* (80 FR 21302, Apr. 17, 2015) (hereinafter the "2015 Final Rule") EPA states on page 21412 that, "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 the Proposed Denial, EPA explained "its decision to rely on the plain language meaning of 'infiltration' explicitly rejecting the interpretation that the term refers only to the vertical migration of liquid through the final cover system" (88 FR 55237, Aug. 14, 2023). To illustrate this point, EPA cites the *Denial of Alternative Closure Deadline for General James M. Gavin Plant* (Gavin Final Denial), which was issued in November 2022 (and was initially proposed January 11, 2022), rather than referencing existing regulations or historical guidance documents. *The Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundment* (88 FR 31982, May 18, 2023) proposed rule (proposed Legacy Rule) states:

EPA construes the word 'infiltration' in this regulation as a general term that refers to the migration or movement of liquid into or through a CCR unit from any direction, including the top, sides, and bottom of the unit. This is consistent with the plain meaning of the term. For example, Merriam-Webster defines infiltration to mean "to pass into or through (a substance) by filtering or permeating" or "to cause (something, such as a liquid) to

permeate something by penetrating its pores or interstices." Similarly, the Cambridge English Dictionary defines infiltration as "the process of moving slowly into a substance, place, system, or organization…'None of these definitions limit the source or direction by which the infiltration occurs.

As noted by EPA, the definitions cited above do not limit the source or specify the direction by which infiltration occurs. As a part of the proposed Legacy Rule, EPA proposes to adopt a regulatory definition of infiltration, using the "plain meaning and dictionary definitions referenced above" (88 FR 32026, May 18, 2023). However, while the proposed Legacy Rule does not include a proposed definition for 'infiltration' it can be implied by the referenced quote above and the Final Gavin Denial that EPA intends to adopt or at the very least implement an expanded definition of infiltration, which would reference the bottom and sides of the unit, to meet EPA's current objectives.

On the contrary, as presented below, EPA has a long-standing practice of interpreting "infiltration" as the vertical migration of liquids through the waste mass and down into underlying soils. For example, the *Closure of Hazardous Waste Surface Impoundments* manual, issued by EPA in September 1982[6], identifies seven principal input and output components of the water balance of a hypothetical closed surface impoundment. These include precipitation, surface runoff onto the impoundment, surface runoff from the impoundment area, evapotranspiration, ground water underflow in, groundwater underflow out, and infiltration or seepage. It is clear from this list that infiltration is distinct and separate from groundwater inflow and outflow from the impoundment. Infiltration is further described as surface water that moves "down through the waste material" to directly join the ground water underflow or form a leachate plume (*Closure of Hazardous Waste Surface Impoundments* manual, Sept. 1982. See Section 3.3.1, pages 23-25). This is illustrated by Figure 3-1 (see below). The document goes further to state that "infiltration represents the primary mechanism for the downward migration of waste-derived constituents", with four processes involved. These four processes include entry through the cover soil, storage within the soil, transmission through the soil and deep drainage through the residual waste strata and into the underlying soil. An impermeable soil cover is identified as one mechanism to "significantly reduce the net volume of vertical flow" (*Closure of Hazardous Waste Surface Impoundments* manual, Sept. 1982. See Section 3.3.1, page 26).

[6] It should be noted that the *Closure of Hazardous Waste Surface Impoundments* manual is referenced extensively in the 2015 Final Rule and the Final Gavin Denial.

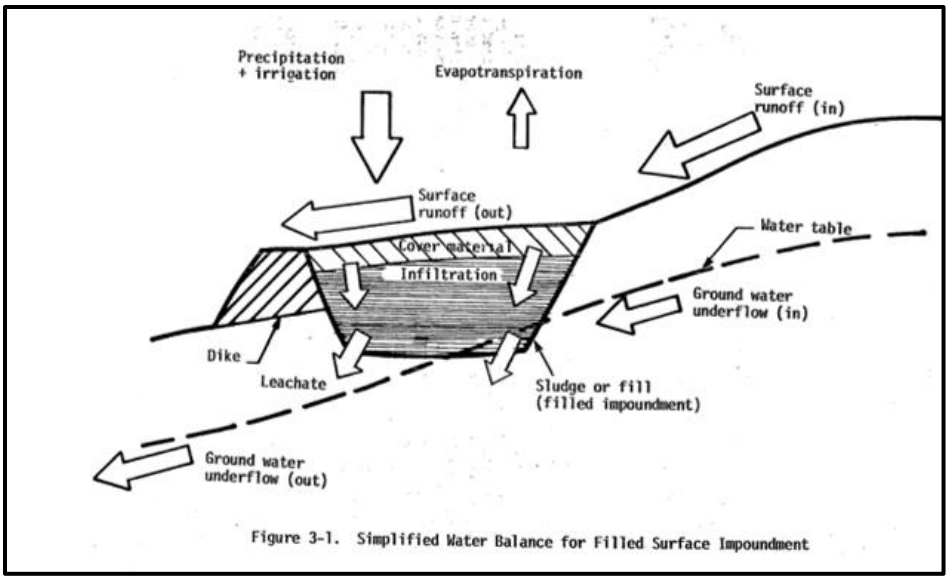

Figure 3-1. Simplified Water Balance for Filled Surface Impoundment

In addition, Section 2.2.1.2.6 of EPA's *Composite Model for Leachate Migration with Transformation Products* (EPACMTP) Technical Background Document, April 2003, "is a subsurface fate and transport model used by EPA to simulate the impact of the release of constituents present in waste that is managed in land disposal units". The EPACMTP Technical Background Document discusses the difference between infiltration and recharge. The EPACMTP model requires "input of the net areal rate of vertical downward percolation of water and leachate through the unsaturated zone to the water table". Infiltration is defined as water percolating through a waste management unit to the underlying soil, while recharge is water percolating through the soil to the aquifer outside of the footprint of the waste management unit (EPACMTP Technical Background Document, page 2-8). This is illustrated by Figures 2.3 (which depicts a surface impoundment whose base is not in contact with the water table) and Figure 4.1 (which depicts a surface impoundment whose base is in contact with the water table). The similarities between infiltration and recharge are most obvious in Figure 4.1, which depicts infiltration and recharge as storm water that seeps down to intercept the water table. The difference in infiltration is the percolation through waste, as opposed to native soils.

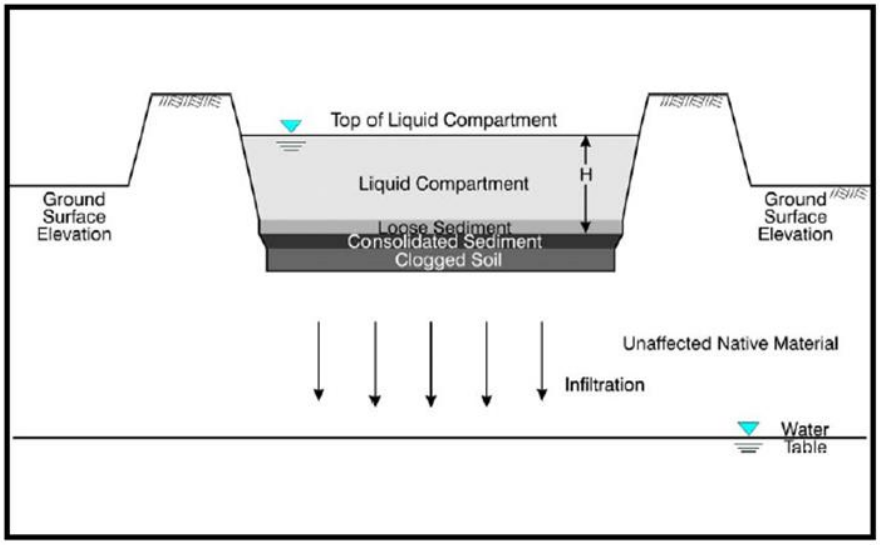

Figure 2.3 Schematic Cross-Section View of SI Unit.

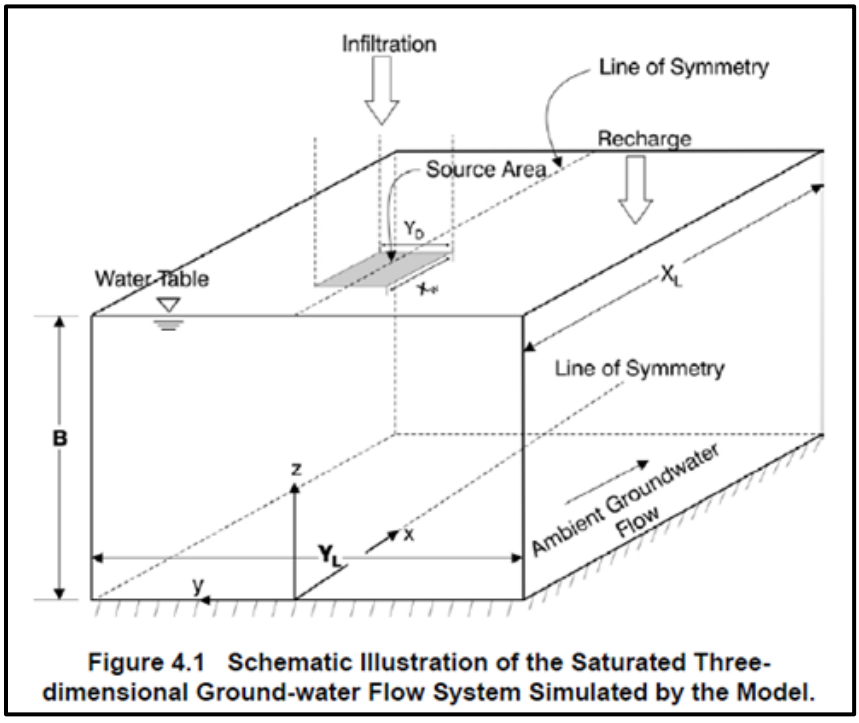

Figure 4.1 Schematic Illustration of the Saturated Three-dimensional Ground-water Flow System Simulated by the Model.

These two referenced documents provide a pre-existing definition, established by EPA, of the term infiltration. However, to further demonstrate EPA's long-standing understanding of infiltration, as part of the initial CCR rulemaking process, EPA conducted a risk assessment for coal combustion wastes (*Human and Ecological Risk Assessment of Coal Combustion Wastes*, April 2010, hereinafter "2010 Risk Assessment").[7] Section 3.5 of the 2010 Risk Assessment states that the peak annual leachate concentrations are "highest when the surface impoundment is in

[7] The 2010 Risk Assessment was included as part of the docket for the 2010 proposed rule and the 2015 Final Rule. See EPA-HQ-RCRA-2009-0640-0005.

operation due to the higher hydraulic head in an operating impoundment, which drives leachate into the underlying soil with greater force than infiltration after the impoundment is covered and closed". This document goes further to state "(t)he leakage (infiltration) rate through the unlined impoundment is a function of the ponding depth in the impoundment and the thickness and effective permeability of the consolidated sediment layer at the bottom of the impoundment" further exemplifying that infiltration is a downward migration of liquids, rather than a migration from the bottom or sides. In developing the 2010 Risk Assessment, EPA used the EPACMTP model described above. While the EPACMTP model is not designed to model scenarios where the water table is above the bottom of the unit, it is capable of modeling surface impoundments in direct contact with the water table. However, EPA did not consider groundwater in contact with the waste management unit in the original risk assessment, among other conditions, because these conditions were considered "site-specific considerations that could not be accommodated in a nationwide risk assessment" (80 FR 21436, Apr. 17, 2015). In fact, using the EAPCMTP model, EPA only modeled disposal sites with the base of the unit above the water table. EPA acknowledged this in its response to comments (80 FR 21440, Apr. 17, 2015) but failed to provide a rationale for not utilizing the model's capability to model waste in contact with the water table.

As part of the 2010 proposed CCR rule, EPA modeled surface impoundments using the inputs for clean closure of the impoundment (2010 Risk Assessment). EPA's risk assessment found that the highest risks were associated with CCR surface impoundments due to the hydraulic head imposed by impounded water. For this reason, EPA concluded that "dewatered CCR surface impoundments will no longer be subjected to hydraulic head so the risk of releases, including the risk that the unit will leach into the groundwater, would be no greater than those from CCR landfills" (80 FR 21342, Apr. 17, 2015). In 2014, between proposal[8] and promulgation of the 2015 Final Rule, EPA revised the 2010 Risk Assessment. In response to comments received on the modeling approach used in the 2010 Risk Assessment, EPA included modeling for the operational and post-closure phases for a surface impoundment in the 2014 Risk Assessment. Using the EPACMTP model, EPA modeled the operational phase of an impoundment using the standard impoundment source inputs. For this part of the model, liquid wastes in the impoundment were assumed to be replenished over the operational life to maintain a constant level of liquid in the unit with constant constituent concentrations (Appendix K of 2014 Risk Assessment). Modeling the post-closure portion of the surface impoundment was done via a second run of EPACMTP, using the inputs for a closed landfill, with the full constituent mass to continue to leach without replenishment. The results indicate that releases from surface impoundments drop dramatically after closure, even with waste in place, due to the reduced hydraulic head present during operation which forces leachate down at a faster rate. EPA concluded, based on this analysis, that the assumption of clean closure for surface impoundments (during modeling) "had a negligible effect on modeled risks" (Section 5.1.7 of 2014 Risk Assessment) as compared to post-closure modeling. EPA determined that "high-end risks identified for surface impoundments are consistently higher than those for landfills. These results are attributed to the higher infiltration rates through surface

[8] At the time of proposal of the CCR rule in 2010, the 2010 Risk Assessment was the only risk assessment available to the public for consideration and comment. EPA references both the 2010 Risk Assessment and the 2014 Revised Risk Assessment in the 2015 Final Rule.

impoundments, which are driven by the hydraulic head of the ponded water" (*Human and Ecological Risk Assessment of Coal Combustion Residuals*, December 2014). Similar to the definition used in the EPACMTP model, the 2014 Risk Assessment defines infiltration as "the process through which water migrates through waste management units and enters the subsurface environment" (Section 4.4 of the 2014 Risk Assessment). Through modeling EPA was able to determine that the "highest releases from surface impoundments are anticipated to occur during operational life due to the presence of a large hydraulic head that will drive infiltration rates" (Section 4.3.1 of the 2014 Risk Assessment). Appendix K of the 2014 Risk Assessment states "(t)he forces driving leaching from surface impoundments during operation and post-closure are different. During operation, free liquids that are ponded in the impoundment create a strong hydraulic head that acts to increase infiltration through the base of the impoundment. The removal of free liquids and capping during closure reduces the hydraulic head and the rate of contaminant migration. After closure is complete, infiltration through the impoundments is driven only by percolation of incident precipitation through the cap" (Section K.2.1, page K-2 of the 2014 Risk Assessment).

One of the required inputs for the EPACMTP model is the infiltration rate. For the purposes of the 2014 risk assessment modeling, the infiltration rate for a closed impoundment was set equal to the regional recharge rate for unlined units[9]. This substitution clearly shows the relationship between recharge and infiltration. It also shows that EPA's current interpretation of infiltration (as occurring from all sides and the base of the unit) was not in place during the 2010 CCR Rule proposal, comment period or 2015 rule finalization.

Furthermore, as shown in Section K.2.2 of Appendix K in the 2014 Risk Assessment, when modeling for post-closure leaching, higher peak concentrations were noted for only about five percent of the modeled surface impoundments. In addition, approximately 99% of the higher peak concentrations resulted in a difference four orders of magnitude below the maximum arsenic concentration. For these reasons, EPA concluded that "(b)ecause the frequency of higher concentrations is very small and the magnitude of the higher concentrations that do occur is typically small, the decision to neglect these post-closure releases is not a major source of uncertainty" and that "(a)ny increase in risks attributable to post-closure releases would not be sufficient to change the results presented" in Section 4 of the 2014 Risk Assessment. To address the issue of infiltration, EPA proposed and ultimately finalized closure performance standards at § 257.102. The 2015 Final Rule states "EPA received no significant comments on the proposed performance standards" (80 FR 21414, Apr. 17, 2023). However, EPA recognized that:

> *A final cover system that does not perform as designed may result in unacceptable infiltration of water into the closed CCR unit that may lead to leachate and releases from the unit. To address this concern, as well as the concerns raised by commenters regarding the long-term performance of certain cover systems by providing further assurance that*

[9] For clay lined impoundments, the post-closure infiltration rate was set equal to the Hydrologic Evaluation of Landfill Performance (HELP) - modeled infiltration rate calculated based on the assigned climate center and a clay liner hydraulic conductivity of 1×10-7 cm/sec. For composite lined impoundments, the infiltration rate from the pre-closure period was used.

> *the final cover system will perform over the long term, EPA has deleted the proposed provision that would have allowed owners or operators to shorten the length of the post-closure care period.*

In the Proposed Denial, EPA states "there are several ways in which the failure to remove CCR from the water table as part of closure can result in significantly higher risks than a comparable closure where waste no longer remains in contact with the water table," citing the proposed Legacy Rule (88 FR 32009, May 18, 2023). The proposed Legacy Rule states that there were additional management practices that may result in higher risk at individual sites than those originally recognized in the 2014 Risk Assessment. For example, CCR disposal below the water table was not modeled because "EPA was unable to quantitatively model the associated risks as there was little data on how common this practice was or the extent to which it could affect groundwater chemistry". The proposed Legacy Rule itself, as well as EPA's new interpretation on waste below the water table, is based on assumptions not supported by the data collected during the 2010 and 2014 Risk Assessments. In addition, EPA failed to revise the 2014 Risk Assessment to account for waste in contact with groundwater or modify the EPACMTP model to account for management practices not previously modeled.

Finally, EPA offers this response to a commenter to the 2015 rule pointing out that surface impoundments can come in direct contact with groundwater:

> *EPA acknowledges that EPACMTP is not designed to handle scenarios where the water table is above the bottom of the landfill. However, EPACMTP can accommodate surface impoundments in direct contact with the water table. If unit geometry and the selected depth to the water table create a scenario where the bottom of the unit is in contact with the water table, then the entire soil column is considered saturated (80 FR 21440, Apr. 17, 2023).*

This clearly shows that, at the time of first promulgating Part 257, EPA envisioned that some units would exist in contact with groundwater but made no effort to add additional closure requirements for these units.

Collectively, these points demonstrate how EPA's novel interpretation of "infiltration" is entirely contrived and completely inconsistent with long-standing practice and precedent. Furthermore, EPA's novel interpretation has not been promulgated and is therefore an invalid rule. As such, it is inappropriate for EPA to use this invalid rule to deny approval of ADEM's CCR program. And, given EPA's use of "infiltration" for hazardous waste surface impoundments, such a rule would lack rational basis.

EPA's Misinterpretation Of "Free Liquids"

While EPA claims that the plain text of the regulations clearly communicates the definition and application of "free liquids" to the CCR Federal Rule, it is clear from the multitude of comments EPA has received for the proposed Legacy Rule that EPA's interpretation is still up for debate. EPA requested comments on whether to include regulatory definitions for "liquids" and "infiltration" in an attempt to address the numerous issues that regulated entities have raised.

Furthermore, as the proposed Legacy Rule (88 FR 31982, May 18, 2023) has not yet been finalized, it seems premature to attempt to act on the interpretation EPA claims. If the definition of liquids and infiltration are clear, why would EPA invite comments on proposed definitions for these terms?

In its July 17, 2023, comments addressing the proposed Legacy Rule[10], the Utility Solid Waste Activities Group (USWAG) raised multiple issues with EPA's interpretation of free liquids that parallel ADEM's concerns, including the following:

1. Groundwater is not contained within the definition of free liquids.
2. Groundwater does not fall under the category of a solid or liquid waste.
3. The paint filter test is not designed for the application the Federal CCR Rule proposes.
4. EPA's definition of "free liquids" does not match the definition used by EPA's Hazardous Waste Program.
5. Requiring the elimination or solidification of free liquids prior to installing the final cover system is not feasible.

"Free liquids" are defined in 40 CFR §257.53 as *"liquids that readily separate from the solid portion of a waste under ambient temperature and pressure."* In contrast, groundwater is defined by 40 CFR §257.53 as *"water below the land surface in a zone of saturation."* From both a technical and regulatory perspective, these are different entities. This is demonstrated further by noting that groundwater, as defined above, cannot separate from its surroundings under ambient temperature and pressure as required by the definition of free liquids requires.

Furthermore, on July 17, 2023, USWAG further stated that "over the four decades of the implementation of RCRA's groundwater regulatory programs, USWAG has not found one instance of the term "[f]ree liquids," which is a well-established definition under RCRA, ever being interpreted as encompassing groundwater, and EPA cites none in its Proposed Decisions" in its response to the proposed Legacy Rule.

Additional proof that "free liquids" does not include groundwater within its definition was also provided by USWAG in reference to the initial efforts EPA took to gather data when first developing the CCR Rule in June 2010. EPA issued data collection requests under the Clean Water Act and RCRA directing facilities to provide, among other things, information describing, for each CCR management area, "the area's approximate storage capacity, the volume of waste or wastewater currently stored, and the approximate proportion of free liquid and settled solids within the stored wastewater" and directing recipients to "[e]xplain how the company calculated these volumes."[11]

Based on this request, it is clear that EPA understood "free liquids" to mean the volume of ponded water that had readily separated from the settled solids. Therefore, this information that

[10] Comments submitted by Utility Solid Waste Activities Group dated July 17, 2023 to EPA Docket, See Comment ID. EPA-HQ-OLEM-2020-0107-0242

[11] Comments submitted by Utility Solid Waste Activities Group dated July 17, 2023 to EPA Docket, See Comment ID. EPA-HQ-OLEM-2020-0107.-

was used as a foundation for the 2015 Final Rule is in direct conflict with EPA's current claim that "free liquids" encompasses groundwater.

An environmental law judge (ELJ) ruling on the partial approval of a Closure/Post-Closure Plan for Duke Gallagher Generating Station Ash Pond System on May 4, 2021[12], rejected the argument that contaminated groundwater at the base of a closed CCR impoundment constituted a "free liquid" and reiterated that the term "free liquid" under RCRA did not include groundwater. The following points were stated by the ELJ:

> *"32. The term "free liquids" is not a new term under RCRA and the Federal CCR Rule. EPA intentionally used the same definition of "free liquids" that is used in EPA's existing hazardous waste rules, such as the commonly used paint filter liquids test (EPA Method 9095B). This is a routine EPA test method for hazardous waste "used to determine the presence of free liquids in a representative sample of waste.".*
>
> *33. EPA states that groundwater, and for that matter, any environmental medium containing contaminants, is not a solid waste in the first place. Therefore, because groundwater is not a solid waste, it is axiomatic that groundwater does not, and cannot, constitute a "free liquid."*
>
> *34. This legal conclusion is also confirmed by the language in the Federal CCR Rule itself, which defines "groundwater" as "water below the land surface in a zone of saturation." On the other hand, the Federal CCR Rule (like the paint filter liquids test) defines "free liquids" to mean "liquids that readily separate from the solid portion of a waste under ambient temperature and pressure."*
>
> *35. Consequently, for present purposes, "free liquids" in the Federal CCR Rule consists of the water that separates from sluiced ash and forms the surface water in an ash pond."*

As pointed out by the ELJ, groundwater does not fit the definition of a solid waste. The closure regulations in § 257.102(d)(2) only require the elimination of "free liquids" through the removal of liquid wastes or the solidification of remaining wastes and waste residues, thereby excluding groundwater, which is defined instead as an environmental medium.

The paint filter test is not designed for the application the Federal CCR Rule proposes: Another issue highlighted by the ELJ is the use of the paint filter test in the CCR Rule. Typically, this test is employed under RCRA provisions to determine whether or not free liquids are present within an environmental medium. However, it is of note that this rule has typically been used to determine the presence of free liquids within a waste before the waste is disposed, and under ambient temperature and pressure. How can the conditions of confined groundwater be expected to provide actionable results if the parameters of the test cannot actually be met? EPA's definition of "free liquids" does not match with the definition used by EPA's Hazardous Waste Program. In

[12] In the Matter of Objection to the Issuance of Partial Approval of Closure/Post Closure Plan Duke Gallagher Generating Station Ash Pond System, No. 20-S-J-5096 at 32-35(Ind. Office of Environmental Adjudication, May 4, 2021.

addition to being at odds with the regulatory text and rulemaking record, EPA's position that the closure requirement to "eliminate free liquids" includes groundwater conflicts with EPA's interpretation of the same requirement under the Subtitle C hazardous waste program, which does not include the removal of groundwater as part of the directive to eliminate free liquids. Further, units under Subtitle C are required to address groundwater contamination using post-closure care and corrective action provisions set forth by RCRA. EPA provides at 80 FR 21412 (April 17, 2015) that, "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 light of this statement, it does not make sense for CCR units to be regulated to a higher standard than what is required for hazardous waste.

Requiring the elimination or solidification of free liquids prior to installing the final cover system is not feasible. When it was previously understood that the free liquids EPA was referring to were those visibly present within an impoundment and which needed to be removed to ensure that the working surface was sufficiently dewatered to install the required engineered cover system properly and safely, this was a logical and feasible requirement. However, under the proposed Legacy Rule, EPA's new position that infiltration is a "term that refers to the migration or movement of liquid into or through a CCR unit from any direction, including the top, sides and bottom of the unit" incorporates free liquids into its interpretation-making the elimination or solidification of free liquids prior to installing the cover system no longer technically feasible. Based on EPA's revised definition, free liquids will continue to enter via infiltration, even after the cover system is installed. It is only logical that free liquids can be removed prior to the installation of the final cover system to the extent necessary to create an adequate working surface to safely and properly install the required cover system (which is exactly what the plain text of the rule requires).

The Consequences Of EPA's Flawed Interpretation

EPA has refused to confront the consequences of its new interpretations by effectively removing any option but to close existing unlined cells by removal. The choice to close-in-place, clearly provided in 40 CFR § 257, is taken away because there is no practical design protocol that would allow a final cover system to address lateral movement of liquids at depth in an existing, unlined impoundment. This can only be accomplished by retrofitting the cell. This was pointed out to EPA leadership in one of the conference calls where EPA first began to review ADEM CCR permits. However, EPA had no answers for what alternative options would be available for those impoundments closing with material below the known water table. So, in the absence of any guidance from EPA, the possible alternatives to closure-in-place are limited. First retrofitting the cell would involve dewatering and removing the waste material and temporarily staging it while the liner system for the cell is constructed. Provisions would have to be made to protect the staged material from leaching and erosion. The facility would have the expense of the construction of the staging area, handling/moving the waste mass twice (first to remove the waste to the staging area, then to replace it in the newly-lined cell) and of constructing a liner system within the newly emptied cell in addition to the costs of the final cover system, post-closure maintenance, groundwater monitoring, and, if necessary, corrective action. EPA's own estimates put these costs

at $734M to $7.240B (80 FR 21459, Apr. 17, 2015). It is clear that retrofitting an existing cell is completely impractical.

The second alternative would be the permitting and construction of a new disposal cell on or near the site. This is certainly a possible option, provided there is available space for such construction. But this would involve siting, permitting, and constructing the new disposal unit (a process which in itself often requires five or more years to complete before the new cell can be certified complete to begin receiving wastes) at the facility, and the facility occupying double the amount of land for CCR management and double the cost and regulatory burdens. This option does not address the common public concern for the waste's proximity to nearby surface water bodies. In addition, it is presumed that EPA would be opposed to this option since it also proposes to deny Alabama's permitting authority for new CCR management units.

This leaves only one impractical option, the complete removal and offsite disposal of all residual material. Other parties at the Public Hearing in Montgomery on September 20, 2023, raised the issue that truck transportation is not a viable transportation option due to the vast quantities of material to be moved, and the associated risks of highway transportation, leaving rail transport as the remaining option for most facilities. In Alabama, and the Southeast generally, there is only one facility which has rail access currently permitted to manage CCR, the Arrowhead Landfill in Uniontown, Perry County, Alabama. This landfill has been the subject of many environmental justice (EJ) concerns and a Title VI complaint, which EPA took 5 years to review and resolve. It is simply impractical to assume any other facility would be chosen for offsite disposal. Arrowhead Landfill is owned by interests located primarily in New York and New Jersey, two states with some of the most stringent environmental justice requirements in the country. Discussing the acquisition of the Arrowhead facility, Co-Founder & CEO William Gay stated, "Our vision was to capitalize on the macro trends of declining disposal capacity and rising transportation and disposal costs in the Northeast and create a novel disposal solution for customers in the region."[13] EPA and advocacy groups appear to seek to undermine their stated goals of protecting underserved and vulnerable communities from becoming the dumping ground for the waste disposal needs in more affluent areas. Requiring the movement and re-disposal of vast amounts of CCR will only exacerbate this situation. It would appear that the current EPA administration, and the environmental advocacy groups supporting this action, are intent on pushing wholesale CCR disposal to EJ area landfills, such as in Perry County, Alabama. Alabama's citizens, those who are the utility rate payers, and many of whom live in these underserved and vulnerable communities, will ultimately pay the enormous increased cost of this movement.

Thus, EPA remains unprepared to face the harsh realities of its new interpretation of requiring re-disposal of the hundreds of millions of tons of CCR that would result from this new interpretation. Alabama landfills currently dispose of approximately 9 million tons per year of solid waste (municipal solid waste+ industrial + construction/demolition). Estimated volumes of Alabama CCR alone amount to 12 to 13 times this annual volume of other solid waste , and would quickly consume all of the currently available airspace in all of Alabama's currently permitted

[13] Quinn, Megan, **WasteDive**, August 4, 2023.

MSW landfills, leaving no room for meeting the routine MSW disposal needs of the State and its citizens.

A CLOSER LOOK AT THE 2015 FINAL RULE

Setting The Stage

Now that we have taken a look back at the regulatory history of infiltration, liquids, and waste below the water table (WBWT), let's take a closer look at the 2015 Rule itself, as a means of confirming that the Department's assessments and conclusions drawn related to the closure-in-place requirements are consistent with EPA's original intentions in finalizing the 2015 rule.

First, to put the 2015 rule in context – in December 2008, the Kingston, Tennessee (TN) release occurred, which spurred a renewed effort to regulate CCR and resulted in the 2010 proposed rule, *Disposal of Coal Combustion Residuals from Electric Utilities* (75 FR 35128, Jun. 21, 2010) which considered multiple options – 1) regulation under Subtitle C (Hazardous Waste), 2) regulation under Subtitle D (Solid Waste), and 3) a hybrid approach (Subtitle D Prime).

From 2009 to 2015, EPA and TVA responded to the Kingston, TN CCR release. During Phase 1 of the emergency response action, TVA, EPA and their response contractors, working around the clock seven days per week (i.e., 24/7 operations), excavated approximately 3.5 million cubic yards of CCR materials and transported it via railcars to the Arrowhead Landfill in Perry County, Alabama. In Phase 2, EPA and its contractors spent approximately 4 years removing, compacting and disposing of an additional 2.3 million cubic yards of CCR materials in an on-site disposal cell[14]. From this, we can conclude that the removal and re-disposal of the 5.8 million cubic yards of CCR materials required approximately 6 years, at a cost of more than one billion dollars, with the first Phase being 24/7 operations, and using railcars, not trucks to transport the material to an off-site landfill. Simply extrapolating this example up to a single large CCR unit such as the Plant Barry ash pond, would indicate that removal and re-disposal of approximately 21 million cubic yards of CCR will take 20 to 25 years at an inflation adjusted cost exceeding $4 billion, regardless of whether such re-disposal occurs on or near the existing facility, or at an existing off-site landfill.

It has been speculated[15] that at least nine CCR impoundments in Alabama potentially have CCR in contact with groundwater (thus requiring removal under EPAs new interpretations), with total CCR volumes in these units estimated to total as much as 120 million cubic yards. Again, using the simple extrapolation from the above example results in an estimated inflation adjusted cost for removal and re-disposal of Alabama CCR exceeding $20 billion. For EPA's national estimate of potentially 160 CCR[16] units which may contain CCRs which are in contact with groundwater, this estimated inflation adjusted cost would total hundreds of billions of dollars in removal and re-disposal costs.

[14] Overview of Coal Combustion Residuals (CCR) and TVA Kingston Case Study by Jeffrey Ragucci, March 30, 2018
[15] https://www.eenews.net/articles/leaked-list-epa-eyes-closure-plans-for-160-coal-ash-ponds/
[16] https://www.eenews.net/articles/leaked-list-epa-eyes-closure-plans-for-160-coal-ash-ponds/

Why is this important when looking at the 2015 final rule? Because, after extensive public comment and almost 5 years of evaluation of the 2010 proposal, and over 6 years of direct experience responding to the Kingston release, EPA issued the April 15, 2015 Final CCR Rule (80 FR 21302).

What Does The 2015 Rule Say About Closure Of CCR Units?

In section VI.M. of the preamble to the final rule, EPA discusses and describes, in its own words, its evaluation of the proposed rule, the issues raised during the public comment period, and its decisions regarding the selection of the appropriate regulatory language for the final regulations regarding closure.

In section VI.M.2 (80 FR 21412, Apr. 15,2015), EPA states, regarding the two options for closure of CCR impoundments:

> *EPA did not propose to require clean closure nor to establish restrictions on the situations in which clean closure would be appropriate. As EPA acknowledged in the proposal, most facilities will likely not clean close their CCR units given the expense and difficulty of such an operation. Because 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. However, both methods of closure (i.e., clean closure and closure with waste in place) can be equally protective, provided they are conducted properly. Thus, consistent with the proposal, the final rule allows the owner or operator to determine whether clean closure or closure with the waste in place is appropriate for their particular unit. EPA agrees that the risk-based corrective action (RBCA) process, using recognized and generally accepted good engineering practices such as the ASTM Eco–RBCA process, can be a useful tool to evaluate whether waste removal is appropriate at the site. It is, however, not a necessary prerequisite.*

In section VI.M.3., EPA describes the selected requirements for closure-in-place (located on pgs. 21412-21414, See Attachment C). The plain text of this section makes it exceedingly clear that the closure-in-place option is all about the installation of a proper cover, and that infiltration is controlled by installation of a proper cover. As noted in this section, the primary purpose of the final cover system is to control infiltration, and infiltration is clearly described as the downward movement of water from the surface. Note that EPA's discussion of its basis for the requirements for closure-in-place in this section do not simply mention cover design and its role in reducing infiltration in passing as part of a larger discussion of other requirements, rather, the discussion of the placement of appropriate cover and its role in controlling infiltration is the central theme of the entirety of EPA's lengthy rationale for the final rule requirements for closure-in-place. Also, as clearly described, the closure performance standards are related to the construction, long-term stability, and long-term maintainability of the final cover system. This lengthy discussion of the closure-in-place requirements and expectations makes no mention of any requirement for waste removal as a component of the closure-in-place option.

Further, in Section VI.M.4.b.ii., (located on pgs. 21420-21423, See Attachment D), EPA discusses its rationale for the timelines allowed for Closure of CCR Surface Impoundments in the

final rule. Throughout this discussion, it is clear that for closure-in-place, the primary considerations were to ensure that regulated units were closed and secured as soon as possible, and this was based on the time required for the operators of large units to dewater the unit and haul and place the large quantities of cover material required to complete closure (see for example the Duke Energy discussion at the bottom of column 2 on pg. 21421, and also the discussion (in the middle column on pg.21422) regarding the documentation required for requesting and receiving an extension of time to complete closure of the unit). Note that in this analysis by EPA describing its rationale for the final closure timelines included in the final rule, there is no mention of the significant amount of time that would be required to remove large quantities of waste prior to placing the cover material and constructing the final cover, and there is no mention of the significant amount of time that would be required to establish other engineering controls (such as the installation of a bottom liner, barrier wall or other such controls as discussed related to EPAs NEW interpretations) to address inflow of groundwater or other circumstances as part of the closure-in-place requirements.

Moving on to Section XII [the Regulatory Impact Analysis (RIA) section] on pg. 21459 in Section XII.A. Table XII-A Item 7., and on pg. 21459 in Section XII.B Item 11, EPA notes that the only "closure" costs evaluated in the Regulatory Impact Analysis Costs, and in the Regulatory Impact Analysis Benefits for the Final Rule were "Closure capping", and "Increased property values surrounding electric utility plants (from closure capping and re-vegetation of CCR surface impoundments)", respectively. Based on the information presented in these Sections of the final rule, the RIA document for the final rule[17], and the Kingston-extrapolated cost considerations described above, it is noted that there is no mention of the requirements of EPA's new interpretations regarding "infiltration", "liquids", and "waste below the water table", nor is there any mention of the significant costs related to the removal and re-disposal of large quantities of waste costs described above, which EPA and TVA had recently experienced first-hand in the Kingston response action.

[17] Regulatory Impact Analysis (RIA) for EPA's Final Coal Combustion Residuals (CCR) Rule, Document No. EPA-HQ-RCRA-2009-0640-12034

TABLE XII–A—ESTIMATED COST OF POLLUTION CONTROLS REQUIRED BY THE CCR FINAL RULE
[Millions 2013$]

CCR pollution control	@ 3% discount rate		@ 7% discount rate	
	Annualized values	Present values	Annualized values	Present values
1. Groundwater monitoring	$4.79	$151	$2.80	$39.9
2. Bottom liners	491	15,500	297	4,230
3. Leachate collection system (landfills only)	51.6	1,630	18.4	263
4. Fugitive CCR dust controls	7.09	224	3.36	48.0
5. Stormwater run-on/run-off controls	18.8	594	13.0	186
6. Location restrictions	43.6	1,380	20.0	285
7. Closure capping	20.1	630	12.0	171
8. Post-closure groundwater monitoring (30 years)	0.08	2.40	0.04	0.61
9. Impoundment structural integrity requirements	10.9	344	11.1	158
10. Corrective action (CCR contaminated groundwater cleanup)	19.0	600	19.1	273
11. Reporting and recordkeeping	26.3	831	27.3	389
12. Conversion to dry CCR handling	29.0	916	57.3	818
13. Inactive impoundments (dewater and closure cap)	12.0	380	26.7	381
14. Subtotal industry costs (1+...+13)	734	23,200	508	7,240
State Agency Burden Costs				
15. Impoundment structural integrity requirements	0.22	6.88	0.22	3.16
16. Corrective action	0.38	12.0	0.38	5.45
17. Reporting and recordkeeping	0.53	16.6	0.55	7.78
18. Subtotal State agency burden costs (15+16+17)	1.12	35.5	1.15	16.4
19. Total cost (14+18)	735	23,200	509	7,260

Section XII.B - Benefits of the Final Rule states

The RIA contains two categories of benefits (1) benefits that are monetized and (2) non-monetized benefits. The RIA estimates 11 categories of expected future human health and environmental benefits for the CCR rule. These include reduced future CCR impoundment structural failure releases; reduced future CCR groundwater contamination; improved air quality from reduced power plant air pollution; and surface water quality benefits. The estimated value of each of the 11 monetized benefits is presented in Table XII–B below.

TABLE XII–B—EPA ESTIMATED MONETIZED BENEFITS FOR THE CCR FINAL RULE
[Millions 2013$ over 100-year period of analysis 2016–2114]

	3% discount rate		7% discount rate	
	Annualized	Present value	Annualized	Present value
1. Reduced CCR impoundment structural failure releases	$156	$4,910	$143	$2,040
2. Reduced CCR landfill & impoundment groundwater contamination	12.8	405	9.86	141
3. Induced increase in future annual CCR beneficial uses	117	3,130	79.0	1,120
4. Reduced incidence of cancer from CCR exposure	<0.1	0.17	<0.1	<0.1
5. Avoided IQ losses from mercury in CCR	0.28	8.80	<0.1	0.35
6. Avoided IQ losses from lead in CCR	0.186	5.87	<0.1	0.23
7. Reduced need for specialized education (associated with 5 & 6 above)	<0.1	<0.1	<0.1	<0.1
8. Non-market surface water quality benefits	2.26	71.4	1.89	27.0
9. Protection of threatened & endangered species near CCR impoundments	0.91	28.7	0.76	10.8
10. Improved air quality from induced changes to power plant emissions	4.66	147	2.04	29.1
11. Reduced power plant groundwater withdrawals	<0.1	<0.1	<0.1	<0.1
12 Total monetized benefits (1 + . . . + 11)	294	8,710	236	3,360

In addition to the monetized benefit categories, the RIA describes 11 additional non-monetized benefit categories. Due to uncertainties and weaknesses in supporting documentation for quantifying and monetizing these benefits, the RIA presents these benefits separately from the benefits listed above and does not include them in the quantified comparison of benefits and costs. These non-monetized benefits include:

1. Financial market benefits

2. *Reduced community dread of CCR impoundment structural failure releases*
3. *Reduced health and property nuisance impacts from CCR fugitive dust*
4. *Cancer and non-cancer human health benefits from reduced CCR contamination of fish consumed by recreational anglers and subsistence fisher households in surface waters near power plants (additional to monetized avoided health effects)*
5. *Cancer and non-cancer human health benefits from reduced CCR exposure by other recreational users of surface waters near power plants (additional to monetized avoided health effects)*
6. *Avoided CCR contamination of sediments in surface waters near power plants*
7. *Water quality benefits from avoided CCR contamination treatment costs for use of surface waters for drinking and irrigation water supply*
8. *Commercial fisheries benefit in surface waters near power plants*
9. *Increased participation in water based recreation near power plants*
10. *Avoided fish impingement and entrainment mortality from power plant water intakes (induced conversion to dry CCR handling reduces future water demand for CCR sluicing)*
11. *Increased property values surrounding electric utility plants (from closure capping and re-vegetation of CCR surface impoundments)*

The total monetized benefits less the total costs of the rule provide the net monetized benefits of the rule. Table XII–C summarizes the total costs and benefits as well as the net benefits of the rule.

Finally, moving to Section XIV (the Executive Order 12866 Review) – on pg. 21462 in Section XIV.A. we again find that the only mention of significant "closure" costs evaluated in the Executive Order 12866 Review for the Final Rule were described as "closure capping to cover units", and again, no mention of removal or re-disposal costs:

In addition, EPA prepared an analysis of the potential costs and benefits associated with this action. The Regulatory Impact Analysis (RIA) estimated the costs and benefits for this action. The RIA estimated 12 regulatory costs: (1) Groundwater monitoring; (2) bottom liner installation; (3) leachate collection system installation and management; (4) fugitive dust controls; (5) rain and surface water run-on/run-off controls; (6) disposal unit location restrictions (including water tables, floodplains, wetlands, fault areas, seismic zones, and karst terrain); (7) closure capping to cover units; (8) post- closure groundwater monitoring requirements; and (9) impoundment structural integrity requirements; (10) corrective actions (CCR contaminated groundwater cleanup); (11) paperwork reporting/recordkeeping; and (12) impoundment closures and conversion to dry handling.

What Does This Mean?

From this review, it is clear that the new interpretations first presented by EPA in January 2022 are not "longstanding interpretations", and are not part of the existing [2015] CCR rules, and EPAs attempt to use them as its basis to disapprove the Alabama CCR Program is not only contrived, it is arbitrary and capricious, and due to be reversed. Given EPA's explicit evaluation that ADEM's rules mirror the federal rules, and the fact that the permits issued by ADEM require compliance with these rules, the Alabama CCR Permit Program is due to be approved.

EPA has, since early 2022, taken a strong position that its current interpretations regarding "infiltration", "waste below the water table", and "liquids" were in fact EPA's interpretations at the time the 2015 rule was promulgated. If that position were accurate, then it appears that EPA would have failed to provide an adequate description of the final rule's requirements related to closure-in-place in the preamble, failed to provide an adequate Regulatory Impact Analysis and failed to provide an adequate Executive Order Analysis, all of which did not address the costs of CCR removal as a part of closure-in-place, and all of which significantly underestimated the economic impact of the final rule.

If though, EPA's interpretations are indeed new - as is more likely the case - then it is clear that 2015 rules do not require removal of CCR as a part of a closure-in-place closure, and do not require the complete isolation of the CCR from all potential sources of moisture in order to meet the performance standards required as a part of the closure-in-place. Rather, these issues are addressed as a part of the post-closure risk-based corrective action process, as clearly contemplated in the 2015 rules.

Obviously, as explored above, the potential economic impact of these new interpretations require that they be subjected to the full notice and comment rulemaking process required by the Administrative Procedures Act and the various related Executive Orders prior to final promulgation. As the Department has previously noted, we are committed to ensuring that the Alabama CCR program is at least as protective as the federal law and regulations, and will make appropriate adjustments to our program and permits at such time as updated final federal rules are promulgated.

A Closer Look At 42 USC §6945(d)

In addition to rebutting EPA's assertions based on its new interpretations, which form the basis for its proposed denial of the ADEM program, it is also important to examine 42 USC §6945(d) as established in the 2016 WIIN Act, and Congress' direction regarding the implementation of CCR regulations and the establishment of CCR permit programs.

42 USC §6945(d)(1)(A) and (B) states:

(1) Approval by Administrator

(A) In general

Each State may submit to the Administrator, in such form as the Administrator may establish, evidence of a permit program or other system of prior approval and conditions

under State law for regulation by the State of coal combustion residuals units that are located in the State that, after approval by the Administrator, will operate in lieu of regulation of coal combustion residuals units in the State by—

(i) application of part 257 of title 40, Code of Federal Regulations (or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title); or

(ii) implementation by the Administrator of a permit program under paragraph (2)(B).

(B) Requirement

Not later than 180 days after the date on which a State submits the evidence described in subparagraph (A), the Administrator, after public notice and an opportunity for public comment, shall approve, in whole or in part, a permit program or other system of prior approval and conditions submitted under subparagraph (A) if the Administrator determines that the program or other system requires each coal combustion residuals unit located in the State to achieve compliance with—

(i) the applicable criteria for coal combustion residuals units under part 257 of title 40, Code of Federal Regulations (or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title); or

(ii) such other State criteria that the Administrator, after consultation with the State, determines to be at least as protective as the criteria described in clause (i).

Clearly, as provided in (1)(A) and (1)(B), Congress expects that States will be the primary implementers of the CCR program, and that upon submission of their program approval application demonstrating that the State program requires each CCR unit located in the State to achieve compliance with criteria that is at least as protective as the federal criteria located in 40 CFR Part 257, EPA will expeditiously approve the State program. EPA, in its proposed denial, has clearly established that the ADEM CCR regulations mirror the federal requirements contained in 40 CFR Part 257, and in this response to the proposed denial, ADEM has clearly established that, contrary to EPA's contrived assertions, the permits issued by ADEM require each unit in the State to comply with those requirements.

42 USC §6945(d)(1)(C) states:

(C) Permit requirements

The Administrator shall approve under subparagraph (B)(ii) a State permit program or other system of prior approval and conditions that allows a State to include technical standards for individual permits or conditions of approval that differ from the criteria under part 257 of title 40, Code of Federal Regulations (or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title) if, based on site-specific conditions, the Administrator determines that the technical standards established pursuant to a State permit program or other system are at least as protective as the criteria under that part.

To the extent that the ADEM regulations differ from the 40 CFR Part 257 criteria, this section of the statue provides that these differing provisions shall also be approved by EPA provided they are at least as protective as the 40 CFR Part 257 criteria. Obviously, Alabama's CCR program differs from the federal criteria in that the Alabama regulations include a CCR Permit Program, which the federal criteria do not. Again, ADEM has clearly established, contrary to EPA's contrived assertions that the State permit program regulations and the permits issued pursuant to these regulations require each unit in the State to meet or exceed the federal requirements.

Continuing, 42 USC §6945(d)(1)(D) states:

> *(D) Program review and notification*
>
> *(i) Program review*
>
> *The Administrator shall review a State permit program or other system of prior approval and conditions that is approved under subparagraph (B)—*
>
> *(I) from time to time, as the Administrator determines necessary, but not less frequently than once every 12 years;*
>
> *(II) not later than 3 years after the date on which the Administrator revises the applicable criteria for coal combustion residuals units under part 257 of title 40, Code of Federal Regulations (or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title);*
>
> *(III) not later than 1 year after the date of a significant release (as defined by the Administrator), that was not authorized at the time the release occurred, from a coal combustion residuals unit located in the State; and*
>
> *(IV) on request of any other State that asserts that the soil, groundwater, or surface water of the State is or is likely to be adversely affected by a release or potential release from a coal combustion residuals unit located in the State for which the program or other system was approved.*
>
> *(ii) Notification and opportunity for a public hearing*
>
> *The Administrator shall provide to a State notice of deficiencies with respect to the permit program or other system of prior approval and conditions of the State that is approved under subparagraph (B), and an opportunity for a public hearing, if the Administrator determines that—*
>
> *(I) a revision or correction to the permit program or other system of prior approval and conditions of the State is necessary to ensure that the permit program or other system of prior approval and conditions continues to ensure that each coal combustion residuals unit located in the State achieves compliance with the criteria described in clauses (i) and (ii) of subparagraph (B);*

(II) the State has not implemented an adequate permit program or other system of prior approval and conditions that requires each coal combustion residuals unit located in the State to achieve compliance with the criteria described in subparagraph (B); or

(III) the State has, at any time, approved or failed to revoke a permit for a coal combustion residuals unit, a release from which adversely affects or is likely to adversely affect the soil, groundwater, or surface water of another State.

The key takeaways from this portion of the statute are that after program approval, 1) the approved State program remains subject to EPA review and oversight, and 2) the State remains obligated to update its program requirements (which includes the permits issued pursuant to the approved program) as necessary to continue to ensure that the State criteria remain at least as protective as the federal criteria, when the federal criteria, as contained in 40 CFR Part 257 are revised (see specifically, 42 §USC 6945(d)(1)(D)(i)(II) and 42 USC §6945(d)(1)(D)(ii)(I)). As documented in EPA's docket for this proposed action, and as re-stated in our formal responses to the current proposed denial, ADEM has clearly communicated its firm commitment that the Alabama CCR program regulations and permits issued thereunder, will be evaluated and updated as necessary to remain at least as protective as the federal criteria, at such time as the federal statutory or regulatory requirements as contained in 40 CFR Part 257 are revised.

Continuing, 42 USC §6945(d)(1)(E) states:

(E) Withdrawal

(i) In general

The Administrator shall withdraw approval of a State permit program or other system of prior approval and conditions if, after the Administrator provides notice and an opportunity for a public hearing to the relevant State under subparagraph (D)(ii), the Administrator determines that the State has not corrected the deficiencies identified by the Administrator under subparagraph (D)(ii).

(ii) Reinstatement of State approval

Any withdrawal of approval under clause (i) shall cease to be effective on the date on which the Administrator makes a determination that the State has corrected the deficiencies identified by the Administrator under subparagraph (D)(ii).

The key takeaways from this portion of the statute are that 1) in the event the State were to fail to cure program implementation deficiencies identified during EPA's periodic review of the State program, or if the State were to fail to deliver on its commitment to update its approved program at such time as the federal requirements change, EPA has the authority and responsibility to withdraw the State's program approval, after appropriate notice and opportunity for a public hearing, and 2) once a program withdrawal occurs, the State has the opportunity to have its program approval restored upon correction of the offending program deficiencies.

As discussed in other portions of this response, Alabama asserts that the above analysis of 42 USC §6945(d) demonstrates that the will of Congress is for State programs to be primary implementers of the CCR regulatory programs, that the State programs be at least as protective as the federal CCR criteria contained in 40 CFR Part 257, and that EPA maintain effective and timely oversight of the State programs.

EPA'S UNTIMELY, UNPROFESSIONAL, INCOMPLETE, AND DEEPLY FLAWED REVIEW OF PERMITS

As discussed previously, EPA's proposed denial stands entirely on its post-issuance review and critique of ADEM's CCR permits and attached closure plans, groundwater monitoring plans, and other technical plans and supporting materials. Much of EPA's ill-timed permitting critique attempts to stand on requirements that EPA claims exist in the federal rules, but do not. EPA's novel interpretation of infiltration in closed CCR units, discussed in detail above, is one example of EPA contriving requirements that do not exist. ADEM has already discussed why EPA's reinterpreted view of infiltration is false and contradictory, but it should also be noted that it's new interpretation is unpromulgated and the subject of litigation. It is inappropriate for EPA to use this as a standard for its program approval before the matter is resolved by the courts.

ADEM will highlight additional examples of how EPA's permitting critiques stand on claimed requirements that do not exist in current laws, rules, or guidance. In addition, EPA's permitting critiques fall short for other reasons, including misinterpretations of various pieces of technical plans and data, a failure to review and consider the holistic battery of technical data, and, in a few instances, the novel and, frankly, astonishing disregard of long-standing, very-widely used technical procedures and investigation methods. In some cases, EPA's critiques contradict its own long-standing technical guidance. In other cases, EPA merely seeks to substitute its judgement for that of ADEM's highly qualified and experienced technical staff. ADEM will now generally respond to each of these missteps by EPA below.

Colbert Fossil Plant Well Locations And Screened Intervals

In its post-issuance review of the TVA Colbert CCR Facility Permit, EPA conjectures that ADEM has approved a monitoring plan with an insufficient number of monitoring wells at necessary locations and vertical depths to ensure that all potential pathways have been monitored. EPA further asserts that bedrock monitoring wells have not been installed at the downgradient boundary as required by 40 CFR §257.91(a)(2) and that some wells are located up to hundreds of feet away from the boundary and on the other side of Cane Creek. This leads EPA to conclude that ADEM issued a final permit that approved the bedrock monitoring wells to not be installed at the waste boundary as required by federal rules.

In fact, the Colbert monitoring system was designed (by TVA) and approved by ADEM by considering site-specific technical information as required by 40 CFR §257.91(b), that EPA, apparently, ignored. EPA fails to consider that some monitoring wells at the facility were installed prior to implementation of the CCR program and not directly at the unit boundary. Geophysical methods confirmed fractures present at these locations, implying an existing connection to the

CCR unit, and because of the high hydraulic conductivity in karst due to the presence of preferential pathways, it is appropriate to assume that groundwater samples from these monitoring wells located beyond the boundary should accurately represent the quality of water that passes it. Additionally, some specific well locations were chosen based on anomalies detected from surface geophysical (electrical resistivity) investigations to target areas with preferential pathways. EPA also references monitoring wells located on the opposite side of Cane Creek from the CCR unit. It should be noted that Cane Creek is recharged by water from the alluvium, and groundwater within the bedrock aquifer is expected to flow beneath the creek. ADEM's approval of the Colbert monitoring system was based on its review and understanding of the entirety of information and data available for the site.

Regarding the screened or open intervals of monitoring wells, again, site-specific technical information was considered during the design and approval of this monitoring well system. For monitoring wells COF-111 and COF-111BR, the shallow screened interval and the larger open borehole interval were targeted zones to ensure the presence of groundwater for monitoring. The "57-foot vertical gap" as described by EPA consists of a fat clay from a depth of 18 feet to approximately 60 feet and competent un-fractured limestone bedrock from 60 feet to 77 feet, both of which would likely not be a productive zone. It is also important to note that the zone within this "gap" should not be connected to the zone monitored by monitoring well COF-111BR to prevent cross-contamination.

Thus, EPA has failed to consider the holistic battery of information and technical data in its post-issuance review of the Colbert Permit.

Colbert Plant Waste Is More Stable Than Suggested In The Proposed Denial

EPA seems to perceive a lack of clarity regarding whether, "the remaining wastes have been stabilized sufficiently to support the final cover system, as required by § 257.102(d)(2)(ii)" during the TVA Colbert Plan closure. This perceived lack of clarity, apparently, causes EPA to determine that the Closure Plan fails to meet the requirements of 40 CFR § 257.102(d)(2)(ii).

A detailed summary of the completed and planned stability activities can be found in the TVA Colbert Ash Pond 4 Seismic Project Finding No Sig Impact, dated September 21, 2021. These activities are a result of multiple slope stability evaluations dating back to 2009 and include a liquefaction analysis and the installation of walls by a Deep Mixing Method (DMM) in the subgrade to stabilize the east dike. Further, in 2018 and 2019, TVA evaluated the instrumentation and performed an additional subsurface investigation to monitor the current closed condition - especially the liquefaction potential in an anomalous area noted during the DMM project. TVA is currently installing a soil-and rock-fill buttress against the east dike of Ash Pond 4 within the anomalous area after determining that the pore water had dropped significantly, but not enough to completely improve the safety factors in the liquefaction analysis.

In regard to the stability of the cap itself, as described in the QA/QC Plan in Attachment G of the Permit Application dated December 10, 2021, ash fill material was compacted at a minimum of 90% of its maximum Standard Proctor dry density to minimize differential settling. In addition, pressure transducers have been installed throughout the unit to monitor groundwater levels and

potential stability issues, and regular inspections of the cap are being conducted (and will continue to be conducted throughout the life of the post-closure period to verify stability).

EPA continues its critique of the TVA Colbert closure (years after it has been completed) by claiming capping a CCR unit in contact with the water table will "disrupt the integrity of the cover system." EPA cited two documents published in 2001 and 2006 by Electric Power Research Institute (EPRI) related to groundwater remediation for CCR units. To summarize the 2001 study (cited by the 2006 study), existing CCR units both with and without caps were studied to assess the effectiveness of a cap in preventing leachate. This analysis included predictive modeling to simulate the groundwater flow and transport of contaminants with different types of caps installed. Part of the rationale behind this investigation was to determine under what conditions caps are necessary or effective.

Although the study facility was closed without a cap, the predictive modeling yielded nearly identical results for groundwater flow and transport regardless of the type of cap or lack thereof on the impoundment. Ultimately, results indicated that capping would be ineffective at reducing groundwater elevations by more than a foot due to the continual contact between the ash and the water table. This is expected because the cap is designed to control infiltration from precipitation and surficial runoff. But the study drew no conclusions about the effect of groundwater contact on the stability of the cover system. The EPRI study does not support EPA's conclusion.

Once more, EPA fails to review the complete permit record, and misstates its own data to draw faulty, incomplete conclusions about the Permit and associated closure plan.

Contrary To EPA Assertions, The Use Of Rotosonic Drilling Was Appropriate

EPA concludes that ADEM approved wells at the Colbert Plant were not constructed in accordance with 40 CFR §257.91(e), and, as a consequence the monitoring system does not accurately represent the quality of groundwater flowing from Ash Pond 4.

EPA references the Rotosonic drilling method used at this site as a "disruptive process" and indicates that sample materials may be "altered, pulverized, or otherwise destroyed or obfuscated" by this particular drilling method. EPA further indicates there is potential to mischaracterize the referenced three- to five-foot zones as "competent and unweathered" due to an incomplete sequence, and that the method introduces uncertainty regarding the integrity and effectiveness of the casing to isolate groundwater of the bedrock from the overlying residuum and epikarst.

Sonic drilling is a method that uses high-frequency vibration to cause liquefaction of soils at the point of contact, thereby reducing any friction impacts. Rotation may be necessary for more competent rock layers, but the vibration effects still allow the drill head to penetrate with minimal friction. One of the most recognized benefits of utilizing this method is the ability to produce a continuous and minimally disturbed core sample. EPA technical guidance documents regularly include rotosonic methods as a common and acceptable method for installation of groundwater monitoring wells. When discussing sonic methods, the Region 4 U.S. EPA Science and Ecosystem Support Division (SESD) Guidance Design and Installation of Monitoring Wells details that

"cuttings can be removed nearly intact from the inner casing for examination of the stratigraphy prior to sampling or disposal." ASTM Standard D6914 "Standard Practice for Sonic Drilling for Site Characterization and the Installation of Subsurface Monitoring Devices" states that "(t)he continuous core sample recovered provides a representative lithological column for review and analysis." The statements in these EPA guidance documents directly contradict EPA's determination that "rotosonic drilling can be a disruptive process that may not result in full recovery of undisturbed samples of soil or bedrock." This method satisfactorily allows for adequate differentiation between weathered, partially weathered, and un-weathered bedrock.

Rotosonic drilling is widely used in all State and federal regulatory programs where groundwater monitoring wells are required. Has EPA notified these programs that it now considers this drilling method to be "disruptive?" Does EPA intend to revise its technical guidance documents to remove rotosonic drilling as an acceptable method of groundwater monitoring well installation? What is the source of EPA's new concern about rotosonic drilling and what are the ramifications for the many ongoing State and federal projects where this method of drilling is being used?

Colbert Bedrock Wells Were Installed In Accordance With EPA Guidance

Continuing through EPA's post-issuance critique of the Colbert Permit, EPA derides the installation of monitoring wells with open boreholes stating, "(a)nother systemic issue is that the bedrock wells were installed as open-borehole completions with long permanently grouted surface casings, and as a consequence have significant potential to systemically exclude zones that have been "cased off" from the monitoring well network (88 FR 55239, Aug. 14, 2023." This, somehow, leads EPA to conclude the Colbert monitoring well network will not yield sufficient samples to monitor the quality of groundwater at Ash Pond 4, and that, somehow, is grounds for permit program denial.

EPA again contradicts its own, long-standing guidance[18], and again without consideration of site-specific data. ADEM previously addressed this in correspondence to EPA dated October 27, 2022. Monitoring wells COF-111BR, COF-112BR, COF-113BR, COF-114-BR, and COF-116-BR were completed as open boreholes for several reasons, including for the use of downhole geophysics for site characterization. A large percentage of the bedrock is competent and un-fractured, and the referenced geophysical methods were used to identify any discrete fractures present within the bedrock, including their specific locations and sizes. For example, for the boring COF-113BR completed with an open borehole from a depth of 21 feet to 100 feet below ground surface (bgs), the only fractures identified were one at a depth of 39 feet and five fractures between depths of 49 to 52 feet. It is worth noting that the aperture of these fractures was measured in millimeters, signifying their relatively small size. Because of the infrequency and small size of fractures present, the likelihood of dilution, even across a relatively long open borehole, remains

[18] EPA Region 4 SESD Guidance, Design and Installation of Monitoring Wells, "*The installation of open bedrock wells is generally not acceptable in the Superfund and RCRA programs, because of the uncontrolled monitoring intervals. However, some site conditions might exist, especially in cavernous limestone areas (karst topography) or in areas of highly fractured bedrock, where the installation of the filter pack and its structural integrity are questionable. Under these conditions the design of an open bedrock well may be warranted*."

small. Furthermore, the preferential pathways within the aquifer itself are considered interconnected.

It is worth noting here that evaluation of a site's groundwater monitoring program, especially one located within a complex karst aquifer, is ongoing as additional data is collected, and this may result in a change over time to the conceptual site model and/or possible modifications to the monitoring network.

Intrawell Data Comparisons Were Not Utilized

EPA incorrectly states that "the procedures for updating background levels used in intrawell data comparisons are approved in the Final Permit resulting in noncompliance with either the federal requirements at[40 CFR 257.91(a)(1) or an alternative State requirement that is equally as protective". However, the approved method for updating background in the Final Permit is simply not intrawell data comparisons.

It is true that the groundwater monitoring plan (GWMP) for Ash Pond 4 describes a process for using intrawell analysis in Section 2.1 of Appendix D. In its review of the Colbert permit application, ADEM pointed out to TVA that because no compliance monitoring wells were installed prior to the placement of waste at the facility, it does not appear that intrawell analysis will accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit as required by ADEM Admin. Code r. 335-13-15-.06(2)(a)l. TVA stated in a response letter submitted to the Department, dated December 27, 2019, that, "TVA has evaluated all of the data from monitoring for selecting the appropriate statistical method. That information will be summarized in the updated GWMP, and does not use intrawell analysis or recommend a mixture of statistical approaches."

It is also true that the approved GWMP has not yet been updated by TVA to remove the referenced intrawell analysis procedures. However, the Statistical Methods Certification for Compliance with the Final Coal Combustion Residuals Rule (40 CFR §257.93) located in Appendix C of the approved Groundwater Monitoring Plan dated June 10, 2022, describes the statistical methods for the groundwater monitoring network as follows:

> *The statistical method for evaluating groundwater data in detection monitoring described in Section 3 of this document – prediction limits – is consistent with method/paragraph (3) of Section 257.93(f), which includes a prediction interval procedure. In assessment monitoring or corrective action, the method described in Section 4 of this document — confidence intervals (and its variant confidence bands) — is consistent with Unified Guidance recommendations and is also justified under method/paragraph (5) of Section 257.93(f), namely "Another statistical method that meets the performance standards of paragraph (g) of this section."*

The process described above is clearly not intrawell analysis. Furthermore, a review of TVA Colbert's Annual Groundwater Monitoring Reports demonstrates that the interwell statistical methods described above and within the GWMP are being utilized for analysis of groundwater data.

It should also be noted that the Statistical Methods Certification for Compliance with the Final Coal Combustion Residuals Rule (40 CFR §257.93) for this facility was prepared by Dr. Kirk Cameron, MacStat Consulting Ltd., who also prepared the March 2009 U.S. EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance.

ADEM acknowledges that, in a perfect world, the GWMP would have been updated to remove the obscure reference to intrawell analysis, but, as ADEM has demonstrated, an intrawell method is not being used at the site. On the contrary, the methods that are being utilized are entirely appropriate and compliant with 40 CFR §257.91(a). EPA's decision to bring this particular issue forth as a ground for program denial is truly astonishing.

ADEM's CCR Permits Do Not Authorize A Delay In Remedy Selection

The Department will provide a more detailed discussion of the permitting process later in this response, but the following assertion by EPA deserves special consideration. EPA includes the following in its post-issuance critique of the TVA Colbert permit, and repeats a similar theme throughout the proposed denial:

> *"The Final Permit issued by ADEM merely reiterates the Alabama regulations, which are the same as the federal corrective action requirements. However, incorporating the regulations verbatim in the permit does not require TVA to achieve compliance with those requirements."*
>
> *"This is because ADEM did not take into account relevant facts about the status of corrective action at Colbert, such as whether the 2019 ACM complied with the regulatory requirements, or whether the 2021 CD ACM complied with either the Consent Decree or the regulations or both. Most importantly, ADEM did not adjudicate what actions are still necessary in light of those facts to achieve compliance with the regulations and include those actions as requirements in the Final Permit. As a consequence, EPA is proposing to determine that the permit in essence authorizes TVA to continue to delay selection of a remedy well beyond the required deadline, in order to pursue assessment of a remedy that does not appear to meet the criteria in § 257.97(b)."*

ADEM cannot determine how EPA arrived at this conclusion from the status of the various Assessment of Corrective Measures (ACMs). Since EPA did not communicate this issue formally to ADEM prior to the proposed denial, we can only make assumptions about the permit or programmatic changes EPA is seeking. ADEM is aware that EPA has employed third parties to review CCR facilities websites and published ACMs, and from those reviews have identified several deficiencies. It must be noted that CCR facilities were required by the self-implementing federal rules to publish these ACMs, regardless of whether they had been reviewed/approved by EPA or the State.

EPA appears to be taking the position that the ACMs must be fully implemental at the time of permit issuance, or the permit must completely detail the revisions needed to approve them. If this is what EPA seeks, then we must reiterate that there is, currently, no federal permit program and this simply is not required by the federal rules. Furthermore, it would seem that EPA has

forgotten the lessons learned through the many years of implementing the RCRA Post-Closure Permitting Rule. One of these lessons is that the evaluation, selection, and design of corrective measures is typically a multi-year effort, and delaying permit issuance in order to complete this effort also delays important and protective stabilizing efforts achieved during site-closure. Furthermore, the issued permit provides more enforcement leverage to achieve corrective action goals than simply relying on the current self-implementing federal rules. Examples of relevant ADEM CCR permit conditions follow:

> *The Permittee shall install and maintain additional groundwater monitoring wells as necessary to assess changes in the rate and extent of any plume of contamination or as otherwise deemed necessary to maintain compliance with 335-13-15-.06.*
>
> *Assessment of Corrective Measures. The Permittee must initiate an assessment of corrective measures as specified in 335-13-15-.06(7) if any constituent listed in Appendix IV of 335-13-15 has been detected at a statistically significant level exceeding the groundwater protection standard, or immediately upon detection of a release from the CCR unit.*
>
> *The permittee must continue to monitor groundwater in accordance with the assessment monitoring program while assessing corrective measures.*
>
> *Selection of Remedy. Based on the results of the corrective measures assessment, the Permittee must select a remedy as specified in 335-13-15-.06(8).*
>
> *Implementation of the Corrective Action Program. Within 90 days of selecting a remedy, the Permittee must initiate remedial activities as specified in 335-13-15-.06(9), and shall be required to modify the permit in accordance with Section II.E.9."*

ADEM's review of the facility ACM's, where applicable, is ongoing. There is no practical reason to delay issuance of any of the State's CCR permits until the ACM's are complete and final remedies are selected. Again, there is no federal rule requiring us to do so.

EPA's Flawed Assertion That Permits Fail To Delineate The "Uppermost Aquifer"

In its post-issuance critique of the CCR permits for multiple Alabama facilities, EPA conjectures the groundwater monitoring well network ADEM approved does not meet the performance standards in 40 CFR §257.91(a) or (b), that the approved groundwater monitoring system is not based on a thorough characterization of the elements listed in 40 CFR §257.91(b), and that the groundwater monitoring system does not "yield groundwater samples from the uppermost aquifer" as required by 40 CFR §257.91(a). This is, apparently, due to EPA's conclusion that the subject facilities have failed to delineate the uppermost aquifer. This assertion was brought forth following a lengthy discussion analogizing the aquifer systems at the subject facilities to a "layer cake."

With due respect to EPA's resident baker, there is simply no requirement for the compliance groundwater monitoring network to vertically delineate the uppermost aquifer. EPA has, once again, read requirements into the federal rules that simply do not exist. 40 CFR §257.91(a)(2)

requires that the groundwater monitoring system consist of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that accurately represent the quality of groundwater passing the waste boundary of the CCR unit. These performance standards do not speak to complete delineation of the aquifer, but only to obtaining samples that accurately reflect the quality of groundwater passing the waste boundary. Complete vertical delineation is not only not required on all cases, it is not logical or practical to require it in all cases. Furthermore, EPA has approved, overseen, or itself installed groundwater monitoring systems around the nation in the RCRA and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program, and, at no time, has taken a remotely similar position requiring complete vertical aquifer delineation in all of them.

With respect to Plant Gadsden, EPA specifically mentions, "the variable nature of the bedrock/overburden contact was not sufficiently characterized to meet the performance standards in 40 CFR 257.91(a) or (b)." EPA continues by stating "In addition, the top-of-bedrock surface has not been adequately resolved in all areas of the site because some boring logs lack reliable confirmatory data. According to the boring logs that were included in the Permit Application, there are multiple missing intervals of "no recovery" from numerous borings advanced into bedrock, which indicate a large potential for hydraulically significant zones that are currently insufficiently characterized. EPA is proposing to determine that the thickness, variability, nature, and hydrogeologic significance of the transitional zone of weathering in the uppermost part of bedrock has not been established, as required by 40 CFR 257.91(b)." However, nineteen of the twenty-four monitoring wells and piezometers included within the Permit were drilled utilizing a sonic drilling method - a method known for the benefit of reliably providing continuous and minimally disturbed core samples. As such, characterization of the uppermost portion of the bedrock has been successfully achieved through the thorough descriptions of recovered materials produced during activities related to installation of monitoring wells, piezometers, and vertical delineation wells that were provided on the very boring logs referenced by EPA.

With respect to Plant Gorgas, EPA expands on their claim that the uppermost aquifer has not been sufficiently characterized and the depth of the lower confining unit has not been established, contending that contradictory information has been portrayed in the facility file by stating, "the Pratt Coal System and the American Coal Systems are mapped together and separately in different groundwater monitoring reports." This faulty conclusion stems from EPA's limited and perfunctory review of the massive amount of data available for the facility. The separation of the Pratt and American flow systems stemmed from the receipt of additional site cross-sections with the Supplemental Site Hydrogeologic Characterization Report dated March 5, 2021. It is a well-established fact that a successful conceptual site model is continually improved as more data becomes available, as was the case with this distinction of the Pratt Coal and American Coal Systems. As previously discussed, complete vertical delineation may not be logical or practical in every case, and as such, the uppermost aquifer has been characterized to the extent that is technically feasible.

Zone Specific Background Wells Are Not Necessary

EPA conjectures that the approved GWMPs in multiple permits do not document either that the background wells are upgradient of the CCR unit or that the wells meet the performance standards specified in 40 CFR §257.91(a)(1)(i) or (ii). EPA also conjectures that the approved background monitoring wells do not "accurately represent the quality of the background groundwater" because of differences in the lithology between the background and downgradient monitoring wells (88 FR 55251, Aug. 14, 2023). Here again, EPA fails to consider the holistic battery of information and technical data available for the site and seeks to substitute its judgement for that of ADEM.

The various GWMPs in the permit application provide details on the selection of appropriate locations for background monitoring wells and how these locations meet the performance standards required by 40 CFR §257.91(a)(1)(i).

With respect to Plant Gadsden, radial flow has historically been observed at the CCR unit. This has resulted in the installation of background wells at a true upgradient location becoming technically infeasible. The federal rules allow for instances such as these in 40 CFR §257.91(a)(1)(i) and (ii):

> *A determination of background quality may include sampling of wells that are not hydraulically upgradient of the CCR management area where:*
>
> *(i) Hydrogeologic conditions do not allow the owner or operator of the CCR unit to determine what wells are hydraulically upgradient; or*
>
> *(ii) Sampling at other wells will provide an indication of background groundwater quality that is as representative or more representative than that provided by the upgradient wells; and …*

In compliance with 40 CFR §257.91(a)(1)(i) and (ii), background wells were placed at alternate locations to ensure that background water quality is representative of that unaffected by a release from the Ash Pond. Although the background wells were installed across a groundwater divide, these wells are located within the same geologic formation as the compliance wells surrounding the CCR unit. Background monitoring wells GSD-AP-MW-14 and GSD-AP-MW-16 are both screened within the alluvium deposits, and background monitoring well GSD-AP-MW-17 is screened within the limestone bedrock of the Conasauga Formation. Therefore, it is reasonable to expect the groundwater quality in the designated background wells to be similar to that of groundwater unaffected by the CCR unit. If at any time groundwater from one of these wells appears unrepresentative of background water quality, appropriate measures can be taken, including the discontinuation of updates to background and the use of historical background for comparisons. Consequently, background monitoring wells do meet the performance standards set forth by 40 CFR 257.91(a)(1) and do accurately represent the quality of the background groundwater not affected by leakage from the CCR unit.

At Plant Gorgas, criteria used for evaluating these locations includes analysis of groundwater elevation and flow, comparison of geochemical field data, boron isotopic analyses,

and statistical screening. Because of vertical flow within the Pottsville Aquifer, groundwater from the upgradient monitoring well locations in the recharge areas represent groundwater that will migrate into the lower zones including the Pratt and American Coal zones. This is why zone-specific background wells are not necessary.

Lateral And Vertical Spacing Of Compliance Wells Is Appropriate

EPA asserts multiple times throughout its post-issuance critiques of multiple permits that there is an insufficient number of wells laterally and vertically along the downgradient perimeter of the unit to monitor all potential contaminant pathways. The performance standard for groundwater monitoring systems requires a sufficient number of wells installed at appropriate locations and depths to accurately represent the quality of groundwater passing the waste boundary of the CCR unit. A minimum spacing between well locations and well depths is not specified by the federal rules. It is then left to the professional judgement of ADEM staff scientists, geologists, and engineers, working collectively with the permittees to design/approve the most practical system to monitor the quality of groundwater entering the uppermost aquifer from the units. This is an ongoing effort. Groundwater monitoring systems are continuously evaluated and modified as more data is collected and analyzed. For the most part, EPA seeks to substitute its judgement, based on a cursory review of limited information, for that of ADEM, whose professional staff have conducted extensive reviews and analyses of the holistic battery of data available for each facility.

With respect to lateral spacing, for example, one of the considerations ADEM took into account is that most of the CCR units are unlined. As such, it would be reasonable to assume that potential leakage from these units would not follow the same pattern as those from a lined unit. A leak resulting from a failure or breach to a liner system would likely represent an individual "point of release," whereas with an unlined unit, the leakage would likely result in more widespread impacted areas dependent on the variable permeability of the clay base. As such, a tighter-spaced network of wells would be required to adequately monitor and detect a release from a lined unit, whereas the monitoring well network for adequately detecting a release from an unlined unit would not be required to be as closely spaced.

In other cases, ADEM had to consider the topographic relief, geometric footprint, or other site conditions at the waste boundary, verified, at times, by ADEM staff conducting site visits, that prohibited access or installation directly at the limits of the CCR unit. In situations where installation at the waste boundary was considered to be technically infeasible, as was the case with Plant Gorgas, monitoring well locations were selected based on best professional judgement. For example, monitoring wells were strategically placed in areas that receive groundwater from multiple directions occurring from the finger-like features of the CCR unit.

With respect to vertical spacing, much of EPA's commentary on vertical spacing seems to orbit the idea that federal rules require compliance monitoring wells throughout the entire depth of the uppermost aquifer including its upper and lower bounds. This is neither correct nor feasible, because, as ADEM explained in response to the delineation issue, the federal rules require a monitoring network that detects contamination released from the unit, not one that characterizes the entire depth of the aquifer. This is also not practical. Consider, for example, that the majority

of the lower boundary of the CCR unit at Plant Gadsden is at approximately 500 to 505 feet AMSL (above mean sea level). Monitoring wells installed at depths of 100 feet or greater, or at elevations near 415 feet AMSL, as suggested by EPA would not detect contamination from a breach of the liner system and would not accurately represent the quality of groundwater passing the waste boundary. In order for EPA's logic to be valid, contaminants breaching the liner system would have to immediately descend to the lower bounds of the aquifer perfectly along the vertical plane of the waste boundary. Contaminant migration is simply not expected to occur in this manner in any of the geological systems at any of Alabama's CCR facilities.

EPA goes further with this faulty notion by asserting that an insufficient number of monitoring wells are screened within Unit 1 of the uppermost aquifer at Plant Greene, resulting in inadequate vertical spacing of compliance wells. It is true that the majority of monitoring wells have been screened within Unit 2 of the uppermost aquifer. But here again, EPA does not appear to understand the site geology and characteristics of each unit. Quaternary alluvium and low terrace deposits comprise the uppermost aquifer. These units overlie the Demopolis Chalk, which acts as a lower confining unit for the aquifer. Unit 1 of the uppermost aquifer consists of lean to fat clays that thin and become slightly more sandy towards the southwest. Unit 2 consists of fine- to medium-grained sands that coarsen downward and include gravel lenses. Groundwater tends to sit on top of the chalk and within Unit 2, and Unit 1 acts as a semi-confining unit across much of the site. Thus, compliance monitoring wells are appropriately screened within the Unit 2 sands and gravels to have the highest probability to detect any constituents that may be released from the CCR unit.

What Is A Permit?

EPA states that the ADEM issued permits do not require specific actions to bring the facility into compliance and do not include specific schedules for completing corrective actions. Again, EPA contrives requirements that do not exist, since neither of these two items are required by the federal rules to be directly notated in permit conditions. This information is provided within the documents incorporated into the permit by reference (i.e. approved closure plans and corrective action plans). These plans will only be incorporated into the permit after they have been determined complete and subsequently approved following the public participation process. Closure plans have been determined complete for all Alabama CCR units and these plans have been incorporated into the permits by reference. The approved Closure Plans meet the required performance standard identified in the regulations and contain the required information. As stated above, ADEM has not determined any ACM or corrective action remedy documents complete so there are no associated schedules for completing corrective actions at this time. The timelines required for initiating corrective action and remedy selection are identified in the regulations and required by the permits issued by ADEM. Therefore, the information EPA asserts is missing from the permits is either incorporated by reference or not required at this time. Again, EPA is attempting to hold ADEM to a new and higher standard than the federal rules require, and this should not be used as basis to disapprove ADEM's CCR Program.

Much more of EPA's commentary on ADEM's CCR permits proceeds from a faulty and unrealistic view of how a permit is developed and how it functions to guide the Permittee to

compliance. EPA also states "(t)he Final Permit issued by ADEM merely reiterates the Alabama regulations, which are the same as the federal corrective action requirements (88 FR 55241-55242, Aug. 14, 2023). However, incorporating the regulations verbatim in the permit does not require [the Permittee] to achieve compliance with those requirements (88 FR 55242, Aug. 14, 2023)." EPA goes on, "(w)hat the permittee is required to do in order to achieve compliance with the regulations must be determined prior to final permit issuance, because the permit must contain these requirements (88 FR 55242, Aug. 14, 2023)."

The permit contains provisions for the submittal and implementation of a closure plan, which meets the required performance standards in addition to provisions to perform corrective action, including an ACM. The details of what the closure and/or corrective actions would consist of to achieve compliance with the regulations are included in those respective documents and would be incorporated into the permit by reference. The requirements to submit these documents are equivalent to the federal requirements. Any deficiencies noted during the review and evaluation of these documents are not required to be notated or addressed directly in the permit language, rather these issues are addressed through the typical "comment and response" process (including suspense dates for resubmittal of revised documents) until the document is approved by ADEM.

Specific actions required pursuant to ADEM comments on a document are not included as "action items" in the permit conditions, as this would result in overly burdensome administrative work and the need for numerous and costly permit modifications to address technical comments on documents that are not approved. Once approved, the documents will then be incorporated in the permit by reference using the established permit modification process, which includes provisions for public participation. This basic permit process has been the standard way to address deficiencies, comments, approval and incorporation of permit required documents for decades. Also, as an approved document will contain all appropriate information, including schedules, and will be incorporated into the permit by reference, it is not necessary to reproduce these specific schedules in the permit conditions directly. With this understanding, EPA's statement that the permits do not require a facility to take specific actions to come into compliance can only be interpreted to mean that EPA expects the permits to include actions to correct specific deficiencies noted during the reviews of closure or ACM documents – a process which is not required by federal rules nor consistent with typical permit program implementation.

There are multiple references by EPA throughout the Proposed Denial identifying perceived deficiencies in the permits issued by ADEM for CCR units. For example, EPA states "(d)uring its review, EPA identified a consistent pattern of ADEM issuing permits to CCR units that fail to demonstrate compliance with fundamental requirements in part 257, without requiring the permittees to take specific actions to bring the units into compliance" (88 FR 55230, Aug. 14, 2023). Comments such as this attempt to discredit entire permits issued by ADEM and aim to disparage and undermine ADEM's permit program without specifically identifying which requirements of part 257 are supposedly not addressed in the permits. Since many of the comments made by EPA relate to information not included in the permit, which EPA perceives as deficiencies, it is important to recognize what a permit is and is not in order to clarify what basic information is

necessary in a permit. A permit is a legally binding document that establishes the waste management activities a facility can conduct and the conditions under which it can conduct them. A permit also establishes the administrative and technical conditions under which waste at the facility must be managed. Essentially, the permit establishes the framework for actions the facility must take to ensure compliance with the regulations. This is accomplished with the inclusion of permit conditions which require actions to ensure compliance with regulatory requirements. A permit is not an administrative record that reflects all the technical reviews, comments, etc. that are associated with determining a facility's compliance, or lack thereof, with the regulations.

Since EPA's comments specifically relate to the interaction of both closure and corrective action requirements in the permit, this response focuses on how these specific requirements are properly addressed in the permit. As stated above, the permit requires compliance with the regulations by including conditions which, in turn, require certain actions to be taken by the facility consistent with regulatory requirements, such as requirements to close those CCR units in accordance with applicable federal and State regulations. The permits include conditions regarding minimum requirements for the closure plan, closure timeframes, criteria for closing, initiation and completion of closure activities, notification requirements, and conditions requiring post closure activities where necessary. These conditions are worded such that the actions and timeframes required for closure are equivalent to both the federal and state regulations and in many instances point to the regulations themselves which establish the required timeframes and actions. In addition to the basic information required by the permit conditions and regulations, relevant information pertaining to closure is provided as part of the required closure plan. Therefore, the permits require submission of a closure plan and references the regulatory requirements to drive the timing of the submission as well as the information that is required to be included in the closure plan. This does not mean that the details of the closure plan itself are then written directly into the permit, rather, the closure plan is incorporated by reference into the permit which results in the entire closure plan becoming a part of the permit, and the facility is then responsible under the permit for compliance with the closure plan.

Prior to the closure plan being incorporated into the permit, ADEM performs a technical review of the plan and works with the facility to have any deficiencies addressed to ensure compliance with the regulatory requirements for the closure plan. Following ADEM's technical review, and after the plan has been revised as necessary to address comments from the technical review, the plan is made available for public review and comment through the public notice process. It should be noted that EPA also has the opportunity to comment at this time through the public participation process. Any comments received during the public participation process are thoroughly evaluated and addressed as determined necessary to ensure compliance with regulatory requirements. After this process has completed, the permit is modified to incorporate the closure plan with the final approval of the plan occurring as part of the final determination made on the permit modification. Once included in the permit by reference, the details of the closure plan are enforceable through the permit even though many of these details are not specifically called out in the permit conditions themselves. To reiterate, the permit does not serve as a compendium of technical review comments with permit conditions developed to drive action to reference all technical review comments. These technical reviews and associated actions by the facility to

revise documents to comply with regulatory requirements occur outside of the permit. This is, and has been, the standard procedure for addressing technical deficiencies in permit related documents for decades across multiple permit programs throughout the nation. Therefore, it is unclear how EPA's comments indicating that the permits issued by ADEM do not actually require the facility to comply with the regulations have merit since the permit conditions themselves are equivalent to the requirements in the regulations and the incorporated closure plans (that have been determined to comply with the regulatory requirements) are incorporated by reference in the permits and contain the specific details of required closure activities.

These permits also include conditions which require corrective actions where necessary based on the federal and state regulations with corrective action requirements including the requirement to perform/initiate an ACM (based on required groundwater monitoring results), a remedy selection, and remedy implementation. To be clear, these permit conditions and required actions are equivalent to both the federal and state regulations in all aspects. The procedures for review, evaluation, and approval of the ACMs is the same as described above for closure plans, however it is again noted that although EPA provided multiple pages of comments related to draft ACM documents submitted by facilities, ADEM has not approved any ACMs at this point, which raises questions as to the purpose of EPA commenting on draft documents as part of this proposed action by EPA. As no ACM has yet been approved by ADEM, the permits do not currently incorporate corrective action remedy documents. Even though no ACMs have been approved, the permits include the requirements (consistent with both federal and state regulation) to perform ACMs and follow through with remedy selection and implementation pursuant to the schedules included in both federal and state regulations.

EPA's vision of a "super permit" that includes every last detail needed to guide closure, groundwater monitoring, and corrective action is simply unworkable and demonstrates the widening gap between EPA's top-down policy making and the long established pragmatic realities of environmental regulation, management, and protection through the accepted permitting practice. EPA's approach to permitting CCR units in Alabama would have tens of millions of cubic yards of CCR sitting for decades in unlined, uncovered, leaking impoundments while the Department negotiates all levels of detail of all aspects of CCR management at each facility, one by one. ADEM's approach to permitting has already resulted in initial, effective controls at all its eight CCR management facilities while continuing the assessments, investigations, closure procedures, and long-term corrective measures studies needed to achieve lasting final controls. EPA's apparent vision of closure, groundwater monitoring, post-closure management, and corrective action sets the RCRA and Superfund program back decades to a time of inefficient program management resulting in long delays of meaningful actions with no benefit to human health or the environment.

SUMMARY AND CONCLUSIONS

In summary, as discussed and described in detail herein:

1. Alabama's CCR Permit Program is a "State permit program or other system of prior approval and conditions" as described in 42 USC §6945(d)(1)(A), and Alabama's CCR Permit Program Application has been demonstrated to be complete pursuant to the requirements of 42 USC §6945(d)1.

2. Alabama's CCR Permit Program has been demonstrated to adhere to the official Program Guidance published by EPA in 2017.

3. Alabama's CCR Permit Program regulations have been demonstrated to require compliance with and to be at least as protective as the federal CCR criteria as currently contained in 40 CFR Part 257.

4. In addition, although not specifically required by 42 §USC 6945(d)(1) prior to program approval, it has also been demonstrated that the permits issued pursuant to Alabama's CCR Permit Program are enforceable, and do require each CCR unit located in the State to achieve compliance with the applicable requirements of the Alabama CCR regulations, and by extension, the federal criteria, as required by 42 USC §6945(d)(1)(B).

5. Therefore, the currently proposed denial of Alabama's CCR Permit Program Application by EPA is in error and due to be withdrawn. ADEM requests that EPA respect the rule of law and **APPROVE** the Alabama CCR Permit Program.

ADEM CCR RESPONSE

ATTACHMENTS A - D

ATTACHMENT A

From: Story, S Scott
To: Cobb, Stephen
Cc: Jones, Heather M
Subject: EPA CCR Program Approval Talking Points-SAC
Date: Wednesday, April 28, 2021 4:55:37 PM
Attachments: EPA CCR Program Approval Talking Points-SAC.docx

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Heather,

If you have anything to add, please do.

SSS

EPA CCR Program Approval Talking Points

I received a call from Delores Rodgers-Smith (EPA R4) last Thursday wanting to set up a time for call to discuss ADEM's CCR program approval package that was submitted to EPA for review in February 2021.

The teleconference was set for Tuesday, April 27, 2021. Present on the call was Delores Rodgers-Smith (EPA R4), Colleen Michuda (EPA R4) along with Heather Jones and myself from the ADEM SWB. Midway through the teleconference, Richard Huggins (EPA HQ) joined the teleconference.

The call began with EPA R4 (Ms. Rodgers-Smith and Ms. Michuda) letting us know that although they had been fighting hard for us to get partial approval that there were 3 aspects of our package that EPA HQ indicated that they would have trouble defending:

- Public Participation-Although the public participation process was satisfactory for initial issuance, EPA HQ indicated that it was lacking when it came to permit modification since our rules had a very narrow definition of major modifications that require public notice.
- Endangered Species-We already had this provision in our MSW regulations and so we referenced it. Although these definitions were basically identical, EPA HQ indicated that since they were sued in Oklahoma over this issue, they requested that we adopt the CCR provision word for word.
- CCR Landfills-In order to keep all the landfill requirements in one place, initially we added the CCR landfill provisions into Chapter 4 with the MSW landfill instead of Chapter 15 with the rest of the CCR requirements. EPA HQ noted that by doing this it wasn't always clear which requirements applied to which landfill type.

  (Note: Although ADEM and EPA had been meeting and discussing the program approval package for the better part of a year, the issues of the public participation and CCR landfills were not identified until the last meeting prior to ADEM submitting it's package for review. EPA indicated that ADEM could still partial approval, but needed to do a good job justifying our actions in the narrative, and they would just carve out these areas.)

EPA R4 indicated that even with these issues identified, they continued to push EPAHQ to carve out these issues so ADEM could receive at least partial approval. EPAHQ stated that they did not see any way possible to carve out the modification provisions since they would be happening throughout the permitting, closure, and corrective action process.

(Note: It was during this discussion that it became apparent that the sole reason for this change in direction was the public participation issue. Earth Justice had sued previously EPA over this issue.)

Although we are pushing forward with updated rulemaking that should address each of the three issues noted from EPAHQ, ADEM still questions EPA decision to not give partial approval:

1. EPA does not have a permitting program or public participation requirements so the fact that ADEM has proposed one is more stringent that the Federal Program.
2. Since there were no specific requirements, ADEM modeled its permitting and public notice requirements after its Subtitle D program that:
    a. Has been approved by EPA and implemented for decades.
    b. MSW landfills can accept CCR material for disposal and are exempt from the CCR regulations.
3. Other approved programs (OK, GA, TX) will have permitting and public notice requirements that won't likely meet the mark when the Federal rules are adopted and will most likely need to update their regulations to maintain primacy. ADEM should be no different.
4. Why is ADEM being required to meet a standard that does not even exist yet?

Lastly, as noted above, ADEM is again moving forward with rulemaking, with the assurances that if we fix these few items (mostly just public participation) EPA will fast track out letter of completion once our proposed rulemaking is complete. However, similar assurances have made in the past and ADEM has little confidence that anything will change moving forward.

ATTACHMENT B

From: Story, S Scott
To: Rodgers-Smith, Delores; Jones, Heather M
Subject: RE: AL changes to modifications
Date: Wednesday, April 28, 2021 8:41:02 AM
Attachments: image002.png

Dee,

FYI, the effective date of our revised regulations will be December 13th.

SSS

From: Rodgers-Smith, Delores <Rodgers-Smith.Delores@epa.gov>
Sent: Tuesday, April 27, 2021 10:56 AM
To: Jones, Heather M <HJones@adem.alabama.gov>
Cc: Story, S Scott <SSS@adem.alabama.gov>
Subject: RE: AL changes to modifications

Scott/Heather,
I am so sorry and we are still doing everything possible to get AL CCR Package approved. I just met with the R4 CCR Team and directed them to start working on the key components (Technical support document, FR notice, letter of completion) for starting the 180 clock when your regulations are approved on Dec. 10 estimated date. Looking forward to working with you to get AL CCR package approved.

Dee

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From: Jones, Heather M <HJones@adem.alabama.gov>
Sent: Tuesday, April 27, 2021 11:26 AM
To: Rodgers-Smith, Delores <Rodgers-Smith.Delores@epa.gov>
Cc: Story, S Scott <SSS@adem.alabama.gov>
Subject: AL changes to modifications

Dee,
Please find attached the chapter that includes major/minor mods. The section for modifications starts on page 5-12. We would also like to mention that we are proposing to require public notice for variances.

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ATTACHMENT C

Excerpts From Section VI.M.3

residual CCR was left in place. Finally, a number of commenters supported a provision that would allow the owner or operator to remove the deed notation required provided all CCR is removed from the site.

EPA did not propose to require clean closure nor to establish restrictions on the situations in which clean closure would be appropriate. As EPA acknowledged in the proposal, most facilities will likely not clean close their CCR units given the expense and difficulty of such an operation. Because 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. However, both methods of closure (*i.e.,* clean closure and closure with waste in place) can be equally protective, provided they are conducted properly. Thus, consistent with the proposal, the final rule allows the owner or operator to determine whether clean closure or closure with the waste in place is appropriate for their particular unit. EPA agrees that the RBCA process, using recognized and generally accepted good engineering practices such as the ASTM Eco–RBCA process, can be a useful tool to evaluate whether waste removal is appropriate at the site. It is, however, not a necessary prerequisite.

EPA has adopted the provisions governing clean closure from the proposed rule with only one revision. The final provisions consist of two performance standards: First, the owner or operator must remove all CCR from the unit and decontaminate all areas affected by releases from the CCR landfill or surface impoundment. As part of meeting this performance standard, the final rule requires facility owners or operators to remove all wastes from the closing unit, and remove all liners contaminated with CCR waste and CCR waste leachate. The final rule also requires the owner or operator 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 and flushing, pumping, and/or treating the aquifer. The Agency interprets the term ''soil'' broadly to include both unsaturated soils and soils containing groundwater.

Second, the final rule 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 and groundwater monitoring demonstrates that all concentrations of the assessment monitoring constituents listed in appendix IV to part 257 do not exceed either statistically equivalent background levels or MCLs. This standard encompasses both saturated and unsaturated soils, as well as the groundwater. 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. Typically, any metals in these ''subsoils'' in excess of background levels are allowed to either naturally attenuate, or are removed by flushing. Once the facility has removed all of the assessment monitoring constituents listed in appendix IV down to background levels or MCLs the groundwater is considered to be ''clean'' and closure is complete.

EPA disagrees that specific provisions requiring the use of adequate engineering controls to prevent contamination of soil and groundwater during excavation are necessary to ensure that closure will be protective. To the extent that any contamination of soil or groundwater has occurred during CCR removal, this would constitute a release (or an ''area affected by a release'') from the CCR unit, and the final performance standard requires the facility to ensure that this has been removed before closure is deemed to be complete.

Contrary to the commenter's suggestion that quarterly monitoring for five years is necessary to demonstrate that no residual CCR was left in place, the rule requires a facility to document that all appendix IV concentrations are below MCL or background levels for two consecutive sampling events, using the statistical procedures in § 257.93(g). This is the same sampling required to demonstrate under the groundwater monitoring program that there is no longer a reason to suspect a source of contamination, and that consequently assessment monitoring can cease. EPA selected these provisions as the most factually analogous to the circumstances surrounding the clean closure of a CCR unit. Once a facility has removed the waste and any liner, the presumption is that the source of contamination has been removed as well. Although there may be site-specific factors that could support the need for a longer monitoring period, there is no factual basis to require a longer minimum period of sampling on a national basis.

This represents a change from the proposal. EPA proposed a performance standard that required decontamination to either any state established numeric cleanup levels for CCR constituents, or in the absence of state cleanup levels, the removal of metals to either statistically equivalent background levels, or to MCLs, or health-based numbers. This was taken directly from the current part 258 standards for MSWLFs. EPA has deleted both of these standards as inappropriate for these units.

The reference to state established clean up levels was inadvertently carried over from the existing part 258 regulations. As explained throughout this preamble, EPA is unable to rely on state programs to establish the specific standards under this rule; the record does not contain information on all state cleanup standards, and there is no mechanism for states to operate approved programs in lieu of federal programs.

EPA determined that the requirement to clean all soils to background levels was equally inappropriate. 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.

Upon completion, the unit is exempt from the groundwater monitoring and any other post-closure care requirements. In addition, the final rule adopts the proposal to allow the owner or operator to remove the deed notation required under § 257.102(i)(4), upon certification that clean closure has been completed. EPA proposed this option to create a further incentive for clean closure, and it is clear from the commenters, who uniformly supported this option, that it does so. Some commenters raised concern about the effect this option will have on state laws, which may not allow the deed notation to be removed. EPA notes that these criteria do not preempt state laws; to the extent state law requires the facility to retain a deed notation despite the completion of clean closure, those requirements will remain in place, notwithstanding this final rule.

3. Closure of a CCR Unit With CCR in Place

The proposed rule would have also allowed facilities to close a CCR unit by leaving the CCR in place and installing a final cover system. The final cover

system would have been required to be designed and constructed to a have a permeability less than or equal to the permeability of any bottom liner system or the natural subsoils present, or a permeability no greater than 1×10^{-5} centimeters per second (cm/sec), whichever is less. The proposal would have also required an infiltration layer that contains a minimum of 18 inches of earthen material and an erosion layer containing a minimum of six inches of earthen material that is capable of sustaining native plant growth to help minimize erosion of the final cover. These proposed requirements were generally modeled after the performance standard and technical requirements contained in § 258.60 for MSWLFs. 75 FR 35208. EPA also proposed that the final cover system would have to be designed to minimize the disruption of the final cover through a design that accommodates settling and subsidence and provides for major slope stability to prevent the sloughing of the closed CCR unit over the long term. These last two criteria are based on existing requirements for interim status units under RCRA part 265 and MSHA requirements under 30 CFR part 77, subpart C, respectively.

As proposed, CCR surface impoundments would have been subject to an additional set of performance standards. The owner or operator of a CCR surface impoundment would have been required to either drain the CCR unit or solidify the remaining wastes. In addition, the owner or operator would have been required to stabilize the wastes to a bearing capacity to support the final cover. The proposed criteria would also have required that the final cover for all CCR units be designed to minimize the migration of liquids through the closed CCR surface impoundment over the long term; promote drainage, and accommodate settling and subsidence so that the final cover's integrity is maintained. Finally, closure of the CCR unit would also have been subject to the general performance standard that the probability of future impoundment of water, sediment, or slurry be precluded.

The Agency also proposed to allow owners or operators of CCR units to select an alternative final cover design. As proposed, the alternative final cover design would have required an infiltration layer that achieves an equivalent reduction in infiltration, and an erosion layer that would provide equivalent protection from wind and water erosion, as the infiltration and erosion layers specified for final covers described above. In addition, the proposed approach for alternative final cover designs would have also required certification by an independent registered engineer, notification being provided to the state that the alternative final cover design has been placed in the facility's operating record, and placement of the alternative final cover design on the owner or operator's publicly accessible Internet site.

a. Final Cover System Design

EPA received comments supporting the proposed approach, while other commenters opposed the proposed final cover system design requirements. One state commenter generally supported using the part 258 final cover design requirements as a general model for CCR units. This commenter also requested that the Agency clarify whether new CCR units would be required to install a composite final cover system given that it was proposed that new CCR units would be required to designed and constructed with a composite bottom liner. Another state indicated that its state regulations allow final cover designs similar to that proposed by EPA, although the state requires a 24 inch infiltration layer and a 12 inch erosion layer. Another commenter referenced current research showing that soil-only covers may not be effective in minimizing infiltration over the long term under certain climates. This commenter recommended that a geomembrane should be made a standard component of the cover system. Other commenters stated that the final cover system should be a composite system consisting of a synthetic component and a low permeability clay component. A state commenter offered that post-closure maintenance of composite cap system incorporating a geomembrane has been challenging in that state. Another commenter stated that a compacted clay liner should not be used as a final cover for landfills due to the potential for settlement cracking, desiccation cracking, and root and animal penetration. Instead, it was suggested that if a single barrier system is used, then a benefit-cost analysis favors a geomembrane, and if a composite barrier is to be used, a benefit-cost analysis favors a composite system of a geomembrane and geosynthetic clay liner.

The Agency also received many comments on the proposed approach to allow the use of alternative final cover systems. Most commenters supported allowing the use of alternative covers. One commenter stated that the use of geosynthetic clay liners in lieu of 18 inches of earthen material for the infiltration layer is a commonly accepted for cover systems for MSWLFs. This commenter also noted that that geosynthetic clay liners have documented permeability characteristics on the order of 1×10^{-9} cm/sec. Another commenter supported allowing the use of alternative cover systems because a one-size-fits-all approach is not appropriate for final cover system designs. A state also offered that appropriately designed alternative final covers such as capillary barrier covers and evapotranspiration covers are being successfully used at facilities in the state.

After considering comments received regarding final covers, the Agency is essentially finalizing the approach in the proposed rule with minor revisions. The final rule allows owners or operators to use a final cover system consisting of an infiltration layer and an erosion layer, provided the infiltration layer has a permeability less than or equal to the bottom liner or natural subsoils. However, regardless of the bottom liner or natural subsoils present, the final cover must have a permeability no greater than 1×10^{-5} cm/sec.

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. 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. Thus, 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. The final rule requires the final cover system design to be certified by a qualified professional engineer that the design meets both the performance standard and cover system criteria.

The final rule does not require the use of composite final covers, such as a geomembrane underlain by a compacted soil infiltration layer. This is also the

case in situations for a CCR unit that is designed with a composite bottom liner or if the permeability of the soil underlying the unit is comparable to the permeability of a geomembrane. As EPA has concluded for municipal solid waste landfills, in certain site-specific situations it may be possible to construct an infiltration layer that achieves an equivalent reduction in infiltration without matching the permeability in the bottom liner material. 62 FR 40710.

Nonetheless, in certain locations, composite cover systems may be necessary to achieve the rule's performance standards. EPA acknowledges that under certain circumstances issues can arise with compacted clay barriers, particularly when used alone. These can include desiccation, freeze-thaw sensitivity, and distortion due to total and differential settlement of the underlying wastes. These issues can generally be addressed through proper maintenance of the cover system; and in fact the final rule requires as part of post-closure care that the owner or operator maintain the integrity and effectiveness of any final cover, including making repairs to the final cover to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover. Consequently, EPA is not mandating the installation of a composite liner system.

However, fewer problems are typically seen with the use of composite cover systems. And while ongoing oversight and proper maintenance is necessary to ensure the efficacy of any cover system, less effort is generally involved to ensure the continued performance of a composite cover system. EPA therefore generally recommends that facilities install a composite cover system, rather than a compacted clay barrier, as the composite system has often proven to be more effective (and cost effective) over the long term. For these reasons, EPA also anticipates that composite cover systems will be recommended in many circumstances by qualified professional engineers.

The final rule also allows the use of an alternative final cover. The rule requires that the alternative final cover must include infiltration and erosion layer that achieve equivalent performance as the minimum designs specified for final cover systems as discussed above. As discussed in the proposed rule, EPA included this provision to increase the flexibility for an owner or operator of a CCR unit to account for site-specific conditions. Moreover, these provisions will provide an opportunity to incorporate future technology improvements that would be missed if the rule required prescriptive design measures. In addition, these requirements would not supersede more stringent state requirements. Thus, if a state either has more prescriptive or more stringent standards in its state regulations applicable to CCR units, those state requirements would control any final cover system or alternative final cover system design.

While the rule provides the owner or operator flexibility in selecting the final cover for the unit, EPA remains concerned about the lack of guaranteed state oversight on final cover selection. A final cover system that does not perform as designed may result in unacceptable infiltration of water into the closed CCR unit that may lead to leachate and releases from the unit. To address this concern, as well as the concerns raised by commenters regarding the long-term performance of certain cover systems by providing further assurance that the final cover system will perform over the long term, EPA has deleted the proposed provision that would have allowed owners or operators to shorten the length of the post-closure care period. As discussed in Unit M.9 below, the final rule requires facilities to conduct post-closure care for all CCR units for 30 years.

b. Performance Standards When Leaving CCR in Place

EPA received no significant comments on the proposed performance standards. The Agency is therefore finalizing these requirements without revision from the proposal (although EPA has reorganized the final regulatory text for greater clarity). The performance standards are summarized below:

i. As discussed in the previous section, the CCR unit must be closed in a manner that will control, minimize or eliminate, to the maximum extent practicable, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters.

ii. The CCR unit must be closed in a manner that will preclude the probability of future impoundment of water, sediment, or slurry.

iii. The CCR unit must be closed in a manner that will provide for major slope stability, which is discussed is Unit M.1 of this document for closure plans above.

iv. The CCR unit must be closed in a manner that will minimize the need for further maintenance of the unit.

v. The CCR unit must be closed in the shortest amount of time consistent with recognized and generally accepted good engineering practices. The Agency added this performance standard to be consistent with the final provisions applicable for the timeframes for initiating and completing the closure of CCR units.

4. Timeframes for Closure

The Agency proposed that closure of a CCR landfill or CCR surface impoundment must be initiated by the owner or operator no later than 30 days following the known final receipt of CCR. To address concerns about ''inactive'' or abandoned units, the proposed rule also provided that a CCR unit must initiate closure no later than one year after the most recent receipt of CCR if the CCR unit had remaining capacity and there was a reasonable likelihood that the CCR unit would receive additional CCR (*i.e.,* the rule would have forced the facility to close the CCR unit). See 77 FR at 35209 and proposed § 257.100(j). In addition, the proposed rule would have required an owner or operator to complete closure activities within 180 days of initiating closure. See proposed § 257.100(k). Thus, the maximum amount of time a facility would have had to initiate and complete closure of a CCR unit was seven months.

While the existing closure criteria for MSWLFs allow the Director of an approved State to grant time extensions for closure (both to initiate and to complete closure) if steps are taken to prevent threats to human health and the environment from the unclosed unit, EPA proposed not to include similar provisions for owners or operators of CCR units. At proposal, the Agency believed that extending the closure deadlines was inappropriate because, in the absence of an approved state program, the owner or operator could unilaterally decide to extend the time for closure of a CCR unit, without any basis, or oversight by a regulatory authority. 75 FR 35209.

EPA received numerous comments in response to the proposed deadlines under the subtitle D proposed approach. Industry and state commenters stated that the proposed deadlines to begin and complete closure activities (30 and 180 days, respectively) are technically impracticable and simply too short for the vast majority of CCR units, especially for CCR surface impoundments to complete closure. Commenters stated that a 30-day deadline to initiate closure activities may not be workable in situations such as when there are construction

ATTACHMENT D
Excerpts From Section VI.M.4.b.ii

operator must complete closure within six months of initiating closure activities. The rule, however, provides procedures for an owner or operator to rebut either presumption and obtain additional time, provided the owner or operator can make the prescribed demonstrations. For CCR surface impoundments, the amount of additional time beyond the five years varies based on the size (using surface area acreage of the CCR unit as the surrogate of size) of the unit. For impoundments 40 acres or smaller, the maximum time extension is two years. For impoundments greater than 40 acres, the maximum time extension is five two-year extensions (ten years) and the owner or operator must substantiate the factual circumstances demonstrating the need for each two year extension. For a CCR landfill, the amount of additional time beyond the six months does not vary according to the size of the landfill, rather the maximum time extension is two one-year extensions (two years) for any CCR landfill. The owner or operator must substantiate the factual circumstances demonstrating the need for each one-year extension.

ii. CCR Surface Impoundment Timeframes

To develop these timeframes the Agency began by identifying the period of time in which most surface impoundments could feasibly complete closure. EPA intended this period of time to serve as the basis for the rebuttable presumption of the rule. As EPA recognized in the NODA, a timeframe that would be feasible for the largest units would grant more time than could be justified to complete the closure of smaller units. The closure of CCR units, and particularly the closure of CCR units that are compelled to close because they fail to comply with the rule's requirements (*e.g.,* are structurally unstable or are contaminating groundwater), needs to occur as expeditiously as is feasible. While these units (and particularly the larger CCR surface impoundments) are in the process of closing, they continue to present risks to human health and the environment. On the other hand a presumptive time period that is feasible for a small percentage of units would simply result in a greater number of facilities that would need to obtain time extensions. It is well established that the law cannot compel actions that are physically impossible, ''*lex non cogit ad impossibilia,*'' and it is incumbent on EPA to develop a regulation that does not in essence establish such a standard.

The available information shows that CCR surface impoundments can vary in size by orders of magnitude (*i.e.,* from less than one acre to nearly 1,000 acres). EPA evaluated the information on the size distribution of CCR surface impoundments in its database of survey results from EPA's 2009 Information Request.[123] Through this effort, EPA received a substantial amount of factual information from 240 facilities covering 676 surface impoundments, including surface area information on over 650 impoundments. The database of survey responses shows that the median surface impoundment is approximately 14 acres in size, 75 percent of impoundments are 50 acres or smaller, 80 percent of impoundments are 66 acres or smaller, and 90 percent of impoundments are 111 acres or smaller.

Available information on actual and projected timeframes needed to close CCR surface impoundments of varying sizes (using surface area as the surrogate for size) is summarized below. Much of this information came from public comments from utilities. The largest CCR surface impoundment in this data set that has actually completed closure is a 40-acre unit that closed over a period of approximately five years (*i.e.,* the surface impoundment at PPL Corporation's Martins Creek Power Plant).[124] This facility closed with waste in place, and included installation of a final cover system. According to the facility, this CCR unit ceased receiving wastewater in January 2008, and the closure work began with dewatering the unit and preparing the revised closure plan and permit modification applications. Installation of the final cover, in addition to final soil grading and seeding of the unit was completed in spring 2012. By early 2013, all remaining closure actions were completed and state regulators issued final approvals in July 2013. EPA gave substantial weight to this information because (1) it was a CCR surface impoundment—the units of greatest relevance to the issue at hand; (2) the closure was recently completed, and so would accurately reflect current and available engineering practices; and (3) the facility actually completed closure of the unit. See EPA–HQ–RCRA–2012–0028–0103 and EPA–HQ–RCRA–2012–0028–0113.

As another example, American Electric Power (AEP) provided some information on the recent closure of a CCR surface impoundment in 2013. This 21-acre unit had been inactive for several years and was closed over the course of two construction seasons. The impoundment was closed by leaving CCR in place and installing a composite cap, in addition to the installation of hydraulic appurtenances to control the design storm events. See EPA–HQ–RCRA–2012–0028–0067.

Cleco Corporation provided planned closure timeframes contained in existing permits for its CCR surface impoundments. For three of its CCR surface impoundments, which in aggregate totaled 66 acres, Cleco Corporation estimated that it could take approximately one year to complete closure, which would be accomplished by leaving CCR in place and installing a final cover system. Cleco Corporation also estimated that it would take approximately nine months to complete closure of two additional CCR surface impoundments, with an aggregate acreage of 5.5 acres, by removing CCR from the CCR units, (*i.e.,* clean closure of the units). Information on the size of any of the five CCR units was not provided, which complicates the Agency's ability to assess the closure of any of the individual CCR units. In addition, the time period appears to begin when dewatering operations are initiated and the comments do not discuss how much time may be needed to obtain any necessary approvals from the state prior to commencing closure activities. See EPA–HQ–RCRA–2012–0028–0106.

Similarly, Xcel Energy stated in its comments to the NODA that it closed four CCR surface impoundments at its Northern States Power of Minnesota's Minnesota Valley Plant by removing all of their contents. See EPA–HQ–RCRA–2012–0028–0079. While the commenter did not provide any information on the time needed to close the four CCR units, other information available to the Agency indicated that closure took place sometime after May 2009 and was completed prior to September 2013. Based on information obtained from Xcel Energy in response to EPA's request for information from May 2009, the four CCR units at the Minnesota Valley Plant each have a surface area less than one acre. In addition, the response to the information request showed that one CCR surface impoundment was nearly full of ash, a second was more than half full, and the final two CCR units were less than one quarter full.

In the August 2013 NODA, the Agency solicited comment on a draft plan to close two CCR surface

[123] More information on EPA's Information Request, including a data base of survey responses, can be accessed at *http://www.epa.gov/epawaste/nonhaz/industrial/special/fossil/surveys/index.htm.*

[124] EPA included information on the planned closure of this CCR surface impoundment in the NODA. 78 FR 46945. The closure plan estimated that the closure process would take approximately three years to complete.

impoundments at Santee Cooper's Grainger Generating Station in South Carolina. 78 FR 46945. The plan estimated that closure of the two CCR units, approximately 42 and 39 acres in surface area, could be accomplished during a three year period. This original estimate was based on closing the unit with waste in place and installing a final cover. However, Santee Cooper has since amended its draft plan and is now pursuing closure by removal of CCR and transport off-site for either disposal or beneficial use.[125] The revised draft envisions the complete removal of CCR from both CCR units and also one foot of underlying soil beneath the units. In total, the draft closure plan estimates that approximately 1.3 million cubic yards of CCR and underlying soil will be removed from both units—approximately 900,000 cubic yards from one unit and 400,000 cubic yards from the second—over a period of six to ten years.

The Florida Electric Power Coordinating Group (FCG) claimed that, based on FGC member experience, closing a 30 acre CCR surface impoundment is expected to take approximately two years to complete, but provided no additional information or details. See EPA–HQ–RCRA–2012–0028–0064.

The Utility Solid Waste Activities Group (USWAG) provided another projected closure schedule for a 20 acre CCR surface impoundment operated by Luminant. This facility was in the process of closing the unit when the comments were prepared. The schedule estimated that completion of all closure activities, would take approximately 45 months (3 years, 9 months) to complete. However, the commenter also states that, when complete, the ''full closure period will take approximately 84 months (seven years) due to the unique circumstances of that closure.'' No other information was provided on this closure to explain the ''unique circumstances'' that warrant such an extended period of time. See EPA–HQ–RCRA–2012–0028–0113.

There is other information in these data that indicates that larger impoundments may be able to complete closure within approximately the same timeframes as smaller units. For example, the data included the projected closure of a 100-acre CCR surface impoundment over a four and one-half year period, which seems to indicate that larger units may be able to close in approximately the same period of time. However, the Agency gave substantially less weight to this information for a number of reasons. Most critically, this information merely demonstrated projected timeframes for CCR surface impoundments, not actual timeframes that had been achieved. In addition, for some of these data, it was unclear whether the circumstances that allowed for completion within this timeframe were generally applicable to the majority of CCR surface impoundments. In one instance, the commenter noted that the time to complete closure was shorter than would normally be expected because the impoundment was being closed well before it reached full capacity and because water in the impoundment could be pumped into an adjacent impoundment. The commenter also noted that the impoundment had been built with a leachate collection system to facilitate dewatering at closure. See EPA–HQ–RCRA–2012–0028–0113.

Moreover, the majority of commenters claimed that it would take substantially longer than five years to close the largest impoundments. For example, USWAG stated that one of its members obtained ''approval for a closure plan for a 343-acre surface impoundment that provided for a twelve-year closure period to ensure adequate time to complete dewatering of the impoundment, assure the stability of the dewatered CCRs, and uniformly construct the slope of the final cover materials.'' No other information was provided on this closure example. See EPA–HQ–RCRA–2009–0640–10483. USWAG also provided information on the closure of the CCR surface impoundment at First Energy's Little Blue Run Disposal Area. This 950 acre surface impoundment, which is the largest CCR surface impoundment in the country, has a projected closure period of 15 years.

Similarly, to illustrate the time required simply for earthmoving operations to close a large CCR surface impoundment (in their example, 350 acres), Duke Energy Corporation estimated that the time needed in the schedule to deliver and place the necessary volume of materials for construction of the final cover and the sub-base to the cover system could take between nine and 12 years. This estimate is based on the need for approximately 10 to 11 million cubic yards of fill to construct and shape the sub-base of the final cover and the cover system itself that would require nearly 500,000 truckloads to deliver. See EPA–HQ–RCRA–2012–0028–0095.[126]

Collectively, this information formed the basis for the five year presumptive default. As noted the median size of CCR surface impoundments is approximately 14 acres, and 75 percent of impoundments are 50 acres or smaller. The information presented by the utilities documents that impoundments as large as 66 acres under normal circumstances can close within two to three years. EPA therefore expects that most, if not all, units should be able to complete closure within five years. For all but the very largest units, this timeframe would even accommodate potential delays caused by weather or any other unpredictable variables. This is clearly demonstrated by the examples presented by public comments, and by the recent example of the 40-acre CCR surface impoundment in Martins Creek that closed within five years.

EPA also notes that five years is the timeframe Congress mandated for the completion of open dumps to close or upgrade. While the closure times apply generally to all units—both those whose closure is mandated by this final rule and those that close because the facility decides to do so—the statutory directive provides further support for EPA's decision.

But as many commenters stated, initial estimates can and often do vary from actual closure times due to unforeseen or variable conditions. EPA acknowledges that a host of variables can, and frequently do, delay closure activities, such that the initial time estimates to complete closure of the unit are ultimately exceeded. For example, the 40 acre impoundment at Martins Creek Power Plant discussed above was initially scheduled in its closure plan to be completed within three years; however, closure ultimately took five years to complete. The additional two

[125] ''Amended Closure Plan Wastewater Ash Ponds, Grainger Generating Station, Conway, South Carolina,'' January 2014.

[126] EPA also received information from Consumers Energy Company on the closure of three former fly ash surface impoundments at the JR Whiting plant. These surface impoundments (combined) totaled approximately 52 acres and are scheduled to be closed with a final cover over an approximately 12-year period. The commenter claimed that the extended time for closure ''was necessary to allow dewatering and the filling of numerous voids, but principally to allow the generation of fly ash to allow the placement of structurally placed, low permeability ash to provide minimal required slopes for closure and to serve as the select layer for the flexible membrane liner.'' See EPA–HQ–RCRA–2012–0028–0068. Information on the individual size of any of the three CCR units was not provided in the comments, which complicates any assessment of the time needed to complete closure of any single CCR unit. Because the facility appears to be continuing to use the unit to actively manage waste, EPA does not consider this to be representative of a typical closure process.

years was due to the need to obtain approval of a modified closure plan from the state, as well as modifications to three permits, in addition to obtaining other local planning approvals. Further time was also needed to accommodate the public notice and comment processes for several of the permits and approvals.

EPA recognizes that there are a number of unpredictable or variable conditions that can affect the time needed to close a CCR unit and that those conditions are not within the control of the owner or operator. For example, some states require review and approval of a closure plan prior to initiating of closure activities. See, for example, 25 Pa. Code sections 288.292(b) and 289.311(b) for CCR landfills and CCR surface impoundments, respectively. Another commenter noted that in Illinois, permits from several different authorities may need to be obtained to commence closure, including the Illinois Department of Natural Resources, the U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Services.

Climate and weather can also impact the time needed to complete closure. For example, an unusually wet or short construction season can result in schedule delays; one commenter noted that in certain regions of the Midwest, it is possible for as much as 40 inches of rain to fall in a given season.

To account for these conditions, a substantial majority of commenters requested that the final rule include the potential for time extensions, and several specifically referenced the need for a ''force majeure'' provision. One commenter also recommended that a ''force majeure'' clause specifically include delays caused by court order (*i.e.,* appeals of permits issued by state agencies causing judgments in court). Another commenter provided an example of a ''force majeure'' provision that could serve as a model:

> An extension shall be granted for any scheduled activity delayed by an event of force majeure which shall mean any event arising from causes beyond the control of the owner that causes a delay in or prevents the performance of any of the conditions under this rule including but not limited to: acts of God, fire, war, insurrection, civil disturbance, explosion; adverse weather conditions that could not be reasonably anticipated causing unusual delay in transportation and/or field work activities; restraint by court order or order of public authority; inability to obtain, after exercise of reasonable diligence and timely submittal of all applicable applications, any necessary authorizations, approvals, permits, or licenses due to action or inaction of any governmental agency or authority; and delays caused by compliance with applicable statutes or regulations governing contracting, procurement or acquisition procedures, despite the exercise of reasonable diligence by representatives of the owner.
>
> Events which are not force majeure include by example, but are not limited to, unanticipated or increased costs of performance, changed economic circumstances, normal precipitation events, or failure by the owner to exercise due diligence in obtaining governmental permits or performing any other requirement of this rule or any procedure necessary to provide performance pursuant to the provisions of this rule.

EPA agrees that the rule should include procedures to obtain extensions of time to complete closure of the unit, based on the complexity of the activity. As previously noted, the law, including a regulation, cannot compel the impossible. However, because the record demonstrates that most units, even the larger units, can close within that five year timeframe, the rule establishes a high threshold to obtain additional time. To account for those instances of true physical impossibility, the rule limits extensions to circumstances in which the owner or operator can demonstrate that the additional time is needed due to factors that are truly beyond the facility's control—*i.e.,* could fairly be characterized as an example of ''force majeure.'' To obtain additional time, the owner or operator of the CCR unit must document in writing the exact reasons why additional time is needed. The regulation specifies that such reasons could include: (1) Complications stemming from the climate and weather, such as unusual amounts of precipitation or a significantly shortened construction season; (2) the time required to dewater a surface impoundment due to the volume of CCR contained in the CCR unit or the geotechnical characteristics of the CCR in the unit; (3) the geology and terrain surrounding the CCR unit will affect the amount of material needed to close the CCR unit; or (4) the time required or delays caused by the need to obtain State permits and/or to comply with other State requirements. These findings would need to be certified by the owner or operator of the unit, as well as by a qualified professional engineer.

The final rule limits the amount of time that closure can be extended based on the size of the CCR unit. Specifically, the rule allows CCR surface impoundments 40 acres or smaller a time extension of up to two years, while CCR surface impoundments larger than 40 acres can obtain up to five two-year extensions. The 40 acre size demarcation is based on the available information showing that surface impoundments of 40 acres or smaller routinely have either completed closure or are projected to be able to complete closure within a timeframe shorter than five years. EPA expects that facilities will account for all potential delays that can reasonably be foreseen in planning their closure activities, and that this is feasible within this five year timeframe. Consequently the final rule restricts facilities with units of this size to a single extension to account for truly exception circumstances (*e.g.,* Acts of God).

The Agency also recognizes that there is increased uncertainty for CCR surface impoundments larger than 40 acres. First, while available information documents that some CCR surface impoundments larger than 40 acres can be closed within this same five year period, the Agency has other information indicating that closure of units larger than 40 acres can be expected to take much longer than five years. For example, the largest surface impoundment in the country is approximately 950 acres and is scheduled to cease receiving CCR by December 31, 2016 and commence closure in 2017. The facility's projected closure period is 15 years. However, EPA currently has no data (anecdotal or otherwise) on the actual timeframes in which a surface impoundment of that size has completed closure. Given that closure for the largest of surface impoundments could reasonably be expected to take more than five years to complete, the Agency has concluded that surface impoundments larger than 40 acres need to be provided with the possibility of additional time extensions beyond the two years provided to impoundments less than 40 acres. Based on available information, in particular the current estimates of the time needed to close the largest unit in the country, the rule authorizes a facility to obtain a maximum of five time extensions, totaling as much as ten years in two year increments to close a CCR surface impoundment greater than 40 acres. However, the owner or operator must substantiate the factual circumstances demonstrating the need for each two-year extension.

Several commenters also urged EPA to specify in the final rule what EPA intended by the phrase ''completion of closure;'' and to define the activities or actions the owner or operator must complete to satisfy the closure requirements. For purposes of this rule, closure of a CCR unit is complete when the unit meets all of the requirements of this rule and the owner or operator

obtains certification from a qualified professional engineer verifying that closure has indeed been completed, consistent with all of the performance standards in the rule. While EPA recognizes that under some state programs closure is not considered complete until the owner or operator receives certification from the state, this is not a prerequisite to completion of closure under these federal rules.

iii. Closure Timeframes for CCR Landfills

Similar to the approach for CCR surface impoundments, EPA recognizes that there can be unforeseen and extraordinary circumstances that warrant additional time to close a CCR landfill. Accordingly, the rule adopts procedures analogous to those for CCR surface impoundments that allow the owner or operator to obtain additional time to complete the closure of a CCR landfill, provided the owner or operator can make the prescribed demonstrations. However, the amount of additional time the facility can obtain beyond the presumptive six month timeframe does not depend on the size of the landfill; rather the maximum time extension is two one-year extensions (two years) for any CCR landfill. As with the procedures for CCR surface impoundments, the owner or operator must substantiate the factual circumstances demonstrating the need for each one-year extension.

EPA developed this timeframe based on its review of the available information in the record regarding the timeframes for completing the closure of CCR landfills, some of which is summarized below. Additional information may also be found in the comment response document.

In response to the August 2013 NODA, Nebraska Public Power District (NPPD) provided information documenting that it completed closure of a 10 acre CCR landfill within 180 days after the final volume of fly ash and bottom ash was placed in the CCR landfill. Closure was accomplished by leaving CCR in place and installing a final cover system. NPPD's comments do not indicate what year closure of this CCR landfill was completed. See EPA–HQ–RCRA–2012–0028–0076.

The Florida Electric Power Coordinating Group (FCG) stated in its comments that FCG member experience with CCR landfill closure has ''demonstrated the need for a period of time greater than 180 days to complete closure activities.'' However, the commenter did not provide any information indicating how long such closures actually took, nor any information to substantiate their claim. See EPA–HQ–RCRA–2012–0028–0064.

Overall, the closure of CCR landfills is less complex than the closure of CCR surface impoundments. Portions of the CCR landfills that reach final grade can be closed as other areas of the CCR landfill continue to receive CCR, which is typically not possible at CCR surface impoundments. Nor does the owner or operator need to dewater the unit, which appears to be the aspect of closure most likely to be a source of unanticipated circumstances. Finally, there is substantially less uncertainty with respect to the timeframes to complete the closure of CCR landfills, which are not all that different (in this respect) than landfills containing other forms of solid or hazardous waste. EPA therefore has greater confidence that a fixed period of two years will be adequate to account for the vast majority of circumstances.

c. Alternative Closure Requirements

The Agency is finalizing alternative closure requirements in two narrow circumstances for a CCR landfill or CCR surface impoundment that would otherwise have to cease receiving CCR and close, consistent with the requirements of § 257.101(a), (b)(1), or (d). The first is where the owner or operator can certify that CCR must continue to be managed in that CCR unit due to the absence of both on-site and off-site alternative disposal capacity. § 257.103(a). The second is where the owner or operator of a facility certifies that the facility will cease operation of the coal-fired boilers no later than the dates specified in the rule, but lacks alternative disposal capacity in the interim. § 257.103(b). Under either of these alternatives, CCR units may continue to receive CCR under the specified conditions explained below. In addition, under either alternative, the owner or operator must continue to comply with all other requirements of the rule, including the requirement to conduct any necessary corrective action.

1. No alternative CCR disposal capacity (§ 257.103(a)).

The Agency recognizes that the circumstance may arise where a facility's only disposal capacity, both on-site and off-site, is in a CCR unit that has triggered the closure requirements in § 257.101(a), (b)(1), or (d). As a result, the facility may be faced with either violating the closure requirements in § 257.101 by continuing to place CCR in a unit that is required to close, or having to cease generating power at that facility because there is no place in which to dispose of the resulting waste. For example, while it is possible to transport dry ash off-site to alternate disposal facility that simply is not feasible for wet-generated CCR. Nor can facilities immediately convert to dry handling systems. As noted previously, the law cannot compel actions that are physically impossible, and it is incumbent on EPA to develop a regulation that does not in essence establish such a standard.

Should a facility choose to comply with the regulation and stop generating power, there would be significant risks to human health that would arise if a community would be left without power for an extended period of time. As information in the record demonstrates, obtaining alternative capacity can sometimes require a substantial amount of time (*e.g.,* if the facility needs to construct alternative capacity, including potentially the need to locate an alternative site or purchase additional property). EPA recognizes that there are also significant risks to human health and the environment, as demonstrated throughout this preamble, from a leaking or improperly sited CCR unit, and that these risks justify requiring those units to either retrofit to meet the federal criteria established in the final rule or close. EPA also acknowledges that in the interim period while the owner or operator seeks to obtain additional capacity, the risks associated with the continued use of these units will be significant. However, the Agency believes that the risks to the wider community from the disruption of power over the short-term outweigh the risks associated with the increased groundwater contamination from continued use of these units. This conclusion is further buttressed by the fact that during this interim period the risks associated with allowing these units to continue to receive CCR are mitigated by all of the other requirements of the rule with which the facility must continue to comply, including the requirements to continue groundwater monitoring and corrective action.

Under § 257.103(a)(1), a CCR unit that would otherwise be required to cease receiving CCR under § 257.101(a), (b)(1), or (d), may continue to receive CCR provided the owner or operator certifies that the CCR generated at that facility must continue to be managed in that unit due to the absence of alternative disposal capacity both on-site and off-site. The rule also requires the owner or operator to document this claim, and the claim must be based on the real absence of an alternative and not justified based on the costs or inconvenience of alternative disposal capacity. § 257.103(a)(1)(i). The owner