No. ______

In the Supreme Court of the United States

EAST KENTUCKY POWER COOPERATIVE, INC.,
Applicant,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY and MICHAEL REGAN, in his official capacity as Administrator of the United States Environmental Protection Agency,
Respondents.

TO THE HONORABLE JOHN G. ROBERTS, JR.,
CHIEF JUSTICE OF THE UNITED STATES AND
CIRCUIT JUSTICE FOR THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

APPENDIX TO APPLICATION FOR IMMEDIATE STAY OF FINAL AGENCY ACTION PENDING APPELLATE REVIEW

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9 and 257

[EPA–HQ–OLEM–2020–0107; FRL–7814–04–OLEM]

RIN 2050–AH14

Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: On April 17, 2015, the Environmental Protection Agency (EPA or the Agency) promulgated national minimum criteria for existing and new coal combustion residuals (CCR) landfills and existing and new CCR surface impoundments. On August 21, 2018, the United States Court of Appeals for the District of Columbia Circuit vacated the exemption for inactive surface impoundments at inactive facilities (legacy CCR surface impoundments) and remanded the issue back to EPA to take further action consistent with its opinion in *Utility Solid Waste Activities Group, et al.* v. *EPA.* This action responds to that order and establishes regulatory requirements for legacy CCR surface impoundments. EPA is also establishing requirements for CCR management units at active CCR facilities and at inactive CCR facilities with a legacy CCR surface impoundment. Finally, EPA is making several technical corrections to the existing regulations, such as correcting certain citations and harmonizing definitions.

DATES: This final rule is effective on November 4, 2024.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–HQ–OLEM–2020–0107. All documents in the docket are listed on the *http://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *http://www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT: For questions concerning this proposal, contact Michelle Lloyd, Office of Resource Conservation and Recovery, Materials Recovery and Waste Management Division, Environmental Protection Agency, 1200 Pennsylvania Avenue NW, MC: 5304T, Washington, DC 20460; telephone number: (202) 566–0560; email address: *Lloyd.Michelle@epa.gov,* or Taylor Holt, Office of Resource Conservation and Recovery, Materials Recovery and Waste Management Division, Environmental Protection Agency, 1200 Pennsylvania Avenue NW, MC: 5304T, Washington, DC 20460; telephone number: (202) 566–1439; email address: *Holt.Taylor@epa.gov.* For more information on this rulemaking, please visit *https://www.epa.gov/coalash*.

SUPPLEMENTARY INFORMATION:

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List of Acronyms

ACM Assessment of Corrective Measures
ANPRM Advance Notice of Proposed Rulemaking
ARAR applicable or relevant and appropriate requirements
ASD alternative source demonstration
CAA Clean Air Act
CBI Confidential Business Information
CBR closure by removal
CCR coal combustion residuals
CCRMU coal combustion residuals management unit
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
CIP closure in place
CFR Code of Federal Regulations
COALQUAL U.S. Geological Survey coal quality database
CWA Clean Water Act
DOE Department of Energy
EAP Emergency Action Plan
EIA Energy Information Administration
EIP Environmental Integrity Project
EJ environmental justice
ELG Effluent Limitation Guidelines
EPA Environmental Protection Agency
EPACMTP EPA Composite Model for Leachate Migration with Transformation Products
EPRI Electric Power Research Institute
FER Facility Evaluation Report
FERC Federal Energy Regulatory Commission
FGD flue gas desulfurization
FR Federal Register
GWMCA groundwater monitoring and corrective action
GWPS groundwater protection standard
HQ hazard quotient
HSWA Hazardous and Solid Waste Amendments
ICR Information Collection Request
IRIS Integrated Risk Information System
LEAF Leaching Environmental Assessment Framework
MCL maximum contaminant level
MDE Maryland Department of the Environment
MNA monitored natural attenuation
MODFLOW–USG Modular Three-Dimension Finite-Difference Ground-Water Flow Model
MSW Municipal Solid Waste
MW Megawatts
NAICS North American Industry Classification System
NERC North American Electric Reliability Corporation
NODA notice of data availability
NPDES National Pollution Discharge Elimination System
NPL National Priorities List
NTTAA National Technology Transfer and Advancement Act
OAFU Other Active Facilities
OLEM Office of Land and Emergency Management
OMB Office of Management and Budget
OSHA Occupational Safety and Health Administration

P.E. Professional Engineer
PM particulate matter
PRA Paperwork Reduction Act
PRG preliminary remediation goal
PUC Public Utility Commission
QA/QC quality assurance/quality control
RCRA Resource Conservation and Recovery Act
RIA Regulatory Impact Analysis
RME reasonable maximum exposure
RTO Regional Transmission Organizations
SMCL secondary maximum contaminant level
SSI statistically significant increase
SSL statistically significant level
TDS total dissolved solids
TSCA Toxic Substances Control Act
TSDF Transportation Storage and Disposal Facility
TVA Tennessee Valley Authority
UMRA Unfunded Mandates Reform Act
USGS U.S. Geological Survey
USWAG Utility Solid Waste Activities Group
WIIN Water Infrastructure Improvements for the Nation
WQC water quality criteria

I. General Information

A. Does this action apply to me?

This rule applies to and may affect all CCR generated by electric utilities and independent power producers that fall within the North American Industry Classification System (NAICS) code 221112. The reference to NAICS code 221112 is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This discussion lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not described here could also be regulated. To determine whether your entity is regulated by this action, you should carefully examine the applicability criteria found in 40 CFR 257.50 of title 40 of the Code of Federal Regulations. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

B. What action is the Agency taking?

EPA is amending the regulations governing the disposal of CCR in landfills and surface impoundments, codified in subpart D of part 257 of Title 40 of the Code of Federal Regulations (CFR) (CCR regulations). Specifically, the Agency is establishing regulatory requirements for inactive CCR surface impoundments at inactive utilities (''legacy CCR surface impoundment'' or ''legacy impoundment''). This action is being taken in response to the August 21, 2018, opinion by the U.S. Court of Appeals for the District of Columbia Circuit in *Utility Solid Waste Activities Group* v. *EPA,* 901 F.3d 414 (D.C. 2018) (''*USWAG* decision'' or ''*USWAG*'') that vacated and remanded the provision exempting legacy impoundments from the CCR regulations. This action includes adding a definition for legacy CCR surface impoundments and other terms relevant to this rulemaking. It also requires that legacy CCR surface impoundments comply with certain existing CCR regulations with tailored compliance deadlines.

While this action is responsive to the D.C. Circuit's order, it is also driven by the record, which clearly demonstrates that regulating legacy CCR surface impoundments will have significant quantified and unquantified public health and environmental benefits. As EPA concluded in 2015, the risks posed by unlined CCR surface impoundments are substantial, and the risks from legacy impoundments are at least as significant. EPA's 2014 Risk Assessment concluded that the cancer risks from unlined surface impoundments ranged from 3×10^{-4} for trivalent arsenic to 4×10^{-5} for pentavalent arsenic. Non-cancer risks from these same units also significantly exceeded EPA's level of concern, with estimated Hazard Quotients (HQ) of two for thallium, three for lithium, four for molybdenum and eight for trivalent arsenic. In addition, as described in Unit III.A.1 of this preamble, information obtained since 2015 indicates that the risks for legacy CCR surface impoundments are likely to be greater than EPA originally estimated. Finally, based on the demographic composition and environmental conditions of communities within one and three miles of legacy CCR surface impoundments, this final rule will reduce existing disproportionate and adverse effects on economically vulnerable communities, as well as those that currently face environmental burdens. For example, in Illinois the population living within one mile of legacy CCR surface impoundment sites is over three times as likely compared to the State average to have less than a high school education (35.66% compared to 10.10%, see Regulatory Impact Analysis (RIA) exhibit ES.14), and that population already experiences higher than average exposures to particulate matter, ozone, diesel emissions, lifetime air toxics cancer risks, and proximity to traffic, Superfund sites, Risk Management Plan sites, and hazardous waste facilities (see RIA exhibit ES.15). Consistent with the directive in section 4004(a) to ensure that the statutory standard is met at all regulated sites, including the most vulnerable, this final rule will help EPA further ensure that the communities and ecosystems closest to coal facilities are sufficiently protected from harm from groundwater contamination, surface water contamination, fugitive dust, floods and impoundment overflows, and threats to wildlife.

EPA is also establishing requirements to address the risks from currently exempt solid waste management that involves the direct placement of CCR on the land. EPA is extending a subset of the existing requirements in 40 CFR part 257, subpart D to CCR surface impoundments and landfills that closed prior to the effective date of the 2015 CCR Rule, inactive CCR landfills, and other areas where CCR is managed directly on the land. In this action, EPA refers to these as CCR management units, or CCRMU. The final rule expands the CCRMU requirements to a set of active facilities that were not regulated by the 2015 CCR rule because they had ceased disposing of CCR in their on-site disposal units, and they did not have an inactive surface impoundment. Accordingly, this rule applies to all CCRMU at active CCR facilities and inactive facilities with a legacy CCR surface impoundment.

EPA is also finalizing alternative closure provisions to allow a facility to complete the closure by removal in two stages: first, by completing all removal and decontamination procedures; and second, by completing all groundwater remediation in a separate post closure care period.

Finally, EPA is making a number of technical corrections to the existing regulations, such as correcting certain citations and harmonizing definitions.

EPA intends the provisions of the rule to be severable. In the event that any individual provision or part of the rule is invalidated, EPA intends that this would not render the entire rule invalid, and that any individual provisions that can continue to operate will be left in place. For example, EPA intends that the provisions governing each class of facilities—legacy CCR inactive surface impoundments, CCR management units, other active facility units, and regulated CCR landfills containing waste in contact with groundwater—to be independently severable from one another as each set of requirements operates independently from the other.

Likewise, the provisions regulating existing units at active facilities, including those units at non-fossil-fuel-fired facilities generating energy, are severable from the other substantive requirements—each provision may continue operating even if one of the others is invalidated. EPA also intends that, within each set of provisions for legacy CCR surface impoundments and for CCR management units, the substantive requirements be severable from each other. For example, if any of the closure requirements were to be set aside (*e.g.,* the requirement that CCRMU initiate closure within 48 months of publication), the groundwater monitoring and corrective action requirements can continue to fully and effectively operate. These requirements function independently from each other, address environmental concerns through different means, and are not dependent on the others; they are therefore severable from each other. Lastly, as set forth below, EPA has deferred the dates by when some units in some circumstances must comply with the substantive standards governing legacy CCR surface impoundments and CCR management units. If any of the deferrals were to be set aside, EPA intends that the substantive standards would remain in place because the rationale for and effectiveness of each set of substantive standards is not dependent on any of the deferrals.

For the reader's convenience, EPA has provided a background description of existing requirements in several places throughout this preamble.

C. What is the Agency's authority for taking this action?

EPA is publishing this notice under the authority of sections 1008(a), 2002(a), 3007, 4004, and 4005(a) and (d) of the Solid Waste Disposal Act of 1970, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA) and the Water Infrastructure Improvements for the Nation (WIIN) Act of 2016, 42 U.S.C. 6907(a), 6912(a), 6927, 6944, 6945(a) and (d).

RCRA section 1008(a) authorizes EPA to publish ''suggested guidelines for solid waste management.'' 42 U.S.C. 6907(a). RCRA defines solid waste management as ''the systematic administration of activities which provide for the collection, source separation, storage, transportation, transfer, processing, treatment, and disposal of solid waste.'' 42 U.S.C. 6903(28).

Pursuant to section 1008(a)(3), the guidelines are to include the minimum criteria to be used by the States to define the solid waste management practices that constitute the open dumping of solid waste or hazardous waste and are prohibited as ''open dumping'' under section 4005. Only those requirements promulgated under the authority of section 1008(a)(3) are enforceable under section 7002 of RCRA.

RCRA section 4004(a) generally requires EPA to promulgate regulations containing criteria distinguishing ''sanitary landfills,'' which may continue to operate, from ''open dumps,'' which are prohibited. 42 U.S.C. 6944(a); *see id.* 6903(14), (26); 6945(a). The statute directs that, ''at a minimum, the criteria are to ensure that units are classified as sanitary landfills only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid wastes at such facility.'' 42 U.S.C. 6944(a).

RCRA section 4005(a), entitled ''Closing or upgrading of existing open dumps,'' prohibits any solid waste management practices or disposal of solid waste that does not comply with EPA regulations issued under RCRA section 1008(a) and 4004(a). 42 U.S.C. 6945(a). See also 42 U.S.C. 6903(14) (definition of ''open dump''). This prohibition takes effect ''upon promulgation'' of any rules issued under section 1008(a)(3) and is enforceable either through a citizen suit brought pursuant to section 7002, or through an EPA enforcement action brought pursuant to section 4005(d)(4)(A). See 42 U.S.C. 6945(a), (d)(4)(A) (authorizing EPA to use the authority under RCRA section 3008(a) to enforce the open dumping prohibition for CCR). RCRA section 4005(a) also directs that open dumps (*i.e.,* facilities out of compliance with EPA's criteria), must be closed or upgraded. See 42 U.S.C. 6945(a).

RCRA section 4005(d)(3) specifies that the regulations in 40 CFR part 257, subpart D ''(or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title), shall apply to each CCR unit'' unless a permit issued by an approved State or by EPA is in effect. Similarly, section 4005(d)(6) [1] provides that:

> a CCR unit shall be considered to be a sanitary landfill for purposes of this chapter, including subsection (a), only if the coal combustion residuals unit is operating in accordance with [a permit issued by EPA or an approved State] or 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).

1. Regulation of Solid Wastes Under RCRA Subtitle D

Solid wastes that are neither a listed nor characteristic hazardous waste are subject to the requirements of RCRA subtitle D. Subtitle D of RCRA establishes a framework for Federal, State, and local government cooperation in controlling the management of nonhazardous solid waste. The Federal role is to establish the overall regulatory direction by providing minimum nationwide standards that will protect human health and the environment. States may, but are not required to, adopt these requirements into their State programs.

Under RCRA section 4005(a), upon promulgation of criteria under section 1008(a)(3), any solid waste management practice or disposal of solid waste that constitutes the ''open dumping'' of solid waste is prohibited. The Federal standards apply directly to the facility (are self-implementing) and facilities are directly responsible for ensuring that their operations comply with these requirements.

RCRA section 4005(d) establishes an additional regulatory structure, applicable exclusively to the solid waste management of CCR, that builds on the provisions in sections 1008(a)(3), 4004, and 4005(a), without restricting the scope of EPA's authority under those sections. See, 42 U.S.C. 6945 (d)(7). Under 4005(d), States may seek EPA approval of a State permitting program under which individualized facility permits would ''operate in lieu of [EPA] regulation of coal combustion residuals units in the State.'' 42 U.S.C. 6945(d)(1)(A). EPA is also directed to ''implement a permit program,'' which would operate in absence of an approved State program. 42 U.S.C. 6945(d)(2). However, the statute makes clear that facilities must continue to comply with the Federal regulations until a permit issued by either EPA or an approved State is in effect. 42 U.S.C. 6945(d)(3), (6).

RCRA sections 1008(a)(3) and 4004(a) delegate broad authority to EPA to establish regulations governing the management of solid waste. Under section 4004(a) EPA is charged with establishing requirements to ensure that facilities will be classified as sanitary landfills and not an open dump ''only if there is no reasonable probability of adverse effects on health or the environment from the disposal of solid waste'' at the facility. Or in other words, under section 4004(a) EPA is charged with issuing regulations to address all ''reasonable probabilities of adverse effects'' (*i.e.,* all reasonably anticipated risks) to health and the environment from the disposal of solid waste. Section 1008(a)(3) expands EPA's authority to address the risks from any of the activities identified as ''solid waste management'' in RCRA section

[1] 42 U.S.C. 6945(d)(6).

1004(28). Specifically, EPA is authorized to establish requirements applicable to ''storage, transportation, transfer, processing, treatment, and disposal of solid waste.'' (42 U.S.C. 6907(a), 6903(28)). Under RCRA, EPA sets these requirements without taking cost into account as a factor. See *USWAG et al.* v. *EPA,* 901 F.3d at 448–49 (citing RCRA section 4004(a)).

The statute is clear that EPA is authorized to issue regulations to address the current risks from previous solid waste management activities. EPA explained at length the basis for this conclusion as part of the Agency's rationale for regulating inactive impoundments. See, 80 FR 21344—21347. See also *USWAG,* 901 F.3d at 440. Among other provisions, the statutory definition of an ''open dump'' conclusively resolves the question. RCRA defines an ''open dump'' as ''any facility or site where solid waste is disposed of . . . .'' 42 U.S.C. 6903(14). As the D.C. Circuit explained,

> Importantly, while the ''is'' retains its active present tense, the ''disposal'' takes the form of a past participle (''disposed''). In this way, the disposal itself can exist (it ''is''), even if the act of disposal took place at some prior time . . . . Properly translated then, an open dump includes any facility (other than a sanitary landfill or hazardous waste disposal facility), where solid waste still ''is deposited,'' ''is dumped,'' ''is spilled,'' ''is leaked,'' or ''is placed,'' regardless of when it might have originally been dropped off. *See* 42 U.S.C. 6903(3), (14). In other words, the waste in inactive impoundments ''is disposed of'' at a site no longer receiving new waste in just the same way that it ''is disposed of'' at a site that is still operating.

901 F.3d at 440. See also *In re Consolidated Consol. Land Disposal Regulation Litig.,* 938 F.2d 1386, 1389 (D.C. Cir. 1991) (EPA's reading of the term ''disposal'' in RCRA's subtitle C, 42 U.S.C. 6924, to include ''the continuing presence of waste'' was reasonable); *USWAG,* 901 F.3d at 453–54 (Henderson, J., concurring) (same). By the same logic, these provisions would authorize EPA to regulate closed units that continue to pose risks to health or the environment, for example by requiring the owners or operators of such units to remediate any contamination from these units, or to take action to prevent such contamination.

The 2016 amendments further confirm EPA's authority over these activities. In section 4005, Congress referenced the 2015 regulations in the statute, and expressly stated that the amendments in 4005(d) were not intended to limit or restrict the authority already provided under sections 1008(a)(3) and 4004(a). See, 42 U.S.C. 6945(d)(3), (6), (7). By incorporating the rule into the statute without modification, Congress has affirmed the Agency's authority to impose the kind of requirements established in part 257 (*e.g.,* corrective action to remediate groundwater contamination). Moreover, Congress made clear that EPA retains the authority to modify or expand these requirements as necessary to ensure that the standard in section 4004(a) will continue to be met. See, *e.g.,* 42 U.S.C. 6945(d)(1)(A)(i), (3), (6) (referencing ''or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title'').

EPA interprets the standard in section 4004(a) to apply equally to criteria issued under sections 1008(a)(3) and 4004(a); namely that the criteria must ensure that a facility is to be classified as a sanitary landfill, and thus allowed to continue to operate, ''only if there is no reasonable probability of adverse effects on health or the environment'' from either the disposal or other solid waste management practices at the facility. Thus, under the combined authority conferred by sections 1008(a)(3) and 4004(a), a facility is an ''open dump'' if it engages in any activity involving the management of solid waste that does not meet the standard in section 4004(a); or in other words, any activity involved with the management of solid waste that presents a reasonable probability of causing adverse effects on health or the environment. EPA also interprets these provisions to authorize the establishment of criteria that define the manner in which facilities upgrade or close, consistent with the standard in section 4004(a), to ensure there will be no reasonable probability of adverse effects on health or the environment.

D. What are the incremental costs and benefits of this action?

As noted previously, EPA establishes the requirements under RCRA sections 1008(a)(3) and 4004(a) without taking cost into account. See, *USWAG,* 901 F.3d at 448–49. The following cost estimates are presented in the RIA and summarized in this preamble for compliance with OMB Circular A–4, E.O. 12866, and E.O. 14094. The requirements in this rule do not rely on these cost estimates.[2]

The RIA estimates that the annualized monetized costs of this action will be approximately $214–$240 million per year when discounting at 2%. Of this, $123–$135 million is attributable to the requirements for legacy CCR surface impoundments, which are subject to the D.C. Circuit's order in *USWAG,* $79–$92 million is attributable to the requirements for CCRMU, an additional $8–$9 million is attributable to the requirements for CCRMU at Other Active Facilities (OAFUs) (a term used in the RIA) that are discussed in Unit III.C.2.e of the preamble, and $4 million is attributable to requirements for landfills. The costs of this final rule are discussed further in the RIA and include the costs of unit closure, corrective action, fugitive dust controls, structural integrity inspections, and recordkeeping and reporting.

The RIA estimates that the annualized monetized benefits attributable to this action will be approximately $53–$80 million per year when discounting at 2%. Of this, $43–$57 million is attributable to the requirements for legacy CCR surface impoundments, $9–$21 million is attributable to the requirements for CCRMU, $1–$2 million is attributable to the requirements for CCRMU at ''other active facilities,'' or OAFUs. Requirements for landfills account for a de minimis amount of benefits.

In addition to monetized benefits, the RIA describes ten categories of non-monetized benefits. These include human health effects from lead exposure such as ADHD, cardiovascular mortality, and increased cancer risk. They also include ecosystem benefits from avoided exposure to the heavy metals in CCR effluent. The RIA describes several property-related benefits including increased property values near closed and remediated CCR units, and option values for remediated land. The RIA also contextualizes the final rule within EPA's broader efforts to regulate air and surface water pollution from coal fired power plants.

Further information on the economic effects of this action can be found in Unit V of this preamble.

[2] Although EPA did not consider costs in developing this rule, if the Agency had considered costs, the final rule would not have been different. As discussed in greater detail later in this preamble and in the RIA, the monetized benefits are based on only a subset of adverse health effects from a single constituent. EPA monetized the benefit from two additional human health endpoints associated with that single constituent in a sensitivity analysis and estimated an additional $19 million per year when discounting at 2% from that single contaminant. The RIA also describes a number of important benefits that cannot currently be quantified or monetized due to data limitations or limitations in current methodologies. Based on these estimates EPA believes that after considering all unquantified and distributional effects, the public health and welfare gains that will result from the proposed alternative would justify the rule's costs.

II. Background

A. 2015 CCR Rule

On April 17, 2015, EPA finalized national minimum criteria for the disposal of CCR as solid waste under Subtitle D of RCRA titled, ''Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities'' (80 FR 21302) (2015 CCR Rule). The 2015 CCR Rule, codified in 40 CFR part 257, subpart D, established regulations for existing and new CCR landfills, as well as existing and new CCR surface impoundments (including all lateral expansions of CCR units). The criteria consist of location restrictions, design and operating criteria, groundwater monitoring and corrective action requirements, closure and post-closure care requirements, recordkeeping, notification, and internet posting requirements.

The 2015 CCR Rule also imposed requirements on inactive surface impoundments at active facilities. A CCR surface impoundment is a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR. The 2015 CCR Rule defined an ''inactive CCR surface impoundment'' as ''a CCR surface impoundment that no longer receives CCR on or after October 19, 2015, and still contains both CCR and liquids on or after October 19, 2015.'' 40 CFR 257.53. The rule defined ''active facility or active electric utilities or independent power producers'' as ''any facility subject to the requirements of this subpart that is in operation on October 19, 2015. An electric utility or independent power producer is in operation if it is generating electricity that is provided to electric power transmission systems or to electric power distribution systems on or after October 19, 2015. An off-site disposal facility is in operation if it is accepting or managing CCR on or after October 19, 2015.'' 40 CFR 257.53.

The 2015 CCR Rule did not impose any requirements on inactive facilities. EPA explained that this was consistent with past decisions under RCRA subtitle C. See, 80 FR 21344 (April 17, 2015). EPA further raised concerns that it would be difficult to identify the owners or other parties responsible for such facilities, as well as concerns that the present owner of the land on which an inactive facility was located might have no connection (other than present ownership of the land) with the prior disposal activities. *Id.* Consequently, EPA exempted those units at § 257.50(e).

B. 2018 USWAG Decision

The 2015 CCR Rule was challenged by several parties, including coalitions of regulated entities and environmental organizations (''Environmental Petitioners''). See *USWAG et al.* v. *EPA,* 901 F.3d 414 (D.C. Cir. 2018). Environmental Petitioners raised two challenges that are relevant to this final rule. First, they challenged the provision at § 257.101(a)(1) that allowed existing, unlined surface impoundments to continue to operate until they exceeded the groundwater protection standard. They contended that EPA failed to show how continued operation of unlined impoundments met RCRA's baseline requirement that any solid waste disposal site pose ''no reasonable probability of adverse effects on health or the environment.'' 42 U.S.C. 6944(a). Second, Environmental Petitioners challenged the exemption at § 257.50(e) for inactive surface impoundments at inactive power plants (*i.e.,* ''legacy ponds''). Environmental Petitioners argued that legacy ponds are at risk of unmonitored leaks and catastrophic structural failures.

On August 21, 2018, the U.S. Court of Appeals for the D.C. Circuit upheld most of the 2015 CCR Rule but decided in favor of Environmental Petitioners on these two claims. The Court held that EPA acted ''arbitrarily and capriciously and contrary to RCRA'' in failing to require the closure of unlined surface impoundments [3] and in exempting inactive surface impoundments at inactive power plants from regulation. The Court vacated these provisions and remanded the matter back to the Agency for further action consistent with its opinion.

In overturning the exemption for legacy ponds, the Court evaluated the evidence in the rulemaking record and reached specific conclusions about the risks that legacy ponds pose based on the record for the 2015 CCR Rule. The Court pointed to evidence that legacy ponds are most likely to be unlined and unmonitored and that such units have been shown to be more likely to leak than units at utilities still in operation. 901 F.3d at 432. The Court also determined that legacy ponds:

> . . . pose the same substantial threats to human health and the environment as the riskiest Coal Residuals disposal methods, compounded by diminished preventative and remediation oversight due to the absence of an onsite owner and daily monitoring. *See* 80 FR at 21343 through 21344 (finding that the greatest disposal risks are ''primarily driven by the older existing units, which are generally unlined''). Notably, this very Rule was prompted by a catastrophic legacy pond failure that resulted in a ''massive'' spill of 39,000 tons of coal ash and 27 million gallons of wastewater into North Carolina's Dan River. . . .
>
> [T]here is no gainsaying the dangers that unregulated legacy ponds present. The EPA itself acknowledges the vital importance of regulating inactive impoundments at active facilities. That is because, if not properly closed, those impoundments will ''significant[ly]'' threaten ''human health and the environment through catastrophic failure'' for many years to come. 75 FR at 35,177; *see also* 80 FR at 21,344 n. 40.
>
> The risks posed by legacy ponds are at least as substantial as inactive impoundments at active facilities. *See* 80 FR at 21,343–21, 344 (finding ''no [ ] measurabl[e] differen[ce]'' in risk of catastrophic events between active and inactive impoundments). And the threat is very real. Legacy ponds caused multiple human and environmental disasters in the years leading up to the Rule's promulgation. *See* 75 FR at 35,147 (proposed rule discusses multiple serious incidents). For example, a pipe break at a legacy pond at the Widows Creek plant in Alabama caused 6.1 million gallons of toxic slurry to deluge local waterways. *Id.* Another legacy pond in Gambrills, Maryland caused the heavy metal contamination of local drinking water. *Id.* And the preamble to the Rule itself specifically points to the catastrophic spill at the Dan River legacy pond in North Carolina. 80 FR at 21,393–21,394.

Id. at 432–433. Relying on this evidence, the Court concluded there was no logical basis for distinguishing between the inactive impoundments at active facilities that were regulated and the legacy impoundments that were exempt. *Id.* at 434. Consequently, the Court vacated the provision of the 2015 CCR Rule (§ 257.50(e)) that specifically exempted inactive impoundments at inactive facilities from regulation and remanded the matter back to EPA for further action consistent with its opinion. Notwithstanding the vacatur of § 257.50(e), until EPA amended the regulations to effectuate the Court's order, facilities were not legally obliged to take any action to comply with the Federal CCR regulations. This is because, as originally drafted, legacy CCR surface impoundments did not fall within the scope of the rule, as defined in § 257.50. The specific provision in § 257.50(e) exempting legacy impoundments merely identified the units that were not covered by § 257.50(b). Because the vacatur of § 257.50(e) did not amend § 257.50(b), legacy impoundments remained exempt.

[3] After the Court's ruling, the closure of unlined CCR surface impoundments was addressed in a separate regulatory action that was published on August 28, 2020 (85 FR 53516).

C. 2020 Part B Proposed Rule

In the March 3, 2020 proposed rule, Hazardous and Solid Waste Management System: Disposal of CCR; A Holistic Approach to Closure Part B: Alternate Demonstration for Unlined Surface Impoundments; Implementation of Closure (85 FR 12456), EPA proposed revisions to the 2015 CCR Rule, including: procedures to allow facilities to request approval to use an alternate liner for CCR surface impoundments; two alternative proposed options to allow the use of CCR during unit closure; an additional closure option for CCR units being closed by removal of CCR; and requirements for annual closure progress reports. On November 12, 2020, EPA finalized the procedures to allow facilities to request approval to use an alternate liner for CCR surface impoundments. 85 FR 72506. In this final rule, the Agency is taking final action on the proposed closure option for units being closed by removal of CCR, which action is discussed in Unit III.D of this preamble. EPA is still considering provisions from the proposed rule that are not addressed in this rule and may be addressed in a subsequent action.

D. 2020 Advance Notice of Proposed Rulemaking

On October 14, 2020, EPA published an Advance Notice of Proposed Rulemaking (ANPRM) (85 FR 65015). In that action, EPA requested information related to legacy CCR surface impoundments to inform a future rulemaking. The Agency requested input on its regulatory authority, input on a potential definition of a legacy CCR surface impoundment and specific information on the types of inactive surface impoundments at inactive facilities that might be considered legacy CCR surface impoundments. Specifically, EPA requested information on how many of these units exist, the current status of these units (*e.g.,* capped, dry, closed according to State requirements, still holding water), and the names, locations, and closure dates of former power plants that may have these units. Finally, the Agency took comment on which CCR regulations should apply to legacy CCR surface impoundments and on suggestions for compliance deadlines.

During the 60-day public comment period, the Agency received over 15,000 comments from environmental groups, four States, one Tribe, individual utilities, and industry trade associations. The topics raised in comments included a potential definition of a legacy CCR surface impoundment, EPA's regulatory authority, the scope and applicability of the legacy impoundment rule, and regulatory requirements to propose. Moreover, the comments generally agreed that EPA must prescribe timeframes for coming into compliance with the regulations and they recommended timeframes that are shorter than compliance timeframes in the 2015 CCR Rule.

As noted in the ANPRM, EPA took comment on whether, in light of the Court's opinion in *USWAG,* the Agency could reconsider whether it has the authority to regulate inactive impoundments under RCRA subtitle D. 85 FR 65017–65018 (October 14, 2020). The general consensus from commenters on the ANPRM was that, because the Court resolved the question based on the plain meaning of the statute, EPA does not have the discretion to reinterpret its authority. In addition, no commenter identified a factual basis for not regulating legacy CCR surface impoundments that addressed the Court's concern about the risks these units pose. *Id.* at 65018. Consequently, EPA is not revisiting the question of whether it may regulate inactive or legacy CCR surface impoundments.

E. 2023 Proposed Rule and Comments

On May 18, 2023, EPA proposed revisions to the CCR regulations (88 FR 31982) (''the proposed rule'' or ''2023 proposed rule''). These revisions included establishing regulations specifying that legacy CCR surface impoundments are subject to 40 CFR part 257, subpart D and specifying that owners or operators of legacy CCR surface impoundments comply with all the appropriate requirements applicable to inactive CCR surface impoundments at active facilities. In addition, EPA proposed to establish requirements to address the risks from currently exempt solid waste management that involves the direct placement of CCR on the land. EPA proposed to extend a subset of the existing requirements in part 257, subpart D to CCRMU, which was proposed to include CCR surface impoundments and landfills that closed prior to the effective date of the 2015 CCR Rule, inactive CCR landfills, and other areas where CCR is managed directly on the land. This proposal would apply to all active CCR facilities and all inactive facilities with legacy CCR surface impoundments. Lastly, EPA proposed to make several technical corrections to the CCR regulations. These are: (1) To clarify the definitions of ''feasible'' and ''technically feasible''; (2) To correct the CFR reference in the definition of wetlands at § 257.61(a); (3) To correct a reference in the groundwater monitoring scope section; (4) To standardize the references to CCR websites throughout the CCR regulations; and (5) EPA requested comment on extending the period for document retention and posting.

The Agency received over 33,500 comments on the proposed rule, with over 600 unique comments. Commenters included individual electric utilities and independent power producers, national trade associations, State agencies, public interest and environmental groups, private citizens, and entities involved with the beneficial use of CCR. All public comments submitted in response to the proposal can be found in the docket for this action. Most commenters focused on the scope of the proposed rule, definitions, compliance deadlines, and EPA's statutory authority to regulate CCRMU. Most commenters also requested that EPA adopt additional requirements to address the risks from CCR units. EPA's responses to the comments on the proposed rule are addressed either in this preamble or in a response to comment document available in the docket to this final rule.

EPA conducted two public hearings on the proposed rule. EPA held an in-person public hearing in Chicago, Illinois on June 28, 2023. At this hearing there were 87 speakers and a total of 150 registered attendees. EPA also held a virtual public hearing on July 12, 2023, using an internet-based software platform. The platform allowed the public hearing participants to provide oral testimony using a microphone and speakers connected to their computers or using a phone. It provided the ability for any person to listen to the public hearing via their computer. At the virtual hearing, there were 93 speakers and a total of 353 registered attendees. Testimony at both public hearings focused generally on EPA's proposed amendments, and on the following topics: whether to further expand regulation to all CCR, regardless if it was onsite of a regulated facility; whether to regulate structural fill and other beneficial uses; enforcement of the CCR regulations; requests for more engagement with communities; and requests for EPA to amend other regulations to strengthen corrective action and limit the use of alternative source demonstrations (ASD). Finally, some commenters discussed site-specific concerns of facilities near their homes, or health effects witnessed in communities close to CCR sites, and general concerns about the health and environmental risks from CCR.

Transcripts for both public hearings are included in the docket for this action.

F. 2023 Notice of Data Availability

On November 14, 2023, EPA published a notice of data availability (NODA), to solicit comments on additional information and statistics developed in response to comments on the Agency's May 18, 2023 proposed rule. 88 FR 77941. Some of the information contains data or analysis obtained directly from comments submitted during the May 18, 2023 proposed rule's comment period, which might aid in the formulation of the final rule. EPA also solicited comments on a supplemental risk assessment EPA conducted in response to comments raised on the proposed rule. This risk assessment builds on the findings of the previous Human and Ecological Risk Assessment of Coal Combustion Residuals (2014 Risk Assessment)[4] and better quantifies the specific risks that may result from placement of CCR in legacy CCR surface impoundments and CCRMU. EPA requested comment on all aspects of the assessment including the validity and propriety of relying on the new information, data, and analyses contained in the updated risk assessment to inform the final rule.

EPA also sought further information on legacy CCR surface impoundments and CCRMU, including information on the location, presence, condition, history, and risk associated with any of the potential legacy CCR surface impoundments or any of the potential CCRMU within the docket. EPA also requested any information regarding the presence of water, distance to surface water bodies, proximity to floodplains, unit size, CCR volume, depth to groundwater, date of CCR placement, closure status, any corrective action associated with the unit, and any groundwater monitoring data. EPA also requested comment on the accuracy of the information that was submitted regarding potential legacy CCR surface impoundments or potential CCRMU. Furthermore, EPA sought similar information on any other potential legacy CCR surface impoundments or potential CCRMU of which EPA may not be aware or for which we may have incomplete information.

EPA accepted public comment on the NODA until December 11, 2023. The Agency received over 70 comments on the NODA. Commenters included individual electric utilities and independent power producers, national trade associations, State agencies, public interest and environmental groups, private citizens, and entities involved with the beneficial use of CCR. All public comments submitted in response to the NODA can be found in the docket for this action. The majority of commenters focused on the supplemental risk assessment; some focused on the request for additional information on the universe of legacy CCR surface impoundments and CCRMU. EPA's responses to comments received on the NODA are addressed either in an updated risk assessment (the 2024 Risk Assessment), this preamble, or in the response to comment document available in the docket to this final rule.

III. What final action is the Agency taking?

In response to the *USWAG* decision, EPA is finalizing a provision at § 257.50(e), specifying that legacy CCR surface impoundments are subject to 40 CFR part 257, subpart D. EPA is also requiring owners or operators of legacy CCR surface impoundments to comply with the following existing requirements in the CCR regulations: installation of a permanent marker, history of construction, hazard potential classification, structural stability and factors of safety assessments, emergency action plan (EAP), air criteria, inspections, groundwater monitoring and corrective action, closure and post-closure care, recordkeeping, and notification and CCR website requirements. EPA further is establishing new compliance deadlines for these newly applicable regulatory requirements to ensure the owners or operators of these units have time to come into compliance.

In addition to the revisions EPA proposed to address the *USWAG* decision, EPA is establishing requirements to address the risks from currently exempt solid waste management that involves the direct placement of CCR on the land. EPA is extending a subset of the existing requirements in 40 CFR part 257, subpart D to CCRMU, which are CCR surface impoundments and landfills that closed prior to the effective date of the 2015 CCR Rule, inactive CCR landfills, and other areas where CCR is managed directly on the land. These additional requirements apply to all active CCR facilities, all inactive facilities with legacy CCR surface impoundments subject to this final rule, and those active facilities (*i.e.,* facilities producing electricity for the grid as of October 19, 2015) that ceased placing CCR in onsite CCR units prior to the effective date of the 2015 CCR Rule.

EPA is also finalizing alternative closure provisions to allow a facility to complete the closure by removal in two stages: first, by completing all removal and decontamination procedures; and second, by completing all groundwater remediation in a separate post closure care period.

Lastly, EPA is finalizing several technical corrections to the CCR regulations. These are: (1) to clarify the definitions of ''feasible'' and ''technically feasible''; (2) to correct the CFR reference in the definition of wetlands at § 257.61(a); (3) to correct a reference in the groundwater monitoring scope section; (4) to standardize the references to CCR websites throughout the CCR regulations; and (5) to extend the period for document retention and posting.

A. Risks From Legacy CCR Surface Impoundments and CCR Management Units

1. Summary of May 2023 Proposal

The proposal largely relied on the model results from the 2014 Risk Assessment, as EPA considered the results were equally applicable to legacy CCR surface impoundments and CCRMU.[5] This determination was based on the fact that many of these unregulated units are similarly constructed, manage the same types of ash, and are frequently located either at the same or nearby facilities as their regulated counterparts. In particular, some unregulated units are known to be located directly adjacent to or beneath currently regulated units.

The 2014 Risk Assessment concluded that the management practices that EPA believed were generally in use in 2014 at surface impoundments and landfills were likely to pose risks to human health through groundwater exposure within the range that EPA typically considers warrants regulation. For highly exposed individuals, the cancer risks from arsenic due to the operation of surface impoundments were as high as 2×10^{-4}, while noncancer risks were as high as an HQ of 5 for arsenic, 2 for lithium, and 2 for molybdenum. Cancer risks associated with the operation of landfills were estimated to be as high as 5×10^{-6} from the ingestion of arsenic-contaminated drinking water. In 2015, EPA relied on this risk assessment to support the regulation of both active CCR units and inactive CCR surface

[4] U.S. EPA. 2014. ''Human and Ecological Risk Assessment of Coal Combustion Residuals.'' RIN 2050–AE81. Office of Solid Waste and Emergency Response. Washington, DC. December.

[5] U.S. EPA. 2014. ''Human and Ecological Risk Assessment of Coal Combustion Residuals.'' RIN 2050–AE81. Office of Solid Waste and Emergency Response. Washington, DC. December.

impoundments at active facilities. The 2014 Risk Assessment reported risks for the units that were anticipated to be subject to the 2015 CCR Rule and therefore drew no conclusions about the older units excluded from the scope of that rule. Nevertheless, information available in the record supports the conclusion that these older units can pose risks at least as high as reported in the 2014 Risk Assessment.

EPA further proposed to find that the risks associated with legacy impoundments and CCRMU may be even higher than EPA modeled on a national scale in the 2014 Risk Assessment for active units. First, the proposal explained that these units have been present onsite for longer and had more time to leak. In addition, EPA explained that there are several management practices that have the potential to result in higher leakage, but that were previously modeled either less frequently for active units—based on a belief that the practices had declined over time—or not at all—due to data constraints on a national scale. These include: (1) The greater prevalence of unlined units; (2) The greater likelihood of co-management of CCR with coal refuse and other wastes in surface impoundments, making the overall waste pH far more acidic and (3) The potential for the units to be constructed below the water table or to have become inundated with groundwater after construction. The proposal estimated that the solid waste management practices associated with legacy impoundments and CCRMU could pose lifetime cancer risks from arsenic as high as 2×10^{-5} to 1×10^{-3} (*i.e.,* 2 to 100 cases of cancer for every 100,000 individuals exposed), and non-cancer risks for cobalt as high as an HQ of 13, mercury up to an HQ of 13, lithium up to an HQ of 3, molybdenum up to an HQ of 4, and thallium up to an HQ of 2, depending on the specific management practice. Finally, EPA explained that each of these practices individually can pose greater risks than those previously modeled for the currently regulated universe of CCR units, and a combination of these practices could push risks even higher.

2. 2023 Draft Risk Assessment

A number of commenters claimed that the 2014 Risk Assessment did not adequately capture various factors associated with legacy CCR surface impoundments and CCRMU that the commenters believed will result in significantly different risks than those posed by currently regulated units. In response to these comments, EPA conducted a supplemental risk assessment to determine the potential for some of these factors to affect national risks. This risk assessment built on the findings of the 2014 Risk Assessment and better quantified the specific risks that may result from placement of CCR in legacy CCR surface impoundments and CCRMU.

The 2023 draft supplemental assessment consisted of: (1) Additional modeling of inactive and closed CCR landfills and surface impoundments that was actually conducted in 2014 using the same methodology and data. These results were ultimately not included in the original 2014 Risk Assessment because the units were not regulated under the final 2015 rule, and (2) Some further model runs relying on some updated data. In addition, EPA modeled the placement of CCR in smaller quantities than would typically be found in a CCR surface impoundments or landfill (*i.e.,* smaller CCRMU placements or CCRMU fills) to determine the potential for these smaller CCRMU placements to contaminate groundwater. Through this modeling, EPA identified potential for these fills to contaminate onsite groundwater. Model results indicated potential for exceedance of groundwater protection standards (GWPS) at the fill boundary under both high-end and moderate conditions. These results also showed potential for substantial spread of the resulting groundwater plume. Under high-end conditions, these plumes are large and persistent enough to sustain exposures for over a century or more at average risks of 2×10^{-5} or higher.

Finally, EPA assessed the potential for exposure to radiation from CCR remaining in the soil (subsurface). EPA found the amount of radon emitted by CCR is not distinguishable from background soil and so did not retain this pathway for further consideration. EPA also found greater potential for risk from gamma radiation as CCR comes to be located closer to the ground surface due to a reduction in shielding. An additional sensitivity analysis identified potential for further risk if CCR becomes mixed with surface soil. Accumulation of CCR can result in elevated cancer risk from incidental ingestion of arsenic and radium, in addition to direct exposure to gamma radiation from radium. For high-end waste concentrations, an eight percent mixture of CCR in surface soil was found to result in risk on the order of 1×10^{-4}.

The 2023 draft risk assessment was made available for public comment as part of a NODA released on November 14, 2023.

3. Response to Comments on the Proposal and the NODA

The following subsection provides a summary of comments received on either the proposed rule or NODA that are germane to the risk record for legacy impoundments and CCRMU. EPA considered these comments as it worked to finalize the supplemental risk assessment (''2024 Risk Assessment''). The Agency also received a number of general comments, which were either editorial in nature or expressed general support or disapproval for the risk assessment methodology, data, or results. However, these comments did not provide any specific technical recommendations or data that could otherwise be used to update the risk assessment. These general comments did not provide EPA with a basis to alter or otherwise re-evaluate the risk assessment in response.

a. Comments Related to Applicability of 2014 Risk Assessment

Comment: Several commenters generally affirmed the Agency's risk basis for regulating historical and inactive disposal units. However, other commenters argued the Agency's risk record is inadequate to support regulation of certain legacy impoundments or any CCRMU. Others contended that because the 2014 Risk Assessment supported regulation of active landfills and surface impoundments, it is not appropriate to apply that record to disposal units that previously ceased receipt of waste. In particular, commenters pointed to the current lack of ponded water and/or the presence of a cap and vegetative cover that would reduce infiltration through certain units. Some commenters noted that State programs may include requirements for unit design, monitoring, and closure that ensure a cover is present. Commenters stated these factors must be accounted for through an updated risk assessment.

EPA Response: Claims that the results of the 2014 Risk Assessment are applicable only to active units represent a fundamental misunderstanding of scope of the 2014 Risk Assessment. EPA did not only model units during operation. Instead, the risk assessment modeled the specific stage of the unit lifecycle anticipated to contribute the most to long-term risk. For surface impoundments this was during operation, but for landfills it was after closure. EPA modeled the leakage that occurred over this one lifecycle stage and tracked the subsequent migration through groundwater over time. The risks to downgradient receptors resulting from the modeled leakage were used to represent risk over the entire unit lifecycle. Consideration of a single lifecycle stage was necessary because of model constraints and the high computational burden of tracking shifting configurations for every single unit.

Both landfills and surface impoundments progress through similar lifecycle stages from construction to closure. Thus, the fact that some historical and inactive units may no longer contain ponded water or may have installed a soil cover only places these units in a different stage of that lifecycle. That does not differentiate the long-term risks of those units from those previously modeled. In particular, existing groundwater contamination does not vanish once a unit ceases operation. As one State commenter noted, ''[g]roundwater contamination is an important aspect to legacy impoundment closure and should not be overlooked simply because the impoundment does not contain liquid or CCR at the date of the final rule.''

By contrast, the 2014 Risk Assessment only modeled landfills after closure; in other words, EPA assumed that no leakage occurred prior to closure, while the landfill was operating. EPA only modeled landfills after closure because based on the assumption that this stage of the landfill lifecycle would have the greatest contribution to long-term risk for offsite receptors because the unit would be filled to capacity and the post closure stage represented the greater period of time over which leakage can occur. EPA modeled unlined units with a soil cap and vegetative cover equivalent to the surrounding native soils and found risks from arsenic as high as 2×10^{-5} for receptors up to a mile away. Even assuming some landfills have been closed in a manner more consistent with the existing CCR regulations (*i.e.,* with some kind of composite cover system), this is unlikely to change the overall conclusions of the risk assessment. This is because, regardless of the cover that is ultimately installed, higher leakage can occur throughout the active life of the unit when the landfill face is open and able to intercept more precipitation. This conclusion is reinforced by the fact that facility monitoring reports document that around 20% of currently active landfills have triggered corrective action. Additionally, EPA has seen no evidence to suggest that the closure of older units has been consistently more protective than EPA modeled in 2014. As discussed in Unit III.B.2.g.iii(a) of the preamble, as part of developing the 2015 CCR Rule, EPA reviewed State statutes and regulations, with a more detailed focus on the 16 States responsible for approximately 74% of the CCR generated in 2009. See 80 FR 21324. The Agency's review of State programs prior to 2015 found that oversight of these wastes and the overall protectiveness of particular programs varied widely. For example, EPA estimated that in 2015, approximately 20% of the net disposable CCR was entirely exempt from State regulatory oversight. Similarly, a 2006 joint Department of Energy (DOE) and EPA study reported that only 19% (three out of 19) of the surveyed surface impoundment permits included requirements addressing GWPS (*i.e.,* contaminant concentrations that cannot be exceeded) or closure/post-closure care. Furthermore, some of the photographs and descriptions of these older units provided by commenters indicate extensive growth of trees and other woody vegetation that can compromise the integrity of any cap present and increase the rate of infiltration into the unit. For these reasons, the 2014 Risk Assessment is equally representative of the national risks from historical and inactive landfills.

The 2014 Risk Assessment modeled all surface impoundments during the active stage of their lifecycle. This was based on the presumption that the highest rates of leakage would occur while wastewater is ponded above the ash, because this water creates a large and sustained hydraulic head that serves to drive leachate into the subsurface. Although the current configuration of historical and legacy impoundments may vary, all these units previously held ponded water during the active stage of their lifecycle. And, in the case of legacy impoundments, ponded water may still be present. As a result, the current configuration of the unit is immaterial to the releases that occurred during operation. For this reason, the modeling approach relied upon in the 2014 Risk Assessment is equally applicable to historical and legacy impoundments.

The 2014 Risk Assessment also accurately represents the potential risks that remains for units that were closed consistent with the 2015 CCR Rule. If the cover system is not adequately maintained after closure, degradation over time from human or animal activity, natural settling, freeze-thaw cycles, flooding and other extreme weather events, and other factors can result in greater leakage from the unit than designed. In some cases, groundwater monitoring may provide the only clear evidence the cap is not performing as designed. Thus, the 2014 Risk Assessment accurately describes the risks that can result if these units are not adequately maintained and monitored in line with regulatory requirements.

Comment: Multiple commenters argued that historical and inactive disposal units will generally have a smaller footprint than those modeled in the 2014 Risk Assessment. For example, some commenters noted the average sizes of landfills and surface impoundments modeled in the 2014 Risk Assessment were around 120 acres and 50 acres, respectively, while the estimated average sizes of CCRMU and legacy impoundments in the proposed rule were both closer to 30 acres. Others cited to the sizes of individual units that at their facilities to contend that these units are much smaller than average. These commenters contended that a smaller footprint would result in a lower mass loading of groundwater and lower associated risk.

EPA Response: EPA disagrees that the referenced data indicate that older disposal units are significantly smaller in size than the units EPA modeled in 2014. The 2014 Risk Assessment relied on data submitted by facilities in the EPA Surveys to estimate an average active landfill size of around 120 acres from over 310 landfills and an average active impoundment size of around 50 acres from over 735 impoundments. The RIA summary referenced by commenters relies only on data that could be independently verified by data from posted facility reports and recent public comments. From the final list of 195 CCRMU and 194 legacy impoundments, EPA identified data for only one landfill with a size of 90 acres and 47 historical or legacy impoundments with an average size of 44 acres. Thus, when CCRMU are separately grouped as landfills and impoundments, the differences in size are not as substantial as indicated by commenters.

EPA also disagrees that any differences that do exist would result in substantially lower risks than previously modeled. As part of the 2014 Risk Assessment, EPA modeled 122 landfills and 163 impoundments that were excluded from the reported risk results because these units were determined to not be subject to that rule. These excluded units represent some combination of legacy impoundments, inactive landfills, and historical disposal units. The average sizes of these previously excluded units are 77 acres for the landfills and 28 acres for the impoundments. These sizes are approximately half the size of the units identified in the 2014 Risk Assessment or more recent data collection efforts. However, as discussed in Section 3 of the 2024 Risk Assessment, the risks associated with these older units are substantially the same as those for currently regulated units. Therefore, there is no evidence that these differences in size have a meaningful impact on national risks, or that the results of the 2014 Risk Assessment are nor equally applicable to legacy impoundments and CCRMU. While there may be individual disposal units at these sites that are smaller than average, the model results summarized in the 2024 Risk Assessment model include landfills as small as 2 acres and impoundments as small as 0.01 acres. Therefore, there is no indication based on the data provided that the overall distribution of unit sizes has not been adequately reflected in the national model.

Finally, EPA notes that individual unit size is not necessarily a reliable metric to draw conclusions about the overall risk from CCR disposal at electric utilities. The 2014 Risk Assessment modeled the risks from each landfill and impoundment separately because it was difficult to confirm the relative locations and orientations of different units with data from the EPA Surveys. However, the Agency is now aware of many sites where multiple units, both landfills and impoundments, are located immediately adjacent to one another. As a result, there is potential the 2014 Risk Assessment underestimated site risk to some degree by not evaluating the combined leakage over the full contributing area of these adjacent disposal units.

Comment: One commenter stated the 2014 Risk Assessment did not specifically characterize the risks from impoundments that do not contain fly ash. This commenter argued that historical and legacy impoundments are more likely to only contain bottom ash or boiler slag, as the process of capturing fly ash was not common prior to the 1970s. Therefore, this commenter concluded that the 2014 Risk Assessment does not adequately characterize the risks for these older units.

EPA Response: EPA disagrees that the 2014 Risk Assessment does not address the risks associated with these impoundments. The risk assessment incorporated porewater data from impoundments that contained only bottom ash, but EPA did not separately break out risks for this subset of units because the amount of data available was inconsistent across the set of modeled constituents. However, available porewater data show the potential for certain constituents, such as molybdenum, to leach from bottom ash at levels as high as from fly ash.

Additionally, available monitoring reports for currently regulated units posted on facility websites document that these units have a similar potential to contaminate groundwater as units containing other types of CCR. Of the units designated as managing bottom ash, 32% of surface impoundments and 38% of landfills have triggered corrective action. Of the units designated as managing slag, 38% of surface impoundments have triggered corrective action. No landfills were identified as dedicated to slag. For comparison, 48% of remaining surface impoundments and 21% of remaining landfills have triggered corrective action. Therefore, there is no indication that these types of units are overall less likely to result in groundwater contamination.

Comment: One commenter claimed that a nationwide assessment should not be used to make determinations about the risks at individual sites or to support national requirements. This commenter stated that, unlike individual damage cases, the Agency's groundwater model does not adequately represent the specific conditions at each individual unit. However, this commenter provided no data to support their broad claims. One other commenter pointed to data they had identified to contend that the model does not reflect the specific environmental conditions at their facility.

EPA Response: The modeling conducted for both the 2014 and 2024 Risk Assessments utilized a probabilistic, site-based approach that combined site-specific data with more regional and national data sources. The model incorporated data about the specific location, dimensions, and liner status of individual disposal units where available. The aim of this approach is not to assign an exact risk to each individual unit, but to provide an overall accurate picture of the potential risks posed by these types of units on a national scale. Indeed, many of the findings from the 2014 Risk Assessment were supported by available damage cases. The commenters did not articulate why they believe the risks associated with individual units fall far outside the broader distribution of modeled units. But as acknowledged by the one commenter who did submit data, there is overlap between the range of conditions modeled and those they identified as present at their particular facility. EPA does acknowledge that there are some site conditions that the 2014 and 2024 Risk Assessments were not able to adequately model, such as waste below the water table. However, this is why the Agency separately relied on damage cases to identify additional constituents of potential concern for groundwater monitoring.

Comment: One commenter stated that EPA should not rely on the findings of the Environmental Integrity Project's report, ''Poisonous Coverup: The Widespread Failure of the Power Industry to Clean Up Coal Ash Dumps'' without independently validating the quality of analyses conducted for each site.

EPA Response: EPA recognizes that the method used in the cited report to identify potential exceedances of GWPS is not the same as the regulatory standard for triggering corrective action. For this and other reasons, the Agency does not rely on the report as a primary basis for the current rulemaking or to draw any conclusions about the monitoring status of any individual unit. Instead, EPA previously referenced the report as a supplementary source of information that further supports the findings of the 2014 Risk Assessment. Specifically, the fact that the constituents identified as risk drivers in the 2014 Risk Assessment are the same ones detected most frequently above GWPS indicates that the fate and transport modeling conducted by EPA was able to correctly identify the constituents most likely to be released and migrate at environmentally significant concentrations. While high background concentrations may be present at some of these sites, many have already triggered corrective action and the Agency believes that number will increase as more facilities come into compliance with the rule requirements. Because this report does not form a basis for the rule, it is not discussed further in the preamble to the rule or the 2024 Risk Assessment outside of responses to other comments that cite to the same or similar reports.

b. Comments Related to Draft 2023 Supplemental Risk Assessment Conceptual Model

Comment: Multiple commenters broadly argued that the draft 2023 risk assessment relied on data and assumptions that represent maximum values or otherwise reflect worst-case scenarios that could never occur, and therefore do not represent a ''reasonable probability'' of adverse impacts and so is not an appropriate basis for regulatory action.

EPA Response: EPA disagrees that the design of the risk assessment is inappropriately conservative. Consistent with EPA's long-standing practice under RCRA (as well as other agency programs), an individual with *reasonable* maximum exposure (RME) provides the principal basis for evaluating potential human health risks. An RME scenario is intended to be conservative, while remaining within the range of possible high-end exposures.[6] Specifically, ''high end'' has been defined as the part of the exposure distribution that falls above the 90th percentile, but below the 99.9th percentile.[7] Reliance on this type of scenario is intended to protect sensitive populations. Selection of the data and assumptions incorporated in the 2024 Risk Assessment is in line with this objective. Further critiques about the potential for the specific data and assumptions to overestimate risk are addressed in subsequent responses.

Comment: Multiple commenters argued that it was inappropriate for EPA to consider future onsite residential exposures as a basis for evaluating the potential risks associated with onsite CCR disposal. One commenter claimed that the estimates of existing populations living near these facilities used in the 2024 Risk Assessment was both overestimated and inconsistent with estimates from the Agency's RIA. One commenter acknowledged that older units tend to be located closer to population centers. However, others argued that this proximity to existing populations or water bodies would not make them overall more likely to become residential in the future. One commenter stated that EPA should have surveyed the intended land use for facilities or otherwise directly assessed the likelihood of residential land use.

EPA Response: EPA disagrees that consideration of a population within a five-mile radius overstates the likelihood of residential development. Five miles away from a population center is a small distance for residential development to expand, even in the near future. Nevertheless, the Agency has updated the population estimates in the 2024 Risk Assessment to more closely align with reporting in the RIA and to include both one- and three-mile radii. EPA also disagrees that consideration of a future residential land use scenario is inappropriate or unrealistic. The substantial populations already living near many facilities and the generally higher property value of land near water bodies are two indicators of the potential for land to be attractive for future residential land use. Facilities do not dictate the ultimate use of a property after the land has been sold for redevelopment. These types of facilities can include considerable tracts of land beyond that dedicated to waste disposal that may be considered for a range of different uses. EPA is currently aware of 22 examples in which former electric utilities have been proposed for residential development, 19 of which are known to have burned coal.[8] Thus, there is evidence of community interest in residential land use at these types of facilities.

Although future residential use is considered as the RME scenario in the 2024 Risk Assessment, that does not mean it is the only scenario EPA considered or on which this final rule is based. Depending on their location, leakage of Appendix IV constituents from individual CCRMU fill may migrate off-site at levels of concern. In addition, even if the constituents from a single CCRMU do not migrate off-site, the modeling conducted in 2024 confirms that smaller CCRMU fills can meaningfully contribute to groundwater contamination across a facility. Concentrations from a single CCRMU can combine with contamination from other CCRMU, currently regulated CCR units, or legacy CCR surface impoundments that are also present on the same site. Although EPA did not model the aggregate or cumulative risk associated with these potential sources of co-located contamination, at a minimum, EPA expects that the presence of multiple sources of potential contamination at the same facility would increase the likelihood of a contaminant plume that could migrate off-site at levels of concern.

Nor is residential use the only scenario where exposures present concern. One commenter described donating property to a local government for recreational uses. Several other commenters described redeveloping sites as nature preserves. Even under these non-residential land uses, the is a reasonable potential for exposure (and consequently risk) to human and ecological receptors if the ash is subsequently disturbed. For example, as discussed in Section 6 the 2024 Risk Assessment, concentrations of certain contaminants may also pose risk to wildlife if ash becomes intermingled with surface soil.

Comment: Commenters asserted that consideration of residential land use is inconsistent with various EPA guidance documents[9 10 11] and Agency cleanup programs. These commenters argued such guidance instructs EPA to assume that facilities surrounded by operating industrial facilities will remain industrial unless there is clear evidence otherwise. These commenters further argued that guidance instructs EPA to account for institutional controls, such as State or local zoning laws, that would make residential development or resulting exposures at individual sites unlikely. Some commenters cited to specific State requirements they assert would prevent residential land use or prohibit future use of site groundwater as a source of drinking water. Others claimed that due diligence reviews would be adequate to identify and address any remaining sources of contamination before exposures could occur.

EPA Response: EPA disagrees that consideration of future residential land use at these facilities is inconsistent with applicable guidance and cleanup programs. First, the risk assessment was conducted to establish minimum national criteria rather than to clean up an individual site. To determine whether the section 4004(a) standard will be met at all sites nationwide, as the statute requires, the Agency needs to evaluate the risks associated with full range of reasonable scenarios. As discussed in the previous response, there are numerous examples in the record of instances in which these kinds of sites have been redeveloped for residential use.

Moreover, as the commenters have acknowledged, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and other cleanup programs only address contamination that has already occurred. In contrast, national standards for waste management developed under RCRA section 4004(a) are to prevent environmental releases

6 U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I—Part A, Human Health Evaluation Manual.'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

7 U.S. EPA. 2004. ''An Examination of EPA Risk Assessment Principles and Practices.'' EPA/100/B–04/00. Prepared by the Office of the Science Advisor. Washington, DC. March.

8 Memorandum to the Docket: Compilation of News Articles on Future Land Uses for Electric Utilities.

9 U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A).'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

10 U.S. EPA. 1991. ''Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals).'' Publication 9285.7–01B. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

11 U.S. EPA. 1995. ''Land Use in the CERCLA Remedy Selection Process.'' OSWER Directive No. 9355.7–04. Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. May.

before they occur. See, *USWAG,* 901 F.3d at 429–431. As EPA has previously explained, groundwater contamination is a concern, even if the aquifer is not currently used as a source of drinking water. Sources of drinking water are finite, and future users' interests must also be protected. See, 44 FR 53445–53448.

EPA further disagrees that the risk assessment failed to appropriately account for existing State and local requirements for institutional controls that would limit residential exposure. The purpose of a baseline risk assessment is to provide ''. . . an analysis of the potential adverse health effects (current or future) caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (*i.e.,* under an assumption of no action).'' [12] Thus, the intent of the risk assessment is to characterize the harm that could result if institutional and other controls are not implemented. This provides a consistent basis to understand the risks to be controlled and define appropriate national requirements such as a national requirement for deed restrictions at all sites at which CCRMU fills will remain in place. The Agency did not assume that all facilities will ultimately be used for residential purposes as a consequence of these factors in developing this final rule.

Furthermore, as several commenters have acknowledged, facilities have not historically been required to identify smaller placements of ash as a form of disposal and consequently have not maintained reliable records of where such placements are located. Indeed, most commenters have acknowledged that they are currently unable to identify all CCRMU at their existing facilities. These commenters do not explain how due diligence assessments would reliably identify such placements in the absence of such records, as such assessments typically rely on available site records to guide further investigation. Nor do commenters explain how existing State programs would reliably identify such placements or otherwise prevent exposures, when the facilities themselves cannot identify the presence of the ash on-site. This is reinforced by EPA's review of State programs, which found that the specific requirements, level of oversight over these wastes, and the overall protectiveness of individual programs varied widely among States. See, 80 FR 21324. As a result, EPA currently lacks a record to conclude that currently unidentified CCRMU fills located across a facility would be subject to the same institutional controls that are required for the disposal units the commenters reference. Given the current absence of national requirements, and that commenters have generally acknowledged that they have not reliably kept records of the existence of CCRMU, it is appropriate to evaluate the risks that can reasonably arise in the absence of institutional controls.

Comment: One commenter argued that EPA had already considered the practice of disposal below the water table because it had been discussed in previous risk assessments. Another commenter asserted the Agency's conceptual model assumed all legacy impoundments were in contact with the water table. Another commenter stated that EPA cannot use information about active units to make assumptions about which historical and inactive units at the same sites are in contact with the water table, due to differences in unit construction and location. By contrast, a number of other commenters agreed that because EPA cannot model the effects of waste below the water table, EPA had previously underestimated the risks associated with CCR units. Other commenters argued the conceptual model for surface impoundments did not adequately distinguish between the types of water that may be present in an impoundment. These commenters asserted that any residual water remaining after the unit has been initially drained would not exert the same hydraulic head within the unit that would drive leachate into the subsurface during unit operation, and so leakage would more closely resemble a landfill.

EPA Response: The conceptual models for landfills and surface impoundments in the 2014 and 2024 Risk Assessments did not evaluate contact with groundwater. Although these assessments both acknowledged that this could occur, the scenario could not be incorporated into groundwater fate and transport modeling as a result of data and model constraints. Because the 2014 and 2024 Risk Assessments did not directly model the effects of disposal below the water table, neither assessment incorporates any assumptions about the prevalence of this practice in the conceptual model. EPA has acknowledged that its inability to reliably model the effects of this practice means that its risk estimates on a national scale underestimate the risks associated with higher rates of leaching and/or formation of strongly reducing conditions.

EPA acknowledges the rates of leakage from surface impoundments will generally decrease after ponded wastewater has been allowed to drain, reducing the overall hydraulic head across the unit. As such, discussion in the 2024 Risk Assessment has been updated to clarify the distinction between water ponded above the ash and porewater within an impoundment. However, any free liquids that remain within the unit can still result in higher leakage than would occur if the unit were fully dewatered. And the amount of ''residual water remaining'' can sometimes be substantial; in some cases, closed impoundments remain saturated by 20–54 feet of groundwater. See, *e.g.,* 88 FR 31982–319873, 55236.

In addition, regardless of the current configuration of an impoundment, it is appropriate for the conceptual models in the 2024 Risk Assessment to consider the stage of the unit lifecycle anticipated to contribute the most to long-term risk. For surface impoundments, this is when the units are in operation due to the presence of wastewater ponded above the ash. Subsequent draining of the unit does nothing to remediate any adverse impacts that occurred during operation. Furthermore, to the extent that impoundments leak at rates more similar to landfills after ponded wastewater has been drained, EPA notes the 2014 Risk Assessment previously modeled the risks from dry management in landfills and found the potential for unacceptable risk from these units. Therefore, continued leakage from drained units still has the potential to sustain releases.

Comment: One commenter affirmed that ''EPA is likely correct in its observations and assumptions that CCRMU fills 'will remain in place when ownership of the property changes,' and that, 'in the absence of land use restrictions, there is no guarantee [that] engineering controls will remain in place when the property is redeveloped.' '' However, multiple commenters argued the conceptual model for CCRMU fills does not adequately account for the full diversity of CCRMU that may be present onsite. Various commenters stated that a conceptual model for fills does not adequately address specific types of placements, such as use in the construction or closure of CCR disposal units, storage in waste piles, construction of roadways and railroads, or spreading on roadways for snow and ice control. Another asserted that reliance on the similar conceptual models in the 2014 Risk Assessment to

[12] U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A).'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

evaluate the disposal units and CCRMU fills is inappropriate because the CCRMU fills will tend to be smaller than the disposal units modeled in 2014.

EPA Response: EPA disagrees that the conceptual model for CCRMU fills does not adequately address the configurations of these units. The majority of the units described by commenters have a concentrated footprint, such as placement beneath a parking lot. Some of the specific alternate examples raised by commenters are either already regulated under the existing regulations (*e.g.,* waste piles) or are outside the scope of the current rulemaking. For others, there is little to no information available about the manner or frequency of such placements that could be used to characterize the units. Therefore, these types of placements are not considered as part of the conceptual model for CCRMU fills in the 2024 Risk Assessment.

The commenters do not explain how placement of CCR in a landfill or impoundment in service of construction or closure of that unit would be substantially different than the disposal scenarios previously modeled and found to pose risk. Finally, EPA has proposed and is finalizing the definition of CCRMU to exclude CCR used in roadbed and associated embankments.

There is little data that could be used to develop a conceptual model for diffuse placements, which may occur on a periodic basis. Nor do commenters provide any data on the manner or frequency of such placements. As a result, the 2024 Risk Assessment did not model these types of placements. This represents a source of uncertainty in the assessment. However, EPA notes that even small placements of CCR can contribute to broader leakage and have the potential to leak Appendix III constituents and influence nearby groundwater monitoring. Therefore, it is still necessary to identify where these types of onsite placements have occurred.

EPA also disagrees that applying a similar conceptual model for CCR landfills and CCRMU fills is inappropriate. Specifically, the conceptual model does not make any upfront assumptions regarding the sizes of these fills. As described in Section 4 of the 2024 Risk Assessment, EPA considered a range of potential sizes for these fills that were smaller than landfills reported in the EPA Surveys.

Comment: One commenter stated that it is inappropriate for the 2024 Risk Assessment to rely on similar data sources as the 2014 Risk Assessment to characterize environmental parameters, claiming these data are outdated. Another argued that the conceptual model does not adequately account for the presence of alternative liners, such as thick natural clay beneath the units.

EPA Response: First, EPA notes that the 2024 Risk Assessment does incorporate more recent weather data available from the most recent version of the Hydrologic Evaluation of Landfill Performance Model, updated in 2020. As explained in the 2014 Risk Assessment, EPA found the remaining data sources provide the most recent and representative data to characterize environmental conditions on a national basis. Commenters provide no explanation why these data should be considered outdated. For example, why the soil type present at a site would have changed substantially since 2014. EPA notes that to the extent that there is natural clay soil present in the vicinity of a facility, that would already be reflected through the environmental data.

c. Comments Related to Supplemental Risk Assessment Groundwater Model

Comment: Some commenters asserted that modeled leachate concentrations are unrealistically high. One commenter specifically argued that the LEAF data is unable to accurately reflect field leaching concentrations, citing two EPRI reports comparing LEAF and field leachate data both collected from the same units.[13] [14] They separately compared the leachate concentrations modeled in the risk assessment to field samples collected from around a number of different landfills. Based on this comparison, the commenter asserted that the high-end concentrations modeled in the risk assessment were substantially higher than measured in the field and so unrepresentative of actual leaching behavior. For these reasons, this commenter concluded that porewater data provide better representation of leaching in the field and so EPA should rely on that type of data to model leakage from CCRMU fills.

EPA Reponse: EPA disagrees that leachate concentrations modeled in the 2024 Risk Assessment are unrealistically high. EPA has previously demonstrated that the LEAF laboratory leaching tests are ''effective for estimating the field leaching behavior for a wide range of materials under both disposal and use conditions.'' [15] The two studies cited by commenters do not contradict these findings. Indeed, one of the cited reports concludes that LEAF Method 1313 measurements tended to only underestimate porewater concentrations of lithium and molybdenum and did not consistently overestimate or underestimate porewater concentrations of arsenic and thallium. These conclusions are consistent with previous Agency findings that LEAF Method 1313 measurements (1) can underestimate leakage of highly soluble constituents, such as lithium and molybdenum, if not adjusted to properly account for the sample liquid to solid ratio and (2) can over or underestimate leakage of redox sensitive contaminants, such as arsenic, if not further adjusted with geochemical speciation modeling. In response to these findings, the Agency has established general recommendations for how to address these issues.[16] Modeling of highly soluble constituents in both the 2014 and 2024 Risk Assessment are consistent with these recommendations. Sufficient data are not yet available on the prevalence or magnitude of reducing conditions to allow EPA to adequately model the effects of these conditions on leaching behavior at a national scale. However, given that the 2024 Risk Assessment identified potential for extensive groundwater contamination with overall risks as high as 1×10^{-4} for the less mobile pentavalent speciation of arsenic, this uncertainty is unlikely to affect the conclusions of the risk assessment.

EPA also disagrees that the field data presented by commenters demonstrates that the modeled concentrations are unrealistic. As a general matter, these commenters did not make available the underlying data for the graphs presented or the reports from which the graphs were drawn. Therefore, it is not possible to fully evaluate these graphs, as EPA cannot determine how and where these data were collected, how many individual samples are represented, and how the data were compiled. Based on

[13] EPRI. 2020. ''Leaching, Geotechnical, and Hydrologic Characterization of Coal Combustion Products from a Closed Coal Ash Impoundment.'' Palo Alto, CA. June.

[14] EPRI. 2021. ''Leaching, Geotechnical, and Hydrologic Characterization of Coal Combustion Products from an Active Coal Ash Management Unit.'' Palo Alto, CA. February.

[15] U.S. EPA. 2014. ''Leaching Test Relationships, Laboratory-to-Field Comparisons and Recommendations for Leaching Evaluation using the Leaching Environmental Assessment Framework.'' EPA 600/R–14/061. EPA Office of Research and Development. Research Triangle Park, NC. October.

[16] U.S. EPA. 2019. ''Leaching Environmental Assessment Framework (LEAF) How-To Guide: Understanding the LEAF Approach and How and When to Use It.'' SW–846 Update VII. Prepared by the EPA Office of Land and Emergency Management. Washington, DC. May.

the limited description provided, it appears that the graphs summarize data on the average leachate concentrations collected from around different landfills. Thus, the cited median values would represent a median of the average measurements from each landfill. This type of summary does not provide a meaningful understanding of the leaching potential of CCR. For example, landfills can contain mixtures of different CCR types and other wastes, which may result in variable leaching profiles over the footprint of the unit. An average of measured leachate concentrations can mask regions of higher leaching potential over many acres. This potential for variable leaching is one reason why groundwater monitoring wells are required to be spaced along the entire downgradient boundary of these units. In contrast, CCRMU fills are smaller in size and more likely to be constructed with a single source of ash. Additionally, there is no indication of how long the waste has been present in these landfills prior to sampling. More soluble constituents can become depleted over time. For example, Modular Three-Dimension Finite-Difference Ground-Water Flow Model (MODFLOW) runs conducted for the 2024 Risk Assessment showed that molybdenum can deplete from the ash anywhere from several years to a few decades after leaching first began. Thus, these graphs could understate the full leaching potential of CCR.

Commenters also mischaracterize the results of the probabilistic analysis. The 90th percentile of all model inputs for leachate concentration is not the same as the 90th percentile of modeled risks. There are a number of other model parameters that will influence contaminant release and subsurface transport. As a result, the model runs with the highest initial leachate concentrations are not always the same as those with the highest downgradient concentrations. EPA reviewed a subset of model runs around the 90th percentile risk result reported in the 2024 Risk Assessment, representing 1% of all model runs at 1,000 feet from the waste boundary. This review found the median leachate concentration representative of these runs was closer to 0.31 mg/L for arsenic and 35 mg/L for molybdenum. There are multiple samples in the record of porewater or leaching tests with concentrations of the same order-of magnitude or higher than these concentrations. Therefore, EPA concludes that the methods used to generate model inputs do not result in unrealistically high leachate concentrations.

EPA maintains that LEAF leachate provides the most realistic estimate of long-term leaching potential from CCR placed in fills. There is little field leachate data for dry-managed CCR available in the record, as it can be difficult to collect representative samples from landfills. Additionally, field samples would reflect the specific waste mixtures and chemistry of these disposal units. Instead, LEAF provides data on the leaching behavior of individual CCR under a range of relevant environmental conditions. EPA did consider using impoundment porewater data to supplement the data on leaching of lithium because of the lack of LEAF data for this contaminant, and because lithium is a highly soluble, monovalent ion expected to be less influenced by specific impoundment chemistry. However, this constituent was not modeled in the 2024 Risk Assessment due to other data limitations. The uncertainties associated with exclusion of lithium are discussed in Section 6 of the 2024 Risk Assessment.

Comment: One commenter asserted that the distribution of leachate pH values used to represent CCRMU fills is unrepresentative. In particular, the commenter took issue with the prevalence at which acidic conditions were modeled within CCR fills. This commenter pointed to field data collected from CCR landfills to assert that leachate from fills would rarely be acidic.

EPA Response: EPA disagrees that the modeled leachate pH is unrepresentative of conditions at smaller CCRMU fills. Modeled leachate pH is based on the natural pH (or ''own pH'') of the ash sample measured with LEAF. Thus, these data represent the properties of real ash samples. Landfills can contain a mixture of different CCR types and other related waste streams and so it is reasonable that the average pH of larger landfills may differ from that of individual CCR. At the same time, regions of individual landfills can be more acidic than average, which can be masked by consideration of only average values. The potential for such variations is part of the reason that placement of monitoring wells is required across the full downgradient boundary of these landfills. Smaller CCRMU fills are more likely to be constructed with a single ash type and so it is most appropriate to consider the pH of individual ash samples, rather than broader landfill conditions. The uncertainties associated with the modeling of pH are discussed in Section 6 of the 2024 Risk Assessment.

Comment: One commenter stated that use of a five-mile radius to draw environmental data for purposes of groundwater modeling is not adequately justified and inconsistent with both the 2014 Risk Assessment and Draft 2023 RIA.

EPA Reponse: EPA has reviewed and updated the sampling radius for environmental and population data. Based on this review, EPA established the sampling radius for environmental data at two kilometers (1.2 miles). This is consistent with the methodology applied in the 2014 Risk Assessment, which the Agency previously found adequately represented the environmental conditions near units for which a more precise location at the facility property could not be determined. EPA established the sampling radii for population data to be consistent with the rationale outlined in the 2024 RIA.

Comment: Multiple commenters criticized the Agency's use of soil-water partitioning coefficients (*i.e.,* Kd values) to model contaminant sorption in the subsurface. These commenters argued that use of individual Kd values was inappropriate and unable to reflect the variability of subsurface transport conditions. They also stated that the Kd values used in the risk assessment for arsenic were biased low and likely to underestimate retention on soil. These commenters cited field measurements collected at various locations to assert that actual values for arsenic are likely to be higher. One commenter cited an alternative set of Kd values they had calculated to contend that actual values for arsenic would be orders-of-magnitude different than used in the risk assessment.

EPA Response: These commenters are incorrect; EPA did not rely only on individual Kd values for the risk assessment. As part of the 2014 Risk Assessment, EPA previously developed sorption isotherms for each modeled constituent, which represent the distribution of individual Kd values calculated and reflect the range of anticipated subsurface conditions and specific CCR waste characteristics. Each individual model run in the EPA Composite Model for Leachate Migration with Transformation Products (EPACMTP) samples from that distribution based on the key factors for that run (*e.g.,* leachate concentration, pH, ionic strength). No individual model run will precisely represent conditions at a particular site. Instead, the model runs collectively capture the variability of conditions that can occur across sites. Thus, EPA relies on the model runs in aggregate to draw conclusions about the potential for risk nationwide.

EPA also disagrees that the specific Kd values used in MODFLOW are unrepresentative. The limited number of MODFLOW runs are intended to further characterize the subset of high-end scenarios modeled in EPACMTP. Thus, it is entirely reasonable that these model runs are those more likely to reflect scenarios where pentavalent arsenic is more mobile in the environment.

The field data shared by commenters for specific CERCLA sites or agricultural fields are not representative of conditions at CCR disposal units. As previously noted, the calculated sorption isotherms reflect the properties of CCR leachate, which can be vastly different from precipitation infiltrating through soil. In particular, both the high ionic strength and variable pH of this leachate are expected to result in different sorption behavior. EPA is also unable to fully review the Kd values calculated by commenters or compare them with Agency values because the commenters provided insufficient information regarding whether and how specific key environmental factors were considered. Nevertheless, EPA notes that the range of values presented by commenters falls within the full distribution of Kd values developed for arsenic in 2014. The full distribution of values is summarized in Appendix H of the 2014 Risk Assessment, and is the full range of values EPA sampled from to model groundwater transport in the 2024 Risk Assessment.

Comment: One commenter stated that any CCR material placed beneath the soil would become naturally compacted. Another commenter asserted that the pozzolanic nature of some ash would result in far lower hydraulic conductivity than EPA modeled.

EPA Response: In the absence of periodic inspections and a well-maintained cap, there is no guarantee that any ash placed in the ground will remain undisturbed by human or animal activity, natural settling or freeze-thaw cycles, flooding and other extreme weather events, or other unforeseen factors. Given that such disturbances can result in increased permeability, it was not possible to develop a fixed probabilistic distribution of conductivities. Instead, EPA modeled conductivity based on the dominant soil megatexture as described in Appendix B of the 2014 Risk Assessment. As such, the model assumes the ash has been subjected to a similar degree of compaction as the surrounding soil. EPA acknowledges that some fly ash is pozzolanic in nature. Yet, the commenter provided no information that would indicate how common it is for this type of ash, which can be marketed for use in concrete, to be placed in CCRMU fills. EPA is also not aware of any information that could be used to represent the long-term conductivity of this ash when left in the field and exposed to the elements.

Comment: One commenter contended that EPA had not adequately demonstrated that consideration of more recent weather data drawn from the latest version of the Hydrologic Evaluation of Landfill Performance model would result in consistently higher infiltration rates than previously modeled in 2014 for CCR landfills.

EPA Response: The 2023 Draft Risk Assessment proposed that the higher rates of infiltration modeled for certain soil types with the new HELP data indicates the potential for higher leaching and risk to groundwater than previously modeled in 2014. However, because EPA found that the model results from the 2014 Risk Assessment are sufficient to support the current rulemaking, the Agency did not conduct the additional modeling that would be necessary to refine this draft analysis. As a result, EPA does not rely on this particular analysis to support the final rule and so it is not included in the 2024 Risk Assessment.

Comment: Several commenters stated that consideration of a limited subset of contaminants for groundwater modeling would result in an underestimation of risk. These commenters further assert that EPA further underestimated risk by not accounting for the effects of cumulative exposure to multiple contaminants.

EPA Response: EPA disagrees that the selection of constituents for groundwater modeling resulted in lower risks than would have otherwise been identified. The constituents selected for groundwater modeling were those found to be risk drivers for unlined surface impoundments in the 2014 Risk Assessment, as these are considered the most likely to also result in the greatest risks for unlined landfills and comparable management units. EPA notes that some of the additional constituents raised by commenters had been previously identified as risk drivers only for specific CCR types, such as flue gas desulfurization (FGD) wastes, which are considered far less likely to be used in CCRMU fills. The commenters presented no new information that could alter the previous model results and so there is no expectation that inclusion of these additional constituents would identify risks higher than those already modeled for the relevant CCR types. Some other additional constituents raised by commenters lack health benchmarks within the Office of Land and Emergency Management (OLEM) hierarchy and so could not be quantitatively evaluated. See, 85 FR 72526. Uncertainties associated with the selection constituents for modeling is further discussed in Section 6 of the 2024 Risk Assessment.

Comment: Several commenters argued that a modeling horizon of up to 10,000 years was unrealistic. These commenters stated that such a long time frame is not consistent with identifying a reasonable probability of adverse effects because there is no reliable way to predict whether any receptors will exist that far in the future.

EPA Response: EPA ran the groundwater model until either the observed groundwater concentration at the receptor point reached a peak and then fell below a model-specified minimum concentration (1×10^{-16} mg/L), or the model had been run for a time period of 10,000 years. This is the same modeling horizon applied in the 2014 Risk Assessment. The text in the 2024 Risk Assessment has been updated to make it clear that the selection of a maximum 10,000-year time horizon does not mean that it typically took that long for contamination be identified or that all model simulations continue for the full 10,000 years. EPA also notes that the time to first exceedance of selected risk criteria is typically considerably less than the time to the greatest exceedance.

EPA acknowledges that future groundwater use patterns may shift over time as the number and location of receptors changes, and that it is unknown whether or how future shifts in receptor locations and other surface conditions might affect risk. However, EPA notes that all the contaminants associated with CCR are inorganic and so will remain present in the environment over the full modeling horizon. As such, a longer modeling horizon can provide useful information about the potential duration of groundwater contamination in the absence of regulation. EPA found that contaminant plumes modeled in MODFLOW did not fully dissipate for around 2,300 years for arsenic V and 100 years for molybdenum.

Comment: Multiple commenters argued that EPA was inconsistent with the 2014 Risk Assessment and overestimated risks for CCRMU fills by not evaluating the interception of groundwater by surface water.

EPA Response: EPA did not explicitly evaluate interception by surface water on groundwater fate and transport in the

2024 Risk Assessment. As acknowledged by commenters elsewhere, facilities have generally not maintained reliable records about the location or construction of all CCRMU fills. As a result, it is not possible for EPA to develop a representative, probabilistic distribution of the distance from these fills to downgradient water bodies or offsite receptors. However, given the diversity of reasons for such placements listed by commenters, there are few limitations as to where these fills might be located onsite. As a result, there is greater potential for these fills to be located further away from water bodies than disposal units, allowing for further contaminant spread prior to any interception. Therefore, the 2024 Risk Assessment evaluated the potential magnitude and extent of onsite groundwater contamination that could occur in the absence of interception. It is considered unlikely that further quantitative evaluation of interception would affect the conclusions of the 2024 Risk Assessment. The reductions in modeled risks attributed interception in the 2014 Risk Assessment were predominantly for median risks. However, the 2014 Risk Assessment still identified high-end risks to offsite receptors, and it was these risks that formed the basis for the 2015 CCR Rule. Thus, it is similarly unlikely that quantitative evaluation of surface water interception would affect the high-end risks reported in the 2024 Risk Assessment, especially because the current assessment considers onsite groundwater quality prior to discharge to a water body. Furthermore, as discussed in the 2024 Risk Assessment and in response to comments elsewhere, the fact that a contaminant plume that has migrated off-site is intercepted by surface water does not mean that there is no potential for risk or no need for further action to address the presence of groundwater contamination onsite.

Comment: Some commenters requested clarification on the prevalence of different types of liners modeled for the landfills and surface impoundments previously excluded from the 2014 Risk Assessment. Citing to data relied upon in the 2014 Risk Assessment, one commenter asserted that a majority of modeled landfills had some form of liner and that national regulations should be based on the risks for all units, rather than those that are unlined.

EPA Response: The handling of liner status for these units was described in Section 5 of the 2014 Risk Assessment. Of the units evaluated in the 2014 Risk Assessment, approximately 42% of landfills and 65% of surface impoundments were modeled as having no engineered liner system. Of the previously excluded units summarized in the 2024 Risk Assessment, approximately 71% of landfills and 57% of surface impoundments were modeled as having no engineered liner system. EPA has updated the discussion of this issue in the 2024 Risk Assessment to better distinguish the specific liner status modeled for these different units. Differences in the national risks reported in 2014 and 2024 are largely attributed to the relative prevalence of engineered liners modeled for each. Modeled risks in both assessments are nearly the same for the subset of units with no engineered liner.

Far from being an isolated practice, a substantial fraction of the currently operating landfills across the country have no engineered liner. Although the 2014 Risk Assessment did model a majority of landfills as having some form of engineered liner, data that has become available since then indicates a greater proportion of operating units lack an engineered liner than EPA previously understood. Furthermore, the 2014 Risk Assessment modeled the performance of both clay and composite liners based on the assumption of good construction practices. However, it has become clear since then that some liner systems do not perform as modeled. For example, facility reporting shows that around 10% of composite and alternate-lined units have already entered into corrective action. Therefore, it is considered likely that national risks for both landfills and surface impoundments (including the inactive landfills and legacy impoundments subject to this final rule) are more similar to those unlined units than previously modeled.

Nevertheless, the 2014 and 2024 Risk Assessments, which provided much of the basis for this final rule, modeled the risks associated with both lined and unlined units. Under RCRA sections 1008(a)(3) and 4004(a), EPA establishes national criteria; because the criteria are national in scope EPA must evaluate the full range of conditions. In addition, EPA must establish requirements that will achieve the statutory standard at all sties subject to the criteria—including those that pose the greatest risk. Under these provisions, the criteria may authorize a CCR unit to continue operating ''only if there is no reasonable probability of adverse effects on health and the environment from the disposal [or other solid waste management] of solid waste at such facility.'' 42 U.S.C. 6903(a)(3), 6944(a). Given the requirement that the standard be met at each facility covered by the regulation, it is not particularly surprising that the final requirements are driven by the higher end risks associated with unlined units—especially as the overwhelming majority of legacy impoundments and CCRMU are expected to lack the composite liner that would largely mitigate the risks of CCR units. But that does not mean that the national regulations are not based on the risks for all units.

Comment: One commenter argued that modeled groundwater concentrations and associated risk downgradient of smaller CCRMU fills are unrealistic because they are higher than previously modeled for landfills and surface impoundments. Other commenters contended that modeled groundwater concentrations were unrealistic, citing comparisons to monitoring data for all regulated units in a report by the Environmental Integrity Project (EIP) [17] or for some smaller subset of units. These commenters calculated summary statistics from concentrations reported for site groundwater monitoring wells to assert that modeled concentrations were an order of magnitude higher or more than the concentrations that have occurred in the field.

EPA Response: The 2014 Risk Assessment modeled risks from landfills and surface impoundments to receptors located up to a mile away from these units. The 2024 Risk Assessment modeled the magnitude and extent of contamination extending from smaller CCRMU fills, including the likelihood of exceedance of GWPS at the waste boundary of the unit. It is entirely reasonable that concentrations and risk closer to the waste boundary are higher than EPA modeled in 2015 up to a mile away from a unit.

EPA disagrees that the modeled groundwater concentrations are contradicted by available monitoring data. First and foremost, EPA modeled the long-term potential for groundwater contamination that may occur in the absence of regulatory action. Thus, monitoring data from units of variable age and operational status do not represent a one-to-one comparison. Second, field monitoring data can diverge from model results as a result of improper well installation. As just one example, EPA is aware of multiple instances where monitoring wells are located far from the waste boundary, in some cases, hundreds of feet away. See, for example, 88 FR 55239. Third, EPA used EPACMTP to model

[17] EIP. 2022. ''Poisonous Coverup: The Widespread Failure of the Power Industry to Clean Up Coal Ash Dumps.''

concentrations along the centerline of the plume and to provide a best estimate of contaminant transport potential to inform further modeling with MODFLOW. Even if all wells in a network were properly installed and spaced, there is no guarantee that any individual well will intersect with the exact point of highest concentration; some wells may not intersect with the plume at all. Finally, the 90th percentile concentration modeled is not intended to correspond precisely to a 90th percentile of well concentrations. Instead, it reflects an RME scenario that is conservative, while remaining within the range of possible high-end exposures. The EIP dataset cited by commenters do show multiple instances of well concentrations at individual landfills of the same order of magnitude as modeled in the 2024 Risk Assessment or even higher. Further, in the case of arsenic, modeled GWPS exceedances between 26 and 19 for arsenic III and V are of a similar magnitude as the exceedance of 16 estimated by one commenter based on the EIP report. Therefore, EPA maintains that the magnitude of modeled groundwater concentrations is realistic.

Comment: Some commenters claimed that EPA had not justified modeling groundwater concentrations at fixed distances along the centerline of the plume or within the upper five feet of the aquifer and had not demonstrated how this approach compares with the 2014 Risk Assessment, which modeled concentrations within the top 30 feet of the aquifer.

EPA Response: The goal of modeling with EPACMTP was to identify the potential magnitude of GWPS exceedances at the waste boundary and potential for contaminant spread to support further modeling with MODFLOW. For both goals, a sampling along the centerline of the plume and to a depth of five feet was determined to be most relevant portion of the aquifer for consideration for the reasons documented in the 2024 Risk Assessment. Because different scenarios were modeled in the two risk assessments, a comparison with the results of 2014 Risk Assessment is not relevant here.

Comment: EPA received several comments regarding a graph from the 2023 Draft Risk Assessment, which summarized modeled risks from the 2014 Risk Assessment for unlined landfills as a function of unit size. Commenters stated that it demonstrated that risks consistently decline below a certain acreage and that smaller units do not warrant regulation because they pose less risk. One commenter stated that the underlying model runs for the 2014 Risk Assessment were not made available alongside the graph and so its validity could not be confirmed.

EPA Response: One purpose of the referenced graph was to demonstrate that risks remain above levels of concern over a broad range of unit sizes modeled in the 2014 Risk Assessment. However, upon further review, EPA has determined that the graph incorrectly summarized model results for receptors of all age cohorts into one figure. This has the potential to bias the plotted risks low. However, filtering the model runs for only (1) unlined landfills, (2) where drinking wells are located closer than surface water bodies, and (3) where an adult was exposed results in a relatively small number of model runs. EPA is concerned that this number of runs is not sufficient to reflect national variability or support broader conclusions about risk. As such, EPA does not rely on this line of evidence to support the final rule and so it is not included in the 2024 Risk Assessment.

EPA cautions the data presented in the graph was for landfills and so use of this graph to draw conclusions about the risks from surface impoundments is not appropriate. EPA further cautions that it is not appropriate to use the referenced graph to identify a specific unit size below which landfill risks are not possible. The graph summarized the results of the 2014 Risk Assessment, which modeled risks to offsite receptors up to a mile away from the waste boundary. The risks identified based on these receptors provided a robust basis for the 2015 CCR Rule. Yet, this does not mean these are the only relevant risks. EPA's longstanding and consistent policy (across numerous regulatory programs) has been that groundwater contamination is a significant concern that merits regulatory action in its own right, whether or not the aquifer is currently used as a source of drinking water. The 2024 Risk Assessment identifies the potential for CCRMU fills to contaminate groundwater above levels of concern. Where CCR landfills and surface impoundments are located at the same sites even more extensive contamination can occur as a result of their larger size. As such, these disposal units warrant regulation to protect groundwater resources, regardless of their size.

Comment: One commenter questioned why MODFLOW—Unstructured Grid (USG) was used to model groundwater transport, stating that MODFLOW 6 is more commonly used. This commenter also inquired why the model was not run in steady-state mode. They further argued that insufficient information had been provided to allow for evaluation of the design of MODFLOW model runs. Finally, the commenter identified a potential discrepancy in the reported model inputs for EPACMTP and MODFLOW.

EPA Response: MODFLOW–USG was selected for its ability to: (1) Simulate flow and transport in both the unsaturated and saturated zones without the need for additional modeling packages and (2) Simulate groundwater flow and transport sequentially without the need for reading cell by cell flow and transport. Steady state simulations were not used because they do not provide a time series representation of plume evolution. EPA has reviewed the model documentation to ensure that this and other relevant information raised by commenters was made clear in the 2024 Risk Assessment. However, EPA notes that this and much of the other specific information raised by commenters was previously described in the 2023 Draft Risk Assessment. EPA did not incorporate the full output files for all MODFLOW model runs because the file size would become prohibitively large to manage. The level of documentation of model inputs and outputs is consistent with that provided for EPACMTP. The identified discrepancy between EPACMTP and MODFLOW inputs were the result of a typo, which has been corrected.

Comment: One commenter stated that EPA had not provided sufficient evidence to support its conclusion that the location of legacy facilities that were not modeled in 2014 could result in somewhat higher risks for this subset of units compared to those previously modeled units.

EPA Response: EPA previously found that the locations of legacy facilities were clustered in the eastern half of the country. As a result, the rates of precipitation at these facilities will tend to be higher than modeled for the nation as a whole. Higher precipitation can result in greater vertical infiltration and subsequent leakage down to groundwater. The Agency has not conducted further sensitivity analyses to support this contention, as this argument is not central to the findings of either the risk assessment or the rulemaking. Instead, discussion in the 2024 Risk Assessment has been updated to clarify that the primary finding is that there is no indication based on geography that these additional units would be exposed to substantially different environmental conditions than EPA modeled in 2014.

Comment: Multiple industry commenters argued that modeled arsenic risks do not warrant regulation because the associated concentrations often fall below the current maximum contaminant limit (MCL). One commenter noted that 70 percent of runs identified peak arsenic concentrations below the MCL at the unit boundary. In contrast, environmental advocacy groups stated that cancer risks within the OLEM risk range can occur at even lower levels. Another asserted it was inappropriate for EPA to identify risk based on modeled concentrations above GWPS because corrective action requires ''a statistically significant level exceeding the groundwater protection standard.''

EPA Response: First, EPA notes that arsenic is only one of the contaminants modeled. Molybdenum was found to be above the associated GWPS on a more frequent basis. Indeed, EPA identified exceedances for this contaminant at both the 90th and 50th percentile results. EPA disagrees that risks identified below MCLs do not pose a concern. MCLs are not purely risk-based and can incorporate other considerations, such as the technical feasibility of reliably achieving even lower levels. As environmental commenters have pointed out, the arsenic MCL in particular represents a concentration that can fall outside the OLEM risk range. As such, these standards should be understood as values that corrective action must achieve and not levels that never warrant concern. Indeed, EPA established GWPS at the unit boundary with the intent to limit downgradient transport of contamination above this level and prevent the same magnitude of risk identified in the risk assessment.

EPA also disagrees that a statistically significant increase above GWPS is an appropriate standard for risk modeling. It is not clear, nor do commenters articulate, how such a statistical analysis would be conducted as part of the model. Thus, EPA believes this comment represents a general misunderstanding of both groundwater monitoring programs and probabilistic analysis. Statistical analysis is used in groundwater monitoring programs because factors, such as natural fluctuations in groundwater and uncertainty from sampling or laboratory analysis procedures, can introduce variability into the broader dataset. In this context, statistical analysis allows evaluation of the broader data and identification of an exceedance of GWPS with a specified level of certainty. However, numerical models are not subject to the same constraints. A model tracks the fate and transport of all contaminant mass from the point of release to the point of exposure. Therefore, no additional steps required to confirm that an identified exceedance of GWPS resulted from leakage from the modeled unit.

Comment: Several commenters stated that the toxicity value used for arsenic underestimated risks from groundwater, citing draft values they assert would increase modeled arsenic risks by an order of magnitude or more.

EPA Response: The Agency's current risk estimates are based on the same cancer slope factor of 1.5 mg/kg/d^{-1} for arsenic in EPA's Integrated Risk Information System (IRIS). EPA is currently in the process of reviewing this slope factor and has released a draft toxicological review, which, if finalized without revision, would increase the individual risk estimates for arsenic by a factor of approximately 35. See, 88 FR 71360. However, the Agency has not yet finalized this updated IRIS reassessment, and EPA cannot base a final decision on a draft IRIS value that is subject to revision. Nor did EPA receive any other information during the development of this final rule that would help to resolve this uncertainty. The current IRIS values thus represent the best data available to the Agency until the IRIS reassessment is complete.

d. Comments Related to Supplemental Risk Assessment Soil Model

Comment: One commenter contended that radionuclides and non-radionuclides have different health endpoints and so it is not appropriate to treat the resulting risks as additive.

EPA Response: EPA disagrees that it is inappropriate to consider the cumulative risk from chemical and radiological contaminants. EPA policy is to treat the risk resulting from exposure to multiple carcinogens as additive.[18] Agency policy is also to evaluate the risks from exposure to radionuclides in the same manner as chemical contaminants.[19] Therefore, it is appropriate to evaluate the cumulative cancer risk from chemical and radiation contaminants. However, EPA notes that considering chemical and radiological risks separately would not alter the overall conclusions of the analysis, as each have demonstrated potential to individually result in risk exceeding EPA's levels of concern. Uncertainties associated with umulative risk is further discussed in Section 6 of the 2024 Risk Assessment.

Comment: EPA received comments that argued the U.S. Geological Survey coal quality (COALQUAL) database does not adequately account for several factors that may affect bulk content of the resulting ash, such as: CCR type, regional variability, coal rank, mining practices, coal preparation prior to combustion, and the presence of unburnt carbon remaining after combustion. Another commenter stated that because the risk assessment addresses historical disposal of CCR, sampling of the COALQUAL database should be updated to reflect production over time, rather than current production. Finally, one commenter argued that differences identified between activity calculated from COALQUAL data and measured elsewhere in the literature demonstrates that handling of COALQUAL data is likely to overestimate concentrations in the ash.

EPA Response: The Agency acknowledges that the bulk contaminant content of specific CCR samples can be influenced by a range of factors, such as the manner in which a coal sample is prepared and combusted. As detailed in Section 6 of the 2024 Risk Assessment, EPA considered the information provided by commenters on the potential for mining practices, residual unburnt carbon, and coal washing to affect estimated ash concentrations and concluded these factors are likely to have a minimal or inconsistent effect on overall distribution of concentrations. EPA did determine that concentrations of some contaminants are sensitive to differences in region and coal rank and so reviewed the Energy Information Administration (EIA) coal production reports referenced by commenters when updating the weighting of available samples.

For purposes of modeling groundwater exposure, EPA did not use the COALQUAL database to estimate the leachable content of CCR in the 2024 Risk Assessment. Previous reviews of EPACMTP summarized in the 2014 Risk Assessment did not identify leachable content as among the sensitive model parameters. Even at lower bulk concentrations, there is often sufficient soluble mass present to support sustained leaching. Instead, EPA represented leachable content using available LEAF data in a manner

[18] U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A).'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

[19] U.S. EPA. 2014. ''Radiation Risk Assessment at CERCLA Sites: Q&A.'' OSWER 9285.6–20. Prepared by the Office of Land and Emergency Response. Washington, DC. June.

consistent with the 2014 Risk Assessment and Agency guidance.[20]

For purposes of modeling soil exposure, EPA retained use of the COALQUAL database in the 2024 Risk Assessment to calculate the bulk content of thorium and uranium of CCR. In this instance, use of COALQUAL provides information about the relative levels of each contaminant, which allowed for a more refined estimate of cumulative exposure that provides a more direct comparison with relevant benchmarks. As discussed in Section 6 of the 2024 Risk Assessment, EPA also considered available EIA data when updating the calculation of bulk content for these two contaminants and found that concentrations of both are less sensitive than other contaminants to regional geography. Therefore, further efforts to refine these calculations are considered unlikely to result in changes that would affect the overall conclusions of the evaluation.

The bulk contaminant content calculated from COALQUAL represents a mixture of fly ash and either bottom ash or boiler slag, collectively referred to in the 2024 Risk Assessment as the ''whole ash.'' Because fly ash is generated in the greatest volumes during coal combustion, the calculated bulk content primarily reflects this type of CCR. However, other available data sources indicate that the activity of fly ash and bottom ash are not substantially different. EPA has seen no indication that the activity of boiler slag would differ markedly from that of bottom ash. The whole ash does not include any CCR generated by scrubber systems and similar pollution control technologies. However, these CCR types are not considered relevant to the evaluation of CCRMU fills. EPA further discusses the uncertainties associated with these different types of CCR in Section 6 of the 2024 Risk Assessment.

Based on the comments received, EPA reviewed the available data on radioactivity drawn from the literature. This review led to the removal of several samples that were determined to be duplicative and removed all the data for one study because it was determined to not be representative of the broader ash generated at the facility. Altogether, the data removed represent a small fraction of the overall dataset. This review also identified some inaccuracies in how samples were described and averaged to avoid biasing the overall dataset toward individual facilities that reported a greater number of samples. This had resulted in more samples being averaged together than was intended. The database presented as part of the 2024 Risk Assessment has been updated along with a summary of these updates. Following these corrections, the updated summary statistics for thorium align more closely with those calculated with COALQUAL. Therefore, there is general agreement between these two datasets. It is inevitable there will be some differences between datasets developed through different methodologies. In particular, any individual study may not reflect the full variability of coal produced over time. However, the magnitude of differences between activities drawn from COALQUAL and the broader literature are small on an absolute basis and consequently would not affect the overall conclusions of the risk assessment. Therefore, EPA concludes that COALQUAL can provide a reasonable estimate of both median and high-end ash activity.

Comment: One commenter critiqued multiple individual model inputs used in RESRAD as likely to overestimate potential for radon exposure. They also stated that the risk assessment should consider an additional scenario with RESRAD of CCR disposed at the ground surface to provide a consistent frame of reference to compare risk results obtained from RESRAD and the preliminary remediation goal (PRG) calculator. Other commenters separately commented that the assumed presence of some soil cover is inappropriate, referencing one CCRMU purported to have been placed with the intent to level out the ground surface and without any additional soil cover.

EPA Response: EPA has not established default parameters for modeling of radon fate and transport. Nor is there currently enough information available on a national scale to develop distributions that could be sampled probabilistically. Instead, EPA previously conducted a deterministic analysis for radon exposure by specifying high, moderate, and/or low values for model inputs to capture the range of potential exposure. EPA first modeled risk with all inputs set to moderate values to identify a baseline risk more representative of the central tendency. From this baseline, EPA adjusted each individual input to lower or higher values to better understand which inputs exert the greatest influence on modeled risks and support development of an RME scenario. However, EPA ultimately concluded that the rate of radon emanation from CCR is not distinguishable from background soil and so the Agency did not develop this RME scenario or draw final conclusions about risk from radon exposure. For this same reason, EPA did not retain the quantitative evaluation of radon in the 2024 Risk Assessment.

Some CCRMU fills may currently be uncovered, but EPA was not able to confirm the status of the specific unit identified by the commenter based on the information provided. Nevertheless, EPA maintains it is unlikely that future residential construction would occur in the absence of some initial soil cover. It is generally anticipated residential construction sites will cover any exposed land with topsoil or turf to support uniform lawn growth. However, this does not guarantee this soil cover will be adequately maintained by residents into the future. As such, EPA agrees it is appropriate to evaluate a scenario of CCR without any soil cover to provide a bounding estimate of potential risk and a more direct link between the primary and sensitivity analyses. This updated scenario is discussed in Section 6 of the 2024 Risk Assessment.

Comment: Some commenters raised concerns about the sensitivity analysis conducted with the PRG calculator. One commenter asserted that the PRG calculator is intended for use with contaminated soils and is inappropriate for comparison against undiluted CCR. This commenter further argued that the sensitivity analysis conducted with the PRG calculator is overly generic and did not incorporate scenario-specific inputs, such as the potential for greater soil cover, shorter exposure duration, and ability of radon to emanate from CCR. Finally, this commenter stated that the degree of mixing of soil with CCR would not result in activities higher than either background or applicable or relevant and appropriate requirements (ARARs), concluding that the evaluation of radiation risk should consider contributions from background soils when presenting risk results. Another commenter stated that the ARAR was only exceeded around the 90th percentile concentrations and that regulation based on 90th percentile concentrations is not appropriate.

EPA Response: EPA disagrees that the PRG calculator is not applicable to the modeled scenario of CCR intermixed with soil. The commenters provide no rationale for this assertion beyond the fact that the PRG calculator nominally identifies soil as an environmental media of interest. This is reasonable as it would quickly become overwhelming to identify a comprehensive list of sludges, sediments, and other soil-like

[20] U.S. EPA. 2019. ''Leaching Environmental Assessment Framework (LEAF) How-To Guide: Understanding the LEAF Approach and How and When to Use It.'' SW–846 Update VII. Prepared by the EPA Office of Land and Emergency Management. Washington, DC. May.

materials that might be encountered at cleanup sites. EPA notes that the exposure assumptions incorporated into the PRG calculator are equally relevant for CCR intermixed with soil. CCR consist of small particulates that can be readily intermixed with the soil and result in exposures through the exact same routes, specifically incidental ingestion and direct exposure to gamma radiation.

EPA also disagrees that the analysis of exposure to CCR mixed with soil is overly simplistic. First, the presence of additional cover soil is already considered in the main analysis and is not relevant to the types of exposures explicitly considered in the sensitivity analysis. Second, because EPA concluded the rate of radon emanation from CCR and soil were not distinguishable, the sensitivity analysis explicitly does not incorporate risk from inhalation of radon gas. Only a relatively small fraction of the radon generated from fly and bottom ash is expected to escape into the ambient air and these losses can be counteracted by upward migration from deeper ash. Therefore, it is unlikely that further consideration of radon emanation would have substantial impacts on exposures through incidental ingestion or direct gamma exposure. Third, the model parameters used to characterize exposure to gamma radiation in the PRG calculation are generally the same as in RESRAD and other available models. Finally, exposure factors selected for use in the PRG calculator are consistent with Agency policy for characterizing an RME scenario and many of the remaining parameters are based on extensive modeling.[21 22 23]

EPA generally only considers contributions from disposed wastes to risk when conducting national risk assessments under RCRA. Background concentrations may contribute to risk when present and can sometimes be higher than concentrations modeled in a risk assessment. Although constituent concentrations in undisturbed environmental media can be highly variable, they are often relatively low in concentration. As a result, consideration of these concentrations would generally have no impact on the overall conclusions of a national risk assessment. Therefore, consideration of background concentrations is more appropriate on a site-specific basis when risk managers are determining the need for and scope of corrective action. EPA recognizes that a focus on background is more common for discussion of radioactivity, particularly when providing context for the associated risks to the broader public. However, as one point of reference, EPA has found that the median activities of fly and bottom ashes already fall close to the standard of 5 pCi/g radium-226+228 above background soil, which has been adopted as an ARAR for some cleanups under Superfund and State programs (*i.e.,* around 4.3 pCi/g higher).[24] Additionally, EPA has found that high-end radium-226+228 activity in CCR has the potential to be nearly 10 pCi/g higher than typical background soil. Thus, there is real potential for mixing of CCR with soil to further increase any risk already associated with background.

Commenters are correct that mixing small quantities of CCR with soil may not result in a surface soil activity above the ARAR. For high-end CCR activity, this would require a roughly equal mixture of soil and ash. However, risks are still possible at activities below the ARAR. The PRG calculator estimates that an increase of only 1.13 pCi/g of the thorium-232 decay chain or 1.45 pCi/g of the uranium-238 decay chain in surface soils could increase cancer risk for residential receptors by 1×10^{-4}. Such risks can result from relatively low mixtures of CCR and soil, which are possible if ash beneath the soil surface is disturbed. As a result, EPA has identified ARAR of 5 pCi/g above background as equally applicable to subsurface contamination that may be disturbed in the future and concluded ''it would not generally be appropriate to allow backfilling with material with concentration higher than 5 pCi/g.'' Uncertainties associated with background concentrations are further discussed in Section 6 of the 2024 Risk Assessment.

Comment: One industry commenter presented an analysis they had conducted comparing the concentrations of certain inorganic constituents in CCR to soil screening levels. The commenter contended this analysis demonstrated that ''even daily direct contact to trace elements in coal ash would not pose a significant risk to human health.''

EPA Response: EPA did not evaluate the potential soil risks for human health associated with many of the constituents considered in the cited analysis. The Agency believes that any risk from additional constituents would be mitigated by the rule requirements that address the risks identified for radionuclides. However, EPA notes that the cited analysis is not sufficient to demonstrate a lack of risk for these additional constituents on a national scale. The ash concentrations reported for some constituents are already near or above the health benchmarks, indicating some potential for risk. Further, the reported ash concentrations are based on samples from a limited number of geographically constrained facilities. As a result, the reported concentrations may not reflect the broader variability of potential concentrations from across the region or country. In particular, EPA notes there is evidence in the regulatory record of arsenic concentrations approaching an order of magnitude higher than considered in this analysis.

Comment: Several commenters argued that EPA underestimated risk by not considering other potential exposure pathways, specifically inhalation of loose CCR.

EPA Response: EPA selected direct exposure gamma radiation and incidental ingestion of soil as the pathways for evaluation because these represent the most direct routes of exposure to contamination in the soil. EPA agrees that inhalation is another pathway through which future receptors could be exposed if CCR becomes intermixed with surface soil. Quantitative evaluation of this pathway would require additional model inputs that could further increase the uncertainty of results on a national scale, such as the degree of vegetative cover and mean wind speed. However, EPA notes the default PRGs for inhalation of the uranium-238 decay chain in secular equilibrium is nearly three orders of magnitude higher than for external exposure to gamma radiation and two orders of magnitude higher than for incidental ingestion of soil. As a result, it is unlikely consideration of this pathway would substantially increase calculated risk. Therefore, this pathway does not represent a major source of uncertainty in the evaluation. EPA acknowledges that there may be other exposure pathways that could occur if CCR is mixed with surface soil. These are further discussed in Section 6 of the 2024 Risk Assessment.

[21] Oak Ridge National Laboratory. 2014. ''Area Correction Factors for Contaminated Soil for Use in Risk And Dose Assessment Models.'' ORNL/TM–2013/00. Oak Ridge, TN. September.

[22] Oak Ridge National Laboratory. 2014. ''Gamma Shielding Factors for Soil Covered Contamination for Use in Risk and Dose Assessment Models.'' ORNL/TM–2013/00. Oak Ridge, TN. September.

[23] Oak Ridge National Laboratory. 2020. ''Bateman Equation Adaptation for Solving and Integrating Peak Activity into EPA ELCR and Dose Models.'' ORNL/TM–2020/1780. Oak Ridge, TN. September.

[24] U.S. EPA. 1998. ''Use of Soil Cleanup Criteria in 40 CFR part 192 as Remediation Goals for CERCLA Sites.'' OSWER Directive 9200.4–25. Office of Emergency and Remedial Response and Office of Radiation and Indoor Air. Washington, DC. February.

e. Comments Related to Site Monitoring Data

Comment: Some commenters stated that, as part of any further risk assessment efforts, EPA should incorporate data that have been collected as part of the monitoring programs required by either the 2015 CCR Rule or prior State programs. Such data might include site hydrogeology from borings around the units and groundwater quality sampled from monitoring wells. These commenters claimed these data are more recent and more relevant to characterizing the actual nature and extent of contaminant release at individual sites.

EPA Response: There are multiple reasons why it is neither practical nor prudent to incorporate site-specific monitoring data into national fate and transport modeling. First, there are documented concerns about the quality and reliability of these data. For example, EPA has identified significant deficiencies in the monitoring networks at each facility for which the Agency has completed reviews under the Part A (85 FR 53516, August 28, 2020) and Part B (85 FR 72506, November 12, 2020) Rules. It is unlikely such deficiencies are isolated to this specific subset of facilities. Monitoring wells that are located too far apart, installed in the wrong aquifer, or otherwise inadequately installed would result in data that are incomplete or unrepresentative of relevant site conditions. Thus, use of these data would require thorough review prior to use. Much of the site characterization data are not required to be posted on facility websites and so would take substantial time to compile and review for the over 1,000 individual landfills and surface impoundments. Further, it is highly unlikely that any identified deficiencies could be remedied within a reasonable timeframe.

Second, the hydrogeologic data that have been collected in support of well installation can provide an incomplete or erroneous picture of site conditions for the purpose of fate and transport modeling. For example, at sites with lower conductivity soils, EPA has previously raised concerns that collection of hydrogeologic data with a focus on characterizing the predominant soil type can underestimate the prevalence of more localized deposits of higher conductivity soil and other discontinuities that can serve as preferential flow pathways to groundwater. See, 85 FR 72519. Therefore, the current approach to probabilistic characterization of soil and aquifer characteristics using more local data sources is believed to provide the most reliable means to capture the potential variability of conditions across different facilities and represent contaminant fate and transport on a national scale. Furthermore, EPA notes that consideration of more site-specific data would not be expected to change the fact many units are known to be constructed on relatively permeable soils. As a result, further refinements on the hydrogeology modeled at each individual site is unlikely to alter overall model results, which show contaminants can escape from these units and spread considerable distances through groundwater.

Third, groundwater monitoring only provides a snapshot in time of groundwater concentrations at each well location. It is not obvious, nor do commenters articulate, how these data would be applied to model long-term unit leakage. Factors such as natural fluctuations in background groundwater concentrations make it difficult to apportion measured concentrations from individual sampling events into the specific contributions from background and unit leakage. That is why groundwater monitoring programs rely on statistical analysis of data across numerous sampling events to make a binary determination whether or not contaminant concentrations downgradient of a unit have increased above background and GWPS. Even if it were practical to utilize these monitoring data, groundwater samples do not provide broader information about the progression of leakage over time. Specifically, groundwater samples do not provide information on the magnitude of source leachate concentrations, how long the unit has been leaking, or any indication of the potential magnitude and extent of contamination in the future. EPA modeling previously showed that the magnitude and extent of a plume may not peak until decades or centuries after the unit first beings to leak. As a result, incorporation of groundwater monitoring samples into a model would require a number of additional assumptions about the site characteristics and conditions that could substantially increase the overall uncertainty of model results.

Finally, EPA is not aware of similar site-specific data available for the subset of smaller CCRMU intended for purposes other than disposal. As several commenters have acknowledged, facilities have not typically maintained reliable records of the locations of all these smaller units. Thus, any modeling of these units must, by necessity, draw on other datasets to characterize the potential for environmental release and subsequent contaminant fate and transport.

f. Comments Related to Additional Risk Drivers

Comment: Multiple commenters asserted that risks higher than those modeled in the 2014 Risk Assessment are unlikely for landfills. One commenter stated that the previous risks modeled for unlined landfills are ''only slightly above'' the point of departure at 2×10^{-5} and so, even if most CCRMU landfills are unlined, it would not result in risks higher than this value.

EPA Response: The national risks reported in the 2014 Risk Assessment were based on the understanding of relative liner prevalence at the time of that assessment. However, it has since become clear that an even greater proportion of regulated unit have no engineered liner and there is no evidence that CCRMU landfills are lined to any greater degree. Additionally, EPA notes that the 2014 Risk Assessment modeled both clay-lined and composite-lined units under the assumption of good construction practices that achieved the regulatory performance standard. However, it has become clear since then that some liner systems do not achieve this standard. For example, facility reporting shows that around 10% of regulated units with composite or alternate liners have already entered into corrective action. Therefore, even for those units that do have some form of engineered liner, there is potential for national risks to be higher than previously modeled. For all these reasons, national risks for both currently regulated and CCRMU landfills are only expected to be more similar to those previously modeled for unlined landfills. Furthermore, EPA has identified additional factors that have the potential to result in even higher risks than modeled, but that could not be fully quantified as part of either the 2014 or 2024 Risk Assessment. These include co-disposal with coal refuse and disposal in contact with the water table. The greater prevalence of unlined units makes it even more likely these additional factors will occur at unlined units. The combination of these factors has the potential to result in national risks even higher than previously modeled.

Comment: One commenter acknowledged that the 2014 Risk Assessment had demonstrated the potential for co-disposal with coal refuse to increase risk from surface impoundments. However, multiple others argued that the same assessment shows that neither co-disposal with coal refuse nor extreme pH conditions increase risks for landfills. Specifically, commenters pointed to one sensitivity analysis summarized in Table 5–6 of the 2014 Risk Assessment that concluded modeled risks did not exceed the point of departure for any subset of the modeled pH conditions. One commenter argued the Agency's conclusions are not based on actual observations of CCR porewater and groundwater quality at sites where coal refuse is managed. This commenter stated that not all units that accepted coal refuse will contain enough to affect the broader chemistry of the unit and not all coal refuse will contain enough pyrite to influence pH. This commenter further argued that, where acidic conditions and higher leachate concentrations do occur, it will not necessarily result in higher downgradient groundwater concentrations due to other site-specific factors. To support this argument, the commenter summarized findings from multiple EPRI reports that analyzed field samples from around several landfills and surface impoundments believed to have accepted coal refuse.

Response: These commenters misrepresent the findings of the referenced sensitivity analysis. This analysis represents a parsing of groundwater model runs conducted in 2014 as a function of leachate pH. This analysis incorporates model results for a substantial number of lined units, which can mask the effects of leachate pH due to the low overall leakage rates from these units. As such, this sensitivity analysis does not support any conclusions about the impacts of pH on risks from unlined units. Further, very few model runs were conducted at highly acidic pH; the sensitivity analysis did not summarize any results for a pH lower than around 4. Thus, this analysis also does not support any conclusions about the risks associated with highly acidic conditions.

Available LEAF leachate data used to model landfills show that many constituents, including arsenic, can leach at highest concentrations near one or both extremes of the pH scale. The effects of these higher concentrations are reflected in the sensitivity analysis, with higher risks observed around a highly basic pH of 13. Therefore, this sensitivity analysis is consistent with the broader risk record and shows that extreme pH conditions can result in higher risk.

The commenters are also incorrect that the risk record is not based on observations of CCR porewater. EPA relied on empirical measurements of porewater to support modeling of surface impoundments in 2014, which included samples co-disposed with coal refuse. As acknowledged by some commenters, these data supported identification of higher risks from these co-disposed wastes in impoundments. Corresponding pH data are not available for every porewater sample, but available data do show the potential for highly acidic pH around 1, roughly equivalent to stomach acid. The cited EPRI reports do not contradict the finding that co-disposal can affect CCR leaching behavior. As summarized by the commenter, these reports found that a third of units had impacts to unit pH and porewater chemistry. Individual units had potential or confirmed impacts on groundwater quality, causing at least one to trigger remedial measures by the facility. EPA further notes that these reports provide only a snapshot in time of the environmental impacts associated with disposal in this subset of disposal units. As a result, there remains potential for future releases beyond the waste boundary if these conditions persist.

Comment: Multiple commenters asserted that waste disposed below the water table would not result in higher risks from surface impoundments than previously modeled in the 2014 Risk Assessment. These commenters generally argued the hydraulic head present in an operating impoundment from ponded wastewater will result in greater leakage than groundwater flowing through a unit. One commenter presented a hypothetical comparison of the relative hydraulic flux from a unit due to ponded water, infiltrating precipitation, and contact with groundwater to argue that the presence of a ponded water would result in higher leakage. Others pointed to analyses from the 2014 Risk Assessment, which compared leakage from surface impoundments before and after dewatering, to argue that risks from impoundments remaining in groundwater would be lower. Others further argued that the lower hydraulic conductivity of some ash would limit flow through the impoundment and cause groundwater to preferentially flow around the unit.

Several commenters presented data from groundwater monitoring conducted at individual units to assert that risks are more likely to result from the hydraulic head in active impoundments than the intersection of waste with the water table. The presented data depict concentrations of boron, a highly soluble constituent that one commenter noted was selected for its ''insensitivity to redox conditions.'' These plots generally show concentrations of boron to decrease over time after the impoundments were taken out of service, though that pattern was not universal. Some commenters went further, concluding that eliminating the hydraulic head in the unit would allow any prior groundwater contamination to naturally attenuate. Conversely, other commenters pointed to a documented case study where groundwater concentrations increased after ponded water was drained to contend that contact with the water table can result in higher releases.[25]

EPA Response: A number of the commenters misconstrue the findings of the 2014 Risk Assessment, which did not include any assessment of the effects of CCR disposal within the water table. EPA was unable to quantitatively model the risks associated with this management practice because there was little data on how common the practice was or the extent to which it would affect groundwater chemistry. Instead, these commenters are referring to a comparison of the risks resulting from surface impoundments during operation and post-closure (*i.e.,* after free liquids had been eliminated consistent with § 257.102(d)(2)(i)) that was undertaken to understand if only modeling these units only during operation might underestimate peak risks. EPA only concluded that continued leakage after elimination of free liquids and closure would rarely result in higher peak risks. Thus, this assessment did not consider the effects of disposal below the water table or draw any conclusions about the risks associated with this practice.

When waste is managed above the water table, any leakage out of the unit must first infiltrate down through unsaturated subsurface soils and then mix with groundwater before it can flow beyond the waste boundary. As a result, downgradient groundwater concentrations can end up substantially lower than the original leachate concentration. In contrast, when waste is disposed below the water table, the entire volume of groundwater in contact with the CCR and all water infiltrating from above would become undiluted leachate. As the thickness of CCR below the water table increases, the volume of leachate generated can increase substantially based on the sheer size of these disposal units. There is no evidence the properties of CCR would reliably limit transport of this leachate away from the unit. Rather, the hydraulic gradient of the aquifer will continue to drive continued flow

[25] EPRI. 2001. ''Evaluation and Modeling of Cap Alternative at Three Unlined Coal Ash Impoundments.''

through the unit. The hydraulic conductivity of different CCR overlaps with that of common aquifer materials. Even in instances where the average conductivity within a unit is lower than the surrounding aquifer, these units often contain different ash types and other wastes. This can lead to stratification within the unit that creates regions of higher conductivity and allows for greater flow. For all these reasons, there is potential for sustained leakage from units when waste is disposed below the water table. Whether or not the magnitude of this continued leakage is greater than from water ponded in an impoundment does not address the potential for such leakage to cause a release or sustain one that began when water was still ponded in the unit. Such comparisons also ignore that the waste would also be in contact with groundwater while the unit operates, greatly increasing the likelihood of groundwater mounding around the impoundment and increased contaminant transport in all directions.

It is not feasible to draw conclusions based on the small and curated sample of units presented by commenters. Various factors can complicate any interpretation of the presented graphs. First, boron is a highly soluble constituent that can washout at high concentrations into small amounts of water. Thus, the extent to which decreases in concentration over timeframes of a long as a decade or more simply represent the depletion of this highly soluble constituent from the ash is unclear. Second, unit geometry may not be uniform and consistently intersect with the groundwater table, resulting in more spatially isolated releases that cause higher concentrations in some wells and not others. Third, at sites with intermittent contact with groundwater, predefined sampling dates may not align with periods when contact with groundwater occurs. Therefore, it is not possible to draw meaningful conclusions, either at these sites or more broadly, based on the data provided. As pointed out by other commenters, there are also examples available where sustained contract with groundwater after a unit is drained resulted in increased groundwater concentrations of other Appendix III constituents.

The fact that downgradient concentrations have decreased at some impoundments after the unit was drained despite ongoing contact with groundwater does not prove such reductions will be sustained or further groundwater releases will not occur. As one EPRI report concluded, ‘‘the existence of saturated ash will greatly reduce the effectiveness of any cap design when the facility is underlain by geologic materials with high hydraulic conductivity, because groundwater will continue to leach ash constituents.’’ [26] Thus, removal of ash from groundwater may be the only reliable means of source control for these units.

Comment: Several commenters agreed that use of porewater to represent leakage from impoundments is appropriate. However, these commenters also raised concerns that available porewater data collected during the active life of an impoundment may underestimate the risks associated with legacy impoundments because it may not accurately reflect leachate concentrations after the unit has ceased operation. As one example, they cited potential for reducing conditions to form through prolonged contact between waste and groundwater.

By contrast, one commenter asserted that elevated arsenic concentrations identified in the two journal articles EPA referenced in the proposal are only representative of that one site and that the majority of available impoundment porewater data have lower concentrations than reported in those articles.[27] [28] The commenter also noted the data presented in the journal articles were collected in support of an EPRI report, which found these concentrations had not translated to exceedances of GWPS in downgradient wells.[29] Based on this finding, the commenter concluded leachate concentrations alone are not a reliable indicator of which units will cause groundwater contamination due to variable site geochemistry and hydrogeology.

EPA Response: EPA agrees that porewater samples remain the best available data to represent leakage from operating surface impoundments. These field samples provide empirical data on leakage from various mixtures of CCR and other wastes managed under consistently saturated conditions. EPA also acknowledges there can be uncertainties associated with field data submitted to the Agency, which might lead to an underestimation of concentrations in the field. One example is the potential for stronger reducing conditions to form after a unit has been closed as a result of less oxygenated water infiltrating through the unit. As acknowledged by commenters, however, there is not sufficient data to characterize the magnitude or extent of such conditions on a national basis. Therefore, the impact of this uncertainty is not known.

EPA disagrees that the arsenic concentrations identified in the referenced studies should be considered an isolated occurrence. These studies clearly demonstrate that: (1) Sustained contact with groundwater can result in stronger reducing conditions than dry management, (2) Reducing conditions can cause higher leaching of arsenic, and (3) LEAF methods can underestimate actual leaching from CCR under reducing conditions by as much as an order of magnitude. Given that disposal beneath the water table is a more common practice than previously understood, there exists the real potential for higher leachate concentrations in the field than previously modeled, particularly at landfills modeled with LEAF data.

EPA does agree that initial leachate concentrations are not the sole determining factor for contaminant fate and transport. As discussed in response to previous comments, this fact is reflected in Agency modeling. Individual model runs with the highest leachate concentrations are not always those with the highest risk. However, factors that will tend to push the overall distribution of leachate concentrations higher will also tend to push modeled nationwide risks higher because of the greater likelihood that higher leachate concentrations will occur at sites where these concentrations can more readily spread. Thus, the greater prevalence of units in contact with groundwater has the potential to result in higher risks on a national scale than previously modeled.

Finally, EPA notes that groundwater monitoring only represents a snapshot in time and does not necessarily provide any indication of the potential for future contamination. In the case of the studied unit, it is not known whether reducing conditions formed during or after operation. As such, there remains potential for future releases if the unit remains in contact with groundwater

[26] EPRI. 2001. ‘‘Evaluation and Modeling of Cap Alternative at Three Unlined Coal Ash Impoundments.’’

[27] Wang, X., A.C. Garrabrants, Z. Chen, H.A. van der Sloot, K.G. Brown, Q. Qiu, R.C. Delapp, B. Hensel, and D.S. Kosson. 2022. ‘‘The Influence of Redox Conditions on Aqueous-Solid Partitioning of Arsenic and Selenium in a Closed Coal Ash Impoundment.’’ Journal of Hazardous Materials. 428:128255.

[28] Wang, X., H.A. van der Sloot, K.G. Brown, A.C. Garrabrants, Z. Chen, B. Hensel, and D.S. Kosson. 2022. ‘‘Application and Uncertainty of a Geochemical Speciation Model for Predicting Oxyanion Leaching from Coal Fly Ash under Different Controlling Mechanisms.’’ Journal of Hazardous Materials. 438:129518.

[29] EPRI. 2020. ‘‘Leaching, Geotechnical, and Hydrologic Characterization of Coal Combustion Products from a Closed Coal Ash Impoundment.’’

and continues to leak such elevated arsenic concentrations.

g. Comments Related to Complete Exposure Pathways

Comment: Multiple commenters asserted that EPA must demonstrate the existence of a complete exposure pathway to justify regulatory action, which some defined as exposures that have already occurred. Specifically, commenters stated that ''the presence of groundwater contamination alone does not constitute a risk'' and ''in many cases no one is drinking the water or contacting the CCR materials.'' One commenter presented a summary of analyses that had been conducted across 27 sites, which concluded that groundwater risks do not exist at most sites because no drinking water wells are currently present. Another commenter asserted that the high-end risks identified in the 2014 Risk Assessment assumed that receptors were exposed immediately downgradient of the disposal units. This commenter went on to state that complete exposures would not occur at the many sites adjacent to water bodies because groundwater contamination would be intercepted by surface water first and that the 2014 Risk Assessment found no risks warranting regulation for surface water. Several other commenters also claimed that groundwater quality should be measured at the facility boundary because that would be more representative of a complete exposure pathway.

EPA Response: Section 4004(a) of RCRA requires EPA to establish requirements that will ensure no reasonable probability of adverse effects both to human health *and* the environment. See, 42 U.S.C. 6944(a). EPA therefore disagrees that only the presence of receptors within the impact sphere of a contaminating facility merits consideration. EPA's longstanding and consistent policy (across numerous regulatory programs) has been that groundwater contamination is a significant concern that merits regulatory action in its own right, whether or not the aquifer is not currently used as a source of drinking water.

Once a potentially harmful constituent has leached from a disposal unit into groundwater, whether the constituent ultimately causes further damage by migrating into drinking water wells does not diminish the significance of the environmental damage caused to the groundwater under the site, even where it is only a potential future source of drinking water. As EPA explained in the preamble to the original 1979 subtitle D criteria, EPA is concerned with groundwater contamination even if the aquifer is not currently used as a source of drinking water. Sources of drinking water are finite, and future users' interests must also be protected. See, 44 FR 53445–53448. (''The Act and its legislative history clearly reflect Congressional intent that protection of groundwater is to be a prime concern of the criterion. . . . EPA believes that solid waste activities should not be allowed to contaminate underground drinking water sources to exceed established drinking water standards. Future users of the aquifer will not be protected unless such an approach is taken.''). See also, 80 FR 21453.

The commenters' approach is also inconsistent with Agency guidance, which states that a ''. . . pathway is complete if there is (1) a source or chemical release from a source, (2) an exposure point where contact can occur, and (3) an exposure route by which contact can occur.'' [30] The guidance goes on to state that ''. . . exposure assessments are concerned with current and future exposures.'' Thus, a key consideration in evaluating risk is the potential for future exposure. If it were necessary to wait for exposures to occur as a prerequisite for action, an untold number of receptors could be subject to potential harm. Further, implementation of corrective action is not instantaneous and so this harm could persist for some time after receptor exposures are first identified. Commenters do not explain how such delayed action could be considered protective of human health and the environment, and so meet RCRA's standard. See, *USWAG,* 901 F3d at 429–431.

Commenters also misrepresent the findings of the 2014 Risk Assessment regarding surface water interception. EPA modeled a distribution of distances for both groundwater wells and surface water bodies, accounting for interception whenever a water body was located closer than a well. Thus, reported high-end risks do not include any assumptions about the proximity of receptors to the units. Even if direct exposure to groundwater from use as a drinking water source is considered unlikely due to the potential for interception by nearby surface water, that does not justify no further action. EPA did identify the potential risks from individual disposal units to ecological receptors present in these water bodies and human receptors who fish from those water bodies, as well as associated damage cases, which is why constituents, such as cadmium and mercury, were added to the Appendix IV list of constituents. Additionally, surface water bodies are large and highly interconnected systems that are likely to have multiple electric utilities, as well any number of other industrial sources, located along their banks. If all these facilities were allowed to freely discharge to a water body solely because no individual release posed risk, the cumulative impacts can result in risk to surface water resources and nearby receptors. The 2015 CCR Rule addresses the potential for such risk by specifying corrective action must ''remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible.'' 40 CFR 257.97(b)(3). Thus, dilution of a groundwater plume into surface water could not be considered a presumptive remedy. This requirement is consistent with guidance for OLEM programs that specify the need to prevent groundwater contamination above GWPS from contaminating other aquifers or environmental media.[31]

EPA also disagrees that a point of compliance at the facility boundary would provide a better estimate of actual risk than the waste boundary. Again, the commenter disregards that the contamination of the aquifer is an adverse effect on the environment, not simply a potential risk to subsequent receptors. Consequently, the regulations require facilities to address the contamination at the first available point, that is, when it first leaves the unit. There are several additional reasons that the waste boundary is the appropriate point of compliance. First, a point of compliance at the facility boundary would result in greater potential for current residences or water bodies immediately adjacent to the facility boundary to be exposed before the presence of contamination can be confirmed. Second, the facility boundary may be a significant distance away from the waste boundary, which would allow contamination to increase and spread for some time before triggering corrective action. The further contamination is allowed to increase and spread, the more difficult it may become to clean it up due to factors such as complex contaminant chemistry and site hydrogeology. This may render

[30] U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A).'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response. Washington, DC. December.

[31] U.S. EPA. 2009. ''Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration.'' OSWER Directive 9283.1–33. Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. June.

large volumes of groundwater unusable for drinking water or other purposes. Finally, EPA has previously documented numerous instances where, once the contaminant plume has migrated off-site and impacted private water wells, a utility has purchased these properties, thereby rendering the off-site contamination, ''on-site,'' further delaying corrective action. See, 80 FR 21456. For all these reasons, EPA considers the waste boundary to provide the most consistent and protective basis on which to establish evidence of a release.

4. 2024 Final Risk Assessment

EPA identified risks to groundwater from active CCR landfills and surface impoundments, as well as to inactive CCR surface impoundments at active utilities in the 2014 Risk Assessment, which are now regulated under the 2015 CCR Rule. The results of EPA's further analyses in the final 2024 Supplemental Risk Analysis confirm that the findings on the risk from active units from the 2014 Risk Assessment are equally applicable to units that ceased receipt of waste prior to 2015 and either closed or became inactive. This final rule therefore relies upon the 2014 Risk Assessment, the additional data and analysis presented in the March 2023 proposal indicating that the legacy CCR surface impoundments and CCRMU would be expected to have risks even higher than previously modeled, and the 2024 Supplemental Risk Assessment. Each of these is discussed in turn below.

a. Summary of 2014 Risk Record

In the 2014 Risk Assessment EPA conducted a national-scale, probabilistic analysis that characterized potential risks to human and ecological receptors associated with leakage from CCR surface impoundments and landfills in operation at that time. A combination of models was used to predict fate and transport of contaminants through the environment, receptor exposures, and the resulting risks to human and ecological receptors. The specific exposure routes evaluated were: (1) Human inhalation of particulate matter blown from open management units, (2) Human ingestion of crops and livestock raised on nearby fields, (3) Human ingestion of groundwater used as a source of drinking water, (4) Human ingestion of fish caught from freshwater streams, and (5) Ecological contact with and ingestion of surface water and sediment. Site-specific data were used where available, supplemented by regional and national data to fill data gaps, to capture the variability of waste management practices, environmental conditions, and receptor behavior. EPA reported risks for both highly exposed individuals and more moderately exposed individuals. Risks to highly exposed individuals represent a reasonable maximum estimate that members of the general population might be exposed to, which were calculated as the 90th percentiles of all probabilistic model results. Risks to moderately exposed individuals represent a more typical estimate that members of the general population might be exposed to, which were calculated as the 50th percentiles of all probabilistic model results.

Under RCRA, EPA typically relies on a risk range to determine the point at which regulation is appropriate. This policy was first developed in the context of determining whether to regulate (or ''list'') wastes as hazardous under subtitle C of RCRA. See 80 FR 21449; 59 FR 66075–66077, December 22, 1994. However, over the years EPA has relied on this risk range more broadly to determine whether regulation is warranted under both subtitles C and D of RCRA. See 75 FR 35193 (''Although the statutory standards under subsections C and D differ, EPA has historically interpreted both statutory provisions to establish a comparable level of protection, corresponding to an acceptable risk level ranging between 1×10^{-4} and 1×10^{-6}.'').

Thus, to determine whether there is a reasonable probability of adverse effects on health or the environment from the disposal or other solid waste management of solid waste, EPA typically uses as an initial cancer risk ''level of concern'' a calculated risk level of 1×10^{-5} (one in one hundred thousand) or an HQ above 1.0 for any noncarcinogenic risks. See, 80 FR 21,449. For example, wastestreams or activities for which the calculated high end individual cancer-risk level is 1×10^{-5} or higher generally are considered candidates for regulation. Wastestreams or activities with risks calculated to be 1×10^{-4} (one in ten thousand) or higher generally will be considered to pose a reasonable probability of adverse effects on health or the environment and generally will be regulated. Wastestreams or activities for which these risks are calculated to be 1×10^{-6} (one in one million) or lower, and lower than 1.0 HQ or environmental risk quotients for any noncarcinogens, generally will be considered not to pose a reasonable probability of adverse effects on health or the environment, and generally will not be regulated. Id.

EPA first evaluated national-scale risks in the 2014 Risk Assessment, which provides a snapshot in time of potential risks across the country. This was accomplished by weighting risks from individual management practices in proportion to the anticipated prevalence of those practices. National-scale risks provide important context as to whether risks are a systemic issue that warrant national regulations or are limited in scope and better addressed through more targeted actions. The Agency's evaluation found that the management practices that EPA believed were generally in use in 2014 at surface impoundments and landfills were likely to pose risks to human health through groundwater exposure within the range that EPA typically considers warrants regulation. For highly exposed individuals, the cancer risks from arsenic due to the operation of surface impoundments were as high as 2×10^{-4}, while noncancer risks were as high as an HQ of 5 for arsenic, 2 for lithium, and 2 for molybdenum. Cancer risks associated with the operation of landfills were estimated to be as high as 5×10^{-6} from the ingestion of arsenic-contaminated drinking water. In contrast, all risks for moderately exposed individuals fell below EPA's risk range. This was largely attributed to the fact that many facilities are located next to major water bodies and so contaminant plumes were frequently intercepted by these water bodies before they could reach private wells.

EPA next evaluated the risks associated with individual management practices at surface impoundments and landfills. This was accomplished by filtering the national-scale model runs to focus only on those that included the practice of interest and using the filtered set of runs to calculate risks associated with that specific practice. These individual risks provide important context about the range of contaminants and practices that could pose risk at individual sites. The Agency's evaluation identified two specific management practices that could lead to risks higher than those identified in the national risk estimates.

The first practice EPA evaluated was the disposal of CCR in unlined and clay-lined units. Management in unlined surface impoundments resulted in cancer risks for arsenic up to 3×10^{-4}, as well as noncancer risks for lithium up to an HQ of 3, molybdenum up to an HQ of 4, and thallium up to an HQ of 2. Management in unlined landfills resulted in cancer risks for arsenic up to 2×10^{-5}. The larger increase in arsenic risks identified for unlined landfills above those for national-scale landfills (2×10^{-5} vs. 5×10^{-6}) compared to unlined and national-scale impoundments (3×10^{-4} vs. 2×10^{-4}) is because a larger proportion of landfills nationwide were initially modeled as having a liner. Since promulgation of the 2015 CCR Rule, it has become clear that more units are unlined than originally estimated. Thus, it is anticipated that national-scale risks for landfills would actually be closer to those for unlined landfills (2×10^{-5}), rather than the lower nation-wide estimates reported in the 2014 Risk Assessment.

Although clay-lined units tended to have lower risks than unlined units, they still had potential to result in risks within the range that EPA considers for regulation under RCRA. Management in clay-lined impoundments with a liner thickness of three feet resulted in cancer risks for arsenic of up to 7×10^{-6} and noncancer risks for lithium up to an HQ of 2, while management in similarly unlined landfills resulted in cancer risks for arsenic up to the 1×10^{-5}. The larger increase in arsenic risks for unlined impoundments above those for clay-lined impoundments (1×10^{-5} vs. 7×10^{-6}) compared to unlined and clay-lined landfills (2×10^{-5} vs. 1×10^{-5}) is because the layer of low conductivity clay counteracts the hydraulic head in impoundments that would otherwise freely drive greater volumes of leachate into the subsurface.[32] In contrast, leachate generation in both types of landfills is limited far more by the rate of precipitation. As a result, EPA further considered how reducing the modeled clay liner thickness of impoundments to the minimum allowable standard of two feet would affect arsenic risk and found it would increase to as high as 2×10^{-5}.

The second practice evaluated was the management of wastes with an extreme pH. In particular, empirical porewater data revealed that co-disposal of CCR with other wastes in surface impoundments had the potential to result in a highly acidic pH, cancer risks for arsenic up to 1×10^{-3}, and noncancer risks for cobalt and mercury up to an HQ of 13 and 5, respectively. Laboratory leaching test data also indicated that highly acidic and basic CCR wastes have the potential to leach similarly high arsenic concentrations, up to an order of magnitude higher than under more neutral conditions. Only a small number of previous landfill model runs considered acidic conditions based on the information available about conditions in active units; identified risks for these units were driven by more basic conditions. Thus, to the extent that conditions at either extreme of the pH scale are more prevalent than previously estimated, it is likely that overall risks from disposal in both surface impoundments and landfills would be even higher than modeled.

EPA acknowledged in the 2014 Risk Assessment that there were some additional management practices that could result in higher risk at individual sites, but that could not be quantitatively modeled with the data available at the time. One specific example provided was of CCR disposal below the water table. 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. Because EPA could not quantitatively model these management practices (and because the Agency had no information to indicate that it was a current, widespread management practice), EPA noted only that, based on its review of damage cases, the damage from the placement of CCR in sand and gravel pits was almost always associated with CCR being placed in contact with water, which indicated that the placement of CCR in contact with water can lead to higher risks than from dry disposal. 80 FR 21352. EPA further explained that ''in this situation, the sorption that occurs in the unsaturated zone of the risk assessment model does not occur in the field. This and other site-specific risk factors could lead to additional contamination beyond what was modeled nationwide.'' 2014 Risk Assessment at pages 5–48. As a consequence, EPA specifically included sand and gravel pits that received CCR in the definition of CCR landfills covered by the regulations. 80 FR 21354.

The above model results from the 2014 Risk Assessment are equally applicable to legacy CCR surface impoundments and CCRMU. Many of these unregulated units are similarly constructed, manage the same types of ash, and are frequently located either at the same or nearby facilities as their regulated counterparts. In particular, some unregulated units are known to be located directly adjacent to or beneath currently regulated units. The fact that some of these unregulated units no longer contain water ponded above the ash surface or have installed some form of cover system does not meaningfully distinguish the long-term risks of these units from those previously modeled. This is because all landfills and surface impoundments progress through similar lifecycle stages. Progression toward closure does not remediate any releases that occurred during operation of the unit. Furthermore, if a unit is not closed with an effective cover system or remains in contact with the groundwater table, the higher rates of leakage that can result could sustain releases long after the unit has ceased operation. It is expected that legacy impoundments and CCRMU have been present for longer than currently operating units and so would have had more time to leak. As a result, previous and ongoing releases from these units have the potential to be greater and to have migrated further than those from the currently regulated universe of units.

The risks associated with legacy impoundments and CCRMU may be even higher than EPA modeled on a national scale in the 2014 Risk Assessment. The 2014 Risk Assessment aimed to provide a static snapshot of waste management practices at that time based on the available data. As such, it did not reflect the greater prevalence of some practices at older closed and inactive units based on the understanding those practices had declined over time. Nor did it reflect some ongoing practices for which there was not enough data to characterize prevalence on a national scale. The Agency is now aware of several practices that are more common than were modeled in 2014 and have the potential to result in higher leakage. However, because the 2014 Risk Assessment identified baseline risks that warrant regulation, the national risk record does not depend on the greater prevalence of these practices to justify the need for regulation of closed and inactive units. Instead, the potential for even higher risk from these practices at individual units, which are discussed below, only reinforces the basis for regulation.

First, a greater number of units lack an adequate liner system than EPA previously understood. For example, in the 2014 Risk Assessment, EPA estimated that 65% of impoundments had no engineered liner (*i.e.,* do not meet the regulatory standard for either a clay or composite liner) based on surveys conducted by EPA between 2009 and 2010 (''EPA Surveys'').[33] It has since become clear that even fewer impoundments are actually lined. EPA's review of available liner demonstration documents posted on facilities' CCR websites indicates closer to 83% of impoundments have no engineered liner. Similar reporting is not available

[32] The somewhat higher risks identified for clay-lined landfills compared to similarly lined impoundments are likely related to site-specific conditions, such as where in the country these units are located.

[33] U.S. EPA. 2014. ''Human and Ecological Risk Assessment of Coal Combustion Residuals.'' RIN 2050–AE81. Office of Solid Waste and Emergency Response. Washington, DC. December.

on the liner prevalence for older units. However, EPA is also not aware of any evidence that these older units have been lined at higher rates, particularly those constructed prior to the promulgation of minimum standards for disposal in RCRA subtitle D landfills in 1991. See, 40 CFR part 257, subpart A and part 258. Indeed, most coal-fired utilities in the United States were constructed before 1990.[34] Even when units do report having an engineered liner, they may not perform as well as previously modeled. The 2014 Risk Assessment modeled both clay and composite liners based on the presumption both would achieve regulatory performance standards. Yet, facility reports show that around 10% of landfills and surface impoundments with a composite liner have already entered into corrective action. Thus, many units previously modeled as lined are now believed to either have no engineered liner or to perform more like an unlined unit. For these reasons, EPA anticipates that national risks for both currently regulated units and those newly covered under this rulemaking will be closer to those previously modeled for unlined units. For landfills, this could increase national risks by up to an order of magnitude, as high as 2×10^{-5} for arsenic. That risk is twice the level that EPA typically considers for regulation and is the same level of risk as those associated with the clay-lined CCR surface impoundments that the D.C. Circuit required to close.

Second, a greater number of older units co-disposed CCR with the wastes generated from coal preparation activities, collectively referred to as ''coal refuse.'' These activities may have included coal handling by conveyor systems, coal washing for removing mineral matter, and coal ''sizing'' to reduce the average particle size of coal. Co-disposal with coal refuse can have a pronounced effect on the leaching behavior of CCR because of the potential for the refuse to make the overall waste pH far more acidic. Available Leaching Environmental Assessment Framework (LEAF) leaching data considered in the 2014 Risk Assessment show that multiple Appendix IV constituents are most soluble under extreme pH conditions and thus able to leak at higher rates. EPA found modeled risks are highest when CCR was disposed in surface impoundments with coal refuse. The modeled cancer risks for the co-disposal of ash and coal refuse in surface impoundments ranged between 1×10^{-3} for trivalent arsenic to 4×10^{-4} for pentavalent arsenic. Non-cancer risks were similarly high, ranging between and an HQ of 13 for cobalt and HQ of 14 for pentavalent arsenic to 26 for trivalent arsenic, based on the ingestion of contaminated drinking water.

The practice of co-disposal with coal refuse has declined over time. A survey conducted by Electric Power Research Institute (EPRI) in 1995 showed 34% of unlined landfills and 68% of unlined surface impoundments actively managed CCR with coal refuse.[35] In contrast, EPA Surveys indicated that, by 2014 this management practice had declined to around 5% of active units. EPA's 2014 national-scale modeling was based on the 5% reported in the EPA Surveys, and as a consequence, this practice had minimal influence on the overall nationwide risk estimates in the 2014 Risk Assessment. However, it is clear from the EPRI data that management of CCR with coal refuse used to be far more common prior to 1995. Of the 283 disposal units that were previously excluded from the 2014 Risk Assessment and that reported a start year in the EPA Surveys, around 91% had already begun operation by 1995. Therefore, the risks associated with these older disposal units are likely to be higher than the national scale risks reported in the 2014 Risk Assessment.

Finally, it has become apparent since promulgation of the 2015 CCR Rule that the practice of disposing of CCR below the water table is more common than EPA previously understood. EPA was aware of this practice in 2014 and raised it as an uncertainty in the risk assessment, but had little information about the frequency of this practice. EPA's review of the location restriction demonstrations posted on facilities' CCR websites found that approximately 31% of active CCR surface impoundments had waste below the water table. Similar statistics are not currently available for landfills, though it is clear from previously identified damage cases that this practice is not unique to impoundments. Nor is EPA aware of any evidence that would indicate older units are less likely on the whole to have been constructed within the water table. EPA was unable to model the effects of disposal in the water table in 2014 due to constraints on data availability and modeling capabilities.

Disposal beneath the water table, either continuously or intermittently, will result in conditions that mirror those previously found to drive risk from active surface impoundments. Specifically, saturation of disposed CCR provides a larger reservoir of leachate and the hydraulic gradient across the aquifer maintains a hydraulic head that serves to drive this leachate away from the unit. The implications for landfills are particularly significant, as the potential for greater contaminant transport from these units can result in higher risks to groundwater than previously modeled under dry conditions. Further, because these landfills leak directly to groundwater, there is potential for these risks to remain long after the unit has ceased operation. This is equally true for impoundments. Even if the hydraulic head within the aquifer is not as great as from ponded water, it can still sustain higher rates of leakage than if the unit were fully dewatered. As a result, removal of the saturated ash may be the only reliable means to control the source of contamination.

Since promulgation of the 2015 CCR Rule, EPA has identified evidence of another way in which disposal below the water table could result in greater risk. This disposal practice has the potential to alter groundwater chemistry in ways that increase either the solubility or mobility of some CCR contaminants. This is due to the residual, unburnt organic matter in CCR serving as a carbon source (*i.e.,* substrate, electron donor) for bacteria in the soil. Bacteria preferentially use any dissolved oxygen (O_2) for oxidation of organic matter (*i.e.,* electron transfer from the organic matter to oxygen) because this yields the greatest energy returns for the bacteria. With a sufficient source of biodegradable organic matter, bacterial consumption of oxygen can outpace replenishment of dissolved oxygen that occurs through diffusion from the atmosphere and infiltration of precipitation. Depletion of oxygen is more likely to occur in saturated soils because the constant presence of water allows biological activity to proceed unimpeded by periods of drying, the relatively slow flow rate of groundwater does not transport dissolved oxygen from the upgradient side of the unit fast enough to outpace consumption across the footprint of the unit, and sustained saturation of the soil limits oxygen exchange with the atmosphere. In the absence of oxygen, bacteria will instead use nitrate, manganese, iron, sulfate, and other compounds for reduction of organic matter (*i.e.,* electron transfer to

[34] United States Energy Information Administration. 2017. ''Most Coal Plants in the United States were Built Before 1990.'' Accessed online at: *https://www.eia.gov/todayinenergy/detail.php?id=30812.*

[35] EPRI. 1997. ''Coal Combustion By-Products and Low-Volume Wastes Comanagement Survey.'' Palo Alto, CA. June.

organic matter from other compounds). Such reducing conditions will not affect all constituents equally, serving to mobilize some and immobilize others. However, reducing conditions can mobilize arsenic, the primary source of risks identified in the 2014 Risk Assessment.

Research conducted since the 2014 Risk Assessment has better documented the potential effects of disposal below the water table on leakage from CCR units. Studies published in 2022 examined, among other things, the degree to which environmental conditions can differ within the same closed impoundment, both above and below the water table.[36 37] Specifically, arsenic concentrations measured in the water intermingled with CCR beneath the water table were as high as 4,100 mg/L due to the presence of reducing conditions and a near neutral pH of 8. That concentration is substantially higher than 20 mg/L, measured from the same ash with LEAF Method 1313 at a similar pH, or 780 mg/L, which is the 90th percentile of all impoundment porewater measurements previously compiled by EPA. This indicates that the porewater and LEAF data relied on the 2014 Risk Assessment may significantly underestimate the magnitude of leakage from CCR units under reducing conditions.

The extent to which the porewater data EPA used to model surface impoundments in 2014 reflect strong reducing conditions is not known, as this information was not commonly reported. Such conditions might occur during operation as a result of sustained saturation or might evolve after an impoundment has been drained of ponded water and capped, thereby decreasing mixing of oxygen within the unit. However, it is known that the LEAF data used to model landfills does not reflect reducing conditions. All standardized leaching tests tend to reflect oxidizing conditions due to contact between the sample and the atmosphere during sample collection and laboratory analysis. As such, it has since been recognized that further analysis of leachate data with geochemical speciation models may be warranted when field conditions diverge from those present in the laboratory setting (*e.g.,* reducing conditions).[38] Therefore, there is clear potential for significantly higher leachate concentrations than modeled if a landfill is in contact with groundwater.

b. 2024 Risk Assessment and Results

As noted above, a number of commenters argued the 2014 Risk Assessment does not adequately capture various factors associated with legacy impoundments and CCRMU that the commenters believe will result in significantly different risks than those posed by currently regulated units. In response, EPA prepared a supplemental risk assessment to determine the potential for some of these factors to affect national risks (''2023 Draft Risk Assessment''). EPA began by reviewing available information about the characteristics and locations of legacy impoundments and CCRMU to determine whether there was any potential for the risks from these units to be meaningfully different from currently regulated units. This included a review of groundwater model results previously excluded from the 2014 Risk Assessment because the units were ultimately not covered by the 2015 CCR Rule.

As part of this review, EPA grouped legacy impoundments and CCRMU disposal units into different categories based on unit type: (1) Historical and inactive landfills and (2) Historical and legacy impoundments. The 2024 Risk Assessment defines historical units as those that have steps taken toward closure, but that may or may not meet all the requirements of § 257.102(d). Additionally, EPA further considered the influence of unit size on risk and conducted additional modeling for the subset of CCRMU that is smallest in size, those used as fill or for similar purposes (hereafter ''CCRMU fills''). Because facilities have not historically regarded such placement as disposal units or necessarily maintained associated records, EPA believes there is potential for exposures different than those previously considered for landfills and surface impoundments. Specifically, EPA evaluated the potential for risk from onsite exposure to contaminated groundwater or CCR accumulations in the soil under a future residential land use scenario.

i. Problem Formulation

EPA first developed conceptual models to illustrate a generalized layout of legacy impoundments and CCRMU, the different pathways through which constituents may be released from CCR and migrate through the environment, and the risks to human health and the environment that could result. The conceptual models for landfills and impoundments were the same as used in the 2014 Risk Assessment/EPA determined that a second model was warranted for CCRMU because some smaller placements have not historically been regarded as disposal by facilities and so have not been reliably tracked or maintained over time. These smaller placements may be disturbed after land use changes, which can result in additional release pathways. Therefore, EPA prepared a second conceptual model for smaller units (*i.e.,* CCRMU fills). These conceptual models provide the basis for subsequent modeling efforts.

When CCR are placed on the ground for any purpose, they may leach metals and other inorganic contaminants to groundwater. Once mixed with groundwater, contamination may migrate downgradient to private wells where it is ingested by receptors who rely on groundwater as their primary source of drinking water. But a receptor does not need to be presently exposed for there to be a reasonable probability of adverse effects on health or the environment. EPA evaluated this exposure pathway in the 2014 Risk Assessment and identified a set of constituents most likely to pose risk to offsite receptors living up to a mile away. The 2024 assessment builds on those model results and identifies arsenic, lithium, molybdenum, and thallium as constituents that warranted further evaluation. These are the constituents found in the 2014 Risk Assessment to pose the greatest risk for unlined surface impoundments and have the greatest demonstrated potential to spread and pose risk on a national scale. These 2014 model results therefore also provide a reasonable screen to identify the most likely risk drivers for receptors living even closer to these types of units.

When CCR is placed in fills and left unmonitored, the ash can be disturbed in the future when land use changes. In the absence of records of the presence of CCR, and in the absence of inspection and maintenance, any engineering controls currently present that might serve to limit exposure cannot reasonably be assumed to remain in place in perpetuity. For this reason, EPA

[36] Wang, X., A.C. Garrabrants, Z. Chen, H.A. van der Sloot, K.G. Brown, Q. Qiu, R.C. Delapp, B. Hensel, and D.S. Kosson. 2022. ''The Influence of Redox Conditions on Aqueous-Solid Partitioning of Arsenic and Selenium in a Closed Coal Ash Impoundment.'' Journal of Hazardous Materials. 428:128255.

[37] Wang, X, H.A. van der Sloot, K.G. Brown, A.C. Garrabrants, Z. Chen, B. Hensel, and D.S. Kosson. 2022. ''Application and Uncertainty of a Geochemical Speciation Model for Predicting Oxyanion Leaching from Coal Fly Ash under Different Controlling Mechanisms.'' Journal of Hazardous Materials. 438:129518.

[38] U.S. EPA. 2019. ''Leaching Environmental Assessment Framework (LEAF) How-To Guide: Understanding the LEAF Approach and How and When to Use It.'' Office of Land and Emergency Management. Washington, DC. May.

considered the potential for additional exposure pathways that could occur under a future residential land use scenario. The 2014 Risk Assessment did not evaluate risks from direct placement of CCR in the soil. However, EPA previously identified radium as a constituent of concern in the 2015 CCR Rule and included two radioisotopes on the Appendix IV list for groundwater monitoring, radium-226 and radium-228. These radioisotopes are part of larger, naturally occurring decay chains that begin with uranium-238 and thorium-232, respectively. Even if some form of cover remains over the ash, future receptors who live on or around a fill may be exposed to radiation through direct exposure to gamma radiation or inhalation of radon gas. Therefore, EPA considered potential for exposure to the full decay chains of these radium isotopes as the primary risk driver for this pathway.

ii. Disposal Unit Groundwater Risk

All disposal units pass through the same lifecycle stages, ranging from initial construction to final closure. As a result, there is potential for historical and inactive disposal units to result in the same types of environmental releases as currently regulated units over the course of their lifecycle. The fact some historical and inactive units may have since drained ponded wastewater or installed some form of cover system does nothing to remediate any prior releases. EPA conducted a review of the available data on these historical and inactive units to understand whether the associated risks would be expected to differ from those previously modeled for regulated units.

The 2014 Risk Assessment modeled risks for a total of 122 landfills and 163 impoundments that were ultimately excluded from the final summary of national risks because it was determined that these units fell outside the scope of the 2015 CCR Rule. These units were excluded because they were anticipated to cease receipt of waste prior to the effective date of the rule. Therefore, model results for these previously excluded units directly address the historical and inactive units subject to the current rulemaking. EPA reviewed model results for these previously excluded units to better understand whether the associated risks were any different from those of currently regulated units. For highly exposed individuals, landfills were estimated to pose cancer risks as high as 7×10^{-6} from arsenic III, while surface impoundments were estimated to pose cancer risks as high as 8×10^{-5} from arsenic III and noncancer HQs as high as 2 for arsenic III, 2 for lithium, and 1 for molybdenum.

Differences between these risks and those for currently regulated units are attributed primarily to differences in the prevalence of engineered liners modeled for the two sets of units. The previously excluded units were modeled as having no engineered liner at 71% of landfills and 57% of impoundments, compared to 42% of landfills and 65% of impoundments for currently regulated units. For unlined units, the arsenic III risk from previously excluded units was 1×10^{-5} for landfills and 2×10^{-4} for surface impoundments, while corresponding risk from regulated units were 2×10^{-5} for landfills and 3×10^{-4} for surface impoundments. Since all of this modeling was completed in 2014, it has been discovered through facility reporting that a greater percentage of regulated units has no engineered liner than EPA previously modeled. For example, in the 2014 Risk Assessment, EPA estimated that 65% of impoundments had no engineered liner based on the EPA Surveys.[39] It has since become clear that even fewer impoundments are actually lined. EPA's review of available liner demonstration documents posted on facilities' CCR websites indicates closer to 83% of have no engineered liner. EPA has seen no evidence that would indicate older historical and inactive units would be lined at any greater frequency. Thus, EPA concludes that the national risks for regulated and previously excluded units will fall closer to those modeled for unlined units.

EPA reviewed available data on facility location to understand whether environmental conditions (*e.g.,* precipitation, soil type) at inactive and active facilities could be substantially different than previously modeled. Such conditions can affect the rate of leakage from a unit and subsequent transport of that leachate through the subsurface. This review found that around 80% of the active and inactive facilities that were not subject to the 2015 CCR Rule had already been modeled as part of the 2014 Risk Assessment and so are already reflected in the risk results for those previously excluded units. The remaining 20% of facilities are located an average distance of 26 miles from the nearest modeled facility. Therefore, EPA concludes that the 2014 Risk Assessment adequately captures the effects of facility location on national risk.

[39] U.S. EPA. 2014. ''Human and Ecological Risk Assessment of Coal Combustion Residuals.'' RIN 2050–AE81. Office of Solid Waste and Emergency Response. Washington, DC. December.

Commenters stated that the smaller size of historical and inactive disposal units would result in lower volumes of leakage and could not sustain plumes of the same magnitude as from larger regulated units. EPA reviewed data from the EPA Surveys to determine whether the sizes of previously excluded units are substantially different than EPA modeled for currently regulated units. This comparison indicates that excluded units do tend to be somewhat smaller. The average size modeled for excluded units was 77 acres for landfills and 28 acres for impoundments. The average size modeled for regulated units was 107 acres for landfills and 47 acres for impoundments. Despite these differences, there remains a great deal of overlap in the range of sizes for both sets of units. Further, as described above, similar risks were identified for both sets of units. Thus, there is no indication that size differences of this magnitude have any notable effect on national risk. Nor is there any information available about the units not captured in the EPA Surveys that would indicate these remaining units are significantly smaller. Therefore, EPA concludes that the 2014 Risk Assessment adequately captures the effects of unit size on national risk.

iii. CCRMU Fill Groundwater Risk

EPA conducted national-scale modeling of CCRMU fills to understand the potential groundwater risks that could result from these smaller placements of CCR. The exposure route evaluated for was human ingestion of groundwater used as a source of drinking water. The evaluation incorporated many of the same data sources used in the 2014 Risk Assessment to characterize the variability of site conditions. Two models were used to evaluate contaminant fate and transport, EPACMTP and MODFLOW–USG. EPACMTP was run first at specified distances along the centerline of the plume to understand the potential for releases to occur and spread further downgradient. MODFLOW–USG was then run for a subset of the conditions to understand the broader magnitude and extent of these plumes.

Groundwater concentrations modeled with EPACMTP at the waste boundary were first compared to respective GWPS to understand the potential for fills to impact groundwater quality to an extent that would trigger corrective action at regulated landfills. The 90th percentile concentrations exceeded GWPS by factors of 26 for arsenic III, 19 for arsenic V, 156 for molybdenum, and 19 for thallium. The 50th percentile concentrations exceeded GWPS by a factor of two for molybdenum. Based on these results, EPA finds that CCRMU fills can meaningfully contribute to groundwater contamination across a facility.

Groundwater concentrations modeled with EPACMTP at 500 and 1,000 feet away from the waste boundary were used calculate risks to individual RME receptors exposed to these concentrations. The 90th percentile concentration of each modeled constituent exceeded at least one risk benchmark at 1,000 feet. This indicates potential for leakage from fills to spread at environmentally significant concentrations. However, because these model runs represent concentrations at a fixed location, they do not provide broader information about the magnitude and extent of the plume. As a result, EPA does not rely primarily on these results to draw direct conclusions about overall risk. Instead, the Agency retained a subset of these model runs for both arsenic V and molybdenum from around the 90th percentile concentrations modeled at 1,000 ft. EPA selected pentavalent arsenic because it is the less mobile species and so provides a reasonable bounding on the high-end concentrations that can result for this contaminant. These runs were retained for further modeling with MODFLOW–USG to characterize the full magnitude and extent of each plume over time.

The MODFLOW–USG runs were designed with the same inputs as corresponding EPAMCTP runs. Altogether, these model runs reflect a range of conditions that collectively resulted in high-end groundwater concentrations 1,000 feet from the fill. These corresponding placements of CCR range from around 3,500 to 70,000 tons placed over areas between 0.15 to 2.0 acres. EPA calculated the midpoint across these runs to define values representative of the 90th percentile model runs. For arsenic V, the model identified a peak risk of 1×10^{-4} averaged over 32 million gallons (Mgal) of groundwater and a peak volume of 147 Mgal with an average risk of 7×10^{-5}. The same leakage of arsenic V would result in a peak GWPS exceedance of three averaged over a plume volume of 1.2 Mgal and a peak plume volume of 8 Mgal with an average exceedance of 2 times GWPS. It would take around 2,300 years from the time of first exceedance for the plume to fully dissipate. For molybdenum, the peak exceedance of both risk benchmark and GWPS was 10 averaged over a plume volume of 27 Mgal and a peak plume volume of 80 Mgal with an average exceedance of 4 times GWPS. It would take around 100 years from the time of first exceedance for the plume to fully dissipate. Plumes of these size and duration could readily sustain exposures for typical residential receptors that are anticipated to use around 80 gallons of water a day for all indoor household needs, resulting in less than 0.8 Mgal of use over 26 years of exposure.

iv. CCRMU Fill Soil Risk

EPA modeled of CCRMU fills to understand the potential risks that could result from CCR present in the soil. Exposure routes initially considered for evaluation were human inhalation of radon gas and direct exposure to gamma radiation emitted from the CCR. However, based on a preliminary review of available data, EPA determined that radon emanation from CCR (*i.e.,* fraction of radon able to escape into the surrounding air) is generally lower than from most soils. Despite the higher overall activity of CCR, the resulting radon emanation from the ash is not distinguishable from that of most surface soils. Therefore, EPA did not retain exposure to radon for further consideration.

Modeling of exposure to gamma radiation was conducted with the EPA PRG calculator. EPA evaluated the potential for direct exposure to gamma radiation from CCR under a soil cover ranging in thickness from 60 to 20 cm (2 to 0.66 feet). EPA compared the combined activity of the uranium-238 and thorium-232 decay chains in the CCR to the health benchmarks for each cover thickness to calculate the risks that could result from receptors living on or near the fill. Both 90th and 50th percentile activities have potential to result in cancer risks at or above 1×10^{-5} with a cover of 40 cm. The 90th percentile activity resulted in a cancer risk of 1×10^{-4} with a cover of 20 cm. This indicated the potential for even higher risk if the cover were to be disturbed and the CCR brought to the ground surface. However, evaluation of this scenario would require additional assumptions about the degree of mixing, which could be a major source of uncertainty on a national scale. Therefore, EPA retained this scenario for further consideration as part of a separate sensitivity analysis.

v. Uncertainty and Sensitivity Analyses

EPA reviewed the models used, as well as the data and assumptions input into the models, to better understand the potential sources of uncertainty inherent in the model results. The Agency qualitatively and, to the extent possible, quantitatively analyzed these sources to understand the potential effects each may have on modeled risks. EPA also conducted further sensitivity analyses to understand how the modeled national risks vary in response to changes in sensitive parameters and to evaluate the potential for risks through exposure pathways that could not be fully modeled on a national scale.

The major source of uncertainty identified for the groundwater model is the potential for greater risk from multiple units located in close proximity. The EPA Surveys did not provide information on the relative location or orientation of different landfills and impoundments at any given facility and so the 2014 Risk Assessment modeled risks from each unit individually. However, the Agency is now aware of many instances where multiple units are located directly adjacent to one another, resulting in a larger total area over which leakage can occur. This could result in greater cumulative risk to offsite receptors than predicted based on contributions from each individual unit. Furthermore, there is potential for legacy impoundments and CCRMU (disposal units and fill) to confound groundwater monitoring programs when located upgradient of a regulated unit. Ongoing leakage from these unregulated units has the potential to skew the characterization of background groundwater quality. Under these circumstances, any leakage from a regulated unit would need to progress even further and faster to be distinguishable from that skewed background. This could delay or entirely prevent a regulated unit from entering into corrective action, resulting in risk to downgradient receptors.

EPA conducted a sensitivity analysis to determine whether there is a unit size below which adverse impacts to groundwater quality are unlikely and monitoring is not warranted. This analysis found exceedances of GWPS are possible for placements below 1,000 tons. Thus, such placements can meaningfully contribute to groundwater contamination at these facilities. It was not possible to identify a limit much lower than this tonnage because of the few model runs conducted at smaller amounts. Extrapolation beyond available model runs could introduce a great deal of uncertainty into any specific limit identified. The extent to which any identified limit could shift higher or lower in response to further modeling around these lowest tonnages is not known. Therefore, the Agency could not identify a lower limit based on the current modeling.

EPA conducted further sensitivity analyses to better characterize the risks to human health that may result from mixing of CCR with the soil. There is little data available to predict the likelihood of different degrees of mixing that could occur across the country. Instead, EPA considered the incremental contributions from CCR through increased mixing with soil to identify the point at which accumulation would raise concern. This analysis focused on radionuclides previously identified as potential risk drivers for soil, but also considered contributions from arsenic that may further contribute to cancer risk. The exposure pathways considered were incidental ingestion of the CCR and soil mixture and direct exposure to gamma radiation. For radionuclides, cancer risks above $1 \times {}^{10-4}$ are possible for residential receptors at mixing of more than 11% for 90th percentile activity and 21% for 50th percentile activity. For arsenic, cancer risks above $1 \times {}^{10-4}$ are possible at mixing of more than 33% for 90th percentile concentration, but would not occur at any degree of mixing for 50th percentile concentration. Both radionuclides and arsenic also occur naturally in soil; however, levels in CCR can be markedly higher than typical background levels. In particular, EPA has identified the potential for CCR to have a combined radium activity nearly 10 pCi/g above typical background soils. This is greater than the ARAR that has been applied at some cleanups for surface and subsurface soils under Superfund and State programs. As such, consideration of the incremental increase above background does not alter the overall results of this analysis. Therefore, EPA concludes that accumulation of CCR within the soil column can result in risks within the range that EPA considers or regulation.

EPA separately considered the potential for risk to ecological receptors that may result from mixing of CCR with the soil based on comments received that a future use for these facilities could be as a nature preserve. EPA calculated the incremental contributions from CCR as described above and compared the resulting concentrations to available ecological benchmarks. This analysis focused on constituents for which ecological soil screening levels are available. This comparison indicates that antimony, selenium, and vanadium are most likely to drive risk and require further evaluation at both high-end and median ash concentrations. In some cases, ecological benchmarks are lower than typical background soil levels. However, consideration of the incremental increase above background does not alter overall results. Therefore, the potential for risk from accumulation of CCR within the soil column remains even if future residential land use is not anticipated.

vi. Final Conclusions

Based on the analyses summarized in the current risk assessment, EPA concludes that there is a reasonable probability of adverse effects on health and the environment due to leakage from legacy CCR surface impoundments and CCRMU. EPA's assessment estimates that the risks that leakage from these units would adversely impact groundwater quality and pose risk to future receptors fall within the range EPA typically considers warrants regulation under section 4004(a) (*i.e.,* cancer risks greater than 1×10^{-5} and non-cancer risks exceeding an HQ of 1). Older historical and inactive disposal units can pose risks to offsite receptors substantially the same as previously reported for currently regulated units. Smaller CCRMU fills can pose risk to onsite receptors and materially contribute to broader groundwater contamination across the facility. Depending on the location of these fills, they can also pose risk to offsite receptors. The risks identified for CCRMU fills are also believed to provide a bounding estimate on the risks posed by disposal units, as leakage from these larger units would generally be expected to result in more extensive releases than modeled for fills. Risks to human health from groundwater are anticipated to be driven by ingestion of arsenic, lithium, molybdenum, and/or thallium. Health effects associated with arsenic ingestion are an increase in the risk of cancer in the skin, liver, bladder, and lungs, as well as nausea, vomiting, abnormal heart rhythm, and damage to blood vessels. Health effects associated with ingestion of lithium are neurological and psychiatric effects, decreased thyroid function, renal effects, cardiovascular effects, skin eruptions, and gastrointestinal effects Health effects associated with molybdenum ingestion are higher levels of uric acid in the blood, gout-like symptoms, and anemia. Health effects associated with thallium ingestion are hair loss, ocular effects, and behavioral changes.

EPA also concludes the unmonitored accumulation of CCR in surface and subsurface soils has the potential to result in risk to future human and ecological receptors in the range OLEM typically considers for regulation. Potential human health risks are driven by incidental ingestion of ash mixed with the soil and direct exposure to gamma radiation from radium and its associated decay chains. Health effects attributed to radium exposure include increased risk of several types of cancer, particularly lung and bone cancer. Potential ecological risks are driven by exposure to antimony for mammals, selenium for plants and mammals, and vanadium for birds from ash mixed with the soil. Health effects attributed to these exposures are decreased reproduction, growth, or survival. EPA did not seek to identify a comprehensive list of other contaminants that might also contribute to risk as part of the current assessment; however, any further risk would be equally addressed by controls put in place to mitigate the identified soil risks.

B. Legacy CCR Surface Impoundment Requirements

The Agency is amending the CCR regulations in 40 CFR part 257, subpart D to require legacy CCR surface impoundments to comply with the same regulations that apply to inactive CCR impoundments at active facilities, except for the location restrictions (at §§ 257.60–257.64) and liner design criteria (at § 257.71). EPA is also establishing new requirements to address issues specific to legacy CCR surface impoundments. Finally, EPA is establishing new compliance deadlines for legacy CCR surface impoundments.

1. Definition of a ''Legacy CCR Surface Impoundment''

EPA is finalizing the proposed definition of a ''legacy CCR surface impoundment'' without revision. A legacy CCR surface impoundment must meet three criteria: (1) The unit meets the definition of a CCR surface impoundment; (2) The unit contains both CCR and liquids on or after October 19, 2015; and (3) The unit is located at an inactive electric utility or independent power producer. An inactive impoundment must meet all three criteria to be a legacy CCR surface impoundment. This definition is codified in § 257.53.

EPA estimates there are 194 legacy CCR surface impoundments located at 85 facilities that will be subject to the requirements of this final rule.[40] This estimate also takes into account the information received in response to the Agency's lists of potential legacy CCR surface impoundments published in the dockets with the proposed rule and

[40] An updated list of potential legacy CCR surface impoundments can be found in the docket for this action. See document titled ''Universe of Legacy CCR Surface Impoundments. April 2024.''

subsequent notice of data availability. This estimate is an increase from the 127 legacy CCR surface impoundments located at 59 facilities identified in the proposed rule. 88 FR 32028.

The sections below briefly explain what EPA proposed, summarize the public comments received, and provide the Agency's responses.[41] The Agency addresses several aspects of the definition in the following order: (1) Date for determining applicability; (2) The requirement to contain both CCR and liquids; and (3) The requirement to be located at an inactive facility.

a. Legacy CCR Surface Impoundment—Date for Determining Applicability

EPA explained in the proposed rule that the 2015 CCR Rule exempted ''inactive surface impoundments at an inactive facility'' and codified definitions of an ''inactive CCR surface impoundment'' and an ''active facility or active electric utility.'' The Agency further stated that in developing a definition of a ''legacy CCR surface impoundment'' two separate components need to be addressed: (1) The definition of an ''inactive CCR surface impoundment''; and (2) The definition of an ''inactive facility or electric utility.'' 88 FR 31989.

At proposal, the Agency relied on the existing definitions of an ''inactive CCR surface impoundment'' and ''active facility or active electric utilities or independent power producers,'' as well as the 2018 *USWAG* decision to inform the options discussed. Specifically, EPA explained that both terms establish applicability based in part on the effective date of the 2015 CCR Rule—a unit is an ''inactive CCR surface impoundment'' if it does not receive CCR on or after October 19, 2015, and still contains both CCR and liquids on or after October 19, 2015, and an ''active facility or active electric utilities or independent power producers'' is only active if it was in operation on or after October 19, 2015. 40 CFR 257.53.

The Agency proposed to define a legacy CCR surface impoundment, in part, as a surface impoundment that contained both CCR and liquids on or after October 19, 2015. EPA explained in the proposed rule, that using October 19, 2015 as the date to determine applicability was most consistent with the *USWAG* decision; first because legacy CCR surface impoundments would be regulated the same as the currently regulated inactive impoundments at active facilities. Second, an October 19, 2015 applicability date would restore the status quo, as intended by court's decision to vacate the exemption. EPA also concluded that this was the most protective option. 88 FR 31990–31991. However, as an alternative, the Agency also solicited comment on defining a legacy impoundment as a unit that contains both CCR and liquids on or after the effective date of this final rule in 2024. 88 FR 31991–92.[42]

Several commenters opposed the proposed applicability date of October 19, 2015, stating that the only legally defensible and workable approach is to establish an applicability date based on the effective date of this final rule. Some of these commenters argued that an applicability date of October 19, 2015, would constitute a retroactive rule, which they considered to be both legally impermissible and unreasonable. These commenters stated that establishing an applicability date based on the effective date of this final rule would honor the bedrock administrative principle that ''rules should apply prospectively absent express statutory grant'' consistent with *Bowen* v. *Georgetown Univ. Hosp.,* 488 U.S. 204, 208–09 (1988).

Other commenters stated that EPA was overreading the *USWAG* decision and inappropriately interpreting the court's decision. These commenters stated that the court did not specify how legacy impoundments should be regulated, or the appropriate applicability date and regulatory controls that should apply to the units but remanded those issues to EPA to address through rulemaking. These commenters further stated that the court's ruling was based on the administrative record for the 2015 CCR Rule, which they claimed is very different than the current record for the facilities that would be covered by the proposal. According to these commenters, the court was focused only on those legacy impoundments for which significant risks remained, which they characterized as exclusively CCR surface impoundments with a hydraulic head. These commenters argue that, by contrast, the proposal will also apply to CCR surface impoundments for which EPA has failed to demonstrate any significant level of risk, which they characterized as (1) CCR impoundments that contain ''any amount of water,'' but no hydraulic head; and (2) CCR impoundments that are in the process of closing or have completed closure.

Several commenters similarly raised concern that the proposal ignores that there have been numerous changes since the court issued its decision in 2018. For example, some commenters stated that facilities have proactively worked with their States to close these impoundments and have invested substantial resources to close these units in compliance with existing regulatory requirements and thus these units should not be considered legacy impoundments. According to these commenters, the final rule should take into account the significant closure and corrective action work that has been undertaken since the 2015 CCR Rule was promulgated, rather than assuming the landscape has not changed over subsequent years.

In addition, a number of commenters noted that the proposed definition would capture numerous sites where former legacy CCR surface impoundments were closed by removal under then-applicable State regulations and where no CCR remains. These commenters raised concern that EPA lacks jurisdiction under RCRA to impose requirements at a site once all CCR has been removed. Many of these commenters further asserted that EPA should accept such closure as sufficient to protect the environment and not seek to impose an unnecessary set of requirements. Finally, some commenters explained that some of these sites have subsequently been restored and are now home to established natural ecosystems, and thus it would be counterproductive to require them to be disturbed.

By contrast, a number of commenters asserted that the record has not significantly changed since the court issued its opinion. These commenters stated that all legacy impoundments, including those that have been dewatered or completed closure, pose significant risks to human health and the environment that warrant regulation under RCRA. Citing the *USWAG* decision and EPA's findings from the 2015 CCR Rule and the proposal, these commenters stated that the risks associated with legacy impoundments are greater than currently regulated units because they are more likely than regulated ponds to be unlined, more likely not to have been designed by a professional engineer, and more likely to contain a mix of ash and coal refuse, all of which increase the potential for groundwater contamination. The commenters further noted that harm from contaminant releases from legacy ponds worsens as time passes, citing the

[41] EPA's responses to public comments can be found either in this preamble or the Response to Comments document available in the docket.

[42] EPA also published an ANPRM on October 14, 2020 (85 FR 65015). The Agency solicited input on a potential definition of a legacy CCR surface impoundment in the ANPRM and addressed comments to the ANPRM in the subsequent proposal. 88 FR 31989–91.

finding in EPA's 2014 Risk Assessment that peak contaminant releases from CCR surface impoundments will not occur until 70 years after waste placement.

These commenters also estimated that close to half a million people live within 1 mile of the 417 active and inactive coal-fired power plants in 44 States and Puerto Rico that have reported coal ash units. Using the Council on Environmental Quality's (CEQ) Climate and Economic Justice Screening Tool (CEJST), the commentor estimated that approximately half (213) of the facilities are located within a mile of a disadvantaged community, while over 70% of the facilities (297 of 417) are located near a community that has higher-than-State average levels of low-income populations or populations of color. These commenters also estimated that many of the communities living nearby may experience cumulative impacts from other threats. CEJST offers data at the census tract-level on $PM_{2.5}$ exposure, diesel particulate matter, traffic proximity, abandoned mine land, formerly used defense sites, hazardous waste site proximity, Superfund site proximity, underground storage tanks and releases, wastewater discharge, and Risk Management Plan site proximity. According to the commentor, using CEJST, more than half of the 417 power plants with historic or active ash units (214) are within one mile of a census tract that experiences pollution from at least two of these additional sources to a degree higher than that of 75% of all census tracts in the United States.

The commenters also discussed several individual legacy impoundments with longstanding groundwater contamination, noting that for several plants, due to lack of Federal regulation and oversight, little or no action has been taken to remediate clearly documented contamination. Among those they highlighted were:

- At the Muskingum River Power Plant, where onsite groundwater has exceeded the primary EPA MCLs for barium and gross alpha as well as EPA secondary MCLs (SMCLs) for iron, sulfate, and Total Dissolved Solids. According to the commenter no remediation has occurred to date.
- At the retired Dynegy Vermilion Power Station in Oakwood, Illinois, 70-year-old unstable pits with more than 3 million tons of CCR are leaking CCR constituents into Illinois' only National Scenic River. The pits run along the river for a half-mile where kayaking and other recreational activities are common.
- At American Electric Power's retired Tanners Creek in Lawrenceburg, Indiana, leaking ash pits at the plant are contaminating groundwater with high levels of boron within 500 feet of public drinking water wells and the Ohio River.
- At Georgia Power's retired Plant Arkwright, the unlined abandoned ash ponds have been leaking chemicals, such as boron, at levels above health standards into the groundwater and nearby Ocmulgee River for nearly 20 years, according to a peer-reviewed study.[43]

According to these commenters, substantial risks to human health and the environment remain even where the impoundment has been dewatered or closed. In support of this conclusion, the commenters pointed to EPA's explanation in the proposal that even if impoundments have been at least partially dewatered or have undergone some type of closure, the current risks to human health and the environment can still be significant, due to contamination remaining at the site from releases that occurred while the unit was operating. Referencing data that legacy impoundments are, on average, 55 years old, the commenters also pointed to the proposal's explanation that the potential magnitude of releases from older units are greater than for currently regulated CCR units due to a number of factors, including (1) the likely absence of a liner in older impoundments; (2) the mixture of coal ash with coal refuse, which was a common disposal practice in older units; and (3) the older a CCR unit is, the longer it has had to leak and for hazardous constituents to migrate further from the unit. The commenters also discussed the results of a report, "Assessment of Legacy Surface Impoundments" by Gordon Johnson, M.Sc., P.Eng., which examined ten CCR surface impoundments at inactive facilities that were not on EPA's list of potential legacy ponds and do not appear to contain standing water, and concludes that all posed significant risks to health and the environment.

As a consequence, these commenters criticized EPA's proposed definition of a legacy impoundment as one that contains liquid on or after October 19, 2015. These commenters argue that this would exclude surface impoundments at inactive plants that pose a reasonable probability of adverse effects on health and environment, whether or not they contain liquid.

[43] J.S. Harkness et al., Evidence for Coal Ash Ponds Leaking in the Southeastern United States. Environmental Science & Technology, 50(12): 6583–6592 (2016).

Several commenters also supported EPA's proposal to regulate units at sites that are heavily vegetated or redeveloped on the surface with established natural ecosystems, stating that the possibility that conducting a proper closure might disrupt the current land use is outweighed by the fact that inadequately closed units pose ongoing threats to health and the environment. These commenters also supported coverage of legacy impoundments that had completed or were undergoing closure pursuant to State programs, citing EPA's review of State programs as part of the 2015 CCR Rule, which concluded that significant gaps remain in many State programs, and discussing specific examples of problematic State permits.

Some commenters also stated that the proposed applicability date of October 19, 2015, presents serious practical challenges to implementation because it requires facilities to look back more than eight years to determine the historical status of legacy impoundments. Commenters explained that this extended look-back period could prove to be an impossible task for sites where power plant operations ceased decades ago. Furthermore, the proposed applicability date illegally requires actions by facilities that are physically impossible. For example, operating records, construction and inspection reports, groundwater monitoring data, and employee testimonials may not exist for some facilities that ceased generating power decades ago. In addition, commenters pointed out that historic aerial photography will not inform whether liquids are present beneath the surface of the inactive impoundments. Finally, some commenters stated that EPA's proposed approach is particularly challenging to small public power utilities given their size, staffing levels, and record retention policies once a facility is closed.

After considering the comments and all of the information in the record, this final rule adopts the proposed date of October 19, 2015, for determining applicability for legacy CCR surface impoundments. This applicability date is justified for two independently sufficient reasons. First, it most effectively targets the risks to human health and environment posed by legacy impoundments. Second, it is consistent with the *USWAG* decision. Accordingly, this final rule specifies that an inactive impoundment at an inactive facility that contained both CCR and liquids on or after October 19, 2015, is a legacy CCR surface impoundment subject to the requirements of this final rule. The definition of a legacy CCR surface impoundment is codified in § 257.53.

This option best addresses the risks legacy impoundments pose to human health and the environment. EPA's record for this rule, which includes the 2015 rulemaking record, supplemented by new information, establishes that that the environmental risks posed by legacy impoundments are greater than or similar to those posed by operating impoundments. EPA acknowledges that it is not bound by the 2015 rulemaking record that the court reviewed in *USWAG*—and, as just stated, in fact has supplemented that record with new information for this rulemaking. EPA further acknowledges that since the 2015 CCR Rule and the *USWAG* decision some units have closed or have begun to close in accordance with State permits, or on their own initiative in response to the D.C. Circuit's ruling. But EPA disagrees that the record shows that the risks to human health and the environment posed by the legacy impoundments regulated under this final rule are significantly or meaningfully lower than the risks the court found to be unacceptable in *USWAG.* In fact, as described in III.A.4 of this preamble, the record instead demonstrates that the totality of the risks is potentially greater than EPA estimated in 2014.

A subset of legacy impoundments is identical to those described in *USWAG;* the impoundments are structurally unstable and pose significant risk of contaminating groundwater because they are unlined, with a hydraulic head promotes the continual leaching of contaminants from the CCR and drives the resulting leachate into underlying soils and potentially into the underlying aquifer. No commenter disagreed that these legacy impoundments warrant regulation under part 257.

Another subset, on which many of the commenters largely focused, have been fully or partially dewatered, or have completed some form of closure. In response to the proposal, EPA received information that since October 19, 2015, 22 surface impoundments at inactive facilities have closed by removal or are in the process of closing by removal, and 10 surface impoundments have closed with waste in place, either with oversight from a State agency or on their own initiative in response to the *USWAG* decision. These commenters claimed that, as a consequence of dewatering their units, the units no longer pose any appreciable risk.

EPA agrees that once the water in the impoundment has been reduced the likelihood of structural failure will also have been reduced; and if the liquid and or CCR have been entirely removed there will be no appreciable risk of structural failure. But these units nevertheless continue to present significant risk to human health and the environment as a consequence of existing—and in some cases, continuing—groundwater contamination. This contamination can exist even where CCR has been entirely removed from the disposal unit. First, in many cases facilities have only removed some of the free liquids in the impoundment; that is, have only partially dewatered. As described in Unit III.B.2.g of this preamble, many commenters claimed that under the existing closure regulations they are only required to eliminate free liquids to the extent necessary to support heavy machinery or other construction activities (*i.e.,* to the extent necessary to support the cover system), rather than to eliminate free liquids without qualification, as the regulation requires. Such units present essentially the same environmental and human health risks the *USWAG* court was concerned with. Second, to the extent a unit intersects with groundwater, free liquids will remain (because the groundwater is continually saturating the CCR), and the unit will continue to present significant risks, because the same conditions that promote the rapid leaching of contaminants in operating units are present, and will persist indefinitely. Finally, at many of these sites the existing contamination resulting from when the unlined impoundment was operating has not been addressed. Each of these are discussed further below.

Contrary to the commenters' claims, the partial dewatering they describe does not, as they claim, ''eliminate'' either the hydraulic head from a unit or the risk of groundwater contamination. Until the water (liquid) is fully removed, gravity will continue to exert downward pressure on the water in the saturated waste until it reaches equilibrium with the water table. Thus, although reducing the water in the unit also reduces hydraulic head, hydraulic head will be present as long as water remains in the unit.

Hydraulic head represents the energy to move a liquid. Liquid flows from locations of higher hydraulic head to locations of lower hydraulic head. A simple illustration of hydraulic head is the water percolating through (*i.e.,* exerting downward pressure on) coffee grounds into the cup below. As the water moves through the solids, particles of the solids combine with the water (create leachate) and drain downward. Even after the water is no longer visible above or among the coffee grounds, liquids continue to drain into the cup below.

In a diked impoundment located above the water table, after the removal of free standing (or ''ponded'') water, the CCR in the unit would still remain saturated with liquids (*i.e.,* the free liquid [44] and/or porewater). Once the CCR material is saturated, some liquids may remain bound within the CCR due to retention forces. However, the remaining (free) liquids will drain in response to gravity and hydraulic head. Because the saturated waste is at a higher elevation than the normal water table, the free liquids within the saturated waste would continue to drain toward the normal water table (''exert downward pressure'') even if the unit no longer contained ponded water on top of the CCR. Until the water is eliminated from the CCR, gravity will continue to exert downward pressure on the water in the saturated waste, but at some point, gravity will be insufficient to overcome the retention forces in the CCR. Until that point, free liquids will continue to drain until they reach the water table. Continued contact with free liquids causes the metals and other constituents to leach out of the CCR, and the downward pressure of the hydraulic head drives the resulting leachate toward the bottom and sides of the unit. In an unlined unit, which the overwhelming majority of legacy impoundments are likely to be, any remaining free liquids saturating the CCR in the impoundment will eventually leak out of the unit into the surrounding soil and/or into the aquifer, along with any CCR constituents that have leached from the waste in the interim. As mentioned previously, it is important to note that after this draining occurs, some liquids will remain bound within the pore spaces of the CCR material and will not readily drain under ambient temperature and pressure. Consequently, these residual liquids are not free liquids. Because any remaining residual liquids (*e.g.,* bound porewater or potential leachate) will not continue to drain from the unit absent other forces, further releases of these residual liquids are not likely.

By contrast, when some portion of the unit has been constructed in or below the water table, even if the hydraulic head is reduced by the removal of free-standing or ponded water, hydraulic head remains present as long as groundwater flows through the unit

[44] Free liquids are any liquids that readily separate from the solid portion of a waste at ambient temperature and pressure. § 257.53. In the example described above, free liquids are the liquids that drain from the coffee into the cup below.

from higher groundwater elevations to lower groundwater elevations. And even where the CCR above the water table in such a unit has been partially or fully dewatered, the ''conditions that promote rapid leaching of contaminants'' still remain as a consequence of the continued saturation of CCR in the unit from groundwater infiltrating the unit.

As EPA explained in Unit III.A.2 of this preamble, a CCR landfill saturated with water during operation, either continuously or intermittently, would behave more like an operating CCR surface impoundment even though such a unit would not have the level of hydraulic head from ponded water present in an operating impoundment. The same is true of a dewatered legacy impoundment constructed in or below the water table. See also 88 FR 32011. The hydraulic head from the ponded water in an operating impoundment unit allows for continual leaching of contaminants from CCR and drives the resulting leachate into the underlying soils and potentially into the underlying aquifer. However, where any part of the unit is actually constructed below the water table, the conditions caused by the continuous saturation of the CCR by the groundwater flowing in and out of the unit allow the contaminants to continuously leach directly into the nearby ground and surface waters even without any downward pressure from hydraulic head pushing leachate out of the unit. Id.

The record shows that significant numbers of the currently regulated CCR surface impoundments were constructed such that the base of the unit intersects with groundwater,[45] and that many inactive, or even ''closed,'' impoundments continue to impound water below the water table (*i.e.,* contain liquids).

In any event, even if an impoundment has been completely dewatered, the current absence of impounded water does not remediate the releases that occurred during operation of the unit. In general, legacy impoundments are likely to have been present for longer than the currently operating units: For example, one commenter presented information to demonstrate that legacy impoundments are, on average, 55 years old; by comparison, EPA estimated in 2015 that most currently operating surface impoundments were between 20 and 40 years old. See 80 FR 21327. This is significant in two regards: (1) The older the impoundment the greater the likelihood it is unlined; and (2) The more time the unlined unit would have to leak and for hazardous constituents to migrate further from the unit. Consequently, previous and ongoing releases could potentially be greater and have migrated further from the unit than releases from the universe of currently regulated units. In this regard, it is notable that EPA estimated in its 2014 Risk Assessment that peak contaminant releases from CCR surface impoundments will not occur until 70 years after waste placement. This is further confirmed by the modeling originally conducted in 2014 for legacy impoundments.

Furthermore, as described in Unit III.A there are a number of additional reasons to believe that the potential magnitude of releases is even greater than EPA originally estimated in 2014. These include: (1) The likely absence of a liner at older impoundments; and (2) The greater likelihood that coal ash was managed with coal refuse, which was a common disposal practice in older units.

Finally, defining a legacy impoundment as one that contains both CCR and liquid on or after October 19, 2015, retains oversight of units that may have been dewatered but have not yet completed closure. In any unit without an effective cover system, precipitation can continue to freely migrate into the unit, and any leachate generated as a result would be a potential ongoing source of contamination, particularly where the unit is already leaking or in contact with groundwater. Further, significant risks can remain if a unit is not closed properly; for example, a closure that leaves that millions of tons of CCR saturated with groundwater and only a cover system to control downward infiltration of precipitation will not protect human health and the environment. And, as discussed in further detail in the next section, even at sites where the CCR has been completely removed from the impoundment it is possible that, in addition to the likely significant groundwater contamination present at the site, contaminated soil remains, which can serve as a source of further contamination. See, Unit III.B.1.b.ii.(a).

EPA acknowledges that some of these units may be closing pursuant to State laws that provide for a significant degree of State involvement and oversight, but that is not universally the case. As EPA concluded in 2015, there is a wide range of protectiveness in State programs. Clear deficiencies were present in some State regulatory programs, and questions remained with respect to others. See, 80 FR 21326–21327, 21456 and Unit III.B.g.iii. EPA is aware that some State programs have been substantially revised since 2015, and some individual States provided additional information regarding their programs in their comments, but again this is not universal. For example, some commenters documented recent State approved closures that were deemed complete despite the absence of any groundwater monitoring to determine whether groundwater contamination remained at the site. The absence of a consistent, sufficiently protective approach among all State programs reinforces the need for a single, protective Federal standard.

EPA also continues to believe that an applicability date of October 19, 2015, is the most consistent with the *USWAG* decision. See, 88 FR 31991. The Court expressly found that EPA's record for the 2015 CCR Rule demonstrated that legacy ponds ''pose the same substantial threats to human health and the environment as the riskiest Coal Residuals disposal methods, compounded by diminished preventative and remediation oversight due to the absence of an on-site owner and daily monitoring.'' 901 F.3d at 432. EPA agrees with this conclusion that legacy ponds ''pose substantial risk to human health and the environment.'' Id. Consistent with that determination, the final rule imposes essentially the same requirements on legacy CCR surface impoundments that currently apply to inactive impoundments at active facilities. In addition, as EPA explained in the proposed rule, D.C. Circuit's decision setting aside the exemption for inactive impoundments meant that these impoundments were similarly situated to the impoundments regulated by the 2015 CCR Rule. EPA thus had an obligation to address the substantial environmental risks from those impoundments through regulation. By setting aside, rather than simply remanding the exemption back to the Agency for further explanation, the Court made clear that the existing record was sufficient for these units to be regulated.

Nor is EPA persuaded by the commenters' remaining objections to the applicability date of October 19, 2015. EPA disagrees that reliance on the effective date of the 2015 CCR Rule would constitute a retroactive application of law. A regulation is impermissibly retroactive where, absent clear Congressional intent, the rule changes the past legal consequences of past conduct. See *Bowen* v. *Georgetown Univ. Hosp.,* 488 U.S. 204, 208 (1988). This is generally referred to as primary

[45] EPA's review of the location restrictions demonstrations posted on facilities' CCR websites found that approximately 31% of operating impoundments have waste below the water table. There is no reason to believe that this percentage is not also representative of legacy impoundments.

retroactivity. See *Bergerco Canada, a Div. of Conagra, Ltd.* v. *U.S. Treasury Dep't, Off. of Foreign Assets Control,* 129 F.3d 189, 192 (D.C. Cir. 1997). Rules can also affect the legal rights flowing from past acts. See *Bergerco,* 129 F.3d at 192. This is referred to a secondary retroactivity. *Id.* Such effects are common, and permissible so long as they are not arbitrary or capricious. The D.C. Circuit in *Bergerco* noted that a rule may be arbitrary or capricious if it ''makes worthless substantial past investment incurred in reliance upon the prior rule.'' Id.

Here EPA is merely relying on a past fact to support the future application of regulations. And because EPA has established future compliance dates, no facility would be subject to penalties solely because one of its legacy CCR surface impoundments was out of compliance with the regulatory requirements prior to the effective date of this final rule. Thus, the rule is not primarily retroactive.

To the extent the rule has secondary retroactive effects in upsetting parties' expectations of regulation of legacy CCR surface impoundments and CCMRU, such effects are permissible. First, the D.C. Circuit considered and rejected this same argument in *Util. Solid Waste Activities Grp.* v. *Env't Prot. Agency,* 901 F.3d 414 (D.C. Cir. 2018). There, industry petitioners argued that EPA lacked statutory authority to regulated legacy CCR surface impoundments because such regulation would be retroactive. The D.C. Circuit held that ''straightforward reading of the statute's language allows for the regulation of inactive sites.'' Id. at 439. In short, as facilities ''where solid waste is disposed of,'' 42 U.S.C. 6903(14), inactive impoundments are ''open dumps,'' And no one denies that the EPA has authority to regulate (and to prohibit) ''open dumps.'' Id. at 441.

Moreover, as explained in detail below, EPA rationally explained why regulation was necessary and appropriate here notwithstanding facilities' reliance interests. EPA understands that facilities may have closed legacy impoundments and treated CCMRU in compliance with State law requirements, or otherwise made business decisions premised on the absence of Federal regulation. EPA has taken these reliance interests into account in developing the regulations here. As explained below, EPA surveyed State regulation of legacy impoundments and CCMRU and concluded that, on the whole, such regulations were not sufficiently protective, and did not meet RCRA's standard. Uniform, national regulation was therefore necessary to ensure adequate protection of human health and the environment. To be sure, EPA recognizes that it is possible that some legacy impoundments, for example, may have been closed in a manner that is protective. But, due to the absence of adequate groundwater monitoring and other data, the adequacy of such closures cannot be verified. EPA has also accounted for other reliance interests, including renewable facilities' use of land containing CCRMU, in establishing compliance deadlines, and allowing for deferrals of additional closure measure where appropriate. EPA also notes that regulated entities have been on notice since the D.C. Circuit's 2018 decision in *USWAG* that Federal regulation of legacy CCR surface impoundments was forthcoming, 901 F.3d at 414.

A number of commenters also claimed that their units are heavily vegetated or developed and that reopening or other removal/remediation activities may disrupt the current use of the site. EPA acknowledges some old units may be heavily vegetated. However, no commenter submitted any data or analysis to demonstrate that, over the short or long term, removal or remediation activities would be more detrimental to health and the environment than either cleaning up the contaminated groundwater or taking measures to prevent the legacy CCR surface impoundment from contaminating groundwater.

Moreover, the fact that some impoundments have become heavily vegetated or redeveloped does not resolve the risks these unlined legacy CCR surface impoundments continue to pose. As discussed above, the risks associated with such units can be substantial. See Unit III.A of this preamble for more information. Consequently, the current record does not support an exemption for units that still contain both liquid and CCR even if the closure or remediation may disrupt the current use of the land.

As discussed in more detail in the subsequent section, EPA also disagrees that the removal of CCR from a disposal unit necessarily demonstrates that EPA lacks jurisdiction over the site. EPA's jurisdiction rests on the presence of solid waste that ''is disposed of'' at the site, not solely the presence of CCR. To the extent any CCR leachate or CCR constituents remain in the soil or in the aquifer at the site, solid waste remains at the site and EPA retains jurisdiction. However, as EPA stated in the proposal, the Agency agrees that it lacks jurisdiction over a site where the owner or operator can document that it meets the standard for closure by removal in § 257.102(c). Accordingly, the final rule retains the provision specifying that any facility that documents that this standard has been met will not be subject to any further requirements. See Units III.B.2.b.iii and III.B.2.g of this preamble for further discussion.

The Agency disagrees that adopting an applicability date of October 19, 2015, requires actions that are physically impossible or that the implementation challenges cannot be addressed. The final rule does not require owners and operators to acquire historical operating records, construction and inspection reports, groundwater monitoring data, and employee testimonials where they no longer exist, or where they have never existed. EPA acknowledges that such information will not be available in some situations. Rather, EPA expects owners and operators of inactive impoundments at inactive facilities to develop a strategy to gather readily available and reliable information to determine whether the unit meets the definition of a legacy CCR surface impoundment. If, after making a good faith effort a facility is genuinely unable to obtain information to document that the impoundment contained both CCR and liquids on October 19, 2015, the unit would not be regulated as a legacy impoundment. See Unit III.B.2.b.i of the preamble for an explanation of the actions the Agency expects owners and operators to take to determine whether the inactive impoundment meets the definition of a legacy CCR surface impoundment.

Nevertheless, EPA agrees that the final rule should account for the significant closure work that has taken place at some legacy CCR surface impoundments between October 19, 2015, and the effective date of this final rule. For example, as noted, commenters provided several examples of closures that were completed prior to the effective date of this final rule. The final rule accounts for this not by exempting these units but by modifying the applicable requirements. A facility that can document that it has met the criteria in § 257.102(c) would be subject only to the requirement to document that they had met those standards. Similarly, a facility that completed closure with waste in place before the effective date of this final rule would only be subject to the closure performance standards in § 257.102(d), and the post-closure care requirements (*i.e.,* groundwater monitoring and corrective action, if necessary). In addition, a facility that completed closure under a regulatory authority's oversight and approval, such as pursuant to a Federal or State cleanup order could be subject to even fewer requirements. Provided certain conditions have been met EPA is deferring a decision on the adequacy of such closures to a subsequent permitting authority to determine on an individual site-specific basis, whether the completed closure meets the Federal performance standards in § 257.102 or is equivalent to (*i.e.,* is as protective as) such a closure. In the interim, these units would be subject only to the requirements of a post closure care permit (*i.e.,* groundwater monitoring and corrective action, if necessary). See Unit III.B.2 of the preamble for further explanations of these provisions. As EPA stated in the proposal, units that contain liquid present different risks than those that do not, and the applicable requirements should differentiate among them accordingly on that basis. See 88 FR 31993.Consistent with that logic, while EPA agrees that legacy impoundments that were dewatered or closed prior to October 19, 2015 can still pose significant risks to human health and the environment, as discussed in the next section, the final rule retains the approach described in the proposal, and requires that an impoundment contain both liquid and CCR on or after October 19, 2015 to be regulated as a legacy impoundment.

b. Legacy CCR Surface Impoundment—Definition of an Inactive Impoundment—Contains Both Liquid and CCR

The final rule requires that to be considered a ''legacy CCR surface impoundment'' a CCR surface impoundment must have contained both CCR and liquids on or after October 19, 2015. In addition, the final rule further defines what it means to contain both CCR and liquid by reference to § 257.102(d)(2)(i). In this Unit of the preamble, the Agency briefly explains what was proposed, summarizes the public comments received, and provides EPA's responses. EPA first discusses what it means for an impoundment to ''contain liquids'' followed by what it means to ''contain CCR.''

i. What does it mean to contain liquid?

Consistent with the definition of an inactive CCR surface impoundment at active facilities under the existing regulations, EPA proposed in the May 2023 proposed rule that a legacy impoundment would be required to have contained liquids on or after October 19, 2015, in order to be subject to the requirements of this rule. In the proposed rule, EPA also responded to comments previously raised in response to the ANPRM, alleging that the phrase ''contains both CCR and liquids'' was impermissibly vague. These commenters were concerned that the definition might not include those units whose bases are in contact with groundwater or that no longer have visible, standing water at the surface. EPA further responded to questions whether, based on the existing definition of an inactive CCR surface impoundment, the following would be considered a legacy CCR surface impoundment: (1) Where, prior to October 19, 2015, the facility has decanted the surface water, but, because the base of the impoundment intersects with the groundwater, water continues to flow through the impoundment and permeate the waste in the base of the unit; (2) Impoundments that contained both CCR and liquids in the past but are now closed; (3) Impoundments that contained CCR and liquids in the past but are in the process of closing on the effective date of the legacy rulemaking; and (4) Impoundments that once contained CCR and liquids but have been fully dewatered and are now maintained so as to not contain liquid.

EPA explained that the answers to these questions turn on the meaning of the terms ''contain'' and ''liquids'' in the definition of an inactive impoundment in § 257.53. Relying on dictionary definitions, EPA explained that the term ''liquids'' includes the free water, porewater, standing water, and groundwater in the unit, because once any are present in the unit, they have the same potential to create leachate, as well as to contribute to hydraulic head and drive flows propelled by hydraulic gradients. 88 FR 31992. EPA also explained that based on dictionary definitions an impoundment ''contains'' liquid if there is liquid in the impoundment, that is, it *has* water within it, even if water continues to leak from the unit. EPA also stated that as a factual matter, a surface impoundment that has only decanted the surface water would normally still contain liquid if the CCR was still saturated with water.

Accordingly, EPA explained that to the extent the unit still contains liquids on or after October 19, 2015, it is considered an inactive impoundment under the existing definition in § 257.53. EPA proposed that such units would also be considered legacy CCR surface impoundments, when located at inactive facilities. EPA also explained that under the proposal, such an impoundment would be considered a legacy CCR surface impoundment: (1) Even if it is considered ''closed'' under State law; (2) It is in the process of closing on the effective date of this rule; or (3) The unit is only fully dewatered and can no longer impound liquid after October 19, 2015.

EPA further explained that to determine whether an impoundment has been dewatered, EPA relies on the existing requirements in § 257.102(d)(2)(i) (''Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues''). EPA explained that this provision requires a facility to eliminate both the standing liquid in the surface of the impoundment and the separable porewater in any sediment located in the base of the impoundment, regardless of the source of the standing water or porewater (*i.e.,* whether it was present in the impoundment due to surface water infiltration, intentionally added sluice water, or groundwater intrusion).

EPA also solicited comment on whether to adopt a regulatory definition of the term ''liquids'' to clarify that the term includes free water, porewater, standing water, and groundwater.

Finally, the Agency explained that under the existing regulations, an impoundment that did not contain liquids prior to October 19, 2015, whether because it was closed in accordance with existing State requirements or for other reasons, is not an inactive impoundment. Similarly, a unit that still contains both CCR and liquid after that date would still be considered an inactive unit even if it was closed in accordance with the requirements in effect at the time (*e.g.,* has a cover). Consistent with this definition, EPA proposed not to expand the definition of a legacy CCR surface impoundment to include units that no longer contained any liquid on October 19, 2015. 88 FR 31993.

(a) Pending Litigation Over EPA's Regulatory Interpretations

A number of commenters claimed that the interpretation of ''liquids'' presented in the preamble was first announced in connection with proposed Part A determinations in January 2022, and is currently being litigated in the D.C. Circuit Court of Appeals in multiple cases combined under the name, *Electric Energy, Inc., et al.* v. *EPA, Case Nos. 22–1056 and 23–1035.*[46] These

[46] On January 11, 2022, EPA issued determinations on demonstrations submitted by facilities for extensions to the cease receipt of waste deadline per 40 CFR 257.103(f)(1) and 257.103(f)(2), which the Agency refers to as ''Part A determinations'' or ''Part A''. The CCR Part A Final Rule (85 FR 53516, August 28, 2020), grants facilities the option to submit a demonstration to EPA for an extension to the deadline for unlined

commenters complained that EPA makes no mention of this litigation in the proposed rule, even as it claims that its interpretation is ''sufficiently clear that a definition is not necessary.'' According to these commenters, EPA must acknowledge (and make a good faith attempt to reconcile) the competing interpretations of key terms of art in the 2015 CCR Rule before extending them into this final rule. One commenter further stated that if EPA ultimately elects to adopt regulatory definitions of those terms, it should wait until the court rules so that the definitions are informed by and consistent with any such ruling.

EPA disagrees that it is necessary to wait until the court issues its decision in the pending litigation (*Electric Energy, Inc., et al.* v. *EPA, Case Nos. 22–1056 and 23–1035).* The central issue Petitioners raised in that case was exclusively procedural—whether EPA effectively amended the 2015 CCR Rule without going through notice and comment. Even if the D.C. Circuit addresses this procedural question, it would not resolve the substantive question EPA posed in the proposal, of whether the inclusion of a definition for the term ''liquids'' would provide further clarity.

Finally, EPA considers that it has more than met any obligation to ''acknowledge (and make a good faith attempt to reconcile) the competing interpretations of key terms of art in the 2015 regulation,'' in the proposal and again in this final rule. EPA has repeatedly explained its construction of the regulations in documents held out for public comment, including in the May 2023 proposal, and most recently, in the proposal to deny Alabama's application for approval of its CCR permit program. See, *e.g.,* 88 FR 31992–31993, 32025–32026, 55236–55238. EPA has also repeatedly responded to public comments, addressing each of the commenters' alternative interpretations, and explaining in detail the reasons for the Agency's disagreement. See, *e.g.,* 88 FR 55237; U.S. EPA. Denial of Alternative Closure Deadline for General James M. Gavin Plant, Cheshire, Ohio. November 18, 2022. pp 14–42, Response to Comments on Proposed Denial (Docket ID No. EPA–HQ–OLEM–2021–0590). November 2022. EPA has again responded to the commenters' alternative interpretations throughout this preamble and in the Response to Comments document in the docket. And even though EPA remains entirely unconvinced by the commenters' alternative interpretations, and without exception, considers that they are inconsistent with the plain language of the provisions at issue, EPA has responded to them by incorporating definitions of ''liquids'' and ''infiltration'' that reflect EPA's existing construction of the regulations. Neither RCRA nor the APA requires anything further.

(b) Comments on the Definition of an ''Inactive CCR Surface Impoundment'' and the Meaning of ''Contains Liquids''

All commenters agreed that, consistent with the existing definition of an inactive surface impoundment, any impoundment that ''contains both liquids and CCR'' at an inactive facility should be classified as a legacy CCR Surface impoundment. However, commenters disagreed on the correct interpretation of the phrase ''contains. . .liquids.'' Several commenters agreed with EPA's explanation in the proposal that to the extent an impoundment still contains liquids on or after October 19, 2015, it is properly considered an inactive impoundment under the existing definition in § 257.53, even if (1) The unit had ''closed'' under State law; (2) The unit is in the process of closing on the effective date of this rule; or (3) After October 19, 2015 the unit is fully dewatered and can no longer impound liquid. These commenters also agreed that such units should also be considered legacy CCR surface impoundments when located at inactive facilities.

But other commenters objected to proposal's construction of the regulation. These objections fell generally into two categories. First, a number of commenters argued that the discussion in the proposed rule reflected a ''new'' interpretation that expanded the meaning of the terms ''CCR surface impoundment'' and ''inactive surface impoundment'' by interpreting the phrase ''contains liquids'' to reach units that the commenters believe EPA never intended to cover in 2015. In support of this argument, these commenters objected to the statement in the proposal that free water, porewater, standing water, and groundwater are liquids under the existing regulation defining inactive CCR surface impoundments, arguing that this expands the existing definition of liquids to sources of water that the commenters assert ''are not demonstrated to be contributing to hydraulic head creating the potential for impoundment failure and spread of contaminated water.'' These commenters further claimed that the existing definition of an ''inactive impoundment'' does not include: (1) Units ''with any amount of water;'' (2) Impoundments that closed prior to the effective date of the 2015 CCR Rule; and (3) ''Dewatered'' impoundments. These commenters contend therefore, that none of these units should be considered legacy CCR surface impoundments either. Second, a number of commenters raised concerns about the merits or wisdom of the approach. Many of these commenters also offered alternative definitions.

In addition, as discussed in the preceding section, a number of commenters objected to EPA's proposal not to expand the definition of a legacy CCR surface impoundment to include units that no longer contained any liquid on October 19, 2015. These commenters argued that the proposed definition failed to address the full universe of surface impoundments at inactive plants that pose a reasonable probability of adverse effects on health and environment. In support of their contention, these commenters referenced EPA damage cases documenting harm to groundwater and/or surface water from impoundments that may not have contained liquid on or after 2015. The commenters also referenced a report, ''Assessment of Legacy Surface Impoundments'' by Gordon Johnson, M.Sc., P.Eng., that examines ten CCR surface impoundments at inactive facilities that were not on EPA's list of potential legacy impoundments and do not appear to contain standing water. According to the commenter, the report shows that unacceptable levels of risk may still be present for historical impoundments that have been dewatered and/or capped.

(1) What is a ''liquid''?

The May 2023 proposed rule explained that free water, porewater, standing water, and groundwater are liquids under the existing regulation. The source of the liquid does not impact its basic and fundamental designation as a liquid and its contribution to the risk posed by an impoundment. It therefore does not matter whether the liquid in the surface impoundment comes from the rain, waters the facility deliberately places in the unit, floodwaters from an adjacent river, or from groundwater—all are liquids, and once present in the unit, they have the same potential to create leachate (another type of liquid), and to contribute to hydraulic head and drive flows driven by hydraulic gradients. 88 FR 31992.

CCR surface impoundments to stop receiving waste. Facilities had until November 30, 2020 to submit demonstration to EPA for approval.

Several commenters agreed that the final rule should reflect EPA's existing interpretation that an impoundment containing any of the following types of liquid would be considered to contain liquid: free water, porewater, standing water, and groundwater without regard to their source.

However other commenters disagreed that under the existing regulations the term ''liquids'' includes free water, porewater, standing water, and groundwater in CCR units, and disagreed that EPA should adopt such a definition. Many of these commenters argued that EPA should not focus on ''liquids'' but on ''free liquids,'' which they interpret to exclude groundwater. For example, one commenter asserted that ''the term liquids, which is used in the definition of ''free liquids,'' is not defined in the CCR Rule, and that the term ''free liquids'' was never used in relation to groundwater.'' Another commenter objected that the existing regulations establish two separate definitions of free liquids and groundwater, which they claim do not reference each other or refer to overlapping concepts. The commenter further argued that free liquids are ''liquids that readily separate from the solid portion of a waste under ambient temperature and pressure,'' but ''groundwater'' is ''water below the land surface in a zone of saturation,'' and that these are different things from a technical perspective.

These commenters urged that regulating based on the presence of free liquids would be consistent with EPA's philosophy for regulating CCR surface impoundments because free liquids contribute to hydraulic head and hydraulic gradients regardless of their origin and impounded water must be removed from the impoundment to create a stable subgrade for the final cover system. Another commenter stated that this would be consistent with the 2015 CCR Rule, because even a unit closed under the existing regulatory criteria may contain some liquids after closure, so long as they are not free liquids.

The final rule continues to define ''liquids'' in accordance with its plain language meaning, consistent with the ordinary dictionary definition. Reliance on the ordinary meaning here is the default, as neither RCRA nor the existing part 257 regulations include a definition of the term ''liquids.'' *FTC* v. *Tarriff,* 584 F.3d 1088, 1090 (D.C. Cir. 2009) (*quoting Williams* v. *Taylor,* 529 U.S. 420, 431 (2000)) (''It is fixed law that words of statutes or regulations must be given their 'ordinary, contemporary, common meaning.' '').

This reflects EPA's existing construction of the current regulations. As discussed in greater detail in Unit III.B.1.b.i.(b)(4), the final rule incorporates this definition into § 257.53.

The dictionary definition encompasses all of the various types of liquid that may be present in a CCR unit, including water that was sluiced into the impoundment along with the CCR, precipitation, surface water, and groundwater that has migrated into the impoundment, which may be found as free liquids, free water or standing water ponded above the CCR or porewater intermingled with the CCR. These definitions are consistent with the surrounding regulatory text and structure of the regulation as a whole, as well as the wider context in which the terms are employed. As a consequence, the term functions effectively in all of the various contexts in which it is used in part 257. This is particularly true of the term ''liquids,'' which plays a critical role in determining both whether a unit is subject to the regulations and in the performance standards that apply to impoundments closing with waste remaining on-site at § 257.102(d).

Further, reliance on this definition best achieves the statutory purpose of protecting human health and the environment. By accounting for all liquids, regardless of the source, the regulation ensures that the risks that legacy CCR surface impoundments pose will be addressed—both by focusing on the impoundments that pose the greatest risks and by ensuring that all sources of risk are addressed in closing an impoundment. As explained in the proposal, the source of the liquid does not determine its basic and fundamental properties. It therefore does not matter whether the liquid in the surface impoundment comes from the rain, waters the facility deliberately places in the unit, floodwaters from an adjacent river, or from groundwater. All liquids, once present in the impoundment have the same potential to become free liquids and promote contaminant leaching and contribute to structural instability or failure, by contributing to the creation of leachate (another type of liquid), and hydraulic head.

Contrary to the commenters' contentions there is no inconsistency between the regulatory definitions of groundwater and free liquids. By their terms the definitions of free liquids and groundwater are not mutually exclusive; rather, the term ''free liquids'' encompasses the term ''groundwater.'' Nor is there any inconsistency in applying both of these terms in this context. First, the word ''liquid,'' which appears both in the existing definitions of an inactive CCR surface impoundment and free liquids, is broad enough that it can encompass groundwater, which has been defined in § 257.53 since 2015. Not all liquids are groundwaters, but all groundwater (water) is a liquid. And, where the water in the surface impoundment sits ''below the land surface in a zone of saturation,'' the water in the unit meets the regulatory definition of groundwater. 40 CFR 257.53. Moreover, nothing in the definition of free liquids restricts the source of the liquid. It therefore does not matter whether the liquid in the surface impoundment comes from rain, waters that the facility deliberately places in the unit, floodwaters from an adjacent river, or from groundwater—all are liquids. The only test the regulation establishes for free liquids is whether the liquid readily separates from the solid portion of the wastes under ambient temperature and pressure. Id.

However, EPA generally agrees that regulating based on the presence of free liquids, albeit not based on the commenters' misinterpretation of the term, would be consistent with the existing regulations and the risks associated with CCR surface impoundments. As described in Unit III.A above, the risks are largely driven by the presence of free liquids in the unit, as these are the liquids that causes the metals and other constituents to leach out of the CCR, and that will eventually leak out of the unit into the surrounding soil and/or into the aquifer, along with any CCR constituents that have leached from the waste in the interim. Although some liquids will remain bound within the pore spaces of the CCR material and will not readily drain under ambient temperature and pressure, these residual liquids (*e.g.,* bound porewater or potential leachate) will not continue to drain from the unit, absent other forces, and exposure to these residual liquids is therefore not likely.

As discussed in the next section, EPA has adopted an approach based on whether free liquids are present in the impoundment.

(2) What does it mean to contain liquid?

The proposal explained that under the existing regulations, EPA determined whether an impoundment ''contains liquids'' by reference to a combination of the dictionary definition of ''contains,'' and the dewatering standard in § 257.102(d)(2)(i). In essence, if liquids are present in an impoundment, the unit ''contains liquid.'' However, EPA considers a unit that met the performance standard in

§ 257.102(d)(2)(i) to have been dewatered. Several commenters supported this proposal.

However, numerous other commenters raised concerns about relying on the plain language meaning of the phrase. For example, some commenters stated that all units contain some liquid, explaining that a landfill ''contains'' rain after a heavy rainfall event. Similarly, a commenter argued that that under EPA's interpretation, a fully closed unit with ponded water on the cover resulting from precipitation or from fugitive dust control activities, and closed units with an engineered capability to impound water atop their covers would potentially be subject to the CCR regulations. The commenter stated that in all of these cases, the ponded water would seem to pose no risk.

Commenters also separately questioned whether EPA had real risk concerns from units that contained ''any amount'' of liquid. For example, one commenter asserted that EPA has not demonstrated that units with any amount of water, no matter how small an amount or without regard to whether the liquid is separable from the CCR will present sufficient risks to warrant regulation under RCRA section 4004(a). This commenter contended that EPA cannot rely on the 2014 Risk Assessment to support regulating such units because the assessment showed only that surface impoundments with a hydraulic head exceed that risk threshold. Several of these commenters recommended that EPA regulate based on whether the impoundment contains free liquids rather than liquids.

Another commenter raised concern that relying on the plain language meaning would present a number of technical challenges. These included how owners can determine whether a previously closed and dewatered surface impoundment at an active (or inactive) facility still contains ''liquids.'' The commenter explained that in some cases, State regulators confirmed that a site no longer had the capacity to impound water and therefore indicated that the site was no longer subject to the State's dam safety and impoundment rules. The commenter also asked whether EPA would accept use of the paint filter test, the detection of water in piezometers, or some other method to determine whether sufficient separable porewater is present for an impoundment to be considered to ''contain liquids.'' The commenter also asked what kinds of samples would be required—individual or composite—as well as how many and at what locations, to determine if an impoundment ''contains liquids.'' The commenter believed these questions need to be resolved in the numerous situations in which a formerly closed impoundment may contain some porewater as a result of periodic rainfall infiltration but is not in contact with the uppermost aquifer.

By contrast commenters generally supported reliance on § 257.102(d)(2)(i) to determine whether a unit contains liquid; although they disagreed over what that provision requires. Several commenters agreed with the proposal's explanation of these existing closure requirements, stating that the discussion was fully consistent with EPA's long-held position under the largely identical hazardous waste regulations, citing to EPA documents from 1982 and 1988.

But numerous other commenters argued that EPA had misinterpreted § 257.102(d)(2)(i), and consequently was proposing to regulate impoundments that the commenters believed had been dewatered, and therefore posed little risk. According to these commenters, § 257.102(d)(2)(i) does not require the elimination of all liquids, or even all free liquids, but only requires the removal of liquid wastes to the extent necessary to support the cover system. These commenters also contended that ''the plain language of the 2015 CCR Rule does not require facilities to address groundwater as part of the closure performance standards under 40 CFR 257.102(d),'' based in part on the claim that regulatory definition of free liquids does not encompass groundwater. These commenters urged EPA adopt the same approach to determining whether an impoundment contains liquid.

Several commenters also raised concern that the proposal failed to explain or provide clear guidance on how much water an impoundment must contain to be regulated as a legacy impoundment under the 2023 proposed rule. Many of these commenters requested EPA to clearly define a reasonable threshold associated with what it means to ''contain liquids,'' to aid the regulated community in determining when the performance standard has been met. One commenter noted that the Agency had attempted to fix this problem by relying on the closure standard in § 257.102(d)(2)(i), which requires the elimination of ''free liquids,'' but the commenter considered this approach to be insufficient because EPA had not articulated how to determine whether free liquids have been eliminated.

The final rule largely adopts the approach laid out in the proposal, relying on a combination of the plain language meaning of the phrase and the performance standard in § 257.102(d)(2)(i) to determine whether an impoundment ''contains liquid.'' Under the ordinary meaning, an impoundment ''contains liquid'' if liquid is present in the impoundment, even if the impoundment does not prevent the liquid from migrating out of the impoundment. In other words, it ''contains'' water if it has water within it. See, *USWAG, supra* at 454 n. 23 (''The EPA's regulatory definition of ''impoundment'' is consistent with the dictionary definition of the verb ''impound,'' which manifests continuing action,'' citing Impound, Webster's Third New International Dictionary 1136 (3d ed. 1993) (''[T]o confine or store (water)[.]'')). Accordingly, under the final rule, if liquids are present in the unit, it will be considered to contain liquids, unless the facility can demonstrate that free liquids have been eliminated. Simply put, if a facility can document that free liquids were permanently eliminated prior to October 19, 2015, the unit will not be considered a legacy impoundment.

Relying on § 257.102(d)(2)(i) in this context is reasonable and protective. Both the definition of an inactive CCR surface impoundment and the closure performance standard are designed to address the same issues (the presence or removal of liquid wastes) and are designed for the same purpose (to ensure the risks from the co-management of CCR and liquid are adequately addressed). Once the free liquids have been eliminated from the impoundment, any remaining liquids do not present a reasonable probability of contaminating the aquifer. Thus, EPA does not intend an operator to removal all moisture from an impoundment, but only the free liquids required under § 257.102(d)(2)(i), because of free liquids' contribution to risk.

Contrary to some commenters' claims, the existing text in § 257.102(d)(2)(i) requires a facility to eliminate both the standing liquid in the surface of the impoundment and all readily separable porewater in any sediment located in the base of the impoundment. Free liquids are currently defined at § 257.53 to mean ''liquids that readily separate from the solid portion of a waste under ambient temperature and pressure.'' This definition encompasses both standing liquids in the impoundment as well as any readily separable porewater (*i.e.,* porewater that readily separates under ambient temperature and pressure) in any sediment or CCR. As EPA explained in the proposal, the existing regulation does not differentiate between the sources of the liquid in the impoundment (*e.g.,* surface water infiltration, sluice water intentionally added, groundwater intrusion). This is further supported by the fact that the performance standard at § 257.102(d)(2)(i) was modeled on the regulations that apply to interim status hazardous waste surface impoundments, which are codified at § 265.228(a)(2)(i). EPA's guidance on these interim status regulations clarifies that these regulations require both the removal of standing liquids in the impoundment and sediment dewatering. See, ''Closure of Hazardous Waste Surface Impoundments,'' publication number SW–873, September 1982. EPA previously discussed the subtitle C regulations at length beginning on page 29 in the Final Decision on Request For Extension of Closure Date Submitted by Gavin Power, LLC, 87 FR 72989 (November 15, 2022), as well as in the associated Response to Comments document located in the docket.[47] And the definition of liquid included in this final rule removes any misunderstanding.

The commenters are also mistaken that the existing regulation only requires the elimination of free liquids to the extent necessary to support the unit's final cover system, The provision does not state that the facility must ''eliminate free liquids to the extent necessary to support the final cover system,'' or anything comparable. Given that § 257.102(d)(2)(ii) does specify that ''waste must be stabilized sufficient to support the final cover system,'' the absence of any similar text in paragraph (d)(2)(i) is dispositive. Compare § 257.102(d)(2)(i) and (ii).

EPA disagrees that it is not taking into account whether the water in the unit poses risk. And for the same reasons EPA disagrees that it has failed to demonstrate that the units subject to regulation under this rule warrant regulation under RCRA section 4004(a).

Impoundments with free liquids do in fact pose significant risk for the reasons discussed above. In the proposal, EPA discussed two examples of units that still ''contain liquids'': (1) A unit constructed such that the CCR in the unit was continually saturated by water flowing freely through the unlined impoundment; and (2) Where the facility has removed only the standing water from the impoundment. As EPA explained, as a purely factual matter, a surface impoundment that has only decanted the surface water would normally still contain free liquids if the waste in the unit was still saturated with water. Neither of these examples—which in actuality, likely represent the overwhelming majority of legacy impoundments subject to the final rule—have eliminated free liquids or involve trivial amounts of water. As explained in the preceding sections, such impoundments still contain hydraulic head and are otherwise essentially indistinguishable from the impoundments described in the 2015 CCR Rule preamble and modeled in the 2014 Risk Assessment. And as EPA explained in the proposal, these units retain the conditions that cause a heightened risk of contaminating the aquifer. That is true even if the unit is considered ''closed'' under State law, is in the process of closing, or at some subsequent point, the unit is fully dewatered and no longer contains liquid.

Moreover, as several commenters confirmed, it has apparently been a common practice to maintain CCR impoundments in a dewatered state. Even assuming these commenters meant that they had done more than merely remove the standing water, which seems unlikely given their comments on § 257.102(d)(2)(i), without an effective cover system many ''dewatered'' impoundments can nevertheless contain significant volumes of water simply as a consequence of the amount of precipitation that continually percolates through the unit. Based on an online USGS Rainfall Calculator Tool,[48] the example unit will receive a total of 27,154 gallons of water per acre during a single 1-inch rainfall event. Taking that a step further, a 50-acre impoundment in Atlanta, Georgia typically receives an average of 50 inches of rain a year, which equates, on a yearly average, to 67,885,000 gallons of water per year.[49] In the absence of any action taken to remove the water, over time it will continue to accumulate in the unit.

Thus, in many areas of the country (*e.g.,* the Southeast), CCR surface impoundments without an effective cover system may contain free liquids and meet the definition of a legacy impoundment due to the amount of annual rainfall.[50] But this approach is intended to also clarify that contrary to the commenters' contention, a unit whose periodic rainfall does not result in free liquids (*e.g.,* is readily absorbed into the CCR) would not be regulated as a legacy CCR surface impoundment.

Finally, with respect to the small number of units that may have been completely dewatered after October 19, 2015, these units likely pose significant (and unacceptable) risks to human health and the environment that warrant regulation under RCRA section 4004(a), based solely on the expected presence of contamination that occurred while the impoundment was operating. See Unit III.A.2 of this preamble.

This approach also largely addresses commenters' request for a clear standard, and many of their technical concerns. For example, the clarification that EPA is concerned with the presence of readily separable porewater, (that is, free liquids), which can be easily verified by technical equipment such as piezometers, thus resolves the commenters' concern that that porewater may be difficult to measure as it is held in the interstices or pore spaces between particles of soil, sediment, and/or CCR material and may not flow readily or be easily quantified using field or laboratory methods. EPA has also developed a memorandum describing the current methods and tools that are available to determine whether free liquids have been eliminated, which is available in the docket for this rulemaking. EPA has provided a brief summary of the memorandum in the next four paragraphs below.

Many of the tools and methods to identify and eliminate free liquids are already widely used by industry to investigate and close surface impoundments. For example, tools currently used to identify free liquids include soil borings and cone penetrometers to map the stratigraphy of the CCR unit and characterize the geotechnical and hydraulic properties of the various CCR layers, as well as the installation of traditional piezometers, monitoring wells and vibrating wire piezometers to monitor pore pressures and water levels. Properly constructed

[47] The Final Decision and Response to Comments documents can be found in the docket for that action. See docket items EPA–HQ–OLEM–2021–0590–0100 and EPA–HQ–OLEM–2021–0590–0099, respectively.

[48] Found at *https://www.usgs.gov/tools/usgs-rainfall-calculator*. Found at *https://www.usgs.gov/tools/usgs-rainfall-calculator*.

[49] Based on 30-year average rainfall from National Weather Service data.

[50] The frequency and severity of future rainfall events may be amplified by the effects of climate change. On average this would result in more water percolating through, and accumulating in, legacy CCR surface impoundments, which may further increase the risk of these units contaminating their underlying aquifers. More frequent and more severe rainfall events may also increase the risk that legacy CCR impoundments flood, overtop, and experience structural failures leading to potentially catastrophic releases of CCR into the surrounding environment. Many legacy CCR surface impoundments are located in 100-year floodplains which suggests that they are particularly vulnerable to rainfall driven flooding. Unit V of this preamble and the RIA accompanying this final rule describe this scenario in more detail.

wells and piezometers screened in the appropriate locations and depths have a prominent role in networks of instruments used to assess free liquids, as their design directly measures water levels under ambient conditions. Fundamentally, water levels in properly constructed and developed wells and piezometers are indicative of free liquids at that location. Conversely, networks of spatially discretized wells and piezometers can be used as part of a program to determine or confirm that free liquids no longer exist.

Similarly, tools and methods to eliminate free liquids within the CCR, such as rim ditches, underdrain systems, pumping wells, manifolded extraction wellpoints, etc., are also currently widely employed by industry. These elimination technologies can also provide diagnostic and confirmatory insights into the presence and nature of free liquids at a given CCR unit, *e.g.,* rim ditches and open excavations enable direct observation of free liquids.

EPA recommends that a demonstration of whether free liquids are present rely on a holistic evaluation of all information collected from site-wide monitoring networks (*e.g.,* piezometers and vibrating wire piezometers), as well as data collected from actual dewatering efforts. EPA further recommends that monitoring networks include points of sufficient density to independently verify dewatering performance determined from implementation of elimination technologies.

The memorandum also provides general guidance on considerations for developing successful site-specific strategies and approaches to identify, measure, monitor and eliminate free liquids. The elimination of free liquids relies on a well resolved understanding of the character and variability of the site-specific geology and hydrology, as well as the CCR materials themselves. Such information is frequently compiled into a Site Conceptual Model (CSM), and the memorandum also discusses some considerations related to the elements needed to construct a CSM if one does not already exist, or to augment a weak or poorly resolved CSM.

EPA has adopted this approach rather than the commenters' suggestion to define a legacy CCR surface impoundment as a CCR surface impoundment that ''contains CCR and free liquids''—even though EPA expects the effect will be the same in almost all cases—because it represents the best balance of several competing considerations. First reliance on the broad dictionary definition is the most protective because all liquids have the potential to become the free liquids that create leachate and contribute to hydraulic head. This approach also maintains consistency with the existing definition of an inactive CCR surface impoundment.

At the same time, EPA acknowledges that once the free liquids have been eliminated from the impoundment, any remaining liquids typically do not present a reasonable probability of contaminating the aquifer. EPA is also mindful of not establishing criteria that blur the lines between landfills and impoundments, EPA agrees with commenters that it would not be appropriate to designate a CCR landfill as a CCR surface impoundment based solely on periodic rainfall that is readily absorbed into the CCR and does not result in free liquids.

The regulation reflects this balance by placing the burden on the owner or operator to demonstrate that the standard in in § 257.102(d)(2)(i) has been met. In other words, the absence of free liquids is an affirmative defense, and therefore any uncertainty as to whether the standard in § 257.102(d)(2)(i) has been met is to be construed in favor of regulation because of the risks of environmental harm from free liquids in contact with CCR.

Although, consistent with the 2015 CCR Rule, EPA is not requiring facilities to post documentation to demonstrate that no legacy impoundment is present at the site, EPA recommends that facilities develop and retain records to support any determination that a particular unit meets this exception. Finally, as discussed in Unit III.B.2.b.i of this preamble, EPA has provided additional time to allow a facility to determine that it has eliminated free liquids as part of its applicability report.

(3) Whether the Proposal Reflected a ''New'' Interpretation

To support their claim that EPA had adopted new definitions of ''liquid'', ''CCR surface impoundment'' and ''inactive CCR surface impoundment,'' a number of the commenters identified aspects of the 2015 CCR Rule or preamble that they believe to be inconsistent with the May 2023 proposed rule preamble. First, several of these commenters claimed that statements in the proposed rule are inconsistent with the requirement in the existing definition of a CCR surface impoundment that the unit must be ''designed to hold an accumulation of CCR and liquids.'' 40 CFR 257.53. For example, some commenters stated that an impoundment that was dewatered and closed or is otherwise maintained so as not to impound liquids is no longer ''designed to hold an accumulation of CCR and liquids,'' and therefore, cannot be considered an inactive or legacy impoundment. Several commenters also claimed that the 2015 CCR Rule preamble, explained that the phrase, ''designed to hold an accumulation of CCR and liquids,'' means *only* units that ''contain a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants.'' According to these commenters, although a dewatered or closed impoundment may ''contain liquid'' as EPA defined it in the May 2023 proposal, no hydraulic head would be present. Or as one commenter stated, ''The Proposed Rule definition of liquids was expanded to include sources of water that are not demonstrated to be contributing to hydraulic head, or creating the potential for impoundment failure and spread of contaminated water.'' These commenters argue that facilities had relied on this guidance in good faith, and that ''simply citing the dictionary definitions of a 'liquid' and 'contains' eight years after the 2015 CCR Rule published and without context is not a sufficient rationale or appropriate.''

Several of these same commenters raised concern that EPA was proposing to regulate units that do not present the same risks on which the original rule was based. These commenters stated that in 2015 EPA did not strictly interpret ''liquids'' as precipitation, porewater, or groundwater without considering the associated force of liquids on the unit's embankment. According to the commenters, the 2015 CCR Rule was based on—and the current rulemaking should continue to be concerned with only—''the risk of excessive hydraulic head and the potential for structural failure of embankments from impounded water.'' The commenters further stated that the maintenance of CCR impoundments in a dewatered state significantly reduces the risk of structural failure, reduces the contact time with larger quantities of CCR, and reduces constituent concentrations and overall risk of impact to groundwater.

Other commenters pointed to statements in the 2015 CCR Rule preamble that EPA did not intend the term ''inactive impoundments'' to include units that are closed, or to require closed units to reclose. Several of these commenters quoted the following discussion:

EPA did not propose to require ''closed'' surface impoundments to ''reclose.'' Nor did

EPA intend, as the same commenters claim, that ''literally hundreds of previously closed. . .surface impoundments—many of which were properly closed decades ago under state solid waste programs, have changed owners, and now have structures built on top of them—would be considered active CCR units.'' Accordingly, the final rule does not impose any requirements on any CCR surface impoundments that have in fact ''closed'' before the rule's effective date—*i.e.,* those that no longer contain water and can no longer impound liquid.

80 FR 21343.

Another commenter asserted that based on the proposal's ''strict interpretation,'' all CCR landfills and all CCRMU would (inappropriately) be considered inactive or legacy CCR surface impoundments. As the commenter explained, a CCR landfill could contain liquids, especially after heavy rainfall, but as it was not designed to hold an accumulation of CCR and liquid it is not a CCR surface impoundment.

A number of commenters also argued that the interpretation in the proposal of ''contains liquids'' is inconsistent with the decision in 2015 to define sand and gravel pits as a CCR landfill. According to the commenters, if EPA intended inactive CCR surface impoundments to broadly encompass CCR in contact with groundwater, without hydraulic head, sand and gravel pits would have instead been added to the definition of CCR surface impoundment. The commenters base this on EPA's statement in the proposed rule that ''the damage from the placement of CCR in sand and gravel pits was almost always associated with CCR being placed in contact with water, which indicated that the placement of CCR in contact with water can lead to higher risks than from dry disposal.'' See, 80 FR 32010.

Finally, a commenter raised concern that owners of inactive facilities that dewatered a CCR surface impoundment before October 19, 2015, but completed the removal of CCR at some time after October 19, 2015, could be subject to the CCR legacy rules because of what the commenter characterizes as the modification to the definitions of liquid and contains. This commenter also raised concern that some former coal-fired power plant properties were sold based on EPA's prior guidance that dewatered surface impoundments were not regulated, and asked whether these non-utilities will be required to comply with the documentation requirements.

As discussed above, this final rule defines a legacy CCR surface impoundment as a CCR surface impoundment at an inactive facility that ''contains both CCR and liquid,'' as EPA discussed that phrase in the proposal. EPA continues to believe that the appropriate construction of the phrase is to rely on its plain language meaning, consistent with the ordinary dictionary definitions those terms, in combination with the dewatering standard in § 257.102(d)(2)(i). EPA is also promulgating a definition of this term in this final rule. As discussed above, some commenters have asserted that this definition is ''new.'' EPA disagrees. Regardless, even if it were new, it is permissible for EPA to define the term here in this rulemaking—EPA is not bound to any prior definition, and fully explained its rationale for the definition herein. In addition, the definition of liquids is not in any way inconsistent with other definitions in § 257.53 or any other provisions from the 2015 CCR Rule.

EPA agrees that a legacy CCR surface impoundment must meet the existing definition of a CCR surface impoundment in § 257.53. That definition contains three criteria: (1) The unit must be ''a natural topographic depression, manmade excavation or diked area;'' (2) The unit must be ''designed to hold an accumulation of CCR and liquid;'' and (3) The unit ''treats, stores or disposes of CCR.'' 40 CFR 257.53. None of these require the presence of a particular amount of water or hydraulic head—or indeed any. Rather, the unit must be ''designed''—that is, intended to—hold an accumulation of CCR and liquid. Although EPA expected that, based on its understanding of the utilities' current management practices, water would be present as a consequence of the treatment, storage, or disposal occurring in the unit, nothing in the text of the definition requires it, let alone requires a minimum amount. The requirement that liquid actually be present in the unit appears in the definition of an ''inactive surface impoundment'' (or ''legacy CCR surface impoundment''), which as discussed, requires that the unit ''contains both CCR and liquids.'' 40 CFR 257.53.

With this understanding, EPA disagrees with the commenter who asserted that based on the proposal's ''strict interpretation,'' all CCR landfills and all CCRMU would be considered inactive or legacy CCR surface impoundments. The commenter explained that, for example, a CCR landfill could contain liquids, especially after heavy rainfall, and the commenter believed that the construction of the regulation outlined in the proposal would mean that this unit would be classified as a CCR surface impoundment even though the unit was not ''designed to hold an accumulation of both CCR and liquid.'' EPA agrees that a unit that meets the definition of a CCR landfill would not become a CCR surface impoundment merely because it contained liquid; as the commenter noted, such a unit would not have been ''designed to hold an accumulation of both CCR and liquid.'' Ordinarily there should be clear indications that the unit was not intended or designed to function as an impoundment; for example, if the facility placed only dry CCR into a unit, or had designed or constructed the unit as a CCR landfill (*e.g.,* it was constructed or operated with a leachate collection and removal system that meets the requirements of § 257.70(d)). It was for this reason that EPA included sand and gravel pits within the definition of a CCR landfill; all of those instances involve the placement of exclusively dry CCR into the sand and gravel pits with no indication that they were designed to hold liquids.

For the same reason, EPA disagrees that an impoundment that has been dewatered and closed or is otherwise now maintained so as not to impound liquids should no longer be considered ''designed to hold an accumulation of CCR and liquids,'' and therefore, should not be considered an inactive or legacy impoundment. Just as a landfill would not suddenly become ''designed to hold an accumulation of both CCR and liquids'' based on the temporary presence of precipitation, removing liquids from a unit that was constructed as a surface impoundment and that operated as a surface impoundment by managing both CCR and liquids for decades, does not suddenly mean that the unit is no longer ''designed to hold an accumulation of CCR and liquids.'' Even assuming all free liquids had been removed from the unit, which as discussed below is unlikely, the subsequent removal of liquids as part of closing the unit does not change either the original design or use of the unit; the commenters do not intend to retrofit the unit for subsequent use as a landfill, but are merely in the process of complying with the requirements applicable to the closure of CCR surface impoundments. Nor does the subsequent dewatering change the present risks arising from the original design and long-term operation of the unit as an impoundment. To avoid any confusion on this point, EPA has deleted the phrase ''which is'' from the existing definition of a CCR surface impoundment.

EPA also disagrees that the proposed (and now final rule) expanded the existing definition of a CCR surface impoundment—either by regulating different kinds of units as surface impoundments than are currently regulated as surface impoundments, or by regulating units that present substantially different kinds or level of risks. These commenters have misunderstood the 2015 CCR Rule and preamble.

EPA did not limit surface impoundments to units ''containing a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants.'' The definition of a CCR impoundment is discussed in the 2015 preamble at 80 FR 21357–21358. Reading the discussion as a whole, rather than the single sentence from the preamble that the commenters reference, clearly demonstrates that the 2015 CCR Rule was concerned with more than the risks associated with the force of impounded water on the embankment structure and included the risks of contamination when water travels from the impoundment to the surrounding are, and that EPA did not limit the CCR surface impoundments regulated under the 2015 CCR Rule to those that contain a particular amount of water or degree of hydraulic head.

It is clear from the complete discussion that what determines whether a unit is considered a CCR surface impoundment are the three criteria [51] (discussed above) actually in § 257.53, rather than a finding that the particular unit ''contain[s] a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants.''

In addition, the critical issue in crafting the definition was the quantity of CCR in the unit, not the quantity of water. Thus EPA explained that it was modifying the proposed definition to address concerns that it would capture ponds that contain only *de minimis* levels of CCR, because it agreed with commenters that the rule as proposed could inadvertently capture units that present significantly lower risks, such as process water or cooling water ponds that ''although they will accumulate any trace amounts of CCR that are present, they will not contain the significant quantities that give rise to the risks modeled in EPA's assessment.'' 80 FR 21357. EPA then stated that by contrast, ''units that are designed to hold an accumulation of CCR and in which treatment, storage, or disposal occurs *will contain substantial amounts of CCR and consequently are a potentially significant source of contaminants.*'' Id. (*Emphasis added*).

These points are best illustrated by the specific examples discussed in the preamble of the 2015 CCR Rule. First, in each example EPA explained whether the units would be considered CCR surface impoundments exclusively by reference to the criteria in the regulation. 80 FR 21357. Second, the units in each of the examples contained varying degrees of water and therefore hydraulic head. The final example was a diked area in which wet CCR is placed in order to remove the water for future transport to a CCR landfill or beneficial use. EPA explained that:

> [t]he unit is accumulating CCR, while allowing for the evaporation or removal of liquid (no free liquids) to facilitate transport to a CCR landfill or for beneficial use. In this instance, the unit again meets all three definition criteria, it is a diked area (*i.e.,* there is an embankment), it is accumulating CCR for ultimate disposal or beneficial use; and it is removing any free liquids, (*i.e.,* treatment). As such, this unit would meet the definition of CCR surface impoundment.

80 FR 21357. The impoundment in this example contains far lower amounts of liquid than would be found in an operating impoundment because it is used to remove liquid from CCR. In essence such units would likely not contain significantly more liquid than the partially dewatered impoundments that the commenters now claim are exempt based on their supposed lack of a hydraulic head. 80 FR 21357–21358.

More to the point, the units that the commenters argue should be exempt do still contain a hydraulic head ''that promotes the rapid leaching of contaminants'' and the consequent increased risks of leachate contaminating groundwater.

Based on their comments on the closure performance standards, what these commenters mean by ''dewatered'' is merely the removal of: (1) Only the standing liquid or the free liquid visible at the surface of the impoundment; or (2) Free liquids in the CCR only to the depth needed to safely work with heavy machinery and to expedite the closure process. Properly characterized, this is merely partial dewatering. As previously discussed, because they are not removing free liquids beyond this depth, this eliminates neither the ''liquid,'' the hydraulic head in the unit, or the conditions that create the heightened risk of leachate contaminating ground or surface water. Although this will reduce the hydraulic head, until the water is eliminated, gravity will continue to exert downward pressure on the saturated waste. Continued contact with free liquids will continue to cause metals and other constituents to leach from the CCR, and the downward pressure of the hydraulic head will continue to drive the leachate toward the bottom of the unit into the surrounding soil and/or into the aquifer, along with any CCR constituents that have leached from the waste.

It is clear from the 2015 preamble that the situation described by the commenters is not what EPA intended when it explained that the regulations did not apply to ''closed'' units. In the paragraphs preceding the commenters' selective quotation, EPA defined inactive surface impoundments as ''those that contain both CCR and water, but no longer receive additional wastes.'' 80 FR 21343. EPA further explained that ''By contrast, a 'closed' surface impoundment *would no longer contain water,* although it may continue to contain CCR (or other wastes), and would be capped or otherwise maintained.'' Id. (emphasis added). See also, Id. (3d col) (''Accordingly, the final rule does not impose any requirements on any CCR surface impoundments that have in fact 'closed' before the rule's effective date—*i.e., those that no longer contain water and can no longer impound liquid.*'') (emphasis added). Note that EPA stated that a closed unit would not contain ''water,'' without qualification or limitation. Nowhere in this discussion (or the rest of the preamble) did EPA distinguish between water, free water, porewater, or groundwater, or expressly suggest that any of those might appropriately remain in the unit after closure.

EPA thus agrees that, as in the 2015 CCR Rule, ''an impoundment that no longer contains liquid prior to October 19, 2015'' would not be considered either an inactive impoundment or a legacy impoundment.[52] EPA acknowledges that CCR surface impoundments that contained liquids prior to October 19, 2015, can still be associated with significant environmental and human health risks. As discussed in Unit III.A.1 of this preamble, many if not all of these impoundments lacked a composite liner system, and therefore likely leached contaminants into the soil and underlying aquifer during operation. Eliminating the liquid from the impoundment will not remediate these releases—which at some sites may be significant—although it may substantially reduce or eliminate a source of additional or continuing

[51] The existing definition of a CCR surface impoundment contains three criteria: (1) The unit must be ''a natural topographic depression, manmade excavation or diked area;'' (2) The unit must be ''designed to hold an accumulation of CCR and liquid;'' and (3) The unit must ''treat[ ], store[ ] or dispose[ ] of CCR.'' 40 CFR 257.53.

[52] EPA also discusses its interpretation of ''impound liquid'' in Unit III.B.2.g of this preamble.

contamination. And to the extent the unit lacks an effective cover system, the unit may still be leaching contaminants, albeit at a reduced rate. Consequently, although such units would not be considered inactive or legacy impoundments, some will be regulated as a CCR management unit, as described in the next section.

However, the proposal by some commenters to regulate any impoundment that has ever contained CCR and liquids would represent a significant expansion of the regulations, in that it would essentially capture every CCR surface impoundment that ever operated in the United States. To illustrate the potential implications of such a revision: approximately 533 surface impoundments and 239 landfills are regulated under the 2015 Rule. EPA estimates that as a consequence of this final rule, an additional 194 (legacy) surface impoundments will be regulated. By contrast, as one commenter calculated, approximately 2,170 surface impoundments were operating in 1973 alone.[53] EPA, however, is not prepared at this juncture to expand the regulation so dramatically without first obtaining at least some basic information about the kinds of sites that would be regulated. Instead, EPA is proceeding to address the effects of past CCR management one step at a time, and is focusing here on a narrower universe of regulated units.

The Agency is not required to address every aspect of a problem immediately; courts have long recognized that it can be appropriate to address complex problems in stages. This final rule expands oversight to approximately 194 legacy CCR surface impoundments, and as discussed in Unit III.C, closes gaps in the existing regulations that currently fail to require facilities to remediate known contamination resulting from the operation of their CCR units. EPA expects to shortly publish a final permit rule and to begin issuing permits to bring facilities into full compliance. While the Agency works to address the risks from this current universe, EPA will also continue to collect information to better understand the full extent of the potential problem posed by the universe of abandoned sites that remain unregulated. In the interim, authority under RCRA section 7003 and CERCLA section 106 remains available to address any imminent and substantial threats to human health or the environment that these unregulated sites may present. 42 U.S.C. 6873 and 9606.

EPA also agrees that as a consequence of the plain language meaning of the phrase ''contains liquid,'' the owners of inactive facilities that dewatered a CCR surface impoundment before October 19, 2015, but completed the removal of CCR at some time after October 19, 2015, would be subject to this final rule if only the standing water had been removed from the impoundment by this date. As EPA explained in the proposal, as a purely factual matter, a surface impoundment that has only removed visible surface water would normally still contain liquids if the waste lower in the unit was still saturated with water. However, this issue is also discussed further in the next section. Because the regulation applies exclusively to the current owners and operators, if such a facility had been sold to a non-utility, the new owner, rather than the previous owner, will be required to comply with the any applicable requirements.

(4) Adding a Definition to the Regulations

As noted previously, EPA solicited comments on whether adopting a definition of ''liquids'' into part 257 would provide greater clarity. The preamble discussed various possible definitions, including from Merriam-Webster and a technical definition. The proposal also explained that the term ''liquids'' encompasses all the various types of liquid that may be present in a CCR unit, including water that was sluiced into the impoundment along with the CCR, precipitation, surface water, and groundwater that has migrated into the impoundment due to the construction of the unit, which may be found as free water or standing water ponded above the CCR or porewater intermingled with the CCR. 88 FR 31992. Although there was widespread disagreement about what the definition should be, most commenters appeared to support including a definition in the regulations. Several commenters supported including a definition of ''liquids'' in the final rule to prevent future disputes over the meaning of the term. Some of these commenters stated that ''given the clear, plain language of the CCR Rule's closure provisions and EPA's longstanding implementation of the regulations, codifying a regulatory definitions [sic] of the plain term 'liquid(s)' should be unnecessary.'' However, the commenters also stated that ''in light of industry's apparent preference to litigate the reality that groundwater is liquid in favor of properly closing its leaking, unlined ponds, EPA should codify its longstanding, plain meaning definitions of key terms in the hope of avoiding unnecessary and costly future litigation and ensuring timely, proper closure.''

By contrast several commenters opposed including a definition in the regulations, suggesting that EPA should instead continue to rely on how the commenters believed those terms have been used in the 2015 CCR Rule and historically applied in implementing RCRA requirements. Some of these commenters stated that EPA has not provided adequate notice to the public of a new regulatory definition of ''liquids,'' and claimed that EPA therefore could not adopt a regulatory definition of ''liquids'' in a final rule. Finally, a commenter opposed adding a definition of ''liquids'' to the regulations, arguing that it would not change the definition of ''free liquids,'' which the commenter believes is a distinct, technical regulatory term that does not encompass groundwater, or the performance standard in § 257.102(d)(2)(i), which, according to the commenter, only requires the removal of liquid wastes and stabilization of remaining wastes to support the cover system.

Several commenters recommended that in the absence of a statutory definition of ''liquid(s)'' and consistent with the CCR regulatory definition of ''free liquids'' and EPA's longstanding implementation of the predecessor hazardous waste closure regulations, EPA should codify a definition of ''liquid'' based on the dictionary definitions as set forth in the Proposed Rule. They also suggested that the definition should make clear that the term encompasses free water, porewater, standing water, and groundwater without regard to their source.

Commenters also offered numerous alternatives. For example, several commenters offered technical definitions from various sources. One of those commenters raised concern that the technical definition discussed in the proposal had the potential to be confusing. According to this commenter, bulk particulate solids, such as fly ash, exhibit the physical properties of a liquid identified in the technical definition: specifically, dry fly ash flows when poured from container to container and conforms to the shape of a container—retaining its volume but not its shape. Instead, this commenter suggested that soil mechanics might provide useful information on which to base a definition.

As noted above, numerous commenters also suggested that EPA should focus on ''free liquids'' rather

[53] GenOn Comments at 5–6. Estimate based on the number of coal-fired generating units operating in 1973 according to the U.S. Energy Information Administration (1,839) and assuming 1.2 surface impoundments per plant, consistent with operations in 2010.

than ''liquids.'' Several of these commenters recommended that the final rule adopt the definition in 40 CFR 258.28(c)(1), which relies on the Paint Filter Liquids Test to determine whether liquids are present. The commenters recommended that the CCR and MSW landfill programs be consistent as both reside under RCRA subtitle D. However, one of these commenters also raised concern that it is unclear how far back in time this would reach and how EPA or the States would be expected to regulate inactive utilities that no longer exist but may have closed units that meet the definition. By contrast, other commenters raised concern about a definition that relied on the Paint Filter Liquids Test, stating that facilities had experienced difficulties implementing the test in the field.

Another commenter explained that focusing on porewater, rather than the separable porewater covered by the definition of free liquids would cause technical difficulties. According to this commenter, porewater may be difficult to measure as it is held in the interstices or pore spaces between particles of soil, sediment, and/or CCR material and may not flow readily or be easily quantified using field or laboratory methods. Consequently, the commenter believed that it would not be feasible to identify whether liquids inclusive of all porewater (whether separable or not) were present in an impoundment or landfill closed prior to October 19, 2015, or in other words, to demonstrate the absence of liquids eight years ago.

Similarly, one commenter stated that EPA should adopt a definition in the context of material in the ''liquid state'' such as free liquids and materials that behave as liquids and can be readily separated from the ''solid'' matrix and should not include those materials that are bound within the matrix and not readily separable. And another commenter recommended that EPA define a legacy impoundment based on the presence of free liquids and data to support that the free liquids have impacted groundwater.

EPA continues to strongly believe that the plain text of the regulation clearly communicates the Agency's positions laid out above, and that in light of the dictionary definition a regulatory definition is not strictly necessary. However, in light of the different understanding of the regulations among commenters, EPA is incorporating the existing requirements into the definitions in § 257.53. Accordingly, the final rule includes a definition of ''liquids'' based on the definition from Merriam-Webster discussed in the proposal. The new definition, codified at § 257.53, provides that ''Liquids means any fluid (such as water) that has no independent shape but has a definite volume and does not expand indefinitely and that is only slightly compressible. This encompasses all of the various types of liquids that may be present in a CCR unit, including water that was sluiced into an impoundment along with CCR, precipitation, surface water, groundwater, and any other form of water that has migrated into the impoundment, which may be found as free water or standing water ponded above CCR or porewater intermingled with CCR.

In addition, the final rule includes in § 257.53 a definition of the phrase ''contains both CCR and liquids,'' consistent with the discussion above and in the proposal. The definition reflects both the dictionary definition of ''contains'' and EPA's explanation that it relies upon the closure standard in § 257.102(d)(2)(i) to determine whether a unit contains liquids.

The definition states that ''Contains both CCR and liquids means that both CCR and liquids are present in a CCR surface impoundment, except where the owner or operator demonstrates that the standard in § 257.102(d)(2)(i) has been met.''

These definitions reflect EPA's construction of the existing regulations. In addition, codifying these definitions definitively confirms that an impoundment saturated by groundwater or continually inundated by surface water is an inactive or legacy impoundment. It also provides greater clarity that all kinds of liquid are relevant to determining whether an impoundment is subject to part 257 and has properly closed.

Consequently, EPA decided not to adopt either the technical definition of liquid discussed in the proposal or any of the suggested alternatives. EPA agreed that the technical definition in the proposal had the potential to be confusing given that fly ash can sometimes exhibit the physical properties of a liquid identified in the technical definition. While EPA also agrees that CCR is a porous material similar to soil, EPA did not adopt the commenter's suggestion to rely on soil physics to craft an alternative. CCR is not a soil, and EPA is concerned more with the hydraulic characterization of CCR that involves other considerations in addition to soil physics.

EPA also chose not to adopt the definition in 40 CFR 258.28(c)(1), which relies on the Paint Filter Liquids Test, or to otherwise mandate reliance on the Paint Filter Liquids Test. First, a number of other commenters raised technical concerns about relying on this test in this context. In addition, EPA would not generally recommend using the Paint Filter Liquids Test in this context. There can be physical effects from obtaining the sample that could affect the representativeness of the sample (vibration, heat from the drilling bit, etc.) and that can result in false negatives. Consequently, although it might provide relevant information to confirm the presence of water in a sample, EPA does not generally consider the results to be sufficiently reliable to confirm the absence of free liquids.

EPA disagrees that the public had insufficient notice of a potential definition. EPA explained the subjects and issues the agency would consider in reaching its decision, and provided examples of possible definitions. In general, to provide adequate notice an agency must ''provide sufficient factual detail and rationale for the rule to permit interested parties to comment meaningfully.'' *Florida Power & Light Co.* v. *United States,* 846 F.2d 765, 771 (D.C. Cir. 1988). As demonstrated in the preceding section, numerous other entities were able to effectively provide comments, for example raising concerns about the definitions discussed in the preamble, and offering potential alternatives. No commenter has indicated what further information is necessary to be able to comment effectively on the issue.

EPA agrees that adopting these definitions will not change the performance standard in § 257.102(d)(2)(i), but for very different reasons than those proffered by the commenters. Incorporating these definitions into the part 257 regulations merely reaffirms the plain language meaning of the term ''liquids,'' which, as previously explained, is the status quo. But because the term ''liquids'' is used in the definition of ''free liquids,'' defining liquids to expressly encompass all of the various types that may be present in a CCR unit, including groundwater, removes any misunderstanding that such liquids cannot be considered to be free liquids when they otherwise meet the definition, that is, they readily separate from the solid potion of CCR at ambient temperature and pressure.

However, the commenters are correct that it will not address their misconstruction of § 257.102(d)(2)(i), which attempts to limit the requirement based on text that does not appear in the provision. Further discussion of § 257.102(d)(2)(i) can be found in Unit III.B.2.g.

In conclusion, under this final rule the surface impoundments discussed in the proposal would still be considered legacy impoundments, as all would still contain free liquids. Specifically this includes (1) Any impoundment where, on or after October 19, 2015, water flowed or continues to flow through the impoundment, permeating the waste in the unit, such as where the base of the impoundment intersects with the groundwater; (2) A surface impoundment where only the surface water has been decanted; here too the impoundment would normally still contain free liquids if the waste in the unit was still saturated with water; and (3) Any impoundment that still contains free liquids: (a) even if it is considered ''closed'' under State law; (b) it is in the process of closing on the effective date of this rule; or (c) the unit has been fully dewatered and can no longer impound liquid only after October 19, 2015 (*i.e.,* it contained free liquids on October 19, 2015).

ii. What does it mean to ''contain'' CCR?

In the proposal, EPA explained that under the existing regulation, an inactive CCR surface impoundment must contain CCR to be subject to the rule. 40 CFR 257.53. EPA further explained that it was not proposing to revise that aspect of the legacy impoundment definition. EPA proposed that, consequently, a legacy impoundment that had closed by removal in accordance with the performance standards in § 257.102(c) before October 19, 2015, would not be considered an inactive (and therefore not a legacy) CCR surface impoundment.

EPA also proposed that an impoundment at an inactive facility that was still in the process of closing by removal on October 19, 2015, would be considered a legacy CCR surface impoundment subject to the final rule requirements. EPA proposed that facilities with such a unit would be required to certify and post documentation that they have met the existing standard for closure by removal in § 257.102(c) on their CCR website (*i.e.,* ''certification requirement''). However, if a facility could not demonstrate that the closed impoundment meets the existing performance standards in § 257.102(c), the unit would be considered a legacy impoundment subject to the rule. EPA further explained that because the impoundment contained liquid and CCR on October 19, 2015, it would meet the definition of a legacy CCR surface impoundment, and that EPA had no basis to exempt it, because EPA had no factual basis to conclude that a legacy CCR surface impoundment that was in the process of closing posed no risk. However, EPA explained that depending on when the impoundment completed closure, some individual requirements may no longer be applicable to the legacy CCR surface impoundment (*i.e.,* when the compliance date in the final rule falls after the date closure is completed for the impoundment).

No commenter opposed the proposal to exclude impoundments that did not contain any CCR prior to the effective date of the 2015 CCR Rule, although several commenters believe that additional impoundments should also be excluded. For example, many commenters stated that EPA does not have jurisdiction under RCRA over impoundments from which all CCR was removed between October 19, 2015, and the effective date of this final rule. As one of these commenters explained:

> As proposed, a closed unit would still be regulated under the final rule if all CCR has been removed but groundwater monitoring shows exceedances of the groundwater protection standard constituents listed in Appendix IV. RCRA's juridical boundaries are exceeded under this interpretation. The *USWAG* decision explained that RCRA gives EPA the authority to regulate past disposal of CCR based on the continued presence of CCR. Once the CCR is removed, CCR is no longer disposed of, and EPA does not have the ability to regulate based on the previous existence of CCRs.

Commenters also provided examples of the type of facility they believe that EPA cannot regulate. For example, one commenter described a closure of three interconnected CCR surface impoundments associated with the Richard H Gorsuch Power Plant. According to the commenter,

> the closure was permitted by the state of Ohio, along with a redesign of one of the impoundments to control stormwater runoff post-closure. The closure of these impoundments included dewatering and removal of all CCR materials to clean soil prior to filling with clean soil and grading. All CCR was transported to the associated off-site fly ash landfill. No groundwater monitoring was required, all the CCR was removed, and the site is adjacent to an existing RCRA corrective action (Union Carbide) with known groundwater impacts.

Some of these commenters further stated that EPA cannot rely on any residual contamination left in groundwater to support jurisdiction because EPA has made clear that groundwater (as well as other environmental media containing contaminants) is not a solid waste. Finally, some commenters asserted that EPA has no data showing that there is a reasonable probability of adverse impact from historical CCR units that have been closed by removing the CCR, and as a consequence, EPA cannot regulate such units.

By contrast, a number of commenters requested that EPA clarify that its statement in the Proposed Rule that EPA ''no longer has jurisdiction over a former unit that has closed by removal in accordance with § 257.102(c)''—is based on the complete absence of CCR, and requires not only removal of CCR from and decontamination of the unit but completing all groundwater cleanup and other remedial measures and then adequately documenting, with at least two years of post-removal or decontamination groundwater monitoring, that GWPS are reliably achieved by removal prior to the effective date of the final rule.

EPA disagrees that it lacks jurisdiction over a site at which the owner has removed CCR from the impoundment after October 19, 2015. Many of the commenters misunderstand the *USWAG* decision, as well as the legal structure applicable to these units.

First, the *USWAG* decision did not limit EPA's authority to sites where CCR remains, but to sites where *solid waste* is present. See, *USWAG,* 901 F.3d at 440–441 (''Properly translated then, an open dump includes any facility (other than a sanitary landfill or hazardous waste disposal facility), where *solid waste* still ''is deposited,'' ''is dumped,'' ''is spilled,'' ''is leaked,'' or ''is placed,'' regardless of when it might have originally been dropped off.'') (emphasis added).

Second, in the example EPA presented in the proposal, even though the facility may have removed all CCR from the surface impoundment, solid waste still remains on site because groundwater monitoring continues to detect statistically significant levels of one or more Appendix IV constituents. These monitoring results demonstrate the continued presence of CCR leachate[54]—which is a solid waste under the definition in 42 U.S.C. 6903(27)—in groundwater, and, potentially, in soil at the site. As discussed in greater detail below, this is sufficient to demonstrate that EPA retains jurisdiction over the site, under the plain language of the statutory definitions of solid waste and disposal.

EPA also considers that it has authority to regulate as part of this rule, sites similar to the one presented by the

[54] Leachate is produced when liquids, such as rainwater or groundwater, percolate through wastes stored in a disposal unit. The resulting fluid will contain suspended components drawn from the original waste.

commenter above. As discussed in more detail below, the rulemaking record supports a presumption that solid waste remains at the site, even assuming the facility had removed all CCR from the impoundment. The rulemaking record demonstrates the high likelihood that the impoundment will have leaked during its operation. As a consequence, at any site that closed without groundwater monitoring, such as the one described in the comment above, or that has not undertaken any remediation, there is every reason to believe that leachate (and, therefore, solid waste) will remain on site. In addition, the measures that facilities have described taking to remove all CCR from the impoundment would in fact leave CCR leachate remaining in soils at many sites.

(a) Definition of Solid Waste

EPA's jurisdiction over sites at which CCR leachate remains is clear from the plain language of the statutory definitions of solid waste and disposal.

Under the CCR regulations, the statutory definition of solid waste applies, rather than any of the various narrower subtitle C regulatory definitions in 40 CFR part 261. Section 257.53 specifically provides that ''Terms not defined by this section have the meaning given by RCRA.'' Part 257 does not include a definition of ''solid waste'' or ''waste,'' which therefore takes the broader statutory definition of the term. See also the § 257.53 definition of disposal, which references ''solid waste as defined in section 1004 (27) of the Resource Conservation and Recovery Act.''

The subtitle C regulations are equally clear that they do not apply to subtitle D wastes. See, *e.g.,* 40 CFR 260.1(a) (''This part provides definitions of terms, general standards, and overview information applicable to parts 260 through 265 and 268 of this chapter.''); § 261.1 (a) (''This part identifies those solid wastes which are subject to regulation as hazardous wastes under parts 262 through 265, 268, and parts 270, 271, and 124 of this chapter and which are subject to the notification requirements of section 3010 of RCRA.'').

Under RCRA the term ''solid waste'' means:

any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 1342 of title 33, or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923) [42 U.S.C. 2011 *et seq.*].

42 U.S.C. 6903(27). The plain meaning of the word ''discarded'' in this definition is ''disposed of,'' ''thrown away,'' or ''abandoned.'' See, *e.g., American Mining Congress* v. *U.S. EPA,* 824 F.2d 1177, 1184 (D.C. Cir. 1987) (citations omitted) (''*AMC I*''); *American Petroleum Institute* v. *EPA,* 906 F.2d 729, 740–741 (D.C. Cir. 1990) (per curiam). Such materials are ''part of the waste disposal problem'' that Congress enacted RCRA to address. *AMC I,* 824 F.2d at 1193. In other words, under the statute if something has been disposed of, as that term is defined in the statute, it is a solid waste.[55]

Any CCR leachate left behind as soil and groundwater contamination after CCR removal would clearly constitute material that has been ''abandoned'' or ''discarded'' and is thus subject to regulation under subtitle D without further activity. EPA has long considered material that has spilled or leaked onto the soil and not been cleaned up to have been ''abandoned'' or ''discarded.'' See, *e.g., Chemical Waste Management* v. *EPA,* 869 F.2d 1526, 1539 (D.C. Cir. 1989); *Connecticut Coastal Fishermen Ass'n* v. *Remington Arms Co.,* 989 F. 2d 1305, (2d Cir 1993).

The conclusion that the CCR leachate contaminating soil and groundwater is a solid waste is also consistent with EPA's long-held interpretation (discussed at length in the 2015 CCR rule preamble) that leaking or passive migration of leachate constitutes the disposal of solid waste. 80 FR 21342–21347, quoting 43 FR 58954 (''This is an important issue, however, because some, and perhaps most, inactive facilities may still be 'disposing of waste' within the meaning of that term in Section 1004(3) of RCRA. . . . Many inactive facilities may well be leaking solid or hazardous waste into groundwater and thus be 'disposing' under RCRA.''). See also, *e.g., In re Consolidated Land Disposal Litigation,* 938 F2d 1386, 1388–1389 (D.C. Cir. 1991).

And even under the narrower regulatory definition of solid waste in subtitle C, EPA has long considered leachate (*i.e.,* the leaked constituents) from previously disposed hazardous wastes to be a hazardous (and therefore, solid) waste. See, *e.g.,* 40 CFR 261.3(c)(2)(i) (''any solid waste generated from the treatment, storage, or disposal of a hazardous waste, including any . . . leachate . . . is a hazardous waste.''). 45 FR 33096 (May 19, 1980) (''As a practical matter, this means that facilities which store, dispose of or treat hazardous waste must be considered hazardous waste management facilities for as long as they continue to contain hazardous waste and *that any wastes removed from such facilities—including spills, discharges or leaks*—must be managed as hazardous wastes.'')(*emphasis* added). See, also, *Chemical Waste Management,* 869 F.2d at 1539.

Moreover, as discussed above, one factor the D.C. Circuit has considered in determining whether a substance is properly considered a waste is whether ''the materials are 'part of the waste disposal problem' Congress intended to address in enacting RCRA.'' *AMC I, quoting* House Committee Report, H.R. Rep. No. 1491, 94th Cong., 2d Sess. at 2, U.S. Code Cong. & Admin. News 1976, p. 6240. If so, it falls under EPA's authority in RCRA to address. See, *American Mining Congress* v. *EPA,* 907 F.2d 1179, 1186–87 (D.C. Cir. 1990) (deferring to EPA's focus on potential environmental harm in determining whether material is discarded) (*AMC II*). The contamination from legacy impoundments (even when the CCR has been removed from the impoundment) remains a threat to human health and the environment that stemmed from discarded materials, and thus is ''part of the waste disposal problem'' RCRA was enacted to address.

As discussed in more detail in Unit III.A.3, EPA estimates that groundwater contamination at sites with legacy impoundments could pose lifetime cancer risks from arsenic as high as 2×10^{-5} to 1×10^{-5} (*i.e.,* 2 to 100 cases of cancer for every 100,000 individuals exposed), depending on the specific management practices and site conditions. In addition, EPA estimated noncancer risks well in excess of an HQ of one for a wide variety of CCR constituents, depending on the management practices and site conditions; for example, the high-end of noncancer risks for lithium ranged between two to three; for molybdenum up to an HQ of four; thallium up to an HQ of two, and for cobalt and mercury up to an HQ of 13 and five, respectively. Moreover, in the absence of any groundwater remediation, there is no reason to believe that the removal of CCR from the impoundment mitigates these risks. Although the unit may no longer continue to contribute additional contamination, removal of the CCR does not address the release of and risk from the metals or other CCR constituents in any contaminant plume.

[55] As EPA explained in the 2015 preamble, ''placement in a landfill or surface impoundment is prima facie evidence of discard.'' 80 FR 21348.

The leachate from a CCR surface impoundment or landfill is therefore unquestionably a solid waste under the broader statutory definition in 42 U.S.C. 6903(27). And to the extent the leachate remains in soil or groundwater, that is sufficient to support jurisdiction over that site, even though all CCR may have been removed from the disposal unit. The risks from the leachate-contaminated groundwater also clearly establish a reasonable probability of adverse impacts on health and the environment from legacy impoundments that have been closed by removing only the CCR.

EPA disagrees with the commenters who stated that the Agency should not presume that there have been impacts to groundwater from an area where the ash has been fully removed, absent specific evidence to the contrary. The record from both the 2015 CCR Rule and the current rulemaking supports a strong presumption that solid waste remains on-site at these facilities. As the D.C. Circuit noted, legacy impoundments have been shown to be even more likely to leak than units at utilities still in operation. 901 F.3d at 432.

Data collected as part of the 2015 rulemaking shows that the majority of the older operating (pre-1994) waste units lack liners; 63% and 24% of older surface impoundments have either no liners or clay liners, respectively. 80 FR 21326. Thus far, no commenter has identified a legacy impoundment with a composite liner.

Analysis of the information from the damage cases also demonstrates that unlined surface impoundments typically operate for 20 years before they begin to leak. Id. at 21326–21327. As discussed previously, commenters submitted data indicating that on average legacy impoundments are 55 years old. The following examples discussed in the 2015 CCR rule preamble further demonstrate the high probability that legacy impoundments will have leaked, and that in the absence of remediation measures leachate is highly likely.

In the wake of the 2008 TVA Kingston CCR spill, Illinois and North Carolina for the first time required utilities to install groundwater monitoring. Illinois required facilities to install groundwater monitoring downgradient from their surface impoundments. As a result, within only about two years, Illinois reported that seven facilities had detected instances of primary MCL exceedances, and five additional facilities had reported exceedances of secondary MCLs. The data for all 12 sites were gathered from onsite; it appears none of these facilities had been required to monitor groundwater off-site, so whether the contamination had migrated off-site was unknown. Similarly, North Carolina required facilities to install additional down gradient wells. In January 2012, officials from the North Carolina Department of Environment and Natural Resources disclosed that elevated levels of metals were found in groundwater near surface impoundments at all the State's 14 coal-fired power plants. 80 FR 21455.

It is also highly unlikely that removal of CCR would also have removed all areas affected by releases at many (if not most) sites. In their comments, facilities have described relying on visual inspection or in some cases microscopic inspection of soil material to determine whether all CCR have been removed from the impoundment. In such cases, the practical depth limit of such investigations is generally just beneath (*e.g.,* a foot or less) the visually observed maximum depth of CCR. However, it is not likely this practice would be sufficient at many legacy sites to remove all areas affected by releases of CCR leachate.

At a minimum, for units with bases above the groundwater, the soil column beneath the unit from the base of the unit to at least the depth of the lowest water levels recorded in the aquifer, would typically need to determine whether the zone of water table fluctuation constitutes a residual source and may be in need of corrective action. Concentrations of contaminants at this horizon could be significantly elevated. In a case where prior site assessment and groundwater monitoring activities have not resulted in a preexisting well network capable of making this determination it may be necessary to install additional wells or to assess groundwater.

Moreover, in a unit constructed with CCR below the ambient groundwater, after decades of groundwater infiltration through the waste, the leachate generated would be expected to show elevated levels of CCR constituents of concern. This chemically altered leachate can interact with unsaturated or partially saturated soils beneath the CCR and can react with aquifer solids beneath the unit to form intermediate chemical compounds, some of which may be bound to the aquifer matrix in solid phases. Also, depending on the amount of groundwater recharge and infiltration directed through the unit, some downwardly infiltrating leachate is likely to reach the saturated zone where additional chemical reactions occur. Depending on the degree of disequilibrium with the ''ambient'' conditions such reactions can be significant and can also result in formation of mineral species that become temporarily immobilized at or beneath the water table as solid mineral phases by formation of mineral precipitates or simply adsorbed to the aquifer matrices by retardation processes. These intermediate transformation products may contain CCR constituents of concern as either major, minor or trace components of newly formed compounds. Depending on the aquifer chemistry, including redox state, pH, salinity, alkalinity, etc., some CCR constituents may remain mobile in groundwater and may continue to migrate downgradient of the unit. Consequently, in situations where the waste is below the water table, assessment efforts would generally need to penetrate a sufficient depth below the base of the waste or the lowest water levels in the aquifer, whichever is greater, to ensure that potential releases of leachate to the soil have been evaluated.

Consequently, based on the practices that facilities have stated that they use to confirm that they have removed all CCR from a site, both leachate contaminated soil and groundwater would frequently be expected to remain on site even after CCR may have been entirely removed from the impoundment. The totality of the information in the record thus supports a presumption that solid waste remains on-site. Demonstrating compliance with § 257.102(c) rebuts that presumption and documents that the site is no longer under RCRA's jurisdiction.

EPA also disagrees that reliance on the residual contamination left in groundwater to support jurisdiction is precluded by EPA's prior statements that contaminated media are not solid wastes. These commenters are referring to EPA statements made in connection with the ''contained in'' policy under the RCRA hazardous waste regulatory program. As an initial matter, the commenters have misunderstood the policy. The policy states only that with respect to contaminated soil or groundwater, the media itself–the soil or groundwater–is not a solid waste–even though it contains a hazardous waste. In other words, the contamination itself remains a solid waste, and therefore subject to EPA's jurisdiction. See, *Chemical Waste Management* v. *EPA,* 869 F.2d at 1539 (upholding EPA interpretation that hazardous waste restrictions continue to apply to waste ''contained in soil or groundwater'' as ''consistent with the derived-from and mixture rules,'' even though the rules by their terms do not apply to contaminated soil or groundwater because they are not solid wastes).

In any event, as discussed above, none of the regulations in 40 CFR parts 260–268, or 270 apply, except to the extent EPA incorporated them into part 257, subpart D. This also means that any Agency interpretations or policies adopted under those regulations, no matter how long-standing, do not automatically apply to CCR, which are regulated under part 257, subpart D. Moreover, the policies and/or interpretations the commenters identify were developed based on the text of particular statutory or regulatory provisions under subtitle C, as well as the larger statutory context in which those particular statutory or regulatory requirements operate (for example, corrective action obligations at hazardous waste treatment, storage, and disposal facilities). RCRA subtitles C and subtitle D differ greatly. For example, only under subtitle C did Congress expressly prohibit land disposal of hazardous wastes that do not meet treatment standards established in EPA regulations. 42 U.S.C. 6924(d), (g), (h), (m). Similarly, there is no analog under subtitle D to section 6925(j), which imposes detailed requirements on hazardous waste surface impoundments. It would therefore be inappropriate to simply adopt a particular interpretation or policy developed under the particular provisions of the RCRA subtitle C hazardous waste regulatory program into the CCR program without evaluating whether the policy or interpretation is consistent the statutory language in subtitle D or would achieve Congress's purposes or direction. Note that EPA explains above how its approach is consistent with subtitle D and the congressional scheme.

Finally, it is important to note that EPA is not suggesting that the management of CCR leachate is now subject to the CCR regulations. EPA has jurisdiction over CCR leachate because the material is solid waste not because it is CCR. Under the existing regulations the definition of CCR does not include leachate. See, 40 CFR 257.53. EPA did not propose to amend this regulation and does not currently intend to do so.

(b) Exclusions

Several commenters suggested a number of other exemptions. For example, one commenter suggested that the final rule exclude legacy impoundments that only contain *de minimis* quantities of CCR. According to the commenter, EPA's risk analysis from the 2015 CCR Rule supports the conclusion that up to 75,000 tons of CCR used as structural fill is generally safe. Therefore, the commenter recommended that inactive impoundments with 75,000 tons or less, be exempt from regulation. Other commenters urged EPA to clearly define what is meant by *de minimis* amounts of CCR in the context of legacy impoundments.

Other commenters requested that EPA exempt any legacy CCR surface impoundments that met State requirements for clean closure. These commenters argue that EPA cannot expect utilities who have closed legacy impoundments under State guidelines prior to this rulemaking to meet a standard that did not exist at the time of closure. These commenters also asserted that by regulating such units EPA is effectively disregarding a qualified State's regulatory authority to approve closure under the regulations and programs available to them at the time.

Other commenters suggested that EPA should allow facilities to certify that they had completed closure by removal in two additional situations. The first suggestion was to allow a facility to certify that it had complied with § 257.102(c) based solely on documentation that the facility had removed all ash by the effective date of the 2015 CCR Rule, unless EPA or the facility also had evidence (*e.g.,* from existing monitoring networks) of groundwater impacts that could impact human health or the environment. These commenters stated that EPA should not presume that there have been impacts to groundwater from an area where the ash has been fully removed years or even decades ago, absent specific evidence to the contrary. The second suggestion was that EPA exclude facilities that could certify and document that they have met the closure-in-place performance standards in § 257.102(d) by the effective date of this final rule. To support their proposal, the commenter noted that EPA has made it clear that the owner or operator of a CCR facility can close a CCR unit under either § 257.102 (c) or (d) and be in compliance with the Federal CCR regulations.

Finally, EPA received a number of comments on the kind of documentation that a facility needed to support a determination that it had closed a legacy impoundment by removal in accordance with the standards in § 257.102(c) prior to October 19, 2015. Some commenters requested that the final rule require facilities to post detailed documentation demonstrating compliance with § 257.102(c). Other commenters, however, objected to any documentation requirements, asserting that it was inconsistent with EPA's treatment of similar facilities in 2015, who were not required to provide any compliance documentation of closure requirements. These commenters requested EPA to remove the requirements under § 257.100(f)(1)(ii) and allow owners to make the closure determination.

(c) Final Requirements

Consistent with the proposal, this final rule provides that an impoundment that contained CCR (and liquids) on or after October 19, 2015 is subject to this rule. This means that if a facility closed a legacy CCR surface impoundment by removal before October 19, 2015, that site is not subject to this final rule. However, the final rule does not require such facilities to demonstrate that these units were closed "in accordance with the performance standards in § 257.102(c)." Under § 257.102(c) closure is complete when all CCR has been removed from the CCR unit, any areas affected by releases from the CCR unit have been removed, and groundwater monitoring concentrations do not exceed the groundwater protection standard in § 257.95(h) for Appendix IV constituents. The proposed rule incorrectly stated that EPA was proposing to impose a documentation requirement on these facilities. That statement was made in error; EPA did not intend to propose such a requirement. EPA did not propose to require a facility to document that an impoundment did not contain liquids prior to October 19, 2015. Nor did the 2015 CCR Rule require any facilities to document that they were not subject to regulation. These facilities were never subject to the exemption for inactive impoundments at inactive facilities that was vacated in the *USWAG* decision and therefore should not be regulated as part of EPA's action to implement the Court's order. Accordingly—and consistent with the 2015 CCR Rule—if all CCR and liquids have been removed from the impoundment prior to October 19, 2015, nothing further is required.

Under the definition in the final rule, a facility that initiated closure by removal prior to October 19, 2015, but whose impoundment still contained CCR and liquids on or after October 19, 2015 is considered a legacy CCR surface impoundment and regulated under this final rule, even if the facility has removed all CCR prior to the effective date of this final rule. Depending on when the impoundment completes closure, some individual requirements may no longer be applicable to the legacy CCR surface impoundment (*e.g.,* when the compliance date in the final rule falls after the date closure is completed for the impoundment); but as EPA explained in the proposal, the Agency has no basis for concluding that all legacy CCR surface impoundments that are still in the process of closing pose no risk.

The final rule retains the provision under which a facility with a CCR surface impoundment that contained CCR and liquids on October 19, 2015, but that completed closure by removal before the effective date of this rule, would only be required to post documentation on the facility's CCR website that it has met the standards in § 257.102(c) for that unit (*i.e.,* the certification of closure by removal for legacy CCR surface impoundments). To be eligible for the closure certification, the facility must document that it meets the criteria laid out in Unit III.B.2.b.iii. Namely, the facility must demonstrate that consistent with the existing standards, all CCR has been removed from the unit, any areas affected by releases from the CCR unit have been removed, and must have groundwater monitoring data demonstrating that the concentrations of each Appendix IV constituent do not exceed the relevant groundwater protection standard, which would be either the MCL or background concentration, for two consecutive sampling events.

If a facility certifies all of the legacy CCR surface impoundments on-site have met the requirements in § 257.102(c) for closure by removal before the effective date of this rule, the facility would not be subject to any further requirements under this final rule (*i.e.,* neither legacy CCR surface impoundment requirements or CCRMU requirements).

For similar reasons as explained above, EPA cannot accept the commenter's suggestion that EPA establish the same provision for facilities that closed a legacy impoundment prior to the effective date of this final rule in accordance with § 257.102(d) (closure when leaving CCR in place) and allow facilities to simply demonstrate that the closure meets the performance standards in § 257.102(d). The commenters appear to be requesting an exemption from post closure groundwater monitoring and corrective action requirements, but provided no factual basis for such an exemption. Nevertheless, as discussed in Unit III.B.2.g.iii of this preamble, if a facility can document that the closure of its unit meets the performance standards in § 257.102(d), all that would be required is compliance with the groundwater monitoring requirements in §§ 257.90–257.95, and any necessary corrective action throughout the post-closure care period (in addition to recordkeeping and posting).

The documentation requirements, procedures, and compliance deadlines for these various options are discussed further in Unit III.B.2.g of this preamble.

EPA also disagrees with the commenter that 75,000 tons is a *de minimis* amount of CCR. The commenter has misunderstood EPA's findings in 2015; EPA did not conclude that quantities of CCR lower than 75,000 tons used as fill does not pose any risk to human health or the environment. Rather EPA concluded that, while the agency has sufficient information to document that unencapsulated uses can present a hazard, based on the rulemaking record EPA lacked the information necessary to demonstrate that unencapsulated uses in amounts lower than 12,400 tons are likely to present a risk. 80 FR 21352. In any event, as discussed in Unit III.A.4, recent EPA modeling demonstrates that far lower quantities of CCR (1,000 tons) can pose significant risks to human health and the environment.

In the 2015 CCR Rule, EPA provided guidance on which impoundments would not meet the definition of a CCR impoundment because they generally do not contain significant levels of CCR. 80 FR 21357. Specifically, EPA explained that CCR surface impoundments do not include units generally referred to as cooling water ponds, process water ponds, wastewater treatment ponds, storm water holding ponds, or aeration ponds. These units do not meet the definition of a CCR surface impoundment, that is, they are not designed to hold an accumulation of CCR and treatment storage or disposal of accumulated CCR does not occur in these units. Accordingly, EPA considers that such units would also not be legacy impoundments. EPA acknowledges that it mistakenly referred to one of these units as a CCR surface impoundment in the proposal, but that was an error.

c. Legacy CCR Surface Impoundment—Requirement To Be Located at an ''Inactive Facility''

EPA proposed to define an ''inactive facility'' (or inactive electric utility or independent power producer) as one that ceased producing electricity prior to October 19, 2015, which is the effective date of the 2015 CCR Rule. EPA explained that this date is also the same date currently used in the regulation to define ''active facility'' under § 257.53, and that EPA originally used this date to define the exempted inactive units in the 2015 CCR Rule. The proposal further explained that use of this date would mean that the same universe of units that were subject to the original exemption would be regulated and that this is consistent with the Court's vacatur, as vacatur is intended to restore the status quo ante, as though the vacated provision never existed. 88 FR 31994, 32034.

Commenters supported October 19, 2015, as the operative date to be used in the definition of an inactive facility because any other date would be inconsistent with the existing definition of an ''active facility.'' However, many commenters opposed the proposed substitution of the phrase ''regardless of the fuel currently used to produce electricity'' with ''regardless of how electricity is currently being produced at the facility.'' According to these commenters, the existing definition of ''active facility'' does not extend to facilities that do not use fuel, including, for example, facilities that produce solar power, because the plain language of § 257.50(c) makes clear that, to be active, a facility must use a fuel to produce electricity. These commenters cite two preamble statements in the 2015 CCR Rule to support their allegation. The first is the applicability section of 2015 CCR Rule, which only references the NAICS 221112 (Fossil Fuel Power Generation). These commenters speculate that if EPA had intended for the term ''active facility'' to extend to facilities that do not use fuel to produce electricity, EPA would have included other NAICS codes. The second statement appears in the executive summary and explains that the rule applies to:

> Certain inactive CCR surface impoundments (*i.e.,* units not receiving CCR after the effective date of the rule) at active electric utilities or independent power producers' facilities, regardless of the fuel currently used at the facility to produce electricity (*e.g.,* coal, natural gas, oil), if the CCR unit still contains CCR and liquids.

80 FR 21303.

The commenters contended that EPA's proposal represents a significant change that will subject renewable generation to the CCR regulations (*e.g.,* a former coal-fired power plant that was retired, closed and dismantled well in advance of the 2015 CCR Rule that had new renewable generation built at the facility), creating strong disincentives to renewable repowering at those sites. These commenters further added that such a change in position requires EPA to take reliance interests into account. To address this, the commenters made two suggestions. The first was that EPA should establish an exemption from regulation for inactive facilities that generate 50 megawatt (MW) or less to the grid (all from renewable energy). The 50 MW threshold is consistent with the small generating units subcategory under the Federal effluent limitations guidelines and standards (ELG) regulations.[56] In addition, the commenters believed that this would also account for sites that have utilized renewable energy (*e.g.,* solar panels) for the primary purpose of powering the remaining infrastructure, but may potentially supply very limited amounts to the grid on occasion.

The second suggestion was that EPA confirm that this is a prospective change and provide a pathway for compliance for facilities that would be newly subject to the CCR Rule. According to those facilities relied in good faith on the explanatory statements in the 2015 CCR Rule preamble and the plain meaning of the term ''fuel,'' believed they were inactive facilities and did not have units subject to requirements of the CCR Rule, and accordingly should be allotted a separate new compliance timeframe.

EPA disagrees that the phrase ''regardless of the fuel currently used to produce electricity'' under § 257.50(c) indicates that EPA meant to limit the rule to facilities that combust fossil fuels. As EPA stated in the proposed rule, the definition of an active facility at § 257.53 does not include any limitation related to how the facility generates electricity. The clause, ''regardless of the fuel currently used to produce electricity'' in § 257.50(c) does not limit coverage only to facilities that use fuel to generate electricity. The plain language of the clause actually states the opposite; that coverage applies *without regard to the fuel used* to produce electricity. Or in other words, without regard to the type of fuel used or indeed whether any fuel is used to produce electricity.

EPA also disagrees that either of the cited preamble statements demonstrate a contrary intent. As the commenters themselves acknowledge, the discussion of affected entities expressly states that it ''may not be exhaustive; other types of entities not listed could also be affected.'' 80 FR 21302. In addition, EPA expressly stated that ''[t]o determine whether your facility, company, business, organization, etc., is affected by this action, you should refer to the applicability criteria discussed in Unit VI.A of this document.'' Id. Similarly, the parenthetical description ''(*e.g.,* coal, natural gas, oil)'' uses the abbreviation *e.g.,* which indicates that it is not comprehensive.

[56] 80 FR 67838 (November 3, 2015).

Consequently, EPA disagrees that facilities have any reliance interest in a less expansive definition. Generally, a reliance interest may be implicated if an agency issues a policy, a party takes an action based on that policy, and the agency subsequently changes its policy. *DHS* v. *Regents of the Univ. of Cal.,* 140 S. Ct. 1891, 1913 (2020). Here, EPA never changed its position, and there can be no legitimate reliance on a non-existent past position.

Even if the regulatory amendment reflected a changed in policy, EPA issued a proposal and solicited comment from affected entities on the substance of the policy that would be in place in the final action. The commenters had an opportunity to provide EPA with information detailing their reliance interests, although they failed to do more than allege that they had reliance interests in remaining exempt. EPA has explained why, notwithstanding those interests, the agency believes that this is the better policy. No more is required. *DHS* v. *Regents of the Univ. of Cal., supra* at 1913.

Nevertheless, EPA is sensitive to not creating disincentives to renewable repowering at those sites. In addition, EPA acknowledges that although commenters' interpretation is not the best reading of the provision, it is a plausible one. Accordingly, EPA has adopted the commenters' suggestion that the Agency provide a pathway to compliance for facilities that believed they were inactive facilities and did not have units subject to the requirements of the 2015 CCR Rule. This final rule provides that facilities producing electricity through renewables (*i.e.,* non-fuels) are subject to the same applicable compliance deadlines for these units. See § 257.100(a)(1).

EPA is rejecting the commenters' suggestion that EPA exempt inactive facilities that generate 50 megawatt (MW) or less to the grid. This is because an exemption for small generating units based on current operations, such as renewable generation with a capacity of 50 MW or less, do not necessarily correlate to the current risks resulting from past coal-fired generation operations.

d. Innocent Owners

EPA proposed not to establish an ''innocent owner'' provision in the CCR regulations, in part because EPA had no factual basis to establish one. 88 FR 31994–95. The Agency received comments both opposing and supporting such a provision. Most commenters opposed the inclusion of an innocent owner provision in the final rule. Some of these stated that there is no statutory basis for uniformly excluding existing owners and operators from any RCRA regulations applicable to legacy impoundments. According to these commenters, the concept of an ''innocent owner'' does not apply to legacy impoundments because only the owner of the regulated unit can fulfill obligations involving affirmative regulatory controls.

Other commenters stated that relevant parties may allocate liability among themselves through various agreements and arrangements. These commenters explained that liability should not be rigidly limited only to the current owner, that liability should honor existing agreements (*e.g.,* purchase and sale agreement), and that it may be appropriate under some circumstances for shared responsibility between the current owner and the utility. Another commenter stated that each of the utilities and each transferee should remain responsible for rule compliance regardless of how responsibility is currently allocated.

Other commenters supported adoption of an innocent owner provision in the regulations. These commenters claimed that EPA is responsible for creating a new class of innocent owner when it changed the 2015 CCR regulations. Consequently, these commenters urged EPA to develop an innocent landowner provision that would allow both the utilities and developers to come to a mutual agreement as to who has the environmental and financial responsibility of these newly regulated units. Finally, another commenter suggested EPA take time to evaluate the different types of innocent property owners and then consider adding an innocent owner provision to the regulations.

EPA has not included an innocent owner provision in the final rule. EPA explained in the proposal that its analysis of inactive facilities found that most inactive facilities are owned by companies that are already regulated by the CCR regulations. The analysis presented in the proposed rule indicated that approximately 80% of potential legacy impoundments (*i.e.,* 126 of the 156 identified potential units) are owned by companies the Agency knows as already having units subject to the CCR regulations. 88 FR 31994. As a consequence, EPA proposed it had no factual basis to establish an innocent owner provision. 88 FR 31995. EPA has updated the ownership analysis based on an updated list of potential legacy impoundments. The revised analysis continues to indicate that most inactive facilities are owned by companies that are already regulated by the CCR regulations. The 194 potential legacy impoundments identified in the final rule are associated with 52 different unique corporate parents. Of the 194 impoundments, 142 units (or 73%), are owned by 28 companies the Agency knows own facilities currently subject to the CCR regulations. The remaining 52 impoundments are owned by 24 different companies, with each company generally having just one location/site with legacy CCR surface impoundments (with two exceptions, that each own two sites).

EPA is also aware of a number of instances in which parties have allocated liability among themselves through various agreements and arrangements. EPA infers from this that an innocent landowner provision is not necessary to allow utilities and developers to come to a mutual agreement on how best to allocate environmental and financial responsibility. EPA has no interest in taking actions that could potentially inhibit or interfere with these private arrangements. For all these reasons EPA continues to believe that an innocent owner provision is not currently needed and has not included such a provision in the final rule.

2. Applicable Requirements for Legacy CCR Surface Impoundments and Compliance Deadlines

This Unit of the preamble first provides a general overview of how EPA determined the applicable requirements and compliance deadlines for legacy CCR surface impoundments. Then, EPA discusses each of the existing requirements for CCR surface impoundments and explains: (1) Why EPA is (or is not) applying them to legacy CCR surface impoundments; and (2) The rationale for the compliance deadline EPA is finalizing for each requirement.

a. General Overview

i. Applicable Requirements for Legacy CCR Surface Impoundments

EPA proposed to apply all of the existing requirements in 40 CFR part 257, subpart D that are currently applicable to inactive CCR surface impoundments to legacy CCR surface impoundments, except for the location restrictions at §§ 257.60 through 257.64, and the liner design criteria at § 257.71. EPA also proposed one revision to the existing groundwater monitoring requirements and three new requirements specific to legacy CCR surface impoundments: a reporting requirement; a new security requirement to restrict public access to these sites; and a closure certification. As explained in the proposed rule, EPA proposed to exclude the location restrictions and the liner design criteria requirements because EPA believed they would not be necessary if EPA took final action on the proposed requirement that all legacy CCR surface impoundments initiate closure no later than 12 months after the effective date of the final rule. Furthermore, the proposed rule explained that the record for the 2015 CCR Rule demonstrated that ‘‘there is little difference between the potential risks of an active and inactive surface impoundment; both can leak into groundwater, and both are subject to structural failures that release the wastes into the environment, including catastrophic failures leading to massive releases that threaten both human health and the environment.’’ 80 FR 21343. As discussed in Unit II.B of this preamble, the D.C. Circuit came to the same conclusion, and on that basis, vacated the exemption for legacy CCR surface impoundments. See, *USWAG* at 901 F.3d at 434. Based on the record, EPA considered that it has limited discretion to establish requirements for legacy CCR surface impoundments that are significantly different than those currently applicable to inactive CCR impoundments. This is also consistent with how the *USWAG* court viewed the 2015 record. Accordingly, EPA proposed that in most cases the existing requirements in 40 CFR part 257, subpart D applicable to inactive CCR surface impoundments would apply to legacy CCR surface impoundments.

EPA received numerous comments on the proposed rule regarding the requirements applicable to legacy CCR surface impoundments. Several commenters generally supported the regulatory approach, although some suggested that legacy CCR surface impoundments be subject to all the existing CCR regulations, including the location restrictions at §§ 257.60 through 257.64 and the liner design criteria at § 257.71. Other commenters stated that the inspections at § 257.83 were only relevant for operating CCR units and therefore should not be applied to legacy CCR surface impoundments. A few commenters suggested EPA create additional requirements for legacy CCR surface impoundments such as zero discharge limits, new reporting requirements, financial assurance measures, and beneficial reuse restrictions. Other commenters suggested that EPA revise the existing requirements applicable to inactive impoundments, including by adding requirements to the fugitive dust, closure, and post-closure care requirements; further revising the groundwater monitoring requirements to ban intrawell data comparisons; mandating closure by removal; and using a risk-based approach for corrective action and closure requirements.

EPA still considers that based on the record (as described in III.A of this preamble), EPA has limited discretion to establish requirements for legacy CCR surface impoundments that are significantly different than those currently applicable to inactive CCR impoundments. For that reason and those laid out in the preamble of the proposed rule, EPA did not adopt any of the new requirements, such as zero discharge limits, new reporting requirements, financial assurance measures, or new beneficial use restrictions suggested by commenters. The final rule contains only one additional revision of the existing requirements for inactive CCR surface impoundments beyond the four included in the proposed rule: the deferral to permitting of certain closure activities. The rationale for the final requirements is detailed in subsequent sections in this Unit.

For the reasons detailed in the proposed rule, except for certain legacy impoundments, EPA is finalizing the requirement for legacy CCR surface impoundments to comply with the existing regulations in 40 CFR part 257, subpart D applicable to inactive CCR surface impoundments except for the location restrictions at §§ 257.60 through 257.64, and the liner design criteria at § 257.71. EPA is also finalizing the revision to the existing groundwater monitoring requirements, combining detection and assessment monitoring for legacy CCR surface impoundments and the two new requirements specific to legacy CCR surface impoundments: the applicability documentation (§ 257.100(f)(1)(i)) and the site security requirement (§ 257.100(f)(3)(iii)).

The final rule also establishes a tailored subset of requirements applicable to legacy CCR surface impoundments that were closed prior to the effective date of this rule, including those impoundments whose closures qualify for deferral because they were conducted in accordance with substantially equivalent State or Federal requirements. See Unit III.B.2.g.iii.(b) of this preamble for further discussion of the deferral.

(a) Applicable Requirements for Legacy CCR Surface Impoundments Closed by Removal

EPA is finalizing a tailored subset requirements for legacy CCR surface impoundments that have completed closure by removal before the effective date of this final rule but are not able to complete the certification of closure by removal (see, Unit III.B.2.b.iii). For the reasons detailed in this Unit and in the following Units of the preamble (Units III.B.2.b–III.B.2.h), the owner or operator of such units must comply with the following requirements: the applicability report, installation of a permanent marker, all groundwater monitoring and corrective action (including combined detection monitoring and assessment monitoring), recordkeeping, notification, and website posting. In addition, if a CCRMU is discovered onsite during the course of complying with the Facility Evaluation Report (FER), the owner or operator of these units must develop a fugitive dust control plan (see Unit III.C.3).

While EPA acknowledges that these closed units are unlikely to have any ongoing activities that would create fugitive dust, EPA determined that requiring these units to comply with the fugitive dust requirement was appropriate because these units are subject to the CCRMU requirements and there is a reasonable likelihood that CCR fugitive dust would be generated as part of the actions required to comply with those requirements (*e.g.,* field work to determine the presence or absence of CCRMU, CCRMU closure). As such, if a CCRMU is discovered onsite of a facility with a legacy CCR surface impoundment that has closed by removal, the owner or operator must complete a fugitive dust plan no later than six months after the FER is due (*i.e.,* no later than 33 months after becoming subject to these requirements).

EPA determined that the site security requirements applicable to other legacy CCR surface impoundments would not be relevant for this subset of units as the CCR has been removed from the unit and the land may be being used for another purpose (*e.g.,* nature preserve, agricultural land, redevelopment). However, EPA expects legacy CCR surface impoundments that closed by removal to protect the monitoring equipment and monitoring wells, similar to other legacy CCR surface impoundments.

EPA is also not requiring these units to comply with any other design criteria or operating criteria, aside from the installation of the permanent marker and the fugitive dust requirements, as noted above. EPA has determined that the other design and operating criteria are not applicable to units that have closed by removal and therefore no longer contain CCR in the unit on the effective date of this final rule. For example, the requirement to prepare and maintain an EAP is not relevant when CCR is no longer present in the unit nor is the requirement to conduct weekly inspections of the legacy impoundment.

(b) Applicable Requirements for Legacy CCR Surface Impoundments That Closed With Waste in Place

EPA is finalizing a tailored subset of requirements for legacy CCR surface impoundments that, by the effective date of this final rule, have completed: (1) closure with waste in place or (2) a closure eligible for deferral to permitting as described in Unit III.2.g.iii(b). For the reasons detailed in this Unit and in the following sections (Units III.B.2.b–III.B.2.h), the owner or operator of such units must comply with the following requirements: applicability report, site security, installation of the permanent marker, history of construction, fugitive dust control plan, annual fugitive dust control report, all groundwater monitoring and corrective action (including combined detection monitoring and assessment monitoring), written post-closure care plan, post-closure care, recordkeeping, notification, and website posting. In addition, the final rule requires the facility to provide information on the completed closure of the legacy CCR surface impoundment, along with supporting documentation to demonstrate that the closure meets the performance standards in § 257.102(d) or the standards specified in § 257.101(g).

While EPA acknowledges that these closed units are unlikely to have any ongoing activity that would create fugitive dust, EPA determined that requiring these units to comply with the fugitive dust requirement was appropriate because these units are subject to the CCRMU requirements and there is a reasonable likelihood that CCR fugitive dust would be generated as part of the actions required to comply with those requirements (*e.g.,* field work to determine the presence or absence of CCRMU, CCRMU closure). As such, if a CCRMU is discovered onsite of a facility with a legacy CCR surface impoundment that has closed by removal, the owner or operator must complete a fugitive dust plan no later than six months after the FER is due (*i.e.,* no later than 33 months after becoming subject to these requirements).

EPA is also finalizing the requirement for this subset of legacy CCR surface impoundments to comply with the site security requirements applicable to other legacy CCR surface impoundments. EPA determined that the site security requirements are needed to minimize the potential for the unauthorized entry of people or animals to disturb the final cover system, as these units are unlikely to be monitored. EPA also expects facilities that closed legacy CCR surface impoundments with waste in place to protect the monitoring equipment and monitoring wells, similar to other legacy CCR surface impoundments.

This final rule also requires the owners and operators of these units to complete the history of construction in accordance with § 257.73(c). The history of construction provides information regarding the original site conditions, as well as the unit's original design and construction, such as cross sections of the length and width of the CCR unit. It would also include information on subsequent revisions, such as the design and construction of any lateral expansions. This information is relevant to designing (and evaluating) the groundwater monitoring system, unit closures, and corrective actions. For example, the history of construction would normally include the elevations of the unit base and the CCR in the unit (*i.e.,* the ground elevation contours within the footprint prior to unit construction); this information, in conjunction with the site characterization developed under § 257.90 to design the groundwater monitoring system can be used to determine whether the unit intersects with the groundwater (*i.e.,* the unit's ability to sufficiently contain CCR and contaminants that may leach from CCR). This information remains relevant in evaluating closure, when addressing any contamination coming from the unit, and throughout the post-closure care period. Therefore, EPA is requiring this subset of legacy CCR surface impoundments to comply with the history of construction requirement.

EPA has determined that the other design and operating criteria (all those besides the permanent marker, site security, history of construction, and fugitive dust requirements) are not applicable to units that have completed closure in accordance with § 257.102(d) by the effective date of this final rule. For example, the requirement to prepare an inflow design flood control system plan is not relevant for units that have installed a final cover system, as post-closure care requires a final cover system to be maintained and groundwater monitoring to continue. Additionally, periodic assessments, such as the hazard potential classification assessment and the structural stability assessments, are intended to address risks from unclosed unit and therefore, consistent with the requirements for units that have completed closure under the 2015 CCR Rule, are not applicable to units that have closed with waste in place.

ii. Compliance Deadlines for Legacy CCR Surface Impoundments

EPA proposed to establish new compliance dates for legacy CCR surface impoundments. The proposed rule explained that the 2015 CCR Rule compliance deadlines were based on the amount of time determined to be necessary to implement the requirements and the proposed compliance dates for legacy CCR surface impoundments were determined using the same approach. The proposed rule further explained that some factors considered in determining the 2015 CCR Rule compliance deadlines were not relevant for legacy CCR surface impoundments, such as the need coordinate compliance deadlines with the then recently promulgated ELG rule. In addition, EPA anticipated most facilities would already be familiar with the existing regulations, and therefore the proposed requirements for legacy CCR surface impoundments, and fewer facilities and units would need to come into compliance, as compared to the 2015 CCR Rule. Consequently, EPA proposed generally expedited deadlines based on the expected shortest average amount of time needed to complete the necessary activities to meet the requirements. In the proposed rule, EPA requested comment on the proposed compliance deadlines and the feasibility to meet the proposed compliance timeframes for legacy CCR surface impoundments.

EPA received numerous comments regarding the proposed compliance deadlines. Several commenters expressed support for the proposed compliance deadlines for legacy CCR surface impoundments. Generally, these commenters stated that expedited compliance was appropriate due to the increased risk posed by these units, the likelihood that these units are actively contaminating groundwater, and the urgent need for corrective action to address that contamination for the protection of human health and the environment. Some of these commenters echoed the proposed rule, stating that owner's or operator's familiarity with the existing requirements, along with the fact that these units are no longer in use and therefore would not need time to cease receipt of waste, further justified the expedited deadlines.

Many other commenters stated the proposed compliance deadlines were infeasible and should, at a minimum, allow as much time for compliance as the 2015 CCR Rule deadlines, although several commenters expressed that even the 2015 CCR Rule deadlines were inadequate, and that the insufficient timeframes were likely a factor in the gap between EPA's expectations and facilities' good faith efforts and utilization of best practices in developing groundwater monitoring networks, sampling and analysis plans, corrective action programs, and closure plans. Commenters pointed to several factors that they believed EPA did not fully incorporate into the proposed deadline calculations that make compliance with the proposed deadlines infeasible: the large number of CCR units (*i.e.,* existing CCR units, legacy CCR surface impoundments, CCRMU) competing for limited resources to meet overlapping compliance deadlines; the limited number of qualified contractors available to conduct necessary activities to reach the compliance deadlines; the nationwide labor shortage exacerbated by impacts from the COVID–19 pandemic; limited existing alternative disposal options; overlapping regulatory requirements (*e.g.,* State drilling permits, timing restrictions related to protected habitats, State CCR permits, Consent Decrees/Orders); seasonality impacts in different regions across the nation; and accessibility and completeness, or lack thereof, of historical documentation and information. One commenter provided specific information regarding typical delays experienced during the implementation of the 2015 CCR Rule caused by third-party availability and backlogs: two to four weeks for contractor mobilization; two to six weeks for site clearing; two to three weeks for surveys; three to 12 weeks for environmental drillers; and three to four weeks for laboratory analyses. These commenters also said EPA grossly underestimated the amount of time needed to hire a contractor, locate and review historical information, access a legacy CCR surface impoundment site, characterize and delineate a site, comply with the groundwater monitoring requirements, and conduct quality control or quality assurance on data and reports. Several of these commenters expressed the belief that the proposed deadlines would result in unintentional non-compliance despite facilities' best efforts to comply due to the constraints listed above. Finally, a few commenters suggested EPA create alternative deadlines or mechanisms for extensions based on site-specific characteristics.

In response to comments, EPA reevaluated the compliance deadlines for legacy CCR surface impoundments. EPA reconsidered the impact of the following on the amount of time facilities needed to complete the activities involved in meeting the requirements: accessibility and abundance, or lack thereof, of historical documentation; seasonality; clearing restrictions and required local and State approvals to clear vegetation or drill wells; existing disposal options; impact of the national labor shortage and contractor and laboratory backlogs; and overlapping compliance deadlines for CCRMU, existing units (*i.e.,* groundwater monitoring, closure, and post-closure care), and legacy CCR surface impoundments. Overall, EPA found the information provided regarding the infeasibility of the proposed deadlines convincing. Specifically, EPA agrees that the shortage of qualified contractors and laboratory resources has persisted, if not increased, since the 2015 CCR Rule and that the increasing demand on these finite resources from new and existing CCR units, legacy CCR surface impoundments, and CCRMU complying with overlapping requirement deadlines will likely increase the time needed to come into compliance. EPA acknowledges that the proposed deadlines did not adequately account for those nationwide impacts of seasonality and extreme weather events; necessary coordination with outside parties (*e.g.,* State agencies, local governments); locating disposal capacity for those units closing by removal; the need to comply with overlapping regulatory requirements, such as State drilling permits or timing restrictions related to protected habitats; or necessary quality assurance and quality control in calculating the proposed deadlines. Therefore, as detailed in Units III.B.2.b through h, EPA extended the deadlines for legacy CCR surface impoundments to provide at least as much time facilities had to come into compliance with the 2015 CCR Rule. In some cases, EPA extended the deadlines for legacy CCR surface impoundments even further to mitigate factors mentioned by commenters that convinced EPA the 2015 compliance deadlines would be infeasible for legacy impoundments. Overall, most of the comments EPA received supported deadlines that allowed at least as much time as EPA originally provided in the 2015 CCR Rule. While some units regulated by the 2015 CCR Rule were able to come into compliance before the 2015 deadlines, the majority of units used all the time allowed by the 2015 CCR Rule.

Note that all deadlines herein are framed by reference to the effective date of the rule; the final rule will be effective six months after publication of the final rule. Accordingly, facilities will have an additional six months beyond the deadlines to come into compliance. The Agency has included a document in the docket for this rule that summarizes the finalized compliance deadlines.[57]

TABLE 1—FINAL COMPLIANCE TIME FRAMES FOR LEGACY CCR SURFACE IMPOUNDMENTS

40 CFR Part 257, Subpart D requirement	Description of requirement to be completed	Deadline (months after effective date of this final rule)	Date
Applicability Report (§ 257.100)	Complete applicability report	0	Friday, November 8, 2024.
Internet Posting (§ 257.107)	Establish CCR website	0	Friday, November 8, 2024.
Site Security (§ 257.100(f)(3)(iii))	Implement site security measures	0	Friday, November 8, 2024.
Operating Criteria (§ 257.80)	Prepare fugitive dust control plan	0	Friday, November 8, 2024.
Operating Criteria (§ 257.80, 257.82, 257.83).	Initiate weekly inspections of the CCR unit.	0	Friday, November 8, 2024.
Operating Criteria (§ 257.80, 257.82, 257.83).	Initiate monthly monitoring of CCR unit instrumentation.	0	Friday, November 8, 2024.
Design Criteria (§ 257.73)	Install permanent marker	2	Wednesday, January 8, 2025.
Operating Criteria (§ 257.80, 257.82, 257.83).	Complete initial annual inspection of the CCR unit.	3	Monday, February, 10, 2025.
Operating Criteria (§ 257.80)	Complete initial annual fugitive dust report.	14	Thursday, January 8, 2026.
Design Criteria (§ 257.73)	Compile history of construction	15	Monday, February 9, 2026.
Design Criteria (§ 257.73)	Complete initial hazard potential classification assessment.	18	Friday, May 8, 2026.
Design Criteria (§ 257.73)	Complete initial structural stability assessment.	18	Friday, May 8, 2026.
Design Criteria (§ 257.73)	Complete initial safety factor assessment.	18	Friday, May 8, 2026.
Design Criteria (§ 257.73)	Prepare emergency action plan	18	Friday, May 8, 2026.
Operating Criteria (§ 257.82)	Complete initial inflow design flood control system plan.	18	Friday, May 8, 2026.
GWMCA (§§ 257.90–257.95)	Install the groundwater monitoring system, develop the groundwater sampling and analysis program, initiate the detection monitoring and assessment monitoring. Begin evaluating the groundwater monitoring data for SSIs over background levels and SSLs over GWPS.	30	Monday, May 10, 2027.
GWMCA (§ 257.90(e))	Complete initial annual GWMCA report.	January 31, 2027	January 31, 2027.
Closure (§§ 257.100–257.101)	Prepare written closure plan	36	Monday, November 8, 2027.
Post-Closure Care (§ 257.104)	Prepare written post-closure care plan.	36	Monday, November 8, 2027.
Closure and Post-Closure Care (§ 257.101).	Initiate closure	42	Monday, May 8, 2028.

b. New Requirements Specific to Legacy CCR Surface Impoundments

i. Applicability Report for Legacy CCR Surface Impoundments

EPA proposed to require the owner or operator of a legacy CCR surface impoundment to prepare an applicability report for any legacy CCR surface impoundment at that facility no later than the effective date of the final rule. This requirement would apply to all legacy CCR surface impoundments, including incised impoundments and impoundments that do not meet the height and storage volume cutoffs specified in § 257.73(b). EPA proposed that this applicability report would include information to identify the unit, delineate the unit boundaries, include a figure of the facility and where the unit is located at the facility, the size of the unit, its proximity to surface water bodies, and the current site conditions. EPA also proposed that the applicability report include the facility address, latitude and longitude, and contact information of the owner and/or operator of the legacy CCR surface impoundment with their business phone number and email address. EPA proposed that the report should document whether the legacy CCR surface impoundments are incised and whether the units meet the height and storage volume thresholds specified in § 257.73(b). EPA also proposed that the owner or operator of the legacy CCR surface impoundment notify the Agency

[57] A document ''Final Rule Compliance Deadlines for Legacy CCR Surface Impoundments. April 2024.'' is available in the docket for this action.

after a legacy impoundment is identified and the facility's CCR website is established, using the procedures currently in § 257.107(a) via the ''contact us'' form on EPA's CCR website. 88 FR 31998.

EPA received a few comments on the applicability report. Several commenters said the deadline to complete requirements of the applicability report could not be achieved. One commenter requested 24 months to complete the report. Another commenter presented several clarifying questions and said they could not estimate a compliance deadline without understanding these clarifications. This commenter asked if EPA will allow affected utilities to rely on information previously submitted to State regulatory authorities to satisfy the facility description requirements; what does EPA mean by the term ''current site conditions'' in the context of facility site descriptions; when EPA refers to providing a site identification number as previously provided to the State, is this intended only to apply in States that have achieved CCR Rule delegation, or in all States in which there is some level of State oversight over a legacy CCR surface impoundment; and if EPA can further determine what it considers to be ''reasonably and readily available information'' concerning history of construction. The commenter appreciates EPA's recognition that most of this information is likely ''unknown or lost to time,'' but seeks additional guidance on the scope of investigation that should be conducted to meet the ''reasonably and readily available'' standard.

EPA believes that as part of the applicability report, an owner or operator of an inactive CCR facility can include information previously submitted to State regulatory authorities to describe the facility conditions. If, however, any changes have been made since the owner or operator last prepared that information or that information does not address all the issues inherent in an applicability determination, then updated or additional information should be included. The current site conditions should include, for example, when the facility operated, when it ceased generating electricity, the size of the facility property, a visual description of how the legacy impoundment looks on the effective date of the final rule (*e.g.,* ponded water, approximate size, vegetation, incised), a description of any nearby geological or hydrologic features (*i.e.,* rivers, lakes, streams, karst topography), and any other relevant information about the facility. The State identification number can be for a previously issued solid waste, water, or other permit under State program, but does not have to be as part of an EPA-approved State CCR permit program.

EPA addressed the term ''reasonably and readily available'' at 80 FR 21380, ''[t]herefore, in this rule, EPA is using the phrase 'to the extent available' and clarifying that the term requires the owner or operator to provide information on the history of construction only to the extent that such information is reasonably and readily available. EPA intends facilities to provide relevant design and construction information only if factual documentation exists. EPA does not expect owners or operators to generate new information or provide anecdotal or speculative information regarding the CCR surface impoundment's design and construction history.''

Based on the comments about the infeasibility to complete the proposed requirements by the effective date of the final rule, EPA is not requiring that the applicability report include the size of the unit, its proximity to surface water bodies, or delineation of the unit boundaries. The size of the unit and delineation of the unit boundaries will be determined through the history of construction and groundwater monitoring requirements. Proximity to surface water bodies is not required by the 2015 CCR Rule, and EPA determined it is not feasible to determine the distance to surface water bodies before the unit boundaries are delineated, which would not be done by the effective date of the final rule. Therefore, EPA is not requiring proximity to surface water bodies to be completed in the applicability report.

Some commenters agreed with the proposed requirements on the applicability report and urged EPA to require additional information, including an EPA identification number, determination and public disclosure of whether legacy CCR surface impoundments contained both CCR and liquids, location and elevation of any 100-year floodplain within one mile, elevation and depth of CCR waste in the impoundment, proximity to public water supply wells or private water wells within two miles, proximity to wetlands, results of all environmental sampling, and owner/operator certification of the documentation. A commenter also said the applicability report should include a full investigation including the use of appropriate instrumentation to determine water levels, a report documenting the results certified by a qualified professional engineer, and the publication of the report on a CCR website.

EPA considered these comments and decided not to require additional information since the recommended information would not be feasible to collect by the effective date of the final rule, especially given the limitations discussed in Unit III.B.2.a.i of this preamble. As stated previously, commenters discussed how delineating the unit boundaries and determining the exact location of the legacy CCR surface impoundment could not feasibly be completed by the deadline.

EPA is finalizing with revisions the proposed requirement for the owner or operator of a legacy CCR surface impoundment to prepare applicability reports for all legacy CCR surface impoundments at that facility no later than the effective date of the final rule. This requirement applies to all legacy CCR surface impoundments, including incised impoundments and impoundments that do not meet the height and storage volume cutoffs specified in § 257.73(b). This is codified in the regulatory text at § 257.100(f)(1)(i). The applicability report must include information to identify the unit, a figure of the facility and where the unit is located at the facility, and the current site conditions. The applicability documentation must also include the facility address, latitude and longitude, and contact information of the owner and/or operator of the legacy CCR surface impoundment with their phone number and email address. EPA is also finalizing the requirement that the owner or operator of the legacy CCR surface impoundment notify the Agency of the establishment of the facility's CCR website using the procedures currently in § 257.107(a) via the ''contact us'' form on EPA's CCR website.

Further, EPA is finalizing a requirement that a certification of the applicability report must be signed by the owner or operator or an authorized representative similar to the certification that is required at § 257.102(e) and § 257.102(f) for existing units undergoing closure. EPA proposed this requirement in § 257.75(c) for the FER and determined after reviewing the comments that a similar requirement should apply to the applicability report. This requirement is codified in the regulatory text at § 257.100(f)(1)(ii)(C).

For any legacy impoundments that have completed closure by removal or closure in place of the unit pursuant to a State permit or order that meets the requirements of § 257.101(g) prior to the effective date of this final rule, EPA is requiring the owner or operator to attach such documentation to the applicability report required by § 257.100(f)(1) and post this documentation to its CCR website. This information will be evaluated by EPA permitting authorities at a future time to determine what further action, if any, is needed with the unit.

As discussed in Unit III.B.1.b.i.(b)(4) of this preamble, EPA is establishing a new definition of the phrase ''contains both CCR and liquids'' in the final rule. Under this definition CCR and liquids are present in a CCR surface impoundment except where the owner or operator has demonstrated that free liquids have been eliminated from the unit consistent with the performance standard in § 257.102(d)(2)(i). EPA recognizes that some owners and operators of inactive impoundments may not currently have records to demonstrate whether their inactive impoundment contained both CCR and liquids on or after October 19, 2015. In such cases, one option would be for the facility to conduct a field investigation to assess whether free liquids are currently present in the unit. To facilitate such investigations, the final rule establishes procedures to provide owners or operators with additional time to complete the legacy impoundment applicability report, should the owner or operator elect to conduct a field inspection to assess the unit for the presence or absence of free liquids. See § 257.100(f)(1)(v). To be clear, facilities are not required to conduct field testing to determine whether their unit is a legacy CCR surface impoundment. If records are available to allow the owner or operator to make that determination, this final rule does not require them to conduct field testing to confirm that information. However, to the extent facilities would prefer to rely on field investigations to supplement, or lieu of, a purely record-based investigation this final rule provides that option.

In order to obtain additional time to complete the legacy impoundment applicability report required under § 257.100(f)(1), an owner or operator must prepare an ''applicability extension report'' by the effective date of the final rule. The extension report consists of three parts. First, the extension report must include general identifying information about the potential legacy impoundment, including, the name associated with the unit, the identification number of the unit if one has been assigned by the State, and information about the location of the unit at the facility. This information is same as the first three elements of the applicability report under § 257.100(f)(1)(i)(A) through (C).

Second, the extension report must include a statement by the owner or operator that available information does not provide a sufficient basis to determine that the inactive impoundment contained free liquids on or after October 19, 2015. Owners or operators that cannot make this statement are not eligible for this extension and must comply with the applicable requirements for legacy impoundments. For example, an owner or operator who knows that the unit currently contains liquids, or has aerial photographs from 2018 showing that the inactive impoundment contained standing or free water would not be eligible to make use of these extension provisions because the unit contained free liquids since October 19, 2015.

Finally, the extension report must contain a written field investigation workplan. The purpose of this plan is to describe the approach the owner or operator intends to follow to determine whether the inactive impoundment contains free liquids. The written field investigation workplan must contain the following elements:

- A detailed description of the approach to characterize the physical, topographic, geologic, hydrogeologic, and hydraulic properties of the CCR in the unit and native geologic materials beneath and surrounding the unit, and how those properties will be used to investigate for the presence of free liquids in the CCR unit.
- A detailed description of the methods and tools that will be employed to determine whether the inactive impoundment contains free liquids, the rationale for choosing these methods and tools, and how these methods and tools will be implemented, and at what level of spatial resolution at the CCR unit to identify and monitor the presence of free liquids.
- A detailed description of how groundwater elevations will be determined, and at what level of spatial resolution, in relation to the sides and bottom of the CCR unit and how any interaction of the groundwater table with the CCR unit will be evaluated, and at what level of spatial resolution.
- A plan for evaluating stormwater flow over the surface of the unit, stormwater drainage from the unit, and stormwater infiltration into the unit and how those processes may result in the formation of free liquids in the CCR unit. This plan must include a current topographic map showing surface water flow and any pertinent natural or man-made features present relevant to stormwater drainage, infiltration and related processes.
- An estimated timeline to complete the workplan and make a determination if the CCR unit contains free liquids.
- A narrative discussion of how the results from implementing the workplan will determine whether the unit contains free liquids specified.
- A narrative discussion describing any anticipated problems that may be encountered during implementation of the workplan and what actions will be taken to resolve the problems, and anticipated timeframes necessary for such a contingency.

The final rule allows an owner to operator to obtain as many as three 6-month extensions (or 18 months from the effective date of the final rule) to complete the field investigation. Each six-month time extension must be supported by an updated extension report to justify the need for additional time. If the owner or operator needs either of the additional 6-month extensions, the subsequent extension report must be prepared no later than six months after completing the preceding extension report. Each prepared extension report must be placed in the facility's operating record as required § 257.105(k)(2) and posted to the owner or operator's CCR website.

Once the owner or operator determines that an inactive impoundment contains CCR and liquids the applicability report required by § 257.100(f)(1) must be completed within 14 days of the determination. EPA believes 14 days is a sufficient amount of time to complete the applicability report because the information will be known to owners or operators at this point. Following preparation of the applicability report, the inactive impoundment is subject to the requirements for legacy impoundments under § 257.100(f)(2) through (5), but with compliance deadlines adjusted by the length of the extension. These new timeframes are calculated on a unit-by-unit basis because the date the applicability report was prepared can vary by unit.

This following example illustrates how the new compliance timeframes are calculated for one of the design criteria for legacy impoundments. Section 257.100(f)(2)(i) requires that the permanent identification marker must be placed on or immediately adjacent to the legacy impoundment no later than 2 months after the effective date of the rule. If the owner or operator determines 10.5 months after the effective date of the rule that free liquids are present in the inactive impoundment, the owner or operator must prepare the legacy impoundment applicability report with 14 days of that date. The new deadline for the owner or operator to install the permanent marker is 11 months after the original deadline (or in this case, 13 months from the effective date of the final rule (2+ 10.5 + 0.5 months)).

Finally, if the owner or operator determines that the unit does not contain liquids, the owner or operator must prepare a notification stating that the field investigation has concluded and that the owner or operator has determined that the inactive impoundment does not contain CCR and liquids. This notification informs the public, States and EPA that the unit is not a legacy CCR surface impoundment. The final rule also provides that if the owner or operator does not complete the field investigation work within the timeframes specified in § 257.100(f)(1)(iv)(B), the inactive impoundment shall be considered a legacy CCR surface impoundment and must comply with all applicable requirements under the new timeframes specified under § 257.100(f)(1)(iv)(E).

ii. Site Security for Legacy CCR Surface Impoundments

Active facilities generally have guards and fencing to control access to the facility, but inactive CCR facilities may not have such security controls in place at the facility. To minimize that risk, EPA proposed that owners or operators establish security controls to restrict access to legacy CCR surface impoundments. The proposed security requirements are written in terms of a performance standard, as opposed to a prescriptive set of technical standards, such as specific signage, barriers and fencing, or surveillance techniques. EPA chose this approach because it would allow the owner or operator to identify the most appropriate means of providing site security for the impoundment based on site-specific circumstances.

Commenters generally supported performance-based site security measures rather than having EPA prescribe specific technical standards. Some commenters agreed that such requirements are necessary because legacy CCR impoundments are located at inactive power plants, and unlike impoundments at operating power plants, they almost certainly lack the oversight and protection afforded by significant numbers of on-site personnel. These commenters stated that the integrity of impoundments and berms and the safety of nearby residents depend on robust security measures to ensure that people are not—whether intentionally or unknowingly—entering the site and taking actions (such as all-terrain vehicle driving, dirt biking, or similar activities) that endanger the integrity of the impoundment or expose trespassers to health risks. Some commenters added that EPA should consider that some sites may not need security measures, for example, sites with closed legacy impoundments that closed under State programs, especially where CCR have been removed. EPA did not receive comments about the deadline to complete the site security requirements and is therefore finalizing as proposed.

EPA is adopting the proposed site security performance standard without revision from the proposal. Accordingly, the site security performance standard in the final rule requires the owner or operator to prevent the unknowing entry of people onto the legacy CCR surface impoundment and to minimize the potential for the unauthorized entry of people or livestock onto the impoundment. This is codified in the regulatory text in § 257.100(f)(3)(ii). The Agency generally modeled the requirements on the existing regulations that apply to interim status hazardous waste surface impoundments, which are codified at § 265.14(a). EPA recognizes that some facilities may already have facility-wide access controls in place, and in this case, the facility-wide controls would satisfy the requirement to limit public access to the legacy CCR surface impoundment. The Agency is finalizing the requirement for the facility to restrict access to the area containing the legacy CCR surface impoundment no later than the effective date of the final rule.

iii. Certification of Closure by Removal for Legacy CCR Surface Impoundments

EPA proposed that legacy CCR surface impoundments that completed closure by removal of CCR in accordance with the performance standards in § 257.102(c) after October 19, 2015, but before the effective date of the final rule would be subject to no further requirements under 40 CFR part 257, subpart D, provided the owner or operator completed certain actions.[58] 88 FR 31998 and proposed § 257.100(f)(1)(ii). Specifically, EPA proposed that the owner or operator would be required to post documentation on their CCR website showing that the legacy impoundment was closed in accordance with the closure by removal standards in § 257.102(c). EPA further proposed to require that the closure certification be certified by a qualified P.E. Finally, EPA proposed to require that the certified demonstration be completed and placed in the operating record no later than the effective date of this final rule.

A number of commenters requested that EPA expand the certification to cover all State-approved closures by removal—including those in which all CCR was removed from the unit or site, but the State approved the closure without requiring any groundwater monitoring. The only factual basis these commenters offered to support their request was that EPA should rely on the State's determination that the closure was protective.

Other commenters raised concern that the information needed to support a certification may not be readily available, and as a consequence these units would be subject to all of the other requirements of the final rule, including groundwater monitoring, preparation of plans, filing of reports, and closure and post-closure activities. These commenters stated such an outcome is not necessary to protect human health and the environment.

Other commenters stated that the proposed closure certification under § 257.100(f)(1)(ii) was not sufficient to allow EPA, States, and the public to determine whether the facility has actually complied with the closure performance standards under § 257.102(c). These commenters requested that the final rule require owners/operators certifying closure by removal to specify, with supporting documentation all of the following:

- The nature and volume of CCR and all other materials in the unit prior to closure;
- All releases from the unit to the soil, surface water, groundwater, and atmosphere during the operation of the unit, during its inactive period(s), and prior to completion of closure activities;
- The nature and extent of all soil, groundwater, surface water, and other contamination associated with releases from the unit throughout its history, including active and inactive periods;
- The methods to be employed (in closure plans) and actually employed (in closure completeness certifications) to ensure complete removal of all CCR and other contaminated materials from the unit, including but not limited to post-removal sampling and analysis;
- Documentation that all CCR and other contaminated materials were in fact removed from the unit, including but not limited to post-removal sampling and analysis;

[58] These impoundments contained both CCR and liquids on or after October 19, 2015, and subsequently completed closure of the impoundment before the effective date of this final rule.

• The methods to be employed (in closure plans) and actually employed (in closure completeness certifications) to ensure complete decontamination of all areas affected by releases from the unit, including but not limited to post-decontamination sampling and analysis; and

• Documentation that all areas affected by releases from the unit were in fact decontaminated and that all groundwater affected by releases has achieved groundwater protection standards, including but not limited to a minimum of two years of post-removal/decontamination detection and assessment groundwater monitoring data collected pursuant to the CCR Rule's groundwater monitoring performance standards and analyzed pursuant to its sampling and analysis requirements, 40 CFR 257.91 and 257.93, to reliably demonstrate compliance with groundwater protection standards in order to certify the completion of closure in accordance with 40 CFR 257.102(c).

EPA is unable to adopt the commenters' suggestion to expand the certification to all State-approved closures by removal. Without any record of the factual and legal bases for the States' decisions, EPA cannot conclude that all State-approved closures by removal pose no reasonable probability of adverse effects on health or the environment, as it is required to do under RCRA section 4004(a). This is particularly true with respect to closures that were approved without any groundwater monitoring or other information to demonstrate that ''groundwater . . . concentrations do not exceed the groundwater protection standard established pursuant to § 257.95(h),'' 40 CFR 257.102(c). Given the high probability that these impoundments were unlined and leaked, the most likely conclusion is that contamination remains at the site. In the absence of any further information, it is not apparent how EPA could support approving such closures in a nationwide rulemaking. See also Unit III.B.2.g.iii of this preamble for further discussion of State programs.

EPA agrees that certifications under this paragraph need to include sufficient supporting data so that EPA, States, and the public can determine whether the facility has actually complied with the performance standards in § 257.102(c). However, EPA disagrees that all of the information the commenters suggest is necessary to achieve that goal. As described below, the final rule requires that a facility support its certification with information that would have been routinely developed as part of closing the unit; either because the information is routinely required by State permit authorities or because the facility would have developed the information as part of the normal construction processes. Specifically, the final rule requires facilities to include the following supporting information with their certification:

(1) The type and volume of CCR and all other materials in the unit prior to closure;

(2) The methods used to verify complete removal of all CCR and other contaminated materials from the unit, including any post-removal sampling and analysis;

(3) Documentation that all CCR and other contaminated materials were removed from the unit, including, the results of any post-removal sampling and analysis that was conducted;

(4) The methods used to verify complete decontamination of all areas affected by releases from the unit, including but not limited to post-decontamination sampling and analysis; and

(5) Documentation that all areas affected by releases from the unit were decontaminated and that all groundwater affected by releases has achieved groundwater protection standards.

The final rule identifies the minimum information needed to support a certification, but, for the most part does not substantially restrict the analyses or factual information that can be used. This is because these units closed before they were subject to the Federal CCR regulations, or knew that they would be subject to the regulations, and EPA expects it is unlikely that facilities would necessarily have the same documentation as a currently regulated entity. State requirements specifying the information and analyses necessary to obtain approvals or permits can vary significantly. However, the final rule specifies that the facility must have groundwater monitoring data demonstrating that the concentrations of each Appendix IV constituent do not exceed the relevant groundwater protection standard, which would be either the MCL or background concentration, for two consecutive sampling events, consistent with § 257.95(e). The final rule identifies the minimum information needed to support a certification, but does not substantially restrict the analyses or factual information that can be used. Because the facility was not subject to part 257 groundwater monitoring when the monitoring was conducted, the final rule does not require a facility to demonstrate that it had installed a groundwater monitoring system that complied with all of the requirements in §§ 257.90 through 257.95. Nevertheless, the data supporting the certification must be scientifically valid and must credibly support a determination that the monitoring system would reliably detect any releases from the impoundment. Therefore, the final rule requires that owner or operator demonstrate that the groundwater monitoring system used to document the concentrations of Appendix IV constituents met a subset of the performance standards found in §§ 257.91(a) through (e), 257.93(a) through (d), and 257.93(i). Specifically, the facility needs to demonstrate that the groundwater monitoring system met the following criteria:

(1) Accurately represented background water quality unaffected by a CCR unit;

(2) Accurately represented the quality of water passing the waste boundary of the unit;

(3) Was capable of detecting contamination in the uppermost aquifer;

(4) Monitored all potential contaminant pathways;

(5) Established groundwater background concentrations for Appendix IV constituents and compared samples to those background concentrations; and

(6) Utilized wells that are (a) cased and maintained in a manner that protects the integrity of the monitoring well borehole, (b) screened or perforated and packed with gravel or sand, where necessary, to enable collection of groundwater samples, and (c) sealed between the borehole and the well casing to prevent contamination of the sample and groundwater.

Finally, the last sample used to demonstrate that no constituent in Appendix IV was detected in concentrations above the established groundwater protection standards must have been collected no earlier than one year prior to the initiation of closure.

If a facility can certify that all legacy CCR surface impoundments on-site met the standards in § 257.102(c) prior to the effective date of this rule, the facility would not be subject to any further requirements under this final rule (*i.e.,* neither legacy CCR surface impoundment requirements or CCRMU requirements). For these units, the certification of closure by removal would be due no later than the effective date of this final rule and must be placed in the facility operating record then posted on their public CCR website. See § 257.100(g).

EPA agrees that if a facility has actually met the performance standards in § 257.102(c), there is no health or environmental benefit in requiring compliance with all of subpart D simply because the facility lacks the information to support the certification. Accordingly, the final rule provides an option that allows such a facility to obtain the information necessary to support a certification. If a facility has removed all CCR from a legacy CCR surface impoundment before the effective date of this final rule but never conducted groundwater monitoring (or had a groundwater monitoring system that does not meet the criteria laid out above), the facility would initially only be required to install a groundwater monitoring system and initiate groundwater monitoring in accordance with the requirements in §§ 257.90 through 257.95, as well as the recordkeeping, notification, and website posting requirements described in Units III.B.2.f and III.B.2.h. If the owner or operator of one of these units elects to pursue a closure certification, the owner or operator must prepare a notification of intent to certify closure by the effective date of this final rule and place it in the operating record, post it on their CCR website, and submit a notification to EPA or the State or Tribal Authority. The notification must state that the facility has removed all CCR from the unit and will be installing a groundwater monitoring system compliant with §§ 257.90 through 257.95 to determine whether there is contamination coming from the unit. If no SSL above the GWPS is detected for all Appendix IV constituent in at least the first two consecutive sampling events, consistent with the existing provisions of § 257.95(e), the facility could at that time complete the closure certification, and document compliance with § 257.102(c). EPA anticipates that the requirement to conduct two consecutive sampling events will result in one sample being taken during the dry season and one in the wet season and thus capture groundwater fluctuations. If the required sampling demonstrates no exceedances of Appendix IV constituents, the owner or operator of the unit must place the closure certification in the operating record, and submit a notification to the State or Tribal Authority, and post the certification documentation on their public CCR website. At that time, the facility would not be subject to any further requirements under this final rule (*i.e.,* neither legacy CCR surface impoundment requirements or CCRMU requirements). The deadline for the completion of the certification of closure by removal for these units is no later than 42 months after the effective date of the final rule. This will provide the owner or operators of these units with the same amount of time as other legacy CCR surface impoundments to comply with the requirements to design and install a groundwater monitoring network, develop a sampling and analysis plan, collect eight baseline samples, and initiate combined detection and assessment monitoring (*i.e.,* 30 months after the effective date of the final rule) and an additional 12 months to perform at least two sampling rounds.

If, however, groundwater monitoring detects an SSL above the established GWPS of any Appendix IV constituent, the legacy CCR surface impoundment described above becomes subject to the corrective action requirements in §§ 257.96 through 257.98 and is no longer eligible to certify closure by removal under this provision. The owner or operator of the legacy impoundment must then prepare the applicability report no later than six months from the date of receiving the laboratory analysis documenting the SSL. No later than eight months from the date of receiving the laboratory analysis documenting the exceedance of the GWPS, the owner or operator must install the permanent marker. Furthermore, the facility must comply with the CCRMU requirements in Unit III.C. However, the compliance deadlines for the CCRMU requirements will be delayed by the number of months between the publication date of the rule and the date of receiving the laboratory analysis documenting the exceedance of the groundwater protection standard. For example, if a facility receives the laboratory analysis documenting an exceedance of the GWPS for any Appendix IV constituent 36 months after the effective date, the facility would add 42 months to all the CCRMU compliance deadlines. Additionally, if a CCRMU is discovered onsite, the owner or operator must prepare a fugitive dust plan no later than 6 months after the completion of the FER. For such units that are unable to certify, the final rule also includes a provision that allows a facility closing a unit by removal to complete any necessary corrective action during a post closure care period. Assuming the criteria in Unit III.B.2.g.iii are met, the facility can also elect to defer closure to permitting. However, given that the facility must comply with the groundwater monitoring and corrective actions under both options, EPA expects that most facilities will prefer to pursue certifications. See Unit III.D of this preamble for further discussion.

c. Location Restrictions and Liner Design Criteria

Under the existing CCR regulations, existing CCR surface impoundments that cannot demonstrate compliance with the location restrictions for placement of CCR above the uppermost aquifer, in wetlands, within fault areas, in seismic impact zones, or in unstable areas (specified in §§ 257.60 through 257.64) must retrofit or close. The purpose of these requirements is to ensure that units located in particularly problematic areas cease operation. EPA explained in the proposed rule that because, by definition, legacy CCR surface impoundments are not operating, and because it appears that all legacy CCR surface impoundments are unlined and will therefore be required to close, EPA believed that requiring compliance with the location restrictions would be largely redundant.

Commenters largely supported not requiring location restrictions or liner demonstrations on the grounds that location restrictions and design criteria are not relevant to this class of units, as these requirements primarily seek to ensure active units operate safely. Other commenters believed that legacy CCR surface impoundments should not be exempted from liner and structural stability requirements out of concern that requiring compliance with one or more location restrictions would provide information that would be ''critical'' to designing unit closure and any necessary corrective action.

EPA disagrees that applying location restrictions and the liner design criteria to legacy CCR surface impoundments would be appropriate. First, as explained in the proposed rule, these criteria are more appropriate for operational units or units at active facilities. Second the consequence of failing to comply with the location restrictions and liner design criteria requirements is closure by a specific date. 40 CFR 257.101(a) through (b)(1). Because legacy CCR surface impoundments are not operational and will in any event be required to close, the consequence for failure to comply with location restrictions or the liner design criteria (*i.e.,* ceased receipt of waste and closure) is moot. Additionally, the commenter failed to identify any information necessary for conducting corrective action or closure uniquely gained by complying with the location restrictions or liner design criteria. Therefore, EPA continues to conclude that, as stated in the proposed rule, information useful for corrective action or closure that would be obtained by complying with the location restrictions will be captured by compliance with the history of construction requirement, the closure plan, or in the development of the groundwater monitoring system.

EPA also continues to believe that the requirement to document whether the impoundment was constructed with a composite liner or alternative composite liner under § 257.71(a)(1) is not warranted for legacy CCR surface impoundments. The original purpose of this provision was to determine whether the unit was unlined, and consequently subject to closure. However, the available information indicates that legacy CCR surface impoundments were largely constructed well before composite liners systems were typically installed. Indeed, no commenter identified a legacy impoundment with a composite liner. For these reasons, EPA expects legacy CCR surface impoundment to be unlined and, therefore, the final rule requires all legacy CCR surface impoundments to close. As a consequence, requiring facilities to compile the information required by § 257.71(a)(1) would not provide useful information or otherwise be necessary. Therefore, EPA is not finalizing such requirement.

d. Design Criteria for Structural Integrity for Legacy CCR Surface Impoundments

EPA proposed that legacy CCR surface impoundments be subject only to the existing design criteria requirements in § 257.73, in order to help prevent damages associated with structural failures of CCR surface impoundments.

EPA received numerous comments on application of the design criteria requirements to legacy CCR surface impoundments. Most commenters on the design criteria specifically commented on the reporting/assessment requirements in § 257.73 (*i.e.,* history of construction, initial hazard potential classification, initial structural stability assessment, initial safety factor assessment). Some of these commenters supported the expedited deadline for the reports. However, most of these commenters echoed the concerns mentioned in Unit III.B.2.a.ii of this preamble, characterizing the proposed deadlines as infeasible, citing third-party availability, national labor shortage, seasonality, the need to conduct quality control and quality assurance, and the accessibility and completeness, or lack thereof, of historical documentation and data. These commenters stated that because legacy CCR surface impoundments are not operational and have not been operational since before the 2015 CCR Rule took effect, it is highly unlikely that owners or operators will have the required historical documentation or data readily available and that, for most of these facilities, documentation is likely in storage or lost to time. Commenters have stated that more time is needed for owners or operators to do their due diligence in locating and reviewing the necessary data and information.

Furthermore, these commenters stated that due to the likely lack of historical information, additional analyses will more than likely be necessary to collect information essential to meeting the standards in the CCR rule for each report. Additionally, these commenters said that EPA was incorrect in characterizing these additional analyses as minor and capable of being performed within the proposed deadline (*i.e.,* three months from the effective date of the final rule) and that some of these analyses (*e.g.,* site visits, geotechnical investigations) could be impacted by both contractor availability and seasonality. Several commenters also pointed out that Professional Engineer (P.E.) certification or approval by the Participating State Director or EPA was required for these reports (*i.e.,* hazard potential classification assessments, structural stability assessments, and safety factor assessments). These commenters said that the proposed deadline did not provide adequate time to collect and review historical information, acquire any necessary new information (*i.e.,* perform additional analyses), and conduct sufficient quality control and quality assurance of said information to ensure the report would be certifiable by a P.E. or capable of being approved by a State Director, Tribal authority, or EPA. Commenters also highlighted that the information required by § 257.73 will also be important in complying with concurrent and subsequent requirements, such as the design of the groundwater monitoring network and the closure plan. These commenters stated that providing inadequate time to generate reports under § 257.73 that meet the standards set out in the rule has an adverse ripple effect on the inputs of other requirements, undermining the adequacy of those analyses and plans. Lastly, commenters stated the estimates in the proposed rule of the amount of time needed to complete actions necessary to achieve compliance (*e.g.,* hire a contractor; generate a report) were grossly underestimated, based on the experiences of engineering firms, consultants, and owners or operators.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.73. Therefore, EPA is finalizing the application of the structural integrity requirements in § 257.73 to legacy CCR surface impoundments.

As mentioned in Unit III.B.2.a.ii of this preamble, based on the information provided by commenters regarding the impacts of third-party availability, national labor shortage, seasonality, and accessibility and completeness of historical documentation, EPA has extended the deadlines for the design criteria located at § 257.73 as described below. This is at least as much time as facilities were granted to reach compliance in the 2015 CCR Rule deadlines. As detailed below in Units III.B.d.i through III.B.d.v, EPA calculates that this additional time as compared to the proposed deadlines mitigates the seasonality concerns associated with performing any necessary analyses involving field work; accommodates for the unavoidable delays caused by backlogs and shortages currently being faced by necessary third parties; provides owners or operators time to locate and compile the relevant historical documentation that was more readily available and accessible for facilities complying with the 2015 CCR Rule; and ensures a compliance deadline feasible for facility nationwide.

i. Installation of a Permanent Marker for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments, except for ''incised CCR surface impoundments'' as defined in § 257.53, comply with § 257.73(a)(1), which requires the placement of a permanent identification marker, at least six feet high on or immediately adjacent to the CCR unit. EPA also proposed that placement of the permanent marker be completed by the effective date of the final rule.

Overall, commenters stated this deadline should align with the 2015 CCR Rule deadline (*i.e.,* two months from the effective date) to accommodate for site access issues, seasonality, and the time needed to hire necessary third parties to conduct the work. EPA acknowledges that the proposal had not accounted for the national labor shortage of contractors, or the need to factor in seasonality for site access and the installation of the permanent marker. Therefore, EPA agrees with the commenters that extending the deadline for the installation of the permanent marker to no later than two months from the effective date of the final rule provides owners or operators of legacy CCR surface impoundments would provide the necessary time to comply with the requirement at § 257.73(a)(1) while still being protective of human health and the environment.

Therefore, EPA is finalizing the requirement to install the permanent marker no later than Wednesday, January 8, 2025, which is two months after the effective date of the final rule. This is codified in the regulatory text at § 257.100(f)(2)(i).

To complete the installation of the permanent marker, owners or operators must ensure the marker is at least six feet high and displays the name of the legacy CCR surface impoundment, the name of the owner or operator of the unit, and the identification number of the CCR unit, if one has been assigned by the State.

ii. History of Construction for the Legacy CCR Surface Impoundments

Consistent with the existing regulations, EPA proposed that owners or operators of legacy CCR surface impoundments that either have: (1) A height of five feet or more and a storage volume of 20 acre-feet or more; or (2) Have a height of 20 feet or more, would be required to comply with the existing requirements to compile the history of construction of the legacy CCR surface impoundment. In the proposed rule, EPA acknowledged that information regarding construction materials, expansions or contractions of units, operational history, and history of events may be difficult for owners or operators to obtain. Therefore, EPA proposed that owners or operators would only need to provide information on the history of construction to the extent that such information is reasonably and readily available. EPA proposed a deadline of no later than three months after the effective date for owners or operators to comply with this requirement.

Overall, commenters on the proposed rule stated the proposed deadline for the history of construction was infeasible for the reasons listed in Unit III.B.2.d of this preamble; namely the limited availability of contractors, exacerbated by the number of CCR units competing for the same resources; seasonality impacts on necessary analyses; and accessibility and completeness of historical information. Some of these commenters also highlighted the importance of the history of construction requirement as an input into the design of the groundwater monitoring system, closure decisions, and other design criteria assessments; these commenters further emphasized the direct impacts of the quality of the history of construction on the quality of subsequent (*i.e.,* groundwater monitoring network design, closure plan) and interrelated requirements (*i.e.,* hazard potential classification, structural stability and safety factor assessments, inflow design flood control system plan, EAP). These commenters said that, although EPA acknowledged in the proposed rule that EPA would only require information that is reasonably and readily available, owners or operators would still likely need to conduct surveys and other analyses to ensure the report would meet the requirements in § 257.73(a)(2) and to provide sufficient information for the completion of subsequent and interrelated requirements. These commenters also stated that locating the necessary documentation to complete the history of construction would take considerable time and effort due to the age of the units, the inactivity of the facility, and the likelihood of records being located at currently unknown offsite locations. Furthermore, some of these commenters requested clarification of what EPA means by ''reasonably and readily available.'' Finally, commenters' suggested deadlines for the completion of the history of construction requirement ranged from three to 30 months.

As stated in Unit III.B.2.d of this preamble, EPA has reviewed the information provided by commenters citing the shortages and backlogs of qualified contractors, increased strain on those contractors related to the number of CCR units complying with the CCR rule simultaneously, difficulty accessing and reviewing historical documentation, and needed time to perform quality control and quality assurance, and considers it to be persuasive. EPA also acknowledges that the history of construction report ties into several subsequent requirements, including the other design criteria assessments and plan, the groundwater monitoring and corrective action requirements, and the closure and post-closure care requirements and therefore, agrees that providing sufficient time for the completion of a thorough history of construction report is important for the protection of human health and the environment.

Furthermore, as stated in Unit III.B.2.a.ii, EPA extended most deadlines to allow for as much time to come into compliance as was granted in the 2015 CCR Rule. While EPA recognizes that when coming into compliance with the 2015 CCR Rule, owners and operators had to locate historical documentation, based on information provided by commenters regarding the unknown whereabouts of the necessary records, the age and inactivity of these facilities, and the labor shortages, EPA expects it will be slightly more difficult to access and assess historical documentation for the older legacy CCR surface impoundments than it was for the units regulated by the 2015 CCR Rule. Because of the increased difficulty in locating and accessing records, the importance of the history of construction as an input into other requirements, and the high likelihood of additional analyses being needed, EPA is finalizing a deadline of no later than Monday, February 9, 2026, which is 15 months from the effective date. This deadline is an extension of three months longer than the 2015 CCR Rule deadline and is sufficient to accommodate the slight increase in difficulty in accessing legacy impoundment records. This is codified in the regulatory text at § 257.100(f)(2)(ii).

Finally, as explained in Unit III.B.2.b.i, EPA addressed the term ''reasonably and readily available'' at 80 FR 21380. When using this term, EPA intends facilities to provide relevant design and construction information only if factual documentation exists and does not expect owners or operators to generate new information or provide anecdotal or speculative information.

Compliance with the history of construction requirement at § 257.73(c) requires owners or operators of a CCR unit to compile a report that documents identifying characteristics of the unit, the history of how the CCR unit was used, specifics related to the unit's design and construction, and the unit's instrumentation. Once compiled, the report must be placed into the facility's operating record as required by § 257.105(f)(9). If the information included in the history of construction report needs to be changed at any point in time, the owner or operator must update the history of construction report and place the updated report into the operating record. A comprehensive list of information required in the history of construction is in § 257.73(c)(1).

iii. Initial Hazard Potential Classification for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments, except for incised CCR surface impoundments as defined in § 257.53, must complete the initial and periodic hazard potential classification assessments required under § 257.73(a)(2) without revision. EPA proposed a deadline of no later than three months after the effective date for the completion of the initial hazard potential classification assessment.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.73(a)(2). EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.100(f)(2)(iii).

However, EPA received numerous comments on the proposed deadline. Overall, commenters on the proposed rule stated the proposed deadline for the initial hazard potential classification was infeasible for the reasons listed in Unit III.B.2.d of this preamble, namely the limited availability of contractors exacerbated by the number of CCR units competing for the same resources; seasonality impacts on necessary analyses; accessibility and completeness of historical information, and the need for quality assurance and quality control. As mentioned in Unit III.B.2.d.ii, a few commenters noted the interrelationship and overlapping activities (*e.g.,* historical documentation review, site visit, geotechnical investigations, unit modeling) between the initial hazard potential classification and the history of construction, initial safety factor assessment, and the initial structural stability assessment. Specifically, commenters stated that the history of construction is done first and used to complete the initial hazard potential classification. Furthermore, commenters highlighted the direct dependence on the hazard potential classification for determining the design flood to use in inflow design flood control plan (§ 257.82(c)) and the trigger for the EAP requirement (§ 257.73(a)(3)). Commenters' suggested deadlines for the completion of the hazard potential classification requirement ranged from three to 24 months.

As explained in Units III.B.2.a.ii and III.B.2.d of this preamble, EPA acknowledges the need to extend the compliance deadline in consideration of the impacts of labor shortage, contractor backlogs, seasonality, accessibility and completeness of historical information, and the need for quality assurance and control. EPA further acknowledges the interrelationship of the design criteria reports and the direct dependence of the initial inflow design plan and EAP requirements on the completion of hazard potential classification. As explained in Unit III.B.2.d of this preamble, based on the information provided by commenters, EPA determined that extending the deadline for the initial hazard potential classification to allow for at least as much time to come into compliance as was granted in the 2015 CCR Rule (*i.e.,* 18 months after the effective date) is necessary to ensure the compliance deadlines are nationally feasible. Because owners or operators will be locating and compiling historical documents and information as part of the history of construction requirement, EPA assumes that historical documentation necessary for the initial hazard potential classification assessment can be located and compiled concurrently. Additionally, EPA expects necessary historical information (*e.g.,* engineering design drawings, geotechnical studies, dam hazard potential classification documents, stability assessments) and new analyses (*e.g.,* surveys or geotechnical investigations) needed for the history of construction and the initial hazard potential classification to overlap to some degree. Therefore, EPA has determined that additional time beyond that granted to come into compliance with the 2015 CCR Rule is not needed for this requirement. As such, EPA is finalizing a deadline of no later than Friday, May 8, 2026, which is 18 months from the effective date of this final rule.

To comply with the hazard potential classification requirement at § 257.73(a)(2), owners or operators of legacy CCR surface impoundments must determine the hazard potential classification of the CCR unit and justify the determination in a report. The CCR unit can be classified as a low hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a high hazard potential CCR surface impoundment. The report must be certified by a P.E. stating the hazard potential classification was conducted in accordance with the CCR regulations. Subsequent periodic hazard potential classifications are required every five years after the completion of the previous hazard potential classification as described at § 257.73(f)(3).

iv. Initial Structural Stability Assessment and Initial Safety Factor Assessment for Legacy CCR Surface Impoundments

Consistent with the existing regulations and EPA's findings from the 2009–2014 Assessment Program as described in the proposed rule, EPA proposed that owners or operators of legacy CCR surface impoundments that meet the size thresholds in § 257.73(b) and (c), must conduct two types of technical assessments: (1) Structural stability assessments; and (2) Safety factor assessments. In the proposed rule, EPA explained that these two assessments could be conducted concurrently and therefore, a deadline of no later than three months from the effective date of the final rule was proposed for both requirements.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.73(b) and (c). EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.100(f)(2)(iv).

However, EPA received numerous comments on the proposed deadline. Overall, commenters on the proposed rule stated the proposed deadlines for the initial structural stability and safety factor assessments were infeasible for the reasons outlined in Units III.B.2.a.ii and III.B.2.d of this preamble, namely, seasonality, third-party availability, national labor shortage, the need to conduct quality control and quality assurance, and the accessibility and completeness, or lack thereof, of historical documentation and data. As mentioned in Unit III.B.2.d.ii, a few commenters noted the interrelationship and overlapping activities (*e.g.,* historical documentation review, site visit, geotechnical investigations, unit modeling) between the initial structural stability and safety factor assessments and the history of construction, initial hazard potential classification, and the inflow flood control system plan. Furthermore, commenters highlighted the need to have quality information within the structural stability and safety factor assessments to inform the EAP and to make sound closure decisions. Commenters' suggested deadlines for the completion of the initial structural stability assessment and the initial safety factor assessment ranged from six to 24 months.

As explained in Units III.B.2.a.ii and III.B.2.d, EPA acknowledges the need to extend the compliance deadline in consideration of the impacts of labor shortage, contractor backlogs, seasonality, accessibility and completeness of historical information, and the need for quality assurance and control. EPA further acknowledges the interrelationship of the design criteria reports and the value of using the structural stability and safety factor assessment to develop the EAP and the closure plan for the legacy CCR surface impoundment. As explained in Unit III.B.2.d of this preamble, based on the information provided by commenters, EPA determined that extending the deadline for the initial structural stability and safety factor assessments to allow for at least as much time to come into compliance as was granted in the

2015 CCR Rule is necessary to ensure the compliance deadlines are nationally feasible. Because owners or operators will be locating and compiling historical documents and information as part of developing the history of construction, EPA assumes that historical documentation necessary for the initial structural stability and safety factor assessments can be located and compiled concurrently. Additionally, the historical information (*e.g.,* engineering design drawings, operational records) and new analyses (*e.g.,* surveys, geotechnical investigations) needed for the history of construction, initial hazard potential classification, and the initial structural stability and safety factor assessments overlap to some degree. Therefore, EPA has determined that additional time beyond that granted to come into compliance with the 2015 CCR Rule is not needed for this requirement. As such, EPA is finalizing a deadline of no later than Friday, May 8, 2026, which is 18 months from the effective date of this final rule.

To comply with the structural stability assessment and safety factor assessment requirements at § 257.73(d) and § 257.73(e), owners or operators of legacy CCR surface impoundments must conduct initial and periodic structural stability and safety factor assessments. The structural stability assessment must document whether the design, construction, operation, and maintenance of the unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater capable of being contained within the unit. Accepted good engineering practices includes, but are not limited to, stable foundations and abutments, adequate slope protection, sufficiently compacted dikes, slope protections, spillways capable of managing flow during and following peak discharge events, structurally sound and operational hydraulic structures, and structurally sound downstream slopes capable of withstanding sudden drawdown of adjacent water bodies. See 40 CFR 257.73(d).

The safety factor assessment must document whether the calculated factors of safety for the legacy CCR surface impoundment achieves the minimum safety factor specified in §§ 257.73(e)(1)(i) through (iv) for the cross section of the embankment most susceptible to structural failure determined by loading conditions and other appropriate engineering considerations. See 40 CFR 257.73(e).

The periodic assessments are required every five years after the completion of the previous assessment described at § 257.73(f)(3). Each assessment must be certified by a P.E. stating that the assessment was conducted in accordance with the CCR regulations.

v. Preparation of an Emergency Action Plan for Legacy CCR Surface Impoundments

EPA proposed that the owners or operators of legacy CCR surface impoundments that have been identified as having either a high hazard potential or a significant hazard potential would be required to comply with the same requirement as existing CCR surface impoundments under § 257.73 to prepare and maintain a written EAP. An EAP is a document that identifies potential emergency conditions at a CCR surface impoundment and specifies actions to be followed to minimize loss of life and property damage.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.73(a)(3). EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.100(f)(2)(v).

However, EPA received numerous comments on the proposed deadline. Overall, most commenters on the proposed rule stated that at a minimum, EPA should allow as much time for legacy CCR surface impoundment to come into compliance as granted existing units the 2015 CCR Rule deadlines. Several commenters pointed out the direct reliance of the EAP on the hazard potential classification assessment and noted that the history of construction, safety factor assessment, and structural stability assessment provided critical information as well. These commenters noted that if the deadlines for any of those prerequisite requirements were extended beyond the proposed compliance deadline, the EAP deadline should be extended as well. Commenters' suggestions for the deadline for the completion of the EAP ranged from 11 to 18 months.

EPA acknowledges that the EAP relies on the hazard potential classification assessment and agrees with the commenters who stated that if the deadline for the hazard potential classification assessment was extended, the deadline for the development of the EAP should be extended to no earlier than the deadline for the initial hazard potential classification assessment. As stated in Unit III.B.2.d.iv, EPA is finalizing a deadline of no later than 18 months from the effective date of this final rule for the initial hazard potential classification assessment. Furthermore, the deadlines for the initial safety factor and structural stability assessments are being finalized at no later than Friday, May 8, 2026, which is 18 months from the effective date of the final rule. This deadline also provides owners or operators the same amount of time for legacy CCR surface impoundments to comply with the requirements as was granted for existing units in the 2015 CCR Rule. Therefore, EPA is finalizing a deadline of no later than Friday, May 8, 2026, which is 18 months from the effective date of the final rule for legacy CCR surface impoundment to develop an EAP in accordance with § 257.73(a)(3).

As described above, an EAP specifies the actions to take during potential emergency conditions at a CCR surface impoundment. To prepare an EAP, the owner or operator must accurately and comprehensively identify potential failure modes and at-risk developments. See also 80 FR 21377–21379, April 17, 2015. To comply with the EAP requirement, the EAP must, at a minimum, define the events or circumstances involving the CCR unit that represent a safety emergency; describe the procedures that will be followed to detect a safety emergency in a timely manner; define responsible persons, each person's responsibilities, and notification procedures in the event of an emergency; provide contact information for emergency responders; include a map that delineates the downstream area that would be impacted by a CCR unit failure; a physical description of the CCR unit; and provisions for an annual face-to-face meeting between representatives of the owner or operator and the local emergency responders.

e. Operating Criteria for Legacy CCR Surface Impoundments

The operating criteria in §§ 257.80, 257.82, and 257.83 include air criteria for all CCR units, hydrologic and hydraulic capacity requirements for CCR surface impoundments, and periodic inspection requirements for CCR surface impoundments. These criteria address the potential risks from the day-to-day operations of CCR units and are established to prevent health and environmental impacts from CCR units. CCR surface impoundments are subject to hydrologic and hydraulic capacity requirements to ensure the unit can safely handle flood flows, which will help prevent uncontrolled overtopping of the unit or erosion of the materials used to construct the surface impoundment. The existing CCR regulations also require periodic inspections of CCR units to identify any appearance of structural weakness or other conditions that are not consistent with recognized and generally accepted good engineering standards. EPA proposed that legacy CCR surface impoundments comply with these existing requirements without revision.

Several commenters recommended that EPA provide relief from these operating requirements for legacy impoundments that have closed prior to the effective date of this rule, since these operating requirements do not make sense for units that are no longer operating. These commenters also state that the proposed rule includes relief from many requirements for legacy impoundments that have closed by removal of CCR, but does not include similar flexibility for legacy impoundments that have closed in place. Commenters said requiring an owner or operator to meet operating requirements for units that no longer contain both CCR and liquids, and therefore do not pose the same operating risks as existing CCR units, is illogical. They contended these requirements are more applicable for legacy impoundments that continue to contain both CCR and liquids as of the effective date of this final rule. They further said EPA should therefore reconsider its position and account for prior closure activities and afford flexibility to those units that have undergone, or are undergoing, State-led closure activities.

EPA disagrees that applying the operating criteria to legacy CCR surface impoundments is inappropriate even if these units are no longer receiving waste. EPA believes that applying the fugitive dust requirements reduces the risk from airborne dust and requiring inspections and inflow design flood control plan for legacy impoundments that contain both CCR and liquids will reduce the risks from structural stability concerns. EPA further addresses legacy impoundments that closed by removal or closed with waste in place under a State or Federal authority in Unit III.B.2.g of this preamble. Accordingly, EPA is finalizing the requirement that legacy CCR surface impoundments comply with these existing operating criteria requirements in §§ 257.80, 257.82, and 257.83 without revision.

i. Fugitive Dust Control Plan for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments must complete a fugitive dust control plan by the effective date of the final rule. The existing regulations require the owner or operator of a CCR unit to adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities. 40 CFR 257.80(b). To meet this requirement, the owner or operator of the CCR unit must prepare and operate in accordance with a fugitive dust control plan. *Id.* See also 80 FR 21386–21388. EPA considers that fugitive dust controls are warranted because closure activities can produce significant quantities of dust.

EPA received few comments on the fugitive dust control plan. One commenter requested that EPA amend § 257.80 to include additional requirements to protect those who work or live near CCR facilities from the risks of fugitive dust. EPA disagrees that additional fugitive dust controls are needed as EPA has no data to prove that the existing requirements are inadequate.

EPA received some comments on the compliance deadline to complete the fugitive dust control plan. Overall, commenters supported the proposed deadline. However, a couple commenters requested more time. One commenter requested three additional months for all requirements due on the effective date, including the fugitive dust plan. This commenter provided no evidence or factual basis to support this suggested deadline. Another commenter requested a deadline of 30 months for all requirements with proposed deadlines of the effective date to allow owners or operators 24 months to determine if the unit is eligible for the closure certification and prepare the certification report and then an additional 6 months to comply with other requirements, such as the dust plan and creation of a CCR website, if the unit is not eligible for the closure certification. EPA finds the requests for a deadline extension for the fugitive dust control plan to be unfounded.

The primary activities associated with this requirement are hiring a contractor who is a qualified P.E., having the contractor develop a plan based on daily operations at the unit and site conditions, and certification of the plan by a P.E. Little to no field-based activities are required to complete the fugitive dust control plan. Furthermore, this provides the same amount of time that EPA provided in the 2015 CCR Rule for facilities to develop their fugitive dust control plans. Therefore, EPA is finalizing the requirement that owners or operators of legacy CCR surface impoundments must complete a fugitive dust control plan no later than Friday, November 8, 2024, which is the effective date of this final rule. This is codified in the regulatory text at § 257.100(f)(3)(i).

ii. Initial Fugitive Dust Control Report for Legacy CCR Surface Impoundments

EPA proposed to require the initial annual fugitive dust report to be due 12 months after the effective date of the final rule. Consistent with the existing regulations, the report must document all actions taken to control CCR fugitive dust, a record of all citizen complaints, and a summary of any corrective measures taken in the previous year. As this report is primarily a summary of owner or operator activities related to fugitive dust control and does not require a P.E. certification, the report may be completed by the owner or operator without the need for a contractor. The owner or operator has completed the annual CCR fugitive dust control report when the plan has been placed in the facility's operating record.

EPA did not receive comments on the annual fugitive dust control report requirements. As described in Unit III.B.2.a.ii of this preamble, commenters requested that deadlines provide at least as much time as was granted for 2015 CCR Rule requirements. Therefore, EPA is extending the deadline from 12 months to 14 months to allow for a full year to be reported in the first report (12 months plus two months for report generation).

EPA is finalizing the requirement that the initial annual fugitive dust report be completed no later than Thursday, January 8, 2026, which is 14 months after the effective date of this final rule. This is codified in the regulatory text at § 257.100(f)(3)(vi).

iii. Weekly Inspections of the Legacy CCR Surface Impoundment and Monthly Monitoring of the CCR Unit's Instrumentation

EPA proposed that owners or operators of legacy CCR surface impoundments must initiate the inspection requirements set forth in § 257.83(a) no later than the effective date of the final rule. Under § 257.83(a), all CCR surface impoundments must be examined by a qualified person at least once every seven days for any appearance of actual or potential structural weakness or other conditions that are disrupting or that have the potential to disrupt the operation or safety of the CCR unit. The results of the inspection by a qualified person must be recorded in the facility's operating record. Weekly inspections are intended to detect, as early as practicable, signs of distress in a CCR surface impoundment that may result in larger, more severe conditions. Inspections are also designed to identify potential issues with hydraulic structures that may affect the structural safety of the unit and impact its hydraulic and hydrologic capacity. Section 257.83(a) also requires the monitoring of all instrumentation supporting the operation of the CCR unit to be conducted by a qualified person no less than once per month. See also 80 FR 21394–21395.

One commenter opposed applying the inspection requirements to legacy CCR surface impoundment, stating these requirements are intended for operational units and therefore are inappropriate for units that no longer receive waste. EPA disagrees that applying the inspection requirements to legacy CCR surface impoundments is inappropriate even if these units are no longer receiving waste. EPA believes that applying the weekly inspection requirements to legacy CCR surface impoundments that contain both CCR and liquids reduces the risks associated with structural stability concerns. Furthermore, the commenter provided no factual basis for the exclusion of legacy CCR surface impoundments from these requirements. EPA did not get any comments specifically about this deadline, thus, EPA is finalizing without revision the requirement that owners or operators of legacy CCR surface impoundments initiate the inspection requirements set forth in § 257.83(a) no later than Friday, November 8, 2024, which is the effective date of the final rule. This is codified in the regulatory text at § 257.100(f)(3)(iii).

iv. Initial Annual Inspection for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments must conduct the initial annual inspection no later than three months after the effective date of the final rule. Existing CCR surface impoundments exceeding the height and storage volume thresholds in § 257.73(b) and (c), are required to conduct annual inspections of the CCR unit throughout its operating life (§ 257.83(b)). These inspections are focused primarily on the structural stability of the unit and must ensure that the operation and maintenance of the unit is in accordance with recognized and generally accepted good engineering standards. Each inspection must be conducted and certified by a P.E. See also 80 FR 21395.

EPA received comments that said the inspections should be required for legacy impoundments, in addition to the other operating criteria. However, one commenter opposed applying the inspection requirements to legacy CCR surface impoundment, stating these requirements are intended for operational units and therefore are inappropriate for units that no longer receive waste. EPA continues to conclude that the annual inspections required by § 257.83 are relevant for legacy CCR surface impoundments even if these units are no longer receiving waste. EPA believes that applying the annual inspection requirement to legacy CCR surface impoundments that contain both CCR and liquids reduces the risks associated with structural stability concerns. Furthermore, the commenter provided no factual basis for the exclusion of legacy CCR surface impoundments from these requirements.

Annual inspections include documentation review, a visual inspection of the CCR unit, and a visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the CCR unit's dike. Documentation reviewed as part of the annual inspection include operating records, previous structural stability assessments, and the results of previous weekly, monthly, and annual inspections and can overlap with reviews needed to complete the initial structural stability assessment.

EPA proposed that owners or operators of legacy CCR surface impoundments must conduct the initial annual inspection no later than three months after the effective date of the final rule. EPA proposed that owners or operators must prepare the initial inspection report for legacy CCR surface impoundments within the same time frame—no later than three months from the effective date of the final rule—as was required for existing CCR surface impoundments in the 2015 CCR Rule. The Agency believes this time frame to prepare the initial annual inspection is similarly appropriate for legacy CCR surface impoundments as for existing impoundments. As discussed in the preamble to the 2015 CCR Rule, the three-month time frame was based on EPA's experience with its CCR Assessment Program to evaluate the structural stability and safety of existing impoundments throughout the nation. Specifically, EPA found that three months would be adequate to complete the tasks supporting an annual inspection, including retaining the services of a P.E., reviewing relevant information in the facility's operating record, conducting the field inspection, and completing the inspection report. See 80 FR 21395. EPA did not receive any comments objecting to this time frame.

EPA is finalizing the requirement without revision that owners or operators of legacy CCR surface impoundments must conduct the initial annual inspection no later than Monday, February 10, 2025, which is three months after the effective date of the final rule. This is codified in the regulatory text at § 257.100(f)(3)(iv).

v. Initial Inflow Design Flood Control System Plan for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments must prepare the inflow design flood control system plan nine months after the effective date of the final rule. Owners or operators of all CCR surface impoundments are required to design, construct, operate, and maintain hydraulic and hydrologic capacity to adequately manage flow both into and from a CCR surface impoundment during and after the peak discharge resulting from the inflow design flood, which is based on the Hazard Potential Classification of the CCR surface impoundment (§ 257.82(a)). The regulation also requires the preparation of an initial inflow design flood control system plan (§ 257.82(c)). See also 80 FR 21390–21392.

EPA did not receive any comments about this requirement. However, overall, most commenters believed that compliance deadlines should not be accelerated to be shorter than required for active units. Commenters also believed that substantial data collection efforts might be required resulting in situations where it is not feasible to meet the proposed deadline. For example, there is an ongoing shortage of contractors (*e.g.,* consultants, drillers, laboratories) to complete this work. EPA considered these comments and extended the deadline to 18 months in consideration of third-party availability and in order to match the 2015 CCR Rule.

EPA is finalizing the requirement that owners or operators of legacy CCR surface impoundments prepare the inflow design flood control system plan no later than Friday, May 8, 2026, which is 18 months after the effective date of the final rule. This is codified in the regulatory text at § 257.100(f)(3)(v).

f. Groundwater Monitoring and Corrective Action Criteria for Legacy CCR Surface Impoundments

EPA proposed to require legacy CCR surface impoundments to comply with the existing groundwater monitoring and corrective action criteria in 40 CFR 257.90 through 257.98, with one revision, to require sampling and analysis of constituents listed in Appendix IV at the same time as those listed in Appendix III. As explained in the proposed rule at 88 FR 32003, §§ 257.90 through 257.95 require owners or operators of a CCR unit to install a system of monitoring wells, specify procedures for sampling these wells, and set forth methods for analyzing the groundwater data collected to detect hazardous constituents (*e.g.,* toxic metals) and other monitoring parameters (*e.g.,* pH, total dissolved solids) released from the units. If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and post-closure care period of the CCR unit.

Several commenters expressed support for requiring legacy CCR surface impoundments to comply with these groundwater monitoring and corrective action requirements, stating CCR units can and have caused groundwater contamination. Some commenters suggested additional requirements be added to those in §§ 257.90 through 257.98, including a mandate to test groundwater quality outside the boundary of the facility and make those results public; a report documenting the unit's proximity to the closest surface water body and nearest private and public groundwater wells; a deadline for the completion of the selection of remedy required by § 257.97; and a prohibition against using intrawell groundwater data comparisons at legacy CCR surface impoundments. Other commenters stated that applying the existing corrective action requirements to historic sites, such as legacy CCR surface impoundments, is not appropriate and suggested that instead EPA incorporate site-specific risk-based corrective action into the CCR regulations.

EPA further proposed two deadlines for the groundwater monitoring requirements, as opposed to the single deadline in the 2015 CCR Rule. EPA received numerous comments on EPA's proposal to split the single deadline for groundwater monitoring requirements contained within the 2015 CCR Rule (24 months from the effective date of the final 2015 rule) into two separate deadlines (six months from the effective date of the final rule for the installation of the groundwater monitoring network and development of the groundwater sampling and analysis plan and 24 months from the effective date of the final rule for the initiation of the combined detection and assessment monitoring). A few commenters expressed support of the two separate deadlines for groundwater monitoring requirements, stating it increased accountability and ensured owners or operators were not unnecessarily delaying the installation of the groundwater monitoring system. However, overall, commenters stated that the groundwater monitoring requirements should have a single deadline as the separate deadlines made compliance with the rule infeasible. Several commenters said the proposed split deadlines eliminated the flexibility necessary for compliance that was contained within the 2015 CCR Rule's single deadline. Those commenters went on to say the single deadline allowed facilities to accommodate for delays associated with factors outside their control, such as third-party availability, weather, and required permits or approvals, by making schedule adjustments necessary to achieve compliance (*e.g.,* expedite the development of the sampling plan in the case of delays with the well installation). Other commenters said the proposed two deadlines were unnecessarily prescriptive. One commenter pointed out that the proposed rule contained no deliverables to verify compliance for the installation of wells or the development of the sampling and analysis plan.

As explained in the proposed rule, the existing groundwater monitoring and corrective action requirements are essentially the same requirements that have been applied to both hazardous waste and municipal solid waste disposal units for decades, and with the one exception discussed below, there is nothing about legacy CCR surface impoundments that makes them distinct enough to warrant separate requirements from those for other CCR surface impoundments. No commenter provided any factual basis for treating legacy impoundments differently than all the other units that currently comply with the same groundwater monitoring requirements, including other inactive CCR surface impoundments. For those commenters requesting that EPA adopt ''risk-based corrective action'' into the requirements, EPA notes that the commenters have provided no further explanation of what requirements in the existing regulations they wanted EPA to revise, what the revisions should accomplish, or why they are necessary or appropriate. As a general matter EPA considers that the corrective action regulations in §§ 257.95 through 257.98 do currently require facilities to tailor remedies to address the risks to human health and the environment, based on the conditions at the site. It is unclear what more the commenters are seeking. Accordingly, EPA is finalizing the proposal that legacy CCR surface impoundments comply with the existing groundwater monitoring and corrective action requirements with one modification, combined detection and assessment monitoring.

However, EPA agrees that having a single deadline for groundwater monitoring requirements as opposed to two deadlines allows flexibility to complete tasks, such as installing groundwater wells and collecting independent samples, which is necessary for compliance with a nationwide rule. The activities involved in achieving compliance with the groundwater monitoring requirements (*i.e.,* drilling wells, collecting samples, receiving lab results) are more susceptible to factors outside a facility's control, such as extreme weather events, shortages of qualified contractors, and permitting or approval delays, and therefore, warrant greater flexibility. Additionally, activities can be restricted dependent on the time of year and the location of the facility (*e.g.,* due to seasonality, protected species, clearing restrictions). Because the groundwater monitoring requirements build upon each other, EPA must ensure that facilities nationwide are reasonably able to achieve regulatory compliance by the deadline. Utilizing a single deadline for the groundwater monitoring requirements allows facilities to make reasonable accommodations for regional factors in a way the proposed deadlines do not, while still maintaining the same level of protection for human health and the environment. Furthermore, EPA agrees that the proposed rule does not have a clear mechanism for facilities to prove compliance or for interested parties to verify compliance with the separate deadlines for the installation of the groundwater monitoring network and the development of the groundwater sampling and analysis plan. Finally, based on the information provided by commenters, specifically the information regarding the current labor shortages and backlogs experienced by third parties necessary to accomplish tasks involved in complying with the groundwater monitoring requirements (*e.g.,* drillers for well installation, laboratories for sample analysis), time needed to obtain necessary approvals (*e.g.,* State permits to drill water wells or clear vegetation), and to accommodate for seasonality, EPA has calculated six months as the appropriate extension of the 2015 CCR Rule groundwater monitoring system deadlines. Therefore, EPA is finalizing a single deadline of no later than 30 months after the effective date of this final rule for the groundwater monitoring requirements found at §§ 257.90 through 257.95.

i. Design and Installation of the Groundwater Monitoring System for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments install the groundwater monitoring system as required by § 257.91 no later than six months from the effective date of this final rule. EPA further proposed that existing monitoring wells can be used as a part of the legacy CCR surface impoundment groundwater monitoring systems provided the wells meet § 257.91. As explained in the proposed rule, based on the amount of time most facilities needed to complete or to collect baseline sampling, EPA calculated that facilities would be able to install the necessary monitoring wells within a single year.

As mentioned above, some commenters supported the expedited deadlines. However, most commenters stated the proposed deadline of six months from the effective date of the final rule for the design and installation of the groundwater monitoring network was infeasible and should be extended to no less than 24 months from the effective date to align with the 2015 rule deadline. As explained above, many of these commenters expressed the need for a single deadline for groundwater monitoring requirements. Furthermore, as described in Unit III.B.2.a.ii of this preamble, these commenters cited seasonality restrictions, the nationwide labor shortages, limited qualified contractor availability, the need for State approvals and permits, and the number of facilities competing for limited resources as reasons for why the proposed expedited deadline is infeasible. A few commenters noted that in recent decisions on Part A demonstrations, EPA cited deficiencies in the groundwater monitoring network as a basis for non-compliance. These commenters went on to state that the proposed deadline does not facilitate the establishment of a monitoring system that would meet the standards laid out in the CCR rule or the recent proposed decisions and thus, the proposed deadline creates de facto non-compliance. One of these commenters elaborated by saying that the deadline does not allow facilities to acquire the permits that may be required to drill wells and precludes the observation of groundwater levels over time, which is needed to properly characterize groundwater flow. Other commenters stated meeting the proposed compliance deadline would prevent a facility from conducting proper site characterization, which is needed to inform well placement and depth and provide professional engineers sufficient information to certify the groundwater monitoring system. Lastly, commenters stated that contrary to EPA's assertion in the proposed rule that expediting the installation of the groundwater monitoring network is protective of human health and the environment, to meet the proposed deadline, facilities would likely be forced to design groundwater monitoring systems based on inadequate data resulting in unreliable groundwater monitoring data. Commenters provided estimates of time needed to comply with the design and installation of the groundwater monitoring system requirements ranging from 12 to 36 months.

As stated in Unit III.B.2.a.ii of this preamble, in response to comments EPA reevaluated the compliance deadline for the design and installation of the groundwater monitoring network and found the information provided regarding the general infeasibility of the proposed deadline compelling. Specifically, EPA agrees that more time is needed to account for limited third-party availability (*e.g.,* contractor shortages and laboratory backlogs), seasonality and extreme weather events, procuring a contractor, complying with overlapping regulatory requirements, and coordinating with outside parties. EPA acknowledges the importance of proper site characterization as the foundation for designing a groundwater monitoring system and is convinced that although there may be some legacy CCR surface impoundments that have sufficient historical documentation for site characterization, many of these units may need to conduct more extensive site reconnaissance and field work to obtain the necessary information. Lastly, EPA recognizes that groundwater monitoring systems designed using inadequate data would be unable to properly monitor groundwater quality coming from the unit and therefore would not be protective of human health and the environment. Therefore, because EPA is convinced by information from the commenters that facilities would be unable to conduct all the steps necessary to design and install a groundwater monitoring system capable of meeting the standards in § 257.91 by the proposed deadline, EPA has extended the deadline.

As stated in Unit III.B.2.f, based on information provided by commenters, EPA concluded that a single deadline should be used for the groundwater monitoring requirements. In the proposed rule, the latest proposed deadline for groundwater monitoring requirements was the deadline of 24 months from the effective date of this final rule for the initiation of the combined detection and assessment monitoring and the collection of the eight baseline samples. Based on information provided in response to comments on the proposed rule and as explained in Unit III.B.2.f, EPA calculated six months as the appropriate extension of the groundwater monitoring system deadlines. Therefore, EPA is finalizing a deadline for the completion of the design and installation of the groundwater monitoring system of no later than Monday, May 10, 2027, which is 30 months from the effective date of this final rule. This is codified in the regulatory text at § 257.100(f)(4)(i).

To complete the installation of the groundwater monitoring system, the owner or operator of a legacy CCR surface impoundment must ensure the monitoring system consists of sufficient number of wells both upgradient and downgradient of the CCR unit, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that accurately represent the quality of background groundwater and groundwater passing the downgradient waste boundary of the CCR unit, monitoring all potential contaminant pathways. 40 CFR 257.91(a)(1) through (2). Because hydrogeologic conditions vary so widely from one site to another, the regulations do not prescribe the exact number, location, and depth of monitoring wells needed to achieve the general performance standard. Rather the regulation requires installation of a minimum of one upgradient and three downgradient wells, as well as any additional monitoring wells necessary to achieve the general performance standard of accurately representing the quality of the background groundwater and the groundwater passing. See, 80 FR 21399. The number and placement of the monitoring wells is critical to proper characterization of the groundwater. Thus, the specific number, spacing, and depth of the monitoring wells must be determined based on site-specific information, including but not limited to the thorough characterization of aquifer thickness, groundwater flow rate, groundwater flow direction throughout seasonal and temporal fluctuations, the unit's geological setting, and the unit's hydrogeological setting.

The monitoring wells must be cased, constructed, operated, and maintained in a way that preserves the integrity of the monitoring well borehole, screened interval and other components so as to ensure the well performs to the design specifications throughout the life of the monitoring system. EPA expects owners or operators to ensure the groundwater monitoring wells are adequately protected from activities that may damage the wells or otherwise adversely impact their performance, such as accidental damage caused by livestock, vehicles, machinery, or other activities near the unit.

The owner or operator of the unit must ensure that the design, installation, development, and decommissioning of any aspect of the groundwater monitoring system is thoroughly documented and included in the operating record. Furthermore, the owner or operator must obtain a P.E. certification or approval from the Participating State Director or EPA stating the groundwater monitoring system meets the standards set out in § 257.91.

ii. Development of the Groundwater Sampling and Analysis Program for Legacy CCR Surface Impoundments

EPA proposed to require owners or operators of legacy CCR surface impoundments to comply with the existing groundwater sampling and analysis program requirements for CCR surface impoundments, including the selection of the statistical procedures that will be used for evaluating groundwater monitoring data. 40 CFR 257.93. EPA proposed a deadline of no later than six months after the effective date of the final rule for owners or operators to comply with this requirement.

One commenter suggested EPA prohibit use of intrawell groundwater data comparisons for legacy CCR surface impoundments. This commenter stated that intrawell comparisons are only appropriate when the background samples are collected before CCR was placed in the unit and therefore, since these units are likely already leaking, they would be ineligible for intrawell data comparisons. As stated in Unit III.B.2.f, the existing groundwater monitoring and corrective action requirements are essentially the same requirements that have been applied to both hazardous waste and municipal solid waste disposal units for decades, and with the one exception discussed below, there is nothing about legacy CCR surface impoundments that makes them distinct enough to warrant separate or additional requirements. Furthermore, while EPA expects legacy CCR surface impoundments to largely be unlined and potentially leaking, the commenter did not provide any evidence that would support creating a prohibition against intrawell data comparisons. Therefore, EPA did not adopt a prohibition on intrawell data comparisons at legacy CCR surface impoundments. However, EPA acknowledges that since the 2015 CCR Rule went into effect, intrawell groundwater data comparisons have been misused to a large degree. No commenters raised concern about requiring legacy CCR surface impoundments to comply with the existing requirements in § 257.93. EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.100(f)(4)(ii).

However, EPA received several comments on the proposed deadline for the development of the groundwater sampling and analysis plan. As mentioned in Unit III.B.2.a.ii, some commenters supported the expedited deadline. However, several other commenters pointed out that the sampling and analysis plan cannot be completed prior to the collection of the baseline samples, which had a proposed deadline of 24 months from the effective date. Many of these commenters went on to state that the proposed expedited deadline for the development of the sampling and analysis plan could result in too frequent sampling leading to non-independent, autocorrelated baseline samples for a large number of facilities, undermining the required statistical analysis. A few commenters further stated that EPA published decisions on Part A and Part B demonstrations citing lack of statistical independence in sampling as a basis for non-compliance, and failure for EPA to extend the deadline for the sampling and analysis plan to allow adequate time for facilities nationwide to gather independent samples would create de facto non-compliance.[59] Commenters also said that the proposed deadlines do not account for the backlogs already experienced due to the existing CCR units using the small number of laboratories qualified to conduct the specialized analyses required by the rule, coupled with the national labor shortages. The commenters predicted the backlogs with laboratories will only increase with the regulation of legacy CCR surface impoundments and CCRMU, making the proposed deadlines even more infeasible. Finally, as mentioned in Unit III.B.2.f, commenters emphasized the need for one deadline for all groundwater monitoring requirements.

EPA agrees that a sampling and analysis plan cannot reasonably be completed before the collection of baseline samples. EPA also acknowledges the adverse impact of too frequent sampling on the validity of statistical analysis and the need to account for seasonal variability in groundwater flow, groundwater levels, and constituent concentrations. EPA further acknowledges that providing insufficient time for the collection of baseline samples or the development of the sampling and analysis plan would likely result in ineffective groundwater monitoring programs that may fail to alert facilities to groundwater contamination coming from CCR units. As explained in Unit III.B.2.a.ii and Unit III.B.2.f respectively, EPA recognizes the need for more time to accommodate third-party availability and a single deadline for the groundwater monitoring requirements. As stated in Unit III.B.2.f.i, for the reasons laid out above, EPA is finalizing a single deadline for the groundwater monitoring requirements of no later than Monday, May 10, 2027, which is 30 months from the effective date of this final rule.

The owner or operator must develop the groundwater sampling and analysis program that satisfies the requirements in § 257.93 and includes a list of monitoring wells to be sampled (*i.e.,* the monitoring network), the schedule for sampling, sampling procedures and techniques, sample preservation and shipping protocols, analytical procedures including an appropriate statistical method for analysis, and quality assurance and quality control methods. The sampling and analysis plan must include all analytes listed in Appendix III and Appendix IV. Recommendations and information on how to comply with many of the

[59] On January 25, 2023, EPA proposed determinations on six Part B applications for alternate liner demonstrations (''Part B''). All six proposals are proposed denials. The CCR Part B Final Rule (85 FR 72506, November 12, 2020), allowed a limited number of facilities to demonstrate to EPA or a Participating State Director that, based on groundwater data and the design of a particular surface impoundment, the unit has and will continue to ensure there is no reasonable probability of adverse effects to human health and the environment.

requirements for the groundwater sampling and analysis program (*e.g.,* analytical procedures, QA/QC controls, sampling protocol) can be found in the following EPA guidance documents (*e.g., RCRA Groundwater Monitoring: Draft Technical Guidance,* 1992, EPA/530/R–93/001; *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures,* 1996, EPA/540/S–95/504).

iii. Detection Monitoring Program and Assessment Monitoring Program Combined

EPA proposed to require sampling and analysis of constituents listed in Appendix IV at the same time as those listed in Appendix III. The proposed rule explained that this would expedite groundwater monitoring and initiation of corrective action by at least six months at sites where units have potentially been leaking for a time, as is likely the case at unlined legacy CCR surface impoundments. The proposed rule further explained that expediting Appendix IV constituent detection and any resulting corrective action is necessary for the protection of human health and the environment. EPA proposed no other revisions to the existing groundwater monitoring requirements in §§ 257.90 through 257.95.

EPA received few comments on its proposal to combine detection and assessment monitoring. One commenter pointed out the increased demand on laboratory services, facility staff and/or contractors, and P.E.s that would result from having all legacy CCR surface impoundments comply with both monitoring programs simultaneously. Another commenter stated that by combining detection and assessment monitoring and assuming groundwater contamination, EPA has rendered detection monitoring superfluous. Further, the commenter asserted that skipping detection monitoring entirely would lose critical data regarding whether there are statistically significant increases (SSI) in groundwater constituents specifically due to the unit being monitored. Another commenter said that the justification in proposed rule regarding phased groundwater monitoring being ''best suited to situations where there is little likelihood of pre-existing contamination'' conflicts with EPA's position in the 2015 CCR Rule. According to the commenter, in the 2015 CCR Rule, the Agency was aware many CCR surface impoundments were decades old and potentially leaking; yet EPA still adopted a phased approach with detection monitoring to monitor indicators of potential groundwater contamination and assessment monitoring to determine if releases of CCR constituents of concern did occur.

As explained in the proposed rule, the phased approach in the 2015 CCR Rule is best suited to situations where there is little likelihood of pre-existing contamination, such as at a new facility or unit. As EPA explained in 2015, detection monitoring was designed to provide an early warning that a unit might be contaminating the aquifer, by first monitoring for constituents that would rapidly move through the subsurface and thus provide early detection of a potential problem before significant releases of constituents of concern (*i.e.,* those in Appendix IV) had occurred. See, 80 FR 21397. At a site without an old, unlined impoundment, or other evidence of pre-existing contamination, a graduated response to increasing evidence of leakage and potential contamination is easily justified, as it both allows facilities ample time to investigate the source of contamination as well as the environmental fate and transport characteristics of CCR constituents in groundwater, while still protecting human health and the environment. In essence, this approach rests on a presumption that the unit is not already leaking. At new sites, for example, there is no reason to expect that groundwater will have been contaminated above regulatory levels of concern prior to detection by the groundwater monitoring system.

But that presumption is largely inapposite for a universe consisting exclusively of historic unlined units, many of which have operated for decades. And at sites where leakage (and therefore, likely groundwater contamination) has been occurring for a sustained period, the need to protect human health and environment warrants the quick detection of constituents of concern and initiation of any necessary corrective action. Unlike this rule, the 2015 CCR Rule applied both to new facilities, which would be expected to have little likelihood of pre-existing contamination, and to currently operating facilities. Over the long term, EPA expected that there would eventually be a greater percentage of new units than existing units as the older units reached capacity and closed. In addition, as discussed in the proposal at 88 FR 32010 and in Unit III.A.2 of this preamble, it is clear from the data posted on facilities' websites that EPA significantly underestimated the number of unlined units (both impoundments and landfills), and consequently, significantly underestimated the number of leaking units and the extent of contamination at these sites. In light of these considerations, EPA's decision in 2015 to adopt phased monitoring was reasonable.

By contrast, there is good reason to believe that many legacy CCR surface impoundments are currently contaminating groundwater, based on the record from the 2015 CCR Rule, the results of EPA's recent modeling, and the large number of presently regulated CCR surface impoundments that have been found to be leaking, despite frequently inadequate groundwater monitoring networks. In sum, the totality of this record demonstrates that it is highly likely that the installation of groundwater monitoring at legacy impoundments will identify the presence of plumes of contaminated groundwater that have persisted or even expanded over many prior years despite a previous absence of groundwater data.

As a practical matter, EPA expects combining Appendix III and Appendix IV constituents into a unified sampling and analysis plan and approach will likely have only minor effects on schedules, as this change will not require additional field mobilizations or sampling events and will only require collection of a slightly larger number of sample containers at each monitoring well to allow for analysis for both Appendix III and IV constituents. As such, no additional shipments of samples to the analytical laboratory will be required. However, EPA acknowledges that combining Appendix III and Appendix IV constituents into a unified sampling and analysis plan may increase the total throughput burden on analytical laboratories and related services. Similarly, while combined monitoring may require additional evaluation (*e.g.,* concentration and trend analysis of data concerning both Appendix III and Appendix IV constituents), this incremental increase is unlikely to significantly increase the overall reporting level of effort, as the number of reports will be essentially unchanged.

Nevertheless, as discussed in Units III.B.2.a.ii and III.B.2.f of this preamble, EPA acknowledges the commenters' concerns regarding existing and projected labor shortages, backlogs, and third-party availability, and agrees this has the potential to affect facilities' ability to comply with the proposed deadlines for groundwater monitoring requirements. EPA is therefore extending the deadline, as well as building in flexibility for facilities to accommodate for delays, by finalizing a single deadline for groundwater monitoring requirements in lieu of the proposed split deadlines.

However, EPA disagrees that combining detection and assessment monitoring will render detection monitoring redundant, and that critical data would be lost, by sampling for Appendix IV constituents at the same time as Appendix III constituents (*i.e.,* by collecting more information). The commenters provided no further explanation of what information they thought would be lost, but under the combined monitoring, the facility would collect the same information on Appendix III constituents that is collected under the detection monitoring in § 257.94. Given that under the existing assessment monitoring provisions, facilities must simultaneously analyze samples for all parameters in Appendix III and for any Appendix IV constituent detected in the initial sampling, it is not apparent why the commenter believes that requiring simultaneous monitoring more broadly is appreciably different. 40 CFR 257.95(d)(1).

As stated in the previous paragraph, concurrent monitoring for Appendix III and Appendix IV constituents provides considerably more information and enables a more complete understanding of the geochemical nature, fate, and transport of any detected releases. Additionally, simultaneously collecting samples for Appendix III and Appendix IV constituents will still provide the basis for determining SSIs, should they exist, so no information will be lost. Contrary to the commenter's concern, additional information will be gained in an expedited manner (*e.g.,* the potential spatial and temporal correlation of Appendix III SSIs with exceedances of statistically significant levels (SSLs) for Appendix IV constituents). Furthermore, EPA disagrees that its explanation that phased groundwater monitoring is ''best suited to situations where there is little likelihood of pre-existing contamination'' fundamentally conflicts with EPA's decision to adopt phased monitoring in the 2015 CCR Rule. Unlike this final rule, the 2015 CCR Rule applied to both new facilities, which would be expected to have little likelihood of pre-existing contamination, and to existing facilities. Over the long-term, EPA expected that there would eventually be a greater percentage of new units than existing units as the older units reached capacity and closed. In addition, as discussed in the proposal at 88 FR 32010 and in Unit III.A.2 of this preamble, it is clear from the data posted on facilities' websites that in 2015 EPA significantly underestimated the number of unlined units (both impoundments and landfills), and consequently, significantly underestimated the number of leaking units and the extent of contamination at these sites.

If an alternate source is causing an exceedance of an Appendix III constituent, it may also be the source of any SSL detected for any Appendix IV constituents; in such a case, a facility may simply prepare a single ASD that covers constituents from both appendices. The sole difference between phased monitoring and combined monitoring is if the alternate source is only responsible for the Appendix III constituent, but the unit actually is releasing one or more Appendix IV constituents. In such a case, under a phased approach detection of the Appendix IV constituent can be delayed or even remain undetected, because the facility would not trigger assessment monitoring absent an SSI from another Appendix III constituent. In such situations, combined monitoring can make the monitoring program more accurate; it is unclear why the commenter believes this is inappropriate.

To avoid unnecessary and potentially inappropriate delays, ASDs should only be considered in cases where there is a strong technical case for an alternate source, and technically weak or equivocal ASDs should be rejected as soon as is appropriate to minimize delays in corrective action implementation. Given the age of most inactive CCR facilities, the potential for plumes of groundwater contamination extending for significant distances downgradient of the unit boundaries where exceedances are first determined should be anticipated. Additional lateral and vertical delineation of groundwater exceedances should be conducted in conjunction with corrective action as needed.

Ultimately, the combined monitoring expedites the initiation of assessment monitoring which in turn, allows for more expeditious identification of statistically relevant exceedances of Appendix IV constituents. This will in turn expedite ASD development or corrective action, depending on the circumstances.

The phased approach in the 2015 CCR Rule provides for a graduated response to groundwater contamination as the evidence of contamination increases over time. This approach allows facilities ample time to investigate the source of contamination as well as the transport characteristics of CCR constituents in groundwater while, usually being protective of human health and the environment. However, at sites where there is a strong likelihood that groundwater contamination has been occurring for a sustained period, the advantages provided by a protracted graduated response are outweighed by disadvantages of persistent or even increasing contamination that continues to move downgradient. At these sites, the need to protect human health and the environment necessitates the quick detection of the constituents of concern in Appendix IV to expedite any necessary corrective action. See, *USWAG* 901 F.3d at 427–30. In this case, as highlighted in Unit III.A, the record provides strong reason to conclude that many legacy CCR surface impoundments are contaminating groundwater, given the large number of currently regulated CCR surface impoundments that have been found to be leaking.

Therefore, EPA is finalizing this requirement as proposed to be completed no later than Monday, May 10, 2027, which is 30 months after the effective date of this final rule. This is codified in the regulatory text at § 257.100(f)(4)(iii)(B) and (C).

iv. Detection Monitoring Program and Assessment Monitoring Program—Deadline for Collection and Analyses of Eight Independent Samples for Legacy CCR Surface Impoundments

EPA proposed that no later than 24 months after the effective date of the final rule, owners or operators of legacy CCR surface impoundments initiate the detection monitoring program by completing sampling and analysis of a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b). The proposed rule explained that within 90 days after initiation of the detection monitoring program, owners or operators must identify any SSIs over background levels for the constituents listed in Appendix III, as required by § 257.94. To expedite the time to initiate any required corrective action, EPA also proposed that by this same deadline owners or operators initiate the assessment monitoring program by establishing groundwater protection standards and staring to evaluate the groundwater monitoring data for an SSL over GWPS for the constituents listed in Appendix IV as required by § 257.95.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.94(b). Therefore, EPA is finalizing this requirement as proposed. This is codified in the regulatory text at § 257.100(f)(4)(iii)(A).

However, EPA received several comments on the proposed deadline for the collection of the eight baseline samples. As mentioned in Unit III.B.2.a.ii, some commenters supported the expedited deadline. However, several other commenters requested that the groundwater monitoring requirement deadlines be combined into a single deadline that provided at least as much time to come into compliance as was provided in the 2015 CCR Rule deadlines (*i.e.,* 24 months after the effective date of the final rule). As stated in Unit III.B.2.f, based on information provided by commenters, EPA concluded that a single deadline should be used for the groundwater monitoring requirements. In the proposed rule, the latest proposed deadline for groundwater monitoring requirements was the deadline of 24 months from the effective date of this final rule for the initiation of the combined detection and assessment monitoring and the collection of the eight baseline samples. Based on information provided in response to comments on the proposed rule and as explained in Units III.B.2.a.ii and III.B.2.f, EPA calculated six months as the appropriate extension of the groundwater monitoring system deadlines. Therefore, EPA is finalizing a deadline for the completion of sampling and analysis of a minimum of eight independent samples for each background and downgradient well of no later than Monday, May 10, 2027, which is 30 months from the effective date of this final rule.

v. Annual Groundwater Monitoring and Corrective Action Reports for Legacy CCR Surface Impoundments

EPA proposed to apply the existing requirements in § 257.90(e) to legacy CCR surface impoundments and that owners or operators of legacy CCR surface impoundments comply no later than January 31 of the year following the calendar year after a groundwater monitoring system has been established (and annually thereafter).

One commenter suggested that the initial groundwater monitoring and corrective action report be due no later than January 31 of the year following the collection of the eight baseline samples and the first semi-annual sampling event in order to allow facilities to provide all the documentation required by § 257.90(e). EPA disagrees that the information required by § 257.90(e) would not be available to a facility upon completion of the groundwater monitoring system, as the annual report serves as an update on the activities related to the groundwater monitoring program, including the installation of groundwater monitoring wells. Additionally, when specific actions are not required by the CCR regulations (*e.g.,* a facility has not triggered corrective action), facilities are not penalized for not having any activities related to that action to discuss in the groundwater monitoring and corrective action annual report (*e.g.,* not describing progress in selecting a remedy when not in corrective action).

EPA is finalizing the requirement for owners or operators of legacy CCR surface impoundments to comply with the requirements in § 257.90(e) which mandate the preparation of an annual groundwater monitoring and corrective action report no later than January 31, 2027, and annually thereafter. This is codified in the regulatory text at § 257.100(f)(4)(iv).

The report documents the activities associated with the groundwater monitoring program and progress of any corrective action over the past year and must contain specific information identified in the regulations, including but not limited to maps; aerial images or diagrams showing the CCR unit and all upgradient (background) and downgradient wells; identification of any monitoring wells installed or decommissioned in the previous year; monitoring data collected under §§ 257.90 through 257.98; and a narrative discussion of any transition between monitoring programs (*i.e.,* detection and assessment monitoring). Annual reporting should ensure that groundwater level data collected over the reporting period is tabulated, presented, and analyzed to determine groundwater levels relative to any residual CCR left in place as well as to confirm or determine groundwater flow directions.

Upgradient and downgradient well locations and depths should be validated annually with respect to measured and mapped flow directions. Groundwater quality sampling data should be included in appendices and summarized and tabulated in the annual reports. If appropriate, exceedances (SSIs and SSLs) of Appendix III and IV constituents should be tabulated and highlighted. As mentioned in some comments, annual reports should identify the nearest downgradient surface water bodies as well as groundwater supply wells in the vicinity of the unit.

If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action as laid out in §§ 257.96 through 257.98, should be initiated as soon as possible. It is critical that annual corrective action and monitoring reports provide the basis for selection and documentation of corrective actions as early as possible well as graduated data to document initiation of corrective action activities and graduated and ongoing steps and associated data collected over the course of each year to document remedial performance, modifications, and other changes or improvements.

In addition to documenting compliance, the annual report must be posted to the unit's public CCR website which allows the public to review the groundwater monitoring results. Therefore, it is critical that the annual reports contain the basic data that informs the positions and status reported in those documents, including but not limited to boring logs, monitoring well installation diagrams, water level data, field sampling data sheets for groundwater sample collection, laboratory analytical data including QA/QC data, data validation, and others. In summary, the annual groundwater monitoring and corrective action reports should not only contain the information required by the regulations but should be organized in such a way that: (1) Compliance with the CCR regulations is evident; (2) Data supporting compliance conclusions are easily located within the document; and (3) The public is readily able to review the groundwater monitoring data and related information. Lastly, the name of the document on the public CCR website should be such that it is clear what the file is and readily printed and downloaded by the public.

vi. Corrective Action Requirements for Legacy CCR Surface Impoundments

EPA proposed to require owners or operators of legacy CCR surface impoundments to comply with the existing corrective action criteria, as applicable in §§ 257.96 through 257.98. The proposed rule explained that conducting the sampling simultaneously would expedite groundwater monitoring and, where necessary, initiation of corrective action by at least six months at sites where units have potentially been leaking for a long period, as is likely the case at many unlined legacy CCR surface impoundments. The proposed rule further explained that expediting Appendix IV constituent detection, assessment and any subsequent corrective action would protect human health and the environment.

Under the existing regulations, if groundwater monitoring demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required, as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and any post-closure care period of the CCR unit.

A commenter suggested EPA create a deadline for the completion of the selection of a remedy required by § 257.97 of 90 days after the completion of the assessment of corrective measures (ACM) with the ability to extend the deadline up to 180 days after the completion of the ACM. The commenter pointed to the failure of units regulated by the 2015 CCR Rule to select a remedy as soon as feasible after the completion of the ACM as required by the rule and the subsequent unnecessary delay in addressing contaminated groundwater. Other commenters stated that applying the existing groundwater monitoring and corrective action requirements to historic sites, such as legacy CCR surface impoundments, is not appropriate and suggested that instead EPA incorporate site-specific risk-based corrective action into the CCR regulations. One of these commenters further stated that the application of the existing CCR corrective action requirements conflict with EPA's decision-making frameworks in other programs such as RCRA and CERCLA due to lack of site-specific risk assessments to evaluate risk and drive corrective action decisions. This commenter suggested that EPA utilize site-specific, risk-based corrective action that is consistent with the guidance documents EPA has developed for RCRA and CERCLA programs.

EPA acknowledges the widespread non-compliance with the mandate to complete the selection of a remedy as soon as feasible after the completion of the ACM. However, EPA disagrees with the commenter's suggested deadline. The recommended deadline could actually have the effect of extending the deadline for the completion of the selection of a remedy beyond that in 2015 CCR Rule because "as soon as feasible" in many cases would likely be before 90 days after the completion of the ACM. Granting owners or operators more time to select a remedy would be less protective of human health and the environment. Regarding noncompliance with the CCR regulations, EPA has been and will continue to take action to address the non-compliance on a myriad of issues including to the failure of owner or operators to select a remedy as soon as feasible. EPA has announced that enforcing the CCR regulations is part of the ongoing set of National Enforcement and Compliance Initiatives and expects that enforcement actions taken as part of the Initiative may address, where relevant and appropriate, the concern raised by the commenter.[60]

EPA disagrees with the suggestion that the existing corrective action requirements, if triggered, are inappropriate at legacy CCR surface impoundments. As stated in Units III.B.2.a.i and III.B.2.f, the physical characteristics of legacy impoundments are not sufficiently different from currently regulated units to justify different requirements. For those commenters requesting that EPA adopt "risk-based corrective action" into the requirements, EPA notes that the commenters have provided no further explanation of what requirements in the existing regulations they wanted EPA to revise, what the revisions should accomplish, or why they are necessary or appropriate. As a general matter EPA considers that the corrective action regulations in §§ 257.95 through 257.98 do currently require facilities to tailor remedies to address the risks to human health and the environment, based on the conditions at the site. It is unclear what more the commenters are seeking. Furthermore, the commenter that stated that the existing corrective action regulations conflict with other EPA programs (*i.e.,* RCRA and CERCLA) failed to fully explain how the existing corrective action regulations conflict with EPA-published RCRA or CERCLA guidance documents or how they preclude corrective action decisions driven by site-specific risks. Accordingly, EPA is finalizing, without revision, its proposal that legacy CCR surface impoundments comply with the existing corrective action requirements at §§ 257.95 through 257.98.

As explained in the proposed rule at 88 FR 32003, §§ 257.90 through 257.95 require an owner or operator of a CCR unit to install a system of monitoring wells, specify procedures for sampling these wells, and set forth methods for analyzing the groundwater data collected to detect hazardous constituents (*e.g.,* toxic metals) and other monitoring parameters (*e.g.,* pH, total dissolved solids) released from the units (*i.e.,* all parameters listed in Appendices III and IV). If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and post-closure care period of the CCR unit.

When corrective action is required, it should be initiated as soon as possible. The corrective action program includes initiating an ACM to prevent further releases, to remediate any releases, and to restore affected areas to original conditions, as specified in § 257.96(a). After the ACM has been completed, the owner or operator must select a remedy that meets prescribed standards, including a requirement that the remedy attain the groundwater protection standards. See § 257.97(a) and (b). Finally, the corrective action program requires the owner or operator of the CCR unit to initiate remedial activities within 90 days of selecting a remedy. See § 257.98(a). The requirement to address releases under this requirement is identical to those requirements for any CCR unit undertaking groundwater corrective action with the additional requirement that implementation of corrective action begin during the active life of the unit.

EPA expects that when assessing corrective measures and selecting a remedy, the owner or operator of the unit will consider the impact of the corrective measures on the water quality and safety of the nearest surface water bodies and the nearest private and/or public groundwater wells.

With respect to completion of an ACM and remedy selection, § 257.96(a) requires an ACM be initiated within 90 days of determining an SSL has occurred, and then completed within another 90 days. An extension, not to exceed 60 days, may be warranted due to site-specific conditions or circumstances. This deadline to complete an ACM, 180 to 240 days after determining an SSL, was not proposed to be changed, so comments suggesting changes to these provisions are outside the scope of the rulemaking. Additionally, the commenters provided no reason why corrective measures could not be assessed and compared in an ACM and a remedy could not be selected. Prior to closure of a CCR unit, the facility has been required to characterize site conditions, including groundwater flow conditions and geology. The facility has knowledge of wastestreams and water volumes it discharges to a CCR surface impoundment. This information can be used to develop a groundwater model to predict groundwater flow conditions after wastestream disposal ceases and closure is initiated. EPA believes this

[60] EPA Enforcement Alert, National Enforcement and Compliance Initiative, Protecting Communities from Coal Ash Contamination. EPA Document #310F23002. December 2023. *https://www.epa.gov/system/files/documents/2023-12/ccr-enf-alert-2023.pdf.*

would provide sufficient characterization of post-closure conditions to assess and compare groundwater cleanup alternatives to complete an ACM. The commenters have provided no reasons or explanation why this would not be achievable.

Once the ACM is complete, a public meeting has been held, and community input has been considered, a remedy must be selected as soon as feasible. EPA agrees that a selected remedy may include closure by removal to comply with source control requirements, and that this would constitute commencing implementation of a remedy. However, the selected groundwater remediation portion of the remedy must also be implemented within a reasonable time, in accordance with the schedule established in the remedy selection report. 40 CFR 257.97(d). Implementation of the source control measure does not negate this requirement.

g. Closure and Post-Closure Care Criteria for Legacy CCR Surface Impoundments

EPA proposed to apply all of the existing closure and post-closure care requirements in §§ 257.101 through 257.104 to legacy CCR surface impoundments, except for the alternative closure requirements in § 257.103(f). The proposed rule explained that based on the data gathered since 2015 from the currently regulated CCR unit universe, the Agency considered it highly unlikely that any legacy CCR surface impoundment has a composite liner that meets the requirements of § 257.71 and therefore EPA expected legacy CCR surface impoundments to be unlined as defined by § 257.71(a)(3)(i). Consistent with the *USWAG* decision and the existing regulations in § 257.101(a) mandating that all unlined (including clay-lined) impoundments must close, EPA proposed to require that all legacy CCR surface impoundments initiate closure within 12 months of the effective date of this final rule. The proposed rule also explained that the alternative closure provisions in § 257.103(f) were not appropriate for legacy CCR surface impoundments as these units, by definition, are inactive impoundments at inactive facilities and could not therefore demonstrate the need to continue to use the disposal unit, which is a qualifying component of the alternative closure provisions.

EPA received numerous comments on its proposal to apply the existing the closure and post-closure care requirements §§ 257.100 through 257.104 to legacy CCR surface impoundments. Overall, most commenters supported or did not contest EPA's proposal. Some of these commenters agreed that requiring legacy CCR surface impoundments to comply with the existing closure requirements is necessary for the long-term protection of human health and the environment. A few of these commenters also suggested that EPA prohibit legacy CCR surface impoundments from closing with CCR in place under § 257.102(d).

Many other commenters however objected to subjecting legacy impoundments to § 257.101(a), which requires CCR surface impoundments constructed without a composite liner to close. These commenters generally argued that a national requirement to close was not appropriate for legacy CCR surface impoundments and that EPA should instead determine whether closure is warranted at each site based on a finding that the individual unit at the particular site poses unacceptable risks. These commenters largely reiterated comments previously made in response to the ANPRM, without addressing EPA's responses in the proposal. For example, some asserted that their particular legacy impoundments are not contaminating groundwater and do not pose a risk to groundwater. One claimed that the proposal was based on the upper bound of risk pulled from a sensitivity analysis of a nationwide risk assessment based on aggregated data unrepresentative of any given facility, and therefore could not support a finding that any particular site poses ''actual risks.'' This commenter also asserted that a nationwide risk assessment should not be used to impose a ''one-size-fits-all'' closure requirement or universal performance standards for closure, because it could drive closure methods that are not necessary to ensure protection of human health and the environment. Other commenters repeated their claims that the closure of legacy CCR surface impoundments would itself present greater risks than leaving the disposal unit in its existing state. For example, one commenter asserted that closing legacy impoundments could raise environmental justice issues associated with increased traffic and (consequently) decreased air quality; could risk potentially destabilizing the unit and disturbing native species and animal habitats; and would increase air emissions, water consumption, and waste generation.

These commenters asserted that a ''risk-based'' closure or corrective action program was better suited ''to address the unique nature and unknown risk of legacy CCR surface impoundments.'' For example, one commenter suggested that the risks associated with legacy CCR surface impoundments can be better managed through corrective action implemented under a permit program, which the commenter believed would make the mandate to close these units unnecessary. The commenter explained that although closure can be useful as source control in remediating contamination, as long as the exposure pathways are appropriately addressed through corrective action, nearby receptors will not be impacted by the risks, and the RCRA subtitle D protectiveness standard would be met without closing the impoundment. Similarly, another commenter argued that mandating closure for all legacy impoundments is inconsistent with other RCRA and CERCLA or State cleanup programs, which, the commenter asserts generally use site-specific risk assessments to determine whether closure is warranted. The commenter suggested that instead, the final rule should rely on the upcoming implementation of EPA's Federal permitting rule pursuant to the WIIN Act and allow a regulated entity to conduct a site-specific risk assessment to evaluate whether the historical CCR disposal areas pose ''actual risks'' and allow closure and corrective actions to be tailored to site-specific conditions and risks.

Other commenters raised concern that some legacy impoundments are now located beneath infrastructure such as pipelines or transmission lines that cannot be disturbed without disrupting operations, active CCR units, or buildings. These commenters explained that requiring closure of these impoundments could adversely impact grid reliability, business operations, or other necessary public services (*e.g.,* military infrastructure) and suggested that EPA exempt these units or at least extend the closure time frames to allow for closure of the impoundment when the other unit or structure is closed or decommissioned.[61]

[61] EPA also received comments suggesting that it examine the cumulative impact of several recently or soon-to-be finalized power sector and vehicle rules. EPA performed suggested sensitivity analysis which demonstrated 1) the cumulative impact is not expected to adversely impact resource adequacy, and 2) that, considering the power sector rules together, the cumulative effect of these rules in terms of reduction in coal steam electric generating capacity is less than the sum of each of these rules individually for 2035. The affected universe of units with significant mitigation responsibilities among the EPA rules is overlapping, not purely additive, as it largely reflects the same segment of the grid's generation portfolio. See *Resource Adequacy Analysis: Vehicle Rules, 111 EGU rule, ELG, and MATS Technical*

Several commenters expressed support for the proposed 12-month deadline to initiate closure, stating that the shorter deadlines are necessary to address the increased risk from legacy CCR surface impoundments and likelihood these units are and have been contaminating groundwater. Many other commenters characterized the proposed deadline as infeasible for the reasons mentioned in Unit III.B.2.a.ii, including seasonality, need to comply with overlapping regulatory requirements, labor shortages, and the strain on the limited resources necessary to achieve compliance (*e.g.,* contractors, laboratories, P.E.s) caused by the number of CCR units coming into compliance at the same time. Commenters also stated that compliance with the closure requirements should not be required until after the groundwater monitoring system was installed and baseline samples collected so that closure could be informed by the groundwater monitoring data. These commenters pointed to recent EPA Part A and Part B decisions as evidence of the gap between EPA's expectations and the closure and post-closure plans developed using good faith efforts by owners or operators and best practices; these commenters further stated that the proposed deadline precludes the incorporation of groundwater monitoring data in developing closure plans and is likely a contributing factor to the gap between EPA's expectation and closure and post-closure care plans submitted by owners or operators of currently regulated units. One commenter also claimed that legacy CCR surface impoundments are potentially still being used to manage non-CCR wastestreams, and that EPA consequently needed to create a mechanism for facilities to seek extensions similar to those that had been made available under § 257.103(f). Commenters' suggestions for alternative deadlines to initiate closure ranged from 24 to 34 months, or at least after the collection of the baseline groundwater monitoring samples required by § 257.94.

MEMO for more information. Also see *IPM Sensitivities MEMO.* The grid analysis did not include the proposed or final version of this rulemaking, because this CCR rule primarily addresses only disposal units that have not received CCR since before 2015, that is the disposal units are not part of ongoing operations at any facility, and consequently this rule is not expected to impact the generation of electricity. In addition, EPA continues to believe this final rule will not generally impact current utility operations, particularly due to the revisions made in the final rule to address commenters concerns, as discussed in the preamble to the final rule (*e.g.,* extended deadlines for CCRMU located under critical infrastructure).

EPA continues to believe that applying the closure and post-closure requirements in §§ 257.101 through 257.104 to legacy CCR surface impoundments is appropriate and necessary to protect human health and the environment. Based on the record compiled for the 2015 CCR Rule, EPA concluded that "there is little difference between the potential risks of an active and inactive surface impoundment; both can leak into groundwater, and both are subject to structural failures that release the wastes into the environment, including catastrophic failures leading to massive releases that threaten both human health and the environment." 80 FR 21343. As discussed in Unit III.B of this preamble, the D.C. Circuit concurred, and on that basis, vacated the exemption for legacy CCR surface impoundments. See, *USWAG* at 901 F.3d at 434. EPA received no information during this rulemaking that would support a conclusion that legacy CCR surface impoundments present fewer risks than other inactive CCR surface impoundments. Indeed, as discussed in Unit III.A, more recent information continues to indicate that legacy CCR surface impoundments are more likely to contaminate groundwater and at higher levels, even in cases where the unit no longer presents structural stability concerns. Based on this record and on the specificity of the D.C. Circuit's findings in *USWAG,* EPA considers that it has limited discretion to establish requirements for legacy CCR surface impoundments that are significantly different than those currently applicable to inactive CCR surface impoundments. Accordingly, EPA in most cases instances has required legacy CCR surface impoundments to comply with the existing closure and post-closure requirements in 40 CFR part 257, subpart D, that are currently applicable to inactive CCR surface impoundments. This final rule also adopts the provisions that were originally proposed on March 3, 2020, that allow a facility closing by removal to complete required groundwater remediation during a post-closure care period, discussed in Unit III.D of this preamble.

However, in response to comments, EPA included one additional provision to account for the inception of Federal permitting. A key feature of a permit program is that, through a subsequent public process, a regulatory authority can adjudicate legal and factual issues based on the specific facts of an individual site, that would be more complex and challenging to resolve in a national rule. EPA has relied on this feature to resolve one of the more complex legal and factual issues raised in this rulemaking by deferring it to the subsequent permitting process: how to address situations where the impoundment contained CCR and liquids on October 19, 2015, but prior to the effective date of this final rule, a facility closed its legacy CCR surface impoundment in accordance with standards established by a regulatory authority that are different than the performance standards in § 257.102, but that are likely to provide equivalent protection of human health and environment. Provided certain criteria are met, EPA is deferring the requirement for the closed unit to comply with § 257.102 until a permit authority can evaluate the adequacy of the previously completed closure, and determine during permitting whether (as well as what) additional measures are necessary to ensure that the closure is as protective as § 257.102. The criteria EPA is employing are designed to ensure that the regulatory authority overseeing the closure applied standards that were substantially equivalent to the otherwise-applicable CCR rules in terms of evaluating and mitigating the risks. In such cases, EPA would therefore have reliable evidence that the risks have likely been adequately mitigated and therefore, these are unlikely to pose a reasonable probability of adverse effects pending later permitting. The final rule also includes procedures for the closure equivalency determination modeled on similar determinations made for hazardous waste interim status units under § 270.1.

EPA is currently transitioning from the exclusively rule-based program to a Federal permitting program. Although every unit in operation, closure, or corrective action will ultimately receive a permit, and EPA expects to shortly begin issuing permits, it will be several years before permits are issued for every unit. This means that, at least in the near term, most facilities will continue to operate under the current self-implementing regime, similar to units under the subtitle C hazardous waste program that initially operated under interim status prior to obtaining a permit. While this necessarily limits the degree to which this final regulation can rely on the permitting process, this is an example of a situation that is better resolved through a combination of a national rulemaking and the individualized decision making provided through permitting rather than exclusively through a national rulemaking. EPA agrees that there are examples of units closed under alternative criteria that appear to be equally as protective as the part 257 closure requirements. If EPA were to require all previously closed units to document compliance with § 257.102 immediately, several units that have likely already met the protectiveness standards would be swept in unnecessarily. Unfortunately, it is not feasible to evaluate these individual closures as part of this national rulemaking; these units are all subject to different requirements, and commenters have provided insufficient information on each individual unit for the Agency to conclude that they are in fact as protective as a closure conducted in accordance with § 257.102. If EPA were still limited to issuing minimum national criteria through rulemaking, it would be reasonable to craft a regulation that would regulate over broadly in order to ensure that the final rule achieves the statutory standard at each facility subject to the regulation. See 42 U.S.C. 6944(a)(''no reasonable probability of adverse effects on health or the environment . . . at such facility''). As EPA explained in 2015, to establish criteria under this provision, EPA must demonstrate, through factual evidence available in the rulemaking record, that the final rule will achieve the statutory standard at all sites subject to the standards based exclusively on the final rule provisions. This means that the regulations must account for and be protective of all sites, including those that are highly vulnerable. But now that Congress has granted the agency broader authority, it is reasonable in this case, where EPA can craft criteria to identify closures that may be protective and thus warrant a closer evaluation, to rely on that broader authority.

Under this provision, EPA is not exempting a facility from the requirement to demonstrate that a unit closure meets the performance standards in § 257.102, or from agency oversight, but only delaying application of the requirement until the Agency can resolve the outstanding legal and factual issues. EPA is also deferring only the requirement that a closed unit achieve compliance with the closure performance standards. To mitigate any potential risks, all other applicable requirements, including the requirements for groundwater monitoring and corrective action would continue to apply to these units. Further EPA's existing authorities to respond to urgent threats to human health or the environment also remain available, should the need arise. See, *e.g.,* 42 U.S.C. 6973.

i. Requirement for Legacy CCR Surface Impoundments To Close

The final rule continues to require legacy CCR surface impoundments to close. As EPA explained in the proposal, the *USWAG* decision has effectively resolved this issue. No commenter submitted any evidence to demonstrate that the risks associated with these units are any lower than they were in 2018 when the Court decided that closure of all unlined and clay-lined impoundments was required by RCRA section 4004(a) or that the risks posed by legacy CCR surface impoundments are any lower than those at the currently regulated inactive impoundments at active facilities. If anything, more recent information indicates that a greater number of legacy CCR surface impoundments are more likely to have leaked even higher levels of contaminants than the operating impoundments modeled in 2014. See Unit III.A.

No commenter has identified any legacy CCR surface impoundment with a composite liner that meets the requirements of § 257.71. Based on the data gathered since 2015 from the currently regulated CCR unit universe, the Agency considers it highly unlikely that any legacy CCR surface impoundment has such a liner. EPA analyzed the list of inactive CCR facilities compiled based on comments received in response to the ANPRM and this rulemaking and knows that almost all these facilities were opened prior to 1990 (one facility opened in 1996) before composite liner systems were typically installed. Unless legacy CCR surface impoundments are very different than impoundments at active facilities, EPA expects all units of this age to be unlined as defined by § 257.71.

The D.C. Circuit has also already rejected arguments that EPA can avoid requiring CCR surface impoundments to close based on claims that ''all impoundments aren't leaking.''

> The EPA and Industry Intervenors assert that the composite lining required for new units is not needed for existing units because most unlined impoundments do not leak, and an unlined impoundment that is not leaking is not dangerous. Industry Intervenors emphasize that the record suggests that ''almost two-thirds of unlined impoundments do not leak,'' and they assert that ''appropriate controls on impoundments that do leak'' suffice to meet RCRA's ''no reasonable probability'' standard. The EPA underscores that it made no finding of any ''reasonable probability that each and every unlined impoundment will, in fact, result in adverse effects on health and the environment.'' It insists that RCRA's ''no reasonable probability'' standard is met by the Rule's provisions for ''extensive monitoring of groundwater to detect constituent leaking,'' id. at 83, and ''immediate action to stop that leak,'' ''redress that leak,'' and to close the site as soon as a harmful leak is detected.

USWAG, supra at 427. The Court summarily rejected these arguments.

> It is inadequate under RCRA for the EPA to conclude that a major category of impoundments that the agency's own data show are prone to leak pose ''no reasonable probability of adverse effects on health or the environment,'' 42 U.S.C. § 6944(a), simply because they do not already leak.

Id. This holding largely rests on a legal conclusion of what RCRA section 4004(a) requires, which Congress did not alter when it amended the statute in the WIIN Act.

The Court similarly rejected arguments that reliance on the part 257 corrective action provisions to clean up releases can effectively substitute for a national requirement to close impoundments, or that corrective action alone is sufficient to meet the RCRA section 4004(a) standard. As the Court explained, that argument focuses on the wrong risks and addresses only half of the statutory standard. The contamination of a potential source of drinking water is itself an adverse effect on the environment, and the statutory requirement to ensure there will be no reasonable probability of adverse effects on health or the environment requires the Agency to take measures based on the risks to prevent this harm from occurring in the first place. It is not enough to remediate the contamination before it reaches an off-site receptor.

> In defending the Rule here, the EPA looks at too narrow a subset of risk information and applies the wrong legal test.
>
> The Final Rule's approach of relying on leak detection followed by closure is arbitrary and contrary to RCRA. This approach does not address the identified health and environmental *harms* documented in the record, as RCRA requires.
>
> . . .
>
> *RCRA requires the EPA to set minimum criteria for sanitary landfills that prevent harm to either ''health or the environment.''* The EPA's criteria for unlined surface impoundments, limited as they are to groundwater monitoring for contaminant levels keyed to human health, only partially address the first half of the statutory requirement.
>
> . . .
>
> But here, too, the EPA has failed to show how unstaunched leakage while a response is pending comports with the 'no reasonable probability' standard.

Id. at 429–430, 431 (emphasis added). None of this has changed. Nor has any commenter identified any unique characteristic of legacy impoundments that makes any of the Court's analysis irrelevant or inapplicable. Although some commenters continue to claim that their units are heavily vegetated or developed and that reopening or other removal/remediation activities may disrupt current use of the land, no commenter submitted any data or analysis to demonstrate that removal or remediation activities would be more detrimental to health and the environment than not cleaning up the contaminated groundwater in the aquifer or taking measures to prevent the legacy CCR surface impoundment from continuing to contaminate the aquifer. Moreover, the fact that some impoundments have become heavily vegetated or redeveloped does not mitigate the risks these unlined legacy CCR surface impoundments continue to pose.

The same is true for those commenters alleging that the closure of legacy CCR surface impoundments would itself present greater risks than leaving the disposal unit in its existing state; none presented any data or analysis, stating instead that possible effects were self-evident. However, EPA notes that most of these comments appear to have been premised on the assumption that closure by removal would be required. As discussed in the next section, EPA is not prohibiting legacy CCR surface impoundments from closing with waste in place, provided all of the performance standards in § 257.102(d) have been met.

EPA also cannot, as the commenters suggest, proceed exclusively on the basis of site-specific assessments and forego a nationwide risk assessment, national closure requirement, or universal performance standards for closure. When Congress amended the statute in 2016, it added a permitting component but retained without revision the requirements in RCRA sections 1008(a)(3) and 4004(a) that EPA establish minimum national standards (''criteria'') by regulation. The statute relies on these criteria in several provisions, including as the standard EPA must use to evaluate State programs, to issue permits, and to determine whether a CCR unit is a sanitary landfill or an open dump. See, 42 U.S.C. 6945(d)(1)(B), (d)(1)(D), (d)(3), (d)(6). The D.C. Circuit has also effectively confirmed the continued necessity of national criteria; if the Court believed that the WIIN Act obviated the need to comply with RCRA section 4004(a) it would have granted EPA's request for an abeyance or dismissed the case as moot. That it did neither demonstrates that the Court believed that its opinion would remain relevant. See, *USWAG,* 901 F3d at 436–437 (denying EPA's request for voluntary remand because ''this claim involves a question—the scope of EPA's statutory authority—that is intertwined with any exercise of agency discretion going forward.'')

Accordingly, the final rule requires all legacy CCR impoundments to close.

ii. Deferral for Legacy CCR Surface Impoundments Under Critical Infrastructure

As noted above, several commenters stated that some inactive facilities have been redeveloped and that the CCR surface impoundments are now located beneath critical infrastructure. These commenters claimed that requiring closure of units beneath infrastructure could adversely impact grid reliability, business operations, or other necessary public services and suggested EPA create exemptions or extensions for these units. For example, one commenter stated that closure of units located under other structures is not feasible as EPA has proposed. The commenter further explained that:

> the issue is applicable and even more pronounced with respect to legacy impoundments. By definition legacy CCR surface impoundments are located at inactive sites that in some instances have been partially or completely redeveloped. As a result, former legacy units at this stage may be completely inaccessible due to vegetation, new infrastructure like pipelines or transmission lines that cannot be disturbed without disrupting operations, active CCR units, buildings, or other obstacles to access. If EPA proceeds to issue the proposal EPA must address such accessibility issues.

Other commenters supported the decision not to propose an exemption from the closure requirements for legacy CCR surface impoundments beneath redevelopments or infrastructure, based on the risks that these sites can present, and provided specific examples of such sites. Two of the examples related to a situation in which active CCR disposal units were built on top of former CCR surface impoundments (*i.e.,* overfills). In one instance, the commenter described a site where an unlined CCR surface impoundment had been closed by partially draining the impoundment and constructing a new CCR landfill (98.9 acres), two stormwater ponds and a leachate pond (10.8 acres), and a materials handling area (4.4 acres) on top of the former impoundment. According to the commenter, the facility claimed that the closed impoundment rather than any of the active CCR units, was responsible for SSIs detected in its groundwater monitoring. The commenter referenced documents on the facility's CCR website which explained that:

> Although it has not received sluice water since 2008, the CCR in the former Main Pond continues to receive, store, and discharge water, primarily groundwater entering the CCR through the sides of the filled valley. Groundwater flow into the CCR in the former Main Pond drains downward and outward to the east through the toe drain system under the dam.

The commenters explained that overfills can increase groundwater contamination from the underlying unit by reducing the hydraulic gradient and increasing the waste and water contact time. They stated that this has been documented by both an EPRI study and groundwater monitoring at a specific overfill that showed steady to gradually increasing concentrations of CCR related constituents in the landfill monitoring wells, rather than the predicted decline in concentrations of CCR-related constituents from the closure of the underlying surface impoundment.

As an initial matter, under both the existing definitions and the definitions in the final rule a legacy CCR surface impoundment could not be located below an active CCR unit. A legacy impoundment is located at an inactive facility, and the presence of an active CCR unit means that the facility is active, not inactive. See, §§ 257.50(b), 257.53 (definition of active facility). This means that in the example described by the commenter the surface impoundment underneath the active landfill is an inactive CCR surface impoundment at an active facility, and would be considered a ''regulated unit'' subject to the existing requirements in part 257, rather than this final rule.

In any event, EPA disagrees that its proposal did not adequately account for the circumstance in which a legacy CCR surface impoundment may be challenging to access, such as where the impoundment is located beneath infrastructure or buildings. In contrast to the comments received with respect to CCRMU, no commenter provided a concrete example in which closure of a legacy CCR surface impoundment would interfere with critical infrastructure. The overwhelming majority of commenters provided concrete examples of concerns with respect to CCRMU and then concluded that EPA needed to address the issue equally for legacy CCR surface impoundments. The most concrete example of potential interference with critical infrastructure is the reference to ''new infrastructure like pipelines or transmission lines that cannot be disturbed without disrupting operations'' quoted above. But even in that case the commenter provided no explanation of the factual basis for the conclusion that over the five to 15 years the existing regulations provide to complete closure the facility could not schedule the outages necessary to move pipelines or transmission lines, and conduct the closure in stages as necessary to accommodate scheduling any necessary outages.[62] In addition, as discussed in the next Unit of the preamble, EPA has extended the deadline to initiate closure to 48 months from promulgation. The amount of time provided by these deadlines is more than adequate to account for any accessibility issues. Further, EPA has been regulating utilities under multiple environmental statutes for decades and reliability issues are often raised when regulations are promulgated, but EPA is unaware of situations where those reliability concerns have been realized in the form of electric blackouts caused by compliance with Federal environmental standards. In this case, in the unlikely event closure of a legacy CCR surface impoundment cannot occur within the regulatory timeframe without creating a demonstrated reliability concern, the Agency will work with the facility, the relevant RTO, and other relevant Federal agencies to ensure proper closure occurs without causing the power to go out.

Finally, as noted above EPA received a substantial number of comments requesting the agency not require facilities to ''re-close'' any unit that had already completed closure. This final rule does not mandate that any previously closed unit automatically re-close. But, as described in the next section, the final rule does require all legacy CCR surface impoundments to meet the performance standards in § 257.102, although as discussed above, some may not be required to do so until permitting. EPA does not consider this to be equivalent to a requirement to ''re-close'' as, depending on the site conditions, facilities may be able to implement engineering measures, such as the installation of slurry walls to prevent groundwater infiltration, to address any deficits without removing the cover system or entirely re-closing the whole impoundment.

iii. Requirement To Comply With Performance Standards in § 257.102

As discussed above, consistent with *USWAG* and the proposed rule, this final rule requires that the closure of legacy CCR surface impoundments meet the performance standards in either § 257.102(c) or (d). Under this final rule, all closures initiated after the effective date of this rule, as well as those that were not completed prior to the effective date of this rule, will need to comply with these requirements.

And in general, the same is true with respect to closures that were completed prior to the effective date of this rule. As discussed previously, a facility that can certify that its prior closure meets the performance standards in § 257.102(c) only needs to post the documentation that it meets the standard. Similarly, if a facility can demonstrate that the closed unit meets the requirements under § 257.102(d), EPA will consider them to be closed and the only requirements that will be applicable are those that apply to closed units under post-closure care—such as groundwater monitoring, and if necessary, corrective action. EPA never intended to require facilities that otherwise met the closure standards to go through the process again and re-close the unit. In addition, where the facility was subject to standards that are different than the Federal CCR closure standards (*e.g.,* if the closure were conducted as part of a CERCLA cleanup or State order) but are otherwise equivalent in terms of mitigating the risks, the requirement to meet the § 257.102 standards will be deferred to permitting, where a closure equivalency determination will be made.

In response to EPA's proposal that all legacy CCR surface impoundments comply with § 257.102, many commenters again reiterated their request that EPA exempt any unit that has either completed closure or is in the process of closing pursuant to State law (*e.g.,* solid waste permit, consent orders or decrees). Commenters also requested EPA to exempt any site that had closed as part of a cleanup conducted pursuant to another Federal requirement, such as CERCLA or RCRA subtitle C. These commenters stated that EPA had failed to demonstrate that these units posed any risk as a consequence of the lack of ponded water, and that ''re-closure'' of these previously closed units is consequently unnecessary and overly burdensome.

By contrast, several commenters supported EPA's proposal to require all legacy CCR surface impoundments to comply with the performance standards in § 257.102, even if the closure was previously approved by a State regulatory agency. These commenters pointed to EPA's conclusions in 2015 that significant gaps remain in many State programs; that some programs provide minimal or no regulatory oversight of CCR units; and that most CCR surface impoundments were permitted exclusively under NPDES or other surface water pollution prevention programs. See, 80 FR 21324–21325. The commenters also included recent examples of closures approved by various State agencies that were not consistent with the Federal closure standards including: (1) Ohio's approval of the closure of an unlined CCR surface impoundment at the Gavin Plant, which EPA subsequently estimated could be sitting in groundwater as high as 64 feet deep in some locations post closure and that as much as 8.2 million cubic yards (or as much as 40% of the CCR in the Fly Ash Resevoir) could still be saturated—and would remain so indefinitely; (2) Alabama's issuance of several permits authorizing several facilities to close unlined CCR surface impoundments with large quantities of free liquids and saturated CCR remaining in the closed units; and (3) Kentucky's permit authorizing the closure of an unlined CCR surface impoundment by partially draining the impoundment and constructing a new CCR landfill (98.9 acres), two stormwater ponds and a leachate pond (10.8 acres), and a materials handling area (4.4 acres) on top of the impoundment. The CCR in the underlying closed impoundment continues to receive, store, and discharge water, primarily groundwater entering the CCR through the sides of the filled valley, drains downward and outward to the east through the toe drain system under the dam.

Finally, several commenters requested that EPA prohibit legacy CCR surface impoundments from closing in place under § 257.102(d).

EPA disagrees that legacy CCR surface impoundments should be prohibited from closing with waste in place in accordance with § 257.102(d). The commenters did not demonstrate that legacy impoundments could never meet the performance standards in § 257.102(d) or identify unique characteristics or risks of legacy impoundments that would not be adequately addressed by compliance with those provisions. Both clean closure and closure with waste in place can be equally protective, provided that all of the requisite performance

[62] Electric generating facilities are required to schedule and agree upon boiler shutdown periods with their Regional Transmission Organization (RTO) to ensure grid reliability. Most plants have regular boiler shutdowns on an annual basis with a more substantial one every few years. Since regular boiler shutdowns are already scheduled, the facility can plan the closure construction around the already scheduled outage; however, the outage may need to be extended depending on the work. The RTOs require various lead times of consultation or notice prior to any retirements, outages, or extended periods of non-operation.

standards in § 257.102 are met. The final rule therefore requires legacy impoundments to comply with the same requirements applicable to other inactive impoundments, that is, to close in accordance with either § 257.102(c) or (d).

If all of the performance standards for clean closure and the performance standards for closure with waste in place can be met, an owner or operator may determine which alternative is appropriate for their particular unit. The regulations do not require an owner or operator to use one closure option over the other in such situations. However, the facility must meet all the performance standards for the option it has selected, and if it cannot meet all of the performance standards for one option, then it must meet all of the performance standards for the other option. 40 CFR 257.102(a) (specifying that ''[c]losure of a CCR landfill, CCR surface impoundments . . . [m]ust be completed either by leaving the CCR in place and installing a final cover system or through removal of the CCR and decontamination of the CCR unit, as described in paragraphs (b) through (j) of this section.''). For example, if the facility is unable to meet the performance standards for closure with waste in place for a particular unit (or portion of a unit), it must close the unit by removal (or that portion). Whether any particular unit or facility can meet the performance standards is a fact and site-specific determination that will ultimately depend on a number of factual and engineering considerations, such as the hydrogeology of the site, the engineering of the unit, and the kinds of engineering measures available.

As discussed in the preceding section, this final rule does not require previously closed legacy CCR surface impoundments to automatically ''re-close.'' Rather, consistent with the proposal, facilities will be required to ensure that all closed legacy CCR surface impoundments meet the performance standards in § 257.102(c) or (d). To the extent any deficit can be remedied by supplementary engineering methods, that would be all that is required.

(a) Closure of Legacy CCR Surface Impoundments Under State Law

EPA continues to disagree that it would be appropriate to exempt any legacy CCR surface impoundment that has completed closure or is currently in the process of closing pursuant to State requirements. As EPA repeatedly explained in the proposal, Congress established a specific process that would authorize State requirements to operate in lieu of the Federal CCR regulations, and it would be inappropriate for EPA to substitute its own process to achieve the same ends. Under the Congressionally mandated process, a State must obtain EPA approval, in whole or in part, of its CCR permit program, pursuant to RCRA section 4005(d). 42 U.S.C. 6945(d). Those provisions expressly identify the standard EPA must use to evaluate a State program including, where applicable, alternative technical criteria that differ from the Federal CCR regulations, along with requirements for EPA to review approved programs and, if necessary, to withdraw approval. Finally, the statute expressly provides that in the absence of a permit issued under an approved State program, the Federal criteria apply to all CCR units. 42 U.S.C. 6945(d)(6). These provisions reflect Congress' considered judgment of the appropriate legal structure and relationship between State and Federal requirements, and it is not appropriate for EPA to effectively establish its own alternative.

In any event, EPA lacks the record necessary to support a broad exemption for all closures under any State requirement. As discussed in more detail below. the information currently available does not demonstrate that all closures conducted under State authority ''ensure there is no reasonable probability of adverse effects on health or the environment.'' 42 U.S.C. 6944(a).

First, commenters' arguments appear to be premised largely on the existence of a State solid waste program with the attributes of the municipal solid waste landfill requirements adopted and approved well after those dates. But as some commenters acknowledged, many legacy impoundments closed well before any State had developed such regulations—*e.g.,* during 1970s–1990s.[63] EPA has no evidence demonstrating the protectiveness of State requirements during this period. However, the results of the joint U.S. Department of Energy (DOE) and EPA study completed in 2006, ''Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994–2004,'' are not encouraging. Only 19% (three out of 19) of the surveyed surface impoundment permits included requirements addressing groundwater protection standards (*i.e.,* contaminant concentrations that cannot be exceeded) or closure/post-closure care. The EPA/DOE report also concluded that approximately 30% of the net disposable CCR generated was potentially exempt from all State solid waste permitting requirements (EPA/DOE Report at pp 45–46). For example, at the time of the report, Alabama did not regulate CCR disposal under any State waste authority and did not have a dam safety program. Finally, the report found that a number of States only regulated surface impoundments under Clean Water Act authorities, and consequently primarily addressed the risks from effluent discharges to navigable waters, but did not require liners or groundwater monitoring.

As part of developing the 2015 CCR Rule, EPA independently reviewed State statutes and regulations, with a more detailed focus on the 16 States responsible for approximately 74% of the CCR generated in 2009. See 80 FR 21324. This review identified some programs that provided minimal or no regulatory oversight of CCR units. For example, Arizona, New Mexico, and Utah had no regulations applicable to CCR units or entirely exempted CCR from State regulations governing solid waste. Similarly, Mississippi, Montana, and Texas (the largest coal-ash producer) exempted the on-site disposal of CCR (as ''nonhazardous industrial solid waste'') from some or all key requirements, such as permits or groundwater monitoring. Such exemptions covered most of the disposal of CCR within the State, as the majority of utilities dispose of their CCR on-site. Other States, such as Florida, Indiana, Ohio and Pennsylvania, exempted CCR landfills or ''monofills'' from many requirements. For example, Indiana regulations considered surface impoundments that are dredged at least annually to be ''storage units'' that are exempt from solid waste regulations, including from corrective action requirements. Many of these States were among the leading generators of CCR wastes at the time. In total, EPA estimated that in 2015, approximately 20% of the net disposable CCR was entirely exempt from State regulatory oversight.

However, EPA concluded in 2015 that most States regulated the management of CCR to varying degrees, although the particular requirements varied significantly. Most CCR surface impoundments were permitted exclusively under NPDES or other surface water pollution prevention programs. In these States, requirements to protect groundwater, such as liners or groundwater monitoring systems, were frequently less robust than the corresponding requirements applicable to CCR landfills.

[63] As discussed previously, if an impoundment contained CCR and liquids on or after October 19, 2015, it is considered a legacy impoundment under these regulations even if the unit is considered to have been closed under state law.

EPA did not specifically evaluate State closure requirements in 2015. However, EPA's findings with respect to groundwater monitoring requirements suggests that it is unlikely States considered the extent to which a surface impoundment would remain saturated by groundwater after closure. In 2015 EPA had only limited anecdotal evidence on the status of groundwater monitoring in six States, including four States that are among the leading CCR generators. After the Kingston TVA spill in December of 2008, groundwater monitoring wells were installed at 12 of Illinois's existing surface impoundments, almost doubling the number of monitored surface impoundments in the State. However, 55 additional surface impoundments, both active and inactive, still lacked groundwater monitoring systems. In Ohio, 44 CCR units, out of a total of 57 CCR units in the State (42 surface impoundments and 15 landfills) still lacked groundwater monitoring in 2015, even though all the surface impoundments were permitted decades ago under Ohio's NPDES program. Ohio acknowledged in their comments that the extent of groundwater risks in the State was poorly documented, as 40 out of 44 unlined CCR units did not have a groundwater monitoring system. Some State programs also authorized a buffer zone or a ''zone of discharge,'' which allows the facility to defer remediation of groundwater contamination for some period of time, usually until the contaminant plume has migrated to the facility site boundary. Florida, Illinois, North Dakota, and Tennessee were among the States with such a regulatory provision.

EPA acknowledges that some States have substantially revised their programs since 2015, but this is not universal. In addition, although a few States provided further information that was not available to EPA in 2015 about their programs in response to the proposal, most did not. For the most part, commenters offered general assertions that State regulatory authorities have considered the site-specific conditions and determined that the closure or closure plan meets the necessary requirements for addressing risk, and that EPA should not second guess these decisions, but provided little, if any, evidence that would support a wholesale exemption for any closure conducted in accordance with State requirements.

At the same time, as discussed above, several commenters provided examples of recent (post-2015) State-authorized closures that are significantly less protective than § 257.102. For example, at least two States responsible for a significant percentage of the CCR generated annually, Ohio and Kentucky, recently (*i.e.,* after 2015) allowed facilities to close their impoundments by removing the CCR from the impoundment, but did not require groundwater monitoring to determine whether groundwater contamination remained at the site. Under the CCR regulations, closure by removal is only considered complete with documentation that all Appendix IV constituent concentrations are below the GWPS in two consecutive groundwater monitoring sampling events.

More to the point, as EPA explained in the proposal, the record clearly shows that significant numbers of CCR surface impoundments were constructed with at least some portion of the unit actually in the aquifer beneath it, or otherwise consistently saturated by groundwater or surface water migrating into the unlined impoundment. Many of these units were closed without addressing the liquids that continued to saturate the CCR, and the free liquids that remained or the fact that the unit continues to impound water—in some cases with full approval from the State. This is especially likely for closures that occurred prior to 2015. As noted previously, a 2006 DOE/EPA report concluded that only 19% of the surveyed surface impoundment permits included requirements addressing groundwater protection standards (*i.e.,* contaminant concentrations that cannot be exceeded) or closure/post-closure care, and approximately 30% of the net disposable CCR generated was potentially exempt. The risks associated with such closures can be substantial, as discussed in Unit III.A of this preamble. Ultimately, under the Federal CCR regulations what determines whether a unit meets the definition of an inactive CCR impoundment or a closed CCR impoundment—and what determines whether the unit continues to present a reasonable probability of adverse effects on health and the environment—are the conditions that remain and the resulting risks, rather than whether a facility or even a State regulatory authority has labeled the unit as ''closed.''

For all of these reasons, EPA cannot exempt: (1) All units that have closed consistent with State requirements, or (2) All units that have started closure or have had a closure plan approved under State requirements prior to the effective date of the final rule.

(b) Deferral of Certain Completed Closures to Permitting

A few commenters provided examples of closure that they believed were substantially equivalent to closures in accordance with § 257.102, because they involved substantial regulatory oversight, a site-specific risk assessment, and general consistency between the programs on the standards to be applied. These included closures under CERCLA and an approved State's RCRA subtitle C program. According to these commenters, it is a near certainty that there will be slight differences in the way the closure activities were designed or conducted when compared to § 257.102, but because the closure activities accomplish the same environmental goals and meet the same ultimate performance standards with respect to avoiding groundwater impacts, there is little to be gained by duplicative closure activities under the Federal CCR regulations. Another commenter provided a copy of a Consent Order entered in State court governing the closure of CCR surface impoundments at seven sites across the State. The commenter also provided copies of several human health and ecological risk assessments that were conducted to support the State's approval of the closures, along with various third-party reports. The commenter concluded that based on this factual record, it is unnecessary to subject these units to the existing closure criteria for CCR surface impoundments in §§ 257.101 and 257.102.

EPA agrees that closures conducted as part of a CERCLA or RCRA subtitle C response action would normally be expected to be consistent with the performance standards in § 257.102; the CCR closure regulations were based on the closure regulations for hazardous waste facilities, and the CCR regulations would normally be considered ARARs under CERCLA for any closure of a CCR facility after 2015. Consequently, these facilities may ultimately be able to support a certification of compliance with § 257.102. But, as the commenters noted, there can be slight variations in how the standards are applied, and a facility may consequently not be confident that it can support a certification.

Nor are these the only closures that may be substantially equivalent. As the commenters' examples demonstrate, State requirements, even where different, can result in closures that are equally as protective as those conducted in accordance with Federal requirements.

However, as the commenters noted it is a near certainty that there will be differences in the way the closure activities were designed or conducted when compared to § 257.102. EPA does not believe that it can craft an exemption that could encompass all these potential variations. Nor does EPA believe that it could develop criteria that are sufficiently precise that regulated entities could determine whether alternative requirements ultimately accomplish the same environmental goals and meet the same ultimate performance standards as the Federal requirements. But EPA has detailed criteria to identify whether a closure is potentially as protective as those conducted in accordance with § 257.102, and which therefore warrant a closer evaluation; closures that meet these criteria will be deferred until a permitting authority can evaluate the adequacy of the closure.

The closures described above all share certain features such as the risks at the site have been fully evaluated by a regulatory authority and carefully addressed with oversight by a regulatory authority. Even though the specific requirements may differ from § 257.102, there is nevertheless reason to believe that the closure will be protective, at least in the interim until a permitting authority can evaluate the adequacy of the closure to the CCR closure requirements. Based on these considerations, EPA is limiting this deferral to closures where the facility can document that it meets specific conditions. First, the deferral is limited to circumstances in which a regulatory authority played an active role in overseeing and approving the closure activities. EPA considers a ''regulatory authority'' to include a State or Federal permit, an administrative order, or consent order issued after 2015 under CERCLA or by an EPA-approved RCRA State program. The permitting or other authority must have required groundwater monitoring to ensure there was no contamination coming from the unit that is not addressed by corrective action.

Second, to support deferral of evaluation of a prior closure of a legacy CCR surface impoundment as substantially equivalent, the facility with a surface impoundment that closed with waste in place must document that free liquids have been eliminated, consistent with the standard in § 257.102(d)(2)(i). This requirement directly addresses the reason that EPA has concluded that many previously completed closures do not meet the standard in RCRA section 4004(a).

Third, a facility must document that it had installed a groundwater monitoring system and performed groundwater monitoring that meets a subset of the performance standards found in § 257.91(a). Specifically, the facility must demonstrate that the groundwater monitoring system was capable of: (1) Accurately representing background water quality; (2) Accurately representing the quality of water passing the waste boundary; and (3) Detecting contamination in the uppermost aquifer. Finally, the groundwater monitoring system must have monitored all potential contaminant pathways. These are the same subset of standards that apply to a facility certifying that its closure by removal completed prior to the effective date of this final rule meets the performance standards in § 257.102(c).

Fourth, a facility would need to demonstrate that a site-specific risk assessment was conducted or approved by the regulatory authority prior to (or as part of) approving the closure, and that the closure and any necessary corrective action has been overseen by the regulatory authority, pursuant to an enforceable requirement.

These criteria are generally consistent with the criteria a commenter suggested to identify closures under other authorities that would be equivalent to those conducted in accordance with § 257.102. These included that the facility had installed a groundwater monitoring system and performed groundwater monitoring and analysis in accordance with §§ 257.90 through 257.95 and was conducting any necessary remediation in accordance with §§ 257.96 through 257.98, pursuant to an enforceable requirement. Although the commenter proposed these to serve as a basis for an exemption, EPA considers they are equally relevant to identifying decisions that can be deferred for future evaluation.

Fifth, the facility would be required to prepare and include documentation in the applicability report and operating record, demonstrating that it has met these criteria and is eligible for deferral. This would include all relevant specifics such as State permit, order, data, groundwater monitoring results, etc. This must be certified by the owner/operator or an authorized representative using the same language in § 257.102(e).

When it comes time for the permit authority to evaluate the closure, EPA intends to rely on the permit application process as the primary mechanism to collect the information to allow a determination to be made as to whether a legacy CCR surface impoundment that closed under these alternative standards did so in compliance with the requirements of § 257.102. The permit application process is a well-established system for reviewing the types of groundwater, soil and other sampling and analytical data that will typically be required in determining the ''equivalency'' of alternative closures.

When the permit application is called in, the facility must provide sufficient information, including data on contaminant levels in groundwater, to demonstrate that the applicable § 257.102 standards have been met. EPA or a Participating State Director will review the information to determine whether the ''equivalency'' of the closure has been successfully demonstrated. If EPA determines that the closure has met the appropriate part 257 closure standard, EPA will issue a permit. If EPA or a Participating State Director determines that the closure does not meet the part 257 standards, the owner or operator will be required to submit a permit application containing all the applicable information for an operating permit, and EPA or a Participating State Director will issue a permit that contains the specific requirements necessary for the closed unit to achieve compliance with § 257.102.

iv. Closure Compliance Deadlines for Legacy CCR Surface Impoundments

(a) Initiation of Closure for Legacy CCR Surface Impoundments

EPA proposed that legacy CCR surface impoundments be subject to the existing requirement to initiate closure that are applicable to other unlined CCR surface impoundments because, as discussed in the proposed rule and in Unit III.B.2.c of this preamble, the current record indicates that legacy CCR surface impoundments are largely, if not entirely, unlined. Specifically, EPA proposed that owners or operators of legacy CCR surface impoundments initiate closure no later than 12 months after the effective date of the final rule because EPA anticipated 12 months being sufficient time for owners or operators to identify and delineate the legacy CCR surface impoundment, determine relevant engineering information (*e.g.,* structural stability), characterize the site's hydrogeology and other characteristics, and determine whether any of the uppermost aquifer has been contaminated. As explained in the proposed rule, EPA acknowledged that most of this information would be obtained through compliance with the proposed groundwater monitoring and corrective action requirements.

In the proposed rule, EPA solicited comment on whether the regulations should provide owners and operators the option to retrofit a legacy CCR surface impoundment in accordance with the retrofit requirements in § 257.102(k) as an alternative to requiring the closure of a legacy CCR surface impoundment.

As stated in Unit III.B.2.g, generally commenters on the proposed rule supported requiring legacy CCR surface impoundments to close in accordance with the existing requirements. However, some commenters disagreed that closure was appropriate for certain legacy CCR surface impoundments, including those units underneath infrastructure needed to support current activities, those that had completed or currently undergoing closure, and those units that have been demonstrated not to pose unacceptable risk.

Most commenters stated that the proposed deadline for the initiation of closure was infeasible due to the factors listed in Units III.B.2.a.ii and III.B.2.g of this preamble (*e.g.,* labor shortages, seasonality, limited contractor availability, overlapping regulatory requirements) and should be extended in consideration of those factors as well as to allow for the incorporation of the groundwater monitoring data.

No commenters provided feedback on whether the regulations should allow owners and operators to retrofit a legacy CCR surface impoundment.

For the reasons explained in the proposed rule as well as Unit III.B.2.g, EPA continues to conclude that the closure requirements in the existing rule are generally appropriate for legacy CCR surface impoundments. However, as explained in Unit III.B.2.g, EPA recognizes that in specific situations, mandatory closure of a legacy CCR surface impoundment by the deadline may cause more harm than benefits to human health and the environment. Based on information provided by the commenters and experience with the implementation of the 2015 CCR Rule (*i.e.,* regulation of inactive CCR surface impoundments), EPA finds that these situations are limited to those in which the legacy CCR surface impoundment has completed closure under a State authority and those in which the unit is beneath infrastructure necessary for current activities.

For additional closure requirements of a legacy CCR surface impoundment, the decision to require reclosure will be deferred until a permitting authority is authorized to issue CCR permits to the facility, at which point, the permitting authority will be able to look at site-specific factors and evidence to decide if reclosure is necessary to protect human health and the environment. EPA concludes that this approach will mitigate adverse impacts to local communities and the environment, including environmental justice concerns that may result from activities associated with reclosing a facility that is not contaminating groundwater or posing other risk to human health and the environment, such as increased traffic, increased greenhouse gas emissions, habitat loss, loss of native vegetation, water consumption, and additional waste generation.

When the legacy CCR surface impoundment is beneath infrastructure vital to the continuation of activities, such as beneath a substation, the initiation of closure will be deferred until the infrastructure is no longer needed or the closure of the facility, whichever is sooner. This approach protects human health and the environment while appropriately accounting for the need for operational continuity and reliability.

As explained in Unit III.B.2.g, EPA acknowledges the benefit of allowing owners or operators the time needed to incorporate groundwater monitoring data into the closure plan. Additionally, as stated in the proposed rule, EPA acknowledges the importance of using information gained by compliance with the groundwater monitoring and corrective action requirements to inform closure decisions and therefore the initiation of closure. For the reasons explained in Unit III.B.2.f, EPA is extending the deadline for the groundwater monitoring and corrective action requirements to a single deadline of no later than 30 months from the effective date of the final rule. As such, the initiation of closure is being extended as well. To ensure owners or operators have enough groundwater monitoring data to draw conclusions about seasonality impacts on groundwater levels and flow and the source of any potential groundwater contamination in the area, EPA is finalizing a deadline of no later than Monday, May 8, 2028, which is 42 months from the effective date of the final rule. This is codified in the regulatory text at § 257.101(e)(1).

EPA is finalizing the application of the existing requirements to initiate closure to legacy CCR surface impoundments as proposed except for those that fall under the deferral of closure described above (*i.e.,* units closed under State authority, units beneath critical infrastructure).

As stated in § 257.102(e), closure has been initiated once any steps necessary to implement the closure plan as described by Unit III.B.2.g.ii of this preamble have been taken, including submitting an application for any necessary State or agency permits or permit modifications and taking steps to comply with standards of any State or other agency that are a prerequisite to completing closure of a CCR unit.

(b) Preparation of a Written Closure Plan for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments comply with the existing requirements of § 257.102(b) requiring the preparation of a written closure plan no later than 12 months after the effective date of the final rule.

As mentioned above, overall commenters on the proposed rule agreed that closure requirements, including the written closure plan, would generally be appropriate for legacy CCR surface impoundments. One commenter suggested additional requirements for the content of the closure plan including the elevation of the base of the unit, groundwater information, and descriptions of compliance with § 257.102 will be achieved (*e.g.,* how free liquids would be eliminated, how waste will be stabilized, measures to minimize the need for further maintenance of the CCR unit). A few commenters supported the proposed deadline but as summarized in Units III.B.2.a.ii and III.B.2.g of this preamble, other commenters stated the proposed deadline was infeasible and inappropriate. One commenter suggested the deadline for the closure plan be extended to be concurrent with the initiation of closure. Commenters suggestions for the deadline for the completion of the closure plan ranged from 12 (the 2015 CCR Rule deadline) to 32 months, or after the collection of the eight baseline groundwater samples.

EPA disagrees with the commenter that additional requirements regarding the content of the closure plan are necessary. The information the commenter requested be included in the closure plan is 1) already required to be in the closure plan pursuant to §§ 257.102(b) or 2) readily available in other required reports (*e.g.,* the annual groundwater monitoring and corrective action reports). Furthermore, the commenter failed to fully explain how compliance with § 257.102(b) does not provide the information needed to determine if compliance with the closure performance standards will be met.

Regarding the deadline, as stated above, EPA concludes that the deadline for the closure plan should be extended from the proposed deadline to allow for owners or operators to incorporate information about groundwater quality, groundwater flows, seasonality impacts, and the migration of contaminants (if any) into the plan. Therefore, EPA is finalizing a deadline of no later than

Monday, November 8, 2027, which is 36 months after the effective date. This is codified in the regulatory text at § 257.100(f)(5)(i).

Based on comments on the proposed rule and experience from the 2015 CCR Rule, EPA expects the incorporation of this information into the closure plan will allow facilities to select a closure method that most appropriately addresses issues like waste that is in contact with groundwater, groundwater contamination, and long-term structural stability concerns. Closure plans that adequately address these issues will result in more compliant closure plans and therefore, be more protective of human health and the environment.

The closure plan describes the steps necessary to close a CCR unit at any point during the active life of the unit based on recognized and generally accepted good engineering practices. 40 CFR 257.102(b)(1). The plan must set out whether the closure of the CCR unit will be accomplished by leaving CCR in place or through closure by removal and include a written narrative describing how the unit will be closed in accordance with the section, or in other words, how the closure will meet all the performance standards in the regulations. 40 CFR 257.102(b)(1)(i). The written closure plan must also provide a schedule for completing all activities necessary to satisfy the closure criteria of the rule. See also 80 FR 21410–21425.

If the CCR is left in place, the closure plan must include a description of the final cover system and how the final cover system will achieve the regulatory performance standards. If the base of the impoundment intersects with groundwater, the closure plan would need to discuss the engineering measures taken to ensure that the groundwater had been removed from the unit prior to the start of installing the final cover system, as required by § 257.102(d)(2)(i). The closure plan would also need to describe how the facility plans to meet the requirements in § 257.102(d)(1) to ‘‘control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters.’’ This could include, for example, the installation of engineering controls that would address the post-closure infiltration of liquids into the waste from all directions, as well as any post-closure releases to the groundwater from the sides and bottom of the unit.

(c) Preparation of a Written Post-Closure Care Plan for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments would be required to comply with the existing requirement in § 257.104(d) regarding the preparation of a written post-closure no later than 12 months after the effective date of the final rule.

The comments EPA received on the proposed rule regarding the post-closure plan requirement are described in Units III.B.2.g and III.B.2.g.i and can be summarized as requests for an extension of the post-closure care deadline to allow for a more feasible deadline and the incorporation of groundwater monitoring data. For the reasons stated in Units III.B.2.g and III.B.2.g.i, EPA is finalizing a deadline of no later than Monday, November 8, 2027, which is 36 months from the effective date of the final rule to comply with the post-closure care requirement in § 257.104(d). This is codified in the regulatory text at § 257.100(f)(5)(ii).

Section 257.104(d) requires that an owner or operator of a CCR unit prepare a written post-closure plan. The contents of the P.E.-certified plan are stated in the rule at § 257.104(d)(1)(i) through (iii) and can be summarized as a description of the monitoring and maintenance activities required for the unit, the frequency that these activities will be performed, information for the point-of-contact during the post-closure care period, and planned uses of the property.

(d) Deadline To Complete Closure for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundment comply with the existing closure completion time frames in § 257.102(f).

As stated in Unit III.B.2.g of this preamble, some commenters on the proposed rule supported the proposed deadline, however, overall commenters supported applying the existing closure completion time frames as long as the proposed deadline for the initiation of closure was extended. For the reasons described throughout this section, EPA has extended the deadline for the initiation of closure. EPA expects the extension to the deadlines for the closure plan and initiation of closure, as well as the options to defer closure requirements for legacy CCR surface impoundments that have completed closure under a regulatory authority (see Unit III.B.2.g.iii.b), to address the concerns commenters expressed with the infeasibility or inappropriateness of the deadline to complete closure. Therefore, EPA is finalizing the deadline for the completion of closure of legacy CCR surface impoundments as proposed.

Section 257.102(f) generally requires an owner or operator of existing and new CCR surface impoundments to complete closure activities within five years from initiating closure. However, the regulations also establish conditions, including documentation requirements, under which owners or operators can demonstrate and receive two-year extensions of the deadline. For CCR surface impoundments of 40 acres or less, the deadline can only be extended by one two-year extension. For CCR surface impoundments larger than 40 acres, the deadline can be extended in increments of two years for no more than five times.

(e) Post-Closure Care for Legacy CCR Surface Impoundments

EPA proposed to apply the existing post-closure care requirements at § 257.104 to legacy CCR surface impoundments without revision. These criteria are essential to ensuring the long-term safety of legacy CCR surface impoundments.

No commenters raised specific concern about requiring legacy impoundments to comply with the existing requirements in § 257.104. EPA is therefore finalizing this provision without revision.

The existing post-closure care criteria require the monitoring and maintenance of units that have closed with CCR in place for at least 30 years after closure has been completed. 40 CFR 257.104. During this post-closure period, the facility would be required to continue groundwater monitoring and corrective action, where necessary.

h. Recordkeeping, Notification, and Internet Posting Criteria for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments be subject to the existing recordkeeping, notification, and website reporting requirements in the CCR regulations found at §§ 257.105 through 257.107. For reasons specified in the 2015 CCR Rule, the CCR regulations require the owner or operator of a new or existing CCR unit to record specific information in the facility's operating record, maintain files of all required information (*e.g.,* demonstrations, plans, notifications, reports) that supports implementation and compliance with the rule, notify State Director and Tribal authorities, and maintain a public CCR website that hosts this information. 80 FR 21427.

A commenter on the proposed rule supported applying recordkeeping, notification, and internet posting requirements to legacy CCR surface impoundments but stated that the existing requirements were ineffective at ensuring compliance with the CCR regulations or allowing for meaningful public awareness or participation. The commenter suggested that EPA create mechanisms within the rule to ensure the public has the opportunity to participate in the decision-making processes at regulated CCR units; standardize reporting to make the report more easily understood by the public; establish organizational requirements for the CCR websites; require public notice and engagement when notifying the State Director and/or appropriate Tribal authority as required by the CCR rule; extend the period of time the files required by the CCR rule must be maintained in the operating record; and require owners or operators to certify compliance documentation for the CCR units. This commenter also suggested EPA clarify what records owners or operators are required to retain and to publish.

EPA agrees with the commenter on the importance of meaningful public participation. The current regulations allow for public participation by requiring owner or operators to hold a public meeting as part of the assessment of corrective measures in § 257.96, creating a mechanism for the public to file dust complaints in § 257.80(b), and the ''contact us'' form or specific email address on facilities' public CCR websites for questions or issues from the public as required by § 257.107(a). EPA does not have evidence to support the claim by the commenter that these opportunities for public participation are ineffective. Furthermore, EPA does not find other decision-making points in the rule appropriate for mandatory public meetings although facilities are encouraged to engage with the public and to both solicit and incorporate public input into decisions, such as closure methods, as able and appropriate.

With respect to the commenter's suggestions that EPA require the owners or operators of CCR units to certify compliance documentation and create standardized reporting and website layout requirements, as explained in the proposed rule, EPA does not have evidence that legacy CCR surface impoundments are sufficiently different than currently regulated facilities to necessitate substantially different requirements. The commenter provided no factual basis to support the suggestion that requiring owner or operator certifications would improve compliance with the regulations beyond the certifications currently required by professional engineers. When justifying the request for standardized reporting and website layout requirements, the commenter failed to explain how compliance with the public website posting requirements in § 257.107, including the requirement to ensure all information is ''clearly identifiable and must be able to be immediately printed and downloaded by anyone accessing the site'' is inadequate or a hinderance to the public accessing the required information. Therefore, EPA does not believe additional notification, certification, or public engagement requirements for legacy CCR surface impoundments would be appropriate.

EPA agrees with the commenter on the need to extend the period of time files required by the CCR rule must be maintained on the facilities' public websites and in the operating records. As described in Unit III.D.5, EPA is extending how long files must be maintained in the operating record and on the public website. While EPA believes the regulations at §§ 257.105 and 257.107 clearly lay out what records must be retained and published, EPA has included in Unit III.D.5 a table that details what records are required to be maintained in the operating record and on the public website as well as the corresponding retention periods.

EPA is finalizing the requirement that owners or operators of legacy CCR surface impoundments comply with recordkeeping, notification, and internet posting requirements at §§ 257.105 through 257.107. Owners or operators must document implementation and compliance with the rule and must place these files into the facility's operating record. Each required file must be maintained in the operating record for the entirety of the retention period specified in § 257.105 following submittal of the file into the operating record. Each file must also indicate the date the file was placed in the operating record. Files are required to be submitted into the operating record at the time the documentation becomes available or by the compliance deadline specified in the CCR regulations. Section 257.105 contains a comprehensive listing of each recordkeeping requirement and corresponding record retention periods.

Furthermore, the owner or operator of a legacy CCR surface impoundment must maintain a CCR website titled, ''CCR Rule Compliance Data and Information'' that hosts the compliance information so that it may be viewed by the public. Unless provided otherwise in the rule (see, Unit III.E.5), information posted to the publicly accessible internet site must be available for a period of no less than five years from the initial posting date for each submission. Posting of information must be completed no later than 30 days from the submittal of the information to the operating record. Owners or operators of legacy CCR surface impoundments have 30 days from the effective date of this rule to establish a CCR website and post the required applicable information.

C. CCR Management Unit Requirements

EPA is establishing requirements to address the risks from previously unregulated solid waste management of CCR that involves the direct placement of CCR on the land at CCR facilities. Information obtained since 2015 demonstrates that these exempt solid waste management practices are currently contaminating groundwater at many sites, and at others, have the potential to pose risks commensurate with the risks associated with currently regulated activities.

The closure of CCRMU of 1,000 tons or greater also provides significant risk mitigation. As laid out in Unit III.A of this preamble, CCRMU at both active facilities and inactive facilities with legacy impoundments pose risks to human health and the environment that are at least as significant as the risks presented by legacy CCR surface impoundments and the units currently regulated under the 2015 CCR Rule. In particular, for highly exposed individuals off site, landfill CCRMU were estimated to pose cancer risks as high as 7×10^{-6} from arsenic III, while surface impoundment CCRMU were estimated to pose cancer risks as high as 8×10^{-5} from arsenic III and noncancer HQs as high as 2 for arsenic III, two for lithium, and one for molybdenum. Differences in national risks between currently regulated units and these older units are attributed largely to the proportion of units that were modeled at the time as lined. However, the risks associated with these older units may be even higher than EPA modeled in the 2014 Risk Assessment for active units. These units have been present onsite longer and had more time to leak. In addition, there are several management practices that have the potential to result in higher leakage, but that were previously modeled either less frequently for active units—based on a belief that the practices had declined over time—or not at all—due to data constraints on a national scale. These include: (1) The greater prevalence of unlined units; (2) The greater likelihood of co-management of CCR with coal refuse and other wastes in surface impoundments, making the overall waste pH far more acidic and (3) The potential for the units to be constructed below the water table or to have become inundated with groundwater after the time of construction. As discussed in Unit III.A, each of these practices individually have the potential to result in nationwide risks higher than previously reported on a national basis for the currently operating universe of CCR units. For example, unlined landfill CCRMU were estimated to pose cancer risks as high as 1×10^{-5} from arsenic III, while unlined surface impoundment CCRMU were estimated to pose cancer risks ranging from 2×10^{-4} from arsenic III and noncancer HQs as high as 5 for arsenic III, 3 for lithium, 2 for molybdenum, and 1 for thallium. A combination of these practices could push risks even higher than modeled.

Based on these data, EPA is finalizing the addition of a new category of CCR units that would be subject to a set of requirements tailored to the characteristics of such units and the risks that they present. This new category of CCR units, called ''CCR management units'' or CCRMU, consists of CCR surface impoundments and landfills that were closed prior to the effective date of the 2015 CCR Rule, and inactive CCR landfills, which include inactive CCR piles. Under this final rule, CCR management units are subject to the regulations when they are located at: (1) A facility currently regulated under the 2015 CCR Rule; (2) Inactive facilities with a legacy CCR surface impoundment; and (3) Facilities that, on or after October 19, 2015, produced electricity for the grid but were not regulated under the 2015 CCR Rule because they had ceased placement of CCR in onsite CCR units and did not have an inactive CCR surface impoundment (the inclusion of these facilities are discussed in Unit III.C.2.f). EPA refers to the facilities in the above three categories in this preamble as ''covered CCR facilities.''

Owners or operators of any of covered CCR facilities are required to conduct a facility evaluation to identify and delineate any CCRMU containing one ton (or more) at the facility and document the findings in two reports. In addition, owners or operators of a covered CCR facility are required to ensure that all identified CCRMU containing 1,000 tons or more comply with the existing requirements in 40 CFR part 257, subpart D for groundwater monitoring, corrective action (where necessary), and in certain cases, closure, and post-closure care requirements. These issues are discussed in more detail in this Unit of the preamble.

EPA estimates that there are 179 CCRMU at 92 active facilities and 16 CCRMU at 12 inactive facilities that will be subject to the requirements of this final rule.[64] These areas include inactive CCR landfills, closed CCR landfills, closed CCR surface impoundments, and other solid waste management areas of CCR. EPA also identified 20 CCRMU at eight other active facilities. This estimate of CCRMU is an increase from the 134 CCRMU located at 82 facilities identified in the proposed rule. 88 FR 32028.

1. Damage Cases

EPA has a long history of considering damage cases in its regulatory decisions under RCRA. RCRA specifically directs EPA, when making a Regulatory Determination for CCR, to consider ''documented cases in which danger to human health and the environment from surface run-off or leachate has been proved,'' demonstrating that such information is to carry great weight in decisions of whether and how to regulate such wastes. 42 U.S.C. 6982(n)(4). See also 42 U.S.C. 6982(n)(3). In addition, damage cases are among the criteria EPA must consider under its regulations for determining whether to list a waste as a ''hazardous waste.'' See 40 CFR 261.11(a)(3)(ix). EPA also relied on damage cases to develop the specific requirements for CCR in part 257, subpart D. See, 80 FR 21452–21459.

Damage cases generally provide direct evidence of both the extent and nature of the potential risks to human health and the environment that have resulted from actual waste management practice. For example, in the 2015 CCR Rule, EPA relied on damage cases to identify actual management practices that resulted in harm above and beyond that already identified through modeling. Based on the damage cases, EPA identified several additional constituents (antimony, barium, beryllium, chromium, selenium, and lead) that were added to the Appendix IV list for groundwater monitoring.

For CCRMU, EPA proposed to rely on ten potential damage cases to further support the results of the modeling and 2014 Risk Assessment, and to better understand the characteristics of the sites and units, as well as the management practices, in order to develop appropriate requirements. EPA reviewed information received in response to the ANPRM as well as the documents posted on facilities' CCR websites for compliance with CCR regulations. See, 88 FR 32012. Specifically, EPA reviewed groundwater monitoring reports, assessment of corrective measures reports, corrective measures progress reports, remedy selection reports, history of construction reports, closure plans and reports, and fugitive dust control plans for facilities with CCR websites from 2018, 2019, 2020, and 2021. Through review of the groundwater monitoring and corrective action reports, EPA found many instances where the owners or operators of CCR facilities claimed that the detection of an SSI or SSL in concentrations of Appendix III or IV constituents in groundwater came from a CCRMU rather than the monitored regulated CCR unit.

Whenever a facility determines that there is an SSI over background levels for one or more of the constituents in Appendix III at a monitoring well at the downgradient waste boundary, the existing CCR regulations allow the facility an opportunity to complete an ASD showing that a source other than the unit (*i.e.,* an alternative source) was the cause of the SSI. 40 CFR 257.94(e)(2). The existing CCR regulations provide a similar opportunity whenever assessment monitoring results indicate that an SSL exceeding the GWPS has been detected at a downgradient well for any of the Appendix IV constituents. 40 CFR 257.95(g)(3). If a successful ASD for an SSL is not completed within 90 days, corrective action must be initiated.

In reviewing groundwater monitoring and corrective action reports EPA found that 42 ASDs or ACMs concluded that a Federally unregulated CCR source was responsible for the SSI or SSL. The proposed rule included ten examples (*i.e.,* damage cases) where owners or operators of CCR facilities claimed that an SSI or SSL is attributable to a CCR source rather than the Federally regulated CCR unit.

In addition to reviewing the groundwater monitoring and corrective action reports, EPA reviewed the history of construction reports, closure plans and reports, and fugitive dust control plans for facilities with CCR websites from 2018, 2019, 2020, and 2021. These documents contained either site maps, which identified currently regulated units, and in some cases, inactive or closed units at the facility, or narrative discussions of the site history, which included identification of where CCR

[64] An updated list of known potential CCRMU can be found in the docket for this action. See document titled ''Universe of CCR Management Units. April 2024.''

were previously disposed or managed at the facility.

EPA received numerous comments about the damage cases provided in the proposed rule. Some commenters provided information to demonstrate that many of EPA's listed damage cases did not meet EPA's criteria for a damage case to be considered ''a proven damage case,'' that had been developed for purposes of the Bevill Regulatory Determinations described in 65 FR 32214, 32224 (May 22, 2000). One commenter mischaracterized these criteria as ''EPA's criteria for identifying damage cases in RCRA rulemakings,'' and claimed that groundwater exceedances are not sufficient to prove that there is any risk to human health. The commenter stated that ''exceedances [must be] measured in ground water at a sufficient distance from the waste management unit to indicate that hazardous constituents had migrated to the extent that they could cause human health concerns'' citing the 2000 Regulatory Determination (65 FR 32224, May 22, 2000), and the 2010 proposed CCR Rule (75 FR 35131, June 21, 2010). The commenter asserted that without such information, none of the cases can be used to justify EPA's proposed regulation of CCR management units.

Another commenter argued that ''the damage cases are not representative of all CCRMUs, and, consequently, cannot legitimately be relied upon to develop national standards and requirements for all CCRMUs.'' The commenter claims that a report generated by Gradient documents ''many examples of CCRMUs that are not causing any GWPS exceedances, are not associated with any undue risk, and are being effectively regulated under state purview.'' Additionally, the commenter claims that the ''damage cases cited by US EPA do not demonstrate that CCRMUs are currently impacting groundwater quality and causing an unacceptable risk because EPA has not addressed whether the groundwater impacts that they have attributed to CCRMUs result from the current condition of each CCRMU or its historical operating condition.'' The commenter concludes that because EPA has provided no evidence to determine whether the impacts are being caused by the current condition of each CCRMU (potentially closed, inactive, and/or dewatered), EPA's conclusions that the damage cases provide evidence of potential risks associated with CCRMU is misguided and unsupported.

One commenter also took issue with EPA's inclusion of ''only'' ten ''hand-picked'' damage cases to justify regulation of CCRMU. The commenter complained that ''EPA's damage cases are not based on information collected by EPA, but rather are based on information compiled by advocacy groups using data collected from CCR websites, [and t]here is no indication EPA has conducted its own data collection, or verified the data that was collected.'' The commenter went on to say,

> Much of the data refers to alternative source analyses conducted for regulated CCR units, suggesting that the discussed 'CCRMU' may be the source of groundwater contamination; however, EPA makes no statements regarding whether, and conducts no analysis to determine whether, it agrees with those analyses. This is highlighted by the carefulness of EPA's declaration that its review of the third-party compiled information identified 42 areas ''potentially contaminating groundwater.'' . Potential groundwater impacts does not rise to the RCRA protectiveness level of ''reasonable probability of adverse effects on health or the environment from disposal of solid waste at such facility.

Finally, one commenter complained that of the 134 areas EPA identified where the management of CCR remain exempt, less than one third were found to potentially have groundwater impacts, yet EPA seeks to regulate the entire universe of 134 areas and more. According to this commenter, even assuming the potential groundwater impacts are real, they are not necessarily an indication that the CCR management practice creates a reasonable probability of an adverse effect on human health or the environment, as the commenter believes there are several other factors, such as the nature and extent of the CCR management practice, whether a hydraulic head is present, the hydraulic conductivity of surrounding soils, and the proximity of the material to water and the likelihood of contact with water, that must be considered before concluding a CCR management practice creates a reasonable probability of an adverse effect.

EPA disagrees that it is inappropriate to characterize the cited SSIs and SSLs as damage cases. As explained in the 2015 CCR Rule preamble, EPA has a long history of considering damage cases in its regulatory decisions under RCRA. 80 FR 21452. The statute specifically directs EPA to consider ''documented cases in which danger to human health and the environment from surface runoff or leachate has been proved,'' in reaching its Regulatory Determination for these wastes, demonstrating that such information is to carry great weight in determining whether to regulate these wastes. 42 U.S.C. 6982(n)(4). Damage cases, even if only potential damage cases, are also relevant under the third Bevill factor: ''potential danger, if any, to human health and the environment from the disposal and reuse of such materials.'' 42 U.S.C. 6982(n)(4). In addition, damage cases are among the criteria EPA must consider under its regulations for determining whether to list a waste as a ''hazardous waste.'' See 40 CFR 261.11(a)(3)(ix). Damage cases generally provide extremely potent evidence in hazardous waste listings.

As with the 2015 CCR Rule, EPA considers that both proven and potential damage cases provide information directly relevant to this rulemaking. Damage cases—whether proven or potential—provide evidence of both the extent and nature of the potential risks to human health and the environment. The primary difference between a proven and a potential damage case is whether the contamination has migrated off-site of the facility. But the mere fact that groundwater contamination has not yet migrated off-site does not change the fact that a potentially harmful constituent has leached from the unit into groundwater. Whether the constituent ultimately causes further damage by migrating into drinking water wells does not diminish the significance of the environmental damage caused to the groundwater under the site, even where it is only a future source of drinking water. As explained in the original 1979 subtitle D criteria, EPA is concerned with groundwater contamination even if the aquifer is not currently used as a source of drinking water. Sources of drinking water are finite, and future users' interests must also be protected. (See 44 FR 53445–53448.) (''The Act and its legislative history clearly reflect Congressional intent that protection of groundwater is to be a prime concern of the criterion. . . . EPA believes that solid waste activities should not be allowed to contaminate underground drinking water sources to exceed established drinking water standards. Future users of the aquifer will not be protected unless such an approach is taken.''). EPA is therefore presenting its findings with regard to damage cases because this information further supports the results of EPA's 2014 and 2024 Risk Assessments, which together provide the factual bases for the actions taken in this final rule.

EPA also disagrees with the arguments that attempt to minimize the significance of the damage case record. EPA is relying on the damage cases to evaluate the extent and nature of the risks associated with particular CCR management practices. Facts demonstrating the consequences from particular activities therefore remain relevant, particularly (although not solely) where the management practices continue to occur. In other words, what matters in this regard are facts that provide information on the reasons that unit leaked, the particular contaminants that were present, the levels of those contaminants, and the nature of any impacts caused by that contamination. This is entirely consistent with RCRA section 8002(n), which requires EPA to evaluate the ''potential danger, if any, to human health and the environment from the disposal and reuse of such materials'' in addition to ''documented'' damage cases. 42 U.S.C. 6982(n)(3)–(4).

EPA further disagrees that only the presence of receptors within the impact sphere of a contaminating facility merits consideration of a particular damage case. EPA's longstanding and consistent policy across numerous regulatory programs has been that groundwater contamination is a significant concern that merits regulatory action in its own right, whether or not the aquifer is currently used as a source of drinking water. Sources of drinking water are finite, and future users' interests must also be protected. The absence of current receptors is therefore also not an appropriate basis on which to discount damage cases. And for all the reasons discussed above, EPA also disagrees that only exceedances of health-based standards of contaminants that have migrated off-site (*i.e.,* only proven damage cases) should be accounted for as part of this rulemaking.

EPA further disagrees with commenters' assertions about the sources of information that EPA included in the proposed rule and that EPA is relying upon in this final rule. In the proposal EPA discussed information that the Agency obtained from comments submitted in response to the ANPRM, and from other sources provided by environmental groups. However, EPA conducted an independent review of information posted on facility websites, including groundwater monitoring reports, assessment of corrective measures reports, corrective measures progress reports, remedy selection reports, history of construction reports, closure plans and reports, and fugitive dust control plans for facilities with CCR websites from 2018, 2019, 2020, and 2021 to develop the record for the proposed rule. 88 FR 32012–32013.

Several commenters disagreed with EPA's characterization in the proposed rule of certain sites as damage cases because the units have now been closed or the contamination has been remediated (or is in the process of being remediated) under State oversight. For example, one commenter noted that they are ''aware of situations where over the years CCR was intermittently dispersed within fill to facilitate facility expansions (commonly referred to as ''made land''), which was a common practice along heavily industrialized shores of the Great Lakes.'' The commenter further stated that, the ''Phases I and II of the Landfill at NIPSCO's R.M. Schahfer Generating Station, is an example of how the Proposed Rule mischaracterizes the risk associated with CCRMU.'' According to the commenter Phases I and II have been closed in a manner that is protective of groundwater, and the data demonstrates that the groundwater plume resulting from Phases I and II is stable, with concentrations of constituents declining.

Another commenter similarly objected to EPA's inclusion of Reid Gardner as an example of CCRMU with identified SSIs. The commenter said EPA mistakenly assumed the historical ponds under the regulated units may be a cause of SSIs. They said these historical ponds were excavated and removed prior to 2015 so these units cannot be deemed to be a CCRMU. As a result, they said EPA's characterization of Reid Gardner as a damage case is inaccurate and inappropriate and should be removed from the final rule. In addition, they disagreed with EPA's reliance on ''standard GWPS'' equivalent to MCLs, stating that by doing so, EPA fails to consider site-specific factors such as pre-existing groundwater contamination, natural variation in groundwater, and the site conceptual model, as well as EPA guidance for statistical analysis. Finally, the commenter said that corrective actions at Reid Gardner are comprehensively regulated under the State, which governs the performance and/or completion of Environmental Contaminant characterization, the screening and selection of Corrective Action, and the implementation and long-term Operation and Maintenance of [NDEP] approved Corrective Action concerning Pollution Conditions at the Site (Nevada Division of Environmental Protection Administrative Order on Consent Reid Gardner Generating Station, I.4, page 2). According to the commenter, interim corrective actions completed under the Administrative Order have already resulted in the removal of over 2.5 million cubic yards of CCR and associated materials from the site.

The same commenter also disagreed with EPA's inclusion of Huntington as an example of a CCRMU with identified SSLs. They said EPA's statement that the plant's remedy selection report ''does not appear to address releases from the Old Landfill,'' is incorrect, as the selected remedy—a groundwater capture system—has been placed to capture groundwater from both the regulated landfill and the Old Landfill. In addition, the commenter said the Old Landfill is subject to separate State oversight and corrective action, including elimination of infiltration, capping of closed sections and capture of any seepage. As a result, they disagreed with EPA's characterization of Huntington as a damage case and stated it should be removed from the final rule.

One commenter claimed that the damage case example concerning East Kentucky Power Cooperative's Cooper Station does not support the conclusion EPA draws from it. Specifically, EPA's proposal refers to a former surface impoundment below the current landfill at the facility, but, as the proposal recognizes, the facility conducted an ASD that did not identify the former impoundment as an alternate source of groundwater impact and the unit therefore remains in detection monitoring, with no conclusion having been drawn. As such, the commenter said, ''EPA is relying on an ASD which did not identify the impoundment as an alternative source to justify more stringent regulation of CCRMU with respect to groundwater impacts that have not been found to have resulted from the unit.'' EPA agrees that this facility should not be included in the final list of damage case examples based on this comment.

Other commenters provided information about EPA's Damage Case Compendiums developed for the 2015 CCR Rule to show some of those include potential CCRMU. They also provided additional damage cases and lists of potential CCRMU for EPA to include in the record.

Except as noted above, EPA disagrees that the damage cases are not representative of CCRMU, even if the units are regulated under State programs. The data from these units shows these CCRMU are contributing to groundwater contamination, irrespective of any prior State oversight.

EPA also continues to believe that, as EPA explained in the 2015 CCR Rule, cases where contamination has been remediated remain relevant to this rulemaking. EPA is relying on the damage cases to evaluate the extent and nature of the risks associated with particular CCR management practices.

Facts demonstrating the consequences from particular activities therefore remain relevant, particularly (although not solely) where the management practices continue to occur. In other words, what matters in this regard are facts that provide information on the reasons that unit leaked, the particular contaminants that were present, the levels of those contaminants, and the nature of any impacts caused by that contamination. None of these facts are affected by whether the damage is ultimately mitigated or remedied. This is entirely consistent with RCRA section 8002(n), which requires EPA to evaluate the ''potential danger, if any, to human health and the environment from the disposal and reuse of such materials'' in addition to ''documented'' damage cases. 42 U.S.C. 6982(n)(3)–(4). Accordingly, the fact that any contamination has subsequently been remediated is not a basis for disregarding a damage case. See 80 FR 21455.

In summary, EPA continues to believe the damage cases provide extremely valuable evidence that is directly relevant to the question of whether and how to regulate CCR. For example, the damage cases provide ''real world'' evidence against which to compare EPA's risk modeling estimates, such as evidence regarding the frequency with which particular constituents leach into groundwater. 80 FR 21326. They also provide direct evidence regarding specific waste management practices at electric utilities, along with the potential consequences of those practices. Accordingly, EPA has sufficient confidence in the veracity of the collected information to rely on it in making decisions in this rule. EPA expects that additional damage cases will be discovered in response to the installation of the groundwater monitoring systems required by the final rule.

a. Examples of CCRMU With Identified SSLs

Under the existing CCR regulations, when a facility determines there is an SSL for one or more Appendix IV constituents and completes a successful ASD showing that a source other than the regulated unit is the cause of the SSL(s), the facility is not required to initiate corrective action for that particular constituent. Through reviewing the ASD posted on facility websites, EPA identified several areas at active facilities where CCR is managed outside of a regulated unit and is identified as a source of one or more Appendix IV SSL(s). The following facilities are examples of situations in which such areas have been identified as the source of an SSL and therefore support EPA's determination that such areas warrant regulation under RCRA section 4004(a).

James H Campbell Power Plant, West Olive, Michigan

The JH Campbell Power Plant, owned and operated by Consumers Energy Company, is located within a mile of Lake Michigan. The facility has five regulated CCR units, including three CCR surface impoundments (Pond A, Bottom Ash Ponds 1–2, and Bottom Ash Pond 3) and two CCR landfills. The ''wet ash ponds area'' is approximately 267 acres and is bounded by perimeter dikes with a system of internal dikes separating the individual ash ponds. In addition to the five regulated CCR units, there are at least seven other unregulated, unlined ''closed'' impoundments[65] that ceased placement of waste prior to October 19, 2015, do not have an engineered cap nor vegetative cap, and have a closure plan that was approved by the State. Based on the groundwater monitoring report reviews, there were SSIs over background at many wells at all units and some had an SSL for arsenic and selenium. At Pond A, which closed with waste in place in 2019, there are SSIs for boron and sulfate, and SSLs were identified for arsenic (13 μg/L [MCL of 10 μg/L]) and selenium[66] (143 μg/L [MCL of 50 μg/L]) for which an assessment of corrective measures was completed, and the selected remedy is source removal and final cover as the primary corrective action. In the 2021 Annual Groundwater Monitoring and Corrective Action Report posted in January 2022, Consumers Energy concluded there was an ASD for Pond A and said, ''Increases in Appendix III constituents (*e.g.* boron) and direct exceedances of the selenium GWPS in JHC–MW–15011, JHC–MW–15010, JHC–MW–15009, and JHC–MW–15008R that have not yet resulted in a statistically significant exceedance suggest a detectable influence from the immediately adjacent, upgradient, closed, pre-existing CCR units on-site. The closed, preexisting units are not regulated under the RCRA CCR Rule, but remedial action is being taken under Consent Agreement WMRPD No. 115–01–2018. A [remedial action plan] for these units was submitted to [Michigan's Department of Environment, Great Lakes, and Energy] on September 30, 2021.'' During the 2021 groundwater monitoring period for Bottom Ash Ponds 1–2, which closed by removal in 2018, SSIs were identified for boron, calcium, chloride, pH, sulfate, and total dissolved solids (TDS); also, one SSL was identified for arsenic (38 μg/L [MCL of 10 μg/L]).[67] An assessment of corrective measures has been completed for the CCR unit and the primary selected remedy is source removal and final cover. Consumers Energy also said in the 2022 semiannual progress report that the facility is reevaluating the groundwater ''monitoring system for [Bottom Ash] Ponds 1–2 to more accurately account for the influence from the closed, pre-existing units.''

New Castle Generating Station, Pennsylvania

GenOn Power Midwest LP (GenOn) operates the New Castle Generating Station located in West Pittsburg, Pennsylvania. The New Castle Generating Station has two CCR units subject to the regulations—an impoundment (North Bottom Ash Pond) and a landfill (New Castle Plant Ash Landfill). Each of these CCR units has relevance to this proposal due to other unregulated disposal units located adjacent to the regulated CCR units.

The North Bottom Ash Pond was used for the management of bottom ash until 2016 when the facility transitioned from coal to natural gas. After the transition to natural gas, GenOn initiated closure of the North Bottom Ash Pond by removing all waste from the impoundment. Closure of the impoundment was certified in 2019.[68] Groundwater monitoring associated with the impoundment while the unit was operating detected arsenic at SSL above the GWPS in all downgradient monitoring wells.[69] In accordance with the procedures in the regulations for CCR units in 40 CFR 257.94(e)(2), GenOn determined that an alternative source was responsible for these SSLs of arsenic. Specifically, the ASD found that a 120-acre unlined CCR surface impoundment located immediately adjacent to the North Bottom Ash Pond

[65] These ''closed'' impoundments (Pond B, Pond C, Pond D, Pond F, Pond G (G1 and G2), Pond H, and Pond K) are listed in a figure on page 12 of the 2021 Annual Groundwater Monitoring and Corrective Action Report, JH Campbell Power Plant Pond A, January 2022, Prepared for Consumer's Energy.

[66] JH Campbell Semiannual Progress Report—Selection of Remedy, Ponds 1–2 North and 1–2 South, and Pond A, July 30, 2022. Pages 3–4.

[67] Annual Groundwater Monitoring and Corrective Action Report, JH Campbell Power Plant Ponds 1–2 North and 1–2 South, January 2022, Prepared for Consumers Energy. Page 23.

[68] CCR Compliance, Closure Certification Report, Closure by Removal, New Castle North Bottom Ash Pond. June 2019.

[69] *Id.* At 5.

was responsible for the arsenic concentrations in the downgradient monitoring wells.[70] According to the 2019 Annual Report prepared by GenOn, there were SSLs for arsenic (0.087 mg/L [MCL of 10 µg/L]) in the downgradient monitoring wells.[71] Consequently, because the SSLs of arsenic were attributed to another source (*i.e.,* a former unlined CCR surface impoundment), GenOn concluded it was not required to remediate the arsenic contamination under the Federal CCR regulations.

GenOn also determined that there were SSIs above background levels for multiple analytes at the New Castle Plant Ash Landfill (Ash Landfill), which is the other regulated CCR unit at the New Castle Generating Station. In its most recent annual groundwater monitoring report in 2022, GenOn reported SSIs for boron, calcium, fluoride, sulfate, and total dissolved solids.[72] GenOn determined that an alternative source was responsible for these analyte increases, specifically pointing to an ''underlying historic ash impoundment and other closed stages of the landfill.'' [73] Prior to development of the 60-acre Ash Landfill, CCR was disposed in an impoundment from approximately 1939 to 1978.[74] After the impoundment was dewatered in 1978, dry CCR was disposed in this area in several stages of CCR placement up until the time Ash Landfill began operation. Since 2018, GenOn has attributed SSIs for boron, calcium, fluoride, sulfate, and TDS to this historic disposal of CCR.

Huntington Power Plant, Utah

The Huntington Power Plant in Huntington, Utah is owned and operated by PacifiCorp and has one regulated unit, the Huntington CCR Landfill. While conducting the required groundwater monitoring for the Huntington CCR Landfill, there were SSLs for chromium, cobalt, lithium, molybdenum, selenium, fluoride, and arsenic, so the owner or operator conducted assessment of corrective measures. There is also a former combustion waste landfill called the Old Landfill, which is located northwest of the regulated Huntington CCR Landfill. The ACM report [75] assumes the SSLs are the result of groundwater interactions with both the Huntington CCR Landfill and the Old Landfill. Both landfills have stormwater run-on from the area surrounding the landfill. This run-on is routed around the landfills via diversion ditches and run-off from the landfills itself is collected and retained in a sediment basin north of the Huntington CCR Landfill. The facility is implementing a remedy to address releases only from the regulated CCR Huntington Landfill, but the remedy selection report [76] does not appear to address releases from the Old Landfill.

J.B. Sims, Grand Haven, Michigan

The J.B. Sims Generating Station, owned and operated by Grand Haven Board of Light and Power, is located on Harbor Island, north of Grand Haven, Michigan. Harbor Island is bound to the north, east, and west by the Grand River and to the south by the South Channel, tributaries of Lake Michigan. The facility has two Federally regulated CCR units (Unit 1 & 2 and Unit 3), both of which are inactive, unlined surface impoundments. Unit 1 & 2 is approximately 1.2 acres and includes areas where, prior to October 19, 2015, CCR was placed in unlined impoundments and used as fill in low-lying areas of adjacent wetlands. Unit 3 is approximately 0.5 acres and was built on top of historically placed CCR. The boundary of Unit 1 & 2 was updated in an agreement with EPA and the State in January 2021,[77] to include an area that received CCR prior to 1978. Therefore, the groundwater monitoring network and closure plan are currently being updated to reflect the new boundary and better address contamination from historical CCR across the units.[78] Additionally, in March 2022, the State issued an enforcement notice [79] to J.B. Sims citing inadequate groundwater monitoring and failure to address all areas where CCR were managed (*e.g.,* stored, placed) prior to disposal during the unit's operation. As such, the facility is considering expanding Unit 3's groundwater monitoring network. The units are often partially flooded, and groundwater elevations and flow direction are influenced by precipitation and water levels in the Grand River and the South Channel.

Based on groundwater monitoring report reviews, both units have had SSIs and SSLs since groundwater monitoring was initiated in 2017. During 2021, both Unit 1 & 2 and Unit 3 had SSIs for all Appendix III constituents and SSLs for arsenic (98 µg/L [MCL is 10 µg/L]), chromium (270 µg/L [MCL is 100 µg/L]), cobalt (22 µg/L [GWPS is 6 µg/L], fluoride (13 mg/L [MCL is 4 mg/L]), and lithium (2800 µg/L [site-specific GWPS is 59 µg/L]).[80] In December 2020, J.B. Sims submitted an ASD for Unit 3's 2019 SSLs for chromium, cobalt, fluoride, lead, and lithium, pointing to the historic fill across the island as the source of the SSLs. [81] [82] Furthermore, the Fourth Quarterly 2021 Monitoring Report suggested the continued SSIs and SSLs at Unit 3 were due to historical CCR fill beneath the unit, historical fill outside of Unit 1 & 2, and waste historically placed across the site.[83] However, until the groundwater monitoring networks are finalized, the extent of groundwater contamination and the source of all contamination cannot be determined. The assessment of corrective measures for both units began in February 2019 and is ongoing, pending finalization of the groundwater monitoring networks. Based on groundwater monitoring reports, EPA has found that due to the fluctuations in groundwater elevations in response to precipitation and nearby surface water levels, portions of the facility, including Unit 1 & 2, can be inundated or partially in contact with groundwater.

[70] *Id.*

[71] CCR Compliance, Groundwater Monitoring and Corrective Action Annual Report, New Castle North Ash Pond and Ash Landfill. January 2020.

[72] CCR Compliance, Groundwater Monitoring and Corrective Action Annual Report, New Castle Ash Landfill. December 2022.

[73] *Id.* At 3.

[74] New Castle Plant Ash Landfill—Annual CCR Unit Inspection Report. January 16, 2018.

[75] Corrective Measures Assessment CCR Landfill—Huntington Power Plant Huntington, Utah. May 2019.

[76] Remedy Selection Report CCR Landfill—Huntington Power Plant, Huntington, Utah. August 2020.

[77] The meeting between Grand Haven Board of Light and Power, the State, and EPA during which the new boundaries for Unit 1 & 2 were agreed to is discussed on page 3 (PDF page 10) of the 2021 Annual Groundwater Monitoring & Corrective Action Report by Golder Associates. January 28, 2022.

[78] Letter to Grand Haven Board of Light and Power-Update To The October 14, 2019 J.B. Sims Generating Station Inactive Units ½ Impoundment And Unit 3 Closure Plan—Interim Conditions For Closure. October 22, 2021.

[79] The State of Michigan, Department of Environment, Great Lakes, and Energy (EGLE) issued an enforcement notice via email March 22, 2022, to Grand Haven Board of Light and Power, J.B. Sims.

[80] SSL concentrations can be found in Appendix B (PDF page 512) of the 2021 Groundwater Monitoring & Corrective Action Report prepared by Golder Associates on behalf of Grand Haven.

[81] 2020 Alternate Source Demonstration J.B. Sims Generating Station—Unit 3 Impoundments Submitted to: Grand Haven Board of Light and Power Submitted by Golder Associates Inc. December 28, 2020.

[82] Technical Memorandum to Michigan Department of Environment, Great Lakes, and Energy-Unit 3 Impoundments Alternate Source Demonstration Response Grand Haven Board Of Light And Power—JB Sims Power Generating Station. February 12, 2020.

[83] Memorandum to Michigan Department of Environment, Great Lakes, and Energy- Fourth Quarter 2021 Monitoring Report, Former JB Sims Generating Station, Unit 3 A&B Impoundments—Response to Comments. March 8, 2022.

b. Examples of CCRMU With Identified SSIs

Under the existing CCR regulations, when a facility determines there is an SSI for one or more Appendix III constituents and completes a successful ASD showing that a source other than the regulated unit is the cause of the SSI(s), the facility is not required to initiate assessment monitoring for that particular constituent. 40 CFR 257.94(e). Through ASD reviews, EPA identified several areas at active facilities where CCR was managed outside of a regulated unit and was identified as a source of one or more Appendix III SSI(s). As such, any groundwater contamination from these potential CCRMU have not been investigated under the existing Federal CCR regulations. The following facilities are examples of situations in which potential CCRMU have been identified as the source of an SSI and demonstrate the need to regulate CCRMU.

Reid Gardner Generating Station, Moapa Valley, Nevada

Reid Gardner Generating Station (Reid Gardner), owned and operated by NV Energy, is located adjacent to the Muddy River and the Moapa Band of Paiutes reservation, approximately 45 miles northeast of Las Vegas. Reid Gardner has seven regulated CCR units: four unlined inactive surface impoundments (Pond 4B–1, Pond 4B–2, Pond 4B–3, and Pond E–1), two active unlined surface impoundments (Pond M–5 and Pond M–7), and one partially lined landfill (Mesa Landfill). The inactive surface impoundments covered 47 acres and were closed by removal in 2017.[84] The inactive surface impoundments were constructed in 2003 (Pond E–1) and 2006 (Pond 4B–1, Pond 4B–2, and Pond 4B–3) to replace four of the eleven historical unlined evaporation ponds located at the facility that made up the evaporation pond complex (Pond 4A, Pond 4B–1, Pond 4B–2, Pond 4B–3, Pond 4C–1, Pond 4C–2, Pond D, Pond E–1, Pond E–2, Pond F, and Pond G).[85] The evaporation pond complex was built within the Muddy River floodplain and used from approximately 1974 until approximately 2002 to evaporate CCR and other process wastewaters from the facility. The two active surface impoundments (Ponds M–5 and M–7) were constructed in 2010 approximately 0.75 miles south of the historical evaporation ponds and cover 28 acres. Mesa Landfill was constructed and operational prior to the 2015 CCR Rule and has a surface area of roughly 252 acres.

Based on groundwater monitoring report reviews, the inactive surface impoundments had no Appendix III SSIs above their established background concentrations during the detection monitoring event in 2019.[86 87 88 89 90 91] However, the inactive surface impoundments did have Appendix IV constituent concentrations above the standard GWPS, including arsenic (2.52 mg/L [MCL is 0.01 mg/L]), cadmium (0.0072 mg/L [MCL is 0.005 mg/L]), cobalt (242 µg/L [standard GWPS is 6 µg/L]), fluoride (35.4 mg/L [MCL is 4.0 mg/L]), lithium (27,300 µg/L [standard GWPS is 40 µg/L]), molybdenum (6,390 µg/L [standard GWPS is 100 µg/L]), selenium (0.204 mg/L [MCL is 0.05 mg/L]), thallium (0.026 mg/L [MCL is 0.002 mg/L]), and radium 226 & 228 combined (8.02 pCi/L [MCL is 5 pCi/L]). Ponds M–5 and M–7 and the Mesa Landfill have had SSIs for fluoride every year of detection monitoring for which ASDs have been performed pointing to natural variation in groundwater quality.[92 93 94 95 96 97] ASDs were also performed for SSIs at Mesa Landfill for pH (2019 and 2021) and turbidity (2020 and 2021) that attributed the SSIs to natural variation in groundwater quality. Therefore, since ASDs have been performed for all SSIs and the active units, Reid Gardner has not moved from detection monitoring to assessment monitoring. The facility also claims the historical, co-located evaporation ponds are the source of groundwater contamination in the area and not the CCR-regulated units. Specifically, in the closure certification for the inactive surface impoundments, the facility points to documentation as far back as the 1980s that describe seepage from Pond D, the historical Pond E–1 and E–2, Pond F, and Pond G and leakage at an estimated rate of 50 acre-feet/year from Ponds 4C–1 and 4C–2 and historical Ponds 4B–1, 4B–2, and 4B–3.

Seminole Electric Cooperative, Florida

Seminole Electric Cooperative (Seminole) operates the Seminole Generating Station located in Palatka, Florida. For CCR that is not beneficially used, CCR is disposed at the facility in a landfill (Increment One Landfill), which is subject to the CCR regulations. This CCR landfill is a double-lined landfill with a leachate collection system and, because part of the Increment One Landfill overlaps with the side-slope of a former, Federally unregulated landfill, the liner system also includes a high-density polyethylene geomembrane where the two units interface.[98] Seminole determined there were SSIs above background levels for multiple analytes in one or more monitoring wells at the downgradient waste boundary in 2018, including SSIs for boron, calcium, chloride, sulfate, and TDS. Seminole determined that one or more alternative sources were responsible for these analyte increases. These sources include

[84] Reid Gardner Generating Station Inactive Coal Combustion Residual Surface Impoundments Ponds 4B–1, 4B–2, 4B–3, and E–1 Closure Certification, April 2019.

[85] Construction History, Pond E1, Reid Gardner Generating Station. April 11, 2018.

[86] Reid Gardner Generating Station Inactive CCR Surface Impoundment E–1. Coal Combustion Residual 209 Annual Groundwater Monitoring and Corrective Action Report. July 31, 2019.

[87] Reid Gardner Generating Station Inactive CCR Surface Impoundments 4B–1, 4B–2, and 4B–3. Coal Combustion Residual 2019 Annual Groundwater Monitoring and Corrective Action Report. Revision 1. May 14, 2020.

[88] Reid Gardner Generating Station Mesa Impoundments M5 and M7 Coal Combustion Residual 2019 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2020.

[89] Reid Gardner Generating Station Mesa Impoundments M5 and M7 Coal Combustion Residual 2020 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 29, 2021.

[90] Reid Gardner Generating Station Mesa Impoundments M5 and M7 Coal Combustion Residual 2021 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 28, 2022.

[91] Alternate Source Demonstration and Addendum to the Coal Combustion Residual 2017 Annual Groundwater Monitoring and Corrective Action Report Reid Gardner Generating Station Mesa CCR Surface Impoundments (Ponds M5 and M7). Prepared for NV Energy. April 13, 2018.

[92] Reid Gardner Generating Station Mesa Landfill Coal Combustion Residual 2018 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2019.

[93] Reid Gardner Generating Station Mesa Impoundments M5 and M7 Coal Combustion Residual 2018 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2019.

[94] Reid Gardner Generating Station Mesa Landfill Coal Combustion Residual 2019 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2020.

[95] Reid Gardner Generating Station Mesa Landfill Coal Combustion Residual 2020 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2021.

[96] Reid Gardner Generating Station Mesa Landfill Coal Combustion Residual 2021 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 28, 2022.

[97] Alternate Source Demonstration and Addendum to the Coal Combustion Residual 2017 Annual Groundwater Monitoring and Corrective Action Report Reid Gardner Generating Station Mesa Landfill. Prepared for NV Energy. April 13, 2018

[98] Seminole Generating Station Increment One Landfill Annual Groundwater Monitoring and Corrective Action Report. January 31, 2019.

former test cells (*i.e.,* areas where CCR was placed in the 1980s for purposes of construction evaluations that are now located beneath the Increment One Landfill), a former CCR landfill adjacent to the Increment One Landfill, and several process water ponds next to the Increment One Landfill.[99] Since 2018, Seminole has attributed SSIs for these analytes to these alternative sources and therefore, has not moved from detection monitoring to assessment monitoring.

R.M. Schahfer Generating Station, Indiana

The R.M. Schahfer Generating Station, owned and operated by Northern Indiana Public Service Company, LLC (NIPSCO), has several CCR units subject to the regulations, including several CCR impoundments and a CCR landfill consisting of multiple cells or phases of operation (''Landfill''). The Landfill is of particular relevance to this proposal because includes three cells subject to Federal CCR regulations (Phases V through VII) and four landfill cells that are not (Phases I through IV). In the course of conducting the required groundwater monitoring for the regulated cells of the Landfill, in January 2018, NIPSCO determined that there were SSIs above background levels for all seven analytes in Appendix III at one or more monitoring wells at the downgradient waste boundary of the regulated CCR units. This included SSIs for boron, calcium, chloride, fluoride, pH, sulfate, and TDS.[100] Through procedures laid out in the regulations for regulated CCR units in 40 CFR 257.94(e)(2), NIPSCO determined that these groundwater SSI impacts were not due to a release from the regulated CCR landfill cells, but instead were attributable to another source. Specifically, NIPSCO has concluded that ''a release from the non-regulated, unlined portions of the landfill, Phases 1 and II, is the source of the identified SSIs.'' [101] Subsequent groundwater monitoring of the regulated Landfill cells since 2018 continues to identify SSIs and NIPSCO continues to attribute those impacts to releases from the unregulated Phase I and II cells.[102]

Landfill Phase I is a 20-acre unlined cell that received CCR (flue gas desulfurization materials and fly ash) between 1984 and 1991 and subsequently closed with a final cover system in 1999. Phase II of the Landfill is an unlined 42-acre cell where flue gas desulfurization materials and fly ash were disposed between 1991 to 1998. The Phase II cell was closed with a final cover system in 1998. CCR landfills such as the Phase I and II cells are not regulated by the existing regulations because the cells have not received CCR on or after October 19, 2015. As a result, NIPSCO has not been required under the existing Federal CCR regulations to investigate further and remediate as necessary groundwater impacts from the unlined Phase I and II cells.

Waukegan Generating Station, Illinois

An example of CCR used as fill on-site is Midwest Generation's Waukegan Generating Station in Waukegan, Illinois. There are two CCR surface impoundments named the East Ash Pond and West Ash Pond, which were used interchangeably during the facility's operational history and have a multi-unit groundwater monitoring system. The East Ash Pond has a surface area of 9.8 acres with a storage capacity of 184,000 cubic yards. The West Ash Pond has a surface area of 10 acres with a storage capacity of 223,000 cubic yards. According to the 2018 Annual Groundwater Monitoring and Corrective Action Report, there was detection of SSIs over background for Appendix III constituents, including pH and sulfate.[103] An ASD was completed that claimed other potential historic sources were the cause of the SSIs. In the 2019 Annual Groundwater Monitoring and Corrective Action Report, an ASD for Appendix III constituents identified calcium and TDS with the same claim that other potential historic sources were the cause of the SSIs.[104] The ASDs discuss that the downgradient monitoring wells were installed within the berms for the surface impoundments that consisted of a ''mixture of fill and beneficially reused coal combustion by-product''.[105] [106] The 2018 ASD also notes that a upgradient well, MW–05 which is not a part of the CCR groundwater monitoring network, has substantially higher sulfate and boron concentrations than the downgradient wells suggesting an upgradient source. Furthermore, the 2019 ASD mentions that the fluctuating TDS concentrations at downgradient well MW–16 are correlated to fluctuations in TDS at MW–05 further suggesting an upgradient source. While these ASDs suggest that the sources may be CCR within the berms and a upgradient source they do not analyze these potential sources to verify the claims. EPA did verify that the boring logs for groundwater monitoring wells MW–01 through MW–05 and MW–16 show they were installed within 11 to 20 feet of CCR in the berms surrounding the surface impoundments.[107] In addition, construction drawings in the history of construction show ''existing fill'' or CCR was used in the construction of the surface impoundment access ramps and underneath the surface impoundments liners.[108] The facility continued to use the ASDs for SSIs in 2020 and 2021, therefore, the surface impoundments remain in detection monitoring.

White Bluff Steam Electric Station, Arkansas

The White Bluff Steam Electric Station in Redfield, Arkansas is owned or operated by Entergy and has three CCR units: two CCR surface impoundments (A Recycle Pond/South Pond and B Recycle Pond/North Pond); and one CCR landfill (Existing CCR Landfill Cells 1–4). CCR previously was disposed in a 20-acre ravine,[109] which was closed and covered in accordance with the original facility State-issued permit. The active landfill was then built on top of, and adjacent to, the unlined, closed landfill. In 2018, the facility conducted intrawell monitoring of the groundwater at the facility and SSIs for pH, calcium, TDS, and boron were detected. An ASD was completed and determined that the sources of the SSIs were: (1) Releases from portions of the Coal Ash Disposal Landfill (CADL) closed before the effective date of the CCR Rule (October 19, 2015); (2) Surface water that has come into contact with on-site CCR and has migrated into the subsurface; and/or (3) Natural variation

[99] *Id.* at 20.

[100] 2018 Annual Groundwater Monitoring and Corrective Action Report—Landfill Phase V and Phase VI, NIPSCO R.M. Schahfer Generating Station. January 31, 2019.

[101] Northern Indiana Public Service Company, R.M. Schahfer Generating Station, Wheatfield, Indiana, Schahfer Landfill Phase V and Phase VI, Alternative Source Demonstration. April 13, 2018. Begins on PDF page 20 of the 2018 Annual Groundwater Monitoring and Corrective Action Report—Landfill Phase V and Phase VI. April 13, 2018.

[102] 2021 Annual Groundwater Monitoring and Corrective Action Report, Landfill Phase V, Phase VI, and Phase VII, NIPSCO LLC R.M. Schahfer Generating Station. January 31, 2022.

[103] 2018 Waukegan Generating Station Annual GWMCA Report, Appendix B, PDF pg. 100. January 2019.

[104] 2019 Waukegan Generating Station Annual GWMCA Report, Appendix B, PDF pg. 100. January 2020.

[105] 2020 Waukegan Generating Station Annual GWMCA Report. January 2021.

[106] 2021 Waukegan Generating Station Annual GWMCA Report. January 2022.

[107] Waukegan boring well logs.

[108] October 2016, Waukegan Generating Station History of Construction.

[109] Entergy Arkansas, LLC White Bluff Steam Electric Station Landfill Cells 1–4 2021 Annual Groundwater Monitoring and Corrective Action Report. January 31, 2022.

in groundwater quality. Therefore, the landfill remains in detection monitoring.

c. Examples of CCRMU With Identified SSIs or SSLs From Comments

EPA received several comments about potential damage cases from CCRMU. In addition, many comments provided additional potential CCRMU but evidence of a thorough groundwater quality investigation in this area was not presented. If there are monitoring wells at the facility, the wells are not sufficient to characterize groundwater impacts from the CCRMU. Therefore, due to lack of data, EPA and the commenters could not definitively determine if certain unregulated placement of CCR at facilities is a CCRMU or if the CCRMU could be potential damage cases. EPA presents the following additional examples of CCRMU that have adequate groundwater monitoring to show impacts.

Brandywine Ash Management Facility, Maryland

The Brandywine Ash Management Facility in Prince George's County, Maryland has a 217-acre CCR landfill. It is operated by GenOn MD Ash Management, LLC. CCR has been landfilled at the facility since approximately 1971. As of 2018, an estimated 6.8 million cubic yards, or 7 billion kilograms, of CCR were placed at the site. CCR at Brandywine has contaminated groundwater and surface water, leading to legal action by the State of Maryland. A 2013 Consent Decree resulted in the development of a Corrective Measures Plan and a Nature and Extent of Contamination Study.[110] [111] According to the Consent Decree, ''The original design of the disposal cells and operation of the disposal areas. . .has resulted in some leachate escaping the disposal cells via groundwater and constructed outfalls and entering surface waters . . .'' [112]

''Based on a review of the quarterly Discharge Monitoring Reports . . . and other quarterly and annual monitoring reports submitted by GenOn, [Maryland Department of the Environment (MDE)] has determined that wastewater discharges from monitoring points at Brandywine have at times exceeded ambient surface water quality standards for cadmium and/or selenium. MDE has also determined that leachate has entered groundwater and is causing the [maximum contaminant level (MCL)] for cadmium to be exceeded at times at certain groundwater monitoring points, as were federally recommended secondary standards for manganese, sulfate, iron, [total dissolved solids (TDS)], aluminum and chloride.'' [113]

This broader context related to State law—which is absent from documents submitted pursuant to the 2015 CCR Rule—is important for understanding the complexity of the Brandywine site and its impacts. For example, unsafe lithium levels hundreds of times higher than the default GWPS in the 2015 CCR Rule have been documented at groundwater monitoring wells, as have unsafe molybdenum levels up to approximately 80 times higher than its default GWPS. Some of these unsafe levels are found in monitoring wells not included in the network used to demonstrate compliance with the Federal CCR Rule.[114]

The Brandywine site includes four areas of interest: Historical Area 1, Historical Area 2, Phase I, and Phase II.[115] [116] Because these four areas are all part of a single landfill and in some cases overlap, they should have all been subject to the 2015 CCR Rule—even though three of the areas were closed before the rule took effect. In its filings to comply with the 2015 CCR Rule, GenOn has treated the Historical Area 1, Historical Area 2, and Phase I areas as unregulated units and has pointed to these areas as the source of pollution in its ASDs. For this reason, the site has remained in detection monitoring through at least 2021.[117]

Bull Run Fossil Plant, Tennessee

The Bull Run Fossil Plant is owned and operated by Tennessee Valley Authority (TVA) in Clinton, Tennessee and has two unregulated CCR landfills. Groundwater monitoring results show the landfills have been leaching arsenic, boron, cobalt, manganese, and molybdenum into the groundwater for decades, resulting in groundwater that exceeds health standards for these toxins by many times. In addition, a portion of one of the landfills, the Dry Fly Ash Stack, is not regulated by the 2015 CCR Rule as it ceased receipt of CCR in 2015 an interim soil cover was placed on Phase 2, and in accordance with a permit issued by the Tennessee Department of Environment and Conservation, it will be closed in conjunction with the currently operating Dry Fly Ash Stack Lateral Expansion.[118] Among other things, the 2023 Bull Run Environmental Assessment Report states that the Dry Fly Ash Stack contains 3.7 million cubic yards of coal ash, and shows that lithium and molybdenum in downgradient groundwater exceed groundwater screening levels by at least an order of magnitude.[119]

Hennepin Power Station, Illinois

The Hennepin Power Station in Hennepin, Illinois has five CCR units including four CCR surface impoundments (Ash Pond No. 2, East Ash Pond, Old West Ash Pond, and Old West Polishing Pond) and one CCR landfill (CCR Landfill). The East Ash Pond System includes Ash Pond No. 2, the East Ash Pond, and Ash Pond No. 4, which were built on top of historic CCR fill.[120] Ash Pond No. 4 was a 30-foot-deep gravel quarry where coal ash fill was disposed in the mid-1980s.[121] Groundwater downgradient of the East Ash Pond System, showed concentrations of sulfate and boron that exceeded State groundwater standards.[122] The groundwater was (and may still be) contaminated with coal ash constituents.[123]

Will County Station, Illinois

The Will County Station in Romeoville, Illinois is owned and operated by Midwest Generation Co. The facility has two CCR surface impoundments, Ash Pond 2S and Ash Pond 3S. Ash Ponds 1N and 1S were removed from service in 2010, and although they were not actively used for

[110] Consent Decree, *State of Maryland et. al* v. *Genon MD Ash Management, LLC* (No. 8:12–cv–03755–PJM, D. Md., May 1, 2013).

[111] Id.

[112] Id.

[113] Geosyntec Consultants. 2018. 2017 Annual Groundwater Monitoring And Corrective Action Report, Brandywine Ash Management Facility Phase II, Brandywine, Maryland. Prepared for GenOn MD Ash Management. January.

[114] Earthjustice et al. Legacy Proposal Comment Appendix VI. EPA–HQ–OLEM–2020–0107–0368.

[115] Geosyntec Consultants. 2018. Nature and Extent of Contamination Study, Final Report, Brandywine Ash Management Facility, Brandywine, Maryland. Prepared for GenOn MD Ash Management. June.

[116] Geosyntec Consultants. 2018. Corrective Measures Plan, Brandywine Ash Management Facility, Brandywine, Maryland. Prepared for GenOn MD Ash Management. June.

[117] Geosyntec Consultants. 2022. 2021 Annual Groundwater Monitoring and Corrective Action Report, Federal CCR Rule, Brandywine Ash Management Facility, Phase II, Brandywine, Maryland. Prepared for GenOn MD Ash Management. January.

[118] Tennessee Valley Authority. Bull Run Environmental Assessment Report. Appendix D–CCR Management Unit Cross Sections. August 2023.

[119] Tennessee Valley Authority. Bull Run Environmental Assessment Report. Bull Run Fossil Plant, Clinton, Tennessee. August 2023.

[120] U.S. EPA, Damage Case Compendium, Technical Support Document, Vol. IIa: Potential Damage Cases (Reassessed, Formerly Published), Docket ID EPA–HQ–RCRA–2009–0640–12119 (Dec. 18, 2014) at 30, ns.110.

[121] Id at 30.

[122] Id at 30.

[123] Id at 30.

waste storage, they still contained at least one inch of water in 2019 and the base of these unlined impoundments are in contact with at least one foot of groundwater.[124] In addition, through borings taken at the facility, historical CCR has been buried around the ash ponds, and the Former Slag and Bottom Ash Placement Area has been identified at the southeast corner of the station's boundary.

When constructing the groundwater monitoring system in 2010 and 2011, well borings also showed a thick layer of CCR buried along the eastern edge of the four ash ponds. MW–1, MW–2, MW–3, MW–4, and MW–6 show layers of fill between five and twelve feet thick containing CCR.[125] Historical topographic maps and aerial imagery document ponds extending from north of Pond 1N to close to the southern property boundary. These historical waste storage areas would have surrounded the current regulated ponds and the area where CCR has been found buried near the ponds. The topographic map and aerial imagery from 1962 show a large pond extending from north of Pond 1N to the southern property boundary. In 1973, waste storage areas are present in the vicinity of Ponds 2S and 3S and extend to the southern property boundary. By 1980, waste areas are depicted south of Pond 3S and surrounding Pond 1N. The series of unregulated ponds near the southern property boundary south of Pond 3S are visible on available maps until present day.[126] [127]

Historical ash in fill near the ponds is in contact with groundwater. Groundwater elevations fluctuate between 579 and 584 feet above mean sea level in this area. CCR is buried at elevations as low as 578.6 feet above mean sea level. MW–2 provides an example of ash in contact with groundwater. The boring log completed during its installation shows CCR down to 578.6 feet above mean sea level and the groundwater elevation was at 580.6 feet above mean sea level, meaning that at least two feet of groundwater was in contact with CCR at that time. Groundwater measurements at this well commonly range from 582 to 584 feet, meaning three to five feet of CCR are routinely saturated with groundwater near MW–2.[128]

The Former Slag and Bottom Ash Placement Area is located at the southeast corner of the Will County site. A Phase II Environmental Site Assessment completed in 1998 identified this location as an ash disposal area. Borings revealed coal ash mixed with gravel up to three feet below the ground surface.[129]

Groundwater monitoring completed under the 2015 CCR Rule also demonstrates groundwater contamination at Will County. SSIs for chloride, fluoride, and TDS have been identified since the inception of the monitoring program in 2017 and in 2022, SSLs for arsenic and selenium were detected.[130]

While the regulated ponds are likely contributing to groundwater contamination, historical ash at the station is also a likely culprit. Historical ash along the eastern boundary of the four ponds is not capped or lined and is thus exposed to precipitation and groundwater. The regulated and unregulated ponds are unlined and are in contact with groundwater, making these units potential sources of groundwater contamination. Groundwater contamination increases as it passes through/under the ponds. Boron and sulfate concentrations doubled between well MW–1 upgradient of Pond 1N and MW–7 downgradient of the pond in monitoring data collected between 2010 and 2018.[131]

ASDs also provide evidence of a contaminant source other than the regulated ponds. An ASD completed in 2018 following SSIs for chloride, fluoride, and TDS at the regulated units concluded that the SSIs were from ''other potential sources'' and not from the regulated units.[132]

Groundwater monitoring during 2022 identified SSIs for boron, calcium, chloride, fluoride, and TDS across the monitoring network. SSLs for selenium at one well and arsenic at two wells were also identified and resulted in initiation of an ACM for the site. Notably, the two upgradient monitoring wells are contaminated. MW–06 had an SSI for calcium and an SSI for boron and SSL for selenium were detected at MW–05. These two upgradient wells are located along the eastern edge of the ponds in the area known to contain buried ash. SSIs and SSLs in downgradient wells indicate that the regulated ponds may also be contributing to groundwater contamination.[133]

The ASD completed following identification of SSLs at regulated Pond 2S and 3S determined that Pond 3S is likely contributing to groundwater contamination. The ASD reported statistically significant decreasing trends in chloride concentrations in both upgradient monitoring wells and statistically significant increasing trends in chloride concentrations in MW–09 and MW–11, both of which are immediately downgradient of Pond 2S.[134]

The prevailing groundwater flow at the site is from the east to the west across the ponds. Because historical ash is present along the eastern boundary of the ponds, the current monitoring network is not capable of accurately measuring groundwater contamination from each potential source. Further, all the wells designated upgradient are within the likely footprint of the historical CCR disposal area described above. Thus, none of the wells can assess upgradient groundwater quality accurately.

EPA Impoundment Assessments

Commenters provided additional reviews of EPA's impoundment assessment reports that were conducted in 2011–2013. During the impoundment assessments, EPA documented eight power plants with historical ponds where coal dams were constructed in whole or part of coal ash.[135] These plants include six plants on EPA's list of potential legacy CCR surface impoundments: Glen Lyn (VA), Hutsonville (IL), Jefferies (SC), Muskigum River (OH), Philip Sporn (WV), and Tanners Creek (IN). At two additional plants where historical ponds are identified, Cape Fear (NC) and Frank E. Ratts (IN), EPA also found coal ash used in the construction of the dams. The commenters included these plants as additional potential CCRMU.

2. Applicability and Definitions Related to CCR Management Units

EPA is finalizing new definitions and revising several existing definitions necessary to implement the new requirements for CCRMU. Specifically,

[124] Interim Opinion and Order, Sierra Club et al vs. Midwest Generation, LLC, Illinois Pollution Control Board, June 20, 2019.

[125] Id.

[126] Earthjustice et al. Legacy Proposal Comment Appendix VI. EPA–HQ–OLEM–2020–0107–0368.

[127] Earthjustice Appendix II. Examples of historical satellite imagery and topographic maps are included in Figure 23, Figure 24, and Figure 25. EPA–HQ–OLEM–2020–0107–0368.

[128] Interim Opinion and Order, Sierra Club et al vs. Midwest Generation, LLC, Illinois Pollution Control Board, June 20, 2019.

[129] Id.

[130] Earthjustice et al. Legacy Proposal Comment Appendix VI. EPA–HQ–OLEM–2020–0107–0368.

[131] Earthjustice et al. Legacy Proposal Comment Appendix VI. EPA–HQ–OLEM–2020–0107–0368.

[132] Id.

[133] Id.

[134] Id.

[135] EPA, Coal Combustion Residuals Impoundment Assessment Reports (2014), *https://www.epa.gov/sites/default/files/2016-06/documents/ccr_impoundmnt_asesmnt_rprts.pdf*.

the final rule establishes new definitions for ''CCR management unit,'' ''Contains CCR and liquids,'' ''Inactive CCR landfill,'' ''Liquids,'' and ''Regulated CCR unit'' and revises existing definitions for ''CCR landfill or landfill,'' ''CCR unit,'' ''Operator,'' ''Owner,'' and ''State Director.'' Some of these definitions are discussed elsewhere in the preamble.

EPA is also revising § 257.50(d) to specify that part 257, subpart D applies to CCRMU of 1,000 tons or greater, located at facilities with a regulated CCR unit or active facilities without a regulated CCR unit. That provision also applies to CCRMU greater than or equal to one ton and less than 1,000 tons, located at active facilities or facilities legacy CCR surface impoundment are only subject to the requirements of the FER in § 257.75 until a permitting authority determines that regulation of these units, either individually or in the aggregate, is warranted and determines the applicable requirements. Under the 2015 CCR Rule, § 257.50(d) exempted from regulation those CCR landfills that had ceased receiving CCR prior to October 19, 2015. This action amends the exemption included in the 2015 CCR Rule.

The sections below briefly explain what EPA proposed, summarize the public comments received, and provide the Agency's responses. The Agency addresses new and revised definitions in the following order: (1) CCR management unit; (2) CCR unit; (3) Owner and operator; and (4) Conforming revisions to other existing definitions.

a. Definition of CCR Management Unit

EPA proposed to define a *CCR management unit* or CCRMU to capture the solid waste management practices that have been demonstrated in the 2014 and 2024 Risk Assessments and the damage cases to have the potential to contaminate groundwater. EPA proposed to define a CCRMU as any area of land on which any non-containerized accumulations of CCR are received, placed, or otherwise managed, that is not a CCR unit. EPA explained in the proposed rule that the definition of a CCRMU is based on the current definitions of a CCR pile—which is currently regulated as a CCR landfill under part 257, subpart D—and of a CCR surface impoundment, which both rely on the concept of ''accumulations of CCR.'' See, 40 CFR 257.53 and 88 FR 32018.

EPA proposed that CCRMU would include historical solid waste management units such as CCR landfills and surface impoundments that closed prior to the effective date of the 2015 CCR Rule (October 19, 2015), as well as inactive CCR landfills (including abandoned piles). The proposal stated that a CCRMU would also include any other areas where the solid waste management of CCR on the ground has occurred, such as structural fill sites, CCR placed below currently regulated CCR units, evaporation ponds, or secondary or tertiary finishing ponds that have not been properly cleaned up, and haul roads made of CCR if the use does not meet the definition of beneficial use in § 257.53. EPA explained that all of these examples involved the direct placement of CCR on the land, in sufficient quantities to raise concern about releases of hazardous constituents, and—in most, if not all cases—with no measures in place to effectively limit the contact between the CCR and liquids, and subsequent generation and release of any leachate.

EPA acknowledged that the proposed definition was broad, but the Agency did not intend that the placement of any amount of CCR would necessarily constitute a CCRMU. Accordingly, EPA proposed that the following would not be considered CCRMU: consistent with the current regulations, closed or inactive process water ponds, cooling water ponds, wastewater treatment ponds, and stormwater holding ponds or aeration ponds. EPA explained that these units are not designed to hold an accumulation of CCR, and in fact, do not generally contain a significant amount of CCR. See, 80 FR 21357. EPA also explained, consistent with the existing regulations, neither an area or unit at which exclusively non-CCR waste is managed, nor any containerized CCR, such as a silo, would be considered CCRMU because neither of these units present conditions that give rise to the risks modeled in EPA's assessment or identified in the damage cases. See, Id. at 21356.

For similar reasons, the Agency proposed that any CCR used in roadbed and associated embankments would not be considered CCRMU. As EPA explained in the 2015 rule the methods of application are sufficiently different from CCR landfills that EPA cannot extrapolate from the available risk information to determine whether these activities present similar risks. Roadways are subject to engineering specifications that generally specify CCR to be placed in a thin layer (*e.g.,* six to 12 inches) under a road. The placement under the surface of the road limits the degree to which rainwater can influence the leaching of the CCR. There are also significant differences between the manner in which roadways and landfills can potentially impact groundwater, such as the nature of mixing in the media and the leaching patterns. First, CCR landfills are typically a homogenously mixed system, and as a result, there are no spatial variations of the chemical and physical properties of the media (*e.g.,* bulk density, hydraulic conductivity and contaminant concentration). By contrast, roadways are generally constructed of several layers with different material properties (heterogeneity). This difference affects the hydraulic conductivity of a mass of CCR in a landfill, as compared to CCR placed in an embankment. Any potential leaching will tend to spread over the length of the embankment, as opposed to the leaching in a downward motion that would occur in a homogenously filled landfill. Finally, EPA is concerned that groundwater monitoring of a road may not be practicable. However, even though EPA considers that the available information does not demonstrate that use in roadbed present sufficient risk to warrant the suite of requirements applicable to CCRMU, that calculus changes in the event the CCR in roadbed is contaminating groundwater. Accordingly, EPA proposed that if a facility subsequently determines that the CCR in onsite roadbed is contributing to contamination to the aquifer, the facility would be required to address the contamination. For example, if during an ongoing corrective action, a facility identifies the roadbed as an additional source of contamination, it would be required to address that contamination as part of the ongoing remediation of the aquifer. In addition, the measures EPA proposed to require facilities to take would not be expected to identify truly de minimis quantities of CCR. As discussed in greater detail in the next section, EPA proposed that facilities would only be required to identify accumulations if records confirm the existence of the CCRMU or visual evidence of CCR placement on the ground.

In addition, EPA proposed to define the term *inactive CCR landfill* to mean an area of land or an excavation that contains CCR but that no longer receives CCR on or after the effective date of this final rule and that is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine or a cave. For purposes of this subpart, this term also includes sand and gravel pits that received CCR and abandoned CCR piles.

i. RCRA Authority

Some commenters contended that *West Virginia* v. *EPA,* 142 S. Ct. 2587, 2609 (2022) requires EPA to have clear congressional authorization to regulate CCRMU, and that Congress has not provided EPA with such authorization under either RCRA sections 4004(a) or 4005(d). The commenters are incorrect. All of the requirements adopted in this rulemaking to regulate CCRMU fall squarely within the authority Congress delegated to the Agency in RCRA sections 1008(a)(3), 4004(a), and 4005(d). Commenters' arguments to the contrary are based misunderstandings of the statutory structure and EPA's historical practice. The rule does not expand the scope of CCR regulation beyond what Congress envisioned. Further, in large part, commenters' arguments are premised on aspects of the proposal which have been revised in this final action in response to comments. Although the revisions were not necessary under *West Virginia* v. *EPA* (because EPA's exercise of authority through this rule does not implicate a major question), the revisions resolve many of the commenters' objections based on their view of the major questions doctrine. EPA addresses the comments in turn.

Some commenters based their claim that the regulation of CCRMU presents a major question on the assertion that the proposal would regulate an undefinable number of past CCR management and disposal practices, ''irrespective of risk, location, or even whether such past activities have been (or are currently being) addressed by state governments or by EPA itself under other federal authorities.'' These commenters claimed that the proposal has no bounds.

> Just as an example, the Proposal would require operating power generation facilities to identify every CCRMU within its boundaries, even if located under existing structures critical to a plant's energy production operations, and to ''close,'' and in many cases reclose, those CCRMUs under the CCR rule's closure provisions. The Proposal blithely ignores whether in fact such requirements could be met, the associated costs, and the resulting interruption to power generation activities that could be incurred in attempting to meet these requirements.

These commenters also note that Congress's failure to include the same authority for corrective action applicable to permitted hazardous waste sites found in section 3004(u) under subtitle D demonstrates that EPA lacks the authority to require CCRMU to comply with the part 257 corrective action and closure requirements.

Another commenter argued that the proposal ''would impermissibly expand EPA's role in the Subtitle D statutory regime beyond the limited role that Congress envisioned for the Agency'' based on their belief that the Congressional intent behind the WIIN Act was ''to restore the States to their historical, congressionally-intended lead role under RCRA Subtitle D in the implementation and enforcement of solid waste management programs.'' According to this commenter,

> [w]hether or not EPA should have such a ''central role'' in the regulation of CCR under RCRA Subtitle D—one that would allow the Agency to assert federal jurisdiction over any area of land in any state simply because the land was, at any time, used to manage any non-containerized accumulation of CCR, regardless of whether the land has been and is in compliance with applicable state regulations—is a major policy question of significant national economic and political magnitude that Congress has not clearly delegated EPA the authority to address. . . At its core, EPA's delegated RCRA Subtitle D authority entails only the authority to promulgate guidelines and criteria, to be implemented by the States, to prohibit open dumping and to ensure that units are classified as sanitary landfills ''only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid wastes at such facility. EPA's Proposal construes ''open dumps'' and ''sanitary landfills'' to now include historically state-regulated solid waste management and resource conservation and recovery practices that Congress never intended (clearly or otherwise) for the Agency to regulate federally, as most recently evidenced by Congress's definition of a ''sanitary landfill'' in the WIIN Act as a CCR unit that complies with a state CCR permit, or a federal CCR permit in a nonparticipating state, or the requirements of the CCR Rule applicable to CCR units in the absence of a federal CCR permitting program.

This commenter stated that the WIIN Act limited the reach of EPA's authority to '' 'CCR units,' as defined in the 2015 CCR Rule, *i.e.,* to 'any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these.' '' In addition, the commenter argued that EPA lacks the authority to now regulate units that were expressly exempted from regulation under the EPA regulations that Congress specifically incorporated by reference in the WIIN Act. According to this commenter, in 2015 EPA interpreted its RCRA Subtitle D statutory authority to regulate, as ''CCR units,'' only existing and new CCR landfills, existing and new CCR surface impoundments, and inactive CCR surface impoundments at active facilities, and Congress did not in 2016 grant the Agency any authority to regulate anything else. The commenter further claimed that EPA has acknowledged that the definition of a ''CCR unit'' does not include the areas of land that EPA proposed to regulate as CCRMU. Finally, the commenter objected that the proposal would regulate activities or sites that ''have historically been regulated under state programs, per EPA approved State Solid Waste Management Plans, and have closed or continued to operate in accordance with the State's program and plan.''

EPA disagrees that the regulation of CCRMU under this final rule is fairly characterized as an ''unprecedented'' expansion of authority under RCRA Subtitle D or otherwise presents a major question under *West Virginia* v. *EPA,* 142 S. Ct. at 2609. The commenters have mischaracterized EPA's proposal, which largely just removes regulatory exemptions adopted in 2015, and requires the owners and operators of solid waste disposal units to clean up the contamination from their disposal of solid waste (CCR). These are the same requirements that apply to the currently regulated CCR landfills and CCR impoundments—most of which are located at the same sites as the CCRMU regulated under this final rule—and that Congress incorporated into RCRA in the 2016 WIIN Act. See, *e.g.,* See, 42 U.S.C. 6945(d)(3), (6), (7). EPA has imposed these types of requirements on these kinds of entities and activities since 1980. Characterizing this as novel or unprecedented fundamentally misstates both the nature of EPA's action and the authority Congress delegated to the Agency in RCRA sections 1008(a)(3), 4004(a), and 4005(d).

(a) Types of Units and Activities Regulated

As an initial matter, these commenters have mischaracterized EPA's statements about the extent of its authority under subtitle D. EPA never stated that its authority was limited to the particular CCR units regulated by the 2015 CCR Rule. The only citation the commenter provides to support its assertion is 80 FR 21303, which is simply a factual recitation of the CCR units covered by the 2015 CCR Rule. That section contains no statement about EPA's authority to regulate; nor does any other section of the 2015 CCR Rule preamble contain such a statement.

Similarly, EPA never stated or in any way suggested in the May 2023 proposed rule that the existing regulatory definition of a CCR unit—and by implication, the statutory term in 4005(d)—does not include the ''areas of land that EPA proposed to regulate as

CCRMUs.'' Based on the pages in the proposal that the commenter cites, it appears the commenter was confused by EPA's explanation that it was proposing to use two different terms to distinguish between: (1) the CCR units that would be subject to all of the requirements in part 257 and (2) the CCR units that would subject to only a subset of the existing requirements. EPA proposed to use the terms CCR unit and CCRMU, respectively, to refer to these two categories of units. To effectuate this, EPA proposed to *revise* the existing definition of a CCR unit by adding a statement that CCR management units are not covered by the definition. If the commenter were correct that EPA did not consider CCRMU to be a type of CCR unit, EPA would not have needed to revise the definition.

But to the larger point, the CCRMU regulated under this rule clearly fall within RCRA sections 1008(a)(3), 4004(a) and 4005(d). In essence, as the commenter recognizes, CCRMU are simply CCR landfills and CCR surface impoundments that were not regulated by the 2015 Rule: inactive CCR landfills, or CCR surface impoundments and landfills that were closed prior to the effective date of the 2015 rule.[136] As EPA explained in the May 2023 proposal, the proposed definition of a CCRMU was based on the existing definitions of a CCR pile—which is currently included in the definition of a CCR landfill—and of a CCR surface impoundment, which both rely on the concept of ''accumulations of CCR.'' See, 40 CFR 257.53 and 88 FR 32018. And the record for this rulemaking documents that the CCRMU regulated under this final rule present risks at least as significant as the units regulated under the 2015 rule. CCRMU thus clearly are CCR units under both the regulations and the statute. As the commenter itself notes, when the WIIN Act was passed in 2016, and Congress incorporated the term CCR unit into the statute, the 2015 CCR Rule defined (and still defines) a CCR unit as ''*any* CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these.'' 40 CFR 257.53 (*emphasis* added).

The commenter relies heavily on the fact that CCRMU were exempt under the 2015 CCR Rule; but that is ultimately irrelevant. First, as noted above, CCRMU actually fall within the 2015 regulatory definition of a CCR unit. More to the point, Congress did not define the term ''CCR unit,'' thereby leaving it to EPA develop a definition. Although the WIIN Act incorporates the 2015 regulations into the statute, Congress simultaneously made clear that EPA retains the authority to modify or expand those requirements as necessary to ensure that the standard in section 4004(a) will continue to be met. See, *e.g.,* 42 U.S.C. 6945(d)(1)(A)(i), (3), (6) (referencing ''or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title''). The commenters never acknowledge these provisions or address their logical implications.

Instead, the commenters focus on two aspects of the CCRMU definition to support their claims of an ''unprecedented expansion'': (1) the proposal to define a CCRMU as ''any non-containerized accumulation of CCR'' without limitation or threshold; and (2) the regulation of ''any area of land'' on which CCR ''is received, placed, or otherwise managed at any time.'' With the incorporation of the thresholds in § 257.50(d) the first issue has been rendered moot. EPA has also deleted the phrase ''at any time'' from the CCRMU definition. EPA had originally included that phrase to clarify that it did not matter when the CCR was originally placed, received, or otherwise managed, provided the CCR remained at the site. EPA deleted the phrase from the final definition because, as the D.C. Circuit explained, this concept is fully communicated by the phrase ''is placed.''

> Importantly, while the ''is'' retains its active present tense, the ''disposal'' takes the form of a past participle (''disposed''). In this way, the disposal itself can exist (it ''is''), even if the act of disposal took place at some prior time . . . . Properly translated then, an open dump includes any facility (other than a sanitary landfill or hazardous waste disposal facility), where solid waste still ''is deposited,'' ''is dumped,'' ''is spilled,'' ''is leaked,'' or ''is placed,'' regardless of when it might have originally been dropped off. *See* 42 U.S.C. 6903(3), (14).

901 F.3d at 440. The same logic applies to the phrases ''is received'' and ''is otherwise managed.'' Including the phrase ''at any time,'' is consequently at best redundant, and at worst confusing—as demonstrated by the above comments.

In any event, these aspects of the CCRMU definition were either taken directly from or largely mirror existing regulatory or statutory definitions. The phrase ''any non-containerized accumulation of CCR'' appears verbatim in the existing ''CCR pile'' definition, which as EPA previously explained, essentially mirrors the existing definition of a ''waste pile or pile'' from § 257.2 (*i.e.,* the regulation that applied to CCR facilities prior to 2015), as well as the definition in part 260 that has been in place since 1982. See 80 FR 21356. Compare, §§ 257.2, 257.53, and 260.10. More to the point, regulating the placement of non-containerized[137] CCR directly on any land is fully consistent with RCRA's definition of disposal, which is defined in part as the '' 'placing of *any* solid waste or hazardous waste into or *on any land* or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.'' 42 U.S.C. 6903(3) (*emphasis* added). Similarly, and as illustrated by the D.C. Circuit decision quoted above, the phrase ''is received, is placed, or is otherwise managed,'' flows from the statutory definition of an open dump, which RCRA defines as ''any facility or site where solid waste *is disposed* of . . . .'' 42 U.S.C. 6903(14) (*emphasis* added).

EPA responds to comments about the ''any area of land'' portion of the CCRMU definition in relevant portions of the discussions below.

(b) Extent of Requirements

The commenters complain that the proposal was ''virtually unbounded'' as it would require operating power generation facilities to identify every CCRMU within its boundaries, even if located under existing structures critical to a plant's energy production operations, and to ''close,'' and in many cases reclose, those CCRMUs under the CCR rule's closure provisions. While EPA disagrees with the commenters' characterization of the proposal, the final rule, in any event, is more limited than the proposal, and is not unbounded. Under the final rule a covered facility must still identify every CCRMU of one ton or more within its boundaries, but groundwater monitoring, corrective action, closure, and post-closure requirements apply only to CCRMU containing at least 1,000 tons of CCR. Regulation of CCRMU between one and 1,000 tons is deferred to a subsequent permitting authority who will assess the risks posed by these smaller CCRMU, individually and/or in the aggregate, and determine which, if any, requirements are appropriate for the CCRMU. In addition, this final rule defers the requirement to demonstrate

[136] The proposal described an additional category: any solid waste management that involves the placement or receipt of CCR directly on the land; such activities fall within the existing definition of a CCR pile, which is in turn defined as a CCR landfill.

[137] The phrase ''non-containerized'' means that specific measures to control exposures to human health and the environment have not been adopted. See 80 FR 21356.

compliance with § 257.102 for CCRMU that closed prior to the effective date of this rule in accordance with alternative, substantially equivalent requirements. EPA is also deferring the requirement to initiate closure where the CCRMU is located beneath critical infrastructure, such as high power electric transmission towers, air pollution control or wastewater treatment systems, or an electrical substation until the infrastructure is no longer needed, a permit authority determines closure is necessary to ensure that there is no reasonable probability of adverse effects on human health or the environment, or the closure or decommissioning of the facility, whichever occurs first.

The commenters also objected to the imposition of corrective action and closure obligations on disposal units that were closed in accordance with State law or on areas where the State considered the placement of CCR on the land to be beneficial use under State law. But the regulation under subtitle D of closed or inactive disposal units or of activities exempt under State law is neither novel nor unprecedented. Indeed, many CCR units currently regulated under the 2015 CCR rule were inactive or exempt under State law. See, 80 FR 21322–21323, 21456. And in this case EPA is only extending the part 257 regulations to activities or placements of CCR that, as discussed above, are already defined as ''disposal'' under Federal law—and that the record demonstrates present risks exceeding the threshold for regulation in section 4004(a).

Under section 4004(a), EPA is charged with issuing regulations to address all ''reasonable probabilities of adverse effects'' (*i.e.,* all reasonably anticipated risks) to health and the environment from the disposal of solid waste.[138] The statute is clear that this includes regulations to address the current risks from previous solid waste management activities (including disposal). EPA explained at length the basis for this conclusion as part of the Agency's rationale for regulating inactive impoundments. See, 80 FR 21344–21345. See also *USWAG, et al.* v. *EPA* 901 F.3d at 440. *See also In re Consolidated Consol. Land Disposal Regulation Litig.,* 938 F.2d 1386, 1389 (D.C. Cir. 1991) (EPA's reading of the term ''disposal'' in RCRA's Subtitle C, 42 U.S.C. 6924, to include ''the continuing presence of waste'' was reasonable); *USWAG,* 901 F.3d at 453–54 (Henderson, J., concurring) (same). By the same logic, these provisions authorize EPA to regulate inactive landfills and closed disposal units that continue to pose risks to health or the environment, for example by requiring the owners and operators of such units to remediate any contamination from these units, or to take action to prevent such contamination.

The 2016 WIIN Act amendments reaffirmed EPA's authority over these activities. In section 4005(d), Congress relied on the 2015 regulations, and expressly stated that the amendments were not intended to limit or restrict the authority already provided under sections 1008(a)(3) and 4004(a). See, 42 U.S.C. 6945(d)(3), (6), (7). With these amendments, Congress also affirmed the Agency's authority to impose the kind of requirements established in part 257 (*e.g.,* corrective action to remediate groundwater contamination and closure to prevent it). This rule simply extends many of those same requirements to additional areas at which disposal of CCR is occurring—often at the same sites covered by the original 2015 CCR Rule. Moreover, Congress made clear that EPA retains the authority to modify or expand the requirements in the 2015 CCR rule as necessary to ensure that the standard in section 4004(a) will continue to be met. See, *e.g.,* 42 U.S.C. 6945(d)(1)(A)(i), (3), (6) (referencing ''or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title''). None of the commenters acknowledge these provisions or address their logical implications.

Moreover, this rule requires CCR facilities to remediate only the contamination associated with the disposal of CCR on site of a facility with other currently regulated CCR disposal units. Although expanding the corrective action obligations to other areas of CCR disposal on site may seem similar to the facility wide corrective action obligations applicable under the hazardous waste program—in that a facility will be required to clean up all of the on-site contamination caused by its disposal of CCR—the two requirements are not commensurate. For example, in contrast to a clean up under 3004(u), this rule does not require a facility to clean up any Appendix IV constituent from any source on-site, such as a spilled commercial product, unconnected to the solid waste (CCR) in the disposal unit. Rather, this rule imposes the same unit specific obligations that CCR facilities have been required to comply with since 2015, that were clearly authorized under 4004(a) and that Congress effectively affirmed in 2016 with the WIIN Act.

(c) Relationship to State Law

Finally, EPA disagrees that either the proposed or final rule expands ''EPA's role in the Subtitle D statutory regime'' or otherwise alters the Congressionally mandated relationship between EPA and the States.

The fact that EPA regulation affects the status of activities or units that were previously regulated under State law is precisely what the statute authorizes. Even under the more limited authority conferred upon the Agency prior to WIIN Act, EPA's subtitle D criteria established minimum national standards with which facilities were required to comply, irrespective of State law. See 80 FR 21310–21311.

Moreover, the commenter has misunderstood both the intent and effect of the WIIN Act. Under the legal framework in place when the 2015 CCR rule was enacted,

> EPA's delegated RCRA Subtitle D authority entails the authority to promulgate guidelines and criteria, to be implemented by the States, to prohibit open dumping and to ensure that units are classified as sanitary landfills ''only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid wastes at such facility

See 80 FR 21310–21311. Congress deliberately expanded EPA's role under that framework in 2016 when it granted EPA the authority to enforce the Federal criteria, issue permits in nonparticipating States, and to establish the minimum national standards that are both applicable directly to facilities and used to evaluate State programs. The commenter's description of the section 4005(d)(6) definition of a ''sanitary landfill'' is similarly misleading. Congress did not define a sanitary landfill as a CCR unit that complies with any State CCR permit, but a State permit issued in accordance with an EPA approved program. See 42 U.S.C. 6845(d)(6)(A)(i).

(d) Other Comments Concerning Authority To Regulate CCRMU

Other commenters stated that the proposed CCRMU definition exceeds the Agency's authority under RCRA subtitle D because EPA has failed to demonstrate that any amount of CCR placed anywhere on the land at any time presents the level of risk necessary to warrant regulation under section 4004(a). These commenters contend that the proposed CCRMU definition unlawfully eliminates the concept of risk out of the statutory definition of disposal. These commenters further asserted that the authority to regulate

[138] Although section 1008(a)(3) expands EPA's authority to address the risks from any of the listed activities, the CCRMU regulated under this final rule—consisting of CCR surface impoundments and landfills (including CCR piles) only involve disposal.

''solid waste management practices'' under section 1008(a)(3) similarly does not authorize the regulation of any amount of CCR placed anywhere on the land at any time. Finally, a commenter raised concern that the proposed definition would encompass CCR used as fill material pursuant to acts of Congress or validly issued Section 404 permits under the Clean Water Act, which commenter alleged falls outside the scope of RCRA.

EPA disagrees that it lacks the authority for any of the provisions in this final rule. The record demonstrates that the CCRMU regulated under the final rule meet the standard for regulation under section 4004(a). This rule is supported by two separate risk assessments; the final rule adheres closely to the results, and regulates only the units and activities that present risks that warrant regulation under sections 1008(a)(3) and 4004(a). Further, the results of EPA's risk assessments are consistent with the damage cases discussed in Unit III.C.1 of this preamble.

As discussed at length in Unit III.A of this preamble, leakage from CCRMU can adversely impact groundwater quality and pose risk to future receptors in the range that EPA typically considers for regulation. Closed and inactive landfills and surface impoundments pose substantially the same levels of risk to offsite receptors as those estimated in 2014 for currently regulated units. This is particularly true if the unit has not been properly closed, *e.g.,* lacks a final cover system.

In response to comments received on the proposed rule raising concerns about the adequacy of EPA's basis for regulating smaller CCRMU, EPA modeled groundwater concentrations at the boundary of smaller CCRMU fills to understand the potential for exceedance of GWPS that would trigger corrective action. The results of that 2024 Risk Assessment confirm that smaller CCRMU fills can pose risk to onsite receptors and materially contribute to broader groundwater contamination across the facility. In addition, depending on the location of these fills, they can also pose risk to offsite receptors that exceed the levels at which EPA normally regulates. On the whole, this analysis identified the potential for both moderate and high-end groundwater concentrations of molybdenum (among other Appendix IV constituents) to exceed GWPS.

EPA conducted further sensitivity analysis to better understand whether there is an amount below which there is no reasonable probability of adverse impacts to groundwater quality. EPA remodeled quantities of CCR between one ton and 78,000 tons to determine both the risks associated with the potential for groundwater contamination and radioactivity. EPA modeled only individual placements of CCR in these quantities rather than the aggregate risks from the placement of multiple small quantities of CCR co-located at the same site.

This analysis found that exceedances of the GWPS by a factor of as much as 40 are still possible for placements below 1,000 tons of CCR. Thus, such placements can meaningfully contribute to groundwater contamination at these facilities, including, for example by adding two contaminant plumes already present on site from larger placements, or in the aggregate. Although further analysis of the results indicates that there will be a tonnage that does not present a reasonable probability of adverse effects to groundwater quality, EPA was unable to identify that amount based on the available information. EPA conducted no modeling below one ton; however all indications in the existing data are that groundwater concentrations from individual quantities below one ton are very unlikely to exceed GWPSs. In other words, although EPA's modeling indicates that some amount between one ton and 1,000 tons is likely below EPA's level of concern, EPA cannot determine what that precise amount would be. It was not possible to identify a limit much lower than 1,000 tons because too few model runs were conducted at smaller amounts to support extrapolation.

To ensure that the final rule is consistent with the Agency's authority under RCRA section 4004(a), this final rule incorporates thresholds consistent with the results of its risk analyses. Accordingly, the final rule only requires CCRMU containing 1,000 tons or more of CCR to comply with the applicable requirements for CCRMU.

However, EPA estimated the risks associated with a 1,000 ton CCRMU to be an HQ of 40, which exceeds the Agency's normal level of acceptable risk by a significant margin. In addition, EPA's risk assessment may underestimate the risks at some sites. EPA modeled the risks associated with individual CCRMU of varying sizes, rather than the aggregate risks associated with numerous smaller CCRMU across the facility. It is possible that even though smaller CCRMU may not individually give rise to levels of concern, the risks may be greater when all of the CCRMU are considered together. According to many of the commenters, it is common for multiple small CCRMU to be located at a single facility. And although EPA's modeling estimated radiation risks of concern at lower quantities, EPA's concerns were based on a *future* residential use of the property (*e.g.,* after clean closure of the regulated units, but where smaller CCRMU remain on site). As several commenters noted, current exposures at existing facilities (occupational) are very different. To address these risks, as section 4004(a) requires, the final rule does not exempt CCRMU containing between one and 1,000 tons of CCR, but defers the regulation of such units to a permitting authority who will assess the risks posed by these smaller CCRMU, individually and/or in the aggregate, and determine which, if any, requirements are appropriate for the CCRMU to ensure there will be no reasonable probability of adverse effects on health or the environment. In order to facilitate this, the final rule requires facilities to identify these smaller units as part of the FER, so that this information can be submitted as part of their permit application. The facility will also continue to monitor the regulated units and larger CCRMU at the site, consistent with the requirements in this rule and the existing regulations. To the extent that these smaller unmonitored CCRMU are leaching contaminants and contributing to groundwater plumes, that should become apparent as the facility continues to monitor and conduct any necessary corrective action at the currently monitored units.

EPA has codified these provisions in the ''Scope'' section of the regulations, at § 257.50(d). The provision reads as follows:

(1) This subpart applies to CCR management units of 1,000 tons or greater, located at facilities with a regulated CCR unit or active facilities without a regulated CCR unit.

(2) CCR management units greater than or equal to 1 ton and less than 1,000 tons, located at facilities with a regulated CCR unit or active facilities without a regulated CCR unit, are only subject to the requirements of the facility evaluation report in § 257.75 until a permitting authority determines that regulation of these units, either individually or in the aggregate, is warranted and determines the applicable requirements.

Finally, the commenter is mistaken that CCR used as fill material pursuant to acts of Congress or validly issued CWA section 404 permits under the State falls outside the scope of RCRA. To support its allegation, the commenter references section 1006(a), claiming that this ''expressly carves out any activity covered by 33 U.S.C. 1251 *et seq.*'' But RCRA section 1006(a) does not bar EPA from imposing requirements under one of the listed statutes and RCRA on the same units and waste streams, unless those requirements are inconsistent with a requirement in one of the statutes. 42 U.S.C. 6906(a). This is clear from the second sentence, which provides that ''such integration shall be effected only to the extent that it can be done in a manner consistent with the goals and policies expressed in this chapter and in the other acts referred to in this subsection,'' and thus expressly contemplates that there will be situations in which EPA regulates under both RCRA and one of the listed statutes. Id. See, *Chemical Waste Management* v. *EPA,* 976 F2d 2, 23, 25 (D.C. Cir. 1992).

Numerous courts have upheld this interpretation. See, *Ecological Rights Foundation* v. *Pacific Gas & Electric Co.,* 874 F.3d 1083, 1095 (9th Cir., 2017) (''RCRA's anti-duplication provision does not bar RCRA's application unless that application contradicts a specific mandate imposed under the CWA (or another statute listed in RCRA section 1006(a))''); *Goldfarb* v. *Mayor and City Council of Baltimore,* 791 F.3d 500 510 (4th Cir. 2015) (The CWA must require something fundamentally at odds with what RCRA would otherwise require to be ''inconsistent'' under 1006(a)); *Edison Electric Institute* v. *EPA,* 996 F.2d 326, 337 (D.C. Cir.1993) (rejecting ''generalized claim'' that EPA action was barred under section 1006(a) because it interfered with ''the primary purpose'' of the Atomic Energy Act); *U.S.* v. *E.I. du Pont de Nemours & Co., Inc.,* 341 F.Supp.2d 215, 236 (W.D. N.Y. 2004) (approving EPA action as ''not inconsistent'' under RCRA where CERCLA's heightened standard would not be met by release of hazardous substance). The commenter has identified no requirement in the Clean Water Act that is inconsistent with EPA's regulation of CCRMU.

The same is true with respect to the commenter's contention regarding acts of Congress. Although the commenter refers to ''acts of Congress'' it cites only to 33 U.S.C. 59d. That provision of the Clean Water Act states only that a particular area is not a water of the United States, and authorizes the owner to place fill in the area.

The old channel of the River Raisin in Monroe County, Michigan, lying between the Monroe Harbor range front light and Raisin Point, its entrance into Lake Erie, is declared to be not a navigable stream of the United States within the meaning of the Constitution and the laws of the United States, and the consent of Congress is hereby given for the filling in of the old channel by the riparian owners on such channel.

Regulation of CCRMU neither contradicts a specific mandate nor is fundamentally at odds with this provision, which does not require the owner to place CCR in the old channel or grant the owner an exemption from any requirement other than section 404 of the Clean Water Act.

ii. Subcategorization Is Appropriate for CCRMU Because CCRMU Are Dissimilar

Commenters stated that the proposal groups all pre-2015 CCR Rule disposal areas into one large category. According to the commenters, this approach treats many different scenarios as a worst-case by imposing burdensome requirements for all. Commenters provided examples of potential subcategories, including: past CCR disposal varies based on site location (close to a surface water body), geography (eastern vs western sites), hydrology (flow variability/distance to uppermost aquifer), regulatory status (State closed-units vs unaddressed CCR sites), and historical CCR disposal areas currently used to harvest CCR for beneficial use. By categorizing all these situations together, the commenters claimed that EPA ignores the risk profiles of these subcategories and forces actions not tailored to the issues at hand. Some of these commenters opposed including in the CCRMU definition former landfills, impoundments and other accumulations of CCR that been closed in accordance with existing Federal or State regulations and regulatory oversight that pose no risk to groundwater.

As discussed in Unit III.A, the risk record does not support the distinctions the commenters make. This final rule already imposes only a subset of the regulations in part 257 on CCRMU, consisting primarily of groundwater monitoring and closure. Corrective action is required only if triggered by site-specific determinations particular to individual units. EPA disagrees that the commenters have shown that any further differentiation is warranted.

iii. Size Threshold for a CCRMU

Many commenters stated that the proposed definition of CCRMU does not provide the regulated community with ''fair notice'' of what in fact is forbidden or required. Citing to *FCC* v. *Fox Television Stations, Inc.,* 567 U.S. 239, 253 (2012), these commenters stated that due process requires that ''laws which regulate persons or entities must give fair notice of conduct that is forbidden or required.'' According to these commenters, the proposed CCRMU definition does not give fair notice of what is regulated because it is an overly broad definition that would apply to ''*any* non-containerized *accumulation* of CCR.'' Furthermore, commenters raised concern that EPA has not provided any clarity on how much non-containerized CCR is enough to trigger regulation, nor does the proposal provide any criteria for determining significance, but instead points to examples where it does not expect this to be the case, such as closed or inactive process water ponds, cooling water ponds, wastewater treatment ponds, and stormwater holding ponds or aeration ponds. These commenters also questioned the references to evaporation ponds or secondary or tertiary finishing ponds that have not been properly cleaned up as examples of potential CCRMU, because in the 2015 CCR Rule preamble, EPA had identified these as examples of impoundments that would not be considered CCR surface impoundments because they contained only de minimis concentrations of CCR. These commenters argued that the burden is on EPA to provide the regulated community with ascertainable certainty as to what the regulation requires, a mark for which they believe the proposed CCRMU definition falls short.

Commenters also pointed out that the limitations of or exemptions from the definition were only discussed in the preamble to the proposed rule but were not reflected in the regulatory text itself. These commenters argued that the CCRMU definition must include various limitations and exceptions in the final rule, such as, specifying a *de minimis* or insignificant quantity threshold in the definition of a CCRMU. Commenters further stated that without such clarity, owners or operators would be required to consider all CCR placement as CCRMU.

As discussed in the preceding section, EPA has revised the rule to be consistent with the results of the 2024 Risk Assessment, and the final rule defers the regulation of CCRMU containing between one and 1,000 tons of CCR to a permitting authority. Only CCRMU containing 1,000 tons or more of CCR will be subject to the applicable requirements for CCRMU after the effective date of this rule. Although EPA has codified the thresholds in § 257.50(d) rather than the CCRMU definition, the effect is the same. In addition, as discussed in more detail in Unit III.C.2.a, EPA has revised the CCRMU definition in response to concerns raised by commenters that the definition was confusing and unclear. The combined effect of these revisions is more than sufficient to address the commenters' concerns about the clarity of the definition including claims that the proposed regulations would not provide regulated entities fair notice of what the regulations require.

Finally, EPA acknowledges that the reference in the proposal to evaporation ponds, or secondary or tertiary finishing ponds that have not been properly cleaned up as examples of potential CCRMU was a mistake. EPA agrees that these units would generally be expected to contain no more than a *de minimis* amount of CCR.

iv. Exemption for Beneficial Use of CCR

Several commenters stated that the CCRMU definition is too broad and does not account for the beneficial use of CCR. According to these commenters, the proposal to regulate CCRMU effectively revoked or amended the current exemption for beneficial use in § 257.50, and the broad CCRMU definition now requires previously approved beneficial uses to be reexamined for potential regulation. Several of these commenters criticized the agency for failing to address the issue in the proposal, and argued that the Agency lacked the authority to include such beneficial uses, either because neither RCRA section 1008(a)(3) nor section 4004(a) authorize EPA to regulate use or because such regulation would be inconsistent with the 2015 Regulatory Determination. These commenters recommended that the CCRMU definition be revised to exclude any beneficial use of CCR as defined by § 257.53 or as previously approved by State agencies.

By contrast, several commenters request EPA to prohibit the use of coal ash as fill unless full protective measures such as liners, monitoring, and caps are required everywhere it is placed. Commenters claimed that immediate attention to this recommendation will protect the health and environment of millions of U.S. residents by preventing the spread of toxic coal ash pollution.

EPA disagrees that the proposal to regulate CCRMU effectively revoked or amended the current exemption for beneficial use in § 257.50. The proposal merely accurately reflects the existing regulations, which these commenters have misunderstood.

Under the existing regulations, the direct placement of CCR on the land on site of a utility, with nothing to control releases is, by definition, a CCR pile and therefore not beneficial use. The examples of historical CCRMU discussed in the proposal, structural fill and CCR placed below currently regulated CCR units on-site of a utility also clearly fit that definition.

These are the same provisions that have been in place since 2015. The existing definition of a CCR pile is

> Any non-containerized accumulation of solid, non-flowing CCR that is placed on the land. CCR that is beneficially used *off-site* is not a CCR pile.

§ 257.53 (emphasis added). The second sentence expressly limits the beneficial use of CCR to ''off site,'' and thus any non-containerized CCR placed directly on the land on-site of a utility is not beneficial use.

EPA previously explained this in its August 14, 2019, proposal ''Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Enhancing Public Access to Information; Reconsideration of Beneficial Use Criteria and Piles'' to revise the definition of a CCR pile with respect to temporary piles. 84 FR 40353. Specifically, EPA proposed to establish a new set of requirements that would apply equally to temporary or ''storage piles'' located on-site and off-site of a utility. As part of the background to that proposal, EPA described the requirements under the existing regulation so that the public could fully understand what it was–and was not [139]—proposing to revise. The proposal reiterated the existing definition of a CCR pile in § 257.53, and explained that this definition closely mirrors the RCRA definition of disposal, which is defined in part as the ''placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.'' See 42 U.S.C. 6903(3). EPA further explained:

> Under this regulation, CCR piles constitute disposal and are consequently subject to all regulatory criteria applicable to CCR landfills. In contrast, activities that meet the definition of a beneficial use are not considered disposal, even if they involve the direct placement on the land of ''non-containerized'' CCR. See §§ 257.50(g) and 257.53 (definitions of CCR landfill and CCR pile); 80 FR 21327–30.
>
> The current regulation distinguishes piles of CCR on-site (at an electric utility or independent power producer site) from temporary piles of CCR off-site (at a beneficial use site), based on whether CCR from the pile could fairly be considered to be in the process of being beneficially used. See § 257.53 (definition of CCR pile); 80 FR 21356 (April 17, 2015). While the CCR from the pile on-site may someday be beneficially used, it is not currently in the process of being beneficially used . . . If CCR is not containerized, the pile is a CCR pile and subject to the same requirements as a CCR landfill. See Id.
>
> In contrast, the regulations treat CCR stored off-site at a beneficial use site in a temporary pile to be in the process of being beneficially used (even though a pile is not itself a beneficial use). If the CCR is temporarily placed at a beneficial use site and meets the regulatory definition of a beneficial use, the pile is not a CCR pile and is not subject to disposal requirements.
>
> . . . .
>
> In the current definition [of a CCR pile], EPA distinguishes between piles on-site (which were almost always regulated as landfills) and piles off-site, (which, if temporary, were generally considered to be beneficial use, subject only to the four criteria in the definition). The current regulation also distinguishes between on-site piles that are not containerized and those that are containerized. See 80 FR 21356 (April 17, 2017); § 257.53.

84 FR 40365.

Thus, under the 2015 CCR Rule the activities covered under the definition of a CCRMU (*i.e.,* permanent placement of CCR on the land, on-site of a utility, without controlling releases) were defined as disposal rather than beneficial use. In 2019, EPA did not propose to revise or reconsider that. Instead, EPA proposed to extend that existing requirement to permanent piles located off-site of a utility. EPA therefore declines to reconsider the issue here.

In the May 2023 proposed rule EPA expressly stated that it did not intend to reopen or reconsider any issue other than those on which the agency expressly solicited comment.

> In this proposal, EPA is not reconsidering, proposing to reopen, or otherwise soliciting comment on any other provisions of the existing CCR regulations beyond those specifically identified in this proposal. For the reader's convenience, EPA has provided a background description of existing requirements in several places throughout this preamble. In the absence of a specific request for comment and proposed change to the identified provisions, these descriptions do not reopen any of the described provisions.

88 FR 31984. EPA further advised the public that it would ''not respond to comments submitted on any issues other than those specifically identified in this proposal, and such comments will not be considered part of the rulemaking record.'' Id.

Nowhere in the May 2023 proposed rule did EPA solicit comment on or suggest that it was in any way reconsidering the existing definition of

[139] EPA expressly advised the public that it was ''not reconsidering, proposing to reopen, or otherwise soliciting comment on any other provisions of the final CCR rule beyond those specifically identified in this proposal.'' 84 FR 40355.

a CCR pile. The sole mention in the proposal is EPA's explanation that its proposed definition of a CCRMU was ''based on the current definitions of a CCR pile—which is currently regulated as a CCR landfill. . . .'' Id at 32018. Consistent with the interpretation that all CCR placed on the land on-site of a utility is currently regulated, EPA also characterized structural fill and CCR placed below currently regulated CCR units on-site of a utility as ''historical'' solid waste management. Id. While commenters mischaracterize such activities as beneficial use, EPA's characterization of this conduct as ''historical'' shows that the Agency assumed that facilities were complying with the existing requirement and had not continued these practices on-site.

Accordingly, EPA declines the commenters' request to reconsider the definition of a CCR pile. EPA also declines to prohibit the use of CCR structural fill as part of this rulemaking. That issue is related to the 2019 proposal [140] to revise the fourth criterion in the definition of beneficial use, which remains pending.

v. Exemption for Roadbeds and Associated Embankments

EPA proposed to exempt CCR used in roadbeds and associated embankments. EPA further proposed that if a facility subsequently determined that the CCR in onsite roadbed is contributing to contamination of the aquifer, the facility would be required to address the contamination as part of the ongoing remediation.

No commenters opposed EPA's proposal, and several commenters supported it. However, commenters pointed out that EPA had neglected to include an exemption for roadbeds and associated embankments in the proposed regulatory text.

EPA is finalizing the exemption for roadbeds as proposed, and has amended the definition of a CCRMU accordingly.

b. Revision to Definition of CCR Unit

In order to distinguish between CCR units that would be subject to all of the requirements in part 257, and those that would be subject to only a subset, EPA proposed to rely on two terms: (1) CCR unit and (2) CCR management unit. Under the proposal the term, ''CCR units'' would refer to only the units subject to all of part 257, subpart D. As defined in the proposal, the term ''CCR management unit'' would refer to the units subject only to the subset of groundwater monitoring, corrective action, closure, and post-closure requirements. To effectuate this EPA proposed to modify the definition of *CCR unit* by stating that *CCR management units* are not covered by the definition of a *CCR unit.* Under the existing regulations, CCR units are defined as ''CCR landfills and CCR surface impoundments, as well as any lateral expansion of a CCR landfill or CCR surface impoundment. In addition, the term *CCR unit* already covers inactive CCR surface impoundments at active facilities because these units are CCR surface impoundments.'' 40 CFR 257.53

Commenters raised concern about the ''circularity'' of these definitions. and requested clarification on what type of unit would be considered a CCR unit, CCRMU, CCR landfill, or CCR surface impoundment. Several commenters noted that

> ''[f]or instance, 'CCR landfill,' 'CCR management unit,' and 'CCR unit' are defined by reference to each other. For example, a 'CCR landfill is 'not a surface impoundment'' and not a 'CCRMU,' while a 'CCRMU' is ''not a CCR unit'' but includes 'inactive CCR landfills' and ''CCR units that closed prior to October 17, 2015.'' And similarly, a 'CCR unit' is ''not a CCRMU,'' but includes CCR landfills and CCR surface impoundments. Similar circular references are contained in the definitions of 'inactive CCR landfill,' 'inactive facility,' and 'legacy CCR surface impoundment.'

Commenters claimed that defining one term by exclusion of another and in turn defining the latter term by exclusion of the former provides no clarity on the boundary between the two. These commenters went on to state that ''in a context in which definitional clarity is essential for regulatory clarity—*i.e.,* what's ''in'' and what's ''out''—such ambiguity is fatal, EPA must clarify these definitions to define these terms by their essential characteristics, not by circular references to each other.'' And as discussed in a previous section, some commenters were also confused by EPA's explanation in the proposal that, because it planned to use the term ''CCR unit'' to refer only to those CCR units that would be subject to all of the regulations in subpart D, CCRMU would not be included in this term.

In light of these comments, EPA reevaluated the proposed definitions and agrees that revisions are necessary. As noted, the proposed terms were intended to categorize units according to the requirements that would eventually be applied to them. EPA hoped that as a consequence, few revisions to the regulations would be necessary, with the idea that this would be less confusing to regulated entities and the public. Unfortunately, that was not the case and as the commenters noted, the definitions were frequently circular. Consequently, the final rule relies on three definitions: *CCR unit, Regulated CCR unit,* and *CCR management unit.*

EPA has largely reverted to the existing definition of a *CCR unit.* The definition, as it was promulgated in 2015, provides that

> ''*CCR unit* means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified.

Section 257.53. To avoid any ambiguity, EPA has also added a sentence stating that ''This term includes both Regulated CCR units and CCR management units.'' This is now the broadest term under the regulations and encompasses all units subject to 40 CFR part 257, subpart D.

This final rule now also includes the term *Regulated CCR unit,* which refers to the units regulated by the 2015 CCR rule, *i.e.,* new CCR landfills and new CCR surface impoundments (which include all lateral expansions of CCR landfills and CCR surface impoundments), existing CCR landfills, existing CCR surface impoundments, and inactive surface impoundments at active facilities. It also includes legacy CCR surface impoundments. Because legacy CCR surface impoundments will be subject to the same requirements as other inactive CCR surface impoundments, using this term will allow the Agency to implement this with relatively few revisions to the regulatory text.

Finally, the final rule largely reverts to the proposed definition of a CCR management unit. This final rule defines *CCR management unit* to mean any area of land on which any noncontainerized accumulation of CCR is received, is placed, or is otherwise managed, that is not a regulated CCR unit. This term includes inactive CCR landfills and CCR units that closed prior to October 19, 2015. EPA has also included a definition of the phrase, ''closed prior to October 19, 2015,'' which provides that the term means ''the CCR landfill or surface impoundment completed closure of the unit in accordance with state law prior to October 19, 2015.''

EPA deleted the phrase ''at any time'' from the proposed definition. EPA had originally included that phrase to clarify that it did not matter when the CCR was placed, received, or otherwise managed, provided the CCR remained present at the site. EPA deleted the phrase from

[140] 84 FR 40353 (August 14, 2019).

the final definition because, as the D.C. Circuit has already explained, this concept is fully communicated by the phrase ''is placed,'' and the inclusion of the phrase ''at any time,'' is therefore redundant. In addition, several commenters were confused by the phrase, assuming it meant that if CCR had ever been placed on the land at any time, even if it is no longer present, the site would be considered a CCRMU.

These definitions are all codified in the regulatory text at § 257.53. EPA also made conforming changes throughout 40 CFR part 257, subpart D to clarify which types of CCR units are subject to which requirements. As discussed elsewhere in this preamble, consistent with the proposal, EPA is extending only a subset of the existing requirements in part 257, subpart D to CCRMU, consisting of requirements for groundwater monitoring, corrective action, closure, post-closure care, and recordkeeping.

c. Revisions to Definitions of Owner and Operator

EPA proposed revisions to the existing definitions of *Owner* and *Operator.* The existing definition of *Owner* is the ''person(s) who owns a CCR unit or part of a CCR unit.'' First, EPA proposed to revise the definition to incorporate the concept of CCRMU into the existing definition because CCRMU would otherwise be excluded from the definition of a CCR unit as discussed in the preceding Unit of the preamble. This would be accomplished by adding ''or CCR management unit'' to the existing definition. Second, the Agency proposed to revise the definition of *Owner* to include the owner(s) of the entire facility, which would be achieved by adding ''or a facility, whether in whole or in part'' to the definition. EPA did not propose to revise the definition of a ''facility,'' which under the existing regulations means ''all contiguous land, and structures, other appurtenances, and improvements on land, used for treating, storing, disposing, or otherwise conducting solid waste management of CCR. A facility may consist of several treatment, storage, or disposal operational units (*e.g.,* one or more landfills, surface impoundments, or combinations of them).'' 40 CFR 257.53.

Some commenters opposed changing the definition of *Owner.* One commenter said ''It may be the current owner is unaware he owns the newly regulated facility. The current operator may have none of those parties responsible conducting activities since the parties may have ceased to exist long ago. Or, if the current owner is unwilling to work with those who previously disposed of the ash (potentially beneficially) there are legal issues (including potential access and trespass rules) that will need to be resolved.''

Commenters agreed that it would not be appropriate to include an innocent owner provision, specifically because of the difficulty in defining complex owner structures where direct accountability is difficult to define. One commenter ''does not fully agree with this ''limited accountability'' and suggest accountability must also honor indemnity and the assignment of liability defined in a Purchase and Sale Agreement (PSA). Specifically, any entity should transition or maintain liability based on an established purchase and sale agreement, thus responsibility cannot be limited to only the current owner. In addition, it is reasonable to expect that for known active or inactive CCR Units at an active facility, the current owner should be responsible for required closure that satisfies the requirements of the 2015 CCR Rule and for corrective action that does not exceed industry standard for remediation. However, it is unreasonable to expect only current owners to be accountable for all past practices and the responsibility for the unknown, specifically for areas that were undefined and unknown and most importantly unregulated at the time of a transaction from a previous owner, most often a regulated utility.''

EPA proposed and is finalizing this revision in part to account for the more complicated ownership arrangements that exist at some utilities. EPA has found that there may be multiple owners at the same facility; for example, one entity may hold title to a single impoundment, while another entity may own the remaining disposal units at the site. Moreover, ownership can change over time, as individual units or portions of the facility are parceled off. This final rule also more accurately reflects the nature of the obligations EPA is establishing for CCRMU. For example, as discussed below, EPA is finalizing the regulations to require an investigation of the entire facility to identify CCRMU. At many sites, this would involve areas other than those encompassed by the definition of a CCR unit, extending to all areas where disposal or other solid waste management may be occurring. Moreover, relying exclusively on the ''owner'' of the CCRMU may be ambiguous in this context, as at some sites the owner may not yet be aware that a CCRMU is present (*e.g.,* because it results from the historic placement or accumulation of CCR). EPA recognizes that this final rule will apply to currently regulated facilities and newly regulated facilities, but EPA does not expect that this revision will actually amend the entities that currently are liable. EPA expects that most (if not all) utilities currently operate as though the regulation already required the owner and operator of the facility to take actions; for example, under the existing regulations owners and operators are required to conduct corrective action even where the plume has migrated beyond the footprint of the regulated unit. In addition, EPA is extending the deadlines for the CCRMU requirements, which can accommodate any issues with access to the facility in order to conduct the applicable requirements.

For similar reasons, EPA proposed to revise the definition of *Operator* to incorporate the concept of CCRMU into the existing definition by adding ''or CCR management unit'' to the existing definition. In addition, the Agency proposed revisions to account for the unique characteristics of a CCRMU. In cases where the CCRMU is closed (*i.e.,* not receiving waste or otherwise in operation) or is a historic placement or accumulation of CCR, there may not be an entity that neatly fits the normal concept of an ''operator,'' because there may not be any current or ongoing oversight or activity with respect to the continued use of the unit. To avoid any ambiguity, EPA proposed to revise the definition of ''operator'' to clarify that the term *Operator* includes those person(s) or parties responsible for disposal or otherwise actively engaged in solid waste management of CCR. It also includes those responsible for directing or overseeing groundwater monitoring, closure, or post-closure activities at a CCR unit or CCRMU.

Commenters said the revised definition of operator is ''too broad and may be interpreted to impose CCR Rule liability on individuals or contractors who are retained by owners or operators to 'actively engage' in CCR waste management. This definition should be revised to reflect the standard principles for 'operator' liability under environmental laws, which should not include employees, individuals, or contractors operating under the direction of a responsible owner or operator.'' Another commenter disagreed with the revised definition of Operator, ''which can imply the operator could have obligations under this rule. We disagree. While some owners and operators are one and the same many facilities are operated by third parties operators and in these cases, such operators should have no obligations under this proposed rule. We request EPA clarify that distinction and clearly state that third party operators have no obligation.''

Another commenter stated ''Companies actively engaged in the solid waste management of CCR'' would include the construction contractors responsible for installation of CCR units including excavation, lining, filling, regrading, covering, closure, and more. Companies ''responsible for directing or overseeing groundwater monitoring, closure or post-closure activities'' would include well drillers, the professional engineers who certify the plans for CCR units, and again, construction contractors. Contractors will no longer be willing to 'actively engage[ ] in the solid waste management of CCR' or 'direct[ ] or oversee[ ] groundwater monitoring, closure or post-closure activities' if they will consequently become liable for compliance with the CCR rule. As a result, the 'shortage of contractors' will continue and grow worse. EPA should revise the definition of 'Operator' to clarify that contractors are not Operators.''

The revision to the definition of *Operator* is not intended to include every person who is ''actively engaged in the solid waste management of CCR'' but would follow the standard ''operator'' liability under environmental regulations. Such liability would include the operator who oversees the facility to ensure compliance with the regulations.

Because multiple entities may potentially be liable, (i.e., owners and operators) EPA is providing the following guidance. Consistent with EPA's typical practice, unless otherwise provided in the regulations, as long as one responsible entity (an owner or operator) has complied with the requirements, EPA will consider the obligation satisfied as to all potentially liable parties and will initially rely on owners and operators to determine among themselves how best to ensure compliance with the requirements. See, *e.g.,* 45 FR 33295 (May 19, 1980). (''EPA has no intention to require both owner and operator to take all or even most compliance actions in tandem. EPA will regard compliance by either owner or operator with any given obligation under the permit as sufficient for both of them'').

EPA is finalizing the revisions to *Owner* and *Operator* as proposed without revision. This is codified in the regulatory text at § 257.53.

d. Conforming Revisions to Other Existing Definitions

EPA proposed revisions to eight definitions in § 257.53 to refer to CCRMU. These definitions currently refer only to CCR units and EPA proposed to add the words ''or CCR management unit'' to the definitions to incorporate the concept of CCRMU into the existing definition. The eight definitions for which EPA proposed this revision are: Active life or in operation, Active portion, Closed, CCR landfill or landfill, Qualified person, Qualified professional engineer, State Director, and Waste boundary. EPA received comments only about clarifying the definition of ''closed,'' which is discussed in the Volume II Response to Comments document. EPA did not receive comments about the other seven definitions for which EPA proposed this revision. As described in Unit III.C.2.b of this preamble, EPA has revised the definition of ''CCR unit'' in response to comments, and as a consequence the definitions for Active life or in operation, Active portion, Closed, Qualified person, Qualified professional engineer, and Waste boundary no longer need to be amended. EPA is finalizing the proposed revisions to the definitions of CCR landfill and State Director. These are codified in the regulatory text at § 257.53.

e. Scope of Regulated Facilities With CCRMU

EPA proposed to require the owners or operators of both active facilities with one or more currently regulated CCR unit(s) and inactive facilities with a legacy CCR surface impoundment to comply with the CCRMU regulations. The term active facility or active electric utilities or independent power producers is defined in § 257.53. Inactive facilities are discussed in Unit III.A.1.c of this preamble.

Some commenters on the proposed rule opposed limiting the universe to active facilities and inactive facilities with at least one CCR unit. They argued that CCR in landfills, dewatered surface impoundments, and CCRMU at other, currently unregulated, active facilities pose the same risks to groundwater, surface water, and air as facilities with CCR units. These commenters said RCRA section 4004(a) cannot be met if these leaking units are arbitrarily excluded from regulation. Other commenters said EPA does not have the authority to regulate CCRMU at all and should limit the scope of the final rule to units that pose risks.

After reviewing the comments on the proposed rule, EPA reconsidered whether the regulated universe should be expanded to include other facilities currently generating power for the electrical grid that only have CCRMU on-site. These unregulated active facilities, or ''Other Active Facilities,'' are those that: (1) On or after October 19, 2015, were producing electricity for the grid; (2) Had ceased placement of CCR in their on-site CCR units before the effective date of the 2015 CCR Rule (October 19, 2015); and (3) Had no inactive CCR surface impoundments. As such, CCRMU (*e.g.,* inactive CCR landfills, closed CCR landfills, or closed CCR surface impoundments) are located at these facilities. Commenters on the proposed rule identified 13 units at six other active facilities, based on sourced data, and these units including inactive CCR landfills, closed CCR landfills, or closed CCR surface impoundments. Based on the most recent information, including from NODA comments, EPA believes there are nine units at five other active facilities.[141]

The addition of these units provides regulatory consistency; the CCRMU at these active facilities pose the same risks to human health and the environment whether or not they are co-located with a currently regulated CCR unit or a legacy CCR surface impoundment. And with the expansion of corrective action and closure obligations to CCRMU, these facilities are more similarly situated to the currently regulated active utilities and independent power producers than they are to the inactive facilities that remain exempt under this final rule (*i.e.,* inactive facilities with only CCRMU). Moreover, in contrast to the exempt facilities, EPA was able to identify the affected facilities and evaluate the potential consequences of regulating them.

EPA disagrees that it lacks the authority to regulate these CCRMU, for the same reasons discussed in Units II.C and III.C.2.a of this preamble.

The Agency also considered whether to regulate all CCRMU at inactive power plants. But as EPA explained in Unit III.B.1.b.i.(b) of this preamble, the location and number of inactive facilities without a legacy CCR surface impoundment are unknown, as is the number and condition of the units at these facilities. Without being able to better understand the full extent of the sites and entities that could be affected, EPA is not prepared to expand the regulations to this extent at the current time. Even though CCRMU pose the same risk when located at active or inactive facilities, EPA considers that the higher priority is to ensure that active facilities address the full extent of the contamination that currently exists, and to prevent further contamination at

[141] This universe is included in ''Universe of CCR Management Units. April 2024.'' in the docket for this action.

these sites—in other word to address rather ''those ills we have, than fly to others that we know not of.''

Therefore, EPA is finalizing amendments to regulate CCRMU at all active electric utilities or independent power producers that generated power for the electrical grid on or after October 19, 2015, in addition to those facilities with legacy CCR surface impoundments. As noted, EPA refers to these facilities as ''covered facilities'' throughout this preamble. This is codified in the regulatory text at § 257.50(d).

3. Facility Evaluation for Identifying CCR Management Units

EPA proposed that owners or operators of active facilities with a currently regulated unit or inactive facilities with a legacy CCR surface impoundment would need to conduct facility evaluations. The purpose of the facility evaluation is to confirm whether any CCRMU exist on-site, and, if so, to delineate the lateral and vertical extent of the unit(s). In developing the proposal, EPA relied heavily on the RCRA subtitle C Facility Assessment process for identifying solid waste management units at a hazardous waste facility. In addition, EPA accounted for certain existing requirements in the CCR regulations; for example, under the 2015 CCR Rule, facilities were required to compile a history of construction for their existing impoundments. 40 CFR 257.73(c)(1). Facilities were generally able to obtain all information specified in § 257.73(c)(1)(i) through (ix), even for units constructed decades ago. EPA expected that facilities will similarly be able to obtain the information that EPA proposed would be required in the Facility Evaluation Report (FER).

EPA proposed that facilities prepare one report, to be completed in two consecutive steps, with a single deadline. As proposed, the first step would consist of a thorough review of available records in combination with a physical facility inspection and any necessary field work, such as soil sampling, to fill any data gaps from the information obtained from the review of available records. The second step of the facility evaluation would be to generate a FER to document the findings of the facility evaluation. EPA proposed separate deadlines to complete the investigation and to compile the report: a deadline of no later than the effective date of this final rule to initiate the facility evaluation and a deadline of no later than three months after the effective date to complete the FER. Commenters suggested that EPA follow more closely the investigation processes developed under the current RCRA and CERCLA regulatory programs, that is, RCRA Facility Assessment Guidance, CERCLA all appropriate inquiry (Phase I and Phase II) process. Commenters suggested that separating the information collection requirements from the physical evaluation requirements will provide a more thorough evaluation of existing available information to better inform the physical evaluation to fill data gaps and properly identify CCRMU.

EPA is finalizing the procedures for facility evaluation for identifying CCR management units with a few revisions from the proposal. Owners or operators of any covered facilities will need to conduct a facility evaluation. The purpose of the facility evaluation is to confirm whether any CCRMU containing one ton (or more) exist on-site, and, if so, to delineate the lateral and vertical extent of the unit(s). In developing the final rule EPA relied heavily on the investigation processes EPA developed under the current RCRA and CERCLA regulatory programs, that is, the RCRA subtitle C Facility Assessment process for identifying solid waste management units at a hazardous waste facility, and the CERCLA all appropriate inquiry (Phase I and Phase II) process.

There is a two-step process for a facility evaluation. The first step consists of a thorough review of available records. The second step of the facility evaluation is to conduct a physical facility inspection and any necessary field work, such as soil sampling, to fill any data gaps from the information obtained from the review of available records.

In response to comments, EPA examined facility evaluation processes currently being implemented under RCRA and CERCLA and concurs that creating two separate reports—one for each step of the process—is consistent with these established approaches. EPA believes this two-step approach to facility evaluation will reduce the need for rework and the overall burden for both facility owners or operators and contractors who may be hired to complete this work. Additionally, EPA concludes this approach increases transparency by allowing the public the opportunity to see the work plan developed by the owner or operator.

Therefore, the final rule creates two parts to the facility evaluation—the Part 1 FER includes the results of the available information collection and evaluation. The Part 2 FER addresses data and information gaps through a physical evaluation of the facility. Together, the Part 1 and Part 2 reports will give a complete picture of the historic use, placement and the current status of CCR at each facility, ultimately identifying any CCRMU containing 1,000 tons or more that will be required to meet the regulatory requirements of this final rule. The FER must also identify those CCRMU containing between one and 1,000 tons, whose regulations is deferred until permitting. See, Unit III.C.2.a.iii of this preamble for further discussion.

a. Final Requirements for Facility Evaluation for CCR Management Units

During the facility evaluation, the owner or operator of a covered facility will need to identify and delineate the extent, laterally and vertically, of any CCRMU containing one ton or more at the facility. To begin, the owner or operator reviews all existing records and documents reasonably and readily available to (including information that is readily and reasonably attainable by) the facility, that contain information regarding any past and present CCR management that resulted in the accumulation of CCR on the ground. Consistent with the definition of a CCRMU, in this context EPA considers the terms ''placement'' and ''receipt'' to include situations in which spilled or released CCR has been left on the ground. During this first step, the facility is required to gather and review reasonably and readily available information to identify potential locations of CCR placement at, and to determine preliminary boundaries, lateral and vertical dimensions, and estimates of volume of any CCRMU. Then, at the second step, the facility evaluation requires physical inspection of the facility. Where necessary, the physical inspection must include field investigation activities, such as conducting exploratory soil borings, geophysical assessments, or any other similar physical investigation confirmation activities to establish the location and boundaries of identified CCRMU, and to affirmatively rule out other areas of potential CCR placement at the facility that were identified during the information review. The scope of the facility evaluation is the entire facility as the term is currently defined in 40 CFR 257.53.

As noted, the facility evaluation begins with a review of all reasonably and readily available information regarding past and present placement of CCR at the facility. In this first stage, the facility must gather all reasonably and readily available existing information that may be useful to determine any locations at the facility where CCR may have been placed (including spilled) on the ground. EPA expects that in this initial phase, the facility will cast a wide net, and collect all reasonably and readily available information that could potentially contain useful information to identify the potential locations of CCR placement at the facility. Finally, to complete the information review, the investigatory process must be documented, any data gaps identified, and plans for conducting a physical inspection of the site to verify locations, boundaries, and volumes of CCR placement at the facility formalized. This information is documented in the Part 1 FER. Then, at Part 2, the physical inspection must be documented. Each step of this process is described in greater detail below.

All recorded observations and data gathered during the facility evaluation, including any conclusions regarding the status of each CCRMU containing one ton or more of CCR at the facility (*e.g.,* delineation of the lateral and vertical extent of each CCRMU and an associated site map that identifies the location of the CCRMU (including GIS coordinates)), must be assembled and incorporated into the FER.

If, after conducting a thorough document review and a visual inspection, the facility has found no evidence of any CCRMU containing one ton or greater, no further testing or sampling is required to conclude that no such CCRMU are present at the facility. Consistent with the proposal, the final rule does not require facilities to conduct widespread site sampling to prove that no such CCRMU exists on-site.

The FER must include a certification to be signed by a P.E. and the owner or operator or an authorized representative. Owners or operators of active or inactive facilities with one or more CCR unit(s) that do not contain any CCRMU would need to complete and place in the operating record a certified FER documenting the steps taken during the facility evaluation to determine the absence of any CCRMU. Both Part 1 and Part 2 of the FER must be placed in the facility operating record (§ 257.105(f)(25)), submitted to the appropriate regulating entity (§ 257.106(f)(24)), and published on the facility's website (§ 257.107(f)(24)). Further, the Agency is requiring that the FER include a certification to be signed by the owner or operator or an authorized representative similar to the certification that is required at § 257.102(e) and (f) for existing units undergoing closure.

i. Facility Evaluation Report Part 1—Information Collection, Data Gap Identification

The first step in the facility evaluation process involves the collection of reasonably and readily available information that contains any detail or information on whether CCR was either routinely and systematically placed on land, or where facility activities otherwise resulted in measurable accumulations of CCR on land. The quality and reliability of the information review will depend greatly on the owner's and operator's ability to collect relevant information. Information reviews may provide misleading results when significant sources of information are not considered. The information that must be gathered during this step should include any documents that contain information relevant to past facility operations and waste disposal processes. By the conclusion of the facility evaluation, EPA expects that the facility would be able to identify the date, locations, durations, and volumes or estimated quantities of CCR placement.

EPA expects that the amount of available written information and documentation that will be available for review during the document review phase may vary by facility. However, the following documents developed as part of complying with 40 CFR part 257, subpart D, which are reasonably and readily available to facilities, would normally contain information that can be useful in identifying CCRMU: inspection reports; history of construction reports; fugitive dust control plans; annual groundwater monitoring and corrective action reports; ASDs; ACM reports or other corrective action reports; and closure plans and reports. Further, there are other sources of reasonably and readily available data that frequently contain information relevant to past facility operations and waste disposal processes, such as facility compliance reports produced for non-CCR programs (*e.g.,* Toxic Substances Control Act [TSCA]/Occupational Safety and Health Administration [OSHA]/National Pollutant Discharge Elimination System [NPDES]/Clean Air Act [CAA]/Clean Water Act [CWA]); permits and permit applications, including NPDES, solid waste, dam safety, and air permits; historical and contemporary monitoring and reporting data, and facility operating logs and maps; and site imagery including available historical aerial photographs, site photographs, topographic maps, and/or engineering or construction drawings, including drawings for physical facility improvement projects, such as surface water control, water and power infrastructure and utilities, roads, berms, ponds and/or other physical features at the facility. EPA expects that facilities will search all reasonably and readily available records to determine whether they contain information relevant to the potential existence and locations of CCRMU containing at leat one ton of CCR.

EPA proposed that as part of this process, owners and operators must further gather information by conducting meetings with current facility personnel familiar with the facility to the extent that those persons are available and have knowledge about past and/or present facility operations. The goal of the meeting process was to help gather any information relevant to the facility operations and waste disposal processes.

Commenters objected that conducting interviews of current or former facility personnel and any available State and local officials is burdensome and will place a significant strain, specifically, on State and local agencies. In addition, commenters stated that interviews with State personnel would put the State personnel in a difficult position to verify compliance on EPA's behalf without receiving State permit approval first.

In this final rule, EPA is not requiring the owner or operator to conduct interviews of current or former facility personnel, nor any available State and local officials. The regulatory language of the final rule only requires documentation of any interviews that are conducted as part of the information collection process. Nevertheless, owner and operator interviews of current or former personnel could well assist in identification of data and information that will be helpful in identifying CCRMU, particularly at those facilities that have not been in operation recently. Consequently, EPA continues to recommend that facilities use good faith efforts to collect information through interviews where current or past personnel are willing to assist in the identification of information or data that will assist the identification of CCRMU.

During this stage, EPA is requiring that a P.E. review the documents and information gathered during the information review process to draw conclusions regarding the existence of CCRMU at the facility. At the end of this stage, EPA expects the facility to identify: (1) Any areas where the facility can affirmatively conclude based on the reasonably and readily available information that one or more CCRMU containing greater than one ton are present; and (2) Any areas where the reasonably and readily available information indicates that CCR may have been either routinely and systematically placed on the land, or where facility activities otherwise could have resulted in one ton of CCR on the land (*i.e.,* areas where the available information indicates that one or more CCRMU may be present).

Each of the information sources discussed above can provide valuable information that can be used to identify the existence and locations of CCRMU. In addition, some specific examples are provided below:

- Environmental reports for multimedia inspections contain useful information on site management practices, monitoring data, and unit conditions. These reports can also describe comprehensive monitoring evaluations at the site that can indicate where releases or areas of concern exist.
- Multimedia permit and permit applications contain large amounts of information on the facility design, waste management practices including how wastes were disposed of, and the physical characteristics of the surrounding area. These documents can contain old topographic maps, facility figures and drawings, wastestream flow diagrams, and unit and process descriptions.
- If a groundwater monitoring report for a CCR unit indicates that contaminant levels in groundwater monitoring wells are the result of CCRMU rather than the monitored CCR unit, this would need to be further investigated during the facility evaluation process to fully delineate the locations of areas where CCR was placed on the ground, including the size of the unit and other related unit details.
- Similarly, a review of aerial photographs can identify potential CCRMU at the facility at locations that have become overgrown or otherwise hidden over time. When used in conjunction with USGS topographic maps, owners or operators can look for evidence that may be indicative of placement of CCR on the ground. As an example, if aerial photographs and USGS topographic maps indicate the existence of a pond or dam system at the site, this may be enough to warrant further investigation of available documents and may require field investigation depending on the strength of information to determine if the changes were made to allow placement of CCR on the ground.

One of the primary purposes of the information review is to provide an understanding of the CCR management activities at the facility, allowing for subsequent observations during the physical site inspection to be focused to the greatest extent practical. While information obtained during the review may be insufficient to support affirmative conclusions regarding the existence or non-existence of a CCRMU, based on the information available at most facilities, EPA expects that it will be possible to determine which areas at the facility would need to be inspected, and the type of data that would be needed to draw definitive conclusions. The Agency expects that the information gathered in the information review will be relevant to determining the areas to be inspected during the physical (visual) site inspection. Further, the information gathered during the information review would be used to support any necessary field activities.

EPA notes that the amount of available written information and documentation that will be available for review during the document review phase will vary by facility. Commenters confirmed this expectation by noting that many of the facilities subject to this final rule may have ceased operations years, and sometimes decades, ago. They also stated that record retention and storage locations may be difficult to determine and require some effort to access for some facilities. Based on past experience, EPA continues to believe that sufficient information is reasonably and readily available to allow facilities to obtain the information required under the FER. For example, as discussed in the proposal, under the 2015 CCR Rule facilities were generally able to obtain all of the information needed to compile a history of construction for their existing impoundments, even for units constructed decades ago. See, 40 CFR 257.73(c)(1). Nevertheless, owners or operators are required to compile this information only to the extent it is reasonably and readily available. EPA acknowledges that there may be certain information or data that may be unknown or lost. EPA intends that facilities provide relevant information only if documentation exists or if it is obtained during the physical site inspection. EPA does not expect owners or operators to provide anecdotal or speculative information regarding the presence or absence of CCRMU. However, if data gaps exist, owners or operators subject to these provisions may need to collect additional field data to fill the gaps.

The Part 1 FER must also include a narrative that documents the data reviewed as part of the facility evaluation process, and that lists all of the data and information reviewed that indicates the presence or absence of CCR management units at the facility. Finally, the FER must identify any data gaps, and provide a plan for remedying all identified data gaps through a physical examination of the facility, including any field or laboratory work needed to remedy data gaps identified in the narrative in the Part 1 FER record. The plan must include the major milestones needed to fill each identified data gaps (*e.g.,* a physical examination of the facility, sampling of media, measurements of CCR concentrations or physical presence, delineation of CCRMU) and dates to complete the needed tasks.

EPA is finalizing that Part 1 FER must contain the following: (1) The name and address of the person(s) owning and operating the facility; the unit name associated with any regulated CCR unit and CCRMU containing one ton or more of CCR at the facility; and the identification number of each CCR unit and CCRMU if any have been assigned by the State or by the owner; (2) The location of any CCRMU identified on the most recent U.S. Geological Survey (USGS) 7.5-minute or 15-minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available, with the location of each regulated CCR unit at the facility identified. The location of each regulated CCR unit at the facility must also be identified in the same manner; (3) A statement of the purpose(s) for which each CCRMU at the facility is or was being used; (4) A description of the physical and engineering properties of the foundation and abutment materials on which each CCRMU is constructed; (5) A discussion of any known spills or releases of CCR, including any associated remediation activities, from each CCRMU and whether the spills or releases were reported to State or Federal agencies; (6) Any record or knowledge of structural instability of each CCRMU; (7) Any record or knowledge of groundwater contamination associated or potentially associated with each CCRMU; (8) The size of each CCRMU, including the general lateral and vertical dimensions and an estimate of the volume of waste contained within the unit; (9) Identification of all types of CCR in each CCRMU at the facility; (10) A narrative description of any closure activities that have occurred, including any applicable engineering drawings or reports; (11) A narrative that documents the data reviewed as part of the facility evaluation process, and that lists all data and information indication the presences or absence of CCRMU at the facility; (12) Any supporting information used to identify and assess CCRMU at the facility, including but not limited to any construction diagrams, engineering drawings, permit documents, wastestream flow diagrams, aerial photographs, satellite images, historical facility maps, any field or analytical data, groundwater monitoring data or reports, inspection reports, documentation of interviews with current or former facility workers, and other documents or sources of information used to identify and assess CCRMU at the facility; (13) narrative description of any data gaps, for information in paragraphs (c)(i) through (xiii) of this section, not available in existing information collection records and a plan for remedying identified data gaps through a physical examination of the facility, including any field or laboratory work needed to remedy data gaps in the FER Part 1 record. The plan must include the major milestones needed to fill the identified data gaps (*e.g.,* a physical examination of the facility, sampling of media, measurements of CCR concentrations in and around the unit or physical presence, delineation of CCR management unit(s)) and dates to complete such needed tasks. Also, as necessary and timely, any updates to data gap remedy plans must be added to the public record during the FER Part 1. In addition, the FER is required to include a certification from a P.E. stating that the FER meets the requirements at § 257.75(c).

ii. Facility Evaluation Report Part 2—Physical Evaluation and Remedy of Data Gaps

A facility must conduct a physical site inspection of the entire facility in all cases. The purpose of the physical site inspection is to visually inspect the entire facility for evidence of CCR placement on the land, ensure that all CCRMU containing one ton or more of CCR have been identified, and fill any data gaps identified during the initial information evaluation. To that end, EPA is finalizing without revision the requirement that the physical site inspection must consist of a visual inspection of the entire facility to look for evidence that CCR is currently being managed on the land. At a minimum, a facility is required to visually inspect the site to confirm the information obtained from the information review phase and to identify any anomalies that warrant further investigation, such as an unnatural topographic rise or depression or an area where unspecified liquid waste was applied over several years. In addition, the facility is required to conduct any field work, such as soil sampling, necessary to determine whether areas that had been identified as a potential CCRMU in fact contain at least one ton of CCR and to obtain the information required for the FER.

The complexity of past and current facility operations, combined with the amount of data that was available for review during the information review phase would impact how extensive the facility inspection must be. For example, if facility records are sparse or contain data gaps, the Agency expects that the facility inspection would be more thorough than in situations where detailed records exist. However, even in situations where detailed facility records exist, the facility must still conduct a visual inspection to ensure that all CCRMU containing one ton or more of CCR have been identified, whether or not those areas were identified in the initial document review. In addition, EPA expects that in most cases, a facility will need to conduct some sampling or other fieldwork to obtain all the information required for the FER. For example, even if the facility had as-built engineering drawings for an old landfill, EPA expects that in some cases the facility may still need to conduct some sampling to establish the lateral and vertical dimensions of the CCRMU.

A facility can use a variety of visual means to inspect the entire site (*e.g.,* physically walking the site, using motorized vehicles to inspect the site, using drone video footage to inspect the site) to confirm the information obtained from the information review in Part 1 and to identify any anomalies that warrant further investigation, such as an unnatural topographic rise or depression or an area where unspecified liquid waste was applied over several years. EPA recommends that any sampling be conducted using standard industry methods, including any relevant standards and methodologies established by State environmental agencies. The FER must also include a discussion of quality assurance procedures, sampling equipment handling, sample collection, analytical methods, and data reporting.

If, after conducting a thorough document review and a visual inspection, the facility has found no evidence of any CCRMU, no further testing or sampling would be required to conclude that there is no CCRMU present at the facility. EPA is not requiring facilities to conduct widespread site sampling to prove that no CCRMU exists on-site. All recorded observations and data gathered during the facility evaluation, including any conclusions regarding the status of each CCRMU at the facility, must be assembled and incorporated into a FER, which is described in detail below.

EPA is finalizing that Part 2 FER must contain the following: (1) The name and address of the person(s) owning and operating the facility; the unit name associated with any regulated CCR unit and CCRMU containing one ton or more of CCR at the facility; and the identification number of each CCR unit and CCRMU if any have been assigned by the State; (2) The location of any CCRMU containing one ton or greater identified on the most recent U.S. Geological Survey (USGS) 7.5-minute or 15-minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available. The location of each regulated CCR unit at the facility must also be identified in the same manner; (3) A statement of the purpose(s) for which each CCRMU at the facility is or was being used; (4) A description of the physical and engineering properties of the foundation and abutment materials on which each CCRMU was constructed; (5) Any further evidence of known spills or releases of CCR, including any associated remediation activities, of CCR from each CCRMU and whether the spills or releases were reported to State or Federal agencies; (6) Any further evidence of structural instability of each CCRMU; (7) Any further evidence of groundwater contamination associated or potentially associated with each CCRMU; (8) The size of each CCRMU, including the general lateral and vertical dimensions and an estimate of the volume of CCR contained within the unit; (9) Identification of the types of CCR in each CCRMU; (10) A narrative description of any closure activities that have occurred, including any applicable engineering drawings or reports; (11) A narrative that documents the nature and extent of field oversight activities and data reviewed as part of the facility evaluation process, and that lists all data and information that was reviewed indicating the presence or absence of CCRMU at the facility; and (12) Any additional supporting information used to identify and assess CCRMU at the facility, including but not limited to any construction diagrams, engineering drawings, permit documents, wastestream flow diagrams, aerial photographs, satellite images, historical facility maps, any field or analytical data, groundwater monitoring data or reports, inspection reports, documentation of interviews with current or former facility workers, and other documents or sources of information used to identify and assess CCRMU at the facility. In addition, the FER is required to include a certification from a P.E. stating that the FER meets the requirements at § 257.75(c).

In addition to the information described in numbers (1)-(12) in the preceding paragraph, Part 2 of the FER must include a narrative that documents the nature and extent of field oversight activities and data reviewed as part of the facility evaluation process, and that lists all data and information reviewed that indicated the absence or presence of any CCRMU containing one ton or more of CCR at the facility. The narrative must also discuss how each data gap identified in Part 1 was addressed. As many commenters stated, the physical examination and any field work will require the hiring of specialized contractors. EPA understands this level of field and laboratory work will require a detailed work plan, and EPA expects the FER Part 1 data gap remedy plan to reflect this detail, including milestones and time frames for completion. EPA also anticipates that as field activities commence, plans to address data gaps may change and/or additional field work may be necessary based on ongoing discoveries. In these cases, the owner or operators will need to update the plans accordingly and update the publicly available information in the Part 1 or Part 2 FER, depending on the timing of the update.

b. Certification of Facility Evaluation Report—Part 1 and Part 2

The Agency proposed to require that the FER include a certification from a P.E. stating that the FER meets the requirements at § 257.75(c). Further, the Agency proposed to require that the FER include a certification to be signed by the owner or operator or an authorized representative similar to the certification that is required at § 257.102(e) and § 257.102(f) for existing units undergoing closure. Commenters raised concerns that the rules were not sufficiently objective or technically precise for a P.E. to be able to certify. One commenter raised that EPA has indicated that no facility has successfully implemented the 2015 CCR Rule's requirements to date, even though facilities have secured the certification of Qualified Professional Engineers as prescribed by the 2015 CCR Rule.

These commenters have misunderstood the purpose and role of the P.E. in the FER reports. The P.E. does not make final determinations; the role of the P.E. is to act as an engineer in information collection, data gap identification, physical site inspection, and remedy of data gaps and certify accordingly. As stated in the preamble of the 2015 CCR Rule, EPA reasoned that the requirement for a P.E. maintains the most important components of any certification requirement: (1) That the engineer be qualified to perform the task based on training and experience; and (2) that she or he be a professional engineer licensed to practice engineering under the title Professional Engineer which requires following a code of ethics with the potential of losing his/her license for negligence. The final rule requirements are sufficient for an P.E. to implement the final rule and follow industry standards.

Other commenters raised that the P.E. certification requirement is overly burdensome and will extend the timeframe to complete the facility evaluation. EPA has re-structured the process for the FER by extending the time frame and separated the FER into two parts with separate and adequate time frames to prepare the reports. When determining the new compliance deadlines, EPA considered the shortages and backlogs of qualified contractors as well as the increased strain on those contractors.

Another commenter asked for EPA to modify or add language to acknowledge the good faith and due diligence efforts of a P.E., especially when considering the age and nature of the potential CCRMUs. EPA does not agree with this suggestion. As discussed above, EPA discussed in the preamble of the 2015 CCR Rule that the P.E. follows a code of ethics with the potential of losing their license for negligence. As stated in the 2015 CCR Rule preamble, the Agency maintains that an engineer is able to give fair and technical review because of the oversight programs established by the State licensing boards that will subject the professional engineer to penalties, including the loss of license and potential fines if certifications are provided when the facts do not warrant it.

EPA does not agree with suggestions to modify the certification and therefore we are finalizing the certification language as proposed.

c. Facility Evaluation Reports Deadlines

The majority of the comments related to the timing and due date of the FER report stated that EPA had not allowed sufficient time to gather the required information and conduct a physical inspection of the facility. Comments cited many concerns with the proposed time frame, *i.e.,* the time frame was too short to complete all the tasks required, for the FER, *e.g.,* the difficulty in collecting historic information/data that may or may not be accessible at the facility or place of off-site records retention, the possible extensive volume of information, reports and/or data that owner or operators would need to review, the possible iterative nature of field work and sampling, the impact of seasonal disruptions to field work, the lack of qualified field personnel and the timing to acquire their services through contracts. Commenters suggested allowing significantly more time to complete individual aspects of the FER requirements.

EPA has reviewed the information provided by commenters citing the shortages and backlogs of qualified contractors, increased strain on those contractors related to the number of CCR units complying with the CCR rule simultaneously, difficulty accessing and reviewing historical documentation, potential seasonal disruptions, and time needed to perform quality control and quality assurance, and considers it to be persuasive. After considering these factors EPA has extended the time frame and separated the FER into two parts with separate and adequate time frames to prepare the reports.

The FER Part 1 is required to be prepared and placed in the operating record and posted on the facility's website, pursuant to § 257.105(f) no later than 15 months after the effective date of the final rule. This time frame was determined based on suggestions from commenters as to the time necessary to conduct a thorough review of historic records, and, if necessary, conduct interviews of those with facility and site knowledge, and by EPA further considering the time needed under RCRA Subtitle C and CERCLA to do similar reviews for historic sites.

The FER Part 2 is required to be prepared and included in the public record no later than 27 months after the effective date of the final rule. EPA established this time frame by also considering suggestions from commenters, who gave examples of timelines to hire contractors and conduct site work, as well as EPA's own experience and timelines at RCRA Subtitle C and CERCLA sites for conducting facility investigations. EPA believes the provided limited additional time is adequate to perform all necessary tasks under the FER, Part 1 and Part 2 respectively.

After completing the information gathering part of the facility evaluation process, owners or operators of covered facilities must compile and place in the operating record information pertaining to every CCRMU containing one ton or more of CCR located at the facility no later than the deadline identified below. Both Part 1 and Part 2 of the FER must be posted to the facility's CCR publicly accessible internet site within 30 days of that date. In developing the list of items to be included in the FER, the Agency examined certain requirements from existing regulations for History of Construction reports that must be generated for existing CCR surface impoundments at § 257.73(c)(1) as well as other requirements necessary to provide basic information about each CCRMU containing one ton or more of CCR at the facility.

After gathering the information required for the FER Part 1 (*i.e.,* not including a physical evaluation of the facility), the owner or operator must prepare a Part 1 FER by placing the information required in the facility's operating record as required by § 257.105(f)(25).

4. Applicable Existing CCR Requirements for CCR Management Units and Compliance Deadlines

EPA proposed that in addition to the facility evaluation requirements discussed in Unit III.C.3 of this preamble, owners or operators of a CCR facility comply with the existing requirements in part 257 for fugitive dust, groundwater monitoring, corrective action, closure, post-closure care, recordkeeping, notification, and internet posting. As explained in the preamble of the proposed rule, these requirements are intended to address the risks posed by any existing releases of CCR or CCR constituents to the groundwater, regardless of when the CCR was placed in the units and prevent future releases. The other existing requirements in 40 CFR part 257, subpart D are not necessary for CCRMU. For example, (1) since CCRMU should not contain sufficient liquids to create a hydraulic head or to otherwise cause the conditions that might lead to a structural failure, the structural stability requirements are not appropriate; (2) similar to legacy CCR surface impoundments, since CCRMU are existing units and will be required to close, the location restriction and liner design requirements would not be appropriate. EPA proposed that the fugitive dust, groundwater monitoring, corrective action, closure, post-closure care, recordkeeping, notification, and internet posting requirements apply to all CCRMU at active facilities and at inactive facilities with one or more legacy CCR surface impoundment.

Several commenters generally supported the regulatory approach, although a commenter suggested that CCRMU be subject to more existing CCR regulations, namely the location restrictions at §§ 257.60 through 257.64, the liner design criteria at § 257.71, and the structural stability requirements at § 257.73. This commenter stated that these requirements were necessary to protect human health and the environment from the risk of failure posed by poorly constructed and sited CCRMU and to provide information ''critical'' to developing unit closure plans and any necessary corrective action.

EPA disagrees that generally applying location restrictions, the structural stability requirements, and the liner design criteria to CCRMU would be appropriate. First, as explained in the proposed rule, the structural stability criteria are more appropriate for operational units and those units that maintain a hydraulic head. Second, the consequence of failing to comply with the location restrictions and liner design criteria requirements is closure by a specific date. 40 CFR 257.101(a) through (b)(1). Except for those situations described in Unit III.C.4.e (*i.e.,* deferral for CCRMU beneath critical infrastructure and deferral for CCRMU closed under a regulatory authority), because CCRMU are not operational CCR units and will in any event be required to close, the consequence for failure to comply with location restrictions or the liner design criteria (*i.e.,* ceased receipt of waste and closure) is moot. Additionally, the commenter failed to identify any information necessary for conducting corrective action pursuant to §§ 257.96 through 257.98 or closure in accordance with §§ 257.101 and 257.102 that would be gained by requiring CCRMU to comply with the location restrictions or liner design criteria that would not be gained by compliance with the facility evaluation and groundwater monitoring requirements.

Other commenters opposed the regulation of CCRMU holistically, citing lack of authority or lack of demonstrated risk to human health or the environment from CCRMU. Other commenters opposed EPA's proposal to apply specific existing requirements to CCRMU (*i.e.,* groundwater monitoring, corrective action, closure). Several of the commenters that opposed requiring CCRMU to comply with the existing regulations stated that applying a ''one-size-fits-all'' approach to CCRMU was not appropriate due to the variety of units that would be captured in the definition of CCMRU and suggested the EPA wait to regulate these units until site-specific requirements could be developed (*i.e.,* permitting programs). Comments regarding lack of authority or lack of demonstrated risk from CCRMU are summarized and addressed in Units III.A and III.C.2.a.i of this preamble, respectively. Comments about the applicability of specific existing requirements are described and responded to in later portions of this unit (Unit III.C.4). Regarding comments about the existing regulations being what commenters characterized as a ''one-size-fits-all'' approach to the variety of CCR units captured under the definition of CCRMU, EPA disagrees that the existing regulations are not holistically appropriate to apply to CCRMU or to address the potential risk from these units. Furthermore, commenters did not provide suggestions on how to regulate these units under the existing regulatory framework (*i.e.,* self-implementing rule) and EPA, as explained in Units III.A and III.C.1, finds the risks posed by these units to be not only credible but significant enough to warrant regulation at this time (*i.e.,* under the self-implementing rule as opposed to waiting until the Federal permitting program is established).

In response to comments and for the reasons laid out below, EPA is finalizing the requirements for CCRMU to comply with fugitive dust, groundwater monitoring, corrective action, closure, post-closure care, recordkeeping, notification, and internet posting requirements. These requirements apply to all CCRMU at active CCR facilities, at inactive facilities with one or more legacy CCR surface impoundments, and at active facilities that ceased placement of CCR in onsite CCR units before October 19, 2015, regardless of how or when the CCR was placed in the CCRMU. These issues are discussed in more detail in this Unit of the preamble.

a. Compliance Deadlines for CCR Management Units

EPA proposed compliance deadlines for CCRMU that closely aligned to the proposed compliance deadlines for legacy CCR surface impoundments. The proposed rule explained that the 2015 CCR Rule compliance deadlines were based on the amount of time determined to be necessary to implement the requirements and the proposed compliance dates for legacy CCR surface impoundments, and CCRMU were determined using the same approach. The proposed rule further explained that some factors considered in determining the 2015 CCR Rule compliance deadlines were not relevant for CCRMU, such as the need to coordinate compliance deadlines with the then recently promulgated ELG rule. In addition, EPA anticipated most owners or operators of CCRMU would already be familiar with the existing regulations, and therefore most of the proposed requirements for CCRMU. Consequently, EPA proposed generally expedited deadlines, as compared to the 2015 CCR Rule deadlines, based on the expected shortest average amount of time needed to complete the necessary activities to meet the requirements. In the proposed rule, EPA requested comment on the proposed compliance deadlines and the feasibility of meeting the proposed compliance time frames for CCRMU.

EPA received numerous comments regarding the proposed compliance deadlines. Several commenters expressed support for the proposed compliance deadlines for CCRMU. Generally, these commenters stated that expedited compliance was appropriate due to significant risk posed by these units, the likelihood that these units are actively contaminating groundwater, and the urgent need for corrective action to address that contamination for the protection of human health and the environment. Some of these commenters echoed the proposed rule, stating that owners' or operators' familiarity with the existing requirements, along with the fact that these units are no longer in use and therefore would not need time to cease receipt of waste, further justified the expedited deadlines.

Many other commenters stated the proposed compliance deadlines were infeasible and should, at a minimum, allow as much time for compliance as the 2015 CCR Rule deadlines, although several commenters expressed that even the 2015 CCR Rule deadlines were inadequate, and that the insufficient time frames were likely a factor in the gap between EPA's expectations and facilities' good faith efforts and utilization of best practices in developing groundwater monitoring networks, sampling and analysis plans, corrective action programs, and closure plans. Commenters pointed to several factors that they believed EPA did not fully incorporate into the proposed deadline calculations that make compliance with the proposed deadlines infeasible: EPA's grossly underestimated number of CCRMU; the large number of CCR units (*i.e.,* existing CCR units, legacy CCR surface impoundments, CCRMU) competing for limited resources to meet overlapping compliance deadlines; the limited number of qualified contractors available to conduct necessary activities to reach the compliance deadlines; the nationwide labor shortage exacerbated by impacts from the COVID–19 pandemic; limited existing alternative disposal options; overlapping regulatory requirements (*e.g.,* State drilling permits, timing restrictions related to protected habitats, State CCR permits, Consent Decrees/Orders); seasonality impacts in different regions across the nation; and accessibility and completeness, or lack thereof, of historical documentation and information. One commenter provided specific information regarding typical delays experienced during the implementation of the 2015 CCR Rule caused by third-party availability and backlogs: two to four weeks for contractor mobilization; two to six weeks for site clearing; two to three weeks for surveys; three to 12 weeks for environmental drillers; and three to four weeks for laboratory analyses. These commenters also said EPA grossly underestimated the amount of time needed to hire a contractor, locate and review historical information, access historical or heavily vegetated portions of facilities, characterize and delineate a site, comply with the groundwater monitoring requirements, and conduct quality control or quality assurance on data and reports. Several of these commenters expressed the belief that the proposed deadlines would result in unintentional non-compliance despite facilities' best efforts to comply due to the constraints listed above. Finally, a few commenters suggested EPA create alternative deadlines or mechanisms for extensions based on site-specific characteristics.

In response to comments, EPA reevaluated the compliance deadlines for CCRMU. EPA reconsidered the impact of the following on the amount of time facilities needed to complete the activities involved in meeting the requirements: the potential size of the CCRMU universe; accessibility and abundance, or lack thereof, of historical documentation; seasonality; clearing restrictions and required local and State approvals to clear vegetation or drill wells; need to coordinate with local or State regulatory authorities; existing disposal options; impact of the national labor shortage and contractor and laboratory backlogs; and the strain on limited resources from overlapping compliance deadlines for legacy CCR surface impoundments, existing units (*i.e.,* groundwater monitoring, closure, and post-closure care), and CCRMU. Overall, EPA found the information provided regarding the infeasibility of the proposed deadlines convincing. Specifically, EPA acknowledges the potential for an underestimation of the CCRMU universe given the number of comments received regarding non-containerized CCR historically being spread across facilities. Additionally, EPA agrees that the shortage of qualified contractors and laboratory resources has persisted, if not increased, since the 2015 CCR Rule and that the increasing demand on these finite resources from new and existing CCR units, legacy CCR surface impoundments, and CCRMU complying with overlapping requirement deadlines will likely result in additional delays. EPA acknowledges that the proposed deadlines did not adequately account for those nationwide impacts of seasonality and extreme weather events; necessary coordination with outside parties (*e.g.,* State agencies, local governments); locating disposal capacity for those units closing by removal; the need to comply with overlapping regulatory requirements, such as State drilling permits or timing restrictions related to protected habitats; or necessary quality assurance and quality control in calculating the proposed deadlines. Furthermore, as detailed in Unit III.C.3.c, EPA recognizes that the proposed CCRMU deadlines did not provide sufficient time for the completion of the FER which serves as the prerequisite requirement for all other CCRMU requirements. Additionally, the concurrent deadlines for legacy CCR surface impoundments and CCRMU did not allow for inactive facilities to first determine if there is a legacy CCR surface impoundments onsite before complying with the CCRMU regulations. Therefore, as detailed in Units III.C.3 and III.C.4.c through e, EPA extended the deadlines for CCRMU to provide: (1) At least as much time facilities had to come into compliance with the 2015 CCR Rule, (2) Sufficient time for owners or operators to complete a robust FER, and (3) Additional time such that the deadlines for legacy CCR surface impoundment do not coincide with the CCRMU deadlines, with the exception of the requirement to establish a CCR website and the completion of the history of construction (for legacy CCR surface impoundments) and the FER Part 1 (for CCRMU) which can be conducted concurrently. These extended deadlines for CCRMU will mitigate factors mentioned by commenters that convinced EPA the proposed deadlines would be infeasible for CCRMU. Overall, most of the comments EPA received supported deadlines that allowed at least as much time as EPA originally provided in the 2015 CCR Rule.

Note that all deadlines herein are framed by reference to the effective date of the rule; the final rule will be effective six months after publication of the final rule. Accordingly, facilities will have an additional six months beyond the deadlines to come into compliance. The Agency has included a document in the docket for this rule that summarizes the finalized compliance deadlines.[142]

TABLE 2—FINAL COMPLIANCE TIME FRAMES FOR CCRMU

40 CFR Part 257, Subpart D requirement	Description of requirement to be completed	Deadline (months after effective date of the final rule)	Date
Internet Posting (§ 257.107)	Establish CCR website	15	Monday, February 9, 2026.
Facility Evaluation Report (§ 257.75).	Complete the Facility Evaluation Report Part 1	15	Monday, February 9, 2026.
Facility Evaluation Report (§ 257.75).	Complete the Facility Evaluation Report Part 2	27	Monday, February, 8, 2027.
GWMCA (§ 257.91)	Install the groundwater monitoring system	42	Monday, May 8, 2028.
GWMCA (§ 257.93)	Develop the groundwater sampling and analysis program.	42	Monday, May 8, 2028.
GWMCA (§§ 257.90–257.95)	Initiate the detection monitoring and assessment monitoring. Begin evaluating the groundwater monitoring data for SSIs over background levels and SSLs over GWPS.	42	Monday, May 8, 2028.
GWMCA (§ 257.90(e))	Complete the initial annual GWMCA report	January 31, 2029	January 31, 2029.
Closure (§ 257.102)	Prepare written closure plan	48	Wednesday, November 8, 2028.
Post-Closure Care (§ 257.104)	Prepare written post-closure care plan	48	Wednesday, November 8, 2028.
Closure and Post-Closure Care (§ 257.101).	Initiate closure	54	Tuesday, May 8, 2029.

b. Fugitive Dust Requirements for CCR Management Units

The air criteria in the existing regulations address the pollution caused by windblown dust by requiring the owners or operators of CCR units to minimize CCR from becoming airborne at the facility. 40 CFR 257.80. These requirements apply to the entire facility, which means that the owner or operator is required to minimize CCR fugitive dust originating not only from the CCR unit, but also from roads and other CCR management and material handling activities at the facility. Consequently, under the proposal, CCRMU would already be covered by the fugitive dust requirements in § 257.80 because CCRMU are located at facilities with a CCR unit. EPA therefore only proposed to make those changes to the fugitive dust requirements in § 257.80 that are necessary to make clear that these requirements also apply to CCRMU. Specifically, EPA proposed to amend the regulations to add ''CCRMU'' to the list of units subject to the requirements under § 257.80 and associated provisions under §§ 257.105 through 257.107. Additionally, EPA solicited comments on amending § 257.80(b)(6) to include a deadline for facilities to amend the fugitive dust control plan no later than 30 days following a triggering event, such as the closure of a CCRMU or change in facility or CCR unit operations.

No commenters raised concern about requiring CCRMU to comply with the existing requirements in § 257.80. EPA is therefore finalizing this provision without revision.

One commenter supported creating a deadline for the amendment of the fugitive dust plan no later than 30 days following a triggering event. This commenter went on to suggest that EPA further revise § 257.80 to require owners or operators to notify potentially impacted populations including residents living within three miles of the plant, populations potentially impacted by transportation of CCR, and residents living near disposal areas where CCR will be off-loaded and disposed and to require air monitoring at excavation sites and plant boundaries. The commenter was not clear on the circumstances in which owners or operators would notify potentially impacted population or what these populations would be notified of and did not provide a factual basis to support the need for air monitoring at regulated CCR units. Therefore, EPA is therefore only finalizing an amendment to § 257.80(b)(6) to require owners or operators to amend the fugitive dust plan no later than 30 days following a triggering event, such as the closure of a CCR unit or change in facility or CCR unit operations.

c. Groundwater Monitoring and Corrective Action Requirements for CCR Management Units

EPA proposed to require CCRMU to comply with the existing groundwater monitoring and corrective action criteria in 40 CFR 257.90 through 257.98, with one revision, to require sampling and analysis of constituents listed in Appendix IV at the same time as those listed in Appendix III. As explained in the proposed rule at 88 FR 32003, §§ 257.90 through 257.95 require owners or operators of a CCR unit to install a system of monitoring wells, specify procedures for sampling these wells, and set forth methods for analyzing the groundwater data collected to detect hazardous constituents (*e.g.,* toxic metals) and other monitoring parameters (*e.g.,* pH, total dissolved solids) released from the units. If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required as laid out in §§ 257.96 through 257.98. These requirements apply until closure in accordance with § 257.102(c) is

[142] A document ''Final Rule Compliance Deadlines for CCR Management Units. April 2024.'' is available in the docket for this action.

complete or the post-closure care period of the CCRMU ends.

Several commenters expressed support for requiring CCRMU to comply with these groundwater monitoring and corrective action requirements, stating CCRMU can and have caused groundwater contamination. Some commenters suggested additional requirements be added to those in §§ 257.90 through 257.98, including a mandate to test groundwater quality outside the boundary of the facility and make those results public, a deadline for the completion of the selection of remedy required by § 257.97, and a prohibition against using intrawell groundwater data comparisons at CCRMU. However, other commenters stated that applying the existing groundwater monitoring and corrective action requirements to CCRMU is not appropriate and suggested that instead EPA incorporate flexibility into the CCRMU regulations by providing for alternative groundwater monitoring standards and site-specific risk-based corrective action into the CCR regulations. These commenters suggested groundwater monitoring standards that allow owners or operators to complete evaluations to determine if Appendix IV constituents are above the GWPS instead of conducting monitoring, allowing a site-wide groundwater network, and exempting units from groundwater monitoring when owners or operators are able to demonstrate through site-specific risk assessments there is no probable risk to groundwater. These commenters said these alternative approaches are necessary to address the overburdensome nature of compliance with groundwater monitoring and corrective action when a unit has already completed closure under a State authority and when units are completing groundwater monitoring under a State or other Federal program. Some of these commenters stated that EPA does not have the record to demonstrate potential risk from these units to justify requiring groundwater monitoring and corrective action as laid out in the existing regulations, especially for units that have already completed closure under a State authority. Other commenters said that flexibility is needed due to the diversity of CCR units captured in the definition of CCRMU, age of some of the units, and overlapping State requirements.

EPA further proposed two deadlines for the groundwater monitoring requirements, as opposed to the single deadline in the 2015 CCR Rule. EPA received numerous comments on EPA's proposal to split the single deadline for groundwater monitoring requirements contained within the 2015 CCR Rule (24 months from the effective date of the final 2015 rule) into two separate deadlines (six months from the effective date of the final rule for the installation of the groundwater monitoring network and development of the groundwater sampling and analysis plan and 24 months from the effective date of the final rule for the initiation of the combined detection and assessment monitoring). A few commenters expressed support of the two separate deadlines for groundwater monitoring requirements, stating it increased accountability and ensured owners or operators were not unnecessarily delaying the installation of the groundwater monitoring system. However, overall, commenters stated that the groundwater monitoring requirements should have a single deadline as the separate deadlines made compliance with the rule infeasible. Several commenters said the proposed split deadlines eliminated the flexibility necessary for compliance that was contained within the 2015 CCR Rule's single deadline. Those commenters went on to say the single deadline allowed facilities to accommodate for delays associated with factors outside their control, such as third-party availability, weather, and required permits or approvals, by making schedule adjustments necessary to achieve compliance (*e.g.,* expedite the development of the sampling plan in the case of delays with the well installation). Other commenters said the proposed two deadlines were unnecessarily prescriptive. One commenter pointed out that the proposed rule contained no deliverables to verify compliance for the installation of wells or the development of the sampling and analysis plan.

As explained in the proposed rule, the existing groundwater monitoring and corrective action requirements are essentially the same requirements that have been applied to both hazardous waste and municipal solid waste disposal units for decades, and with the one exception discussed below, there is nothing about CCRMU that makes them distinct enough to warrant separate groundwater monitoring requirements from other CCR units. No commenter provided any factual basis for treating CCRMU differently than all of the other units that currently comply with the same groundwater monitoring and corrective action requirements. Specifically, for commenters who requested alternative groundwater monitoring requirements to allow site-wide or property-boundary groundwater monitoring due to the potential presence of CCRMU across the facility, the commenters failed to explain how the provisions at § 257.91(d), which allow for multiunit groundwater monitoring systems fail to address their concern.

Regarding the request for alternative groundwater monitoring criteria to mitigate the inappropriateness of requiring compliance with the CCR groundwater monitoring and corrective action requirements when the CCRMU has already completed closure under a State authority or when the CCRMU is already subject to another State or Federal groundwater monitoring program, the commenters did not provide any factual or specific information to support the conclusions that groundwater monitoring and corrective action is not appropriate for all CCRMU that have completed closure under a State authority or that utilizing or augmenting an existing groundwater monitoring network that may have been required as part of the State closure or other groundwater monitoring program would be infeasible or inappropriate. Furthermore, as explained in Unit III.C.4.e, EPA received comments regarding State closures during which no groundwater monitoring was required, thereby highlighting the need for groundwater monitoring and corrective action, if necessary, even in situations in which closure has been completed under a State authority.

For those commenters requesting that EPA adopt ''risk-based groundwater monitoring and corrective action'' into the requirements, EPA notes that the commenters have provided no further explanation of what requirements in the existing regulations they wanted EPA to revise, what the revisions should accomplish, or any factual basis for why they are necessary or appropriate. As a general matter EPA considers that the corrective action regulations in §§ 257.95 through 257.98 do currently require facilities to tailor remedies to address the risks to human health and the environment, based on the conditions at the site. It is unclear what more the commenters are seeking. Accordingly, EPA is finalizing the proposal that CCRMU comply with the existing groundwater monitoring and corrective action requirements with one modification, combined detection and assessment monitoring.

However, EPA agrees that having a single deadline for groundwater monitoring requirements as opposed to two deadlines allows flexibility to complete tasks, such as installing groundwater wells and collecting independent samples, that is necessary for compliance with a nationwide rule. The activities involved in achieving compliance with the groundwater monitoring requirements (*i.e.,* drilling wells, collecting samples, receiving lab results) are more susceptible to factors outside a facility's control, such as extreme weather events, shortages of qualified contractors, and permitting or approval delays, and therefore, warrant greater flexibility. Additionally, activities can be restricted dependent on the time of year and the location of the facility (*e.g.,* due to seasonality, protected species, clearing restrictions). Because the groundwater monitoring requirements build upon each other, EPA must ensure that facilities nationwide are reasonably able to achieve regulatory compliance by the deadline. Utilizing a single deadline for the groundwater monitoring requirements allows facilities to make reasonable accommodations for regional factors in a way the proposed deadlines do not, while still maintaining the same level of protection for human health and the environment. Furthermore, EPA agrees that the proposed rule does not have a clear mechanism for facilities to prove compliance or for interested parties to verify compliance with the separate deadlines for the installation of the groundwater monitoring network and the development of the groundwater sampling and analysis plan.

As stated in Unit III.C.4.a, EPA recognizes that the proposed CCRMU deadlines did not provide sufficient time for the completion of the FER and therefore extended the deadline for the completion of the FER by 24 months as detailed in Unit III.C.3.c. The FER informs the owner or operator of the presence or absence of CCRMU at the facility, which is vital information for the completion of the groundwater monitoring system requirements (*i.e.,* design and installation of the groundwater monitoring system). As such, the deadline for the groundwater monitoring requirements must be extended as well to allow owners or operators time to locate CCRMU as part of the FER. Furthermore, EPA was convinced that the deadlines for compliance with the legacy CCR surface impoundments and CCRMU requirements should be offset to mitigate impacts mentioned by commenters regarding the current labor shortages and backlogs experienced by third-parties necessary to accomplish tasks involved in complying with the groundwater monitoring requirements (*e.g.,* drillers for well installation, laboratories for sample analysis) and the need for owners or operator of inactive facilities to first determine if there are legacy CCR surface impoundments onsite. Finally, based on the above-mentioned factors and the information provided by commenters, specifically the information regarding the suspected underestimation of the CCRMU universe due to historic facility-wide placement of non-containerized CCR on land, time needed to obtain necessary approvals (*e.g.,* State permits to drill water wells or clear vegetation), and to accommodate for seasonality, EPA has calculated 18 months as the appropriate extension of the groundwater monitoring system deadlines for the latest groundwater monitoring requirement. In the proposed rule, the latest proposed deadline for groundwater monitoring requirements was the deadline of 24 months from the effective date of this final rule for the initiation of the combined detection and assessment monitoring and the collection of the eight baseline samples. Therefore, EPA is finalizing a single deadline of no later than 42 months after the effective date of this final rule for the groundwater monitoring requirements found at §§ 257.90 through 257.95.

i. Design and Installation of the Groundwater Monitoring System for CCR Management Units

EPA proposed that owners or operators of CCRMU install the groundwater monitoring system as required by § 257.91 no later than six months from the effective date of this final rule. EPA further proposed that existing monitoring wells can be used as a part of the CCRMU groundwater monitoring systems provided the wells meet the Federal criteria. As explained in the proposed rule, based on the amount of time most facilities needed to complete or to collect baseline sampling, EPA calculated that facilities would be able to install the necessary monitoring wells within a single year.

As mentioned earlier, some commenters supported the expedited deadlines. However, most commenters stated the proposed deadline of six months from the effective date of the final rule for the design and installation of the groundwater monitoring network was infeasible and should be extended to no less than 24 months from the effective date to align with the 2015 rule deadline. As explained above, many of these commenters expressed the need for a single deadline for groundwater monitoring requirements. Furthermore, as described in Unit III.C.4.a of this preamble, these commenters cited seasonality restrictions, the nationwide labor shortages, limited qualified contractor availability, the need for State approvals and permits, and the number of facilities competing for limited resources as reasons for why the proposed expedited deadline is infeasible. A few commenters noted that in recent decisions on Part A demonstrations, EPA cited deficiencies in the groundwater monitoring network as a basis for noncompliance. These commenters went on to state that the proposed deadline does not facilitate the establishment of a monitoring system that would meet the standards laid out in the CCR rule or the recent proposed decisions and thus, the proposed deadline creates de facto non-compliance. Some of these commenters elaborated by saying that the deadline does not allow facilities to acquire the permits that may be required to drill wells and precludes the observation of groundwater levels over time, which is needed to properly characterize groundwater flow. Other commenters stated meeting the proposed compliance deadline would prevent a facility from conducting proper site characterization, which is needed to inform well placement and depth and providing P.E.s sufficient information to certify the groundwater monitoring system. Lastly, commenters stated that contrary to EPA's assertion in the proposed rule that expediting the installation of the groundwater monitoring network is protective of human health and the environment, to meet the proposed deadline, facilities would likely be forced to design groundwater monitoring systems based on inadequate data resulting in unreliable groundwater monitoring data. Commenters provided estimates of time needed to comply with the design and installation of the groundwater monitoring system requirements ranging from nine to 36 months.

As stated in Unit III.C.4.a of this preamble, in response to comments EPA reevaluated the compliance deadline for the design and installation of the groundwater monitoring network and found the information provided regarding the general infeasibility of the proposed deadline compelling. Specifically, EPA agrees that more time is needed to allow inactive facilities time to determine if a legacy CCR surface impoundment is online prior to complying with the CCRMU requirements and to account for limited third-party availability (*e.g.,* contractor shortages and laboratory backlogs), seasonality and extreme weather events, procuring a contractor, complying with overlapping regulatory requirements, and coordinating with outside parties. EPA acknowledges the importance of proper site characterization as the foundation for designing a groundwater monitoring system and is convinced that although there may be some facilities that have adequate information for site characterization, many of these facilities, especially inactive facilities, may need to conduct more extensive site reconnaissance and field work to obtain the necessary information due to the widespread use of non-containerized CCR across facilities. EPA further recognizes that groundwater monitoring systems designed using inadequate data would be unable to properly monitor groundwater quality coming from the unit and therefore would not be protective of human health and the environment. Lastly, because EPA is convinced by information from the commenters that facilities would be unable to conduct all the steps necessary to design and install a groundwater monitoring system capable of meeting the standards in § 257.91 by the proposed deadline, EPA has extended the deadline.

As stated in Unit III.C.4.c, based on information provided by commenters, EPA concluded that a single deadline of 42 months from the effective date of this final rule should be used for the groundwater monitoring requirements. Therefore, EPA is finalizing a deadline for the completion of the design and installation of the groundwater monitoring system of no later than Monday, May 8, 2028, which is 42 months from the effective date of this final rule. This is codified in the regulatory text at § 257.90(b)(3)(i).

To complete the installation of the groundwater monitoring system, the owner or operator of a CCRMU must ensure the monitoring system consists of sufficient number of wells both upgradient and downgradient of the CCR unit, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that accurately represent the quality of background groundwater and groundwater passing the downgradient waste boundary of the CCR unit, monitoring all potential contaminant pathways. 40 CFR 257.91(a)(1) through (2). Because hydrogeologic conditions vary so widely from one site to another, the regulations do not prescribe the exact number, location, and depth of monitoring wells needed to achieve the general performance standard. Rather the regulation requires installation of a minimum of one upgradient and three downgradient wells, as well as any additional monitoring wells necessary to achieve the general performance standard of accurately representing the quality of the background groundwater and the groundwater passing. See, 80 FR 21399. The number and placement of the monitoring wells is critical to proper characterization of the groundwater. Thus, the specific number, spacing, and depth of the monitoring wells must be determined based on site-specific information, including but not limited to the thorough characterization of aquifer thickness, groundwater flow rate, groundwater flow direction throughout seasonal and temporal fluctuations, the unit's geological setting, and the unit's hydrogeological setting.

The monitoring wells must be cased, constructed, operated, and maintained in a way that preserves the integrity of the monitoring well borehole, screened interval and other components so as to ensure the well performs to the design specifications throughout the life of the monitoring system. EPA expects owners or operators to ensure the groundwater monitoring wells are adequately protected from activities that may damage the wells or otherwise adversely impact their performance, such as accidental damage caused by livestock, vehicles, machinery, or other activities near the unit.

The owner or operator of the unit must ensure that the design, installation, development, and decommissioning of any aspect of the groundwater monitoring system is thoroughly documented and included in the operating record. Furthermore, the owner or operator must obtain a P.E. certification or approval from the Participating State Director or EPA stating the groundwater monitoring system meets the standards set out in § 257.91.

ii. Development of the Groundwater Sampling and Analysis Plan for CCR Management Units

EPA proposed to require owners or operators of CCRMU to comply with the existing groundwater sampling and analysis program requirements for CCR units, including the selection of the statistical procedures that will be used for evaluating groundwater monitoring data. 40 CFR 257.93. EPA proposed a deadline of no later than six months after the effective date of the final rule for owners or operators to comply with this requirement.

One commenter suggested EPA prohibit use of intrawell groundwater data comparisons for CCRMU. This commenter stated that intrawell comparisons are only appropriate when the background samples are collected before CCR was placed in the unit and therefore, since these units are likely already contaminating groundwater, they would be ineligible for intrawell data comparisons. Other commenters requested EPA allow alternative groundwater monitoring requirements, such as alternative groundwater sampling procedures and statistical analysis because of the inability to collect groundwater samples unaffected by CCR at some facilities due to the number of CCRMU at the site. As stated in Unit III.C.4.c, the existing groundwater monitoring and corrective action requirements are essentially the same requirements that have been applied to both hazardous waste and municipal solid waste disposal units for decades, and with the one exception discussed below, there is nothing about CCRMU that makes them distinct enough to warrant separate or additional requirements. Furthermore, while EPA expects many CCRMU have leaked or are potentially leaking, the commenter did not provide any evidence for creating a prohibition against intrawell data comparisons. Therefore, EPA will not be finalizing a prohibition on intrawell data comparisons at CCRMU. However, EPA acknowledges that since the 2015 CCR Rule went into effect, intrawell groundwater data comparisons have been misused to a large degree. Regarding the commenter who stated that the owner or operator would be unable to accurately represent background groundwater quality due to the potential extensive presence of CCRMU across the facility, during implementation of the 2015 CCR Rule, EPA has not found a situation in which representing background groundwater quality was impossible nor does EPA believe such a situation exists, as owners or operators are allowed to collect samples as far upgradient as needed, even offsite, to ensure that the groundwater sample is not impacted by CCR. Additionally, at § 257.91(a)(1), EPA allows the owner or operator to collect background groundwater samples at other representative wells when hydrogeologic condition do not allow the determination of what wells are hydraulically upgradient wells or when other wells are more representative of background groundwater quality than upgradient wells. Furthermore, the commenter's assertion relied solely on the exhaustive presence of CCRMU at the facility as evidence of the inability to represent background water quality and did not provide any factual basis to support their claim that the requirement to establish background groundwater quality as part of the groundwater monitoring requirements is infeasible. EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.90(b)(3)(ii).

EPA received several comments on the proposed deadline for the development of the groundwater sampling and analysis plan. As mentioned in Unit III.C.4.c, some commenters supported the expedited deadline. However, several other commenters pointed out that the sampling and analysis plan cannot be completed prior to the collection of the baseline samples, which had a proposed deadline of 24 months from the effective date. Many of these commenters went on to state that the proposed expedited deadline for the development of the sampling and analysis plan could result in too frequent sampling leading to non-independent, autocorrelated baseline samples for a large number of facilities, undermining the required statistical analysis. A few commenters further stated that EPA published decisions on Part A and Part B demonstrations citing lack of statistical independence in sampling as a basis for non-compliance, and failure for EPA to extend the deadline for the sampling and analysis plan to allow adequate time for facilities nationwide to gather independent samples would create de facto non-compliance.[143] Commenters also said that the proposed deadlines do not account for the backlogs already experienced due to the existing CCR units using the small number of laboratories qualified to conduct the specialized analyses required by the rule, coupled with the national labor shortages. The commenters predicted the backlogs with laboratories will only increase with the regulation of legacy CCR surface impoundments and CCRMU, making the proposed deadlines even more infeasible. Finally, as mentioned in Unit III.C.4.c, commenters emphasized the need for one deadline for all groundwater monitoring requirements.

EPA agrees that a sampling and analysis plan cannot reasonably be completed before the collection of baseline samples. EPA also acknowledges the adverse impact of too frequent sampling on the validity of statistical analysis and the need to account for seasonal variability in groundwater flow, groundwater levels, and constituent concentrations. EPA further acknowledges that providing insufficient time for the collection of baseline samples or the development of the sampling and analysis plan would likely result in ineffective groundwater monitoring programs that may fail to alert facilities to groundwater contamination coming from CCR units. As explained in Unit III.C.4.a and Unit III.C.4.c respectively, EPA recognizes the need for more time to accommodate third-party availability and a single deadline for the groundwater monitoring requirements. As stated in Unit III.C.4.c.i, for the reasons laid out above, EPA is finalizing a single deadline for the groundwater monitoring requirements of no later than Monday, May 8, 2028, which is 42 months from the effective date of this final rule. This is codified in the regulatory text at § 257.90(b)(3)(ii).

The owner or operator must develop the groundwater sampling and analysis program that satisfies the requirements in § 257.93 and includes a list of monitoring wells to be sampled (*i.e.,* the monitoring network), the schedule for sampling, sampling procedures and techniques, sample preservation and shipping protocols, analytical procedures including an appropriate statistical method for analysis, and quality assurance and quality control methods. The sampling and analysis plan must include all analytes listed in Appendix III and Appendix IV. Recommendations and information on how to comply with many of the requirements for the groundwater sampling and analysis program (*e.g.,* analytical procedures, QA/QC controls, sampling protocol) can be found in the following EPA guidance documents (*e.g., RCRA Groundwater Monitoring: Draft Technical Guidance,* 1992, EPA/530/R–93/001; *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures,* 1996, EPA/540/S–95/504).

iii. Detection Monitoring Program and Assessment Monitoring Program Combined

EPA proposed to require sampling and analysis of constituents listed in Appendix IV at the same time as those listed in Appendix III. The proposed rule explained that this would expedite groundwater monitoring and initiation of corrective action by at least six months at sites where units have potentially been leaking for a long period of time, as is likely the case at CCRMU. The proposed rule further explained that the expediting Appendix IV constituent detection and any resulting corrective action is necessary for the protection of human health and the environment. EPA proposed no other revisions to the existing groundwater monitoring requirements in §§ 257.90 through 257.95.

EPA received several comments on its proposal to combine detection and assessment monitoring. One commenter pointed out the increased demand on laboratory services, facility staff and/or contractors, and professional engineers that would result from having CCRMU comply with both monitoring programs simultaneously. Another commenter stated that by combining detection and assessment monitoring and assuming groundwater contamination, EPA has rendered detection monitoring superfluous. Further, the commenter asserted that skipping detection monitoring entirely would lose critical data regarding whether there are statistically significant increases in groundwater constituents specifically due to the unit being monitored. One commenter stated that EPA lacked the record demonstrating risk posed by CCRMU to warrant combined detection and assessment monitoring and should either maintain the approach in the existing regulations or only apply groundwater monitoring to those CCRMU that have been identified as a source of an SSI or SSL in an ASD. Another commenter said that the justification in proposed rule regarding phased groundwater monitoring being ''best suited to situations where there is little likelihood of pre-existing contamination'' conflicts with EPA's position in the 2015 CCR Rule. According to the commenter, in the 2015 CCR Rule, the Agency was aware many CCR surface impoundments were decades old and potentially leaking; yet EPA still adopted a phased approach with detection monitoring to monitor indicators of potential groundwater contamination and assessment monitoring to determine if releases of CCR constituents of concern did occur.

As a practical matter, EPA expects combining Appendix III and Appendix IV constituents into a unified sampling and analysis plan and approach will likely have only minor effects on schedules, as this change will not require additional field mobilizations or sampling events and will only require collection of a slightly larger number of sample containers at each monitoring well to allow for analysis for both Appendix III and IV constituents. As such, no additional shipments of

[143] On January 25, 2023, EPA proposed determinations on six Part B applications for alternate liner demonstrations (''Part B''). All six proposals are proposed denials. The CCR Part B Final Rule (85 FR 72506, November 12, 2020), allowed a limited number of facilities to demonstrate to EPA or a Participating State Director that, based on groundwater data and the design of a particular surface impoundment, the unit has and will continue to ensure there is no reasonable probability of adverse effects to human health and the environment.

samples to the analytical laboratory will be required. However, EPA acknowledges that combining Appendix III and Appendix IV constituents into a unified sampling and analysis plan may increase the total throughput burden on analytical laboratories and related services. Similarly, while combined monitoring may require additional evaluation (*e.g.,* concentration and trend analysis of data concerning both Appendix III and Appendix IV constituents), this incremental increase is unlikely to significantly increase the overall reporting level of effort, as the number of reports will be essentially unchanged.

Nevertheless, as discussed in Units III.C.4.a and III.C.4.c of this preamble, EPA acknowledges the commenters' concerns regarding existing and projected labor shortages, backlogs, and third-party availability, and agrees this has the potential to affect facilities' ability to comply with the proposed deadlines for groundwater monitoring requirements. EPA is therefore extending the deadline, as well as building in flexibility for facilities to accommodate for delays, by finalizing a single deadline for groundwater monitoring requirements in lieu of the proposed split deadlines.

However, EPA disagrees that combining detection and assessment monitoring will render detection monitoring redundant, and that critical data would be lost, by sampling for Appendix IV constituents at the same time as Appendix III constituents (*i.e.,* by collecting more information). The commenters provided no further explanation of what information they thought would be lost, but under the combined monitoring, the facility would collect the same information on Appendix III constituents that is collected under the detection monitoring in § 257.94. Given that under the existing assessment monitoring provisions, facilities must simultaneously analyze samples for all parameters in Appendix III and for any Appendix IV constituent detected in the initial sampling, it is not apparent why the commenter believes that requiring simultaneous monitoring more broadly is appreciably different. 40 CFR 257.95(d)(1).

As stated in the previous paragraph, concurrent monitoring for Appendix III and Appendix IV constituents provides considerably more information and enables a more complete understanding of the geochemical nature, fate, and transport of any detected releases. Additionally, simultaneously collecting samples for Appendix III and Appendix IV constituents will still provide the basis for determining SSIs, should they exist, so no information will be lost. Contrary to the commenter's concern, additional information will be gained in an expedited manner (*e.g.,* the potential spatial and temporal correlation of Appendix III SSIs with exceedances of SSLs for Appendix IV constituents). Furthermore, EPA disagrees that its explanation that phased groundwater monitoring is "best suited to situations where there is little likelihood of pre-existing contamination" fundamentally conflicts with EPA's decision to adopt phased monitoring in the 2015 CCR Rule. Unlike this rule, the 2015 CCR Rule applied to both new facilities, which would be expected to have little likelihood of pre-existing contamination, and to existing facilities. Over the long-term, EPA expected that there would eventually be a greater percentage of new units than existing units as the older units reached capacity and closed. In addition, as discussed in the proposal at 88 FR 32010 and in Unit III.A.2 of this preamble, it is clear from the data posted on facilities' websites that in 2015 EPA significantly underestimated the number of unlined units (both impoundments and landfills), and consequently, significantly underestimated the number of leaking units and the extent of contamination at these sites.

Under the phased approach in the current regulations, detection monitoring was intended to provide an early detection of whether groundwater was potentially being contaminated. In selecting the parameters for detection monitoring, EPA chose constituents present in CCR that would be expected to move rapidly through the subsurface and thus provide an early detection of a potential problem before significant releases of constituents of greatest concern (*i.e.,* those in Appendix IV) had occurred. This approach rests on a presumption that the unit is not already leaking and the record shows (see Unit III.C.1) that presumption is largely inappropriate for CCRMU.

If an alternate source is causing an exceedance of an Appendix III constituent, it may also be the source of any SSL detected for any Appendix IV constituents; in such a case, a facility may simply prepare a single ASD that covers constituents from both appendices. The sole difference between phased monitoring and combined monitoring is if the alternate source is only responsible for the Appendix III constituent, but the unit actually is releasing one or more Appendix IV constituents. In such a case, under a phased approach detection of the Appendix IV constituent can be delayed or even remain undetected, because the facility would not trigger assessment monitoring absent an SSI from another Appendix III constituent. In such situations, combined monitoring can make the monitoring program more accurate; it is unclear why the commenter believes this is inappropriate.

Ultimately, the combined monitoring expedites the initiation of assessment monitoring which in turn, allows for more expeditious identification of statistically relevant exceedances of Appendix IV constituents. This will in turn expedite ASD development or corrective action, depending on the circumstances.

The phased approach in the 2015 CCR Rule provides for a graduated response to groundwater contamination as the evidence of contamination increases over time. This approach allows facilities ample time to investigate the source of contamination as well as the transport characteristics of CCR constituents in groundwater, while usually being protective of human health and the environment. However, at sites where there is a strong likelihood that groundwater contamination has been occurring for a long time, the advantages provided by a protracted graduated response are outweighed by disadvantages of persistent or even increasing contamination that continues to move downgradient. At these sites, the need to protect human health and the environment necessitates the quick detection of Appendix IV constituents of concern to expedite any necessary corrective action. See, *USWAG,* 901 F.3d at 427–30. In this case, as highlighted in Unit III.A, the record provides strong reason to conclude that many CCRMU are contaminating groundwater, given the large number of currently regulated CCR units that have been found to be leaking.

Therefore, EPA is finalizing this requirement as proposed to be completed no later than Monday, May 8, 2028, which is 42 months after the effective date of this final rule. This is codified in the regulatory text at § 257.90(b)(3)(iv) and (v).

iv. Collection and Analyses of Eight Independent Samples for CCR Management Units

EPA proposed that no later than 24 months after the effective date of the final rule, owners or operators of CCRMU initiate the detection monitoring program by completing sampling and analysis of a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b). The proposed rule explained that within 90 days after initiation of the detection monitoring program, owners or operators must identify any SSIs over background levels for the constituents listed in Appendix III, as required by § 257.94. To expedite the time to initiate any required corrective action, EPA also proposed that by this same deadline owners or operators initiate the assessment monitoring program by establishing groundwater protection standards and by starting to evaluate the groundwater monitoring data for an SSL over GWPS for the constituents listed in Appendix IV as required by § 257.95.

EPA is finalizing this requirement as proposed. This is codified in the regulatory text at § 257.90(b)(3)(iii).

EPA received several comments on the proposed deadline for the collection of the eight baseline samples. As mentioned in Unit III.B.2.a.ii, some commenters supported the expedited deadline. However, several other commenters requested that the groundwater monitoring requirement deadlines be combined into a single deadline that provided at least as much time to come into compliance as was provided in the 2015 CCR Rule deadlines (*i.e.,* 24 months after the effective date of the final rule). As stated in Unit III.C.4.c, based on information provided by commenters, EPA concluded that a single deadline of 42 months after the effective date of this final rule should be used for the groundwater monitoring requirements. Therefore, EPA is finalizing a deadline for the completion of sampling and analysis of a minimum of eight independent samples for each background and downgradient well of no later than Monday, May 8, 2028, which is 42 months from the effective date of this final rule.

v. Preparation of Initial Groundwater Monitoring and Corrective Action Report for CCR Management Units

EPA proposed to apply the existing requirements in § 257.90(e) to CCRMU and require that owners or operators of CCRMU comply no later than January 31 of the year following the calendar year after a groundwater monitoring system has been established (and annually thereafter).

One commenter suggested that the initial groundwater monitoring and corrective action report be due no later than January 31 of the year following the collection of the eight baseline samples and the first semi-annual sampling event in order to allow facilities to provide all the documentation required by § 257.90(e). EPA disagrees that the information required by § 257.90(e) would not be available to a facility upon completion of the groundwater monitoring system, as the annual report serves as an update on the activities related to the groundwater monitoring program, including the installation of groundwater monitoring wells. Additionally, when specific actions are not required by the CCR regulations (*e.g.,* a facility has not triggered corrective action), facilities are not out of compliance merely because they do not have activities related to that action to discuss in the groundwater monitoring and corrective action annual report (*e.g.,* not describing progress in selecting a remedy when not in corrective action).

EPA is finalizing the requirement for owners or operators of CCRMU to comply with the requirements in § 257.90(e), which mandate the preparation of an annual groundwater monitoring and corrective action report no later than January 31, 2029 and annually thereafter. This is codified in the regulatory text at § 257.90(e).

The report documents the activities associated with the groundwater monitoring program and progress of any corrective action over the past year and must contain specific information identified in the regulations, including but not limited to maps; aerial images or diagrams showing the CCRMU and all upgradient (background) and downgradient wells; identification of any monitoring wells installed or decommissioned in the previous year; monitoring data collected under §§ 257.90 through 257.98; and a narrative discussion of any transition between monitoring programs (*i.e.,* detection and assessment monitoring). The annual reporting requirement will help ensure that groundwater level data collected over the reporting period is tabulated, presented, and analyzed to determine groundwater levels relative to any residual CCR left in place as well as to confirm or determine groundwater flow directions.

Upgradient and downgradient well locations and depths should be validated annually with respect to measured and mapped flow directions. Groundwater quality sampling data should be included in appendices and summarized and tabulated in the annual reports. If appropriate, exceedances (SSIs and SSLs) of Appendix III and IV constituents should be tabulated and highlighted. As mentioned in some comments, annual reports should identify the nearest downgradient surface water bodies as well as groundwater supply wells in the vicinity of the unit.

It is critical that annual corrective action and monitoring reports provide the basis for selection and documentation of corrective actions as early as possible. The owner or operator must not only document compliance in the annual report, but also post the annual report on the public CCR website to allow the public to review the groundwater monitoring results. It is critical that the annual reports contain the basic data which informs the positions and status reported in those documents, including but not limited to boring logs, monitoring well installation diagrams, water level data, field sampling data sheets for groundwater sample collection, laboratory analytical data including QA/QC data, data validation, etc. In summary, the annual groundwater monitoring and corrective action reports should not only contain the information required by the regulations but should be organized in such a way that: (1) Compliance with the CCR regulations is evident; (2) Data supporting compliance conclusions are easily located within the document; and (3) The public is readily able to review the groundwater monitoring data and related information. Lastly, the name of the document on the public CCR website should be such that it is clear what the file is and it must be capable of being readily printed and downloaded by the public.

vi. Corrective Action Requirements for CCR Management Units

EPA proposed to require owners or operators of CCRMU to comply with the existing corrective action criteria, as appropriate in §§ 257.96 through 257.98. The proposed rule explained that conducting the sampling simultaneously would expedite groundwater monitoring and, where necessary, initiation of corrective action by at least six months at sites where units have potentially been leaking for a long period of time, as is likely the case at many CCRMU. The proposed rule further explained that expediting Appendix IV constituent detection, assessment and any required corrective action would protect human health and the environment.

Under the existing regulations, if groundwater monitoring demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required, as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and any post-closure care period of the CCR unit.

A commenter suggested EPA create a deadline for the completion of the selection of remedy required by § 257.97 of 90 days after the completion of the assessment of corrective measures (ACM) with the ability to extend the deadline up to 180 days after the completion of the ACM. The commenter pointed to the failure of owners and operators of units regulated by the 2015 CCR Rule to select a remedy as soon as feasible after the completion of the ACM as required by the rule and the subsequent unnecessary delay in addressing contaminated groundwater. Other commenters stated that applying the existing groundwater monitoring and corrective action requirements to historic sites, such as CCRMU, is not appropriate and suggested that instead EPA incorporate site-specific risk-based corrective action or State corrective action programs into the CCR regulations. Finally, some commenters requested EPA adopt a RCRA subtitle C approach and utilize existing EPA guidance. One of these commenters further stated that the application of the existing CCR corrective action requirements conflict with EPA's decision-making frameworks in other programs such as RCRA and CERCLA due to lack of site-specific risk assessments to evaluate risk and drive corrective action decisions. This commenter suggested that EPA utilize site-specific, risk-based corrective action that is consistent with the guidance documents EPA has developed for RCRA and CERCLA programs.

EPA acknowledges the widespread non-compliance with the mandate to complete the selection of remedy as soon as feasible after the completion of the ACM. However, EPA disagrees with the commenter's suggested deadline for two reasons. First, the recommended deadline extends the deadline for the completion of the selection of remedy beyond that in 2015 CCR Rule since ''as soon as feasible'' in many cases would likely be before 90 days after the completion of the ACM and granting owners or operators more time to select a remedy would be less protective of human health and the environment. Second, EPA is taking action to address the non-compliance related to the failure of owner or operators to select a remedy as soon as feasible as part of the EPA's National Enforcement and Compliance Initiative and expects this enforcement initiative to address the concern raised by the commenter.[144]

EPA disagrees with the suggestion that existing corrective action requirements, if triggered, are inappropriate at CCRMU. As stated in Units III.A and III.C.4.d, the physical characteristics and potential risks of CCRMU are not sufficiently different from currently regulated units to justify different requirements. For those commenters requesting that EPA adopt ''risk-based corrective action'' into the requirements, EPA notes that the commenters have provided no further explanation of what requirements in the existing regulations they wanted EPA to revise, what the revisions should accomplish, or why such revisions are necessary or appropriate. As a general matter EPA considers that the corrective action regulations in §§ 257.95 through 257.98 do currently require facilities to tailor remedies to address the risks to human health and the environment, based on the conditions at the site. It is unclear what more the commenters are seeking. Additionally, regarding incorporating or allowing State corrective action programs to substitute for the existing corrective action requirements, the commenters failed to demonstrate through factual or specific information that the State corrective action programs referenced are either different than that required by the CCR regulations or adequate to address the risks posed by CCRMU. Even if individual examples were sufficient to overcome the record with respect to State programs generally, none of the examples presented by the commenters provided sufficient detail for EPA to actually evaluate the adequacy of the corrective action programs. More to the point, EPA lacks the record necessary to support a broad exemption for all CCRMU conducting corrective actions under any State requirements. Regarding comments requesting a RCRA subtitle C approach be adopted for CCRMU, a RCRA subtitle C approach is more appropriate for regulation under a permitting program than under the existing regulatory framework (*i.e.,* self-implementing) and as explained in Units III.A and III.C.1, EPA finds the risks posed by CCRMU to be not only credible but significant enough to warrant regulation at this time (*i.e.,* under the self-implementing rule as opposed to waiting until the Federal permitting program is established). Lastly, the commenter that stated that the existing corrective action regulations conflict with other EPA programs (*i.e.,* RCRA and CERCLA) failed to fully explain how the existing corrective action regulations conflict with EPA-published RCRA or CERCLA guidance documents or how they preclude corrective action decisions driven by site-specific risks. Accordingly, EPA is finalizing, without revision, its proposal that CCRMU comply with the existing corrective action requirements at §§ 257.95 through 257.98.

As explained in the proposed rule at 88 FR 32003, §§ 257.90 through 257.95 require that an owner or operator of a CCR unit to install a system of monitoring wells, specify procedures for sampling these wells, and set forth methods for analyzing the groundwater data collected to detect hazardous constituents (*e.g.,* toxic metals) and other monitoring parameters (*e.g.,* pH, total dissolved solids) released from the units (*i.e.,* all parameters listed in Appendices III and IV). If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and post-closure care period of the CCRMU.

When corrective action is required, it must be initiated without delay, in accordance with the time frames laid out in the regulations. The corrective action program includes initiating an ACM to prevent further releases, to remediate any releases, and to restore affected areas to original conditions, as specified in § 257.96(a). After the ACM has been completed, the owner or operator must select a remedy that meets prescribed standards, including a requirement that the remedy attain the groundwater protection standards. See § 257.97(a) and (b). Finally, the corrective action program requires the owner or operator of the CCR unit to initiate remedial activities within 90 days of selecting a remedy. See § 257.98(a). The requirement to address releases under this requirement is identical to those requirements for any CCR unit undertaking groundwater corrective action with the additional requirement that implementation of corrective action begin during the active life of the unit.

EPA expects that when assessing corrective measures and selecting a remedy, the owner or operator of the unit will consider the impact of the corrective measures on the water quality and safety of the nearest surface water bodies and the nearest private and/or public groundwater wells.

With respect to completion of an ACM and remedy selection, § 257.96(a) requires an ACM be initiated within 90

[144] EPA Enforcement Alert, National Enforcement and Compliance Initiative, Protecting Communities from Coal Ash Contamination. EPA Document #310F23002. December 2023. *https://www.epa.gov/system/files/documents/2023-12/ccr-enf-alert-2023.pdf.*

days of determining an SSL has occurred, and then completed within another 90 days. An extension, not to exceed 60 days, may be warranted due to site-specific conditions or circumstances. Prior to closure of a CCR unit, the facilities have been required to characterize site conditions, including groundwater flow conditions and geology. The facilities have knowledge of the wastestreams and water volumes it discharges to CCR units. This information can be used to develop a groundwater model to predict groundwater flow conditions after waste stream disposal ceases and closure is initiated. Therefore, EPA believes this would provide sufficient characterization of post-closure conditions to assess and compare groundwater cleanup alternatives to complete an ACM.

Once the ACM is complete, a public meeting has been held, and community input has been considered, a remedy must be selected as soon as feasible. A selected remedy may include closure by removal to comply with source control requirements. This would constitute commencing implementation of a remedy. However, the selected groundwater remediation portion of the remedy must also be implemented within a reasonable time, in accordance with the schedule established in the remedy selection report. 40 CFR 257.97(d). Implementation of the source control measure does not negate this requirement.

d. Closure and Post-Closure Care Criteria for CCR Management Units

EPA proposed that all of the existing closure and post-closure care requirements in §§ 257.101 through 257.104 would apply to CCRMU, except for the alternative closure requirements in § 257.103(f). EPA further explained that the alternative closure provisions in § 257.103(f) were not appropriate for CCRMU as these units, by definition, are inactive impoundments at inactive facilities and could not therefore demonstrate the need to continue to use the disposal unit, which is a qualifying component of the alternative closure provisions. In addition, EPA solicited comments on two potential revisions to the existing closure standards in § 257.102(d). The first potential revision would extend the existing dewatering requirement in § 257.102(d)(2)(i) to any CCR landfill constructed in groundwater or otherwise saturated by liquids. The second potential revision would incorporate a definition of the term ''infiltration'' into § 257.102.

EPA also proposed to require that all CCRMU initiate closure within 12 months of the effective date of this final rule. While EPA proposed that the CCR unit closure requirements would apply, EPA also solicited comment on other approaches to how a facility might implement the requirement to close at a site where the CCRMU lies beneath an operating unit.

Finally, EPA proposed to apply the existing post-closure care requirements in § 257.104 to CCRMU. Each of these proposals and the comments are discussed in detail below.

EPA received numerous comments on its proposal to apply the existing closure and post-closure care requirements §§ 257.100–257.104 to CCRMU. Several commenters stated that EPA must require all CCRMU to close, because the risks EPA identified in the proposal, together with information provided by regulated facilities under the 2015 CCR Rule, indicate that CCRMU pose significant and ongoing threats of contamination if not properly closed. These commenters also identified several examples of units that the commenters believe demonstrate the need for CCRMU to close. One commenter referenced a report it submitted to support EPA's proposal to regulate CCRMU. The report focuses on six sites with both CCR units currently regulated by the CCR Rule and with CCRMU. According to the commenter the report documents significant and harmful coal ash pollution that has been allowed to persist under the 2015 CCR Rule and that would be remediated under the proposed rule.

For example, the report analyzes the Brandywine Ash Management Facility in Maryland, which has a single landfill that its operator GenOn has treated as four distinct CCR dumpsites for purposes of the CCR Rule. This artificial division of the landfill has enabled GenOn to claim that three of the four areas of the landfill are unregulated under the CCR Rule; to attribute contamination at the site, such as molybdenum levels eighty times above the GWPS, to the three purportedly unregulated areas; and to keep the site in detection monitoring through ASDs. The Proposed Rule will compel GenOn to address all coal ash at the site. Another site that demonstrates the necessity of regulating CCRMU under the Proposed Rule is the Joliet #29 Station owned by Midwest Generation in Illinois. This site has one regulated pond, Ash Pond 2, and a number of additional units that would be treated as CCRMU under the Proposed Rule. In fact, the site was used for coal ash disposal long before it had a power plant, potentially as early as 1917, indicating the presence of unlined landfills going back decades. Midwest Generation has found statistically significant increases (''SSIs'') for TDS, sulfates, chloride, and calcium at the site, but is only monitoring the groundwater around Ash Pond 2 and two former ash ponds, and not monitoring the groundwater around three large onsite landfills.

These commenters also described a facility where, according to the commenters, two million tons of fill containing CCR sits behind corroding steel pilings on the shore of Lake Michigan, and is leaking arsenic and other hazardous chemicals into the lake, as well as into an adjacent creek commonly used for fishing and boating. These commenters also pointed to a facility with an inactive 90-acre unlined CCR landfill that, according to the commenter, is contaminating groundwater with unsafe levels of sulfate, lithium, radium, cobalt, arsenic, molybdenum and selenium. Similarly, a private citizen also provided the following example of a potential CCRMU during one of public hearings:

My utility is City Utilities. Once the current coal ash landfill is full, CU plans to dispose of future coal ash at a temporarily closed landfill next to Lake Springfield, which feeds into the James River. Both dumps are in karst terrain. This makes them susceptible to sinkhole collapses and leakage of pollutants into the James River watershed and the area's shallow and deep aquifers. These waters affect a four-state area, including Table Rock Lake near Branson where tourism is the main industry. Safer methods of disposal exist, although they are more cumbersome and expensive, In December 2022, CU held a public meeting regarding the utility's future. After questions about pollution, one representative said he wasn't aware of any pollutants coming from the landfill. The Interdisciplinary Environmental Clinic at Washington University School of Law researched this. Twelve rounds of sampling done by CU from late 2016 to early 2018 showed 387 statistically significant increases in pollutants in every down-gradient well. Those increases included 27 out of the 35 monitored parameters. Regarding CU's dye tests at the dump site, a 2017 memo from the Missouri Department of Natural Resources stated, ''Dye is moving through the karst system and not being detected by the monitoring well network.''

These commenters also pointed to the high likelihood that many CCRMU have waste in contact with groundwater, as many are located in floodplains, wetlands, or near large rivers and lakes. According to the commenters, if EPA does not mandate closure of CCRMU, aquifer contamination would not be identified until it is too late to be prevented—in contravention of RCRA's protectiveness standard. These commenters have also argued that CCRMU are inactive units with no practical justification to avoid closure.

A number of other commenters however argued that a national requirement to close was not appropriate for CCRMU and that EPA should instead determine whether closure is warranted at each site based on a finding that the individual unit at that particular site poses unacceptable risks. Many of these commenters suggested that the risks associated with CCRMU can be better managed through corrective action implemented under a permit program, which the commenters believed would make the mandate to close these units unnecessary. For example, one commenter claimed that mandating the closure of all CCRMU as part of the proposed CCR corrective action regime is more stringent than what EPA requires under subtitle C for solid waste management units (SWMUs), and therefore any final CCRMU rule cannot impose a mandatory closure requirement on CCRMU. According to this commenter, the subtitle C process does not require the closure of SWMUs, because EPA recognizes that addressing the risks from SWMUs via the site-specific subtitle C corrective action process alone is fully protective. Many commenters also raised concern that CCRMU at their facilities are located beneath vital infrastructure, such as pipelines or transmission lines, active CCR units, or buildings and that requiring closure of these CCRMU could adversely impact grid reliability, business operations, or other necessary public services (*e.g.,* military infrastructure). These commenters suggested that EPA exempt these units or at least extend the closure time frames to allow for closure of the CCRMU when the other unit or structure is closed or decommissioned.

Numerous commenters again requested that EPA exempt any CCRMU that had been closed in accordance with State requirements. These commenters claimed that these closures were protective and that EPA should only regulate these CCRMU where the Agency has affirmative evidence that the particular unit is contaminating groundwater or otherwise presents unacceptable risks. For example, one commenter stated that a more rational approach to regulating CCRMU would be first to determine if the uses are impacting groundwater before requiring expensive closure. According to the commenter,

[i]t is not clear why EPA requires closure before groundwater data indicates there is a problem. If groundwater is impacted by the CCRMU then other corrective action measures should be taken, but only after data indicates that groundwater is being affected. As noted earlier, the 2015 CCR Rule did not require unlined landfills to close unless they failed to meet the location restrictions for unstable areas. In the event an unlined CCR landfill is the source of groundwater contamination, the unit is subject to the CCR Rule's corrective action requirements, but closure is not mandatory.

But many other commenters characterized the proposed deadline as infeasible for the reasons discussed in Unit III.B.2.a.ii, including seasonality, the need to comply with overlapping regulatory requirements, labor shortages, and the limited resources available to achieve compliance (*e.g.,* contractors, laboratories, P.E.s), which the commenters claimed would become even more limited as a consequence of the number of CCR units that would need to come into compliance at the same time. Commenters also stated that compliance with the closure requirements should not be required until after the groundwater monitoring system was installed and baseline samples collected so that closure could be informed by the groundwater monitoring data.

EPA has largely adopted the proposal, with a few significant revisions. This final rule requires CCRMU that contain 1,000 tons or greater of CCR to comply with the existing closure and post-closure care requirements in §§ 257.101 through 257.104, except for the alternative closure requirements in § 257.103(f). The final rule also extends the existing dewatering requirement in § 257.102(d)(2)(i) to any CCR landfill constructed in groundwater or otherwise saturated by liquids, and incorporates a definition of the term ''infiltration'' in § 257.53.

However, consistent with the provision adopted for legacy CCR surface impoundments, EPA is deferring, in certain cases, the requirement to demonstrate compliance with § 257.102 for CCRMU that closed prior to the effective date of this rule in accordance with alternative requirements that are likely to be as protective as the requirements in § 257.102. This is the same provision that EPA is establishing for legacy CCR surface impoundments, as EPA is not aware of a reason to treat CCRMU differently. In addition, EPA is deferring the requirement to initiate closure where the CCRMU is located beneath critical infrastructure or large buildings or structures vital to the continuation of current site activities, such as beneath high power electric transmission towers, air pollution control or wastewater treatment systems, large buildings, or an electrical substation. In this case, the potential exists for adverse, localized impacts on electric reliability (*e.g.,* voltage support, local resource adequacy) from requiring all facilities to meet these requirements on the same time frame, and EPA lacks the record to determine that such impacts are unlikely. Consequently, EPA is deferring the requirement to initiate closure of such a CCRMU until the infrastructure is no longer needed, a permit authority determines closure is necessary to ensure that there is no reasonable probability of adverse effects on human health or the environment, or the closure or decommissioning of the facility, whichever occurs first.

Finally, EPA has extended the deadline to initiate closure to Wednesday, November 8, 2028, which is 48 months the effective date of the final rule to allow groundwater monitoring data to inform closure, consistent with the approach for legacy CCR surface impoundments.

Each of these issues are discussed in greater detail in subsequent sections of this preamble.

i. Requirement To Initiate Closure

The final rule requires CCRMU containing 1,000 tons or greater of CCR to close. Closure will address the existing risks associated with these units. In addition, requiring the closure of CCRMU is consistent with the existing regulations, which require closure of all units that no longer receive waste as a preventative measure, whether or not the unit is currently leaking. See, 40 CFR 257.102(e)(1). CCRMU, which consist of inactive CCR landfills and previously closed CCR surface impoundments and CCR landfills, meet these criteria as they also no longer receive waste.

The closure of CCRMU of 1,000 tons or greater also provides significant risk mitigation. As laid out in Unit III.A of this preamble, CCRMU at both active facilities and inactive facilities with legacy impoundments pose risks to human health and the environment that are at least as significant as the risks presented by legacy CCR surface impoundments and the units currently regulated under the 2015 CCR Rule. In particular, for highly exposed individuals off site, landfill CCRMU were estimated to pose cancer risks as high as 7×10^{-6} from arsenic III, while surface impoundment CCRMU were estimated to pose cancer risks as high as 8×10^{-5} from arsenic III and noncancer HQs as high as two for arsenic III, two for lithium, and one for molybdenum. Differences in national risks between currently regulated units and these older units are attributed largely to the proportion of units that were modeled at the time as lined. However, the risks associated with these older units may be even higher than EPA modeled in the 2014 Risk Assessment for active units. These units have been present onsite longer and had more time to leak. In addition, there are several management practices that have the potential to result in higher leakage, but that were previously modeled either less frequently for active units—based on a belief that the practices had declined over time—or not at all—due to data constraints on a national scale. These include: (1) The greater prevalence of unlined units; (2) The greater likelihood of co-management of CCR with coal refuse and other wastes in surface impoundments, making the overall waste pH far more acidic and (3) The potential for the units to be constructed below the water table or to have become inundated with groundwater after the time of construction. As discussed in Unit III.A, each of these practices individually have the potential to result in nationwide risks higher than previously reported on a national basis for the currently operating universe of CCR units. For example, unlined landfill CCRMU were estimated to pose cancer risks as high as 1×10^{-5} from arsenic III, while unlined surface impoundment CCRMU were estimated to pose cancer risks ranging from 2×10^{-4} from arsenic III and noncancer HQs as high as 5 for arsenic III, 3 for lithium, 2 for molybdenum, and 1 for thallium. A combination of these practices could push risks even higher than modeled.

In addition, the modeling conducted in 2024 confirms that smaller CCRMU fills can meaningfully contribute to groundwater contamination across a facility. The 90th percentile concentrations at the waste boundary exceeded GWPS by factors of 26 for arsenic III, 19 for arsenic V, 156 for molybdenum, and 19 for thallium. The 50th percentile concentrations exceeded GWPS by a factor of two for molybdenum. EPA's modeling also confirms that any prior contamination from CCRMU is likely to still be present. EPA calculated, for example, that it could take around 2,300 years from the time of first exceedance for high-end releases of arsenic V to fully dissipate.

Depending on their location, leakage of Appendix IV constituents from individual CCRMU fills may not migrate off-site at levels of concern. However, according to the commenters it is highly unlikely that only one CCRMU would be present on-site. In addition, these concentrations can combine with contamination from other CCRMU, currently regulated CCR units, or legacy CCR surface impoundments that are also present on the same site. EPA did not model the aggregate or cumulative risk associated with these potential sources of co-located contamination, which may underestimate the risks. At a minimum, EPA expects that the presence of multiple sources of potential contamination at the same facility would increase the likelihood of a contaminant plume that could migrate off-site at levels of concern. In sum, the record confirms that, at a minimum, regulation of the smaller sized CCRMU fills is necessary for any corrective action to successfully reduce the concentrations of Appendix IV constituents in the aquifer to concentrations below the GWPS.

Available toxicological profiles indicate that ingestion of arsenic is linked to increased likelihood of cancer in the skin, liver, bladder and lungs, as well as nausea, vomiting, abnormal heart rhythm, and damage to blood vessels; ingestion of lithium is linked to neurological and psychiatric effects, decreased thyroid function, renal effects, cardiovascular effects, skin eruptions, and gastrointestinal effects; and ingestion of molybdenum is linked to higher levels of uric acid in the blood, gout-like symptoms, and anemia. 80 FR 21451. To date, groundwater monitoring required by the 2015 CCR Rule has revealed that at least 40% of currently regulated surface impoundments and landfills have identified groundwater contamination and require corrective action to mitigate the associated risks. This number is expected to increase as more facilities come into compliance with the groundwater monitoring requirements. Another 23% of existing CCR units have identified evidence of leakage and continue to monitor groundwater to ensure that contamination does not occur before the unit can be closed and source controls put in place. In many cases, CCRMU are historical landfills and surface impoundments. Thus, the relevant release pathways, exposure routes, and associated harm that can result are the same.

Given the locations of many CCRMU (located in floodplains, or wetlands, or near large surface water bodies), EPA is also concerned that the base of these units may intersect with the groundwater beneath the unit. If such CCRMU were not required to close, EPA would not adequately address the risks from those units that still contain CCR saturated with free liquids.

In general, EPA considers that closure is the only effective way to adequately address the source of potential or existing releases from these units. Although, as some commenters suggested, EPA could rely upon the existing corrective action requirements to achieve source reduction, the Agency is concerned that this will not adequately prevent harm, as the statute requires, because these requirements would only apply upon a determination that the CCRMU has contaminated the aquifer above the GWPS. In addition, the closure requirements in § 257.102 provide a uniform approach that EPA is confident will adequately protect human health and the environment.

Contrary to the commenter's contentions the regulation of CCRMU under RCRA section 4004(a) is not analogous to the corrective action requirements applicable to SWMUs under RCRA section 3004(u). Nor is the absence of a national mandate to close SWMUs as part of every corrective action under section 3004(u) based on the recognition that closure is unnecessary because the corrective action process alone is fully protective. The closure and corrective action regulations are distinct and independent requirements that generally serve different purposes. The closure requirements under both subtitle C and D are largely intended to be prevent contamination from occurring in the first place, by ensuring that the closed unit does not become a source of future contamination. See, *e.g.,* 47 FR 32318, 32321, 32323. By contrast, corrective actions are remedial or retrospective in that they are designed to clean up contamination that has already occurred. EPA has previously promulgated regulations mandating the closure of disposal units for wastes under both subtitles C and D for wastes within each subsection's jurisdiction. See, 40 CFR 264, subpart G, 258, subpart F. But the requirement for corrective action of *solid waste* management units under the provisions applicable to hazardous wastes under section 3004(u) is an anomaly; Congress has otherwise limited subtitle C to the regulation of hazardous wastes. The appropriate comparison is thus not to EPA's regulation of SWMUs under subtitle C, but rather to EPA's regulation of hazardous waste units under subtitle C, where the Agency requires hazardous waste units to comply with both closure and corrective action requirements.

In sum, the record demonstrates that closure is warranted for CCRMU, even for those that are not yet leaking. As the D.C. Circuit explained, RCRA requires EPA to set minimum criteria for sanitary landfills that prevent harm, not merely to ensure that contamination is remediated. See, *USWAG,* 901 F.3d at 430.

Consistent with the requirements for legacy CCR surface impoundments, EPA is not requiring previously closed CCRMU to automatically re-close but simply to evaluate whether the unit meets the requirements of § 257.102(d), and if they do not, to take such measures as are necessary to bring the unit into compliance.

ii. Deferral for CCRMU Under Critical Infrastructure

As noted above, many commenters stated that some CCRMU are currently located beneath critical infrastructure. For example, a number of commenters stated that CCR has historically been used on-site at generating stations for many years as structural fill, including for utility line bedding, and under site infrastructure such as switchyards, coal piles, railroad embankments, and occupied buildings. Additionally, commenters pointed to many areas at their existing facilities with CCR currently located under existing critical energy infrastructure such as generating units, cooling towers, substations, levees, dikes, on-site wastewater treatment systems, dams, transmission towers, gas lines, and solar installations.

These commenters claimed that requiring closure of CCRMU beneath infrastructure could adversely impact grid reliability, business operations, or other necessary public services and suggested EPA create exemptions or extensions for these units. According to these commenters, attempting to close any of these areas under the rule's closure standards would not only be impossible, but also would require disturbing and/or even disassembling critical components of power plant's energy infrastructure, which would only further exacerbate the pressures on grid reliability. Other commenters raised concern that remediation would require removal of existing infrastructure to access the CCR, which in some cases could present significant operational risk and potential danger. As one commenter characterized it,

> Particularly at active power plants, requiring closure of CCRMU . . . would cause massive ripple effects that need to be more carefully considered. Closure would be incredibly disruptive for these type of sites—particularly given the inadequate time for electricity resource planning—and exacerbate the grid reliability challenges that co-ops and other utilities are already facing. Moreover, EPA must consider and allow for power plant owners to follow the mandated procedures put in place by the relevant balancing authority, such as regional transmission organizations or electric utilities, and by state authorities which have a role in ensuring the reliability of the local grid.

Several commenters also expressed concern about the closure of CCRMU located under active CCR landfills, asserting that such closures pose complex challenges that EPA did not fully understand or account for in the proposed rule. Many of these commenters asserted that these closed landfill or surface impoundment CCRMU present no risks. For example, one commenter discussed a closed surface impoundment located beneath its active CCR landfill. The commenter asserted that the permitted, Federally regulated CCR landfill above the closed unit, combined with the collective effect of the CCR landfill liner and leachate collection system, runoff controls, and engineered cap, keeps the impoundment isolated from exposure to stormwater runoff and other sources of water infiltration. The commenter further asserts that there is no evidence that this former impoundment is impounding or otherwise contains any significant amount of free liquids, and that such a condition is unlikely given the overlying landfill infrastructure.

By contrast, numerous commenters supported the proposed mandate to close due to the substantial risks that these kinds of ''overfill'' units can pose. As one of these commenters explained,

> In this situation the underlying CCRMU serves the function of the foundation of the overlying CCR unit. The liner of the overlying CCR unit serves as a cap over the underlying CCRMU. CCR contaminants released from either the overlying CCR unit or underlying CCRMU can adversely impact groundwater quality with little potential for distinguishing between contaminants released from one or the other of these units. Each of the co-located units must be capable of containing CCR contaminants if releases to the environment are to be avoided. Construction of a CCR unit over a previously existing CCRMU is known to have the potential to increase concentrations of CCR groundwater contaminants. A 2001 study by the Electric Power Research Institute (EPRI) showed that reducing the hydraulic gradient beneath a CCR impoundment can induce increased contaminant concentrations when the waste is in contact with groundwater. EPRI concluded that reducing the hydraulic gradient by dewatering an impoundment slowed groundwater flow and increased contact time between the waste and groundwater. Contact time between waste and water is an important variable that influences concentrations of contaminants found in groundwater.
>
> Release of contaminants from the overlying unit, while possible, is not necessary to cause increasing contaminant concentrations. The bottom liner of the overlying CCR unit reduces infiltration of water from above, reducing the hydraulic gradient and increasing waste/water contact time. The increased contact time can increase contaminant concentrations in downgradient monitoring wells.

The commenters acknowledged that where the waste in the CCRMU is dry and the owner/operator can assure that separation of the waste from water (groundwater and/or infiltration from above) will be maintained the unit may be closed in place under the CCR rule without posing ongoing risks. The commenter also noted, however, that where unlined waste units are continually or periodically in contact with groundwater, more extensive closure techniques such as engineering controls designed to prevent groundwater from flowing through waste or to stabilize the waste and fix contaminants in place may be attempted, or excavation and clean closure of the unit may ultimately be necessary.

Unlike the comments received on legacy CCR surface impoundments, the overwhelming majority of commenters provided concrete examples of concerns with respect the timing of closure activities for to CCRMU. In total, these commenters have provided sufficient information to raise a legitimate question whether adverse, localized impacts on electric reliability (*e.g.,* voltage support, local resource adequacy) could result from a nationwide requirement to close all CCRMU within the deadlines under the regulations.

EPA agrees that closing CCRMU underlying critical infrastructure at active generating facilities is very different and more challenging than closing disposal units at inactive utilities. When it was developing the proposal, EPA was unaware of the extent to which facilities had historically used CCR as part of the foundation supporting generating units, cooling towers, substations, or on-site wastewater treatment systems. In some cases, it appears that in order to close these CCRMU individual facilities may need to disturb substantial portions of the entire site and disassemble critical components of the power plant's energy infrastructure, such as high power electric transmission towers, and electrical substations.

EPA agrees that its proposal did not adequately account for this circumstance. This is particularly true in the case of a CCRMU located beneath infrastructure necessary for energy production, where the potential exists for adverse, localized impacts on electric reliability (*e.g.,* voltage support, local resource adequacy). This issue arises whenever multiple facilities need to take their EGU offline for an extended period to complete construction or other compliance activities. The likelihood of an adverse impact on electric reliability can be greater if multiple facilities need to schedule outages simultaneously in order to comply with EPA's closure deadlines. EPA understands that it is also possible that in some instances temporarily taking generating units (including coal-fired units) offline could have an adverse, localized impact on electric reliability (*e.g.,* voltage support, local resource adequacy). If a generating asset were needed for local reliability requirements, the grid operator might not approve a request for a planned outage. In such instances, the owners/operators of the generating unit could find themselves in the position of either operating in noncompliance with RCRA or halting operations and thereby potentially causing adverse reliability conditions. In addition, failure of an electric transmission or generation system can lead to substantial risks to human health (*e.g.,* if an outage impairs the ability of emergency services to function properly or it causes home heating or cooling systems to fail, which increases risk, particularly for vulnerable populations).

However, such impacts are far less likely to arise from an individual facility-specific decisions, and should normally be adequately managed by the established RTO processes for scheduling outages. EPA recognizes that this final rule provides a substantial amount of time for facilities to complete these closures. In contrast with the proposal, the final rule provides facilities 54 months to initiate closure, and depending on the CCRMU, the facility may have as much as an additional seven to 15 years to complete closure. Based on the comments, however it appears that the overwhelming majority of CCRMU below critical energy production infrastructure are likely to be landfills, and therefore the seven year deadline is more likely to be applicable.

Further, this situation is not analogous to the closure of unlined and clay lined impoundments in response to the *USWAG* vacatur, and thus the information used to develop the deadline for those CCR units in the Part A rule cannot be used to develop a comparable requirement for these CCRMU. For example, there appear to be a greater number of CCRMU at these sites and the construction estimates EPA relied upon in 2020 in the Part A final rule applied exclusively to the six specific technologies that a facility might use to develop alternative disposal capacity. That rulemaking did not involve the potential effect of disturbing substantial portions of the entire site or disassembling critical components of the power plant's energy infrastructure, such as high power electric transmission towers or electrical substations, which is what some commenters have alleged will be necessary in this case.

Unfortunately, because EPA only became aware of these facts after development of the proposal the Agency has not had the time to obtain the information necessary to evaluate—or to consult with balancing authorities and other electric reliability authorities (*e.g.,* DOE or NERC) on the feasibility of mandating closure of all CCRMU within these deadlines, within the time to complete this rulemaking.[145]

EPA acknowledges that the risks associated with CCRMU above the regulatory threshold are substantial, and generally warrant a mandate to close in accordance with § 257.102. Moreover, the fact that EPA did not model the aggregate risks associated with the widespread use of small amounts of unencapsulated CCR throughout the entire facility raises questions about whether EPA may have underestimated the potential risks associated with these CCRMU. EPA also agrees that overfills can present significant risks, particularly when the closed CCR unit remains inundated by groundwater or otherwise continues to contain free liquids. EPA therefore concludes that exempting these CCRMU from the requirement to close in accordance with § 257.102 is not appropriate.

Given that EPA has the ability to rely on the permitting process to address issues on a case-by-case basis, and because doing so will allow the Agency to adequately address both the competing environmental and reliability risks presented at individual sites, it is reasonable for the Agency to choose this option. Consequently, EPA is deferring the requirement to initiate closure of CCRMU located beneath critical infrastructure until either: (1) The infrastructure is no longer essential for the activity to be successful; (2) A permit authority determines closure is necessary to ensure there will be no reasonable probability of adverse effect on health or the environment; or (3) The closure or decommissioning of the facility, whichever occurs first.

The final rule also includes an additional condition on CCRMU under active disposal units. In order for these units to qualify for the deferral, the facility must document that the CCRMU meets one of two existing performance standards: either (1) The standard in § 257.60 that the unit was constructed with a base that is located no less than 1.52 m (5 feet) above the upper limit of the uppermost aquifer, or must demonstrate that there is no intermittent, recurring, or sustained hydraulic connection between any portion of the CCR unit and the upper limit of the uppermost aquifer or surface water; or (2) The dewatering standard in § 257.102(d)(2)(i) that all free liquids have been eliminated. EPA believes the location standard in § 257.60 is likely to be more directly applicable to many CCRMU, as they are landfills that would not have been constructed or designed to hold free liquids. EPA has also included the dewatering standards in § 257.102(d)(2)(i) for those closed CCR surface impoundment CCRMU. Based on the descriptions provided by commenters EPA expects that this requirement will largely be relevant to closed CCRMU located beneath active disposal units, rather than CCRMU located beneath infrastructure vital to energy production, which are unlikely to be inundated by groundwater. Moreover, this requirement directly addresses the reason that EPA has concluded that many previously completed closures do not meet the standard in RCRA section 4004(a).

To be clear, EPA is not exempting these CCRMU from the requirement to close as commenters requested, but merely extended the deadline for compliance until the Agency can address it on an individualized basis as part of permitting. In addition, these units will be required to comply with all other requirements applicable to CCRMU, including the requirements for groundwater monitoring and corrective action, if necessary.

As noted above and discussed in the next section, in response to public comments, EPA has extended the deadline to initiate closure to Tuesday, May 8, 2029, which is 54 months after the effective date of this final rule. Based on its current schedule, EPA expects to be issuing permits before that deadline.

EPA is defining ''critical infrastructure'' as infrastructure, large buildings, or other structures vital to the success or continuation of current site operations or activities for the public welfare. This does not include infrastructure, large buildings, or other structures that solely provide commercial or financial benefit to private entities. Examples of critical infrastructure include high power electric transmission towers, large buildings, and electrical substations. The structures must be both (1) necessary for the continued generation of power or currently used for an ongoing site activity; and (2) not readily replaced or relocated. For example, a

[145] EPA is obligated to take final action on the proposal no later than May 6, 2024, pursuant to *Statewide Organizing for Community eMpowerment* v. *EPA,* No. 1:22–cv–2562–JDB (D.D.C.).

parking lot that could easily be replaced by a parking lot in a different location onsite would not qualify as critical infrastructure; but a lined industrial stormwater ponds, wind or solar farms, substations, or military infrastructure would qualify.

The owner or operator of a CCRMU located under critical infrastructure must include information documenting their eligibility for the deferral in the FER part 2 in § 257.75(d) that includes at a minimum a description of the infrastructure, its current and anticipated use(s), and the decommissioning date or anticipated active lifespan. The documentation must also demonstrate that the CCRMU complies with either § 257.60 or § 257.102(d)(2)(i). The documentation must also demonstrate that the structures are both: (1) Necessary for the continued generation of power or currently used for an ongoing site activity; and (2) Not readily replaced or relocated.

When it comes time for a permit authority to evaluate the CCRMU, EPA intends to rely on the permit application process as the primary mechanism to collect the information to allow a determination to be made as to whether to require closure of the CCRMU prior to facility closure. The permit application process is a well-established system for reviewing the types of groundwater, soil and other sampling and analytical data that will typically be required in determining the potential risks associated with the CCRMU.

When the permit application is called in, the facility must provide sufficient information, including data on contaminant levels in groundwater, to demonstrate that the criteria listed above for the deferral have been met, and for the permit authority to be able to evaluate the risks associated with the CCRMU. EPA (or other permit authority) will review the information to determine whether the criteria for deferral have been met and whether closure is necessary to mitigate unacceptable risks to human health or the environment from the CCRMU.

Finally, EPA received a substantial number of comments requesting that the Agency not require facilities to ''re-close'' any unit that already completed closure. This final rule does not mandate that any previously closed unit automatically re-close. But as described in the next section, the final rule does require all CCRMU to meet the performance standards in § 257.102, although as discussed above, some may not be required to do so until the permitting process begins for that unit. EPA does not consider this to be equivalent to a requirement to ''re-close'' as facilities may be able to implement engineering measures to address any deficits without removing the cover system or entirely re-closing the whole impoundment. Whether any particular measure will be effective is a site-specific determination, but some reasonably available engineering measures that may be effective and should be considered include the installation of physical barriers (*e.g.,* slurry walls), groundwater diversion techniques (*e.g.,* interception trench) or hydraulic containment systems (*e.g.,* groundwater extraction wells) to prevent groundwater infiltration.

iii. Requirement To Comply With Performance Standards in § 257.102

As discussed above, this final rule requires that the closure of CCRMU meet the performance standards in either § 257.102(c) or (d). Under this final rule all closures initiated after the effective date of this rule, as well as to those that were not completed prior to the effective date of this rule, will need to comply with these requirements.

And in general, the same is true with respect to closures that were completed prior to the effective date of this rule. As discussed previously, a facility that can certify that prior closure of a unit meets the performance standards in § 257.102(c) only needs to post the documentation that the closure meets the standard. Similarly, if a facility can demonstrate that the closed unit meets the requirements under § 257.102(d), EPA will consider the unit to be closed and the only requirements that will be applicable are those that apply to closed units under post closure care—that is groundwater monitoring, and if necessary, corrective action. EPA never intended to require facilities that otherwise met the closure standards to go through the process again and re-close the unit. In addition, as discussed in the next section, where the facility was subject to standards that are different than the Federal CCR closure standards—*e.g.,* if the closure was conducted as part of a CERCLA cleanup—but otherwise is equivalent in terms of mitigating the risks, the requirement to meet the § 257.102 standards will be deferred to permitting, where a closure equivalency determination will be made.

(a) Closure of CCRMU Under State Law and Deferral of Certain Completed Closures to Permitting

In response to EPA's proposal that all CCRMU comply with § 257.102, many commenters requested that EPA exempt any unit that has either completed closure or is in the process of closing pursuant to State law (*e.g.,* solid waste permit, consent orders or decrees). Commenters also requested that EPA exempt any site that closed as part of a cleanup conducted pursuant to another Federal requirement, such as CERCLA or RCRA subtitle C. For the most part, these commenters simply repeated the comments that they had made with respect to legacy CCR surface impoundments, stating that EPA had failed to demonstrate that these units posed any risk as a consequence of the lack of ponded water, and that ''re-closure'' of these previously closed units is consequently unnecessary and overly burdensome. However, several commenters also presented individual examples of CCRMU that had been closed in accordance with State requirements, which the commenters believed would demonstrate the State closures were equally as protective as those conducted in accordance with § 257.102. These included the following examples:

[A facility] has an approximately 20-acre dry stack landfill with 20 plus years of groundwater monitoring that does not show groundwater exceedances, zero potential receptors downstream (from the direction of groundwater) that use wells for drinking water (also no potable wells within a two-mile radius). The landfill construction using best practices to minimize erosion potential, including only placement of stabilized material in the landfill, perimeter ditch surrounding the entire landfill to collect any runoff that is processed before discharge, and the unit is regulated by the Florida Department of Environmental Protection that includes semi-annual groundwater monitoring results review and yearly on-site regulatory inspections.

[Another facility] had two CCRMU landfills that were closed prior to the effective date of the 2015 CCR Rule and were closed in accordance with the State of Florida's Chapter 62–701, F.A.C., for municipal and solid waste landfills. Neither landfill was built on top of a liner system. The closed landfills were subject to design criteria for cover systems and stormwater management, as well as long-term operations and maintenance provisions. The groundwater monitoring system requirements for landfills in Florida are similar to, but not the same as, those in the 2015 CCR rule. Both closed cells would be subject to corrective action if dictated by the monitoring program. Maintenance, inspections, and repair of the cover systems, as needed, are also part of the long-term care program.

[Another facility] reported closing an inactive CCR landfill in the 1980s. The 20-acre site was used to dispose of bottom and fly ash, including scrubber sludge. The owner performed monitoring of a nearby spring to demonstrate whether any ponded water was leaking. Upon visual inspection, it was determined that the bentonite/clay-lined pond remained intact throughout the active operation of the landfill. However, because of the age of the site, groundwater monitoring wells were not required.

In addition, several States provided information about their existing programs or individual closures. In some instances, the information was intended to demonstrate that the closures were equally as protective as § 257.102, and to provide factual support for an exemption for CCRMU that closed in accordance with State requirements. Other States acknowledged the risks but urged EPA to make the CCRMU requirements ''more flexible and allow for practical alternatives to closure and corrective action for units that have not impacted groundwater,'' or to provide an opportunity to demonstrate if the previous closure of the CCRMU is protective of human health and the environment.

By contrast, several commenters supported EPA's proposal to require all CCRMU to comply with the performance standards in § 257.102, even if the closure was previously approved by a State regulatory agency. These commenters also largely made the same comments they had made with respect to legacy CCR surface impoundments, pointing to EPA's conclusions in 2015 that significant gaps remain in many State programs. These commenters also identified recent examples of closures approved by various State agencies that they believed were not consistent with the Federal closure standards.

No commenter submitted any information that would support a conclusion that different provisions are warranted for CCRMU that closed prior to the effective date of this rule than EPA adopted for similarly situated legacy CCR surface impoundments. Even if individual examples were sufficient to overcome the record with respect to State programs generally, none of the examples presented by the commenters provided sufficient detail for EPA to actually evaluate the adequacy of the closures. For instance, in the three examples presented above, neither of the first two examples actually describe the groundwater monitoring that was required; while the second states that ''groundwater monitoring system requirements for landfills in Florida are similar to, but not the same as, those in the 2015 CCR rule'' it provides no further information. The third example explains that no groundwater monitoring at all was required because of the age of the unit; it is unclear why the commenter believes that this supports a finding that the State program is as protective as those in part 257.

More to the point, as EPA explained in Unit III.B.2.g of this preamble, with respect to legacy CCR surface impoundments, EPA lacks the record necessary to support a broad exemption for all CCRMU closures under any State requirement. The limited information currently available does not demonstrate that all closures conducted under State authority, particularly those completed prior to 2015, ''will ensure there is no reasonable probability of adverse effects on health or the environment.'' 42 U.S.C. 6944(a).

EPA, however, agrees that there are examples of closures that are substantially equivalent to those conducted in accordance with § 257.102. Moreover, EPA has no basis for concluding that the same considerations that warrant deferral of certain legacy CCR surface impoundments closures are not equally applicable to comparable CCRMU closures. Accordingly, EPA is deferring the requirement for a CCRMU that closed prior to the effective date of this rule to demonstrate compliance with § 257.102(d) until a permit application is required to be submitted where the facility can document that all of the following conditions have been met. First, the deferral is limited to circumstances in which a regulatory authority played an active role in overseeing and approving the closure activities. EPA considers a ''regulatory authority'' to include a State or Federal agency or department that oversaw implementation of requirements imposed through a permit, an administrative order, or consent order issued after 2015 under CERCLA or by an EPA-approved RCRA State program. The permit, order, regulatory or other authority must have required groundwater monitoring to ensure there was no contamination coming from the unit that is not addressed by corrective action until cleanup standards are achieved.

To support deferral of a prior closure of a CCRMU as substantially equivalent, the facility must also document that the CCRMU meets one of two existing performance standards: either: (1) The standard in § 257.60 that the unit was constructed with a base that is located no less than 1.52 m (5 feet) above the upper limit of the uppermost aquifer, or must demonstrate that there is no intermittent, recurring, or sustained hydraulic connection between any portion of the CCR unit and the upper limit of the uppermost aquifer or surface water; or (2) The dewatering standard in § 257.102(d)(2)(i) that all free liquids have been eliminated. This requirement directly addresses the reason that EPA has concluded that many previously completed closures do not meet the standard in RCRA section 4004(a).

In addition, a facility must document that it had installed a groundwater monitoring system and performed groundwater monitoring that meets a subset of the performance standards found in § 257.91(a). Specifically, the facility must demonstrate that the groundwater monitoring system was capable of: (1) Accurately representing background water quality, (2) Accurately representing the quality of water passing the waste boundary, and (3) Detecting contamination in the uppermost aquifer. The groundwater monitoring system must have monitored all potential contaminant pathways.

Next, a facility would need to demonstrate that a site-specific risk assessment was conducted or approved by the regulatory authority prior to (or as part of) approving the closure, and that the closure and any necessary corrective action has been overseen by the regulatory authority, pursuant to an enforceable requirement.

Finally, the facility would be required to prepare and include documentation in the applicability report and operating record, demonstrating that it has met these criteria and is eligible for deferral. The documentation must include specifics including the State permit, order, data, GWM results, etc. This must be certified by the owner/operator or an authorized representative using the same language in § 257.102(e).

When it comes time for the permit authority to evaluate the closure, EPA intends to rely on the permit application process as the primary mechanism to collect the information to allow a determination to be made as to whether a CCRMU that closed under these alternative standards did so in compliance with the requirements of § 257.102. The permit application process is a well-established system for reviewing the types of groundwater, soil and other sampling and analytical data that will typically be required in determining the ''equivalency'' of alternative closures.

When the permit application is called in, the facility must provide sufficient information, including data on contaminant levels in ground water, to demonstrate that the applicable § 257.102 standards have been met. EPA or an approved State Director (the permitting authority) will review the information to determine whether the ''equivalency'' of the closure has been successfully demonstrated. If EPA determines that the closure has met the appropriate part 257 closure standard, EPA or an approved State Director will issue a post-closure permit. If EPA or an approved State Director determines that the closure does not meet the part 257 standards, the owner or operator will be required to submit a permit application containing all the applicable information for an operating permit, and EPA will issue a permit that contains the specific requirements necessary for the unit to achieve compliance with § 257.102.

(b) Revisions to Performance Standards for Closing With Waste in Place

(1) Expansion of § 257.102(d)(2)(i) to CCR Landfills

Given the locations of many CCRMU (located in floodplains, or wetlands, or near large surface water bodies), EPA is concerned that the base of these units may intersect with the groundwater beneath the unit. As EPA has previously explained, where the base of a surface impoundment intersects with groundwater, the facility will typically need to include engineering measures specifically to address any continued infiltration of groundwater into the impoundment in order to close with waste in place consistent with § 257.102(d). See, *e.g.,* 87 FR 72989 (November 28, 2022), 85 FR 12456, 12464 (March 3, 2020). The same holds true for CCRMU that intersect with groundwater. The existing requirements in § 257.102(d)(1) and (3) apply to all CCR units and EPA proposed that these provisions would also apply to CCRMU without revision. By contrast, the existing requirements in § 257.102(d)(2), which establish performance standards for drainage and stabilization of the unit, only apply to CCR surface impoundments. These performance standards are critical to ensuring that units that contain liquids are properly and safely closed, and therefore should apply to any unit, including a CCRMU and a CCR landfill, where free liquids remain in the unit. Accordingly, EPA proposed to revise § 257.102(d)(2) so that it applies to all CCR units and CCRMU. To assist commenters, the proposal included a background discussion of the existing closure performance standards. Finally, EPA explained that if there are no liquids in the unit, the proposed revision would not require the facility to do anything to meet the performance standards.

Several commenters supported the proposed revision. For example, one commenter provided data about an unlined CCR landfill that was constructed above the groundwater table and was found to be ''impacting groundwater with high concentrations of heavy metals, with particularly high concentrations of boron fluctuating between 14 and 30 mg/L.'' The State of Michigan required closure of this landfill due to groundwater impacts and after the landfill completed closure, ''the boron concentrations returned to background concentrations approximately five years later.'' The commenter further went on to state, ''this example is provided to demonstrate that any type of water contact with CCR disposal areas can impact groundwater, causing concentrations to rise to concerning levels above water quality standards.'' Another commenter suggested that, consistent with its statement in the proposal, EPA should further revise § 257.102 to clarify that the performance standards are met if there is no liquid in the CCRMU. The commenter recommended the following revisions to § 257.102(d)(1) and (2):

(1) General performance standard. The owner or operator of a CCR unit or CCR management unit that contains liquid must ensure that, at a minimum, the CCR unit or CCR management unit is closed in a manner that will: * * *
(2) Drainage and stabilization of CCR units and CCR management units. The owner or operator of any CCR unit or CCR management unit that contains liquid must meet the requirements of paragraphs (d)(2)(i) and (ii) of this section prior to installing the final cover system required under paragraph (d)(3) of this section.

A few commenters opposed extending § 257.102(d)(2) to CCR landfills and CCRMU, asserting that EPA had failed to provide a factual basis to justify the revision. For example, one commenter stated that:

There are two purposes for free liquids removal—addressing stability and potential groundwater contamination. For long-closed units, stability is demonstrably not a concern. For groundwater, any potential contamination can be addressed through corrective action rather than closure. . . . EPA does not explain why the existing corrective action regulations—which would require corrective action and potentially source control in the event groundwater contact causes impacts to groundwater—are insufficient. In short, the proposed extension of the requirements is unnecessary and unsupported by the record.

Another commenter contested the factual basis for the ''proposed rule's assumption'' that CCR are in contact with groundwater. According to the commenter, CCR surface impoundments and CCR landfills are not located in the same hydrogeological environments and requires a site-specific evaluation to determine, which is beyond the requirements of the existing CCR regulations. One commenter criticized EPA for failing to identify the 19 landfills ''already regulated under the 2015 CCR final rule, but which have waste in contact with groundwater,'' and depriving the public of an opportunity to comment on the accuracy of that proposed finding. Another commenter said it takes a very long time to eliminate free liquids in a CCRMU or landfill, which typically happens during post-closure care.

EPA disagrees that it has failed to justify the revision. The proposed rule did not rest on an assumption but on information (*e.g.,* annual groundwater monitoring and corrective action reports, closure plans) posted to facility CCR websites showing that the bases of their CCR landfills are in contact with groundwater. EPA has included a list of these facilities in the docket for this final rule. In addition, other commenters have provided further examples of landfills that are submerged in the aquifer. Moreover, while the commenter is correct that whether groundwater is infiltrating a particular unit is a site-specific determination, the commenter failed to provide any factual basis for its assertion that CCR surface impoundments and CCR landfills are never located in the same hydrogeological environments. And contrary to the commenter's assertion EPA has repeatedly explained why it is insufficient to rely on corrective action rather than closure to address the risks associated with CCR landfills. The closure and corrective action regulations are distinct and independent requirements, each of which must be met. The closure in-place standards are designed to ensure that the waste in the closed unit has been dried out and is kept dry so that leachate cannot form in the closed unit and subsequently be released to the environment. See, *e.g.,* 47 FR 32318, 32321, 32323. For impoundments that are not yet leaking compliance with these provisions are largely designed to ensure that the closed unit does not become a source of future contamination. In other words, the closure standards are expressly designed to *prevent* groundwater contamination. By contrast, the corrective action provisions in §§ 257.96 through 257.98 contain the standards and procedures for cleaning up the contamination in the groundwater that has already leaked out of the unit. See, *e.g.,* 40 CFR 257.97(b)(2) and (4) (requiring that clean up remedies ''attain the groundwater protection standard [in] § 257.95(h)'' and ''remove from the environment as much of the contaminated material as was released from the CCR unit as feasible''). *See, USWAG,* 901 F.3d at 429–430, 431.

EPA appreciates the commenter's suggested alternative regulatory text; however, EPA is concerned that the suggested revision is effectively redundant of the new definition of ''contains CCR and liquids'' and would not clearly communicate the entities that are subject to the regulation. Therefore, EPA is finalizing this requirement as proposed. In addition, because it can take a significant amount of time to meet the performance standards in § 257.102(d)(2), EPA has extended the closure deadlines applicable to any CCR landfill that needs to meet these standards.

(2) Definition of Infiltration

EPA requested comment on whether to adopt a regulatory definition of the term ''infiltration,'' consistent with term's plain meaning and the dictionary definitions discussed in the preamble.

Several commenters agreed that EPA should adopt a regulatory definition of infiltration that explicitly recognizes the myriad ways that liquids can infiltrate CCR surface impoundments. Some commenters supported EPA's proposed definition of ''infiltration'' because industry has argued that ''the presence of groundwater in ash ponds is essentially irrelevant to closure compliance and that the CCR Rule's closure in place requirements are limited to draining the surface portion of the pond, constructing a final cover, and preventing surface water—but not groundwater—infiltration thereafter.'' Another commenter stated EPA should define ''infiltration'' to make clear that it is ''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.''

Other commenters objected to EPA's proposal to adopt a definition, citing on-going litigation in *Electric Energy, Inc., et al.* v. *EPA, Case Nos. 22–1056 and 23–1035.* These commenters complained that EPA makes no mention of this litigation in the proposed rule, even as it claims that its interpretation is ''sufficiently clear that a definition is not necessary.'' One commenter further stated that if EPA ultimately elects to adopt regulatory definitions of those terms, it should wait until the court rules so that the definitions are informed by and consistent with any such ruling.

Another commenter asserted that EPA must acknowledge (and make a good faith attempt to reconcile) the competing interpretations of key terms of art in the 2015 CCR Rule before extending them into this final rule.

One commenter argued that even if EPA adopted its proposed definition, the rule provides no criteria—in contrast to the detailed criteria for the necessary cover system—for how to ''control, minimize or eliminate to the maximum extent feasible'' horizontal groundwater ''infiltration.'' The commenter alleged that ''this type of undefined performance standard would be void for vagueness, especially when compared to the great lengths EPA went to specify the other technical criteria to address vertical infiltration in the performance standard.''

EPA also received numerous comments recommending that infiltration be defined by reference to technical definitions that define infiltration as exclusively the vertical flow of water from the surface down into the unit. These included a definition provided by the U.S. Geological Survey (''USGS''), as ''flow of water from the land surface into the subsurface.'' Also, according to the USGS: ''Water that infiltrates at land surface moves vertically downward to the water table to become ground water. The ground water then moves both vertically and laterally within the ground-water system.''

As discussed previously, EPA disagrees that it is necessary to wait until the court issues its decision in the pending litigation (*Electric Energy, Inc., et al.* v. *EPA, Case Nos. 22–1056 and 23–1035).* However, the court may rule on the procedural question at issue, it would not resolve the substantive question EPA posed in the proposal, of whether the inclusion of a definition would be useful.

EPA also disagrees that it should adopt a definition of infiltration as exclusively the vertical flow of water from the surface down into the unit. The purpose of adopting a definition is not to establish a generic definition of infiltration, but to assist in the application of standards to ensure that a CCR unit closes in a manner that will protect human health and the environment. When promulgating definitions applicable in regulatory programs, EPA relies not only on available dictionary definitions, but also the surrounding context of the regulation as a whole, as well as what will best achieve the overall purpose of the regulation, and the Agency's statutory mandate. None of the commenters address-any of these factors in recommending that EPA adopt their various technical definitions. In this case, the plain language definition of infiltration best fits within the context of the regulation as a whole, and best achieves both the purpose of the regulation and the RCRA section 4004(a) mandate to protect human health and the environment. This is because under the commenters' unnecessarily restrictive definitions the regulation would allow a significant number of sites to continue leaking hazardous constituents, such as arsenic and mercury, indefinitely.

Accordingly, the final rule adopts a definition of infiltration based on the dictionary definitions discussed in the proposal. The final rule defines infiltration to mean ''the migration or movement of liquid, such as surface water or ground water, into or through a CCR unit from any direction, including from the surface, laterally, and through the bottom of the unit.'' This definition also is consistent with two technical sources that use infiltration more broadly by incorporating lateral flow through continuous porous media. As EPRI explained in its comments, Geotechnical Aspects of Landfill Design and Construction (Qian 2002) does not contain an explicit definition of infiltration but does refer to both ''surface water infiltration'' and ''groundwater infiltration'' in its description of landfill leachate. Similarly, the National Research Council in Assessment of the Performance of Engineered Waste Containment Barriers (National Research Council 2007) does not explicitly define infiltration but uses infiltration to describe surface water and groundwater movements into waste as well as soil migration into drainage systems.

With respect to the comment requesting EPA to ''acknowledge (and make a good faith attempt to reconcile) the competing interpretations of key terms of art in the 2015 regulation,'' EPA considers that its adoption of this definition does this. As noted, the definition is consistent with both the plain language meaning of the term, and with relevant technical sources. Further, the definition fits within the context of the regulation as a whole and best achieves both the purpose of the regulation and RCRA's mandate to protect human health and the environment.

Finally, EPA disagrees that the regulation, with or without a regulatory definition of infiltration, is unconstitutionally vague. The scope of the regulatory definition is clear, and thus regulated parties have adequate notice of the rule's requirements.

In point of fact, the commenter's complaint is not that it cannot determine what is required under the regulation, but that it dislikes what the plain language clearly compels. Relying on the plain language definition of infiltration simply requires facilities that want to close an unlined CCR impoundment with waste in place to implement engineering measures to ''control, minimize, or eliminate, to the maximum extent feasible'' liquid entering the unit from the sides or the base of the unit. EPA has previously identified several reasonably available engineering measures exist that can prevent, or at least control, the flow of groundwater into the unit (and consequently the releases out of the unit). For example, EPA's 1982 guidance on the closure of hazardous waste surface impoundments, which the commenter also references, identifies several engineering controls ''to prevent the subsurface flow of ground water into the impounded waste.'' EPA Office of Solid Waste, Closure of Hazardous Waste Surface Impoundments, SW–873, p 81 (September 1982), Revised Edition (emphasis added). In other words, the regulation ''clearly proscribes'' the commenter's preferred conduct of closing its CCR impoundments without addressing the groundwater in its unit. Finally, § 257.102(d)(1)(i) is no more vague than the corresponding requirement in § 265.111(a), which has been in effect since 1982 (requiring interim status facilities to ''control, minimize or eliminate to the extent necessary to protect human health and the environment, post-closure releases of leachate . . .). The clarity of this regulation is shown by the fact that, over the past 40 years the regulation has been in effect, interim status hazardous waste facilities have been able to adequately determine what the regulation requires and comply with it. The commenter has offered nothing to distinguish the interim status requirements from those in § 257.102(d)(i).

(3) Closure in Place Performance Standards Under § 257.102(d)

The May 2023 proposal explained how the performance standards for closing with waste in place applied to a CCR surface impoundment that intersected with groundwater. EPA received a number of comments that agreed with the Agency's explanation, as well as several that opposed it. Several commenters raised objections they had previously presented in the context of prior decisions. EPA has previously responded to these comments in detail in (1) U.S. EPA. Denial of Alternative Closure Deadline for General James M. Gavin Plant, Cheshire, Ohio (November 18, 2022) in the docket at EPA–HQ–OLEM–2021–0590–0100; (2) 88 FR 31982 (May 18, 2023); and (3) 88 FR 55220 (August 14, 2023). EPA continues to be unpersuaded by the commenters objections and to avoid any confusion is reiterating below the explanation provided in the May 2023 proposal.

The CCR closure requirements applicable to closing with waste in place include general performance standards and specific technical standards that set forth individual engineering requirements related to the drainage and stabilization of the waste and to the final cover system. The general performance standards and the technical standards complement each other, and both must be met at every unit.

The specific technical standards related to the drainage of the waste in the unit require that, ''free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.'' 40 CFR 257.102(d)(2)(i). Free liquids are defined as all ''liquids that readily separate from the solid portion of a waste under ambient temperature and pressure,'' regardless of whether the source of the liquids is from sluiced water or groundwater. 40 CFR 257.53. Consequently, the directive applies to both the freestanding liquid in the impoundment and to all readily separable porewater in the impoundment, whether the porewater was derived from sluiced water, stormwater run-off, or groundwater that migrates into the impoundment. In situations where the waste in the unit is inundated with groundwater, the requirement to eliminate free liquids thus obligates the facility to take engineering measures necessary to ensure that the groundwater, along with the other free liquids, has been permanently removed from the unit prior to installing the final cover system. See, 40 CFR 257.102(d)(2)(i).

In addition to the process-specific technical requirements, all closures must meet the requirements in the general performance standard to ''control, minimize or eliminate, to the maximum extent feasible,'' both post closure infiltration of liquids into the waste and releases of CCR or leachate out of the unit to the ground or surface waters, and to ''preclude the probability of future impoundment of water, sediment, or slurry.'' 40 CFR 257.102(d)(1)(i), (ii).

In situations where the groundwater intersects an unlined CCR unit, water may infiltrate into the unit from the sides and/or bottom of the unit because the base of the unit is below the water table. In this scenario, the CCR in the unit will be in continuous contact with water. This contact between the waste and groundwater provides a potential for waste constituents to be dissolved and to migrate out of (or away from) the closed unit. In such a case, the general performance standard also requires the facility to take measures, such as engineering controls, that will ''control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste'' as well as ''post-closure releases to the groundwater'' from the sides and bottom of the unit. 40 CFR 257.102(d)(1).

Whether any particular unit can meet these performance standards is a fact and site-specific determination that will depend on a number of considerations, such as the hydrogeology of the site, the design and construction of the unit, and the kinds of engineering measures implemented at the unit. Accordingly, the fact that prior to closure the base of a unit intersects with groundwater does not mean that the unit may not ultimately be able to meet the performance standards in § 257.102(d) for closure with waste in place.

Depending on the site conditions, a facility may be able to meet these performance standards by demonstrating that a combination of engineering measures and site-specific circumstances will ensure that as a consequence of complying with the closure performance standards, the groundwater will no longer be in contact with the waste in the closed unit. As one example, where groundwater intersects with only a portion of an impoundment, the facility could close that portion of the unit by removing the CCR from that area of the unit but leaving waste in place in other areas. As another example, if the entire unit sits several feet deep within the water table, engineering controls can potentially be implemented to stop the continued flow of groundwater into and out of the waste. See, EPA Office of Solid Waste, Closure of Hazardous Waste Surface Impoundments, SW–873, p 81 (September 1982), Revised Edition.

(4) Methods and Tools for the Identification and Elimination of Free Liquids

Many commenters requested EPA provide greater clarity regarding the closure performance standard that requires that ''free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.'' 40 CFR 257.102(d)(2)(i). Commenters stated that there continues to be confusion over what technical means and methods can be implemented to meet EPA's expectations and, in particular, what design considerations must be taken into account to achieve compliance with the existing closure performance standards (as applied to both currently and newly regulated units). The commenters explained that there are no regulatory specifications for eliminating free liquids prior to installing the final cover system or controlling, minimizing or eliminating, to the maximum extent feasible, the post-closure infiltration of liquids as required by § 257.102(d)(2)(i) and (d)(1)(i), respectively.

In response to these requests, EPA is providing further information with this final rule. EPA has included in the docket to this rulemaking a document titled ''Methods and Tools for the Identification and Elimination of Free Liquids.'' A summary of some of the main points of the guidance are discussed below.

The document discusses many of the methods and tools needed to identify and eliminate free liquids that are already widely used by industry to investigate and close surface impoundments. For example, tools that may be used to identify free liquids include soil borings and cone penetrometers to map the stratigraphy of the CCR unit and characterize the geotechnical and hydraulic properties of the various CCR layers, as well as the installation of traditional piezometers, monitoring wells and vibrating wire piezometers to monitor pore pressures and water levels. Properly constructed wells and piezometers screened in the appropriate locations and depths have a prominent role in networks of instruments necessary for assessing free liquids in that their design directly measures water levels under ambient conditions. At the most basic level water levels in wells and piezometers are indicative of free liquids. Conversely, networks of wells and piezometers could be used as part of a program used to determine that free liquids no longer exist. Similarly, methods and tools to eliminate free liquids within the CCR, such as rim ditches, pumping wells, extraction wellpoints are also currently employed by industry. These technologies also provide insights into the presence and nature of free liquids at a given CCR unit, *e.g.,* rim ditches and open excavations enable direct observation of free liquids.

Finally, the document identifies considerations useful to developing successful site-specific strategies and approaches to identify, measure, monitor and eliminate free liquids. Longer term variables such as potential groundwater intrusion or other influences are also discussed. In summary, full compliance requires successful sustained attainment of performance standards over the long term. Designing successful approaches will necessarily involve careful consideration of all potential sources of free liquids, including groundwater. Owners or operators of units that contain CCR in contact with groundwater will likely need to take additional actions such as CCR removal or implement specific engineering measures applied over time frames needed to preclude groundwater from intruding back into CCR units after free liquids have been initially eliminated.

iv. Preparation of a Written Closure Plan for CCR Management Units

EPA proposed that owners or operators of CCRMU comply with the existing requirements of § 257.102(b) requiring the preparation of a written closure plan no later than 12 months after the effective date of the final rule.

As mentioned in Unit III.C.4.d, aside from those commenters that disagreed with requiring CCRMU to comply with overall closure requirements, commenters on the proposed rule agreed that the written closure plan requirement would generally be appropriate for CCRMU. One commenter suggested additional requirements for the content of the closure plan including the elevation of the base of the unit, groundwater information, and descriptions of compliance with § 257.102 will be achieved (*e.g.,* how free liquids would be eliminated, how waste will be stabilized, measures to minimize the need for further maintenance of the CCR unit). A few commenters supported the proposed deadline but as summarized in Units III.C.4.a and III.C.4.d of this preamble, other commenters stated the proposed deadline was infeasible and inappropriate. One commenter suggested the deadline for the closure plan be extended to be concurrent with the initiation of closure. Another commenter requested EPA create extension mechanisms for this requirement based on the number of CCRMU at the facility. Commenters suggestions for the deadline for the completion of the closure plan ranged from 12 (the 2015 CCR Rule deadline) to 60 months.

EPA disagrees with the commenter that additional requirements regarding the content of the closure plan are necessary. The information the commenter requested be included in the closure plan is 1) already required to be in the closure plan pursuant to §§ 257.102(b) or 2) readily available in other required reports (*e.g.,* the annual groundwater monitoring and corrective action reports). Furthermore, the commenter failed to fully explain how compliance with § 257.102(b) does not provide the information needed to determine if compliance with the closure performance standards will be met.

Regarding the deadline, for the same reasons in Units III.B.2.g and III.B.2.g.iv.b for legacy CCR surface impoundments, EPA concludes that the deadline for the closure plan should be extended from the proposed deadline to allow for owners or operators to incorporate information about groundwater quality, groundwater flows, seasonality impacts, and the migration of contaminants (if any) into the plan. Therefore, EPA is finalizing a deadline of no later than Wednesday, November 8, 2028, which is 48 months after the effective date. This final deadline extends the proposed deadline by 36 months and EPA expects that this adequately address the concern regarding the infeasibility of the deadline expressed by a commenter requesting EPA create extension based on the number of CCRMU at the facility. This is codified in the regulatory text at § 257.102(b)(2)(iii).

However, consistent with the requirements for legacy CCR surface impoundments, EPA is not requiring compliance with the written closure plan requirement for CCRMU that, by the effective date of this final rule, have completed: (1) closure with waste in place or (2) a closure eligible for deferral to permitting as described in § 257.101(g). Instead, the final rule requires the owner or operator to provide information on the completed closure of the CCRMU, along with supporting documentation to demonstrate that the closure meets the performance standards in § 257.102(d) or the standards specified in § 257.101(g). This is codified in the regulatory text at § 257.102(b)(2)(v).

Based on comments on the proposed rule and experience from the 2015 CCR Rule, EPA expects the incorporation of this information into the closure plan will allow facilities to select a closure method that most appropriately addresses issues like waste that is in contact with groundwater, groundwater contamination, and long-term structural stability concerns. Closure plans that adequately address these issues will result in better protection of human health and the environment.

The closure plan describes the steps necessary to close a CCR unit at any point during the active life of the unit based on recognized and generally accepted good engineering practices. 40 CFR 257.102(b)(1). The plan must set out whether the closure of the CCR unit will be accomplished by leaving CCR in place or through closure by removal and include a written narrative describing how the unit will be closed in accordance with the section, or in other words, how the closure will meet all the performance standards in the regulations. 40 CFR 257.102(b)(1)(i). The written closure plan must also provide a schedule for completing all activities necessary to satisfy the closure criteria of the rule. See also 80 FR 21410–21425.

If the CCR is left in place, the closure plan must include a description of the final cover system and how the final cover system will achieve the regulatory performance standards. If the base of the impoundment intersects with groundwater, the closure plan would need to discuss the engineering measures taken to ensure that the groundwater had been removed from the unit prior to the start of installing the final cover system, as required by § 257.102(d)(2)(i). The closure plan would also need to describe how the facility plans to meet the requirements in § 257.102(d)(1) to "control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters." This could include, for example, the installation of engineering controls that would address the post-closure infiltration of liquids into the waste from all directions, as well as any post-closure releases to the groundwater from the sides and bottom of the unit.

v. Preparation of a Written Post-Closure Care Plan for CCR Management Units

EPA proposed that owners or operators of CCRMU would be required to comply with the existing requirement in § 257.104(d) regarding the preparation of a written post-closure no later than 12 months after the effective date of the final rule.

As mentioned in Unit III.C.4.d, aside from those commenters that disagreed with requiring CCRMU to comply with overall closure requirements, commenters on the proposed rule agreed that the written post-closure care plan requirement would generally be appropriate for CCRMU. Overall commenters requested an extension of the post-closure care deadline to allow for a more feasible deadline and the incorporation of groundwater monitoring data. Another commenter requested EPA create extension mechanisms for this requirement based on the number of CCRMU at the facility. For the same reasons in Units III.B.2.g and III.B.2.g.iv.c for legacy CCR surface impoundments, EPA is finalizing a deadline of no later than Wednesday, November 8, 2028, which is 48 months from the effective date of the final rule to comply with the post-closure care requirement in § 257.104(d). This final deadline extends the proposed deadline by 36 months and EPA expects that this adequately address the concern regarding the infeasibility of the deadline expressed by commenter requesting EPA create extension based on the number of CCRMU at the facility. This is codified in the regulatory text at § 257.104(d)(2)(iii).

Section 257.104(d) requires that an owner or operator of a CCR unit prepare a written post-closure plan. The contents of the P.E.-certified plan are stated in the rule § 257.104(d)(1)(i) through (iii) and can be summarized as a description of the monitoring and maintenance activities required for the unit, the frequency that these activities will be performed, information for the point-of-contact during the post-closure care period, and planned uses of the property.

vi. Deadline To Initiate Closure for CCR Management Units

EPA proposed that owners or operators of CCRMU initiate closure no later than 12 months after the effective date of the final rule. As explained in the proposed rule, the proposed deadline was expedited from the 2015 CCR Rule to address the risks posed from these units and EPA's estimated minimum amount of time necessary to collect the information needed to determine whether to close the unit in place or close by removal.

Several commenters expressed support for the proposed 12-month deadline to initiate closure, stating that the shorter deadlines are necessary to address the increased risk from CCRMU and likelihood these units are and have been contaminating groundwater. However, as mentioned in Unit III.C.4.d, many other commenters characterized the proposed deadline as infeasible for the reasons mentioned in Unit III.C.4.a, including seasonality, need to comply with overlapping regulatory requirements, labor shortages, and the strain on the limited resources necessary to achieve compliance (*e.g.,* contractors, laboratories, P.E.s) caused by the number of CCR units coming into compliance at the same time. Commenters emphasized the importance of the groundwater monitoring data to inform closure, stating that compliance with the closure requirements should not be required until after the groundwater monitoring system was installed and baseline samples collected. These commenters pointed to recent EPA Part A and Part B decisions as evidence of the gap between EPA's expectations and the closure and post-closure plans developed by owners or operators and best practices; these commenters further stated that the proposed deadline precludes the incorporation of groundwater monitoring data in developing closure plans and is likely a contributing factor to the gap between EPA's expectation and closure and post-closure care plans submitted by owners or operators of currently regulated units. Additionally, as described in Unit III.C.4.d.ii, several commenters requested the delays for the initiation of closure for CCRMU beneath critical infrastructure until the decommissioning or closure of the infrastructure or facility. Finally, a few commenters suggested EPA create extensions for the deadline to initiate closure to address concerns about comply with overlapping State permitting requirements or based on the number of CCRMU present at the facility. Commenters' suggestions for alternative deadlines to initiate closure ranged from 12 with extensions to 60 months, or at least after the collection of the baseline groundwater monitoring samples required by § 257.94.

Consistent with the approach for legacy CCR surface impoundments closure, EPA acknowledges the benefit of allowing owners or operators the time needed to incorporate groundwater monitoring data into the closure plan. Additionally, as stated in the proposed rule, EPA acknowledges the importance of using information gained by compliance with the groundwater monitoring and corrective action requirements to inform closure decisions and therefore the initiation of closure. For the reasons explained in Unit III.C.4.c, EPA is extending the deadline for the groundwater monitoring and corrective action requirements to a single deadline of no later than 42 months from the effective date of the final rule. As such, the initiation of closure is being extended as well. To ensure owners or operators have enough groundwater monitoring data to draw conclusions about seasonality impacts on groundwater levels and flow and the source of any potential groundwater contamination in the area, EPA is finalizing a deadline of no later than Tuesday, May 8, 2029, which is 54 months from the effective date of the final rule. This is codified in the regulatory text at § 257.101(f)(1). This final deadline extends the proposed deadline by 42 months and EPA expects that the concerns expressed by commenters requesting EPA create extensions (*i.e.,* the need to comply with State permitting requirements and the number of CCRMU at the facility) are addressed by this overall deadline extension. Finally, regarding those CCRMU under critical infrastructure, owners or operators of these units have the opportunity to defer the deadline to initiate closure until the Agency can address these units on an individual basis as part of permitting. See Unit III.C.4.d.ii.

vii. Deadline To Complete Closure for CCR Management Units

EPA proposed to apply the current CCR surface impoundment closure time frames at § 257.102(f) to CCRMU. The existing CCR regulations currently require an owner or operator of a CCR surface impoundment generally to complete closure activities within five years from initiating closure. The regulations also establish the conditions for extending this deadline, upon a showing that additional time is necessary. Consistent with the existing requirements for CCR surface impoundments, EPA proposed the amount of additional time that an owner or operator could obtain would vary based on the size (using surface area acreage of the CCR unit as the surrogate of size) of the CCRMU. For CCRMU 40 acres or smaller, the proposed maximum time extension is two years. For CCRMU greater than 40 acres, the proposed maximum time extension is five 2-year extensions (10 years), and the owner or operator must substantiate the factual circumstances demonstrating the need for each year extension.

Several commenters expressed support for the proposed deadlines to complete closure, citing the increased risk from CCRMU and likelihood these units are and have been contaminating groundwater. However, many commenters on the proposed rule requested an extension of the deadline to complete closure to allow for a more feasible deadline and to mitigate the factors mentioned in Unit III.C.4.a. Some of these commenters stated if the deadline to initiate closure was extended to no less than the time granted for CCR unit closure in the 2015 CCR Rule, then the proposed deadlines would be feasible. These commenters supported the ability of CCRMU to seek extensions of the deadline based on size. However, a few of the commenters requested longer extensions or an increase in the maximum number of extensions for CCRMU. These commenters cited factors mentioned in Unit III.C.4.a as reasons to allow for longer or more extensions (*i.e.,* third-party availability, need to comply with State permitting requirements prior to certain activities, backlogs, number of CCR units coming into compliance at the same time). One commenter stated more extensions were necessary to meet the closure performance standards in § 257.102 (*i.e.,* remove liquid from the unit and meet the groundwater protection standards).

For the reasons described throughout this Unit of the preamble, EPA has extended the deadline for the initiation of closure. EPA expects the extension to the deadlines for the closure plan and initiation of closure, as well as the options to defer closure requirements for CCRMU under critical infrastructure and those that have completed closure under a regulatory authority (see Units III.C.4.d.ii and III.C.4.d.iii.a, respectively), to address the concerns commenters expressed with the infeasibility or inappropriateness of the deadline to complete closure. Furthermore, with respect to requests for longer or more extensions for CCRMU as compared to the existing CCR regulations, EPA still concludes that as explained in the proposed rule, CCRMU closure will closely resemble CCR impoundment closures because of half of these identified potential CCRMU were associated with former, Federally unregulated CCR surface impoundments. Additionally, the requirements for former impoundments to be closed with waste in place (*i.e.,* procurement, transportation, and placement of substantial volumes of soil or borrow material), would also apply to certain CCR fill placements as well as to inactive CCR landfills where past waste disposal did not reach the landfill's design capacity (*i.e.,* landfill airspace was not fully utilized). As such, in these situations, EPA has determined the time frames to complete closure for existing CCR surface impoundments are appropriate (*i.e.,* 5 years). Finally, as discussed in proposed rule, the Agency believes that the base of at least some CCRMU may intersect with the groundwater because CCRMU may be located in floodplains or wetlands, or near large surface water bodies. EPA's experience in implementing the regulations is that such closures are generally more complex and take longer to complete. EPA thus believes the time frames to complete closure of CCRMU should be the same as the time frames provided for existing CCR surface impoundments. No commenters provided factual information or evidence to support the conclusion that CCRMU closure, apart from those CCRMU under critical infrastructure or closed under a regulatory authority mentioned above, is different enough from closure of units regulated under the 2015 CCR Rule to warrant additional extensions or separate requirements. Therefore, EPA is finalizing the deadline for the completion of closure of CCRMU as proposed. This is codified in the regulatory text at § 257.102(f).

viii. Post-Closure Care for CCR Management Units

EPA proposed to apply the existing post-closure care requirements at § 257.104 to CCRMU without revision. These criteria are essential to ensuring the long-term safety of CCRMU.

As mentioned in Unit III.C.4.d, aside from those commenters that disagreed with requiring CCRMU to comply with overall closure requirements, no commenters raised specific concern about requiring CCRMU to comply with the existing requirements in § 257.104. However, one commenter suggested that EPA allow units that have closed under a State program to either continue post-closure care under that State program or reduce the post-closure care period for these units by the number of years of post-closure care completed under the State program. As described in Unit III.C.4.d.iii(a), EPA is finalizing a provision to address closures completed under other authorities provided the closure meets specific criteria by deferring any closure activities to permitting, including the determination of when post-closure care is completed. In instances where the criteria for deferral to permitting has been met and units have conducted post-closure care under a State program for many years, the permitting authority, once authorized, will be able to look at the site-specific information, including the closure and the specific activities required by the State's post-closure care program, and determine what, if any, further closure or post-closure activities would be appropriate. EPA is therefore finalizing this provision without revision.

The existing post-closure care criteria require the monitoring and maintenance of units that have closed in place for at least 30 years after closure has been completed. 40 CFR 257.104. During this post-closure period, the facility would be required to continue groundwater monitoring and corrective action, where necessary.

e. Recordkeeping, Notification and Internet Posting for CCR Management Units

EPA proposed that, like legacy CCR surface impoundments, owners or operators of CCRMU be subject to the existing recordkeeping, notification and website reporting requirements in the CCR regulations found at §§ 257.105 through 257.107. EPA also proposed changes to add CCRMU to § 257.107(a) to require the facility to notify the Agency using the procedures for the establishment of the website no later than the effective date of the final rule. For reasons specified in the 2015 CCR Rule, the CCR regulations require the owner or operator of a new or existing CCR unit to record specific information in the facility's operating record, maintain files of all required information (*e.g.,* demonstrations, plans, notifications, and reports) that supports implementation and compliance with the rule, notify State Director and Tribal authorities, and maintain a public CCR website that hosts this information. 80 FR 21427.

A commenter supported applying recordkeeping, notification, and internet posting requirements to CCRMU but stated that the existing requirements were ineffective at ensuring compliance with the CCR regulations or allowing for meaningful public awareness or participation. The commenter suggested that EPA create mechanisms within the rule to ensure the public has the opportunity to participate in the decision-making processes at regulated CCR units; standardize reporting to make the report more easily understood by the public; establish organizational requirements for the CCR websites; require public notice and engagement when notifying the State Director and/or appropriate Tribal authority as required by the CCR rule; extend the period of time the files required by the CCR rule must be maintained in the operating record; and require owners or operators certify compliance documentation for the CCR units. This commenter also suggested EPA clarify what records owners or operators are required to retain and to publish. Other commenters suggested the website requirement not be due until the first document is required to be posted.

EPA agrees with the commenter on the importance of meaningful public participation. The current regulations allow for public participation by requiring owner or operators to hold a public meeting as part of the assessment of corrective measures in § 257.96, creating a mechanism for the public to file dust complaints in § 257.80(b), and the ''contact us'' form or specific email address on facilities' public CCR websites for questions or issues from the public as required by § 257.107(a). Public comment periods are also held as part of the determination process for Part A and Part B demonstrations; however, these demonstrations are not applicable to CCRMU. EPA does not have evidence to support the claim by the commenter that these opportunities for public participation are ineffective. Furthermore, EPA does not find other decision-making points in the rule appropriate for mandatory public meetings or public comment periods although facilities are encouraged to engage with the public and to both solicit and incorporate public input into decisions, such as closure methods, as able and appropriate.

With respect to the commenter's suggestions that EPA require the owners or operators of CCR units to certify compliance documentation and create standardized reporting and website layout requirements, as explained in the proposed rule, EPA does not have evidence that CCRMU are sufficiently different than currently regulated facilities to necessitate substantially different requirements. The commenter provided no factual basis to support the suggestion that requiring owner or operator certifications would improve compliance with the regulations beyond the certifications currently required by professional engineers. When justifying the request for standardized reporting and website layout requirements, the commenter failed to explain how compliance with the public website posting requirements in § 257.107, including the requirement to ensure all information is ''clearly identifiable and must be able to be immediately printed and downloaded by anyone accessing the site'' is inadequate or a hinderance to the public accessing the required information. Therefore, EPA does not believe additional notification, certification, or public engagement requirements for CCRMU would be appropriate.

EPA agrees with the commenter on the need to extend the period of time files required by the CCR rule must be maintained on the facilities' public websites and in the operating records. As described in Unit III.D.5, EPA is extending how long files must be maintained in the operating record and on the public website. While EPA believes the regulations at §§ 257.105 and 257.107 clearly lay out what records must be retained and published, EPA has included in Unit III.D.5. a table that details what records are required to be maintained in the operating record and on the public website as well as the corresponding retention periods. No commenters raised concerns about requiring CCRMU to comply with the existing requirements in §§ 257.105 through 257.107.

Lastly, EPA agrees with the commenters who suggested the deadline for the establishment of the website coincide with the first required document (*i.e.,* the FER Part 1). Therefore, EPA is finalizing a deadline of 15 months after the effective date for the establishment of the website.

EPA is also finalizing the requirement that owners or operators of CCRMU comply with recordkeeping, notification, and internet posting requirements at §§ 257.105 through 257.107.

As discussed in Unit III.B.2.h of this preamble, owners or operators must document implementation and compliance with the rule and must place these files into the facility's operating record. Each required file must be maintained in the operating record for the entirety of the retention period specified in § 257.105 following submittal of the file into the operating record. Each file must also indicate the date the file was placed in the operating record. Files are required to be submitted into the operating record at the time the documentation becomes available or by the compliance deadline specified in the CCR regulations. Section 257.105 contains a comprehensive listing of each recordkeeping requirement and corresponding record retention periods.

Furthermore, the owner or operator of a CCRMU must maintain a CCR website titled, ''CCR Rule Compliance Data and Information'' that hosts the compliance information so that it may be viewed by the public. Unless provided otherwise in the rule (see, Unit III.E.5), information posted to the CCR website must be available for a period no less than five years from the initial posting date for each submission. Posting of information must be completed no later than 30 days from the submittal of the information to the operating record. Owners or operators of CCRMU have 15 months from the effective date of this rule to establish a CCR website and post the required applicable information.

D. Closure of CCR Units By Removal of CCR

1. Background

On March 3, 2020, in the Proposed Rule entitled: Hazardous and Solid Waste Management System: Disposal of CCR; A Holistic Approach to Closure Part B: Alternate Demonstration for

Unlined Surface Impoundments; Implementation of Closure, EPA proposed to revise the 2015 CCR Rule to, among other things, provide facilities with an additional option for CCR units being closed by removal of CCR. 85 FR 12456. Specifically, EPA proposed to allow a facility to complete the closure in two stages: first, by completing all removal and decontamination procedures; and second, by completing all groundwater remediation in a separate post-closure care period. 85 FR 12456. In this final rule, the Agency is taking final action on this proposal.

The closure by removal regulation consists of two performance standards. In the first standard, the owner or operator must remove all CCR from the unit and decontaminate all areas affected by releases from the CCR unit. In the second standard, the regulation specifies that closure is complete when all CCR in the unit and any areas affected by releases from the CCR unit have been removed and groundwater monitoring demonstrates that there are no exceedances of any groundwater protection standard. See § 257.102(c). Importantly, the second performance standard requires groundwater corrective action of a unit to be completed in order for closure of the unit to be considered complete.

As previously discussed, the CCR regulations also establish deadlines to initiate and complete closure activities. For example, the regulations generally require owners and operators of CCR surface impoundments to complete closure activities within five years of commencing closure activities, while closure of CCR landfills must be completed within six months. See § 257.102(f)(1). Notwithstanding these deadlines to complete closure, the CCR regulations also allow for additional time provided the owner or operator can make the prescribed demonstrations that are based on site-specific circumstances beyond the facility's control. For CCR surface impoundments, the amount of additional time beyond the five years varies based on the demonstrated need and the surface area acreage of the impoundment. For impoundments 40 acres or smaller, the maximum time extension that can be obtained is two years. For impoundments greater than 40 acres, the maximum time extension is five two-year extensions (for a total extension of ten years). For CCR landfills, 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 (for a total extension of two years). To obtain additional time, owners or operators of CCR units must substantiate the factual circumstances demonstrating the need for the extension. See § 257.102(f)(2). In all instances the number of time extensions is capped to a certain number of years.

The CCR regulations also require the owner or operator of the CCR unit to obtain a certification from a qualified professional engineer or approval from the Participating State Director (or EPA where EPA is the permitting authority) verifying that closure has been completed in accordance with the written closure plan and all applicable closure requirements of § 257.102. See § 257.102(f)(3). In addition, the owner or operator must prepare a notification stating that closure of the unit has been completed. This notification must be completed within 30 days of completion of unit closure and must include the certification required by § 257.102(f)(3). See § 257.102(h). As the CCR regulations are currently structured for units closing by removal of CCR, the closure certification and notification cannot be completed until all CCR removal and decontamination activities, including groundwater corrective action,[146] are completed. Prior to this final rule, owners and operators that complete closure of a unit by removal of CCR were exempt from any other post-closure care requirements for the unit and were also exempt from the deed notation requirements upon certification that closure by removal of CCR has been completed.

2. March 2020 Proposed Rule

Under the March 2020 proposal, an owner or operator that cannot complete groundwater corrective action by the time all other closure by removal activities have been completed (*i.e.,* during the active life [147] of the CCR unit) may complete groundwater corrective action during a post-closure care period. Under this option, the owner or operator must first complete all other removal and decontamination activities within the time frames provided for completing closure. In addition, EPA proposed to require the owner or operator to have implemented the remedy selected under § 257.97 such that all components of the remedy are in place and operating as intended prior to completing all removal and decontamination activities. Upon completion of all removal and decontamination activities (except for completion of groundwater corrective action) and implementation of the selected remedy, the owner or operator would be allowed to certify that the CCR unit has been closed. Thereafter, the CCR unit would be required to continue to conduct corrective action in accordance with the existing requirements in § 257.98 and would be subject to the existing post-closure care requirements in § 257.104 until completion of groundwater corrective action. EPA did not propose any substantive revisions to the current closure standard when closing by removal of CCR under § 257.102(c), but presented the current closure standard in a slightly revised format to accommodate the proposed action.

EPA proposed this option because the Agency received new information indicating that the closure of CCR units will likely be more complex than EPA envisioned in 2015, and that more than 40% of existing CCR surface impoundments were planned to be closed by removal of CCR. In addition, available information indicated that more than 70% of all CCR surface impoundments are unlined. EPA determined that, given the number of unlined CCR units, many of which have already reported exceedances of groundwater protection standards, it was evident that many CCR units have released CCR constituents into the surrounding soils and groundwater. EPA concluded that this meant that closure would not simply be a matter of removing CCR from the unit, but would likely require a significant undertaking to remediate impacted soil and groundwater in order to achieve the current CCR removal and decontamination standards. The proposal explained that based on this new information EPA concluded that the existing timelines to complete closure by removal of CCR were not designed to also provide sufficient time to complete groundwater corrective action. The Agency explained that it was also concerned that the existing deadlines in § 257.102(c) may create a disincentive to close a unit by removal of CCR.

After considering the comments received, the same considerations discussed in the proposal remain relevant. Moreover, the groundwater monitoring installed pursuant to the 2015 CCR Rule has documented groundwater contamination that is more extensive and more frequent that EPA had originally estimated. It is now apparent not only that a greater number

[146] For purposes of this preamble discussion, the term ''groundwater corrective action: includes those actions taken to implement the selected remedy specified in § 257.98(c) to attain the groundwater protection standards in § 257.95(h).

[147] The ''active life'' of a CCR unit is defined in § 257.53 as the period of operation beginning with the initial placement of CCR in the CCR unit and ending at completion of closure activities in accordance with § 257.102.

of facilities are electing to close by removal than EPA originally estimated, but also that some facilities may need to close by removal because they are unable to meet the standards to close with waste in place due to the site conditions. And more critically, EPA is concerned that, based on the existing time frames, some facilities could not comply with either performance standard because it is not feasible to remediate the contamination within the existing deadlines in § 257.102(f). EPA has therefore incorporated this provision into this final rule.

Most of the comments EPA received on this proposal [148] related to the revised regulatory text in § 257.102, the requirement to implement the corrective action remedy during the active life of the unit and the requirement for deed notifications. One commenter also stated that there was nothing in the record to demonstrate that facilities were not able to meet the existing § 257.102(c) performance standard by deadlines in § 257.102(f). The commenter also expressed concern that the proposed option would allow exceedances of groundwater protection standards to continue indefinitely after an impoundment is closed by removal. Further, the commenter contended that the proposed change did not include any additional requirements for owners and operators to substantiate the need to take additional time following removal activities. This, they stated, could incentivize the selection of the slowest, least protective corrective measures such as ''natural attenuation,'' allowing dangerous contamination to persist for long periods of time when it could have been stopped decades earlier. They were concerned that owners or operators would unreasonably select remedies that take much longer to achieve compliance over other available options that could achieve compliance faster.

The Agency disagrees that there is no record to support the need for additional time to complete groundwater remediation within the time frames provided in § 257.102(f). For example, this same commenter submitted comments on the May 2023 proposed rule providing examples of numerous plants who have certified the removal portion of closure by removal while noting the need for additional time beyond the existing deadlines in § 257.102(f) in order to be able to certify compliance with GWPS.[149] These facilities include Duke Energy's Gibson Station, LG&E–KU's Ghent Generating Station, and Dominion Energy's Possum Point Power Station.

Additionally, EPA compiled data on remediation efforts published in the Superfund 5-Year Review Reports conducted pursuant to CERCLA § 121(c).[150] The data review focused on sites that presented releases of metals similar to those expected at CCR facilities and sites that were likely to choose remediation technologies that could also be applicable to CCR facilities. The compilation included data for 20 sites with groundwater remediation remedies in place for at least 15 years. There were eight sites that implemented a combination of remediation strategies (for example, pump and treat and vertical barrier wall in the same site). The most common remedy noted was pump and treat (14 sites), followed by monitored natural attenuation (MNA) (eight sites), barrier walls (five sites), in-situ stabilization (two sites), and permeable reactive barriers (one site). At the time of this data compilation, 18 out of 20 remedies were still ongoing with cleanup durations ranging from 15 to more than 32 years. 11 of 20 remedies exceeded 20 years of operation.

The Agency also disagrees that the proposal would allow exceedances to continue indefinitely, and the owner or operator to purposely choose the slowest, least protective groundwater remediation technology. The facility would remain subject to the existing requirements for corrective action, §§ 257.96 through 257.98, which prohibit the actions the commenter describes. Additionally, the facility must have initiated remedial activities as required by § 257.98(a) during the active life of the unit in order to be eligible for this closure alternative. The sole exception to this would be where the facility only triggered corrective action for the constituent near the end of the closure process, and the facility cannot extend the active life of the unit because it would exceed a deadline in § 257.102(f). In such a case, the facility would be required to document that (1) it was in compliance with all applicable requirements in §§ 257.96 through 257.98; and (2) that it could not extend the active life of the unit, consistent with § 257.102(f).

3. What EPA Is Finalizing Related to the March 2020 Proposed Rule

EPA is finalizing its proposal with some limited revisions adopted in response to public comments. Under this final rule and consistent with the proposal an owner or operator would be able to able to close a CCR unit by completing removal of all CCR from the unit and decontamination of all areas affected by releases from the CCR unit, except for groundwater, during the active life of the CCR unit, and completing the groundwater corrective action during post-closure care. The owner or operator will need to meet the following requirements when closing a CCR unit under this option. First, the owner or operator must complete all removal and decontamination activities, except groundwater corrective action, during the active life of the unit. Second, with one exception, the owner or operator must have begun to implement the corrective action remedy selected in accordance with §§ 257.96 through 257.97 to achieve compliance with the GWPS during the active life of the unit (*i.e.,* before completing closure). Third, groundwater corrective action must be completed during post-closure care. Fourth, the owner or operator must amend the written closure and post-closure plans to reflect this approach to close the unit. Fifth, the owner or operator must obtain the certification or approval of closure completion within the current time frames for closure in § 257.102(f). Finally, prior to the start of the post-closure care period, the owner or operator must record the notation on the deed to the property that the land has been used as a CCR unit. Each of these requirements is discussed further below. EPA is revising the regulatory text of § 257.102(c) and § 257.104(g) and (h). The revisions to § 257.104 are to make it clear that the unit must be in detection monitoring in order to complete post closure care.

a. Removal and Decontamination Activities

EPA proposed to revise the closure performance standard at § 257.102(c) to specify all of the various actions that would be required prior to certifying that closure is complete. EPA proposed that this would include removing or decontaminating all CCR and CCR residues, containment system components, contaminated subsoils, contaminated groundwater, and CCR unit structures and ancillary equipment. To qualify for the new closure by CCR removal option, owners or operators would need to complete all the specified removal and decontamination

[148] See the Response to Comments document found in the docket for this rule.

[149] EPA–HQ–OLEM–2020–0107–0368.

[150] Memorandum from RTI International to Mary Jackson, U.S. EPA, Development of Benchmark Times for Conducting the Closure of CCR Units, February 29. 2024. Superfund 5-Year Review Reports conducted pursuant to CERCLA § 121(c). Available in the docket.

activities within the closure time frame except for completing groundwater remediation. The proposal specified that to demonstrate that all CCR has been removed from the unit, the owner or operator would need to remove the entire contents of the CCR unit, including all CCR and any CCR residues. This would include, for example, the removal of any fugitive dust (CCR) discovered outside the waste unit boundary. In addition, the proposal specified that any containment system components such as a bottom liner, contaminated subsoils, and unit structures and equipment (*e.g.,* concrete outlet structures and ancillary piping) would have to be removed prior to closure of the unit. Finally, EPA proposed that any areas affected by releases from the CCR unit must have been removed (*e.g.,* impacted soils beneath the bottom liner system).

Commenters pointed out that the term ''CCR residues'' was not a defined term. They also pointed out that it may not be necessary or wise to require the removal of ancillary equipment or structures if they are not contaminated with CCR. Further, they pointed out that requiring the removal of fugitive dust outside the unit boundary would expand the closure performance standard.

One commenter was concerned that the term ''CCR unit structures,'' appears to encompass both areas impacted by CCR disposal (which should be removed) and non-contaminated disposal unit structural components, which, according to the commenter, in some cases includes CCR that has been beneficially used in the construction of the impoundment or other disposal units (which the commenter asserted need not be removed). The commenter further stated that structural components, including those structures built with beneficially reused CCR (*e.g.,* bottom ash), must be allowed to remain in place.

The Agency does not agree that components of the unit that are constructed with CCR can be left in place if the unit is in fact closing by removal of CCR. If the unit is to be ''closed by removal of CCR,'' consistent with the existing requirement to remove all CCR, the final rule requires that any components of the unit made of or including CCR must also be removed.

The regulatory text included in this final rule requires removing all CCR from the unit, including CCR mixed with soils or that are included in berms, liners or other unit structures, and either removing or decontaminating all areas affected by releases from the CCR unit. Although there are no soil cleanup standards in the CCR regulations, if the soil beneath the unit is contaminated sufficiently to serve as a secondary source of groundwater contamination, its removal may be required as part of the source control portion of a remedy selected under § 257.97. To clarify, contaminated groundwater (groundwater with constituent concentrations triggering corrective action) must be remediated through the corrective action process detailed in §§ 257.96 through 257.98.

Although the regulatory text now specifies the removal and decontamination activities to be conducted, the Agency does not consider this to be a substantive revision to § 257.102(c). The revision is intended to clearly describe the activities that must be completed prior to closure under the new alternative in § 257.102(c)(2). The regulation now expressly describes how EPA interpreted the original phrase ''CCR removal and decontamination.'' Therefore, the regulatory text for § 257.102(c) has been revised from what was proposed:

(c) *Closure by removal of CCR.* An owner or operator closing a CCR unit by removal of CCR must follow the procedures specified in either paragraph (c)(1) or (c)(2) of this section. Closure by removal activities include removing or decontaminating all CCR and CCR residues, containment system components such as the unit liner, contaminated subsoils, contaminated groundwater, and CCR unit structures and ancillary equipment.

To what is being finalized:

(c) *Closure by removal of CCR.* An owner or operator that elects to close a CCR unit by removal of CCR must follow the procedures specified in either paragraph (c)(1) or (c)(2) of this section. Closure by removal is complete when CCR has been removed; any areas affected by releases from the CCR unit have been removed or decontaminated; and groundwater monitoring concentrations of the constituents listed in appendix IV to this part do not exceed groundwater protection standards established pursuant to § 257.95(h). Removal and decontamination activities include removing all CCR from the unit, CCR mixed with soils, and CCR included in berms, liners or other unit structures, and removing or decontaminating all areas affected by releases from the CCR unit.

Under this provision, the owner or operator must complete all CCR removal activities during closure prior to transitioning to the post-closure care period which will largely consist of a groundwater cleanup activity.

b. Implementation of Selected Remedy

Under the existing regulations, if one or more constituents in Appendix IV to part 257 are detected at SSLs above the GWPS in any sampling event, the owner or operator must, among other requirements, initiate a corrective action program. See § 257.95(g). The corrective action program includes initiating an assessment of corrective measures to prevent further releases, to remediate any releases, and to restore affected areas to original conditions, as specified in § 257.96(a). After the ACM has been completed, the owner or operator must select a remedy that meets prescribed standards, including a requirement that the remedy attain the GWPS. See § 257.97(a) and (b). Finally, the corrective action program requires the owner or operator of the CCR unit to initiate remedial activities within 90 days of selecting a remedy. See § 257.98(a). EPA did not propose to revise any of these requirements as part of this option. However, under this closure option, the owner or operator must have initiated remedial activities required by § 257.98(a) prior to certifying that it has completed closure. This requirement would help ensure that impacted groundwater is returned to original conditions as soon as is feasible.

Several commenters objected to this requirement. Some of these commenters suggested that at many sites, it is not appropriate to implement a remedy before source removal is complete. Other commenters claimed that after excavation is complete at certain sites, new groundwater flow patterns may be established and/or groundwater chemistry may need to stabilize, and in these cases neither design nor implementation of a corrective measure may be practical before CCR removal is finished. A few commenters went further yet, stating that it would not be appropriate to require completion of an ACM and selection of a remedy until after CCR removal activities are complete. Finally, other commenters state that source control is required by § 257.97(b) and may be considered part of the remedy, therefore, implementation of the remedy would commence with closure by removal.

Under the existing regulations, the closure requirements and the corrective action requirements operate independent of one another, and facilities are required to comply with both. The commenters cite nothing to support their claim that closure must be completed prior to initiating corrective action. In fact, it would be inconsistent with the existing mandatory deadlines for initiating and pursuing corrective action. For example, § 257.96(a) requires an ACM to be initiated within 90 days of determining an SSL has occurred, and then completed within another 90 days. An extension, not to exceed 60 days, may be warranted due to site-specific conditions or circumstances. EPA did not propose to revise these deadlines, so comments suggesting changes to these provisions are outside the scope of the rulemaking. Additionally, the commenters provided no reason why corrective measures could not be assessed and compared in an ACM and a remedy could not be selected. Long before initiating closure of a CCR unit, the facility was required to characterize site conditions, including groundwater flow conditions and geology to design and install the groundwater monitoring system. See, *e.g.,* § 257.91(b). The facility already has knowledge of the wastestreams and water volumes it disposes into a CCR surface impoundment. This information can be used to develop a groundwater model to predict groundwater flow conditions after wastestream disposal ceases and closure is initiated, which would provide sufficient characterization of post-closure conditions to assess and compare groundwater cleanup alternatives to complete an ACM. The commenters have provided neither reasons nor explanation why this would not be feasible.

Once the ACM is complete, a public meeting has been held, and community input has been considered, a remedy must be selected as soon as feasible. EPA agrees that a selected remedy may include closure by removal to comply with source control requirements, and that this would constitute commencing implementation of a remedy. However, the selected groundwater remediation portion of the remedy must also be implemented within a reasonable time, in accordance with the schedule established in the remedy selection report. 40 CFR 257.97(d). Implementation of the source control measure does not satisfy this separate requirement.

With respect to commenters' assertion that the design and implementation of the groundwater remediation portion of the remedy is not feasible until closure by removal is complete, the commenters provided no explanation or reasons to support this claim, although one commenter identified MNA as an example of such a remedy. EPA does not agree that design or implementation of MNA would need to be delayed due to closure activities. The ACM would include identification of attenuation mechanisms and characterization of site conditions influencing them. This could be based on current site conditions and any modeled future conditions. If MNA is evaluated more favorably than other groundwater remedies and is ultimately selected, it requires no construction other than installation of additional monitoring wells to identify plume boundaries and monitor performance. This installation would occur downgradient of the unit and should not be affected by unit closure activities. The data from downgradient wells are critical to determining if MNA is working. While groundwater elevations may decrease after dewatering a surface impoundment, and therefore additional wells may need to be installed with screens at lower elevations later in the corrective action process, this would be an expected aspect of implementing MNA for a CCR unit.

Some commenters mentioned that geochemical conditions of groundwater may change during closure. The commenters did not provide specific reasons for this or the anticipated effects of excavation. While removal of CCR is not expected to remove reactants available for immobilization reactions (*i.e.,* any attenuation mechanisms) from the environment, EPA agrees that groundwater chemistry could be impacted, particularly near the excavation site. However, in the absence of evidence that permanent immobilization mechanisms are viable at the site, either under current conditions or in modeled future conditions, MNA would not meet the § 257.97(b) criteria for selection as a remedy.

The CCR regulations establish independent performance standards for corrective action and closure. The regulations do not provide for delaying corrective action while closure occurs, or vice versa. In the example of MNA or, in fact, any groundwater remedy, delaying remedy implementation until after closure is complete would be inconsistent with the requirement in § 257.98(d) to complete remedial activities within a reasonable period. This is particularly true in this example, because collecting monitoring data is the primary action required in an MNA remedy. When data collection is delayed, those data are lost. Because this monitoring can be done during closure, it is required in order to move forward with corrective action as soon as possible.

Additionally, delaying groundwater remediation would not be protective. When a release has been detected, corrective action to clean up the contamination is necessary to prevent it from migrating to downgradient receptors, both human and environmental. Because Appendix IV constituents persist in the environment, delaying corrective action increases the amount of the contamination that is released to the environment and allows existing contamination to move further downgradient. To ensure there will be no reasonable probability of adverse effect on health or the environment as EPA is required to do under RCRA section 4004(a), the final regulation requires that corrective action be implemented in accordance with the requirements of §§ 257.96 through 257.98 without unnecessary or unreasonable delays.

Further, as one commenter mentioned, in the event that measures taken to implement the remedy following closure are not proving to be effective, the remedy can be altered during corrective action. Under the existing regulations, an owner or operator is required to ''implement other methods or techniques that could feasibly achieve compliance'' if, after the remedy is implemented, it is determined that compliance is not being achieved. 40 CFR 257.98(b). If such additional measures are necessary after certification of closure, an owner/operator would have the ability to undertake those measures without impacting the facility's closure certification.

Therefore, EPA is finalizing the proposal that the owner or operator must have initiated the remedial activities as required by § 257.98(a) in order to be eligible for this closure alternative.

The sole exception would be if the facility only triggered corrective action for a constituent sufficiently late in the closure process that it would not be feasible to delay closure until a remedy could be selected. For example, if a facility first detected an SSL of antimony one week before the deadline to complete closure in § 257.102(f), it would not be possible to comply with all of the requirements in §§ 257.96–257.97 before the deadline. As explained above, the closure and corrective action obligations are independent of one another and run concurrently. To prevent placing a facility in such a position, EPA has incorporated a provision to allow the facility to demonstrate that it was not feasible to implement the corrective action remedy prior to the expiration of a deadline in § 257.102(f). In such a case, the facility must document that (1) it was in compliance with all applicable requirements in §§ 257.96 through 257.98; and (2) that it could not extend the active life of the unit, consistent with § 257.102(f).

c. Groundwater Corrective Action

For owners and operators that close a unit under this provision, the CCR unit would remain subject to the post-closure care requirements under § 257.104 until groundwater corrective action has been completed. These units would not be subject to the requirement to conduct post-closure care for 30 years; rather, these units would remain in post-closure care until all groundwater monitoring and corrective action requirements are completed, which may be longer or shorter than 30 years. EPA proposed that groundwater corrective action is complete when the groundwater monitoring concentrations do not exceed the groundwater protection standards for constituents listed in Appendix IV to part 257. EPA has reconsidered this, as the Agency did not intend to modify the existing requirement for completing post-closure care, which also applies to concluding post closure care for a unit closed with waste-in-place. The existing provision in § 257.104(c) states that post-closure care ends after 30 years unless at the end of the post-closure care period the owner or operator of the CCR unit is operating under assessment monitoring in accordance with § 257.95. If the unit remains in assessment monitoring, the owner or operator must continue to conduct post-closure care until the owner or operator returns to detection monitoring in accordance with § 257.95. This means that there can be no detections of any Appendix IV constituents for two consecutive sampling events. Therefore, the final regulatory text has been revised to account for this.

The requirement to be in detection monitoring to conclude the post-closure care is the same standard currently specified in the requirements for closure by leaving waste in place. This rule does not change any requirements of the groundwater monitoring and corrective action program. The owner or operator would need to conduct groundwater monitoring and corrective action in accordance with the requirements of §§ 257.90 through 257.98. See revised § 257.104(c).

d. Closure and Post-Closure Care Plans

The Agency is finalizing as proposed the requirement that owners and operators closing a CCR unit under this new closure alternative would need to revise their written closure plan. The closure plan describes the closure of the unit and provides a schedule for implementation of the plan. The owner or operator would need to revise the current plan and describe how the CCR unit would be closed in accordance with the revised closure options. The current CCR regulations already include procedures to amend written plans under certain circumstances, including when there is a change in the operation of a CCR unit that would substantially affect the current written plan or when unanticipated events necessitate a revision of the plan. See § 257.102(b)(3)(ii). EPA expects owners and operators to revise the current closure plan according to these existing procedures. This rule also requires owners or operators opting for this approach to prepare an initial post-closure care plan within six months of the effective date of this final rule. The post-closure care plan describes how the CCR unit will be maintained after closure of the unit is completed. Prior to this final rule, CCR units that closed by removal of CCR are exempt from any post-closure care requirements so the preparation of a post-closure care plan will be a new requirement for owners and operators closing a unit under this new option. EPA believes that six months from the effective date of this final rule, or one year from publication of this final rule is a reasonable amount of time to prepare the post-closure care plan because the owner or operator should already have prepared the closure plan for the unit and begun implementation of the corrective measures remedy.

EPA is aware that some facilities that planned to close a unit by removal of CCR nonetheless completed a post-closure care plan. In this situation, the CCR regulations already include requirements to amend written plans under certain circumstances, including when there is a change in the operation of a CCR unit that would substantially affect the current written plan or when unanticipated events necessitate a revision of the plan. See § 257.104(d)(3). EPA expects that these owners or operators would revise the existing post-closure care plan according to these existing procedures.

e. Notation on the Deed to the Property

Under the existing regulations, following the closure of a CCR unit that will be subject to post-closure care, the owner or operator must record a notation on the deed to the property, or some other instrument that is normally examined during title search, notifying any potential purchaser of the property in perpetuity that the land has been used as a CCR unit, and its use is restricted under the post-closure care requirements. See § 257.102(i). The rationale for this requirement is to ensure that prospective and subsequent owners are aware of the presence of a closed unit on the property and of the need for continued maintenance of the cover or of any ongoing corrective actions. Following that same logic, units that have closed by removal in accordance with § 257.102(c) have been exempt from the deed notation requirement, both because all waste and associated contamination have been removed, and because there is no continuing post-closure care that needs to be maintained.

Units closing under this new closure option will be required to record a deed notation because they would not have closed by removal in accordance with § 257.102(c)(1) (as corrective action would not have been completed) and because post-closure care would be required. See § 257.102(i)(4). But these units are not wholly analogous to the other units subject to a deed notation (*i.e.,* those closing with waste in place). Units falling under this new closure option will have already had all waste removed in its entirety and so would require no continued maintenance. However, groundwater remediation actions would be continuing, raising concern about potential exposures.

Therefore, EPA proposed that the owner or operator record a notation on the deed to the property (or some other instrument normally examined during a title search) until all groundwater corrective action has been completed—that is, when groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to § 257.95(h) for constituents listed in appendix IV to part 257. EPA proposed the deed notation because all removal and decontamination actions have not been completed. Given that groundwater corrective action may continue for years or decades, the deed restrictions are a practical way of limiting human exposure during a period when contamination is still present, and thereby ensuring that the statutory standard under RCRA section 4004(a) continues to be met.

As part of the post-closure care provisions under § 257.104, EPA proposed to allow removal of the deed notation, or the addition of a second notation reflecting the inapplicability of the first notation, as may be applicable under existing State or local law, when groundwater corrective action is completed for the CCR unit. Under this closure option, completion of groundwater corrective action would indicate that all removal and decontamination actions have been completed. To remove the deed notation (or add a second notation), the owner or operator would need to complete two actions. First, the owner or operator would need to demonstrate that groundwater monitoring concentrations no longer exceed any groundwater protection standard established pursuant to § 257.95(h) for constituents listed in Appendix IV to part 257. See § 257.104(g). Second, the owner or operator would need to complete the notification stating the post-closure care requirements have been met as required in § 257.104(e). Removing the deed notation upon completion of all removal and decontamination activities is consistent with the current procedures for CCR units that close by removal under § 257.102(i)(4).

The existing CCR regulations require a specific type of control (*i.e.,* deed notations) to communicate use limitations to present and future users of the land with the closed CCR unit. The Agency solicited comments on whether the use of deed restriction controls is too narrow under this new closure option and whether the CCR regulations should allow for the use of different legal mechanisms and controls to communicate limits on the activities that can safely take place at the site. Some commenters supported inclusion of more flexibility and alternative instruments to accomplish this purpose. For example, one commenter pointed out that in Colorado, the State routinely uses Environmental Use Restrictions/ Environmental Covenants. Other commenters asserted that EPA should allow the owner or operator to determine which instrument to use or allow the Participating State Director to decide. ASTSWMO commented that the proposed language requiring the use of deed restriction controls appears to be consistent with language in 40 CFR 258.60(i) as applicable to Municipal Solid Waste (MSW) Landfills, and that it might be helpful for States that the language between CCR and MSW landfills aligns.

Other commenters mentioned the importance of deed notations is that it compels impoundment owners to create a publicly accessible record attached to a property deed noting that the property is subject to ongoing groundwater corrective action requirements. Attaching such a note to the deed also ensures any subsequent owner of the property would be on notice of ongoing cleanup obligations and would be liable for following through on them. The commenter stated that any alternative to deed notification that EPA may be considering (*i.e.,* other approaches under private property law) should only be considered if they also provide these benefits of the deed notification requirement.

The Agency has decided to finalize the proposal to require that the owner or operator record a notation on the deed to the property until all groundwater corrective action has been completed. EPA agrees that a deed notation performs an important function to ensure any subsequent owner of the property is on notice of the ongoing cleanup obligations and of the liability of any subsequent owner until those obligations are completed. None of the commenters provided sufficient information for EPA to conclude that the alternative measures that they suggested would provide the same level of assurance as a deed notation. Moreover, the use of a deed notation is consistent with the requirements for MSW landfills and with CCR units closing by leaving waste in place, and therefore EPA expects the public and regulated entities will be familiar with them. Additionally, as discussed above, once the closure by removal is complete, the owner or operator can remove the deed notification.

f. Closure Certification or Approval

The Agency is adopting without revision the proposal that the owner or operator will continue to be subject to the same certification or approval requirement that is currently applicable to all CCR units as specified in § 257.102(f)(3). Under this requirement, the owner or operator must obtain a certification from a qualified P.E. or approval from the Participating State Director (or EPA where EPA is the permitting authority) verifying that closure has been completed in accordance with the written closure plan and all applicable closure requirements of § 257.102. Under this provision, the certification or approval would reflect that all removal and decontamination activities, except for groundwater corrective action, have been completed. The certification or approval would not address the remediation of the impacted groundwater because groundwater corrective action will be completed during the post-closure care period, including applicable post-closure care certification and approval requirements.

E. Technical Corrections

Through the implementation of the 2015 CCR Rule, the Agency identified several minor errors and inconsistencies. Therefore, EPA is amending the CCR regulations to clarify definitions, accurately reference the definition of wetlands, and use consistent language when referring to publicly accessible internet sites. The Agency is also amending an incorrect reference to § 257.99 in the groundwater monitoring scope section. Finally, EPA is extending the period for certain document retention and posting.

1. Definitions of ''Technically Feasible'' and ''Technically Infeasible''

EPA proposed to revise the definition of *technically feasible* to clarify that the terms *technically feasible* and *feasible* have the same meaning in the regulations. The existing regulations define *technically feasible* as ''possible to do in a way that would likely be successful.'' EPA codified this definition in 2020 when amending the alternative closure requirements for landfills and impoundments. 85 FR 53542 (August 28, 2020). As EPA explained, the definition was based on two dictionary definitions of ''feasible'': ''capable of being done or carried out'' (Merriam website (*https://www.merriam-webster.com/dictionary/feasible*)) and ''possible to do and likely to be successful'' (Cambridge English Dictionary (*https://dictionary.cambridge.org/us/dictionary/english/feasible*)). Id.

However, some rule provisions use the term *feasible.* EPA never intended to distinguish between these terms. See, *e.g.,* 80 FR 21422–21423, 85 FR 53542. Therefore, EPA proposed to add the term *feasible* to the existing definition of *technically feasible* to make clear that both terms have the same meaning in the regulations. This definition revision would be accomplished by adding ''or feasible'' to the existing definition so that the definition would read ''*Technically feasible* or *feasible* means possible to do in a way that would likely be successful.'' For similar reasons, EPA proposed to also revise the definition of *technically infeasible* to clarify that the terms *technically infeasible* and *infeasible* have the same meaning in the regulations.

EPA received comments on this issue that opposed adding ''feasible'' and ''infeasible'' as definitions. The commenters said the term ''feasible'' is used in the § 257.102(f)(2)(i) standard for obtaining extensions to the closure time frames, and that if EPA finalizes the provision as proposed, the change should not be applied retroactively to facilities that used the closure extension. Other commenters said this is not how EPA should correct regulatory errors and there is a lack of discussion on all situations and regulatory history regarding these terms.

EPA disagrees that these terms have different meanings under the CCR regulations or that this clarification will negatively impact implementation of the requirements by regulated entities. See, 85 FR 53542 (relying on dictionary definitions of ''feasible'' to define 'technically feasible'). EPA is simply clarifying the meaning of these synonymous terms. Id. Therefore, EPA is finalizing these changes as proposed. This is codified in the regulatory text at § 257.53.

2. Wetlands Reference Correction

When the 2015 CCR Rule was finalized in April 2015, § 257.61(a) referenced § 232.2, which contained a definition of wetlands. An EPA and United States Army Corps of Engineers joint final rule published June 29, 2015 (80 FR 37053) amended § 232.2 by removing the definition of wetlands. However, the reference to § 232.2 in § 257.61(a) of the 2015 CCR Rule was not updated. EPA proposed an amendment that would correct the CFR reference for the wetlands definition by referring to 40 CFR 230.41(a) (December 24, 1980, 45 FR 85344). EPA received one comment on this issue about the U.S. Supreme Court decision in *Sackett* v. *EPA, 21–454,* in which the Court substantially narrowed the scope of wetlands subject to Federal jurisdiction under the Clean Water Act. EPA reviewed the Sackett decision and determined that the wetlands definition contained in § 257.61(a) remains valid after that decision. EPA is therefore finalizing this provision as proposed. This is codified in the regulatory text at § 257.61.

3. Groundwater Monitoring and Corrective Action Applicability

EPA proposed to correct a typographical error in the initial applicability paragraph of the groundwater monitoring and corrective action regulations. In § 257.90(a), the existing regulations refer to the ''groundwater monitoring and corrective action requirements under §§ 257.90 through 257.99''; however, there are no requirements codified under § 257.99. This was brought to EPA's attention by a State interested in permit program approval. To avoid confusion with the regulations, EPA proposed to revise the section references in § 257.90(a) to read ''groundwater monitoring and corrective action requirements under §§ 257.90 through 257.98.'' EPA did not receive any comments on this issue and is therefore finalizing this provision as proposed.

4. Publicly Accessible Internet Site

EPA proposed to change several provisions using the term ''CCR website'' to ''CCR website,'' which is the term used in § 257.107(a). The inconsistent spelling of CCR website was brought to our attention by a State interested in permit program approval. To avoid confusion with the regulations, EPA proposed to correct such references in §§ 257.100(e)(1)(iii) and 257.107(b) through (j). EPA did not receive any comments on this issue and is therefore finalizing these provisions as proposed.

EPA is also revising § 257.107(b) to provide owners and operators the flexibility to maintain one website for multiple electric power sector rules. This new provision allows an owner or operator to document the facility's compliance with the requirements of other environmental rules on the same website that is used for CCR units. In order to use a combined website, the final rule requires that the owner or operator delineate the postings for each regulatory program under a separate heading on the website. For example, the required CCR rule postings must be placed under a ''CCR Rule Compliance Data and Information'' heading, while postings required by the ELG rule would be posted under a separate heading ''ELG Rule Compliance Data and Information.'' [151] EPA is providing this flexibility to reduce paperwork burden and make it easier for communities to access this information.

5. Document Retention

The CCR regulations require the production of many documents that provide information on many aspects of regulated CCR units, for example from history of construction to periodic inspections, as well as closure activity and groundwater sampling and cleanup, if necessary. These documents must be retained in the facility operating record as well as posted on the facility CCR website, generally for a five-year period. In the proposed rule, EPA requested comment on potential revision of document posting and retention times currently in the regulations. EPA raised the concern that some of the current retention times may be too short to accomplish the goals underlying the posting requirement, namely transparency and information availability. This concern stems from the fact that information that is still relevant for CCR units may reach the original retention time limit while the availability of the documents would still serve the purposes of transparency and information availability after the original retention deadline.

The comments received were largely in favor of revising the document retention periods, though those commenters who provided suggested approaches or examples of longer retention periods were not entirely consistent in the approaches offered.

One commenter opposed the concept of expanding the retention time for any documents that are required to be posted on facility websites. This commenter stated the current retention period provides clear guidance to the regulated community and that extending the retention period could add to additional redundant or outdated material on the websites. This commenter also said that the purpose of the website posting requirement has been obviated by the passage of the WIIN Act. For several reasons, EPA disagrees with this comment. First, the regulations already include provisions to decrease or eliminate redundancy or outdated postings. See, for example, § 257.107(g)(1), which requires only the most recent dust suppression plan to be maintained on the website. Second, the core principle of the website posting requirement is relevance: facilities are required to post information relevant to the operation and closure of CCR units and cleanup of any releases from those units. It is clear that a five-year retention period may not be adequate for documents that remain relevant well beyond that length of time, which is proving to be true for many of the required documents. Third, while it is true that website posting is one of several measures EPA implemented in the original rule before the WIIN Act was enacted, nothing in the WIIN Act makes the goals of transparency and information availability for communities and other interested parties obsolete.

The other commenters all agree that extensions to the website posting and retention time periods are warranted. Those comments that included actual time frame suggestions based those suggestions on the type of document and relevance to the operation, closure, and cleanup requirements of the regulations, though they varied in the exact approach and length of extensions.

EPA has decided that to accomplish the regulatory goals underlying the document preparation and retention requirements, longer retention times are required. Therefore, EPA is revising the retention periods as provided in this final rule. EPA does agree that the approach for extensions should be based on the nature of each document and the relevance of each document to demonstrating compliance with regulatory milestones. This approach was already employed in the 2015 CCR

[151] See § 423.19 for ELG rule posting requirements.

Rule for numerous documents (*e.g.,* the groundwater remedy selection document is currently required to be retained until remedy completion). See § 257.107(h)(9). In this rule, EPA is applying this same approach to other documents prepared under the regulations.

There are several related issues that are involved in the document preparation, retention and posting requirements that deserve discussion here. First, the website posting regulations in § 257.107 are companions to, and cross-reference, the operating record regulations in subpart § 257.105. The interrelation of these sections means that this revisiting of the website posting regulations necessitates a review of those regulations that address the placing and retaining of documents in the facility operating record. Accordingly, EPA is including accompanying retention time period changes to § 257.105 as appropriate and relevant to the changes to § 257.107. Additionally, as suggested by several commenters, the retention of the documents in the operating record for a longer period than retention on the website not only makes sense for some documents, but supports the Agency not requiring that every prepared document remain on the website. This is particularly true for documents that are either periodically updated or result from recurring assessments. In implementing this approach, the Agency is mindful of and in agreement with the comments that urged the Agency to not require the posting of all documents out of concern that the websites would become cluttered and confusing.

Second, a related issue arises where there may be more than one version of a document, which version of a required document must be posted or retained in the operating record. This situation arises, for example, when a required document is updated or a document is required to be prepared for recurring assessments. Where appropriate, the regulations are being revised to ensure they are clear about what version or versions of documents must be posted and retained.

A third issue is that, for some documents, the five-year retention and posting duration requirements may have expired. However, some of these documents are still relevant to an operating or closing unit, or a unit in post-closure care status or undergoing groundwater cleanup. For these documents, the purposes of retaining and posting them are still viable and there are compelling reasons to ensure these documents are available on the facility website and in the facility operating record. EPA is, therefore, requiring that documents that may have been taken down and removed from operating records are placed back in the operating records and reposted on the website. Although it is unlikely that documents that were required to be prepared under the CCR regulations, placed in the operating record, and posted on the website were destroyed or discarded after the applicable retention time ran, this requirement nonetheless includes such documents. In other words, any required documents that have been destroyed or discarded must be reproduced and placed in the operating record and reposted on the facility website. Otherwise, there could be inconsistencies among the required facility websites totally dependent upon whether a facility had elected to remove documents from the website and operating record and not otherwise retain the documents in any facility files. EPA believes that allowing this inconsistency across facility websites is an unacceptable approach to ensuring information relevant to each CCR unit is publicly available.

Finally, while the approach adopted here links retention and posting times to document relevance and the status of the CCR unit and work undertaken at the unit, EPA does not believe that the interest in information availability ends at the moment a unit's status changes or required work ends (*e.g.,* completion of closure). Therefore, EPA is requiring that documents remain available for a reasonable time period after related milestones are reached. For many documents, EPA has chosen five years as the reasonable time period for document posting and retention after work is completed or the unit's status changes. This is also consistent with timeframes offered by commenters where specific timeframes were suggested.

TABLE 3—DOCUMENT RETENTION IN THE OPERATING RECORD AND CCR WEBSITE

Document	Operating record	CCR website
Location restrictions demonstration as specified in §§ 257.60–257.64.	§ 257.105(e): 5 years after: closure by removal (CBR) or post-closure care ends.	§ 257.107(e): 5 years after: CBR or post-closure care ends.
Landfill liner and leachate collection preconstruction design certification and post construction certification as specified in § 257.70(e) and (f).	§ 257.105(f)(1): 5 years after: CBR or post-closure care ends.	§ 257.107(f)(1): 5 years after: CBR or post-closure care ends.
Documentation of liner type as specified in § 257.71(a).	§ 257.105(f)(2): 5 years after: CBR or post-closure care ends.	§ 257.107(f)(3): 5 years after: unit ends post closure care OR liner is removed.
Surface impoundment liner preconstruction design certification and postconstruction certification as specified in § 257.72(c) and (d).	§ 257.105(f)(3): 5 years after: CBR or post-closure care ends.	§ 257.107(f)(2): 5 years after: CBR or post-closure care ends OR liner is removed.
Documentation that permanent identification marker was installed as specified in §§ 257.73(a)(1) and 257.74(a)(1).	§ 257.105(f)(4): 5 years after: CBR or post-closure care ends.	N/A.
The initial and periodic hazard potential classification assessments as specified in §§ 257.73(a)(2) and 257.74(a)(2).	§ 257.105(f)(5): Retain all versions .... CBR Until closure is complete not including meeting GWPS. Closure in place (CIP): until post-closure care is complete.	§ 257.107(f)(4): Current and previous one. CBR Until closure is complete not including meeting GWPS. CIP: Until post closure care is complete.
The emergency action plan, and any revisions of it, as specified in §§ 257.73(a)(3) and 257.74(a)(3).	§ 257.105(f)(6): Retain all .... 5 years after: CBR not including meeting GWPS or unit ends post-closure care.	§ 257.107(f)(5): Current version, if EAP is required.

TABLE 3—DOCUMENT RETENTION IN THE OPERATING RECORD AND CCR WEBSITE—Continued

Document	Operating record	CCR website
Documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR unit and the local emergency responders, as specified in §§ 257.73(a)(3)(i)(E) and 257.74(a)(3)(i)(E).	§ 257.105(f)(7): Retain all .... 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(6): Current version, if EAP is required.
Documentation prepared by the owner or operator recording any activation of the emergency action plan, as specified in §§ 257.73(a)(3)(v) and 257.74(a)(3)(v).	§ 257.105(f)(8): Retain all .... 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(7): Any documentation prepared in the last five years; if no activation in the last 5 years, a statement posted relating that information.
The history of construction, and any revisions of it as specified in § 257.73(c).	§ 257.105(f)(9): Retain all .... 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(8): Only most recent and any revisions from the last 5 years. 5 years after: CBR or unit ends post closure care.
The initial and periodic structural stability assessments as specified in §§ 257.73(d) and 257.74(d).	§ 257.105(f)(10): Retain all .... CBR Until closure is complete not including meeting GWPS. CIP: Until post closure care is complete	§ 257.107(f)(9): Current and previous one. CBR Until closure is complete not including meeting GWPS. CIP: Until post closure care is complete.
The documentation detailing the corrective measures taken to remedy the structural stability deficiency for existing or new surface impoundments as specified in §§ 257.73(d)(2) and 257.74(d)(2).	§ 257.105(f)(11): Retain all .... 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(10): Current and any corrective measures. 5 years after: CBR or unit ends post closure care.
The initial and periodic safety factor assessments as specified in §§ 257.73(e) and 257.74(e).	§ 257.105(f)(12): Retain all .... 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(11): Current and previous one. 5 years after: CBR or unit ends post closure care.
The design and construction plans of the unit, and any revisions of the plans as specified in § 257.74(c).	§ 257.105(f)(13): Retain all .... 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(12): Current and previous one. 5 years after: CBR or unit ends post closure care.
The application and any supplemental materials submitted in support of the alternative liner demonstration application as specified in § 257.71(d)(1)(i)(E).	§ 257.105(f)(14): 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(13): 5 years after: CBR or unit ends post closure care.
CCRMU Facility Evaluation Report Document Part 1 as specified in § 257.75(c).	§ 257.105(f)(25): 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(24): 5 years after: CBR or unit ends post closure care.
CCRMU Facility Evaluation Report Document Part 2 as specified in § 257.75(d).	§ 257.105(f)(26): 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(25): 5 years after: CBR or unit ends post closure care.
The decision on the alternative liner application as specified in § 257.71(d)(2)(iii)(F).	§ 257.105(f)(19): 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(18): 5 years after: CBR or unit ends post closure care.
The CCR fugitive dust control plan, or any subsequent amendment of the plan as specified in § 257.80(b).	§ 257.105(g)(1): Retain all until last CCR unit at the facility completes post closure care or CBR.	§ 257.107(g)(1): Only most recent. Retain until last unit completes post closure care or CBR.
The annual CCR fugitive dust control report as specified in § 257.80(c).	§ 257.105(g)(2): Retain all until last CCR unit at the facility completes post closure care or CBR.	§ 257.107(g)(2): Current plus last 5 years. Retain until last unit completes post closure care or CBR.
The initial and periodic run-on and run-off control system CCR landfill plans as specified in § 257.81(c).	§ 257.105(g)(3): Only most recent .... Until 5 years after closure of the landfill is complete not including achievement of GWPS.	§ 257.107(g)(3): Current plus any other versions from the last 5 years (if updated). Until 5 years after closure of the landfill is complete not including achievement of GWPS.
Initial and periodic inflow design flood control system CCR surface impoundment plans as specified in § 257.82(c).	§ 257.105(g)(4): Only most recent .... Until 5 years after closure of the landfill is complete not including achievement of GWPS.	§ 257.107(g)(4): Current plus any other versions from the last 5 years (if updated). Until 5 years after closure of the landfill is complete not including achievement of GWPS.
Documentation recording the results of each CCR surface impoundment inspection and monitoring as specified in § 257.83(a).	§ 257.105(g)(5): Retain all until 5 years after closure is complete not including achievement of GWPS.	N/A.
Annual CCR surface impoundment inspection reports as specified in § 257.83(b)(2).	§ 257.105(g)(6): Retain all until 5 years after closure is complete not including achievement of GWPS.	§ 257.107(g)(5): Current plus last 5. Retain until 5 years after closure is complete not including achievement of GWPS.
The documentation detailing the corrective measures taken to remedy the deficiency or release as specified in §§ 257.83(b)(5) and 257.84(b)(5).	§ 257.105(g)(7): Retain all until 5 years after closure is complete not including achievement of GWPS.	§ 257.107(g)(6): Any corrective measures until 5 years after closure is complete not including achievement of GWPS.
Documentation recording the results of weekly landfill structural weakness inspection as specified in § 257.84(a).	§ 257.105(g)(8): Retain all until 5 years after closure is complete not including achievement of GWPS.	N/A.
Annual landfill inspection reports as specified in § 257.84(b)(2).	§ 257.105(g)(9): Retain all until 5 years after closure is complete not including achievement of GWPS.	§ 257.107(g)(7): Current plus last 5. Retain until 5 years after closure is complete not including achievement of GWPS.

TABLE 3—DOCUMENT RETENTION IN THE OPERATING RECORD AND CCR WEBSITE—Continued

Document	Operating record	CCR website
Annual groundwater monitoring and corrective action report as specified in § 257.90(e).	§ 257.105(h)(1): Retain all until 5 years after the last CCR unit at the facility completes post-closure care or completion of CBR including achieving GWPS for 3 consecutive years.	§ 257.107(h)(1): Current plus previous 5 years. Retain until 5 years after last unit completes post-closure care or completion of CBR including achieving GWPS for 3 consecutive years.
Documentation of design, installation, development, and decommissioning of any monitoring wells, piezometers and other devices as specified in in § 257.91(e)(1).	§ 257.105(h)(2): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.	N/A.
Groundwater monitoring system certification as specified in § 257.91(f).	§ 257.105(h)(3): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.	§ 257.107(h)(2): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.
Selection of a statistical method certification as specified in § 257.93(f)(6).	§ 257.105(h)(4): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.	§ 257.107(h)(3): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.
Assessment of corrective measures as specified in § 257.96(d).	§ 257.105(h)(10): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.	§ 257.107(h)(8): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.
Documentation recording the public meeting for the corrective measures assessment as specified in § 257.96(e).	§ 257.105(h)(11): 5 years after CBR and App IV GWPS have been met or 5 years after completion of post-closure care.	N/A.
Notification that the remedy has been completed specified under in § 257.98(e).	§ 257.105(h)(13): 5 years after completion of remedy.	§ 257.107(h)(10): 5 years after completion of remedy.
Demonstration supporting the suspension of groundwater monitoring activities as specified in § 257.90(g).	§ 257.105(h)(14): 5 years after last unit ends post closure care.	§ 257.107(h)(11): 5 years after posting.
Written closure plan, and any amendment of the plan as specified in § 257.102(b).	§ 257.105(i)(4): Only the most recent .... 5 years after CBR or 5 years after post-closure care is complete.	§ 257.107(i)(4): Only the most recent. 5 years after CBR or 5 years after post-closure care is complete.
Demonstration(s) for a time extension for initiating closure as specified in § 257.102(e)(2)(ii) and (iii).	§ 257.105(i)(5): Until notice of closure completion is posted.	§ 257.107(i)(5): Until notice of closure completion is posted.
Demonstration(s) for a time extension for completing closure as specified in § 257.102(f)(2)(i) and (iii).	§ 257.105(i)(6): 5 years after closure is complete.	§ 257.107(i)(6): 5 years after closure is complete.
Notification of intent to close a CCR unit as specified in § 257.102(g).	§ 257.105(i)(7): 5 years after closure complete	§ 257.107(i)(7): 5 years after closure complete.
Notification of completion of closure of a CCR unit as specified in § 257.102(h).	§ 257.105(i)(8): 5 years after unit ends post closure care or CBR.	§ 257.107(i)(8): 5 years after unit ends post closure care or CBR
Notification recording a notation on the deed as specified in § 257.102(i).	§ 257.105(i)(9): 5 years after unit ends post closure care.	§ 257.107(i)(9): 5 years after unit ends post closure care.
Notification of intent to comply with the alternative closure requirements for landfills as specified in § 257.103(c)(1).	§ 257.105(i)(10): 5 years after the unit completes closure.	§ 257.107(i)(10): 5 years after the unit completes closure.
Annual progress reports under the alternative closure requirements for landfills as specified in § 257.103(c)(2).	§ 257.105(i)(11): 5 years after the unit completes closure.	§ 257.107(i)(11): 5 years after the unit completes closure.
Written post-closure plan, and any amendment of the plan as specified in § 257.104(d).	§ 257.105(i)(12): 5 years after unit ends post closure care.	§ 257.107(i)(12): 5 years after unit ends post closure care.
Notification of completion of post-closure care as specified in § 257.104(e).	§ 257.105(i)(13): 5 years after unit ends post closure care.	§ 257.107(i)(13): 5 years after unit ends post closure care.
Notification of intent to comply with the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified in § 257.103(f)(1)(ix)(A).	§ 257.105(i)(14): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(14): 5 years after: CBR or unit ends post closure care.
Approved or denied demonstration for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified in § 257.103(f)(1)(ix)(B).	§ 257.105(i)(15): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(15): 5 years after: CBR or unit ends post closure care.
Notification for requesting additional time to the alternative cease receipt of waste deadline as specified in § 257.103(f)(1)(ix)(C).	§ 257.105(i)(16): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(16): 5 years after: CBR or unit ends post closure care.
Semi-annual progress reports for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified in § 257.103(f)(1)(xi).	§ 257.105(i)(17): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(17): 5 years after: CBR or unit ends post closure care.
Notification of intent to comply with the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as specified in § 257.103(f)(1)(viii).	§ 257.105(i)(18): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(18): 5 years after: CBR or unit ends post closure care.

TABLE 3—DOCUMENT RETENTION IN THE OPERATING RECORD AND CCR WEBSITE—Continued

Document	Operating record	CCR website
Approved or denied demonstration for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as specified in § 257.103(f)(2)(ix).	§ 257.105(i)(19): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(19): 5 years after: CBR or unit ends post closure care.
Annual progress report for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as specified in § 257.103(f)(2)(x).	§ 257.105(i)(20): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(20): 5 years after: CBR or unit ends post closure care.
Legacy Applicability Report as specified in § 257.100(f)(1)(i).	§ 257.105(k)(1): 5 years after: CBR or unit ends post closure care.	§ 257.107(k)(1): 5 years after: CBR or unit ends post closure care.

IV. Effect on State CCR Permit Programs

In the proposed rule, EPA discussed the effect of the amended regulations on State CCR permit programs. The revisions to the CCR regulations both establish standards for new types of units and revise existing requirements for CCR units defined in and subject to the 2015 CCR Rule. For this reason, the requirements for approval and retention of a State CCR permit program in accordance with RCRA section 4005(d) will change. How these revisions will affect States depends on whether the State has received approval for the provisions that are ultimately included in any final rule and whether the State is seeking full or partial approval of its permit program.

EPA received several comments asking for clarification on what States need to do to adopt these revisions. As EPA explained in the proposed rule, if a State has an approved program pursuant to RCRA section 4005(d), that State program will continue to operate in lieu of the portions of the Federal program adopted by the State, even if EPA revised the Federal analog of that regulation in this final action. See 42 U.S.C. 6945(d)(1)(A), (3). This means that the applicable revisions to the Federal CCR regulations will only take effect in an approved State when the State revises its program to adopt them. For this reason, RCRA requires a State to revise its program within three years of any applicable revision to the Federal CCR regulation that is more protective than the existing State program in order to maintain approval. See, 42 U.S.C. 6945(d)(1)(D)(i)(II). Conversely, the Federal requirements continue to apply directly to CCR facilities in States without an approved CCR program and in States with a partial CCR program. EPA will work with each State that is interested in adopting these regulations to ensure the State CCR permit program is at least as protective as the Federal program. If a State chooses not to adopt certain portions of this final rule, when EPA establishes a Federal CCR permit program, EPA will begin issuing permits for CCR units, legacy CCR surface impoundments, and CCRMU in nonparticipating States.

As discussed in Units III.A. and III.B of this preamble, EPA is establishing requirements for legacy CCR surface impoundments and CCRMU. Because legacy CCR surface impoundments and CCRMU are new types of Federally regulated units, no State is currently approved to issue State CCR permits to such units in lieu of the Federal CCR regulations. Thus, any State that wants approval to issue permits to such units will be required to update the State CCR regulations and go through the State CCR permit program approval process set forth in RCRA section 4005(d).

As discussed in Units III.B.g and III.D of this preamble, EPA is also revising requirements under the existing CCR regulations. The revised requirements will directly apply to affected facilities except to the extent EPA has already approved the State to issue permits for the original requirement. In such a case, the State requirement will apply in lieu of the new Federal requirement until the State program is revised. certain provisions (*i.e.,* the requirement to expand § 257.102(d)(2) to landfills that are inundated with groundwater, document retention timeframes) to be more protective

One commenter asked if a State can adopt regulations for either legacy CCR surface impoundments or CCRMU, but not both. EPA issued the Coal Combustion Residuals State Permit Program Guidance Document; Interim Final (82 FR 38685, August 15, 2017) (the ''Guidance Document'') to advise States interested in developing a State CCR permit program for approval by EPA. The Guidance Document explains the process for developing a State CCR permit program and expressly contemplates a State requesting partial approval of such a program. Thus, a State may request approval of the final rule provisions applicable to either or both the legacy CCR surface impoundments and the CCRMU requirements.

Some commenters discussed the process for approving State CCR permit programs and inquired about the number of States that EPA is currently working with and the timeframe for approval of a State program package. As noted above, the Guidance Document explains the process for States to develop of State CCR permit program. The time it takes to develop an approvable State program depends on a number of factors, including the time it takes for a State to promulgate or enact regulations that are as protective as the Federal CCR regulations. Once the State has a complete and approvable program, EPA will issue the final program determination within 180 days of determining that the State's submission is complete. EPA commits to working with States to adopt regulations that are at least as protective as the Federal CCR regulations and to review any draft application materials and provide comments to ensure the final application package can go through EPA's approval process in a timely manner. The process for approving program modifications is the same as for the initial program approval: EPA will propose to approve or deny the program modification and hold a public hearing during the comment period. EPA will then issue the final program determination within 180 days of determining that the State's submission is complete.

Finally, EPA received comments saying that EPA seems to be finalizing these regulations under the self-implementing regulatory scheme that existed when the 2015 CCR rule was promulgated. The comments further say that since then, Congress enacted the WIIN Act, which fundamentally changed the regulatory landscape and now requires implementation through

State and Federal permit programs. EPA acknowledges this Congressional mandate and is working to finalize the Federal CCR permit program in addition to approving State permit programs. States have requested that EPA finalize the legacy CCR surface impoundment provisions and other provisions that were remanded back to the Agency to allow States to apply for full program approval. EPA disagrees that the self-implementing rule is inappropriate in lieu of the WIIN Act requirements because all owners and operators of CCR units and CCRMU will need to follow the self-implementing rule until they obtain a State or Federal permit. Lastly, any permits that are issued by EPA will refer to the regulatory requirements in 40 CFR part 257, subpart D, or the equivalent State regulation in the case of State permits.

V. The Projected Economic Impact of This Action

A. Introduction

EPA estimated the costs and benefits of this action in a Regulatory Impact Analysis (RIA), which is available in the docket for this action.

B. Affected Universe

The universe of facilities and units affected by the final rule includes four categories. The first is comprised of facilities with legacy CCR surface impoundments. The RIA identifies 194 legacy CCR surface impoundments located at 84 facilities. The second component of the affected universe is composed of CCRMU. The RIA identifies 195 CCRMU at 104 facilities. The third component of the affected universe is composed of CCRMU at ''other active facilities,'' or OAFUs. The RIA identifies 15 OAFUs at six facilities. The final component of the universe is comprised of CCR landfills that are already regulated under the 2015 CCR Rule, but which have waste in contact with groundwater. The RIA identifies 39 such landfills at 33 facilities.

C. Baseline Costs

The RIA examines the extent to which baseline practices at legacy CCR surface impoundments and CCRMU address contamination in a manner consistent with the requirements of the final rule. To the extent that legacy CCR surface impoundments and CCRMU are already sufficiently addressing contamination, they are assumed to not incur costs or realize benefits under the final rule. To estimate the proportion of legacy CCR surface impoundments addressing contamination in the baseline, the RIA examines relevant Federal and State programs and determines that about 9.8% of legacy CCR surface impoundments are addressing site contamination. To estimate the proportion of CCRMU addressing contamination, the RIA examines publicly available filings from owners and operators of regulated coal-fired power plants. The RIA estimates that about 20.8% of CCRMU are undergoing sitewide corrective action and closure in a manner sufficient to meet the requirements of the final rule.

D. Costs and Benefits of the Final Rule

The RIA estimates that the annualized costs of this action will be approximately $214–$240 million per year when discounting at 2%. Of this, $123–$135 million is attributable to the requirements for legacy CCR surface impoundments, which are subject to the D.C. Circuit's order in *USWAG,* $79–$92 million is attributable to the requirements for CCRMU, $8–$9 million is attributable to the requirements for OAFUs, and $4 million is attributable to requirements for landfills. The costs of this final rule are discussed further in the RIA and include the costs of unit closure, corrective action, fugitive dust controls, structural integrity inspections, and recordkeeping and reporting.

The RIA estimates that the annualized monetized benefits attributable to this action will be approximately $53–$80 million per year when discounting at 2%. Of this, $43–$57 million is attributable to the requirements for legacy CCR surface impoundments, $9–$21 million is attributable to the requirements for CCRMU, $1–$2 million is attributable to the requirements for CCRMU at ''other active facilities,'' or OAFUs. Requirements for landfills account for a de minimis amount of benefits. The monetized benefits of this proposed rule are discussed further in the RIA, and include reduced incidents of cancer from the consumption of arsenic in drinking water, avoided intelligence quotient (IQ) losses from mercury and lead exposure, non-market benefits of water quality improvements, and the protection of threatened and endangered species. EPA also monetized the benefits of avoided impoundment failures, including both ''catastrophic'' failures and smaller-volume releases. One example of a severe impoundment failure is the Dan River Steam Station failure that occurred in 2014, when a stormwater drainage pipe under the inactive surface impoundments at the Dan River Steam Station caused the inadvertent release of 39,000 tons of CCR directly into the nearby Dan River. The resulting high-end estimate of the costs of this impoundment failure is $300 million.

The monetized benefits in the RIA are incomplete and omit categories of benefits that are known to be significant. One such category of benefits is avoided cases of lung and bladder cancers due to exposure to arsenic III and arsenic V. Inorganic arsenic is known to occur in CCRs, and can leach into drinking water from leaking CCR disposal units. The EPA IRIS Toxicological Review of Inorganic Arsenic (CASRN 7440–38–2) draft, published in October 2023, provides updated toxicity values for cancer outcomes associated with inorganic arsenic exposure. From these values the benefits of avoided cancer cases can be monetized. The RIA does not consider these avoided cancer benefits in the main analysis because the IRIS report underlying them is still draft and subject to revision. These benefits are instead monetized in a sensitivity analysis and are estimated to be $19 million per year when discounting at 2%. As these benefits are but two health endpoints from a single contaminant, they point to the possible true magnitude of benefits attributable to the final rule.

The RIA also describes a number of important benefits that cannot currently be quantified or monetized due to data limitations or limitations in current methodologies. These benefits include reducing the baseline risk of unit leakage and failure attributable to climate-change driven severe weather events. Many legacy CCR surface impoundments and CCRMU are situated close to rivers or are located along the coast. These units are vulnerable to inland or coastal flooding, which may occur at an increased frequency due to the effects of climate change. Flooding events may cause these units to overtop or catastrophically collapse, releasing CCR into the environment, exposing nearby communities to toxic contamination and necessitating potentially costly cleanup and remediation. EPA has identified 62 legacy CCR impoundments at medium or high risk from climate change-driven flooding, and 74 CCRMU at medium or high risk from climate change driven-flooding.

Another set of benefits outside the scope of quantification include reducing the instance of negative human health impacts such as cardiovascular mortality, neurological effects, and cancers (separate from the quantified cancer benefits) brought on by exposure to toxins found in coal ash. Either through leaking impoundment sites or release events, many pollutants from legacy CCR surface impoundments are likely to contaminate nearby water bodies, affecting surface waters, local fish populations, and drinking water reservoirs. Because known transport pathways exist between these release events and human health endpoints, EPA expects the proposed rule to cause risk reductions for various categories that are not yet quantifiable. Toxins such as thallium, molybdenum, and lithium, while all present in CCR, lack the data to create dose-response relationships between ingestion rates and specific health endpoints, and thus precludes EPA from quantifying associated benefits.

The RIA describes several surface water quality benefits such as the improved health of ecosystems proximate to CCR disposal units, and the avoided costs of treating public drinking water impacted by CCR contamination. EPA expects leakages or releases of effluent from any CCR surface impoundment site to contaminate nearby surface waters and environments. Introduction of arsenic, selenium, and other heavy metals associated with CCR surface impoundment contents are shown to accumulate in sediments of nearby stream and lake beds, posing risks and injury to organisms and consequently ecosystems. Although surface waters are broadly protected from high levels of contaminants under EPA's regulations and Water Quality Criteria (WQC), complex interactions from trace amounts of heavy metals and other toxins known to be released from legacy CCR surface impoundment sites have displayed measurable impact to aquatic animals and ecosystems.[152]

The RIA discusses how the final rule may result in avoided drinking water treatment costs and drinking water quality improvements at public water systems. First, by reducing the risk of CCR leakage events and impoundment failures, the proposed rule will help avoid costs of water quality treatment at public intake sources. Second, by preventing release events the proposed rule has the potential to reduce the incidence of eutrophication in source waters for public drinking supplies. Eutrophication is primarily caused by an overabundance of nitrogen and phosphorus. It causes foul tastes and odors, which require additional treatment, and commensurate expenditure, to remove.

The RIA discusses potential impacts on the market for the beneficial use of CCR as a substitute for virgin materials. Future uses of CCR are unknown. Research on the recovery of rare earth elements and yttrium from coal fly ash is ongoing but currently only at laboratory scale. It is possible that in the future, the availability of additional CCR may reach an equilibrium price that encourages demand, particularly as coal plants retire and the supply of ''new'' CCR falls. However, the quality of CCR in legacy CCR surface impoundments and CCRMU may limit their value. Older, closed impoundments or other CCR storage areas are less likely to have CCR material of a known and reliable composition.

The RIA also discusses potential reductions in fugitive dust emanating from legacy CCR surface impoundments, which will benefit fence line communities by reducing the amount of resuspended ash from legacy CCR surface impoundments that could otherwise lead to respiratory health hazards for communities surrounding a given legacy impoundment.

The RIA discusses the benefits of improved property values near closed and remediated sites. Neighborhoods located near hazardous waste sites often experience depressed property values due to health risks posed by contaminant exposure pathways, potential reductions in ecological services, unsightly aesthetics of the disposal unit site, and potential stigma associated with proximity to a disposal site. Almost a million households, and over 2.5 million people are located within three miles of legacy CCR surface impoundments and CCRMU. Approximately 75,000 households and 200,000 people are located within a mile. Improvements in home values resulting from the proposed rule have the potential to bestow welfare gains to homeowners located near legacy CCR surface impoundments and CCRMU.

The RIA also discusses the value of reusing land formerly occupied by legacy CCR surface impoundments, and CCRMU. Once legacy CCR surface impoundments and CCRMU are closed by removal, landfills are properly capped, or corrective action activities are completed, the land is more likely to move into alternative, economically productive purposes. For example, these land reuse projects might include industrial redevelopment or implementation of green energy generation which can utilize the existing electricity grid infrastructure.

Finally, based on the demographic composition and environmental conditions of communities within one and three miles of legacy CCR surface impoundments, the final rule will reduce existing disproportionate and adverse effects on economically vulnerable communities, as well as those that currently face environmental burdens. For example, in Illinois the population living within one mile of legacy CCR surface impoundment sites is over three times as likely compared to the State average to have less than a high school education (35.66% compared to 10.10%, see RIA exhibit ES.14), and that population already experiences higher than average exposures to particulate matter, ozone, diesel emissions, lifetime air toxics cancer risks, and proximity to traffic, Superfund sites, Risk Management Plan sites, and hazardous waste facilities (see RIA exhibit ES.15).

The RIA also discusses the interaction of the CCR rules with Office of Air rules governing emissions at power plants. Following on the significant progress EPA has made over many decades to reduce dangerous pollution from coal-fired electric utilities' stack emissions and effluents, this proposed rule will help EPA further ensure that the communities and ecosystems closest to coal facilities are sufficiently protected from harm from groundwater contamination, surface water contamination, fugitive dust, floods and impoundment overflows, and threats to wildlife. The volume and toxicity of CCR at many sites persisted or increased over past decades even as coal-fired units' air and water emissions decreased, and this proposed rule will help EPA fulfill the promise of substantial public health and welfare gains from its full suite of regulations aimed at reducing the harms from coal-combustion pollution.

As noted previously, EPA establishes the requirements under RCRA sections 1008(a)(3) and 4004(a) without taking cost into account. *See, USWAG,* 901 F.3d at 448–49. Although EPA has accordingly designed its proposal based on its statutory factors and court precedent and has not relied on this benefit-cost analysis in the selection of its proposed alternative, EPA believes that after considering all unquantified and distributional effects, the public health and welfare gains that will result from the proposed alternative would justify the rule's costs.

VI. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders.*

[152] Brandt, Jessica E., et al. ''Beyond selenium: coal combustion residuals lead to multielement enrichment in receiving lake food webs.'' Environmental science & technology 53.8 (2019): 4119–4127.

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 14904: Modernizing Regulatory Review

This action is a ''significant regulatory action'' under section 3(f)(1) of Executive Order 12866, as amended by Executive Order 14094. Accordingly, the EPA submitted this action to the Office of Management and Budget (OMB) for review. Any changes made in response to recommendations received as part Executive Order 12866 review have been documented in the docket. The EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis, Regulatory Impact Analysis: Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments, is available in the docket and is briefly summarized in Unit V.

B. Paperwork Reduction Act (PRA)

The information collection activities in this rule will be submitted for approval to the Office of Management and Budget (OMB) under the PRA. EPA submitted the proposed rule ICR to OMB for approval on March 25th, 2024, triggering a 30-day public comment period for this proposed information collection. EPA anticipates the final ICR will be approved by the effective date of this final rule. If EPA receives any new and substantive comments on proposed collection, *i.e.,* substantive comments that were not received during the 60 day public comment period on the rule (from May 18, 2023–July 17, 2023), EPA will address those comments in a revision to the ICR via the standard PRA approval process. The Information Collection Request (ICR) document that the EPA prepared has been assigned EPA ICR number 2761.01. Due to the concurrent timing of this rulemaking and the timing of the renewal of the collection of information 2050–0223, *Disposal of Coal Combustion Residuals From Electric Utilities,* EPA is requesting a temporary OMB control number for this rulemaking collection, which will be assigned upon approval of the proposed ICR by OMB. EPA will submit a request to merge this rulemaking collection into the existing ICR for the program, 2050–0223, once the final rulemaking ICR and renewal for 2050–0223 are approved by OMB. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here. The information collection requirements are not enforceable until OMB approves them.

The final rule requires legacy CCR surface impoundments to comply with the reporting and recordkeeping requirements already in place for regulated CCR units. Many of these requirements are one-time requirements that will occur soon after the promulgation of the rule, while several are ongoing. The final rule also requires legacy CCR surface impoundments to submit an applicability report, unique to this universe of units, which will provide stakeholders with essential site characteristic and contact information for the unit.

Respondents/affected entities: Inactive electric utility plants with inactive CCR surface impoundments (legacy CCR surface impoundments), electric utility plants with CCRMU, electric utility plants with OAFUs, and electric utility plants with landfills already subject to regulation under the 2015 final CCR rule, but which have waste in contact with groundwater.

Respondent's obligation to respond: The recordkeeping, notification, and posting are mandatory as part of the minimum national criteria promulgated under Sections 1008(a), 2002(a), 4004, and 4005(a) and (d) of RCRA.

Estimated number of respondents: 2,083.

Frequency of response: one-time and annually.

Total estimated burden: 172,909 hours (per year). Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: $11.2 million (per year), includes $11.2 million annualized capital or operation and maintenance costs.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the **Federal Register** and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities contained in this final rule.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. The small entities subject to the requirements of this action are owners and operators of coal fired electric utility plants in NAICS code 221112 and firms that own property on which an inactive/retired coal fired power plant is located. The Agency has identified 175 small entities subject to the final rule. The Agency estimates that the average annual cost to a small entity will be approximately $0.31 million; the vast majority of these entities do not own legacy CCR surface impoundments, CCRMU, or OAFUs, and must only complete the evaluation report requirements of the final rule. EPA has identified 15 small entities owning legacy CCR surface impoundments, CCRMU, and/or OAFUs; EPA assumes that small entities will not be able to pass on any compliance costs to ratepayers. This assumption, in EPA's opinion, constitutes a high-end scenario. In total, these 15 small entities are estimated to incur approximately $52.1 million in annual costs. The Agency has determined that five small entities may experience an impact greater than 3% of annual revenues. Details of this analysis are presented in the Regulatory Impact Analysis, which can be found in the docket for this action.

D. Unfunded Mandates Reform Act (UMRA)

This action contains a Federal mandate under UMRA, 2 U.S.C. 1531–1538, that may result in expenditures of $100 million or more for State, local and Tribal governments, in the aggregate, or the private sector in any one year. Accordingly, the EPA has prepared a written statement required under section 202 of UMRA. The statement is included in the docket for this action and briefly summarized here.

The RIA estimates that the proposed rule may affect 194 legacy CCR surface impoundments at 84 facilities, 195 CCRMU at 104 facilities, 15 OAFUs at six facilities, and 39 landfills already regulated under the 2015 final rule. The final rule will extend the existing requirements of the 2015 CCR final rule, found in 40 CFR part 257, subpart D, to these units.

In preparing the 2015 CCR final rule, and consistent with the intergovernmental consultation provisions of section 204 of the UMRA, EPA initiated pre-proposal consultations with governmental entities affected by the rule. In developing the regulatory options for the 2015 CCR Rule, EPA consulted with small governments according to EPA's UMRA interim small government consultation plan developed pursuant to section 203 of UMRA. The details of this consultation can be found in the preamble to the 2015 CCR final rule. Consistent with section 205 of UMRA, EPA identified and considered a reasonable number of regulatory alternatives, and adopted the least-costly approach (*i.e.,* a modified version of the ''D Prime'' least costly approach presented in the 2010 proposed CCR rule). The final rule merely extends the provisions of the 2015 final rule to four additional classes of facilities.

This action is not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. The threshold amount established for determining whether regulatory requirements could significantly affect small governments is $100 million annually. The RIA estimates annual average costs of $7 million total for the four local governments identified as owning units subject to the final rule. These estimates are well below the $100 million annual threshold established under UMRA. There are no known Tribal owner entities of facilities that would incur substantial direct costs under the final rule.

E. Executive Order 13132: Federalism

This action does not have Federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have Tribal implications as specified in Executive Order 13175. For the ''Final Rule: Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities'' published April 17, 2015 (80 FR 21302), EPA identified three of the 414 coal-fired electric utility plants (in operation as of 2012) as being located on Tribal lands. To the extent that these plants contain CCRMU subject to the proposed rule, the impacts to Tribes will be limited to document review and walking the site. As these are not substantial direct costs, this action does not impose substantial direct compliance costs or otherwise have a substantial direct effect on one or more Indian Tribes, to the best of EPA's knowledge. Neither will it have substantial direct effects on the relationship between the Federal Government and Indian Tribes, or on the distribution of power and responsibilities between the Federal Government and Indian Tribes. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045 directs Federal agencies to include an evaluation of the health and safety effects of the planned regulation on children in Federal health and safety standards and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives. This action is subject to E.O. 13045 (62 FR 19885, April 23, 1997) because it is a significant regulatory action under section 3(f)(1) of E.O. 12866, and EPA believes that the environmental health or safety risks addressed by this action may have a disproportionate effect on children. In addition, EPA's Policy on Children's Health applies. Accordingly, EPA evaluated the environmental health or safety effects of CCR constituents of potential concern on children. The results of this evaluation are contained in the Human and Ecological Risk Assessment of Coal Combustion Wastes available in the docket for this action.

As ordered by E.O. 13045 Section 1–101(a), EPA identified and assessed environmental health risks and safety risks that may disproportionately affect children in the revised risk assessment. Pursuant to U.S. EPA's Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants, children are divided into seven distinct age cohorts: 1 to <2 yr, 2 to <3 yr, 3 to <6 yr, 6 to <11 yr, 11 to <16 yr, 16 to <21 yr, and infants (<1 yr). Using exposure factors for each of these cohorts, EPA calculated cancer and non-cancer risk results in both the screening and probabilistic phases of the assessment. In general, risks to infants tended to be higher than other childhood cohorts, and also higher than risks to adults. However, for drinking water cancer risks, the longer exposure periods for adults led to the highest risks over a standard adult lifetime. Screening risks exceeded EPA's human health criteria for children exposed to contaminated air, soil, and food resulting from fugitive dust emissions and run-off. Similarly, 90th percentile child cancer and non-cancer risks exceeded the human health criteria for the groundwater to drinking water pathway under the full probabilistic analysis (Table 5–17 in the Human and Ecological Risk Assessment of Coal Combustion Wastes). The closure, groundwater monitoring and corrective action required by the rule will reduce risks from currently unregulated legacy CCR surface impoundments, and CCRMU. Thus, EPA believes that this rule will be protective of children's health.

In general, because the pollution control requirements under the CCR rule will reduce health and environmental exposure risks at all coal-fired electric utility plants, the CCR rule is not expected to create additional or new risks to children.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use

This action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution or use of energy. Because the final rule addresses management of CCR and pertains mainly to inactive CCR units (legacy CCR surface impoundments at inactive facilities and CCRMU at facilities already regulated under the 2015 CCR rule), this final rule will have no effect on the production of crude oil, coal, fuel, or natural gas. In addition, the final rule will have no direct effect on electricity production, generating capacity, or on foreign imports or exports of energy.

Electricity price effects on the price of energy are only possible because in some cases, utilities may attempt to pass the costs of managing CCR under the proposed rule on to ratepayers in the form of increased electricity rates through Public Utility Commissions (PUCs). As a result, the final rule may indirectly affect electricity prices within the energy sector. To estimate what the electricity price effects of this final rule may be on a national level, EPA compared the expected costs of this rule to the expected costs and effects resulting from three previously conducted IPM runs for three previous RIAs, the 2015 CCR Rule, the 2015 ELG Rule (which included the costs of the 2015 CCR Rule in its baseline), and the 2019 ELG Rule, which was a deregulatory rule. Extrapolating from these IPM runs, EPA estimates that the effect of the current action on electricity prices will be between 0.060% and 0.156%. Since these effects fall below the 1% threshold, EPA concludes that this rule is not expected to generate significant adverse energy effects. The full energy impacts analysis is available in the Regulatory Impact Analysis that accompanies this action.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking involves technical standards. The EPA has decided to use technical standards in this rule as the existing CCR regulations rely on the following: (1) RCRA Subpart D, Section 257.70 liner design criteria for new CCR landfills and any lateral expansion of a CCR landfill includes voluntary consensus standards developed by ASTM International and EPA test methods such as SW–846, (2) Section 257.71 liner design criteria for existing CCR surface impoundments includes voluntary consensus standards developed by ASTM International and EPA test methods such as SW–846, (3) Section 257.72 liner design criteria for new CCR surface impoundments and any lateral expansion of a CCR surface impoundment includes voluntary consensus standards developed by ASTM International and EPA test methods such as SW–846, and (4) Section 257.73 structural stability standards for new and existing surface impoundments use the ASTM D 698 and 1557 standards for embankment compaction. In this rulemaking, EPA expands the application of § 257.73 structural stability standards, which as noted, rely on the ASTM D 698 and 1557 standards for embankment compaction, to facilities with legacy CCR surface impoundments. This rulemaking does not adopt or otherwise involve any additional technical standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All

EPA believes that the human health or environmental conditions that exist prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on communities with environmental justice concerns.

EPA conducted a demographic screening analysis for all facilities subject to the rule to determine the composition of populations living within one and three miles of facilities with these units. Specifically, EPA looked at the percentages of the relevant populations that are identified as minority/people of color, households below the Federal poverty level, population with less than high school education (among those 25 years and older), and populations characterized by linguistic isolation. EPA chose to look at radii of one and three miles because they represent the areas most likely to be affected by groundwater contamination and surface water impacts from legacy CCR surface impoundments and CCRMU. EPA compared the demographic profile within these radii to national and State averages to assess the extent to which marginalized groups are disproportionately affected by CCR-related contamination in the baseline.

To more fully explore the conditions in communities and populations surrounding facilities subject to the 2024 final rule, EPA expanded the demographic proximity analysis to include a suite of metrics that represent baseline health and social factors that are likely to be affected by, or interact with, changes in the management of facilities as a result of the rule. This analysis also focuses on populations within one mile of legacy CCR surface impoundments and CCRMU sites, but includes a combination of eight baseline indicators from the CDC Environmental Justice Index (EJI) and EPA's EJScreen that document community conditions that (a) suggest potential environmental justice concerns and (b) are relevant to actions resulting from the 2024 final rule. These include:

- CDC EJI Indicators: Lack of internet access, prevalence of disabilities, cancer, poor mental health, high blood pressure, asthma, and diabetes.
- EJScreen Indicators: $PM_{2.5}$ concentrations and low life expectancy.

This specific subset of indicators captures health-related risks, environmental burdens, and access to information that affect a substantial number of communities living near the universe of facilities to provide a clearer picture of the baseline conditions. To assess the extent to which facilities affected by the final rule are located within communities with high baseline risks, the analysis specifically identifies, for each indicator, communities that fall in the highest (most at risk) 40 percent, or top two quintiles of communities nationwide. In other words, the analysis only identifies instances where a community is more at risk or more burdened than 60 percent of all communities in the U.S. For each indicator, the analysis calculates the number of communities within one mile of legacy CCR surface impoundments, CCRMU, and OAFU facilities that are in the top two quintiles.

Many of the health-related indicators appeared in communities with high percentiles for other health-related indicators, especially combinations of high blood pressure, diabetes, and asthma. Communities with high populations of people with disabilities were also likely to have high prevalence of high blood pressure, asthma, diabetes, poor mental health, and cancer. Additionally, high prevalence of poor mental health and lack of internet accompanied prevalence of morbidities besides cancer.

EPA also identified lack of internet access, which is generally associated with poverty but also is a distinct factor in ensuring that information about regulated facilities and units that is required by the 2024 final rule is accessible to the people in surrounding communities. Half of the facilities with a lack of internet access in surrounding communities were also above two times the State average for households below the national poverty level, but the other half are not, suggesting that this barrier to information may be more widespread and less predictable in the 2024 rule context. In addition to the income-related implications, lack of internet access has consequences for information access that are pertinent to the 2024 final rule, which requires facilities to publish information online for public access. Therefore, a lack of internet access is a key barrier for communities who may be unable to receive important information.

These analyses found that of the roughly 182 sites in the regulated universe, more than half are located in areas with environmental justice concerns in surrounding communities. These communities are likely to face existing environmental burdens, economic stressors, and health conditions that put their residents and ecosystems at greater cumulative risk from the impacts associated with proximity to legacy impoundments. Because the final rule is designed to both prevent future contamination and eliminate existing contamination from CCR units that are near these already-vulnerable communities, EPA believes that the rule is likely to incrementally reduce existing disproportionate and adverse effects on communities with EJ concerns. EPA believes that the rule is particularly likely to reduce disproportionate and adverse effects on people of color and populations who experience low income. The rule improves overall environmental quality for all exposed communities and populations by ensuring protection and remediation of groundwater, resulting in avoided health effects (including cancer) from drinking water exposures to arsenic and other contaminants, and by reducing releases of CCR from impoundments into the surface waters, ecosystems, and air surrounding the facilities. The final rule is equity-enhancing in that it addresses EJ concerns present in the communities and populations near many of the facilities by reducing environmental and health burdens that contribute to the cumulative impacts experienced by these communities, including the often-costly burdens associated with health effects. Moreover, the rule requires that facilities make information about their contamination and remediation actions available on public websites; this provides all interested members of the public, including communities with EJ concerns, improved access to information related to their environment or health, supporting effective community involvement.

Overall, EPA found that facilities affected by the rule are often located near populations of color with higher rates of poverty and linguistic isolation, and lower levels of education. Of the roughly 182 sites in the regulated universe, more than half are located in areas with environmental justice concerns in surrounding communities. These communities are likely to face existing environmental burdens, economic stressors, and health conditions that put their residents and ecosystems at greater cumulative risk from the impacts associated with proximity to legacy impoundments. Because the final rule is designed to both prevent future contamination and eliminate existing contamination from CCR units that are near these already-vulnerable communities, EPA believes that the rule is likely to incrementally reduce existing disproportionate and adverse effects on communities with EJ concerns. EPA believes that the rule is particularly likely to reduce disproportionate and adverse effects on people of color and populations who experience low income.

The information supporting this Executive Order review is contained in the accompanying Regulatory Impact Analysis, which can be found in the docket for this action.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action meets the criteria set forth in 5 U.S.C. 804(2).

List of Subjects

40 CFR Part 9

Environmental protection, Reporting and recordkeeping requirements.

40 CFR Part 257

Environmental protection, Beneficial use, Coal combustion products, Coal combustion residuals, Coal combustion waste, Disposal, Hazardous waste, Landfill, Surface impoundment.

Michael S. Regan,
Administrator.

For the reasons set out in the preamble, title 40, chapter I, of the Code of Federal Regulations is amended as follows:

PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

■ 1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 *et seq.,* 136–136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601–2671; 21 U.S.C. 331j, 346a, 31 U.S.C. 9701; 33 U.S.C. 1251 *et seq.,* 1311, 1313d, 1314, 1318, 1321, 1326, 1330, 1342, 1344, 1345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971–1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–1, 300j–2, 300j–3, 300j–4, 300j–9, 1857 *et seq.,* 6901–6992k, 7401–7671q, 7542, 9601–9657, 11023, 11048.

■ 2. Amend § 9.1 by adding an undesignated center heading and an entry for ''257.50–257.107'' in numerical order to read as follows:

§ 9.1 OMB approvals under the Paperwork Reduction Act

* * * * *

40 CFR citation	OMB control No.
* * * * *	
Disposal of Coal Combustion Residuals From Electric Utilities	
257.50–257.107	2050–0223
* * * * *	

* * * * *

PART 257—CRITERIA FOR CLASSIFICATION OF SOLID WASTE DISPOSAL FACILITIES AND PRACTICES

■ 3. The authority citation for part 257 is revised to read as follows:

Authority: 42 U.S.C. 6907(a)(3), 6912(a)(1), 6927, 6944, 6945(a) and (d); 33 U.S.C. 1345(d) and (e).

Subpart A [Amended]

■ 4. Amend § 257.1 by revising paragraph (c)(12) to read as follows:

§ 257.1 Scope and purpose.

* * * * *

(c) * * *

(12) Except as otherwise specifically provided in subpart D of this part, the criteria in subpart A of this part do not apply to CCR units, as that term is defined in subpart D of this part. CCR units are instead subject to subpart D of this part.

Subpart D [Amended]

■ 5. Amend subpart D by removing the phrase ''Web site'' and adding in its place the word ''website'' wherever it appears.

■ 6. Amend § 257.50 by revising paragraph (c), (d), and (e) to read as follows:

§ 257.50 Scope and purpose.

* * * * *

(c) This subpart also applies to inactive CCR surface impoundments at active electric utilities or independent power producers, regardless of how electricity is currently being produced at the facility.

(d) (1) This subpart applies to CCR management units containing 1,000 tons or greater of CCR, located at active facilities or facilities with a legacy CCR surface impoundment.

(2) CCR management units containing greater than or equal to 1 ton and less than 1,000 tons of CCR, located at active facilities or facilities with a legacy CCR surface impoundment, are subject only to the requirements of the facility evaluation report in § 257.75 until a permitting authority determines that regulation of these units, either individually or in the aggregate, is warranted and determines the applicable requirements.

(e) This subpart applies to electric utilities or independent power producers that ceased producing electricity prior to October 19, 2015 and have a legacy CCR surface impoundment onsite.

* * * * *

§ 257.51 [Removed and Reserved]

■ 7. Amend subpart D by removing and reserving § 257.51.

■ 8. Revise § 257.52 to read as follows:

§ 257.52 Applicability of other regulations.

(a) Compliance with the requirements of this subpart does not affect the need for the owner or operator of a CCR unit to comply with all other applicable federal, state, tribal, or local laws or other requirements.

(b) Any CCR unit continues to be subject to the requirements in §§ 257.3–1, 257.3–2, and 257.3–3.

■ 9. Amend § 257.53 by:

■ a. Revising the definition of ''Active facility or active electric utilities or independent power producers'';

■ b. Adding in alphabetical order the definition of ''Closed prior to October 19, 2015'';
■ c. Revising the definition of ''CCR landfill or landfill'';
■ d. Adding in alphabetical order the definition of ''CCR management unit'';
■ e. Revising the definitions of ''CCR surface impoundment or impoundment'' and ''CCR unit'';
■ f. Adding in alphabetical order the definitions of ''Critical infrastructure'', ''Contains both CCR and liquids'' and ''Inactive CCR landfill'';
■ g. Revising the definition of ''Inactive CCR surface impoundment'';
■ h. Adding in alphabetical order the definitions of ''Inactive facility or inactive electric utility or independent power producer'', ''Infiltration'', ''Legacy CCR surface impoundment'', and ''Liquids'';
■ i. Revising the definitions of ''Operator'' and ''Owner'';
■ j. Adding in alphabetical order the definition of ''Regulated CCR unit'';
■ k. Revising the definition of ''State Director'';
■ l. Removing the definitions of ''Technically feasible'' and ''Technically infeasible''; and
■ m. Adding in alphabetical order the definitions of ''Technically feasible or feasible'' and ''Technically infeasible or infeasible''.

The revisions and additions read as follows:

§ 257.53 Definitions.

* * * * *

Active facility or *active electric utilities or independent power producers* means any facility subject to the requirements of this subpart that is in operation on or after October 19, 2015. An electric utility or independent power producer is in operation if it is generating electricity that is provided to electric power transmission systems or to electric power distribution systems on or after October 19, 2015. An off-site disposal facility is in operation if it is accepting or managing CCR on or after October 19, 2015.

* * * * *

Closed prior to October 19, 2015 means the CCR landfill or surface impoundment completed closure of the unit in accordance with state law prior to October 19, 2015.

* * * * *

CCR landfill or landfill means an area of land or an excavation that contains CCR and which is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave. For purposes of this subpart, a CCR landfill also includes sand and gravel pits and quarries that receive CCR, CCR piles, and any practice that does not meet the definition of a beneficial use of CCR.

CCR management unit means any area of land on which any noncontainerized accumulation of CCR is received, is placed, or is otherwise managed, that is not a regulated CCR unit. This includes inactive CCR landfills and CCR units that closed prior to October 19, 2015, but does not include roadbed and associated embankments in which CCR is used unless the facility or a permitting authority determines that the roadbed is causing or contributing to a statistically significant level above the groundwater protection standard established under § 257.95(h).

* * * * *

CCR surface impoundment or *impoundment* means a natural topographic depression, man-made excavation, or diked area, designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR.

CCR unit means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR landfill or CCR surface impoundment, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified. This term includes CCR management units and legacy CCR surface impoundments.

Contains both CCR and liquids means that both CCR and liquids are present in a CCR surface impoundment, except where the owner or operator demonstrates that the standard in § 257.102(d)(2)(i) has been met.

Critical infrastructure means physical structures, such as buildings, railways, bridges, or tunnels, that are not readily replaced or relocated and are either:

(1) Necessary for the continued generation of power, or

(2) Vital to the success or continuation of other on-going site activity for the public welfare. Examples of critical infrastructure include high power electric transmission towers, air pollution control or wastewater treatment systems, active CCR units, buildings, or an electrical substation. Buildings or other structures that exclusively provide commercial or financial benefit to private entities are not critical infrastructure.

* * * * *

Inactive CCR landfill means an area of land or an excavation that contains CCR but that no longer receives CCR on or after October 19, 2015 and that is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave. This term also includes sand and gravel pits that contain CCR and CCR piles, which have not received CCR on or after October 19, 2015, and abandoned or inactive CCR piles.

Inactive CCR surface impoundment means a CCR surface impoundment located at an active facility that no longer receives CCR on or after October 19, 2015, and still contains both CCR and liquids on or after October 19, 2015.

Inactive facility or *inactive electric utility or independent power producer* means any electric utility or independent power producer that ceased providing power to electric power transmission systems or to electric power distribution systems before October 19, 2015. An off-site disposal facility is inactive if it ceased accepting or managing CCR prior to October 19, 2015.

* * * * *

Infiltration means the migration or movement of liquid, such as surface water or ground water, into or through a CCR unit from any direction, including from the surface, laterally, and through the bottom of the unit.

* * * * *

Legacy CCR surface impoundment means a CCR surface impoundment that no longer receives CCR but contained both CCR and liquids on or after October 19, 2015, and that is located at an inactive electric utility or independent power producer.

* * * * *

Liquids means any fluid (such as water) that has no independent shape but has a definite volume and does not expand indefinitely and that is only slightly compressible. This encompasses all of the various types of liquids that may be present in a CCR unit, including water that was sluiced into an impoundment along with CCR, precipitation, surface water, groundwater, and any other form of water that has migrated into the impoundment, which may be found as free water or standing water ponded above CCR or porewater intermingled with CCR.

* * * * *

Operator means the person(s) responsible for the overall operation of a CCR unit. This term includes those person(s) or parties responsible for disposal or otherwise actively engaged in the solid waste management of CCR. It also includes those responsible for directing or overseeing groundwater monitoring, closure or post-closure activities at a CCR unit.

* * * * *

Owner means the person(s) who owns a CCR unit or part of a CCR unit, or a facility, whether in full or in part.

* * * * *

Regulated CCR unit means any new CCR landfill, existing CCR landfill, new CCR surface impoundment, existing CCR surface impoundment, inactive CCR surface impoundment, or legacy CCR surface impoundment. This term does not include CCR management units.

* * * * *

State Director means the chief administrative officer of the lead state agency responsible for implementing the state program regulating disposal in CCR units.

* * * * *

Technically feasible or *feasible* means possible to do in a way that would likely be successful.

Technically infeasible or *infeasible* means not possible to do in a way that would likely be successful.

* * * * *

■ 10. Amend § 257.61 by revising the introductory text of paragraph (a) to read as follows:

§ 257.61 Wetlands.

(a) New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located in wetlands, as defined in § 230.41(a) of this chapter, unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that the CCR unit meets the requirements of paragraphs (a)(1) through (5) of this section.

* * * * *

■ 11. Amend § 257.73 by revising the introductory text of paragraph (a) to read as follows:

§ 257.73 Structural integrity criteria for existing CCR surface impoundments.

(a) The requirements of paragraphs (a)(1) through (4) of this section apply to all existing CCR surface impoundments and legacy CCR surface impoundments, except for those that are incised CCR surface impoundments.

* * * * *

■ 12. Add § 257.75 to read as follows:

§ 257.75 Requirements for identifying CCR management units.

(a) *Applicability.* The requirements of this section apply to owners and operators of active facilities or facilities with a legacy CCR surface impoundment.

(b) *Facility evaluation.* The owner or operator of an active facility or a facility with a legacy CCR surface impoundment must conduct a facility evaluation to identify all CCR management units at the facility in accordance with paragraphs (c) through (e) of this section. At a minimum, the presence or absence of CCR management units at the facility must be confirmed and documented through a thorough evaluation of reasonably and readily available records that contain the information needed to prepare the Facility Evaluation Reports Part 1 and Part 2 required by paragraphs (c) and (d) of this section. The facility evaluation must also include a physical inspection of the facility. Where necessary, the physical inspection must include field investigation activities to fill data gaps, such as conducting exploratory soil borings, geophysical assessments, or any other similar physical investigation activities to establish the location and boundaries of potential or likely CCR management units, and to affirmatively rule out other areas of potential CCR placement at the facility that were identified during the information review or physical inspection. The facility evaluation must identify all CCR management units at the facility regardless of when the CCR management unit came into existence.

(c) *Facility Evaluation Report Part 1.* (1) No later than Monday, February 9, 2026, the owner or operator of an active facility or a facility with a legacy CCR surface impoundment must prepare a Facility Evaluation Report Part 1, which shall contain, to the extent reasonably and readily available, the information specified in paragraphs (c)(1)(i) through (xiv) of this section. The owner or operator has prepared the Facility Evaluation Report Part 1 when the report has been placed in the facility's operating record as required by § 257.105(f)(25).

(i) The name and address of the person(s) owning and operating the facility; the unit name associated with each regulated CCR unit and CCR management unit at the facility; and the identification number of each regulated CCR unit and CCR management unit if any have been assigned by the state or by the owner.

(ii) The location of any CCR management unit identified on the most recent U.S. Geological Survey (USGS) 7½ minute or 15-minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available. The location of each regulated CCR unit at the facility must also be identified in the same manner.

(iii) A statement of the purpose(s) for which each CCR management unit at the facility is or was used.

(iv) A description of the physical and engineering properties of the foundation and abutment materials on which each CCR management unit is constructed.

(v) A discussion of any known spills or releases of CCR, including any associated remediation activities, from each CCR management unit and whether the spills or releases were reported to state or federal agencies.

(vi) Any record or knowledge of structural instability of each CCR management unit.

(vii) Any record or knowledge of groundwater contamination associated or potentially associated with each CCR management unit.

(viii) The size of each CCR management unit, including the general lateral and vertical dimensions and an estimate of the volume of waste contained within the unit.

(ix) Dates when each CCR management unit first received CCR and when each CCR management unit ceased receiving CCR.

(x) Identification of all types of CCR in each CCR management unit at the facility.

(xi) A narrative description of any closure activities that have occurred, including any applicable engineering drawings or reports.

(xii) A narrative that documents the data reviewed as part of the facility evaluation process, and that lists all data and information indicating the presence or absence of CCR management units at the facility.

(xiii) Any supporting information used to identify and evaluate CCR management units at the facility, including but not limited to any construction diagrams, engineering drawings, permit documents, wastestream flow diagrams, aerial photographs, satellite images, historical facility maps, any field or analytical data, groundwater monitoring data or reports, inspection reports, documentation of interviews with current or former facility workers, and other documents used to identify and evaluate CCR management units at the facility.

(xiv) A narrative description of any data gaps for information in paragraphs (c)(i) through (xiii) of this section, not available in existing information collection records and a plan for remedying identified data gaps through a physical examination of the facility, including any field or laboratory work needed to remedy data gaps in the Facility Evaluation Report Part 1 record. The plan must include the major milestones needed to fill the identified data gaps (*e.g.,* a physical examination of the facility, sampling of media, measurements of CCR concentrations in and around the unit or physical presence, delineation of CCR management unit(s)) and dates to complete such needed tasks. Also, as necessary and timely, any updates to data gap remedy plans must be added to the public record during the Facility Evaluation Report Part 1.

(2) The owner or operator of any facility regulated under this subpart must obtain a certification from a qualified professional engineer stating that the Facility Evaluation Report Part 1 meets the requirements of paragraph (c)(1) of this section.

(3) The owner or operator of any facility regulated under this subpart must certify the Facility Evaluation Report Part 1 required by paragraph (c)(1) of this section with the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(4) No later than Monday, February 9, 2026, the owner or operator must notify the Agency of the establishment of a CCR website using the procedures in § 257.107(a) via the ''contact us'' form on EPA's CCR website.

(5) The owner or operator of any facility regulated under this subpart that does not contain any CCR management unit must submit Facility Evaluation Report Part 1 documenting the steps taken during the facility evaluation to determine the absence of any CCR management unit. The Facility Evaluation Report Part 1 must include the certifications required under paragraph (c)(3) of this section.

(d) *Facility evaluation report part 2.* (1) No later than Monday, February 8, 2027, the owner or operator of an active facility or a facility with a legacy CCR surface impoundment must prepare a facility evaluation report part 2, which shall contain, to the extent not provided in the Facility Evaluation Report Part 1 under paragraph (c) of this section, the information specified in paragraphs (d)(1)(i) through (xiii) of this section obtained from a physical evaluation of the facility, including where necessary field sampling. The owner or operator has prepared the facility evaluation report part 2 when the report has been placed in the facility's operating record as required by § 257.105(f)(26).

(i) The name and address of the person(s) owning and operating the facility; the unit name associated with each regulated CCR unit and CCR management unit at the facility; and the identification number of each regulated CCR unit and CCR management unit if any have been assigned by the state or by the owner.

(ii) The location of any CCR management unit identified on the most recent U.S. Geological Survey (USGS) 7½ minute or 15-minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available. The location of each regulated CCR unit at the facility must also be identified in the same manner.

(iii) A statement of the purpose(s) for which each CCR management unit at the facility is or was used.

(iv) A description of the physical and engineering properties of the foundation and abutment materials on which each CCR management unit was constructed.

(v) Any further evidence of known spills or releases, including any associated remediation activities, of CCR from each CCR management unit and whether the spills or releases were reported to state or federal agencies.

(vi) Any further evidence of structural instability of each CCR management unit.

(vii) Any further evidence of groundwater contamination associated or potentially associated with each CCR management unit.

(viii) The size of each CCR management unit, including the general lateral and vertical dimensions and an estimate of the volume of CCR contained within the unit.

(ix) Identification of the types of CCR in each CCR management unit.

(x) A narrative description of any closure activities that have occurred, including any applicable engineering drawings or reports.

(xi) A narrative that documents the nature and extent of field oversight activities and data reviewed as part of the facility evaluation process, and that lists all data and information that was reviewed indicating the presence or absence of CCR management units at the facility.

(xii) Any additional supporting information used to identify and evaluate CCR management units at the facility, including but not limited to any construction diagrams, engineering drawings, permit documents, wastestream flow diagrams, aerial photographs, satellite images, historical facility maps, any field or analytical data, groundwater monitoring data or reports, inspection reports, and other documents used to identify and assess CCR management units at the facility. Additionally, as necessary and timely, any updates to the part 1 data gap remedy plan must be added to the record during the facility evaluation report part 2 timeframe.

(xiii) The Facility Evaluation Report Part 2 must explain how each data gap identified in Facility Evaluation Report Part 1 was addressed.

(xiv) A description of each CCR management unit for which regulation under this subpart is deferred for allowable reasons as specified in § 257.101(g) or (h). The owner or operator must provide documentation in the Facility Evaluation Report Part 2 to substantiate that the requirements § 257.101(g) or (h) have been met.

(2) The owner or operator of any facility regulated under this subpart must obtain a certification from a qualified professional engineer stating that the Facility Evaluation Report Part 2 meets the requirements of paragraph (d)(1) of this section.

(3) The owner or operator of any facility regulated under this subpart must certify the Facility Evaluation Report Part 2 required by paragraph (d)(1) of this section with the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(4) The owner or operator of any facility regulated under this subpart that does not contain any CCR management unit must submit Facility Evaluation Report Part 2 documenting the steps taken during the facility evaluation to determine the absence of any CCR management unit. The Facility Evaluation Report Part 2 must include the certifications required under paragraph (d)(3) of this section.

(e) The owner or operator of the facility must comply with the recordkeeping requirements specified in § 257.105(f), the notification requirements specified in § 257.106(f), and the internet requirements specified in § 257.107(f).

■ 13. Amend § 257.80 by revising paragraphs (a) and (b)(6) to read as follows:

§ 257.80 Air criteria.

(a) The owner or operator of a CCR unit must adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

(b) * * *

(6) *Amendment of the plan.* The owner or operator subject to the requirements of this section may amend the written CCR fugitive dust control plan at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(g)(1). The owner or operator must amend the written plan no later than 30 days whenever there is a change in conditions that would substantially affect the written plan in effect, such as the construction and operation of a new CCR unit.

* * * * *

■ 14. Amend § 257.82 by revising the introductory text of paragraph (a) to read as follows:

§ 257.82 Hydrologic and hydraulic capacity requirements for CCR surface impoundments.

(a) The owner or operator of an existing or new CCR surface impoundment, legacy CCR surface impoundment, or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.

* * * * *

■ 15. Amend § 257.83 by revising the introductory text of paragraphs (a)(1) and (b)(1) to read as follows:

§ 257.83 Inspection requirements for CCR surface impoundments.

(a) * * *

(1) All CCR surface impoundments, including legacy CCR surface impoundments, and any lateral expansion of a CCR surface impoundment must be examined by a qualified person as follows:

* * * * *

(b) * * *

(1) If the existing or new CCR surface impoundment or any lateral expansion of the CCR surface impoundment or legacy CCR surface impoundments is subject to the periodic structural stability assessment requirements under § 257.73(d) or § 257.74(d), the CCR unit must additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:

* * * * *

■ 16. Revise and republish § 257.90 to read as follows:

§ 257.90 Applicability.

(a) *Applicability.* All CCR units are subject to the groundwater monitoring and corrective action requirements under §§ 257.90 through 257.98, except as provided in paragraph (g) of this section.

(b) *Initial timeframes*—(1) *Existing CCR landfills and existing CCR surface impoundments.* No later than October 17, 2017, the owner or operator of the CCR unit must be in compliance with the following groundwater monitoring requirements:

(i) Install the groundwater monitoring system as required by § 257.91;

(ii) Develop the groundwater sampling and analysis program to include selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by § 257.93;

(iii) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well as required by § 257.94(b); and

(iv) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of this part as required by § 257.94.

(2) *New CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units.* Prior to initial receipt of CCR by the CCR unit, the owner or operator must be in compliance with the groundwater monitoring requirements specified in paragraph (b)(1)(i) and (ii) of this section. In addition, the owner or operator of the CCR unit must initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background well as required by § 257.94(b).

(3) *CCR management units.* No later than Monday, May 8, 2028, the owner or operator of the CCR management unit must be in compliance with the following groundwater monitoring requirements:

(i) Install the groundwater monitoring system as required by § 257.91.

(ii) Develop the groundwater sampling and analysis program to include selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by § 257.93.

(iii) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b).

(iv) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of this part, as required by § 257.94.

(v) Begin evaluating the groundwater monitoring data for statistically significant levels over groundwater protection standards for the constituents listed in appendix IV of this part as required by § 257.95.

(c) *Requirement to conduct groundwater monitoring and corrective action.* Once a groundwater monitoring system and groundwater monitoring program has been established at the CCR unit as required by this subpart, the owner or operator must conduct groundwater monitoring and, if necessary, corrective action throughout the active life and post-closure care period of the CCR unit.

(d) *Responding to a release from a CCR unit.* In the event of a release from a CCR unit, the owner or operator must immediately take all necessary measures to control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of contaminants into the environment. The owner or operator of the CCR unit must comply with all applicable requirements in §§ 257.96, 257.97, and 257.98.

(e) *Annual groundwater monitoring and corrective action report.* For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For CCR management units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31, 2029, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

(1) A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

(2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

(3) In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

(4) A narrative discussion of any transition between monitoring programs (*e.g.,* the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

(6) A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:

(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

(iii) If it was determined that there was a statistically significant increase over background for one or more constituents listed in appendix III to this part pursuant to § 257.94(e):

(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and

(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.

(iv) If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in appendix IV to this part pursuant to § 257.95(g) include all of the following:

(A) Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;

(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;

(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and

(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.

(v) Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and

(vi) Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

(f) *Recordkeeping, notification, and internet requirements.* The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the internet requirements specified in § 257.107(h).

(g) *Suspension of groundwater monitoring requirements.*(1) The Participating State Director or EPA where EPA is the permitting authority may suspend the groundwater monitoring requirements under §§ 257.90 through 257.95 for a CCR unit for a period of up to ten years, if the owner or operator provides written documentation that, based on the characteristics of the site in which the CCR unit is located, there is no potential for migration of any of the constituents listed in appendices III and IV to this part from that CCR unit to the uppermost aquifer during the active life of the CCR unit and the post-closure care period. This demonstration must be certified by a qualified professional engineer and approved by the Participating State Director or EPA where EPA is the permitting authority, and must be based upon:

(i) Site-specific field collected measurements, sampling, and analysis of physical, chemical, and biological processes affecting contaminant fate and transport, including at a minimum, the information necessary to evaluate or interpret the effects of the following properties or processes on contaminant fate and transport:

(A) Aquifer Characteristics, including hydraulic conductivity, hydraulic gradient, effective porosity, aquifer thickness, degree of saturation, stratigraphy, degree of fracturing and secondary porosity of soils and bedrock, aquifer heterogeneity, groundwater discharge, and groundwater recharge areas;

(B) Waste Characteristics, including quantity, type, and origin;

(C) Climatic Conditions, including annual precipitation, leachate generation estimates, and effects on leachate quality;

(D) Leachate Characteristics, including leachate composition, solubility, density, the presence of immiscible constituents, Eh, and pH; and

(E) Engineered Controls, including liners, cover systems, and aquifer controls (*e.g.,* lowering the water table). These must be evaluated under design and failure conditions to estimate their long-term residual performance.

(ii) Contaminant fate and transport predictions that maximize contaminant migration and consider impacts on human health and the environment.

(2) The owner or operator of the CCR unit may renew this suspension for additional ten year periods by submitting written documentation that the site characteristics continue to ensure there will be no potential for migration of any of the constituents listed in Appendices III and IV of this part. The documentation must include, at a minimum, the information specified in paragraphs (g)(1)(i) and (ii) of this section and a certification by a qualified professional engineer and approved by the State Director or EPA where EPA is the permitting authority. The owner or operator must submit the documentation supporting their renewal request for the state's or EPA's review and approval of their extension one year before the groundwater monitoring suspension is due to expire. If the existing groundwater monitoring extension expires or is not approved, the owner or operator must begin groundwater monitoring according to paragraph (a) of this section within 90 days. The owner or operator may continue to renew the suspension for

ten-year periods, provided the owner or operator demonstrate that the standard in paragraph (g)(1) of this section continues to be met for the unit. The owner or operator must place each completed demonstration in the facility's operating record.

(3) The owner or operator of the CCR unit must include in the annual groundwater monitoring and corrective action report required by § 257.90(e) or § 257.100(e)(5)(ii) any approved no migration demonstration.

■ 17. Amend § 257.95 by revising paragraph (b) to read as follows:

§ 257.95 Assessment monitoring program.

* * * * *

(b) (1) Within 90 days of triggering an assessment monitoring program, and annually thereafter:

(i) Except as provided by paragraph (b)(1)(ii) of this section, the owner or operator of the CCR unit must sample and analyze the groundwater for all constituents listed in appendix IV to this part.

(ii) The owner or operator of a CCR management unit must sample and analyze the groundwater for all constituents listed in appendix IV to this part no later than Monday, May 8, 2028.

(2) The number of samples collected and analyzed for each well during each sampling event must be consistent with § 257.93(e), and must account for any unique characteristics of the site, but must be at least one sample from each well.

* * * * *

■ 18. Revise and republish § 257.100 to read as follows:

§ 257.100 Inactive CCR surface impoundments and Legacy CCR surface impoundments.

(a) *General.* (1) Inactive CCR surface impoundments are subject to all of the requirements of this subpart applicable to existing CCR surface impoundments, except that an active electric utility or independent power producer that generates electricity without the use of fuel is subject to the compliance deadlines applicable to legacy CCR surface impoundments, provided the facility has not generated electricity using fuels on or after October 19, 2015.

(2) Legacy CCR surface impoundments are subject to all of the requirements of this subpart applicable to existing CCR surface impoundments, except for the requirements in §§ 257.60 through 257.64 and 257.71.(b) through (d) [Reserved]

(e) *Timeframes for certain inactive CCR surface impoundments.* (1) An inactive CCR surface impoundment for which the owner or operator has completed the actions by the deadlines specified in paragraphs (e)(1)(i) through (iii) of this section is eligible for the alternative timeframes specified in paragraphs (e)(2) through (6) of this section. The owner or operator of the CCR unit must comply with the applicable recordkeeping, notification, and internet requirements associated with these provisions. For the inactive CCR surface impoundment:

(i) The owner or operator must have prepared and placed in the facility's operating record by December 17, 2015, a notification of intent to initiate closure of the inactive CCR surface impoundment pursuant to § 257.105(i)(1);

(ii) The owner or operator must have provided notification to the State Director and/or appropriate Tribal authority by January 19, 2016, of the intent to initiate closure of the inactive CCR surface impoundment pursuant to § 257.106(i)(1); and

(iii) The owner or operator must have placed on its CCR website by January 19, 2016, the notification of intent to initiate closure of the inactive CCR surface impoundment pursuant to § 257.107(i)(1).

(2) *Location restrictions.* (i) No later than April 16, 2020, the owner or operator of the inactive CCR surface impoundment must:

(A) Complete the demonstration for placement above the uppermost aquifer as set forth by § 257.60(a), (b), and (c)(3);

(B) Complete the demonstration for wetlands as set forth by § 257.61(a), (b), and (c)(3);

(C) Complete the demonstration for fault areas as set forth by § 257.62(a), (b), and (c)(3);

(D) Complete the demonstration for seismic impact zones as set forth by § 257.63(a), (b), and (c)(3); and

(E) Complete the demonstration for unstable areas as set forth by § 257.64(a), (b), (c), and (d)(3).

(ii) An owner or operator of an inactive CCR surface impoundment who fails to demonstrate compliance with the requirements of paragraph (e)(2)(i) of this section is subject to the closure requirements of § 257.101(b)(1).

(3) *Design criteria.* The owner or operator of the inactive CCR surface impoundment must:

(i) No later than April 17, 2018, complete the documentation of liner type as set forth by § 257.71(a) and (b).

(ii) No later than June 16, 2017, place on or immediately adjacent to the CCR unit the permanent identification marker as set forth by § 257.73(a)(1).

(iii) No later than October 16, 2018, prepare and maintain an Emergency Action Plan as set forth by § 257.73(a)(3).

(iv) No later than April 17, 2018, compile a history of construction as set forth by § 257.73(b) and (c).

(v) No later than April 17, 2018, complete the initial hazard potential classification, structural stability, and safety factor assessments as set forth by § 257.73(a)(2), (b), (d), (e), and (f).

(4) *Operating criteria.* The owner or operator of the inactive CCR surface impoundment must:

(i) No later than April 18, 2017, prepare the initial CCR fugitive dust control plan as set forth in § 257.80(b).

(ii) No later than April 17, 2018, prepare the initial inflow design flood control system plan as set forth in § 257.82(c).

(iii) No later than April 18, 2017, initiate the inspections by a qualified person as set forth by § 257.83(a).

(iv) No later than July 19, 2017, complete the initial annual inspection by a qualified professional engineer as set forth by § 257.83(b).

(5) *Groundwater monitoring and corrective action.* The owner or operator of the inactive CCR surface impoundment must:

(i) No later than April 17, 2019, comply with groundwater monitoring requirements set forth in §§ 257.90(b) and 257.94(b); and

(ii) No later than August 1, 2019, prepare the initial groundwater monitoring and corrective action report as set forth in § 257.90(e).

(6) *Closure and post-closure care.* The owner or operator of the inactive CCR surface impoundment must:

(i) No later than April 17, 2018, prepare an initial written closure plan as set forth in § 257.102(b); and

(ii) No later than April 17, 2018, prepare an initial written post-closure care plan as set forth in § 257.104(d).

(f) *Timeframes for legacy CCR surface impoundments.* Owners and operators of legacy CCR surface impoundments are subject to the requirements of paragraphs (f)(1) through (5) of this section, except as provided in paragraphs (g) through (i) of this section.

(1) *Legacy CCR surface impoundment applicability report.* (i) Except as provided in paragraph (f)(1)(iii) of this section, owners and operators of legacy CCR surface impoundments must prepare a report for each legacy CCR surface impoundment no later than Friday, November 8, 2024. The owner or operator has prepared the applicability report when the report has been placed in the facility's operating record as required by § 257.105(k)(1). At a minimum, the report for each legacy

CCR surface impoundment must contain:

(A) The name and address of the person(s) owning and operating the legacy CCR surface impoundment with their business phone number and email address.

(B) The name associated with the legacy CCR surface impoundment.

(C) Information to identify the legacy CCR surface impoundment, including a figure of the facility and where the unit is located at the facility, facility address, and the latitude and longitude of the facility.

(D) The identification number of the legacy CCR surface impoundment if one has been assigned by the state. (E) A description of the current site conditions, including the current use of the inactive facility.

(ii) (A) The owner or operator of any legacy CCR surface impoundment must certify the applicability report required by paragraph (f)(1)(i) of this section with the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(B) The owner or operator must notify the Agency of the establishment of the facility's CCR website and the applicability of the rule, using the procedures in § 257.107(a) via the ''contact us'' form on EPA's CCR website.

(iii) (A) Notwithstanding the deadline to complete the applicability report under paragraph (f)(1)(i) of this section, an owner or operator may secure additional time to complete the report for the sole reason of determining through a field investigation whether the unit contains both CCR and liquids. The amount of additional time that can be secured is limited as specified in paragraph (f)(1)(iii)(B) of this section. For owners and operators following the procedures of this paragraph (f)(1)(iii), the compliance timeframes for the requirements specified under paragraphs (f)(2) through (5) of this section are adjusted by the length of the extension(s) justified under this paragraph (f)(1)(iii). To qualify for additional time, the owner or operator must prepare an applicability extension report consisting of the following:

(*1*) The information specified in paragraph (f)(1)(i)(A) through (C) of this section;

(*2*) A statement by the owner or operator that to the best of their knowledge or belief, existing and available information does not provide a sufficient basis to determine that the unit contained free liquids on or after October 19, 2015; and

(*3*) The details of a written field investigation work plan, including of the following:

(*i*) A detailed description of the approach to characterize the physical, topographic, geologic, hydrogeologic, and hydraulic properties of the CCR in the unit and native geologic materials beneath and surrounding the unit, and how those properties will be used to investigate for the presence of free liquids in the CCR unit.

(*ii*) A detailed description of the methods and tools that will be employed to determine whether the unit contains free liquids, the rationale for choosing these methods and tools, how these methods and tools will be implemented, and at what level of spatial resolution at the CCR unit to identify and monitor for the presence of free liquids.

(*iii*) A detailed description of how groundwater elevations will be determined, and at what level of spatial resolution, in relation to the sides and bottom of the CCR unit and how any intersection of the groundwater table with the CCR unit will be evaluated, and at what level of spatial resolution.

(*iv*) A plan for evaluating stormwater flow over the surface of the unit, stormwater drainage from the unit, and stormwater infiltration into the unit and how those processes may result in the formation of free liquids in the CCR unit. This plan must include a current topographic map showing surface water flow and any pertinent natural or man-made features present relevant to stormwater drainage, infiltration and related processes.

(*v*) An estimated timeline to complete the workplan and make a determination if the CCR unit contains free liquids.

(*vi)* A narrative discussion of how the results from implementing the workplan will determine whether the unit contains free liquids specified.

(*vii*) A narrative discussion describing any anticipated problems that may be encountered during implementation of the workplan and what actions will be taken to resolve the problems, and anticipated timeframes necessary for such a contingency.

(*viii*) The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer stating that the field investigation work plan meets the requirements of paragraph (f)(1)(iii)(A)(*3*) of this section.

(B) The maximum amount of additional time that can be secured under paragraph (f)(1)(iii) of this section is 18 months, secured in 6-month increments, provided each 6-month increment is supported by an applicability extension report.

(C) Owners and operator must prepare the initial applicability extension report no later than Friday, November 8, 2024. Subsequent applicability extension reports must be prepared no later than 6 months after completing the preceding applicability extension report. The owner or operator has prepared the applicability extension report when the report is placed in the facility's operating record as required by § 257.105(k)(2).

(D) No later than Friday, November 8, 2024, the owner or operator must notify the Agency of the establishment of a CCR website using the procedures in § 257.107(a) via the ''contact us'' form on EPA's CCR website.

(E) If the owner or operator determines that the unit contains free liquids during implementation of the written field investigation workplan, the owner or operator must cease operating under these extension provisions and prepare the applicability report required by paragraph (f)(1) of this section within 14 days of determining that the unit contains free liquids. The owner or operator must comply with the requirements specified under paragraphs (f)(2) through (5) of this section under new timeframes. The new timeframes are determined by adding the total length of the extension(s) justified under paragraph (f)(1)(iii) of this section to each of the deadlines specified under paragraphs (f)(2) through (5) of this section.

(F) If the owner or operator determines that the unit does not contain both CCR and liquids during implementation of the written field investigation work plan, the owner or operator must prepare a notification stating that the field investigation has concluded and that the owner or operator has determined that the unit does not contain both CCR and liquids and does not meet the definition of a legacy CCR surface impoundment. The owner or operator has prepared the notification when the report is placed in the facility's operating record as required by § 257.105(k)(3).

(G) If the owner or operator does not complete the field investigation work within the timeframes specified in paragraph (f)(1)(iii)(B) of this section, the unit shall be considered a legacy CCR surface impoundment and must comply with the requirements under paragraphs (f)(2) through (5) of this section pursuant to the timeframes specified under paragraph (f)(1)(iii)(E) of this section.

(2) *Design criteria.* The owner or operator of a legacy CCR surface impoundment must:

(i) Except for legacy CCR surface impoundments that are incised, no later than Wednesday, January 8, 2025, place on or immediately adjacent to the CCR unit the permanent identification marker as set forth by § 257.73(a)(1).

(ii) Except for legacy CCR surface impoundments that do not exceed the height and/or storage volume thresholds under § 257.73(b), no later than Monday, February 9, 2026, compile a history of construction as set forth by § 257.73(c).

(iii) Except for legacy CCR surface impoundments that are incised, no later than Friday, May 8, 2026, complete the initial hazard potential classification assessment as set forth by § 257.73(a)(2) and (f).

(iv) Except for legacy CCR surface impoundments that do not exceed the height and/or storage volume thresholds under § 257.73(b), no later than Friday, May 8, 2026, complete the structural stability and safety factor assessments as set forth by § 257.73(d), (e), and (f).

(v) Except for legacy CCR surface impoundments that are incised, no later than Friday, May 8, 2026, prepare and maintain an Emergency Action Plan as set forth by § 257.73(a)(3).

(3) *Operating criteria.* The owner or operator of the legacy CCR surface impoundment must:

(i) No later than Friday, November 8, 2024, prepare the initial CCR fugitive dust control plan as set forth in § 257.80(b).

(ii) No later than Friday, November 8, 2024, prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the legacy CCR surface impoundment.

(iii) No later than Friday, November 8, 2024, initiate the inspections by a qualified person as set forth by § 257.83(a).

(iv) No later than Monday, February 10, 2025, complete the initial annual inspection by a qualified professional engineer as set forth by § 257.83(b).

(v) No later than Friday, May 8, 2026, prepare the initial inflow design flood control system plan as set forth in § 257.82(c).

(vi) No later than Thursday, January 8, 2026, prepare the initial annual fugitive dust control report as set forth in § 257.80(c).

(4) *Groundwater monitoring and corrective action.* No later than Monday, May 10, 2027, the owner or operator of the legacy CCR surface impoundment must:

(i) Install the groundwater monitoring system as required by § 257.91.

(ii) Develop the groundwater sampling and analysis program, including the selection of the statistical procedures, that will be used for evaluating groundwater monitoring data as required by § 257.93.

(iii) Be in compliance with the following groundwater monitoring requirements:

(A) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b).

(B) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of this part, as required by § 257.94.

(C) Begin evaluating the groundwater monitoring data for statistically significant levels over groundwater protection standards for the constituents listed in appendix IV of this part as required by § 257.95.

(iv) No later than January 31, 2027, prepare the initial groundwater monitoring and corrective action report as set forth in § 257.90(e).

(5) *Closure and post-closure care.* Except as provided in § 257.102(g), the owner or operator of the legacy CCR surface impoundment must:

(i) No later than Monday, November 8, 2027, prepare an initial written closure plan as set forth in § 257.102(b); and

(ii) No later than Monday, November 8, 2027, prepare an initial written post-closure care plan as set forth in § 257.104(d).

(g) For owners and operators of legacy CCR surface impoundments that completed closure of the CCR unit by removal of waste prior to Friday, November 8, 2024, no later than Friday, November 8, 2024, complete a closure certification that includes the following supporting information:

(1) The type and volume of CCR and all other materials in the unit prior to closure;

(2) The methods used to verify complete removal of all CCR and other contaminated materials from the unit, including any post-removal sampling and analysis;

(3) Documentation that all CCR and other contaminated materials were removed from the unit, including, the results of any post-removal sampling and analysis that was conducted;

(4) The methods used to verify complete decontamination of all areas affected by releases from the unit, including but not limited to post-decontamination sampling and analysis;

(5) Documentation that all areas affected by releases from the unit were decontaminated and that all groundwater affected by releases has achieved groundwater protection standards; and

(6) Document that groundwater monitoring concentrations do not exceed the groundwater protection standards established pursuant to § 257.95(h) for constituents listed in appendix IV to this part. The documentation must also include a demonstration that the groundwater monitoring system has met all of the following:

(i) Was capable of accurately representing background water quality unaffected by a CCR unit;

(ii) Was capable of accurately representing the quality of water passing the waste boundary of the unit;

(iii) Was capable of detecting contamination in the uppermost aquifer;

(iv) Monitored all potential contaminant pathways;

(v) Established groundwater background concentrations for appendix IV constituents and compared samples to those background concentrations;

(vi) Monitoring wells must have been cased in a manner that maintains the integrity of the monitoring well borehole. This casing must have been screened or perforated and packed with gravel or sand, where necessary, to enable collection of groundwater samples. The annular space (*i.e.,* the space between the borehole and well casing) above the sampling depth must have been sealed to prevent contamination of samples and the groundwater; and

(vii) The last groundwater monitoring sample used to document that the standard in paragraph (g)(3) of this section has been met must have been collected no earlier than one year prior to the initiation of closure.

(h) If the owner or operator of a legacy CCR surface impoundment is unable to complete the closure by removal certification by the date listed in paragraph (f)(1)(i) of this section, they may elect to conduct groundwater monitoring in accordance with §§ 257.90 through 257.95 to demonstrate there are no exceedances of the groundwater protection standards. If the owner or operator meets all the requirements of paragraph (h)(1) of this section, no further requirements under this subpart apply. If the owner or operator does not meet the requirements of paragraph (h)(1) of this section by Monday, May 8, 2028 or if one or more constituents in appendix IV to this part are detected at statistically significant levels above the groundwater protection standard established under § 257.95(h), they must proceed in accordance with paragraph (h)(2) of this section.

(1) In order to comply with this paragraph (h)(1), the owner or operator must complete all of the following:

(i) Prepare a notification of intent to certify closure no later than Friday, November 8, 2024. The owner or operator has prepared the notification when the report is placed in the facility's operating record as required by § 257.105(k)(4).

(ii) Conduct groundwater monitoring in accordance with §§ 257.90–257.95 for at least two consecutive sampling events to demonstrate that all constituents in appendix IV of this part have concentrations that do not exceed the groundwater protection standards listed in § 257.95(h).

(iii) Complete a closure by removal certification documenting compliance with paragraphs (g)(1) through (5) and (h)(1)(ii) of this section no later than Monday, May 8, 2028.

(2) If the owner or operator does not meet the requirements of paragraph (h)(1) of this section (*e.g.,* by the date or they detect an SSL of an appendix IV constituent), they must comply with all of the following:

(i) If a statistically significant level is detected, the corrective action provisions and proceed in accordance with § 257.102(c)(2).

(ii) The permanent marker requirements in § 257.73(a)(1) no later than 8 months from the date they became subject to this requirement.

(iii) The applicability report requirements of paragraph (f)(1)(i) of this section no later than 6 months from the date they became subject to this requirement.

(iv) The facility evaluation provisions for CCR management units under § 257.75 no later than 33 months from the date they became subject to this requirement.

(v) If any CCR management unit is discovered after completing the facility evaluation report, the fugitive dust requirements of § 257.80(b) no later than 6 months from the date of the facility evaluation report.

(vi) The groundwater monitoring requirements for CCR management units under § 257.90(b)(3)(i) through (iv) no later than 48 months from the date they became subject to this requirement.

(vii) The requirement to prepare an initial written closure plan for CCR management units consistent with the requirements specified in § 257.102(b)(1) no later than 54 months from the date they became subject to this requirement.

(viii) The requirement to prepare an initial post-closure plan for CCR management units consistent with the requirements specified in § 257.104(d)(2)(iii) no later than 54 months from the date they became subject to this requirement.

(ix) The requirement to initiate the closure of CCR management units in accordance with the requirements of § 257.102 no later than 60 months from the date they became subject to this requirement.

(i) Owners and operators of legacy CCR surface impoundments that completed closure of the unit in accordance with § 257.102(d) or that meet the requirements in § 257.101(g) prior to Friday, November 8, 2024 must only:

(1) Prepare the applicability report as set forth by § 257.100(f)(1);

(2) Prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the legacy CCR surface impoundment as set forth in § 257.100(f)(3)(ii);

(3) Place on or immediately adjacent to the unit the permanent identification marker as set forth by § 257.73(a)(1);

(4) Compile a history of construction as set forth by § 257.73(c);

(5) Prepare the initial CCR fugitive dust control plan as set forth in § 257.80(b);

(6) Prepare the initial annual fugitive dust control report as set forth in § 257.80(c);

(7) (i) Install the groundwater monitoring system as required by § 257.91;

(ii) Develop the groundwater sampling and analysis program, including the selection of the statistical procedures, that will be used for evaluating groundwater monitoring data as required by § 257.93;

(iii) Be in compliance with the following groundwater monitoring requirements:

(A) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b);

(B) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of this part, as required by § 257.94;

(C) Begin evaluating the groundwater monitoring data for statistically significant levels over groundwater protection standards for the constituents listed in appendix IV of this part as required by § 257.95;

(8) Include in the applicability report specified in § 257.100(f)(1) information on the completed closure, along with supporting documentation to demonstrate that the closure meets the performance standards in § 257.102(d) or the standards specified in § 257.101(g);

(9) Prepare an initial written post-closure care plan as set forth in § 257.104(d);

(10) Conduct post-closure care as set forth in § 257.104(b); and

(11) Comply with applicable recordkeeping, notification, and website posting requirements as set forth by §§ 257.105 through 257.107.

(j) The owner or operator of the legacy CCR surface impoundment must comply with the recordkeeping requirements specified in § 257.105(k), the notification requirements specified in § 257.106(k), and the internet requirements specified in § 257.107(k).

■ 19. Amend § 257.101 by adding paragraphs (e), (f), (g) and (h) to read as follows:

§ 257.101 Closure or retrofit of CCR units.

* * * * *

(e) Except as provided in paragraph (g) of this section, the owner or operator of a legacy CCR surface impoundment is subject to the requirements of paragraphs (e)(1) and (2) of this section.

(1) No later than Monday, May 8, 2028, an owner or operator of a legacy CCR surface impoundment must initiate the closure of the legacy CCR surface impoundment in accordance with the requirements of § 257.102.

(2) An owner or operator of a legacy CCR surface impoundment that closes in accordance with paragraph (e)(1) of this section must include a statement in the notification required under § 257.102(g) that the legacy CCR surface impoundment is closing under the requirement of paragraph (e)(1) of this section.

(f) Except as provided in paragraphs (g) and (h) of this section, the owner or operator of a CCR management unit must comply with the requirements of paragraphs (f)(1) and (2) of this section.

(1) No later than Tuesday, May 8, 2029, an owner or operator of a CCR management unit must initiate the closure of the CCR management unit in accordance with the requirements of § 257.102.

(2) An owner or operator of a CCR management unit that closes in

accordance with paragraph (f)(1) of this section must include a statement in the notification required under § 257.102(g) that the CCR management unit is closing under the requirements of paragraph (f)(1) of this section.

(g) Deferral to permitting for closures conducted under substantially equivalent regulatory authority. Notwithstanding the provisions of paragraphs (e) and (f) of this section, the owner or operator of a CCR management unit or a legacy CCR surface impoundment need not demonstrate compliance with the performance standards in § 257.102(c) or (d) provided they demonstrate that the closure of the CCR unit met the standards specified in paragraphs (g)(1) through (g)(6) of this section.

(1) The owner or operator of the CCR unit must document that a regulatory authority played an active role in overseeing and approving the closure and any necessary corrective action, pursuant to an enforceable requirement. This includes a State or Federal permit, an administrative order, or consent order issued after 2015 under CERCLA or by an EPA-approved RCRA State program.

(2) The owner or operator of the CCR unit must document that the regulatory authority required or conducted a site-specific risk assessment prior to (or as part of) approving the closure and any necessary corrective action.

(3) The owner or operator of the CCR unit must document that it installed a groundwater monitoring system and performed groundwater monitoring that meets all of the following:

(i) Was capable of accurately representing background water quality;

(ii) Was capable of accurately representing the quality of water passing the waste boundary;

(iii) Was capable of detecting contamination in the uppermost aquifer; and

(iv) Monitored all potential contaminant pathways.

(4) Must document that the closed unit meets either:

(i) The performance standard in § 257.60; or

(ii) The performance standard in § 257.102(d)(2)(i).

(5) The owner or operator must include the following statement, signed by the owner or operator or an authorized representative, in the facility evaluation report for CCR management units specified in § 257.75 or applicability report for legacy CCR surface impoundments specified in § 257.100(f)(1) along with all information required by paragraphs (g)(1) through (4) of the section:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(6) Closure equivalency determination at permitting. The owner or operator must submit the following documentation to the permit authority.

(i) A permit application that contains sufficient information, including data on contaminant levels in groundwater, to demonstrate that the applicable § 257.102 standards have been met.

(ii) EPA will review the information to determine whether the ''equivalency'' of the closure has been successfully demonstrated. If EPA or a Participating State Director determines that the closure has met the appropriate part 257 closure standard, EPA or a Participating State Director will issue a permit to require compliance with applicable post-closure requirements. If EPA or a Participating State Director determines that the closure does not meet the part 257 standards, the owner or operator will be required to submit a complete permit application and obtain a permit that contains the specific requirements necessary for the closed unit to achieve compliance with § 257.102.

(h) Deferral for CCR management units under critical infrastructure. Notwithstanding the provisions of paragraph (f)(1) of this section, the owner or operator of a CCR management unit located beneath critical infrastructure need not initiate closure until the infrastructure is no longer needed, EPA or a Participating State Director determines closure is necessary to ensure that there is no reasonable probability of adverse effects on human health or the environment, or the closure or decommissioning of the facility, whichever occurs first. Owners and operators of CCR management units under active disposal units must meet either:

(1) Demonstrate that the CCR management unit complies with the performance standard in § 257.60; or

(2) Demonstrate that the CCR management unit complies with the performance standard in § 257.102(d)(2)(i).

■ 20. Revise and republish§ 257.102 to read as follows:

§ 257.102 Criteria for conducting the closure or retrofit of CCR units and closure of CCR management units.

(a) *General.* Closure of a CCR unit must be completed either by leaving the CCR in place and installing a final cover system or through removal of the CCR and decontamination of the CCR unit, as described in paragraphs (b) through (j) of this section. Retrofit of a CCR surface impoundment must be completed in accordance with the requirements in paragraph (k) of this section.

(b) *Written closure plan*—(1) *Content of the plan.* The owner or operator of a CCR unit must prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The written closure plan must include, at a minimum, the information specified in paragraphs (b)(1)(i) through (vi) of this section.

(i) A narrative description of how the CCR unit will be closed in accordance with this section.

(ii) If closure of the CCR unit will be accomplished through removal of CCR from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section.

(iii) If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with paragraph (d) of this section, and the methods and procedures to be used to install the final cover. The closure plan must also discuss how the final cover system will achieve the performance standards specified in paragraph (d) of this section.

(iv) An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit.

(v) An estimate of the largest area of the CCR unit ever requiring a final cover as required by paragraph (d) of this section at any time during the CCR unit's active life.

(vi) A schedule for completing all activities necessary to satisfy the closure criteria in this section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including identification of major milestones such as coordinating with and obtaining necessary approvals and permits from other agencies, the dewatering and stabilization phases of CCR surface impoundment closure, or installation of the final cover system, and the estimated timeframes to complete each step or phase of CCR unit closure. When preparing the written closure plan, if the owner or operator of a CCR unit estimates that the time required to complete closure will exceed the timeframes specified in paragraph (f)(1) of this section, the written closure plan must include the site-specific information, factors and considerations that would support any time extension sought under paragraph (f)(2) of this section.

(2) *Timeframes for preparing the initial written closure plan*—(i) *Existing CCR landfills and existing CCR surface impoundments.* No later than October 17, 2016, the owner or operator of the CCR unit must prepare an initial written closure plan consistent with the requirements specified in paragraph (b)(1) of this section.

(ii) *New CCR landfills and new CCR surface impoundments, and any lateral expansion of a CCR unit.* No later than the date of the initial receipt of CCR in the CCR unit, the owner or operator must prepare an initial written closure plan consistent with the requirements specified in paragraph (b)(1) of this section.

(iii) *CCR management units.* Except as provided for in paragraph (b)(2)(v) of this section, no later than November 8, 2028, the owner or operator of the CCR management unit must prepare an initial written closure plan consistent with the requirements specified in paragraph (b)(1) of this section.

(iv) *Recordkeeping.* The owner or operator has completed the written closure plan when the plan, including the certification required by paragraph (b)(4) of this section, has been placed in the facility's operating record as required by § 257.105(i)(4).

(v) *Closure documentation for certain CCR management units.* Owners and operators of a CCR management unit that completed closure of the unit in accordance with § 257.102(d) prior to Friday, November 8, 2024 or that meet the requirements in § 257.101(g) must include in the facility evaluation report specified in § 257.75 information on the completed closure, along with supporting documentation to demonstrate that the closure meets the performance standards in § 257.102(d) or the standards specified in § 257.101(g).

(3) *Amendment of a written closure plan.* (i) The owner or operator may amend the initial or any subsequent written closure plan developed pursuant to paragraph (b)(1) of this section at any time.

(ii) The owner or operator must amend the written closure plan whenever:

(A) There is a change in the operation of the CCR unit that would substantially affect the written closure plan in effect; or

(B) Before or after closure activities have commenced, unanticipated events necessitate a revision of the written closure plan.

(iii) The owner or operator must amend the closure plan at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise an existing written closure plan. If a written closure plan is revised after closure activities have commenced for a CCR unit, the owner or operator must amend the current closure plan no later than 30 days following the triggering event.

(4) *Certification or approval.* The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority that the initial and any amendment of the written closure plan meets the requirements of this section.

(c) *Closure by removal of CCR.* An owner or operator that elects to close a CCR unit by-removal of CCR must follow the procedures specified in either paragraph (c)(1) or (2) of this section. Closure by removal is complete when CCR has been removed; any areas affected by releases from the CCR unit have been removed or decontaminated; and groundwater monitoring concentrations of the constituents listed in appendix IV to this part do not exceed groundwater protection standards established pursuant to § 257.95(h). Removal and decontamination activities include removing all CCR from the unit, CCR mixed with soils, and CCR included in berms, liners or other unit structures, and removing or decontaminating all areas affected by releases from the CCR unit.

(1) *Complete all removal and decontamination activities during the active life of the CCR unit.* Within the timeframes specified in paragraph (f) of this section the owner or operator must do all of the following:

(i) Complete removal of CCR and decontamination of all areas affected by releases from the CCR unit;

(ii) Document that the standards in paragraph (c) of this section have been met. Documentation that groundwater protection standards have been met for the constituents listed in appendix IV to this part must consist of groundwater monitoring results that show no constituents were detected at statistically significant levels above the groundwater protection standards for either:

(A) Two consecutive monitoring events; or

(B) Three years, in accordance with § 257.98(c); and

(iii) Obtain the completion of closure certification or approval required by paragraph (f)(3) of this section.

(2) *Complete removal and decontamination activities during the active life and post-closure care period of the CCR unit.* The owner or operator may close a CCR unit by completing all removal and decontamination activities, except for groundwater corrective action, during the active life of the CCR unit and by completing groundwater corrective action during the post-closure care period pursuant to the following procedures:

(i) Within the timeframes specified in paragraph (f) of this section, document that CCR has been removed from the unit and any areas affected by releases from the CCR unit have been removed or decontaminated;

(ii) Within the timeframes specified in paragraph (f) of this section, begin implementation of the remedy selected in accordance with § 257.97 such that all components of the remedy are constructed, or otherwise in place, and operating as intended unless the owner or operator documents both that:

(A) All applicable requirements in §§ 257.96 through 257.98 have been met; and

(B) The active life of the unit could not be extended until implementation of the remedy consistent with § 257.102(f);

(iii) Complete groundwater corrective action as a post-closure care requirement as specified in § 257.104(g);

(iv) Amend the written closure plan required by paragraph (b) of this section and the written post-closure care plan required by § 257.104(d);

(v) Within the timeframes specified in paragraph (f) of this section, obtain the completion of closure certification or approval required by paragraph (f)(3) of this section; and

(vi) Within the timeframes specified in paragraph (f) of this section, record the notation on the deed to the property required by paragraph (i) of this section.

(d) *Closure performance standard when leaving CCR in place*—

(1) *General performance standard.* The owner or operator of a CCR unit must ensure that, at a minimum, the CCR unit is closed in a manner that will:

(i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;

(ii) Preclude the probability of future impoundment of water, sediment, or slurry;

(iii) Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period;

(iv) Minimize the need for further maintenance of the CCR unit; and

(v) Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.

(2) *Drainage and stabilization of CCR units.* The owner or operator of any CCR unit must meet the requirements of paragraphs (d)(2)(i) and (ii) of this section prior to installing the final cover system required under paragraph (d)(3) of this section.

(i) Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.

(ii) Remaining wastes must be stabilized sufficient to support the final cover system.

(3) *Final cover system.* If 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, and at a minimum, meets the requirements of paragraph (d)(3)(i) of this section, or the requirements of the alternative final cover system specified in paragraph (d)(3)(ii) of this section.

(i) The final cover system must be designed and constructed to meet the criteria in paragraphs (d)(3)(i)(A) through (D) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.

(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.

(ii) The owner or operator may select an alternative final cover system design, provided the alternative final cover system is designed and constructed to meet the criteria in paragraphs (d)(3)(ii)(A) through (C) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.

(A) The design of the final cover system must include an infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (d)(3)(i)(A) and (B) of this section.

(B) The design of the final cover system must include an erosion layer that provides equivalent protection from wind or water erosion as the erosion layer specified in paragraph (d)(3)(i)(C) of this section.

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

(iii) The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority that the design of the final cover system meets the requirements of this section.

(e) *Initiation of closure activities.* Except as provided for in paragraph (e)(4) of this section and § 257.103, the owner or operator of a CCR unit must commence closure of the CCR unit no later than the applicable timeframes specified in either paragraph (e)(1) or (2) of this section.

(1) The owner or operator must commence closure of the CCR unit no later than 30 days after the date on which the CCR unit either:

(i) Receives the known final receipt of waste, either CCR or any non-CCR waste stream; or

(ii) Removes the known final volume of CCR from the CCR unit for the purpose of beneficial use of CCR.

(2)(i) Except as provided by paragraph (e)(2)(ii) of this section, the owner or operator must commence closure of a CCR unit that has not received CCR or any non-CCR waste stream or is no longer removing CCR for the purpose of beneficial use within two years of the last receipt of waste or within two years of the last removal of CCR material for the purpose of beneficial use.

(ii) Notwithstanding paragraph (e)(2)(i) of this section, the owner or operator of the CCR unit may secure an additional two years to initiate closure of the idle unit provided the owner or operator provides written documentation that the CCR unit will continue to accept wastes or will start removing CCR for the purpose of beneficial use. The documentation must be supported by, at a minimum, the information specified in paragraphs (e)(2)(ii)(A) and (B) of this section. The owner or operator may obtain two-year extensions provided the owner or operator continues to be able to demonstrate that there is reasonable likelihood that the CCR unit will accept wastes in the foreseeable future or will remove CCR from the unit for the purpose of beneficial use. The owner or operator must place each completed demonstration, if more than one time extension is sought, in the facility's operating record as required by § 257.105(i)(5) prior to the end of any two-year period.

(A) Information documenting that the CCR unit has remaining storage or disposal capacity or that the CCR unit can have CCR removed for the purpose of beneficial use; and

(B) Information demonstrating that that there is a reasonable likelihood that the CCR unit will resume receiving CCR or non-CCR waste streams in the foreseeable future or that CCR can be removed for the purpose of beneficial use. The narrative must include a best estimate as to when the CCR unit will resume receiving CCR or non-CCR waste streams. The situations listed in paragraphs (e)(2)(ii)(B)(*1*) through (*4*) of this section are examples of situations that would support a determination that the CCR unit will resume receiving CCR or non-CCR waste streams in the foreseeable future.

(*1*) Normal plant operations include periods during which the CCR unit does not receive CCR or non-CCR waste streams, such as the alternating use of two or more CCR units whereby at any point in time one CCR unit is receiving CCR while CCR is being removed from a second CCR unit after its dewatering.

(*2*) The CCR unit is dedicated to a coal-fired boiler unit that is temporarily idled (*e.g.,* CCR is not being generated) and there is a reasonable likelihood that the coal-fired boiler will resume operations in the future.

(*3*) The CCR unit is dedicated to an operating coal-fired boiler (*i.e.,* CCR is being generated); however, no CCR are being placed in the CCR unit because the CCR are being entirely diverted to beneficial uses, but there is a reasonable likelihood that the CCR unit will again be used in the foreseeable future.

(*4*) The CCR unit currently receives only non-CCR waste streams and those non-CCR waste streams are not generated for an extended period of time, but there is a reasonable likelihood that the CCR unit will again receive non-CCR waste streams in the future.

(iii) In order to obtain additional time extension(s) to initiate closure of a CCR unit beyond the two years provided by paragraph (e)(2)(i) of this section, the owner or operator of the CCR unit must include with the demonstration required by paragraph (e)(2)(ii) of this section the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(3) For purposes of this subpart, closure of the CCR unit has commenced if the owner or operator has ceased placing waste and completes any of the following actions or activities:

(i) Taken any steps necessary to implement the written closure plan required by paragraph (b) of this section;

(ii) Submitted a completed application for any required state or agency permit or permit modification; or

(iii) Taken any steps necessary to comply with any state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the closure of a CCR unit.

(4) The timeframes specified in paragraphs (e)(1) and (2) of this section do not apply to any of the following owners or operators:

(i) [Reserved]

(ii) An owner or operator of an existing unlined CCR surface impoundment closing the CCR unit as required by § 257.101(a);

(iii) An owner or operator of an existing CCR surface impoundment closing the CCR unit as required by § 257.101(b);

(iv) An owner or operator of a new CCR surface impoundment closing the CCR unit as required by § 257.101(c); or

(v) An owner or operator of an existing CCR landfill closing the CCR unit as required by § 257.101(d).

(f) *Completion of closure activities.*

(1) Except as provided for in paragraph (f)(2) of this section, the owner or operator must complete closure of the CCR unit:

(i) For existing and new CCR landfills and any lateral expansion of a CCR landfill, within six months of commencing closure activities.

(ii) For existing and new CCR surface impoundments and any lateral expansion of a CCR surface impoundment, within five years of commencing closure activities.

(iii) For CCR management units, within five years of commencing closure activities.

(2)(i) *Extensions of closure timeframes.* The timeframes for completing closure of a CCR unit specified under paragraphs (f)(1) of this section may be extended if the owner or operator can demonstrate that it was not feasible to complete closure of the CCR unit within the required timeframes due to factors beyond the facility's control. If the owner or operator is seeking a time extension beyond the time specified in the written closure plan as required by paragraph (b)(1) of this section, the demonstration must include a narrative discussion providing the basis for additional time beyond that specified in the closure plan. The owner or operator must place each completed demonstration, if more than one time extension is sought, in the facility's operating record as required by § 257.105(i)(6) prior to the end of any two-year period. Factors that may support such a demonstration include:

(A) Complications stemming from the climate and weather, such as unusual amounts of precipitation or a significantly shortened construction season;

(B) Time required to dewater a CCR unit due to the volume of CCR contained in the CCR unit or the characteristics of the CCR in the unit;

(C) The geology and terrain surrounding the CCR unit will affect the amount of material needed to close the CCR unit; or

(D) Time required or delays caused by the need to coordinate with and obtain necessary approvals and permits from a state or other agency.

(ii) *Maximum time extensions.* (A) CCR surface impoundments of 40 acres or smaller may extend the time to complete closure by no longer than two years.

(B) CCR surface impoundments larger than 40 acres may extend the timeframe to complete closure of the CCR unit multiple times, in two-year increments. For each two-year extension sought, the owner or operator must substantiate the factual circumstances demonstrating the need for the extension. No more than a total of five two-year extensions may be obtained for any CCR surface impoundment.

(C) Except as provided in paragraph (f)(2)(ii)(D) of this section, CCR landfills may extend the timeframe to complete closure of the CCR unit multiple times, in one-year increments. For each one-year extension sought, the owner or operator must substantiate the factual circumstances demonstrating the need for the extension. No more than a total of two one-year extensions may be obtained for any CCR landfill.

(D) CCR landfills that intersect with groundwater are eligible for the time extensions available to CCR units in paragraph (f)(2)(ii)(B) of this section, provided the owner or operator documents that groundwater intersects the CCR unit in the closure plan.

(E) CCR management units of 40 acres or smaller may extend the time to complete closure by no longer than two years.

(F) CCR management units larger than 40 acres may extend the timeframe to complete closure of the CCR management unit multiple times, in two-year increments. For each two-year extension sought, the owner or operator must substantiate the factual circumstances demonstrating the need for the extension. No more than a total of five two-year extensions may be obtained for any CCR management unit.

(iii) In order to obtain additional time extension(s) to complete closure of a CCR unit beyond the times provided by paragraph (f)(1) of this section, the owner or operator of the CCR unit must include with the demonstration required by paragraph (f)(2)(i) of this section the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(3) Upon completion, the owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority verifying that closure has been completed in accordance with the closure plan specified in paragraph (b) of this section and the requirements of this section.

(g) *Notification of intent to close.* No later than the date the owner or operator initiates closure of a CCR unit, the owner or operator must prepare a notification of intent to close a CCR unit. The notification must include the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority for the design of the final cover system as required by § 257.102(d)(3)(iii), if applicable. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(i)(7).

(h) *Notification of completion of closure.* Within 30 days of completion of closure of the CCR unit, the owner or operator must prepare a notification of closure of a CCR unit. The notification must include the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority as required by § 257.102(f)(3). The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(i)(8).

(i) *Deed notations.* (1) Except as provided by paragraph (i)(4) of this section, following closure of a CCR unit, the owner or operator must record a notation on the deed to the property, or some other instrument that is normally examined during title search.

(2) The notation on the deed must in perpetuity notify any potential purchaser of the property that:

(i) The land has been used as a CCR unit; and

(ii) Its use is restricted under the post-closure care requirements as provided by § 257.104(d)(1)(iii).

(3) Within 30 days of recording a notation on the deed to the property, the owner or operator must prepare a notification stating that the notation has been recorded. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(i)(9).

(4) An owner or operator that closes a CCR unit in accordance with paragraph (c)(1) of this section is not subject to the requirements of paragraphs (i)(1) through (3) of this section.

(j) *Recordkeeping, notification, and internet requirements.* The owner or operator of the CCR unit must comply with the closure recordkeeping requirements specified in § 257.105(i), the closure notification requirements specified in § 257.106(i), and the closure internet requirements specified in § 257.107(i).

(k) *Criteria to retrofit an existing CCR surface impoundment.* (1) To retrofit an existing CCR surface impoundment, the owner or operator must:

(i) First remove all CCR, including any contaminated soils and sediments from the CCR unit; and

(ii) Comply with the requirements in § 257.72.

(iii) A CCR surface impoundment undergoing a retrofit remains subject to all other requirements of this subpart, including the requirement to conduct any necessary corrective action.

(2) *Written retrofit plan*—(i) *Content of the plan.* The owner or operator must prepare a written retrofit plan that describes the steps necessary to retrofit the CCR unit consistent with recognized and generally accepted good engineering practices. The written retrofit plan must include, at a minimum, all of the following information:

(A) A narrative description of the specific measures that will be taken to retrofit the CCR unit in accordance with this section.

(B) A description of the procedures to remove all CCR and contaminated soils and sediments from the CCR unit.

(C) An estimate of the maximum amount of CCR that will be removed as part of the retrofit operation.

(D) An estimate of the largest area of the CCR unit that will be affected by the retrofit operation.

(E) A schedule for completing all activities necessary to satisfy the retrofit criteria in this section, including an estimate of the year in which retrofit activities of the CCR unit will be completed.

(ii) *Timeframes for preparing the initial written retrofit plan.* (A) No later than 60 days prior to date of initiating retrofit activities, the owner or operator must prepare an initial written retrofit plan consistent with the requirements specified in paragraph (k)(2) of this section. For purposes of this subpart, initiation of retrofit activities has commenced if the owner or operator has ceased placing waste in the unit and completes any of the following actions or activities:

(*1*) Taken any steps necessary to implement the written retrofit plan;

(*2*) Submitted a completed application for any required state or agency permit or permit modification; or

(*3*) Taken any steps necessary to comply with any state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the retrofit of a CCR unit.

(B) The owner or operator has completed the written retrofit plan when the plan, including the certification required by paragraph (k)(2)(iv) of this section, has been placed in the facility's operating record as required by § 257.105(j)(1).

(iii) *Amendment of a written retrofit plan.* (A) The owner or operator may amend the initial or any subsequent written retrofit plan at any time.

(B) The owner or operator must amend the written retrofit plan whenever:

(*1*) There is a change in the operation of the CCR unit that would substantially affect the written retrofit plan in effect; or

(*2*) Before or after retrofit activities have commenced, unanticipated events necessitate a revision of the written retrofit plan.

(C) The owner or operator must amend the retrofit plan at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the revision of an existing written retrofit plan. If a written retrofit plan is revised after retrofit activities have commenced for a CCR unit, the owner or operator must amend the current retrofit plan no later than 30 days following the triggering event.

(iv) *Certification or approval.* The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer or an approval from the Participating State Director or an approval from EPA where EPA is the permitting authority that the activities outlined in the written retrofit plan, including any amendment of the plan, meet the requirements of this section.

(3) *Deadline for completion of activities related to the retrofit of a CCR unit.* Any CCR surface impoundment that is being retrofitted must complete all retrofit activities within the same time frames and procedures specified for the closure of a CCR surface impoundment in § 257.102(f) or, where applicable, § 257.103.

(4) *Certification or approval.* Upon completion, the owner or operator must obtain a written certification from a qualified professional engineer or an approval from the Participating State Director or an approval from EPA where EPA is the permitting authority verifying that the retrofit activities have been completed in accordance with the retrofit plan specified in paragraph (k)(2) of this section and the requirements of this section.

(5) *Notification of intent to retrofit.* No later than the date the owner or operator initiates the retrofit of a CCR unit, the owner or operator must prepare a notification of intent to retrofit a CCR

unit. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(j)(5).

(6) *Notification of completion of retrofit activities.* Within 30 days of completing the retrofit activities specified in paragraph (k)(1) of this section, the owner or operator must prepare a notification of completion of retrofit activities. The notification must include the certification from a qualified professional engineer or an approval from the Participating State Director or an approval from EPA where EPA is the permitting authority has is required by paragraph (k)(4) of this section. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(j)(6).

(7) *Cease retrofit and initiation of closure.* At any time after the initiation of a CCR unit retrofit, the owner or operator may cease the retrofit and initiate closure of the CCR unit in accordance with the requirements of § 257.102.

(8) *Recordkeeping, notification, and internet requirements.* The owner or operator of the CCR unit must comply with the retrofit recordkeeping requirements specified in § 257.105(j), the retrofit notification requirements specified in § 257.106(j), and the retrofit internet requirements specified in § 257.107(j).

■ 21. Amend § 257.104 by:
■ a. Revising paragraphs (a) and (c)(1);
■ b. Adding paragraph (c)(3);
■ c. Revising paragraph (d)(2); and
■ d. Adding paragraph (g).

The additions and revisions read as follows:

§ 257.104 Post-closure care requirements.

(a) *Applicability.* (1) Except as provided by paragraph (a)(2) of this section, § 257.104 applies to the owners or operators of CCR units that are subject to the closure criteria under § 257.102.

(2) An owner or operator of a CCR unit that elects to close a CCR unit by removing CCR as provided by § 257.102(c)(1) is not subject to the post-closure care criteria under this section.

* * * * *

(c) * * *

(1) Except as provided by paragraph (c)(2) and (3) of this section, the owner or operator of the CCR unit must conduct post-closure care for 30 years.

* * * * *

(3) An owner or operator closing a unit pursuant to § 257.102(c)(2) must complete groundwater corrective action in accordance with § 257.98(c).

(d) * * *

(2) *Deadline to prepare the initial written post-closure plan*—(i) *Existing CCR landfills and existing CCR surface impoundments.* No later than October 17, 2016, the owner or operator of the CCR unit must prepare an initial written post-closure plan consistent with the requirements specified in paragraph (d)(1) of this section.

(ii) *New CCR landfills, new CCR surface impoundments, and any lateral expansion of a CCR unit.* No later than the date of the initial receipt of CCR in the CCR unit, the owner or operator must prepare an initial written post-closure plan consistent with the requirements specified in paragraph (d)(1) of this section.

(iii) *CCR management units.* No later than Wednesday, November 8, 2028, the owner or operator of a CCR management unit must prepare an initial written post-closure care plan as set forth in paragraph (d)(1) of this section.

(iv) *Recordkeeping.* The owner or operator has completed the written post-closure plan when the plan, including the certification required by paragraph (d)(4) of this section, has been placed in the facility's operating record as required by § 257.105(i)(4).

* * * * *

(g) *Removal of a deed notation.* The owner or operator of a CCR unit closed pursuant to §§ 257.102(c)(2) and 257.104 may remove the notation from the deed specified in § 257.102(i) upon:

(1) Completion of groundwater corrective action demonstrating that any areas affected by releases from the CCR unit do not exceed the groundwater protection standards established pursuant to § 257.95(h) for constituents listed in appendix IV to this part; and

(2) Completion of the notification of completion of post-closure care period required by paragraph (e) of this section.

* * * * *

■ 22. Revise § 257.105 to read as follows:

§ 257.105 Recordkeeping requirements.

(a) *Operating Record.* Each owner or operator of a CCR unit subject to the requirements of this subpart must date and maintain files of all information required by this section in a written operating record at their facility. Each file must indicate the date the file was placed in the operating record.

(b) *Document Retention.* Unless specified otherwise, each file must be retained for at least five years following the date of each occurrence, measurement, maintenance, corrective action, report, record, or study.

(c) *Recordkeeping for multiple CCR units.* An owner or operator of more than one CCR unit subject to the provisions of this subpart may comply with the requirements of this section in one recordkeeping system provided the system identifies each file by the name of each CCR unit. The files may be maintained on microfilm, on a computer, on computer disks, on a storage system accessible by a computer, on magnetic tape disks, or on microfiche.

(d) *State Director and/or appropriate Tribal authority notification.* The owner or operator of a CCR unit must submit to the State Director and/or appropriate Tribal authority any demonstration or documentation required by this subpart, if requested, when such information is not otherwise available on the owner or operator's CCR website.

(e) *Location restrictions.* The owner or operator of a CCR unit subject to this subpart must place the demonstrations documenting whether or not the CCR unit is in compliance with the requirements under §§ 257.60(a), 257.61(a), 257.62(a), 257.63(a), and 257.64(a), as it becomes available, in the facility's operating record, except each location restrictions demonstration must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g).

(f) *Design criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The design and construction certifications as required by § 257.70(e) and (f), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(2) The documentation of liner type as required by § 257.71(a), except each liner type documentation must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(3) The design and construction certifications as required by § 257.72(c) and (d), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in

accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(4) Documentation prepared by the owner or operator stating that the permanent identification marker was installed as required by §§ 257.73(a)(1) and 257.74(a)(1), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or until completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(5) The initial and periodic hazard potential classification assessments as required by §§ 257.73(a)(2) and 257.74(a)(2), except each hazard potential classification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(6) The emergency action plan (EAP), and any amendment of the EAP, as required by §§ 257.73(a)(3) and 257.74(a)(3), except each EAP must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(7) Documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR unit and the local emergency responders as required by §§ 257.73(a)(3)(i)(E) and 257.74(a)(3)(i)(E), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(8) Documentation prepared by the owner or operator recording all activations of the emergency action plan as required by §§ 257.73(a)(3)(v) and 257.74(a)(3)(v), except each documentation of EAP activations must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(9) The history of construction, and any revisions of it, as required by § 257.73(c), except each history of construction must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(10) The initial and periodic structural stability assessments as required by §§ 257.73(d) and 257.74(d), except each structural stability assessment must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(11) Documentation detailing the corrective measures taken to remedy the deficiency or release as required by §§ 257.73(d)(2) and 257.74(d)(2), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(12) The initial and periodic safety factor assessments as required by §§ 257.73(e) and 257.74(e), except each safety factor assessment must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(13) The design and construction plans, and any revisions of it, as required by § 257.74(c), except the design and construction plans must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(14) The application and any supplemental materials submitted in support of the application as required by § 257.71(d)(1)(i)(E), except each application and supplemental materials must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(15) The alternative liner demonstration as required by § 257.71(d)(1)(ii)(D).

(16) The alternative liner demonstration extension request as required by § 257.71(d)(2)(ii)(D).

(17) The documentation prepared for the preliminary demonstration as required by § 257.71(d)(2)(ii)(E).

(18) The notification of an incomplete application as required by § 257.71(d)(2)(iii)(B).

(19) The decision on the application as required by § 257.71(d)(2)(iii)(F), except each decision must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(20) The final decision on the alternative liner demonstration as required by § 257.71(d)(2)(vii).

(21) The alternative source demonstration as required under § 257.71(d)(2)(ix)(A)(*4*).

(22) The final decision on the alternative source demonstration as required under § 257.71(d)(2)(ix)(A)(*5*).

(23) The final decision on the trend analysis as required under § 257.71(d)(2)(ix)(B)(*3*).

(24) The decision that the alternative source demonstration has been withdrawn as required under § 257.71(d)(2)(ix)(C).

(25) The facility evaluation report part 1 as required by § 257.75(c), except the facility evaluation report part 1 must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(26) The facility evaluation report part 2 as required by § 257.75(d), except the facility evaluation report part 2 must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(g) *Operating criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The CCR fugitive dust control plan, and any subsequent amendment of the plan, required by § 257.80(b), except each fugitive dust control plan must be maintained for five years after closure by removal in accordance with § 257.102(c)(1) or (2) or completes post-closure care in accordance with § 257.104(e) or (g) is completed at the last CCR unit at the facility irrespective of the time requirement specified in paragraph (b) of this section.

(2) The annual CCR fugitive dust control report required by § 257.80(c), except each fugitive dust control report must be maintained for five years after closure by removal in accordance with § 257.102(c)(1) or (2) or post-closure care in accordance with § 257.104(e) or (g) is completed at the last CCR unit at the facility irrespective of the time requirement specified in paragraph (b) of this section.

(3) The initial and periodic run-on and run-off control system plans as required by § 257.81(c), except each plan must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(4) The initial and periodic inflow design flood control system plan as required by § 257.82(c), except each plan must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(5) Documentation recording the results of each inspection and instrumentation monitoring by a qualified person as required by § 257.83(a), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(6) The periodic inspection report as required by § 257.83(b)(2), except each inspection report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(7) Documentation detailing the corrective measures taken to remedy the deficiency or release as required by §§ 257.83(b)(5) and 257.84(b)(5), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(8) Documentation recording the results of the weekly inspection by a qualified person as required by § 257.84(a), except each inspection report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(9) The periodic inspection report as required by § 257.84(b)(2), except each inspection report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(h) *Groundwater monitoring and corrective action.* The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The annual groundwater monitoring and corrective action report as required by § 257.90(e), except each annual groundwater monitoring and corrective action report must be maintained for five years after the last CCR unit at the facility either completes closure by removal in accordance with § 257.102(c)(1) or completes post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(2) Documentation of the design, installation, development, and decommissioning of any monitoring wells, piezometers and other measurement, sampling, and analytical devices as required by § 257.91(e)(1), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(3) The groundwater monitoring system certification as required by § 257.91(f), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(4) The selection of a statistical method certification as required by § 257.93(f)(6), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(5) Within 30 days of establishing an assessment monitoring program, the notification as required by § 257.94(e)(3).

(6) The results of appendices III and IV to this part constituent concentrations measured as required by § 257.95(d)(1).

(7) Within 30 days of returning to a detection monitoring program, the notification as required by § 257.95(e).

(8) Within 30 days of detecting one or more constituents in appendix IV to this part at statistically significant levels above the groundwater protection standard, the notifications as required by § 257.95(g).

(9) Within 30 days of initiating the assessment of corrective measures requirements, the notification as required by § 257.95(g)(5).

(10) The completed assessment of corrective measures as required by § 257.96(d), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(11) Documentation prepared by the owner or operator recording the public meeting for the corrective measures assessment as required by § 257.96(e), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(12) The semiannual report describing the progress in selecting and designing the remedy and the selection of remedy report as required by § 257.97(a), except that the selection of remedy report must be maintained until the remedy has been completed.

(13) Within 30 days of completing the remedy, the notification as required by § 257.98(e), except each notification must be maintained for five years after completion of the remedy selected pursuant to § 257.97 irrespective of the time requirement specified in paragraph (b) of this section.

(14) The demonstration, including long-term performance data, supporting the suspension of groundwater monitoring requirements as required by § 257.90(g), except each document must be maintained for five years after the last unit at the facility completes post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(i) *Closure and post-closure care.* The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The notification of intent to initiate closure of the CCR unit as required by § 257.100(c)(1).

(2) The annual progress reports of closure implementation as required by § 257.100(c)(2)(i) and (ii).

(3) The notification of closure completion as required by § 257.100(c)(3).

(4) The written closure plan, and any amendment of the plan, as required by § 257.102(b), except that only the most recent closure plan must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(5) The written demonstration(s), including the certification required by § 257.102(e)(2)(iii), for a time extension for initiating closure as required by § 257.102(e)(2)(ii), except each demonstration must be maintained until notice of completion of closure is placed in the operating record in accordance with § 257.102(h) irrespective of the time requirement specified in paragraph (b) of this section.

(6) The written demonstration(s), including the certification required by § 257.102(f)(2)(iii), for a time extension for completing closure as required by § 257.102(f)(2)(i), except each demonstration must be maintained for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (b) of this section.

(7) The notification of intent to close a CCR unit as required by § 257.102(g), except each notification must be maintained for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (b) of this section.

(8) The notification of completion of closure of a CCR unit as required by § 257.102(h), except each notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(9) The notification recording a notation on the deed as required by § 257.102(i), except each notification must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(10) The notification of intent to comply with the alternative closure requirements as required by § 257.103(c)(1), except each notification must be maintained for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (b) of this section.

(11) The annual progress reports under the alternative closure requirements as required by § 257.103(c)(2), except each report must be maintained for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (b) of this section.

(12) The written post-closure plan, and any amendment of the plan, as required by § 257.104(d), except that only the most recent post-closure plan must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(13) The notification of completion of post-closure care period as required by § 257.104(e), except each notification must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(14) The notification of intent to comply with the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as required by § 257.103(f)(1)(ix)(A), except each notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(15) The approved or denied demonstration for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as required by § 257.103(f)(1)(ix)(B), except each approval or denial must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(16) The notification for requesting additional time to the alternative cease receipt of waste deadline as required by § 257.103(f)(1)(ix)(C), except each notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(17) The semi-annual progress reports for the site-specific alternative to initiation of closure due to development of alternative capacity being infeasible as required by § 257.103(f)(1)(xi), except each semi-annual progress report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(18) The notification of intent to comply with the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.103(f)(2)(viii), except each notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(19) The approved or denied demonstration for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.103(f)(2)(ix), except each demonstration must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(20) The annual progress report for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.103(f)(2)(x), except each annual progress report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(k) *Legacy CCR surface impoundments.* In addition to the information specified in paragraphs (e) through (j) of this section, the owner or operator of a legacy CCR surface impoundment subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The applicability report required by § 257.100(f)(1), including the certification required by § 257.100(f)(1)(i), except each report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(2) The applicability extension reports required by § 257.100(f)(1)(iii)(C), except each report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(3) The notification of field investigation conclusion required by § 257.100(f)(1)(iii)(F), except the notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(4) The notification of intent to certify closure required by § 257.100(h)(1)(i), except the notification must be maintained for five years after completion of closure by removal in accordance with § 257.100(h)(1) or § 257.102(c)(2) irrespective of the time requirement specified in paragraph (b) of this section.

■ 23. Amend § 257.106 by:

■ a. Revising paragraphs (a), (b), (c), and (d);

■ b. Adding paragraphs (f)(24) and (25) and (k).

The revisions and additions read as follows:

§ 257.106 Notification requirements.

(a) *Deadline to submit notification to the relevant State Director and/or appropriate Tribal authority.* The notifications required under paragraphs (e) through (i) of this section must be sent to the relevant State Director and/or appropriate Tribal authority before the close of business on the day the notification is required to be completed. For purposes of this section, *before the close of business* means the notification must be postmarked or sent by electronic mail (email). If a notification deadline falls on a weekend or federal holiday, the notification deadline is automatically extended to the next business day.

(b) *Notifications to Tribal authority.* If any CCR unit is located in its entirety within Indian Country, the notifications of this section must be sent to the appropriate Tribal authority. If any CCR unit is located in part within Indian Country, the notifications of this section must be sent both to the appropriate State Director and Tribal authority.

(c) *Combining notifications.* Notifications may be combined as long as the deadline requirement for each notification is met.

(d) *Notification deadline after placement in operating record.* Unless otherwise required in this section, the notifications specified in this section must be sent to the State Director and/or appropriate Tribal authority within 30 days of placing in the operating record the information required by § 257.105.

* * * * *

(f) * * *

(24) Provide notification of the availability of the facility evaluation report part 1 as specified by § 257.105(f)(25).

(25) Provide notification of the availability of the facility evaluation report part 2 as specified by § 257.105(f)(26).

* * * * *

(k) *Legacy CCR surface impoundments.* In addition to the information specified in paragraphs (e) through (j) of this section, the owner or operator of a legacy CCR surface impoundment subject to this subpart must notify the State Director and/or appropriate Tribal authority when information has been placed in the operating record and on the owner or operator's publicly accessible internet site. The owner or operator must:

(1) Provide notification of the availability of the applicability documentation as specified under § 257.105(k)(1).

(2) Provide notification of the availability of the applicability extension report as specified under § 257.105(k)(2).

(3) Provide notification of the availability of the notification as specified under § 257.105(k)(3).

(4) Provide notification of the availability of the intent to certify closure by removal certification as specified under § 257.105(k)(4).

■ 24. Revise and republish § 257.107 to read as follows:

§ 257.107 Publicly accessible internet site requirements.

(a) *CCR website requirement.* Each owner or operator of a CCR unit subject to the requirements of this subpart must maintain a publicly accessible internet site (CCR website) containing the information specified in this section. The owner or operator's website must be titled ''CCR Rule Compliance Data and Information.'' The website must ensure that all information required to be posted is immediately available to anyone visiting the site, without requiring any prerequisite, such as registration or a requirement to submit a document request. All required information must be clearly identifiable and must be able to be immediately printed and downloaded by anyone accessing the site. If the owner/operator changes the web address (*i.e.,* Uniform Resource Locator (URL)) at any point, they must notify EPA via the ''contact us'' form on EPA's CCR website and the state director within 14 days of making the change. The facility's CCR website must also have a ''contact us'' form or a specific email address posted on the website for the public to use to submit questions and issues relating to the availability of information on the website.

(b) *CCR website for multiple CCR units or combined websites for multiple regulatory programs.*

(1) An owner or operator of more than one CCR unit subject to the provisions of this subpart may comply with the requirements of this section by using the same internet site for multiple CCR units provided the CCR website clearly delineates information by the name or identification number of each unit.

(2) An owner or operator may maintain one website combining the postings required under this subpart with the postings required by other regulatory programs (*e.g.,* the ''ELG Rule Compliance Data and Information'' website required pursuant to § 423.19 of this chapter), provided the postings required for each regulatory program are delineated under a separate heading on the website.

(c) *Document retention on a CCR website.* Unless otherwise required in this section, the information required to be posted to the CCR website must be made available to the public for at least five years following the date on which the information was first posted to the CCR website.

(d) *Website posting deadline after placement in operating record.* Unless otherwise required in this section, the information must be posted to the CCR website within 30 days of placing the pertinent information required by § 257.105 in the operating record.

(e) *Location restrictions.* The owner or operator of a CCR unit subject to this subpart must place each demonstration specified under § 257.105(e) on the owner or operator's CCR website except each location restrictions demonstration must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(f) *Design criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) Within 60 days of commencing construction of a new unit, the design certification specified under § 257.105(f)(1) or (3), except each certification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(2) No later than the date of initial receipt of CCR by a new CCR unit, the construction certification specified under § 257.105(f)(1) or (3), except each certification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g), or until the liner is removed irrespective of the time requirement specified in paragraph (c) of this section, whichever is later.

(3) The documentation of liner type specified under § 257.105(f)(2), except each document must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g), or until the liner is removed irrespective of the time requirement specified in paragraph (c) of this section, whichever is later.

(4) The initial and periodic hazard potential classification assessments specified under § 257.105(f)(5), except only the two most recent hazard potential classification assessments must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(5) The emergency action plan (EAP) specified under § 257.105(f)(6), except that only the most recent EAP must be maintained on the CCR website irrespective of the time requirement specified in paragraph (c) of this section.

(6) Documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR unit and the local emergency responders specified under § 257.105(f)(7), except only the most recent documentation must be posted on the CCR website irrespective of the time requirement specified in paragraph (c) of this section.

(7) Documentation prepared by the owner or operator recording any activation of the emergency action plan specified under § 257.105(f)(8); if no activation in the last five years, documentation that includes that information irrespective of the time requirement specified in paragraph (c) of this section.

(8) The history of construction, and any revisions of it, specified under § 257.105(f)(9), except the history of constructions, and any revisions of it, must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(9) The initial and periodic structural stability assessments specified under § 257.105(f)(10), except only the two most recent structural stability assessments must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(10) The documentation detailing the corrective measures taken to remedy the deficiency or release specified under § 257.105(f)(11), except each document must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(11) The initial and periodic safety factor assessments specified under § 257.105(f)(12), except only the two most recent safety factor assessments must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(12) The design and construction plans, and any revisions of them, specified under § 257.105(f)(13), except each plan must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(13) The application and any supplemental materials submitted in support of the application specified under § 257.105(f)(14), except each application must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(14) The alternative liner demonstration specified under § 257.105(f)(15).

(15) The alternative liner demonstration specified under § 257.105(f)(16).

(16) The documentation prepared for the preliminary demonstration specified under § 257.105(f)(17).

(17) The notification of an incomplete application specified under § 257.105(f)(18).

(18) The decision on the application specified under § 257.105(f)(19), except each decision must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(19) The final decision on the alternative liner demonstration specified under § 257.105(f)(20).

(20) The alternative source demonstration specified under § 257.105(f)(21).

(21) The final decision on the alternative source demonstration specified under § 257.105(f)(22).

(22) The final decision on the trend analysis specified under § 257.105(f)(23).

(23) The decision that the alternative source demonstration has been withdrawn specified under § 257.105(f)(24).

(24) The facility evaluation report part 1 as specified under § 257.105(f)(25), except each report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(25) The facility evaluation report part 2 as specified under § 257.105(f)(26), except each report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(g) *Operating criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The CCR fugitive dust control plan, or any subsequent amendment of the plan, specified under § 257.105(g)(1) except that only the most recent plan must be maintained on the CCR website irrespective of the time requirement specified in paragraph (c) of this section until the last CCR unit at the facility completes closure by removal in accordance with § 257.102(c) or completes post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(2) The annual CCR fugitive dust control report specified under § 257.105(g)(2). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(3) The initial and periodic run-on and run-off control system plans specified under § 257.105(g)(3), except each plan must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(4) The initial and periodic inflow design flood control system plans specified under § 257.105(g)(4), except each plan must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(5) The periodic inspection reports specified under § 257.105(g)(6). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(6) The documentation detailing the corrective measures taken to remedy the deficiency or release specified under § 257.105(g)(7). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final documentation must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(7) The periodic inspection reports specified under § 257.105(g)(9). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(h) *Groundwater monitoring and corrective action.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The annual groundwater monitoring and corrective action report specified under § 257.105(h)(1). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(2) The groundwater monitoring system certification specified under § 257.105(h)(3), except each certification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(3) The selection of a statistical method certification specified under § 257.105(h)(4), except each certification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(4) The notification that an assessment monitoring programs has been established specified under § 257.105(h)(5).

(5) The notification that the CCR unit is returning to a detection monitoring program specified under § 257.105(h)(7).

(6) The notification that one or more constituents in appendix IV to this part have been detected at statistically significant levels above the groundwater protection standard and the notifications to land owners specified under § 257.105(h)(8).

(7) The notification that an assessment of corrective measures has been initiated specified under § 257.105(h)(9).

(8) The assessment of corrective measures specified under § 257.105(h)(10), except each assessment must be posted for five years

after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(9) The semiannual reports describing the progress in selecting and designing remedy and the selection of remedy report specified under § 257.105(h)(12), except that the selection of the remedy report must be maintained until the remedy has been completed.

(10) The notification that the remedy has been completed specified under § 257.105(h)(13), except each notification must be posted for five years after completion of the remedy selected pursuant to in § 257.97 irrespective of the time requirement specified in paragraph (c) of this section.

(11) The demonstration supporting the suspension of groundwater monitoring requirements specified under § 257.105(h)(14), except each demonstration must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(i) *Closure and post-closure care.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The notification of intent to initiate closure of the CCR unit specified under § 257.105(i)(1).

(2) The annual progress reports of closure implementation specified under § 257.105(i)(2).

(3) The notification of closure completion specified under § 257.105(i)(3).

(4) The written closure plan, and any amendment of the plan, specified under § 257.105(i)(4), except that only the most recent closure plan must be posted on the CCR website irrespective of the time requirement specified in paragraph (c) of this section and each closure plan must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(5) The demonstration(s) for a time extension for initiating closure specified under § 257.105(i)(5), except each demonstration must be posted until notice of completion of closure is placed in the operating record in accordance with § 257.102(h) irrespective of the time requirement specified in paragraph (c) of this section.

(6) The demonstration(s) for a time extension for completing closure specified under § 257.105(i)(6), except each demonstration must be posted for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (c) of this section.

(7) The notification of intent to close a CCR unit specified under § 257.105(i)(7), except each notification must be posted for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (c) of this section.

(8) The notification of completion of closure of a CCR unit specified under § 257.105(i)(8), except each notification must be posted for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(9) The notification recording a notation on the deed as required by § 257.105(i)(9), except each notification must be posted for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(10) The notification of intent to comply with the alternative closure requirements as required by § 257.105(i)(10), except the notification must be posted for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (c) of this section.

(11) The annual progress reports under the alternative closure requirements as required by § 257.105(i)(11), except the notification must be posted for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (c) of this section.

(12) The written post-closure plan, and any amendment of the plan, specified under § 257.105(i)(12), except that only the most recent post-closure plan must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(13) The notification of completion of post-closure care specified under § 257.105(i)(13), except that only the most recent post-closure plan must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(14) The notification of intent to comply with the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified under § 257.105(i)(14), except each notification must be posted for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(15) The approved or denied demonstration for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as required by as specified under § 257.105(i)(15), except each approval or denial must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(16) The notification for requesting additional time to the alternative cease receipt of waste deadline as required by § 257.105(i)(16), except the notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(17) The semi-annual progress reports for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified under § 257.105(i)(17), except the progress report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(18) The notification of intent to comply with the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as specified under § 257.105(i)(18), except the notification

must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(19) The approved or denied demonstration for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.105(i)(19), except the approval or denial must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(20) The annual progress report for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.105(i)(20), except the progress reports must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(j) *Retrofit criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The written retrofit plan, and any amendment of the plan, specified under § 257.105(j)(1).

(2) The notification of intent to comply with the alternative retrofit requirements as required by § 257.105(j)(2).

(3) The annual progress reports under the alternative retrofit requirements as required by § 257.105(j)(3).

(4) The demonstration(s) for a time extension for completing retrofit activities specified under § 257.105(j)(4).

(5) The notification of intent to retrofit a CCR unit specified under § 257.105(j)(5).

(6) The notification of completion of retrofit activities specified under § 257.105(j)(6).

(k) *Legacy CCR surface impoundments.* In addition to the information specified in paragraphs (e) through (j) of this section, the owner or operator of a legacy CCR surface impoundment subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The applicability report as specified under § 257.105(k)(1), except each report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(2) The applicability extension reports as specified under § 257.105(k)(2), except each report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(3) The notification of field investigation conclusion as specified under § 257.105(k)(3), except each notification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(4) The notification of intent to certify closure as specified under § 257.105(k)(4), except each notification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

[FR Doc. 2024–09157 Filed 5–7–24; 8:45 am]

BILLING CODE 6560–50–P

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 24-1200 **September Term, 2024**

EPA-89FR38950

Filed On: November 1, 2024

City Utilities of Springfield, Missouri, by and through the Board of Public Utilities,

Petitioner

v.

Environmental Protection Agency and Michael S. Regan, Administrator, United States Environmental Protection Agency,

Respondents

Altamaha Riverkeeper, et al.,
Intervenors

Consolidated with 24-1267, 24-1269, 24-1274, 24-1275, 24-1276

BEFORE: Henderson, Pillard, and Walker, Circuit Judges

O R D E R

Upon consideration of the State of Ohio's motion for leave to intervene, the opposition thereto, and the reply; and petitioner East Kentucky Power Cooperative, Inc.'s motion for stay pending review, the oppositions thereto, and the reply, it is

ORDERED that the motion for stay be denied. Petitioner has not satisfied the stringent requirements for a stay pending court review. See Nken v. Holder, 556 U.S. 418, 434 (2009); D.C. Circuit Handbook of Practice and Internal Procedures 33 (2021). It is

FURTHER ORDERED that the motion for leave to intervene be denied. This court has concluded that "all would-be intervenors must demonstrate Article III standing," Old Dominion Elec. Coop. v. FERC, 892 F.3d 1223, 1232 (D.C. Cir. 2018),

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

No. 24-1200 **September Term, 2024**

and Ohio does not argue that it is not required to establish standing here. Nor has Ohio demonstrated that it satisfies the requirements for standing. See, e.g., Nat'l Fam. Plan. & Reprod. Health Ass'n, Inc. v. Gonzales, 468 F.3d 826, 831 (D.C. Cir. 2006) ("self-inflicted harm" neither is "an 'injury' cognizable under Article III" nor is "fairly traceable to the defendant's challenged conduct"); Bhd. of Locomotive Eng'rs & Trainmen v. Surface Transp. Bd., 457 F.3d 24, 28 (D.C. Cir. 2006). Ohio's self-inflicted injury does not give it an interest in this case sufficient to justify intervention. See Fed. R. App. P. 15(d); Fed. R. Civ. P. 24. Ohio's other argument in support of standing – that the rule takes away Ohio's ability to establish less stringent standards – was raised for the first time in its reply, and thus, it is forfeited. See Twin Rivers Paper Co. v. SEC, 934 F.3d 607, 615 (D.C. Cir. 2019). Ohio may, however, participate as amicus curiae. See Fed. R. App. P. 29(a)(2). It is

FURTHER ORDERED, on the court's own motion, that the parties submit, within 14 days of the date of this order, proposed formats and schedules for the briefing of these cases. The parties are strongly urged to submit a joint proposal and are reminded that the court looks with extreme disfavor on repetitious submissions and will, where appropriate, require a joint brief of aligned parties with total words not to exceed the standard allotment for a single brief. Whether the parties are aligned or have disparate interests, they must provide *detailed* justifications for any request to file separate briefs or to exceed in the aggregate the standard word allotment. Requests to exceed the standard word allotment must specify the word allotment necessary for each issue.

Per Curiam

FOR THE COURT:
Mark J. Langer, Clerk

BY: /s/
Selena R. Gancasz
Deputy Clerk

EAST KENTUCKY POWER COOPERATIVE

July 17, 2023

VIA Electronic Submittal to Regulations.gov

Environmental Protection Agency
EPA Docket Center
Washington, D.C.

Re: East Kentucky Power Cooperative (EKPC) Comments on
Proposed Rule, *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments,*
88 Fed. Reg. 31982 (May 18, 2023)
Docket ID No. EPA-HQ-OLEM-2020-0107

Dear Sir or Madam:

East Kentucky Power Cooperative (EKPC) is a non-profit corporation in Kentucky serving 16 owner-member distribution cooperatives or over 1 million rural Kentucky customers. For more than 82 years, EKPC has been providing safe, reliable, affordable energy and services to its owner members, some of the poorest of the poor in the Nation, twenty six percent (26%) of whom make daily choices between food, water, and electricity.

We hereby submit and request for your consideration to review our comments on the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments, in the EPA Docket ID No. EPA-HQ-OLEM-2020-0107

Additionally, we endorse comments provided by the National Rural Electric Association, Utility Solid Waste Activities Group and Utilities Information Exchange Kentucky (UIEK).

Should you have any questions, please let me know at 859-744-4812.

Sincerely,

Jerry Purvis

Jerry Purvis, Vice President
Environmental Affairs

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A Touchstone Energy Cooperative

CC: T. Hatton, Commissioner
T. Hudson, KDWM
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Comments of East Kentucky Power Cooperative on the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments; Proposed Rule
88 Fed. Reg. 31982 (May 18, 2023)
Docket ID No. EPA-HQ-OLEM-2020-0107

East Kentucky Power Cooperative, Inc. (EKPC) is pleased to submit the enclosed comments on the U.S. Environmental Protection Agency's proposed rule entitled "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments," Docket ID No. EPA-HQ-OLEM-2020-0107, 88 Fed. Reg. 31982 (May 18, 2023) (the "Proposed Rule"). We appreciate this opportunity to comment.

EKPC is a not-for-profit electric generation and transmission utility with headquarters in Winchester, Kentucky. The cooperative is owned and governed by 16 member-owned electricity distribution cooperatives. EKPC's vital mission is to safely generate and transmit affordable, reliable power to these cooperatives serving more than 1 million rural Kentuckians, some of whom are the poorest of the poor. Twenty six percent live below the poverty line, making every dollar spent critical to our mission to serve. To build mass and scale in the markets, together with our owner-members, we're known as Kentucky's Touchstone Energy Cooperatives.

As you well know, the Proposed Rule has the potential to impose millions of dollars of additional compliance obligations on EKPC and its owner members – in many cases without any material benefit to the environment and at great potential detriment to our owner member cooperatives and their ratepayers. That burden is particularly critical as a large percentage of those ratepayers are lower-income households who live below the poverty level and additionally have experienced high inflation under recent economic conditions. Some regularly must choose between food, medicine and electricity and cannot afford significant additional financial burdens. But that is likely to be the very result of adoption of the Proposed Rule and other EPA proposals affecting the electric power sector since December 2022.

Legacy CCR Surface Impoundments

The Proposed Rule's definition of newly-regulated "legacy CCR surface impoundments" would unfairly and unnecessarily capture numerous sites where former surface impoundments were properly clean-closed by removal under then-applicable State regulations and where no CCR remains today. Specifically, these are former ash ponds/surface impoundments at inactive electric utilities or independent power producers that contained CCR and liquids on or after October 19, 2015, but where, like at EKPC, the CCR was proactively removed in its entirety – despite any regulatory obligation – before the Proposed Rule was even announced. Many of these sites were clean-closed by removal with State regulatory oversight and approval and should not now be punished by an attempt to retroactively regulate material that has been absent for years.

EKPC is a perfect example of this concern. EKPC's Dale Station ceased generating electricity before the CCR Rule was finalized and took effect in 2015. All of the generating assets have been removed, and there is no ongoing generation at the site. Dale Station contained three ash ponds (known as Ash Ponds 2, 3, and 4) that were used to store and treat ash sluiced from the on-site coal-fired generation. (Note that at the time of closure, Ash Pond 2 included both former Ash Pond 1 and Ash Pond 2, which were combined in the mid-1990s by removal of a dike that had separated them previously.) Although the ponds contained CCR and liquids as of October 19, 2015, they were <u>not</u> regulated by the 2015 CCR Rule because they qualified as inactive impoundments (no active placement of waste) at an inactive facility (no active electric generation). Nevertheless, despite the lack of any regulatory obligation, EKPC decided to act expeditiously and proactively even before the CCR rule was finalized to remove all CCR from the three ponds to eliminate any potential environmental risks they might pose. The Kentucky Department for Environmental Protection and the Kentucky Public Service Commission agreed with our plans to clean close by removal.

The Dale ash ponds were closed in accordance with a closure plan approved by the Kentucky Division of Waste Management (KDWM) on July 14, 2014 – over a year before the CCR Rule became effective. The approved closure plan required removal of all ash/CCR from the ponds to the level of existing soils, certification of ash removal by a third party Professional Engineer, and verification by visual inspection performed by representatives of KDWM. The CCR removed from the Dale ponds was transported to and disposed of in the state-permitted and CCR Rule-regulated CCR landfill at EKPC's J.K. Smith Station. Groundwater monitoring was not required by KDWM at Dale as long as complete removal of CCR was verified and the CCR was properly disposed off-site. EKPC met these requirements, and KDWM issued a letter on January 17, 2019 accepting EKPC's report and certification of clean closure by removal for all three ash ponds. All of the ash was placed in a new off-site landfill at J.K. Smith Station pursuant to the CCR rule.

It is patently unfair after eight years for EPA now to attempt to regulate these clean-closed by removal units as "legacy CCR surface impoundments" when they contain no CCR (as certified by a P.E. and verified by KDWM); they have not contained CCR for several years; EPA had an opportunity to attempt to regulate them as part of the 2015 CCR Rule but chose not to do so; and EKPC nevertheless closed them voluntarily, and expeditiously, under State oversight and approval, all of which EKPC and its owner members paid for through electric rates. These sites do not raise any of the concerns that EPA has identified at sites where CCR is present and may be in contact with groundwater. They not only won't contain CCR when a final rule becomes effective (likely sometime in late 2024 or early 2025); they didn't even contain CCR at the time EPA issued its Advance Notice of Proposed Rulemaking on this subject (October 2020).

This is not an insignificant issue. Nor is it as simple as EPA's claim that owners of these sites can simply file a clean-closure certification pursuant to 40 CFR 257.102(c) and incur no further regulatory obligation. *See* 40 CFR 257.100(f)(1)(ii) of Proposed Rule. EKPC was not required to perform groundwater monitoring for the Dale ash ponds; thus, EPA should not retroactively require compliance with the groundwater performance standards of 40 CFR 257.102(c). EPA's assertion in the preamble that such information should be readily available is unfounded and reflects a lack of understanding of the applicable regulatory requirements prior to this proposal. In this case, a lack of groundwater monitoring requirements at the time of closure (and thus an inability to retroactively demonstrate compliance with the groundwater closure performance standards) would now subject the Dale ash ponds – as purported legacy CCR surface impoundments – to all the other requirements of the CCR Rule, including performance of groundwater monitoring, preparation of plans, filing of reports, and completion of closure and post-closure activities. All of this would come at the cost of at least hundreds of thousands of dollars, and perhaps more. And none of it is necessary to protect the environment in a situation in which EKPC certified and KDWM verified the complete removal of CCR by 2019.

EKPC strongly recommends that EPA amend the Proposed Rule to clarify that a legacy CCR surface impoundment does not include any former impoundment from which CCR and liquids were removed prior to the effective date of the final rule (i.e., sometime in 2024/2025). To do otherwise would be to maintain a dubious assertion of regulatory authority over sites that contain no waste subject to EPA regulation under RCRA and that were not subject to any applicable regulation under the federal CCR Rule when they did contain ash and liquids (i.e., prior to 2019). Where former ash ponds, such as those at Dale, have been closed by removal of CCR under State oversight and approval, certified as such by a P.E., and verified as clean by State regulators (the only regulators with authority at the time), EPA should accept such closure as more than sufficient to protect the environment and should not seek to impose an unnecessary and legally dubious set of retroactive requirements on those responsible owners who voluntarily closed these ponds. Moreover, as many of those sites have subsequently been restored and are now home to established natural ecosystems, it would be counterproductive to require them to be disturbed.

Should EPA insist on imposing retroactive requirements on former impoundments from which CCR and liquids were removed prior to the effective date of the final rule, it would be acting in an arbitrary and capricious manner. *See* 5 U.S.C. § 706(2)(A). But that would not be the only problem. EPA would also be acting in excess of its statutory authority. *See* 5 U.S.C. § 706(2)(C). It is well established that RCRA only authorizes EPA to regulate facilities or sites "where solid waste *is* disposed of." 42 U.S.C. § 6903(14) (emphasis added). In other words, EPA only has authority to regulate sites "where solid waste *still* 'is deposited.'" *Utility Solid Waste Activities Grp. v. EPA*, 901 F.3d 414, 440 (D.C. Cir. 2018) (quoting 42 U.S.C. § 6903(3), 14)). It has no authority to regulate sites or facilities where waste was once deposited but is no longer.

And EPA's proposed course of conduct would also violate several provisions of the United States Constitution. First, because the federal government lacks a general police power, every federal statute and regulation must be premised on some authority specifically given to the federal government by the Constitution. Any "powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." U.S. Const. amend. X. Here, EPA does not articulate which provision of the Constitution permits Congress to give EPA authority to regulate *all* past and present CCR impoundments across the country. And, in fact, no such constitutional authority appears to exist.

The Commerce Clause, for example, might conceivably permit Congress to authorize EPA to regulate CCR impoundments that receive CCR shipped in interstate commerce or that directly impact navigable interstate waters. But the Commerce Clause would not permit EPA to regulate CCR impoundments that have no such relationship to interstate commerce. *See United States v. Lopez*, 514 U.S. 549, 558–59 (1995).

Second, the Supreme Court has held that retroactive regulation can constitute a taking in violation of the Fifth Amendment "if it imposes severe retroactive liability on a limited class of parties that could not have anticipated the liability, and the extent of that liability is substantially disproportionate to the parties' experience." *E. Enters. v. Apfel*, 524 U.S. 498, 528–29 (1998). Such is the case here.

Third, the Fifth Amendment's guarantee of due process is a requirement of fundamental fairness. And it is fundamentally *unfair* to impose retroactive liability on power generators like EKPC who acted in a responsible manner and closed and cleaned their CCR impoundments in cooperation with—and under the watchful eye of—state regulators.

CCR Management Units

EPA must reevaluate its attempt to regulate certain proposed CCR Management Units (CCRMUs), including those potential CCRMUs that are located under existing permitted and regulated CCR landfills or other site infrastructure, including generation assets. Under the Proposed Rule, all such CCRMUs must be identified within three months of the final rule's effective date, and closure of such units must commence within 12 months after the effective date. Aside from the unrealistic nature of the timelines for compliance laid out in the Proposed Rule (and discussed further below), this proposal does not reflect the complex reality of these sites.

EKPC is particularly concerned about the former closed surface impoundment that is located beneath the active CCR landfill at its John Sherman Cooper Station. That surface impoundment – which was the initial impoundment used for management of CCR at Cooper Station and has been out of use for decades – has been effectively capped and closed by the placement of a permitted, CCR Rule-compliant CCR landfill above it. The collective effect of the CCR landfill liner and leachate collection system, runoff controls, and engineered cap is to effectively isolate the underlying former impoundment from exposure to storm water runoff and other sources of water infiltration. Indeed, there is no evidence that this former impoundment is impounding or otherwise contains any significant amount of liquids, or that it is in contact with groundwater, as such conditions are unlikely given the overlying landfill infrastructure that essentially caps the impoundment twice. The Kentucky Department for Environmental Protection has reviewed several applications and regulatory submittals, including ground water monitoring plans; received analyses; approved applications; and authorized placement of waste in the Cooper landfill. Those approvals demonstrate that there is no meaningful risk at this site.

In the Proposed Rule, EPA does not appear to appreciate the complexity and complications inherent in requiring the monitoring and closure of facilities such as the former impoundment underlying the Cooper CCR landfill. The location of these facilities under significant infrastructure poses complex and potentially cost-prohibitive challenges in terms of establishing and operating an effective groundwater monitoring system and designing and implementing an effective "closure" plan – particularly a closure plan that does not require the removal of the overlying CCR landfill. The cost of such facility modifications would likely rise above $300 - 400 million, including the removal of CCR from the active landfill and the underlying impoundment and the siting, permitting, construction, and operation of another landfill to receive all of the removed CCR.

Attempting to open a new landfill onsite would impose significant engineering challenges due to the site topography and current configuration of the landfill and former surface impoundment and lack of available physical space. Removal of the CCR material in the current CCR landfill and underlying former surface impoundment would necessitate the removal, redesign, and reinstallation of all existing landfill infrastructure and engineering controls, including but not limited to, the sedimentation pond, leachate collection system, storm water control structures, etc. After the complete redesign, all CCR material would have to be loaded into trucks and placed into the new landfill. The disruption and/or relocation of this infrastructure, particularly for active generating units, would be incredibly disruptive to the power grid and costly to owners, operators, and ratepayers – and unnecessary where the former surface impoundment underlying the CCR-compliant landfill has been effectively capped and closed. EKPC is aware that other owners and operators may have similar facilities that are situated beneath existing generation and transmission infrastructure.

In the absence of any evidence of significant environmental risk or harm posed by these sites, and in light of the incredible costs likely required to comply with the monitoring and closure requirements of the Proposed Rule, EPA should modify its proposal to eliminate regulation of these former facilities as CCRMUs. They do not pose a meaningful risk to the environment and requiring their "closure" will simply impose unneeded cost and burdens on the generation sector. Moreover, the proposal would suffer from the same constitutional infirmities discussed above.

Inactive Surface Impoundments

EPA's "clarifications" of the definition of "inactive CCR surface impoundments" in the Proposed Rule are troubling and should be revisited and revised. One major concern with those changes is the revision of the scope provision of the CCR Rule concerning inactive CCR surface impoundments to state that active electric utilities or independent power producers include any site "regardless of how electricity is currently being produced at the facility." Proposed 40 CFR 257.50(c). The current regulation classifies such facilities as those that are active "regardless of the fuel currently used at the facility to produce electricity." 40 CFR 257.50(c) (current). This change appears designed to pull in generation facilities that have been retrofitted to replace previous fossil fuel generation with renewable generation resources.

This seemingly minor change poses important questions. Does EPA intend by this change to retroactively regulate inactive CCR surface impoundments at former inactive sites that have been retrofitted with renewable generation and are thereby now considered "active" generation? Is EPA suggesting that these sites should always have been included in the rule under the "regardless of fuel" language, or is EPA suggesting that they are newly regulated? If newly regulated, what is the timeline for compliance of these sites with the CCR Rule? On a related note, if structures supporting ongoing renewable generation are located on top of CCR at one of these former impoundment sites, must they still be closed within 12 months of the effective date? Or can they get delayed closure deadlines while still complying with groundwater monitoring and other requirements? And if groundwater monitoring does not show any impacts to the environment, why should any additional closure be required prior to the end of life of the generation assets (or supporting assets)? All of these are important questions that must be answered by EPA.

Another concern with the EPA's approach to inactive CCR surface impoundments is its continued reliance on the legally dubious and previously unknown interpretations of "free liquids" and "infiltration" first revealed in its "Part A" demonstration decisions in early 2022. As has been amply demonstrated by EKPC and numerous other companies and industry associations, these interpretations have no reasonable foundation in the history of RCRA or its regulatory program, including EPA's regulatory statements and interpretations of the CCR Rule prior to January 2022. They also reflect a simplistic and misguided understanding of the interplay of groundwater, pore water, geology, and other factors that affect the potential risk posed by CCR surface impoundments.

This issue is particularly concerning in the context of the Proposed Rule, as EPA has reiterated these positions to support its approach to regulating legacy CCR surface impoundments as well as inactive CCR surface impoundments – especially in determining whether such impoundments still contain "CCR and liquids." In this context, these dubious interpretations threaten to pull numerous previously closed and dewatered surface impoundments into regulation under the CCR Rule on the basis that they may contain some amount of pore water that is "readily separable." Beyond the legal flaws in these arguments, and the lack of any notice-and-comment rulemaking to support their regulatory application, these interpretations pose numerous difficult questions.

Among the challenges these positions pose for EKPC and others: How can owners determine whether a previously closed and dewatered surface impoundment at an active (or inactive) facility still contains "liquids"? In some cases, State regulators even previously confirmed that a site no longer had the capacity to impound water and therefore indicated that the site was no longer subject to the State's dam safety and impoundment rules. In light of EPA's new interpretations, how does it propose to determine if sufficient separable pore water is present for an impoundment to be considered to "contain liquids" under the CCR Rule? Through use of the paint filter test, the detection of water in piezometers, or other? How many samples are required, and at what locations are they needed, to determine if an impoundment "contains liquids"? What kinds of samples are required – individual or composite? These questions are particularly compelling in the numerous situations in which a formerly closed impoundment may contain some pore water as a result of periodic rainfall infiltration but is not in contact with the uppermost aquifer. They are even more compelling where the former impoundment may have been closed in compliance with applicable State requirements and/or consistent with the CCR Rule's closure design standards, with an engineered cap, run-on and run-off controls, etc.

Finally, if EPA insists upon regulating these closed sites, what is the compliance timeline? Inactive CCR surface impoundments at active generation sites have already been subject to regulation under the CCR Rule. But those sites that may be subjected to regulation for the first time as a result of EPA's new and novel interpretations of "free liquids" and "infiltration" should be given reasonable time to come into compliance with the rule. Otherwise, EPA is placing numerous companies in jeopardy as a result of a previously unannounced and unnoticed policy.

Beneficial Use

The Proposed Rule would purportedly maintain the exemption of "beneficial use" of CCR from the CCR Rule's regulatory provisions. But EKPC is concerned that the ambiguity of the Proposed Rule, including confusing and circular definitions and a lack of clarity regarding the amount and nature of "unencapsulated CCR" that would trigger the CCRMU requirements, places EKPC and other owners and operators at risk of their long-term beneficial use sites being reclassified as CCRMUs – with all the attendant regulatory burdens, including closure. EPA should provide additional clarification in the final rule regarding the distinction between acceptable beneficial uses of CCR and those situations that would constitute CCRMUs.

This concern is particularly acute in situations in which coal ash/CCR was previously used in the construction of structural fill, other than roadbeds, including utility line bedding, and other uses that qualified as beneficial use under applicable State regulations. The amount of CCR used in these applications varies from a single truckload to much larger volumes – yet EPA has not provided any guidelines in the Proposed Rule for how much CCR would trigger the proposed CCRMU requirements (assuming these areas somehow no longer qualify as beneficial use) and what amounts would be considered *de minimis*. Thus, EPA should clarify the minimum applicability thresholds in terms of volumes of CCR that would trigger CCRMU status in the event that a site is not considered to be a legitimate beneficial use.

Moreover, EPA should not now attempt to retroactively regulate these sites without a compelling demonstration that they pose a clear and significant risk to the environment. This is especially the case given that EPA chose to regulate CCR as non-hazardous waste under RCRA Subtitle D and preserved the concept of beneficial use in the regulations under the assumption that CCR used as structural and engineered fill does not automatically pose a risk to the environment.

EKPC is like many similarly situated companies in that CCR has been used for various beneficial purposes at its generating stations for many years. These uses include structural fill under site infrastructure, such as switchyards, coal piles, buildings, foundations and generating units. These uses are consistent with the philosophy behind beneficial use, in which CCR provides a functional benefit; substitutes for the use of a virgin material, thereby conserving natural resources; is not used in excess quantities; and does not pose a meaningful risk of release to the environment at levels above relevant regulatory standards. This is a long-recognized and permitted practice, and EPA must assure that the regulation of CCRMUs as contemplated in the Proposed Rule does not sweep these beneficial use sites into CCR Rule regulation.

The consequences of such overregulation would be significant and harmful. If beneficial use sites are reclassified as CCRMUs, EKPC and other companies would be required to immediately install costly groundwater monitoring systems and begin both detection and assessment monitoring. The complexities of designing and installing adequate groundwater monitoring systems for sites that may include multiple, discrete and geographically separate beneficial use locations would be particularly challenging. Challenges would include, among other things, defining "waste boundaries" and determining whether one or more groundwater monitoring systems are required at each site. The requirement to commence closure of all such sites within 12 months of the effective date of the rule would also be daunting. How does one "close" a roadbed or structural fill underlying a building, coal pile, switchyard, or generation equipment? Meeting the closure in place standards of the CCR rule under these circumstances would be nearly impossible, and performing closure by removal would be catastrophically disruptive and costly to plant operations.

Simply put, EPA must ensure that the long-recognized and permitted practice of beneficial use, which has been followed by scores of companies and authorized for decades under both State and federal law, is not thrown out the window in an unnecessarily broad and poorly defined concept of CCRMUs. To the extent that EPA decides to regulate CCRMUs under the final rule, that concept should not include those numerous areas of legitimate beneficial use that pose no meaningful risk to the environment and that were constructed in full compliance with applicable laws and regulations. Any such retroactive regulation would be patently unfair, contrary to due process, and would constitute an unlawful taking. And, once again, there appears to be no basis for EPA to regulate beneficial uses that have no connection to interstate commerce.

Definitions

- **Circularity of Definitions** – Several of the new or revised definitions contained in the Proposed Rule are ambiguous and often refer to each other in a circular manner. For instance, "CCR landfill," "CCR management unit," and "CCR unit" are defined by reference to each other. For example, a "CCR landfill" is "not a surface impoundment" and not a "CCRMU," while a "CCRMU" is "not a CCR unit" but includes "inactive CCR landfills" and "CCR units that closed prior to October 17, 2015." And similarly, a "CCR unit" is "not a CCRMU," but includes CCR landfills and CCR surface impoundments.

Similar circular references are contained in the definitions of "inactive CCR landfill," "inactive facility," and "legacy CCR surface impoundment." Defining one term by exclusion of another and in turn defining the latter term by exclusion of the former provides no clarity on the boundary between the two. And in a context in which definitional clarity is essential for regulatory clarity – i.e., what's "in" and what's "out" – such ambiguity is fatal. EPA must clarify these definitions to define these terms by their essential characteristics, not by circular references to each other.

- **"Facility"** – This term is defined in the CCR Rule to include "all contiguous land, and structures, other than appurtenances, and improvements on the land, used for treating, storing, disposing, or otherwise conducting solid waste management of CCR." In light of EPA's proposed expansion of the scope of the CCR Rule, and in particular its creation of the category of CCRMUs, EPA should clarify what it means by "contiguous" in this definition. What if CCR locations are separated by a public roadway, site improvements, intervening property, or significant site infrastructure, or are located on different legal parcels? In what circumstances must disparate and discrete locations be considered one "facility" under the rule? This is also important in light of the concerns expressed below concerning the definitions of "inactive facility" and "inactive electric utility or independent power producer."

- **"Inactive facility" vs. "inactive electric utility or independent power producer"** – These terms are identified together in one definition at 40 CFR 257.53 (proposed), as if they are synonymous, but they are not the same and are not used synonymously in the Proposed Rule. Moreover, they are used inconsistently throughout the Proposed Rule in a manner that makes their application confusing. For example, proposed 40 CFR 257.50(d) says that the CCR Rule applies to CCRMUs located at "active or inactive facilities" with a CCR unit – not active or inactive electric utilities or independent power producers. But the intent of the Proposed Rule appears to be to regulate CCR units or CCRMUs at active or inactive generating sites. Did EPA intend this difference and has it evaluated the costs and burdens of extending the rule to non-generation sites? EPA should clarify these terms, and if they are indeed intended to mean different things, they should be defined separately.

- **"Closed"** – The revised definition of "closed" in 40 CFR 257.53 should be clarified to state that a unit is closed, among other things, if the owner or operator "has initiated post-closure care in accordance with § 257.104, ***if applicable***." Post-closure care is not applicable to closure by removal.

- **"Operator"** – The revised definition of "operator" in 40 CFR 257.53 is too broad and may be interpreted to impose CCR Rule liability on individuals or contractors who are retained by owners or operators to "actively engage" in CCR waste management. This definition should be revised to reflect the standard principles for "operator" liability under environmental laws, which should not include employees, individuals, or contractors operating under the direction of a responsible owner or operator.

Necessity of Nationally-Uniform Requirements

The Proposed Rule ignores the fact that the Federal Permit Program for CCR will likely be in place concurrently with, or prior to, the Final Legacy Rule. The Permit Program will provide the opportunity for consideration of site-specific conditions in decision making. Therefore, the prescriptive nature of the Proposed Rule is not necessary. It would be better to have high-level performance-based regulations that the regulated entity and the EPA Permit Manager can use in making appropriate decisions about handling of these units.

Closure Standards

The Proposed Rule is ambiguous with respect to the applicable closure standards for legacy CCR surface impoundments. Proposed 40 CFR 257.101(e) states that legacy units are subject to closure according to 40 CFR 257.102, but legacy CCR surface impoundments are **not** included in the applicability list in 40 CFR 257.102(a), and "CCR unit" is not defined to include legacy CCR surface impoundments.[1] Thus, it is unclear what closure standards apply.

The Proposed Rule is also unclear regarding the applicable closure requirements for a CCRMU if there is no liquid in the unit. Are the cover requirements applicable to such units? EPA appears to state in the preamble that if a CCRMU contains no liquid, no further closure would be required. But does that apply to requirements such as cover, etc.?

For a potential former CCRMU or legacy CCR surface impoundment that previously completed closure by removal, the requirement to comply with the groundwater monitoring requirements that apply to facilities with waste in place[2] is unreasonable. The performance standard for such units should, at least initially, be to perform a presence/absence evaluation of Appendix IV constituents at concentrations greater than the Ground Water Protection Standard (GWPS). In most cases, there will likely be no need to collect eight independent baseline samples and perform statistical evaluations of those data. This approach would help expedite a final closure completion decision should groundwater evaluations be required in the final rule. In some cases, the GWPS might be based upon background concentrations (when greater than drinking water standards) and those units would benefit from a more rigorous background study in establishing site-specific GWPS.

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[1] Although the preamble indicates in several places that a legacy CCR surface impoundment will be a CCR Unit, this is not clearly indicated in the proposed codified text.
[2] Including collection of at least eight independent background samples and subsequent statistical calculation of background.

Compliance Timelines

The compliance timelines in the Proposed Rule for both legacy CCR surface impoundments and CCRMUs are unrealistic and unachievable and will place most owners and operators at immediate risk of non-compliance. Some of the major timing concerns include the following:

- Fundamentally, one of the biggest timing concerns is that so many of the deadlines in the Proposed Rule fall so close to the rule publication and effective dates, that most regulated companies will be forced to begin complying with the rule requirements before they have even seen a final rule. It is unfair to require the regulated community to begin spending time and resources complying with requirements that are only proposed and may change significantly (or even be eliminated) in the final rule. But that is exactly what everyone will have to do to meet the aggressive deadlines in the Proposed Rule.
    - This concern is even more acute in States such as Kentucky, where the Kentucky Public Service Commission's regulations prevent cost recovery through electric rates on the basis of proposed rules. EPA rules must be in final form before regulated utilities may seek recovery through rates. But that timing will be impossible under the Proposed Rule, which will require EKPC and others to incur substantial effort and costs prior to finalization of the rule in order to meet the aggressive timelines under the rule.
- Why are the timelines different for legacy CCR surface impoundments vs. CCRMUs, when the significant technical and logistical challenges for these previously unregulated units are largely the same? For example, owners and operators must have identified all legacy units by the effective date of the rule, even though these units are by definition located at facilities that have not operated for at least eight years. Identifying and evaluating them may require significant effort. In contrast, owners and operators are given an additional three months to identify CCRMUs. (But see below.)
- The requirement to complete Facility Evaluations for every potential CCRMU at every active or inactive facility within three months of the effective date of the rule is unrealistic. The time required to identify and evaluate potential CCRMUs, including evaluating complicated questions regarding beneficial use, will severely tax the in-house and consulting resources available to the regulated community. This effort includes not only detailed record reviews and site inspections, but potential field investigations that would include sampling and analysis of soils, groundwater, etc. Properly designing and implementing a field investigation program takes months, not weeks, and would extend any timeline well beyond nine months from the publication date of the final rule.
- EPA has made unrealistic assumptions about the amount of time (one to two weeks!) needed to obtain and evaluate bids for work and to select contractors. This is not enough time to prepare a complex scope of work, much less seek and evaluate bids and select a contractor. And numerous companies will be seeking the same services from the same companies, stretching the available resources.
- Completion of a stability analysis in 8-12 weeks is not possible. This is not enough time to complete the necessary geotechnical investigations and get reports back from

laboratory testing. Subsurface investigations and geotechnical studies also need to be scoped, bid, and awarded with substantial time to schedule drillers and get testing/lab data/reports back before the required engineering analysis can proceed.

- Structural stability and safety factor assessments cannot be accelerated by 15 months from the 2015 durations. This is not feasible and therefore cannot be required by EPA.
- Site characterization should not occur simultaneously with well installation. EPA has asserted that the industry does not know how to install groundwater monitoring networks; however, now they are suggesting that we can install them without appropriate investigations and design. EPA's assumption of 7 to 8.5 months to install a groundwater network is clearly an arbitrary deadline, and requiring this to be completed six months after the effective date of the rule does not align even with EPA's own aggressive timeline.
- EPA asserts that the list of monitoring wells to be sampled can only be determined after installation of the groundwater monitoring network; however, the sampling and analysis plan must be completed at the same deadline for the installation of the groundwater monitoring network. This is clearly impossible.
- EPA requires that the SAP include selection of statistical methods. This is not possible because such selection requires at least eight (8) independent samples and, as EPA has acknowledged, a period of up to 24 months to generate said sample results. Nevertheless, an SAP is appropriate prior to collection of the eight independent samples to provide defensibility of the data. Therefore, the requirement to include selection of statistical methods in the SAP should be removed, and allowance for a separate statistical evaluation plan should be added.
- Why is there a requirement to create a website at the effective date of the rule when nothing is required to be posted on it for 30 days?
- The Proposed Rule requires initiation of closure of both legacy CCR surface impoundments and CCRMUs within 12 months of the effective date of the rule, even though owners and operators will not even have the results of groundwater monitoring at that time. How can adequate closure plans be designed and implemented in such a short timeframe and with incomplete information?

Conclusion

Thank you for your consideration of these comments. EKPC looks forward to working with EPA concerning this rulemaking. Should you have any questions regarding these comments, please contact Jerry Purvis at 859-744-4812.

BEFORE THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In re: Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments	Docket No. EPA-HQ-OLEM-2020-0107

PETITION FOR STAY

Pursuant to Section 705 of the Administrative Procedure Act (the "APA"), 5 U.S.C. § 705, East Kentucky Power Cooperative, Inc. ("EKPC"), hereby petitions the Administrator of the United States Environmental Protection Agency ("EPA" or the "Agency") to stay the effective date of its final rule entitled *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments*, 89 Fed. Reg. 38950 (May 8, 2024) ("Final Rule"), pending judicial review.

EKPC supports the lawful and reasonable regulation of coal combustion residuals ("CCR"). In fact, EKPC has been a leader in safely and responsibly managing CCR disposal, working proactively with the Commonwealth of Kentucky to ensure that CCR is handled appropriately. But the Final Rule is unlawful and arbitrarily penalizes EKPC by forcing it to re-open a long-completed transaction in which it closed a surface impoundment by removal of the CCR under State supervision. The Resource Conservation and Recovery Act simply cannot be read to authorize this use of regulatory power. *Cf. Loper Bright Enters. v. Raimondo*, 144 S. Ct. 2244, 2266 (2024). Without a stay pending judicial review, EKPC will be forced to begin incurring compliance costs for regulations that will ultimately be declared invalid. This waste of resources is unnecessary and serves no environmental benefit. It also threatens to harm economically vulnerable consumers by ultimately raising their energy prices.

The Final Rule would impose burdensome obligations with regard to legacy CCR surface impoundments that EKPC has already closed by removal under the supervision of the Kentucky Energy and Environment Cabinet's Division of Waste Management. EKPC did so long before such impoundments were regulated under federal law. But the Final Rule now seeks to re-open that long-completed transaction and requires EKPC to do additional, unnecessary work under federal supervision. A stay would allow time for judicial review and spare EKPC from the irreparable harm that would be caused by undertaking efforts to comply with this unlawful Final Rule.

BACKGROUND

1. East Kentucky Power Cooperative

EKPC is a not-for-profit rural electric generation and transmission cooperative with headquarters in Winchester, Kentucky. EKPC is owned and governed by member cooperatives that use the energy and services EKPC provides to supply electricity to end-users across Kentucky. EKPC's vital mission is to safely generate and transmit affordable, reliable power to these cooperatives serving more than 1 million rural Kentuckians in 520,000 homes, farms, and businesses. EKPC provides wholesale energy and services to a customer base that is comprised predominantly of residential customers (93 percent). Of the 87 Kentucky counties that EKPC's cooperatives serve, 40 counties experience persistent poverty, as reported by the USDA. Twenty-six percent of the population EKPC serves lives below the poverty line, making every dollar spent critical to its mission to serve.

Many of these consumers have been plagued by unemployment from economic downturns affecting mines, trucking companies, restaurants, and other businesses. The unemployment rate is 60% higher than the national average. The end users of energy produced by EKPC rely heavily on government assistance to survive; 30 to 54 percent of total income in most eastern Kentucky counties comes from government assistance. Forty-two percent of these electricity users are elderly (65 years or older). Many are on fixed incomes and reside in energy-leaking mobile homes. Given these persistent economic challenges, EKPC has a strong interest in keeping energy affordable for its consumers.

The Final Rule would impose millions of dollars of additional compliance obligations on EKPC. These costs would necessarily be passed on to EKPC's owner-members, in many cases without any material benefit to the environment and at great potential detriment to its owner-member cooperatives and their ratepayers.

2. RCRA Subtitle D

The fundamental framework of the Resource Conservation and Recovery Act ("RCRA") differs significantly between Subtitle C, 42 U.S.C. §§ 6921–6939g—which asserts a cradle-to-grave federal authority over *hazardous* waste management—and Subtitle D, *id.* §§ 6941–6949a—which governs *non-hazardous* solid waste subject to national guidelines. *Util. Solid Waste Activities Grp. v. EPA*, 901 F.3d 414, 423 (D.C. Cir. 2018) ("*USWAG*"). Here, EPA invokes Subtitle D for authority to regulate CCR. Final Rule, 89 Fed. Reg. at 38952.

Under Subtitle C, EPA directly regulates all stages of generation and disposition of hazardous wastes and has administrative enforcement power and authority to initiate or recommend civil and criminal actions in court. *See* 42 U.S.C. §§ 6922–6928. Subtitle D, on the other hand, gives States primary regulatory responsibility for disposal of nonhazardous wastes in landfills and dumps. *USWAG*, 901 F.3d at 423.

As the D.C. Circuit explained in *USWAG*, "Subtitle D leaves it up to the states to 'use federal financial and technical assistance to develop solid waste management plans in accordance with [the] federal guidelines.'" *Id* at 423–24. Specifically, Subtitle D "calls on the EPA to promulgate criteria distinguishing 'sanitary landfills,' which are permissible under the statute, from 'open dumps,' which are prohibited." *Id.* at 420 (quoting 42 U.S.C. § 6944(a)). Broadly speaking, an "open dump" is defined as "any facility or site where solid waste *is disposed of* which is not a sanitary landfill which meets the criteria promulgated under section 6944 . . . ." 42 U.S.C. § 6903(14) (emphasis added). When it comes to promulgating the criteria to distinguish between a sanitary landfill and an open dump, Subtitle D provides that "a facility may be classified as a sanitary landfill and not an open dump only if there is *no reasonable probability* of adverse effects on health or the environment from disposal of solid waste at such facility." *Id.* § 6944(a) (emphasis added).

3. 2015 CCR Rule and the *USWAG* decision

EPA promulgated its first rule regulating CCR in 2015 ("the 2015 Rule"). *USWAG*, 901 F.3d at 423. The 2015 Rule set minimum criteria for the disposal of CCR in landfills and surface impoundments. *Id.* at 424. These included location restrictions on landfills and surface impoundments; requirements pertaining to liners, structural integrity, and groundwater monitoring; and criteria for beneficial use of CCR, such as using CCR in road construction and in the manufacture of concrete and wallboard. *Id.* The 2015 Rule regulated all *active* surface impoundments and *inactive* surface impoundments at *active* power plants, but it expressly exempted *inactive* surface impoundments at *inactive* power plants. *Id.* at 449.

In 2018, the D.C. Circuit vacated and remanded certain provisions of the 2015 Rule that: (1) permitted unlined impoundments to continue receiving CCR unless they leak; (2) classified "clay-lined" impoundments as lined; and (3) exempted from regulation inactive impoundments at inactive facilities in 40 C.F.R. § 257.50(e). *See* *USWAG*, 901 F.3d at 427, 449. The Court expressly declined to address the impact of the Water Infrastructure Improvements for the Nation Act ("WIIN Act"), Pub. L. No. 114-322, 130 Stat. 1628 (2016) (codified at 42 U.S.C. § 6945(d), "leav[ing] it open for the EPA to address on remand the relevance of the [Act], the Act's express incorporation of the EPA regulations published at 40 C.F.R. Part 257, and its definition of 'sanitary landfill.'" *Id.* at 426.

One aspect of the court's decision warrants particularly careful attention for purposes of this Petition. As discussed above, the Court concluded that RCRA requires EPA to regulate inactive impoundments at inactive facilities. In reaching this conclusion, the Court rejected the industry petitioners' argument that inactive impoundments that contain solid waste, but no longer receive new solid waste, cannot be considered "open dumps." *Id.* at 439. Industry petitioners asserted that RCRA's definition of "open dump[s]" is limited to locations where solid waste "is disposed of." *Id.* In other words, they contended that "the site must actively receive new waste to come within the statutory definition of a regulable waste disposal dump." *Id.* The Court disagreed, noting that the "definition of 'open dump,' which is the key term at issue, does not use the word 'disposal.'" *Id.* at 440. Instead, "[i]t uses the phrase 'is disposed of': An 'open dump' is 'any facility or site where solid waste *is disposed of*.'" *Id.* (quoting 42 U.S.C. § 6903(14)). The Court interpreted the active "is" and past participle "disposed," and concluded that "an open dump includes any facility (other than a sanitary landfill or hazardous waste disposal facility), where solid waste still 'is deposited,' 'is dumped,' 'is spilled,' 'is leaked,' or 'is placed,' regardless of when it might have originally been dropped off." *Id.* In other words, a "garbage dump is a garbage dump *until the deposited garbage is gone*." *Id.* at 441 (emphasis added). Thus, the Court set an outer boundary for RCRA's application: Following removal of the disposed-of material, RCRA no longer authorizes EPA to regulate the site.

4. WIIN Act

In 2016, Congress fundamentally amended RCRA Subtitle D with the WIIN Act. Pertinent here, the WIIN Act envisioned a state-permitting program, subject to EPA oversight and approval, to "operate in lieu of [EPA] regulation of coal combustion residuals units in the State," provided that those programs are at least as protective as the existing, or successor, EPA regulations. 42 U.S.C. § 6945(d)(1)(A). The WIIN Act also calls for EPA to create a federal permitting program to operate in the absence of an approved State program.

By directing EPA and the States into a permitting regime for CCR, Congress expressed an unequivocal intent to eschew one-size-fits-all regulation of CCR for a bespoke permitting program that can account for important differences between CCR disposal sites, including differences based on geography and geology. Yet, since adoption of the WIIN Act, EPA has approved only three State permitting programs—in Oklahoma, Georgia, and Texas—and it has yet to create the federal permitting program mandated by the Act, opting instead to address CCR disposal through the Final Rule. EPA recently rejected Alabama's proposed permitting program. 89 Fed. Reg. 48774 (June 7, 2024).

5. Final Rule

The Final Rule regulates two previously unregulated types of CCR units: legacy CCR surface impoundments and coal combustion residual management units, or CCRMUs for short. Significantly, the scope of the Final Rule is not tailored to reach merely those CCR units that have *never been closed*. Instead, its reach extends even to those CCR units that have been closed under the supervision of State regulators. It even impacts units that no longer contain CCR. The Final Rule, for the first time, subjects inactive impoundments at inactive facilities to regulation, and it does so as long as such impoundments contained both liquids and CCR as of *October 19, 2015*. This affects two former impoundments at EKPC's Dale Station that have already been "clean-closed"[1] under the supervision of the Kentucky Energy and Environment Cabinet's Division of Waste Management ("KDWM").

The Dale Station ceased generating electricity before the 2015 Rule was finalized and took effect. All the generating assets have been removed, and there is no ongoing generation at the site. The Dale Station previously contained three CCR impoundments, known as Ponds 2, 3, and 4, and referred to collectively as the former Dale impoundments. These Ponds were used to store and treat ash sluiced from the on-site coal-fired generation. (Note that at the time of closure, Pond 2 included both former Pond 1 and Pond 2, which were combined in the mid-1990s by removal of a dike that had separated them previously.) Pond 3 was not regulated by the 2015 CCR Rule because it did not contain both CCR and liquid as of October 19, 2015, and also because it was located at an inactive facility (*i.e.*, no active electric power generation). Ponds 2 and 4 were not regulated by the 2015 CCR Rule because they were inactive impoundments (*i.e.*, no active placement of waste) at an inactive facility as of October 19, 2015. As of October 19, 2015, only Ponds 2 and 4 contained any liquids; Pond 3 had been completely dewatered by that time. Ponds 2 and 4 were completely dewatered a short time later.

Nevertheless, despite the lack of any regulatory obligation, EKPC decided to act expeditiously and proactively to remove all CCR from the former Dale impoundments. To this end, those former impoundments were closed in accordance with a closure plan approved by the KDWM on July 14, 2014, over a year before the 2015 Rule became effective, and even well before the final 2015 Rule was published on April 17, 2015. The State-approved closure plan required removal of all CCR from the former impoundments down to the level of existing soils, plus certification of removal by a third-party Professional Engineer and verification by visual inspection performed by representatives of KDWM. The CCR removed from the former Dale impoundments was disposed of in the State-permitted and CCR Rule-regulated CCR landfill at EKPC's J.K. Smith Station. KDWM did not require groundwater monitoring at the Dale Station as long as complete removal of CCR was verified and

[1] East Kentucky uses this term as shorthand for closure by removal of the CCR.

the CCR was properly disposed off-site. EKPC met these requirements, and KDWM issued a letter on January 17, 2019, accepting EKPC's report and certification of clean closure by removal for all three former impoundments. Despite this, the Final Rule will impose burdensome requirements pertaining to Ponds 2 and 4—including groundwater monitoring—simply because they still contained liquid and CCR on *October 19, 2015*.

The consequences of EPA's overregulation regarding legacy impoundments are significant and harmful. Under the Final Rule, EKPC and other companies will be required to install costly groundwater monitoring systems and begin both detection and assessment monitoring. The complexities of designing and installing adequate groundwater monitoring systems have not been fully appreciated or accounted for in the rulemaking process.

REQUEST FOR AN APA § 705 STAY PENDING JUDICIAL REVIEW

EKPC filed a petition for review of the Final Rule in the U.S. Court of Appeals for the D.C. Circuit on August 2, 2024. While judicial review is pending, Section 705 of the Administrative Procedures Act authorizes EPA to stay the effective date of the rule if it "finds that justice so requires." 5 U.S.C. § 705. EKPC requests that the EPA make such a finding here.

The Final Rule takes effect on November 4, 2024. A stay is required to avoid the unnecessary expenditure of EKPC resources, EPA resources, State resources, and the resources of the public and regulated industries in complying with a Final Rule that is unlikely to be sustained in its current form. The same four-factor analysis used by courts for granting a judicial stay pending review supports the EPA issuing its own stay pending review here. Under these familiar factors, considerations include: (1) the likelihood of success on the merits of the judicial challenge; (2) irreparable harm to the applicant if a stay is not granted; (3) the potential for harm to others if the stay is granted; and (4) whether the public interest weighs in favor of granting the stay. *Ohio v. EPA*, 144 S. Ct. 2040, 2052 (2024).

1. EKPC is likely to succeed on the merits.

EKPC's petition for review is likely to be granted on the merits for at least five reasons. First, the Final Rule exceeds EPA's authority under RCRA. Second, even if the Final Rule is within EPA's authority under RCRA, it is still invalid because it is outside the federal government's authority under the Commerce Clause. Third, the Final Rule is impermissibly retroactive because it seeks to impose additional requirements for closure on impoundments that were previously closed under state programs at a time when federal law elected not to regulate such impoundments. Fourth, the Final Rule flouts the WIIN Act's directive for EPA to develop and implement a more State-centric, site-specific permitting program for CCR regulation.

Fifth, the Final Rule is arbitrary and capricious. It suffers from myriad arbitrary-and-capricious flaws, including the retroactive re-closure requirements discussed above, departures from Congressional authority under RCRA for areas where solid waste is not "disposed of," and maintaining a self-implementing approach when the WIIN Act requires consideration of site-specific risks—just to name a few.

a. The Final Rule exceeds EPA's authority under RCRA.

"[A]n agency literally has no power to act . . . unless and until Congress confers power upon it." *Louisiana Pub. Serv. Comm'n v. FCC*, 476 U.S. 355, 374 (1986). This "is axiomatic." *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208 (1988); *see also Loper Bright Enters., Inc. v. Raimondo*, 45 F.4th 359, 373 n.15 (D.C. Cir. 2022) (Walker, J., dissenting) (collecting cases), *rev'd* 144 S. Ct. 2244 (2024). RCRA does not authorize EPA to regulate sites where solid waste is no longer disposed of. The D.C. Circuit made this point perfectly clear in *USWAG*. *See* 901 F.3d at 441. EPA must operate "within th[e] boundaries" set by Congress. *Loper Bright Enters.*, 144 S.Ct. at 2263.

Subtitle D of RCRA distinguishes between two types of sites: sanitary landfills and open dumps. 42 U.S.C. §§ 6944, 6945. But the Final Rule regulates sites that are neither, including EKPC's Dale Station site. In that way, the Rule exceeds EPA's statutory authority.

The D.C. Circuit held that RCRA Subtitle D extends to sites where waste was once disposed of, even if those sites no longer receive new solid waste. *USWAG*, 901 F.3d at 440. But the Court also held that Subtitle D's reach is at its end when the waste is cleared from a site: "A garbage dump is a garbage dump until the deposited garbage is gone." *Id*. at 441.

By that definition, the former Ponds 2 and 4 at the Dale Station are not garbage dumps; they are clean-closed units that contain no waste. *See* EKPC Comments on Proposed Rule, *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments,* 88 Fed. Reg. 31982, at 1 (July 17, 2023) (hereafter, "EKPC Comments") (warning that the Rule would "unfairly and unnecessarily capture numerous sites where former surface impoundments were properly clean-closed by removal under then-applicable State regulations"). In other words, no solid waste "is disposed of" at the former Ponds 2 and 4—or any of the former Dale Station impoundments for that matter. 42 U.S.C. § 6903(14). All liquids were removed from those former impoundments nearly a decade ago, and in 2019, the KDWM certified that EKPC completely removed all CCR from the former impoundments and properly disposed of it. As a result, RCRA Subtitle D does not apply to any of the former Dale Station impoundments, or any other like sites where the waste has been cleared. Therefore, EPA's Final Rule exceeds RCRA's scope by purporting to govern clean-closed sites that contain no waste. The plain language of RCRA permits no other conclusion. *See Loper Bright Enters.*, 144 S. Ct. at 2266 ("In the business of statutory interpretation, if it is not the best, it is not permissible."). The statute applies to sites where solid waste "is disposed of," 42 U.S.C. § 6903(14), not sites where solid waste is disposed of *or once was disposed of*. *Cf. Garland v. Cargill*, 602 U.S. 406, 423 (2024) (setting aside ATF's regulation of bump stocks because the statutory definition of "machinegun" "asks only whether a weapon fires more than one shot 'by a single function of the trigger,'" not whether it fires more than one shot by a single pull of the trigger *or* any "analogous motions").

Moreover, with an asserted "breadth of the authority" so vast and the "economic and political significance" so consequential, there is "reason to hesitate before concluding that" RCRA Subtitle D supports EPA's regulatory undertaking of such expanse. *West Virginia v. EPA*, 597 U.S. 697, 721 (2022) (quoting *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 159–160 (2000)). EPA attempted to implement a comparably expansive rule based on its interpretation of the term "air pollutant" in the Clean Air Act, but the Supreme Court prevented EPA from "seizing expansive power that" that no statute granted. *Utility Air Regul. Grp. v. EPA*, 573 U.S. 302, 324 (2014). And the assertion of authority in that case was far more "textual[ly] plausibl[e]" than EPA's assertion here that waste is still disposed of where no waste has been for years. *West Virginia*, 597 U.S. at 722. Significantly, "a colorable textual basis" was not enough to justify that regulation under the Clean Air Act. *Id.* Instead, the Court required EPA to "point to 'clear congressional authorization' for the power it claims." *Id.* at 723 (quoting *Utility Air*, 573 U.S. at 324). EPA should have to do the same here, and it cannot. To the contrary, the authority EPA asserts in the Final Rule is directly contrary to the plain language of RCRA.

Because RCRA Subtitle D does not authorize EPA's attempted regulation of sites like former Ponds 2 and 4 at the Dale Station—in which no waste remains—the Final Rule must be stayed.

b. The Final Rule violates the Commerce Clause.

The Final Rule asserts regulatory authority beyond the reach of the Commerce Clause. *See* U.S. Const. art. I, § 8 (Congress shall have power "[t]o regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes."). The CCR at issue here is a waste product that was generated in Kentucky and disposed of in Kentucky. Neither the CCR nor the units in which it is—or was—disposed are channels of interstate commerce or instrumentalities of interstate commerce, nor do they substantially affect interstate commerce.[2] *See United States v. Morrison*, 529 U.S. 598, 609, 613 (2000) (rejecting attenuated arguments that criminal statute could substantially affect interstate commerce through "costs of crime" and "national productivity").

Further, the Final Rule seeks to regulate sites—like the former Ponds 2 and 4 at the Dale Station—that have already been clean-closed, and therefore have no potential for *any* negative environmental effects, much less negative *interstate* environmental effects. EPA has not linked the scope of its asserted regulatory authority to any interstate environmental effects in any way.

Finally, EPA should not construe RCRA to extend to the outer boundaries of Congressional authority with respect to purely intrastate activities without clear Congressional direction. *See Solid Waste Agency of N. Cook Cnty. v. U.S. Army Corps of Engineers*, 531 U.S. 159, 172 (2001) (rejecting EPA's interpretation of the Clean Water Act because the Agency's interpretation of the Act to cover isolated, purely intrastate ponds would "invoke[] the outer limits of Congress' power."). Such direction does not exist here.

c. The Final Rule is impermissibly retroactive.

EPA's Final Rule imposes a retroactive element to RCRA's definition of "open dump" that cannot be reconciled with the language used by Congress. But even setting that aside, retroactivity itself remains a problem here. "Retroactivity is not favored in the law," and "congressional enactments and administrative rules will not be construed to have retroactive effect unless their language requires this result." *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208 (1988). Thus, "a statutory grant of legislative rulemaking authority will not, as a general matter, be understood to encompass the power to promulgate retroactive rules unless that power is conveyed by Congress in express terms." *Id.* And no such terms exist here.

Impermissible retroactivity is found when the action "would impair rights a party possessed when he acted, increase a party's liability for past conduct, or impose new duties with respect to transactions already completed." *Celtronix Telemetry, Inc. v. FCC*, 272 F.3d 585, 588 (D.C. Cir. 2001) (quoting *Landgraf v. USI Film Prods.*, 511 U.S. 244, 280 (1994)). Stated differently, "[a] retroactive rule forbidden by the APA is one which 'alter[s] the past legal consequences of a past actions.'" *Celtronix*, 272 F.3d at 588. This implicates "the 'familiar considerations of fair notice, reasonable reliance, and settled expectations . . . ." *Nat'l Petrochemical & Refiners Ass'n v. EPA*, 630 F.3d 145, 160 (D.C. Cir. 2010) (quoting *Landgraf*, 511 U.S. at 270).

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[2] East Kentucky does not concede that the "substantial effects" test that has been applied by the courts is an appropriate measure of the federal government's interstate commerce power. *See Morrison*, 529 U.S at 627 (Thomas, J., concurring).

Here, EPA's Final Rule is impermissibly retroactive in several ways as applied to EKPC's clean-closed units at the Dale Station. First, the Final Rule impairs the rights that EKPC had when it acted because EKPC's prior cleanup of CCR under State oversight afforded EKPC with legal rights, and those protections have now been removed even though federal law under the 2015 Rule did not cover such features. Second, the Final Rule imposes new duties on completed transactions by requiring EKPC to re-open and re-close the previously clean-closed impoundments and comply with other requirements. Finally, the Final Rule increases liability for past conduct by requiring EKPC to incur new and additional costs or face penalties unless EKPC follows EPA's new program for closure of these units. If EKPC had known that groundwater monitoring would be required when it closed Dale Ponds 2 and 4 years ago, it would have conducted the grading and earth-moving aspects of the project differently to better facilitate such monitoring. But now it will have to undo some of its prior work and redo it at additional cost.

Further, there is no clear statement here that Congress permitted retroactive regulations, and basic principles of fair notice and reliance compel prospective application, especially when EPA held the opposite position as recently as the 2015 Final Rule (*i.e.*, no regulation of these sites). As Courts have concluded, RCRA generally "operates prospectively," not retrospectively. *Nova Chemicals, Inc. v. GAF Corp.*, 945 F. Supp. 1098, 1104 (E.D. Tenn. 1996) (noting that, "[w]hen President Carter signed CERCLA into law [years after RCRA's enactment], Representative Florio remarked 'Prospectively we have ... [RCRA], and therefore we should have no new Love Canals being created. And [CERCLA], of course, is the second part, which is to go back and clean up what, unfortunately, has been done over the last number of years.'"); *United States v. Price*, 577 F. Supp. 1103, 1109 (D.N.J. 1983) ("RCRA is 'prospective and applies to past sites only to the extent that they are posing an imminent hazard.'") (quoting H.R. Rep. No. 1016, 96th Cong.2d Sess., pt. 1 at 18, reprinted in U.S. Code Cong. & Ad. News 6119, 6125).

In support of its position that the text of RCRA supports retroactive application, EPA offered merely the statement that "inactive impoundments are 'open dumps,'" *i.e.*, "facilities 'where solid waste is disposed of,' 42 U.S.C. § 6903(14) . . . ." 89 Fed. Reg. at 38985. However, this language cannot be interpreted to apply to units—like the former impoundments at the Dale Station—from which the solid waste has been removed and the unit has been clean-closed under State supervision; the solid waste is not "disposed of" there. As discussed elsewhere below, the statutory language certainly falls short of a "clear statement" that Congress intended retroactive application. To the contrary, the language in fact indicates that Congress did *not* intend for retroactive application.

d. The Final Rule is contrary to RCRA Subtitle D, as modified by the WIIN Act.

The Final Rule uses a one-size-fits-all, self-implementing approach to CCR regulation in violation of the WIIN Act's directive for EPA to develop and implement a site-specific permitting program for CCR regulation. In *USWAG*, the D.C. Circuit observed that EPA had historically relied on a "self-implementing" framework for subtitle D—*i.e.*, a framework of standards that come into effect automatically and uniformly, without the need for tailored approaches based on state- or site-specific considerations. However, the D.C. Circuit explained that the WIIN Act changed matters: "[a]lthough a one-size-fits-all national standard might have been necessary for the self-implementing [2015 Rule], more precise risk-based standards are both feasible and enforceable under the individualized permitting programs and direct monitoring provisions authorized by the WIIN Act." *USWAG*, 901 F.3d at 437.

The WIIN Act modified RCRA Subtitle D and requires the EPA to implement a federal permitting program (or to approve State-permitting plans) governing disposal of CCR. *See, e.g.*, 42 U.S.C. § 6945(d)(1)(B) (stating that the Administrator "*shall* approve" a State permit program if certain conditions are met) (emphasis added); *id.* § 6945(d)(2)(B) (subjecting "nonparticipating" States to a federal permitting program that, if certain conditions are met, the Administrator "shall implement"). But EPA has ignored Congress's mandate—for 8 years, despite having funding for the project[3]—and has let a permitting plan languish so it can attempt to regulate CCR via brand-new, self-implementing CCR rules that create wholly new categories of CCR. 89 Fed. Reg. 39035 (CCRMUs); *id.* at 38951 (Surface

[3] *USWAG*, 901 F.3d at 437 n.7 ("On March 23, 2018, the Consolidated Appropriations Act of 2018 was signed into law. Pub. L. No. 115-141, 132 Stat. 348. It allocates funds to the EPA to 'implement[] a coal combustion residual permit program under' the WIIN Act. *Id.* at Division G, Title II. Accordingly, with its recently acquired funding, the EPA is to 'implement a permit program' in non-participating states. 42 U.S.C. § 6945(d)(2)(B)."); National Rural Electric Cooperative Association, Comment on Proposed Rule, *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments,* 88 Fed. Reg. 31892, at 2 (July 17, 2023) (citing "Consolidated Appropriations Act, 2023, Pub. L. No. 117-328, Div. G, Tit. II (2022); Consolidated Appropriations Act of 2022, Pub. L. No. 117-103, Div. G. Tit. II, 136 Stat. 49, 380 (2022); Consolidated Appropriations Act, 2021, Pub. L. No. 116-260, Div. G, Tit. II, 134 Stat. 1182, 1508 (2020); Further Consolidated Appropriations Act, 2020, Pub. L. No. 116-94, Div. D, Tit. II, 133 Stat. 2534, 2715 (2019); Consolidated Appropriations Act, 2019, Pub. L. No. 116-6, Div. E, Tit. II, 133 Stat. 13, 234 (2019); and Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, Div. G, Tit. II, 132 Stat. 348, 662 (2018)") ("Congress has appropriated funding to implement a federal CCR permit program every year since 2018.").

Impoundments). The Final Rule is thus not a "successor regulation," but something entirely new, regulating surface impoundments (as newly defined) and CCRMUs (a whole new unit). *Id.*; *see also* 42 U.S.C. § 6945(d)(3) (explaining that "part 257 of title 40, [C.F.R.] (or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title)" apply to CCR units that do not have a state permit).

The WIIN Act does not authorize EPA to ignore its congressional mandate to adopt a permitting program and elect instead to broaden its authority via one-size-fits-all, self-implementing rules. To be sure, the WIIN Act does permit EPA regulations to govern non-participating states until EPA enacts a federal-permitting program or approves a State program. In this way, the WIIN Act gives EPA some runway to develop its federal permitting program and allows the *existing* 2015 CCR rule to govern either until a State permitting program is adopted (for participating States) or a federal permitting program is developed by EPA (for non-participating States). *See* 42 U.S.C. § 6945(d)(2)(B). But the WIIN Act's structure makes clear that Congress intended EPA to replace a one-size-fits-all, self-implementing regime with a permitting program—whether administered by a State or the EPA itself. *See generally, id.* § 6945. The State- or EPA-permit requirements could be tailored to a site consistent with the WIIN Act mandate, resulting in requirements appropriate to the environmental risk, or lack thereof, at hand.

In *USWAG*, the D.C. Circuit expressly left it for EPA to consider how the WIIN Act has changed the regulatory framework. *USWAG*, 901 F.3d at 426 ("We leave it open for the EPA to address on remand the relevance of the WIIN Act, the Act's express incorporation of the EPA regulations published at 40 C.F.R. Part 257, and its definition of 'sanitary landfill.'"). But rather than acknowledge that the WIIN Act has, in fact, changed the regulatory framework, EPA has plowed ahead in disregard of the WIIN Act. Now, six years after *USWAG*, and eight years after the WIIN Act was adopted, EPA explains in the Final Rule that the risk CCRMUs and CCR units pose justifies regulation under the "self-implementing" framework rather than waiting "several years" until every unit is permitted under the WIIN Act's mandated federal permitting program. 89 Fed. Reg. 39025, 39059.

This is a "crisis" of EPA's own making. EPA has sat on its hands for eight years, ignoring Congress's mandate to develop a permitting program. The Final Rule flouts Congress's will and reveals nothing less than EPA's efforts to turn the WIIN Act into a dead letter. Given the Final Rule's plain incompatibility with the WIIN Act, EPA should stay the rule pending judicial review.

e. The Final Rule is arbitrary and capricious.

In a challenge to an agency rule, the reviewing court must "hold unlawful and set aside agency action . . . found to be . . . arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," or that is "unsupported by substantial evidence." 5 U.S.C. § 706(2)(A), (E). A rule fails under that standard "if it is not 'reasonable and reasonably explained.'" *Ohio*, 144 S. Ct. at 2053 (quoting *FCC v. Prometheus Radio Project*, 592 U. S. 414, 423 (2021)). Courts will find agency action "arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Motor Vehicles Mfrs. Ass'n v. State Farm*, 463 U.S. 29, 43, (1983).

An agency action is also arbitrary and capricious "if it rests upon a factual premise that is unsupported by substantial evidence." *Genuine Parts Co. v. EPA*, 890 F.3d 304, 312 (D.C. Cir. 2018) (*quoting Ctr. For Auto Safety v. Fed. Highway Admin.*, 956 F.2d 309, 312 (D.C. Cir. 1992)). To determine whether an agency action was based on substantial evidence, the court "must consider the whole record upon which an agency's factual findings are based, including" evidence that "'fairly detracts' from the evidence supporting the agency's decision." *Id.* (*quoting Universal Camera Corp. v. NLRB*, 340 U.S. 474, 487–88 (1951)).

i. The Final Rule is arbitrary and capricious because EPA seeks to reopen long-completed transactions that were undertaken with State oversight.

As discussed above, the Final Rule is illegally retroactive. However, it is also arbitrary and capricious because it "alter[s] future regulation in a manner that makes worthless substantial past investment incurred in reliance upon the prior rule." *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 220, (1988) (Scalia, J., concurring) ("a rule is an agency statement 'of future effect,' not 'of future effect and/or reasonable past effect.'"). For example, if EKPC had known in 2015 what was going to happen, it would have closed the former Dale Station impoundments differently. In particular, its engineering practices would have deployed a substantially different approach to the final grading plan by providing roadbed materials and a path to install groundwater monitoring wells. To go back and do this now will require much greater cost than if EKPC had done this work while initially closing the former impoundments. The Final Rule places into question the status of these past investments to close impoundments like Dale Ponds 2 and 4. Thus, the Final Rule threatens to "make[] worthless" much of the prior investments that were made in reliance on the prior regulatory status of these impoundments. *Id.* At minimum, "the agency failed to supply 'a satisfactory explanation for its action.'" *Ohio*, 144 S. Ct. at 2053 (citation omitted).

ii. Requiring re-closure of previously closed CCR units that do not contain CCR is arbitrary and capricious.

EPA has not provided any evidence that legacy CCR surface impoundments that were dewatered and clean-closed under State supervision—like those at EKPC's Dale Station, which were dewatered and clean-closed almost a decade ago—could pose any "reasonable probability" of harm. *See* 89 Fed. Reg. 38984; *see also USWAG*, 901 F.3d at 441 ("A garbage dump is a garbage dump until the deposited garbage is gone."). EPA may regulate "open dumps" under RCRA Subtitle D, but not a facility where "there is no reasonable probability of adverse effects." 42 U.S.C. § 6944(a).

To support its surface impoundment definition as applied to legacy CCR surface impoundments, EPA relies on speculation that these sites formerly had "groundwater contamination present" before closure, and that it is "possible … contaminated soil remains, which can serve as a source of further contamination." 89 Fed. Reg. 38984. EPA provides insufficient evidence to support this speculative finding.

iii. EPA's application of a self-implementing approach to CCR regulation in the Final Rule is arbitrary and capricious in light of the WIIN Act.

As explained above, Congress intended for new CCR regulatory controls promulgated after the WIIN Act to be implemented through federal and State permitting programs that consider site-specific risks. This means the Final Rule's "one-size-fits-all" approach to regulating CCR is arbitrary and capricious.

In *USWAG*, the D.C. Circuit explained that "more precise risk-based standards are both feasible and enforceable under the individualized permitting programs and direct monitoring provisions authorized by the WIIN Act" than the traditional one-size-fits-all, self-implementing approach. *USWAG*, 901 F.3d at 437; *see also Natural Res. Def. Council, Inc. v. SEC,* 606 F.2d 1031, 1053 (D.C. Cir. 1979) (explaining that agencies must consider "reasonably obvious alternative" when rulemaking and "explain its reasons for rejecting alternatives in sufficient detail"). EPA did not sufficiently explain its reasons for creating national criteria for CCRMUs and legacy impoundments and declining to use a site-specific approach to regulate CCR according to Congress's expressed desire. Congress clearly contemplated that new CCR regulatory controls should occur through State or federal permitting processes, not a one-size-fits-all regulation. EPA cannot justify its approach on the fact that the federal permitting program is not yet established after EPA waited eight years to create it.[4] That problem is one of EPA's own making.

iv. The Final Rule is arbitrary and capricious because it penalizes owners that have responsibly and diligently maintained oversight of their facilities.

The Final Rule inexplicably defines "legacy CCR surface impoundment" in a manner that is internally inconsistent and that penalizes owners of impoundments who have responsibly and diligently maintained oversight of their facilities. It does this by exempting legacy impoundments that do not currently contain CCR and liquids if their owners do not have sufficient records or information to show whether the impoundments contained CCR and liquids as of October 14, 2015. *See* 89 Fed. Reg. at 39106. In other words, a records-keeping gap coupled with a *current* (2024) absence of CCR and liquid will exempt a site from the Final Rule. But if an owner's records show that their impoundments contained liquids on October 19, 2015—regardless of the CCR- and liquid-status today—the Final Rule applies. This unfairly penalizes owners who have been responsible and diligent in their records maintenance and in the oversight of their impoundments.

In its definitions section, the Final Rule provides that a "legacy CCR surface impoundment" means a "CCR surface impoundment that no longer receives CCR but contained both CCR and liquids on or after October 19, 2015, and that is located at an inactive electric utility or independent power producer." 89 Fed. Reg. at 39100. Elsewhere, however, the Final Rule provides an inconsistent definition—*i.e.*, that a legacy CCR surface impoundment is one that no longer has both CCR and liquids (presumably, as of November 4, 2024, the Final Rule's effective date). *Id.* at 39106.

The inconsistency stems from the fact that some regulated entities might not know whether their legacy impoundments contained liquids on October 19, 2015. Thus, the Final Rule's preamble provides:

> EPA recognizes that some owners and operators of inactive impoundments may not currently have records to demonstrate whether their inactive impoundment contained both CCR and liquids on or after October 19, 2015. In such cases, one option would be for the facility to conduct a field investigation to assess whether free liquids are currently present in the unit.

Id. at 39008. The actual regulatory text of the Final Rule then provides:

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[4] In the preamble to the Final Rule, EPA explained that it "disagrees" that a one-size-fits-all approach is not "appropriate," in part because the federal permitting program is not established. 89 Fed. Reg. 39059.

> ***If the owner or operator determines that the unit does not contain both CCR and liquids during implementation of the written field investigation work plan***, the owner or operator must prepare a notification stating that the field investigation has concluded and that the owner or operator has determined that the unit does not contain both CCR and liquids and ***does not meet the definition of a legacy CCR surface impoundment***.

Id. at 39106 (emphasis added). In other words, if a regulated entity conducts a field investigation and determines that a unit does not *presently* contain liquids, then the unit does not meet the definition of a legacy CCR surface impoundment regardless of whether it did so on October 19, 2015. There are at least three problems with this exemption.

First, not only is it flatly contrary to the definition of "legacy CCR surface impoundment," but it is arbitrarily so. If the risk of harm from legacy CCR surface impoundments is so great that any impoundment that contained liquids on October 19, 2015, must be regulated, then it makes no sense to exclude presently dry impoundments simply because it is not clear whether they contained liquids on that date. EPA's position effectively concedes that health and safety concerns do not actually require reaching all the way back to October 19, 2015. Otherwise, one would expect every regulated entity to bear the burden of proving that its units contained no liquids on that date, and if a regulated entity could not meet that burden, then the CCR unit in question would have to be considered a legacy CCR surface impoundment. The Final Rule's treatment of units whose histories are not well documented shows that the purported risks do not justify reaching back to 2015.

Second, it is unclear exactly how the exemption will operate. For example, because EKPC has maintained responsible and diligent oversight of the Dale Station, it knows that two of the former Dale impoundments contained both CCR and liquids on October 19, 2015 (the other former Dale impoundment did not). Does this knowledge mean that it is unable to take advantage of the field-investigation process provided by the Final Rule? Perhaps. But it is not clear. This ambiguity will likely lead to arbitrary application of the Final Rule.

Third, if the exemption does not apply to owners and operators like EKPC, then it penalizes entities that have responsibly and diligently maintained oversight of their facilities, and it will benefit less meticulous owners and operators or those who just so happened to acquire properties after October 19, 2015. This obviously provides perverse incentives. Rather than applying a more burdensome standard to those who provided the most careful oversight of their units, EPA should apply the same standard to everyone. Everyone should be evaluated based on the current state of their impoundments, not just those who lack records showing their condition on

October 19, 2015. But EPA has not acted in this reasonable and logical manner, opting instead for an arbitrary and capricious path.

2. The Final Rule will cause irreparable harm.

The Final Rule is also certain to cause irreparable harm. *See Nken v. Holder*, 556 U.S. 418, 434 (2009).

The cost to comply with the Final Rule is astronomical. EKPC will be forced to alter its property, spend tremendous sums of money, and endure constitutional injuries that cannot be remedied. Further, the Final Rule forces EKPC into the unenviable dilemma of immediately incurring costs to comply with the rule or exposing itself to liability. *See Morales v. Trans World Airlines, Inc.,* 504 U.S. 374, 381 (1992) ("irreparable injury" existed when states planned to enforce law and plaintiffs faced "Hobson's choice" of "expos[ing] themselves to potentially huge liability" or "suffer[ing] the injury of obeying" law); *Am.'s Health Ins. Plans v. Hudgens,* 742 F.3d 1319, 1334 (11th Cir. 2014) ("[a]bsent an injunction, [plaintiffs] will be forced either to incur the costs of compliance with a preempted state law or face the possibility of penalties"). And, ultimately, Kentucky's most vulnerable and impoverished citizens will bear the costs of these harms.

a. Alterations to Real Property

Complying with the Final Rule will require EKPC to alter its land permanently, which cannot be undone. For all of EKPC's CCR units—including the long-closed legacy impoundments at the Dale Station—compliance necessitates installing groundwater-monitoring wells and associated equipment. In other words, EKPC will have to undertake "a permanent physical occupation authorized by government." *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426 (1982). Significantly, the groundwater monitoring wells will almost certainly have to be installed before litigation on the merits of the Final Rule will conclude. Perhaps even more significantly, the Final Rule provides multiple pathways for complying with its requirements as to legacy surface impoundments, and the least burdensome pathway requires that EKPC install groundwater-monitoring systems and demonstrate that it meets the applicable groundwater standards by November 8, 2024. *See* 89 Fed. Reg. 39107. This deadline is practically impossible for EKPC to meet. Indeed, even if EKPC had begun the process of installing groundwater-monitoring systems as soon as the Final Rule was promulgated, it is highly unlikely that it would have been able to install the systems and complete the necessary sampling and testing in time to meet the November 8, 2024 deadline.

Finally, it is important to point out that once EKPC starts these efforts, they cannot be undone. Such impositions on private property create "irreparable harm."

Alabama Ass'n of Realtors v. DHS, 594 U.S. 758, 765 (2021) (per curiam); *see also Ohio*, 144 S. Ct. at 2053.

b. Compliance Costs

These structural alterations would come at great—and unrecoverable—cost. Altogether, EKPC will likely need to spend tens (possibly hundreds) of millions of dollars to comply with the Final Rule. That expenditure "can[not] be remedied through subsequent legal action." *In re NTE Connecticut, LLC*, 26 F.4th 980, 990 (D.C. Cir. 2022). "Financial injury is . . . irreparable where no 'adequate compensatory or other corrective relief will be available at a later date, in the ordinary course of litigation.'" *Mexichem Specialty Resins, Inc. v. EPA*, 787 F.3d 544, 555 (D.C. Cir. 2015) (quoting *Wisconsin Gas Co. v. FERC*, 758 F.2d 669, 674 (D.C.Cir.1985)). As then-Judge Kavanaugh explained in *Mexichem*, "the high costs to comply" with unlawful EPA action constitutes "irreparable harm." *Id.* at 562 (Kavanaugh, J., dissenting); *see also Thunder Basin Coal Co. v. Reich*, 510 U.S. 200, 220–21 (1994) (Scalia, J., concurring) ("complying with a regulation later held invalid almost *always* produces the irreparable harm of nonrecoverable compliance costs").

EKPC will need to begin taking measures to comply with the Final Rule almost immediately, including—among other things—assessing its CCR units, developing required plans and reports, installing groundwater-monitoring systems, and potentially re-closing long-closed units. All this will entail significant costs.

The most immediate costs of compliance will be incurred at the Dale Station. Even though the former impoundments at the Dale Station have contained neither liquids nor CCR for nearly a decade, the Final Rule imposes many burdensome requirements on them, including the installation of groundwater-monitoring systems and other near-term compliance activities, which will cost roughly $6.925 million.

c. Constitutional Injuries

Finally, the Final Rule's constitutional infirmities impose *per se* irreparable harm. "[T]he loss of constitutional freedoms, 'for even minimal periods of time, unquestionably constitutes irreparable injury.'" *Archdiocese of Washington v. Washington Metro. Area Transit Auth.*, 897 F.3d 314, 334 (D.C. Cir. 2018) (citation omitted); *Roman Catholic Diocese of Brooklyn v. Cuomo*, 592 U.S. 14, 19 (2020) (per curiam). EKPC should not have to comply with a regulation that is outside the federal government's authority under the Commerce Clause and that violates principles of due process by its unlawful retroactivity.

3. Private and public interests favor a stay.

The final factors—harm to the opposing party and the public interest in a stay—"merge when the Government is the opposing party." *Nken*, 556 U.S. at 435. And they decidedly favor staying the Final Rule. Because the Final Rule "will force [EKPC] to incur [m]illions of dollars in unrecoverable compliance costs," "[t]he equities" favor staying the Final Rule. *NFIB v. OSHA*, 595 U.S. 109, 120 (2022) (per curiam).

The "public [has no] interest in the perpetuation of unlawful agency action." *League of Women Voters of U.S. v. Newby*, 838 F.3d 1, 12 (D.C. Cir. 2016). The public interest lies with EPA operating within the boundaries set by "by the federal laws that govern [its] existence and operations." *Id.*

The private interests are even weightier. EKPC serves some of the Commonwealth's—indeed, the Nation's—most vulnerable citizens. EKPC generates electrical energy to cooperatives that distribute it across Kentucky. EKPC is the energy wholesaler, and its owner-members are retailers. Some 93% of end users of the power generated by EKPC are residential customers, many of whom live in communities afflicted with severe poverty. Increasing the cost of electricity—as the Final Rule will assuredly require—will only make Kentuckians worse off. In fact, the increase in electricity costs may even harm public health, given that many citizens may longer be able to afford to air condition or heat their homes. The population EKPC serves can ill afford a price hike that provides no environmental benefit.

CONCLUSION

EPA should stay the Final Rule pending review in the D.C. Circuit.

Dated: August 7, 2024

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BEFORE THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In re: Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments	Docket No. EPA-HQ-OLEM-2020-0107

AMENDED PETITION FOR STAY

Pursuant to Section 705 of the Administrative Procedure Act (the "APA"), 5 U.S.C. § 705, East Kentucky Power Cooperative, Inc. ("EKPC"), hereby petitions the Administrator of the United States Environmental Protection Agency ("EPA" or the "Agency") to stay the effective date of its final rule entitled *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments*, 89 Fed. Reg. 38950 (May 8, 2024) ("Final Rule"), pending judicial review.

EKPC supports the lawful and reasonable regulation of coal combustion residuals ("CCR"). In fact, EKPC has been a leader in safely and responsibly managing CCR disposal, working proactively with the Commonwealth of Kentucky to ensure that CCR is handled appropriately. But the Final Rule is unlawful and arbitrarily penalizes EKPC by forcing it to re-open a long-completed transaction in which it closed a surface impoundment by removal of the CCR under State supervision. The Resource Conservation and Recovery Act simply cannot be read to authorize this use of regulatory power. *Cf. Loper Bright Enters. v. Raimondo*, 144 S. Ct. 2244, 2266 (2024). Without a stay pending judicial review, EKPC will be forced to begin incurring compliance costs for regulations that will ultimately be declared invalid. This waste of resources is unnecessary and serves no environmental benefit. It also threatens to harm economically vulnerable consumers by ultimately raising their energy prices.

The Final Rule would impose burdensome obligations with regard to legacy CCR surface impoundments that EKPC has already closed by removal under the supervision of the Kentucky Energy and Environment Cabinet's Division of Waste Management. EKPC did so long before such impoundments were regulated under federal law. But the Final Rule now seeks to re-open that long-completed transaction and requires EKPC to do additional, unnecessary work under federal supervision. A stay would allow time for judicial review and spare EKPC from the irreparable harm that would be caused by undertaking efforts to comply with this unlawful Final Rule.

BACKGROUND

1. East Kentucky Power Cooperative

EKPC is a not-for-profit rural electric generation and transmission cooperative with headquarters in Winchester, Kentucky. EKPC is owned and governed by member cooperatives that use the energy and services EKPC provides to supply electricity to end-users across Kentucky. EKPC's vital mission is to safely generate and transmit affordable, reliable power to these cooperatives serving more than 1 million rural Kentuckians in 520,000 homes, farms, and businesses. EKPC provides wholesale energy and services to a customer base that is comprised predominantly of residential customers (93 percent). Of the 87 Kentucky counties that EKPC's cooperatives serve, 40 counties experience persistent poverty, as reported by the USDA. Twenty-six percent of the population EKPC serves lives below the poverty line, making every dollar spent critical to its mission to serve.

Many of these consumers have been plagued by unemployment from economic downturns affecting mines, trucking companies, restaurants, and other businesses. The unemployment rate is 60% higher than the national average. The end users of energy produced by EKPC rely heavily on government assistance to survive; 30 to 54 percent of total income in most eastern Kentucky counties comes from government assistance. Forty-two percent of these electricity users are elderly (65 years or older). Many are on fixed incomes and reside in energy-leaking mobile homes. Given these persistent economic challenges, EKPC has a strong interest in keeping energy affordable for its consumers.

The Final Rule would impose millions of dollars of additional compliance obligations on EKPC. These costs would necessarily be passed on to EKPC's owner-members, in many cases without any material benefit to the environment and at great potential detriment to its owner-member cooperatives and their ratepayers.

2. RCRA Subtitle D

The fundamental framework of the Resource Conservation and Recovery Act ("RCRA") differs significantly between Subtitle C, 42 U.S.C. §§ 6921–6939g—which asserts a cradle-to-grave federal authority over *hazardous* waste management—and Subtitle D, *id.* §§ 6941–6949a—which governs *non-hazardous* solid waste subject to national guidelines. *Util. Solid Waste Activities Grp. v. EPA*, 901 F.3d 414, 423 (D.C. Cir. 2018) ("*USWAG*"). Here, EPA invokes Subtitle D for authority to regulate CCR. Final Rule, 89 Fed. Reg. at 38952.

Under Subtitle C, EPA directly regulates all stages of generation and disposition of hazardous wastes and has administrative enforcement power and authority to initiate or recommend civil and criminal actions in court. *See* 42 U.S.C. §§ 6922–6928. Subtitle D, on the other hand, gives States primary regulatory responsibility for disposal of nonhazardous wastes in landfills and dumps. *USWAG*, 901 F.3d at 423.

As the D.C. Circuit explained in *USWAG*, "Subtitle D leaves it up to the states to 'use federal financial and technical assistance to develop solid waste management plans in accordance with [the] federal guidelines.'" *Id* at 423–24. Specifically, Subtitle D "calls on the EPA to promulgate criteria distinguishing 'sanitary landfills,' which are permissible under the statute, from 'open dumps,' which are prohibited." *Id.* at 420 (quoting 42 U.S.C. § 6944(a)). Broadly speaking, an "open dump" is defined as "any facility or site where solid waste *is disposed of* which is not a sanitary landfill which meets the criteria promulgated under section 6944 . . . ." 42 U.S.C. § 6903(14) (emphasis added). When it comes to promulgating the criteria to distinguish between a sanitary landfill and an open dump, Subtitle D provides that "a facility may be classified as a sanitary landfill and not an open dump only if there is *no reasonable probability* of adverse effects on health or the environment from disposal of solid waste at such facility." *Id.* § 6944(a) (emphasis added).

3. 2015 CCR Rule and the *USWAG* decision

EPA promulgated its first rule regulating CCR in 2015 ("the 2015 Rule"). *USWAG*, 901 F.3d at 423. The 2015 Rule set minimum criteria for the disposal of CCR in landfills and surface impoundments. *Id.* at 424. These included location restrictions on landfills and surface impoundments; requirements pertaining to liners, structural integrity, and groundwater monitoring; and criteria for beneficial use of CCR, such as using CCR in road construction and in the manufacture of concrete and wallboard. *Id.* The 2015 Rule regulated all *active* surface impoundments and *inactive* surface impoundments at *active* power plants, but it expressly exempted *inactive* surface impoundments at *inactive* power plants. *Id.* at 449.

In 2018, the D.C. Circuit vacated and remanded certain provisions of the 2015 Rule that: (1) permitted unlined impoundments to continue receiving CCR unless they leak; (2) classified "clay-lined" impoundments as lined; and (3) exempted from regulation inactive impoundments at inactive facilities in 40 C.F.R. § 257.50(e). *See* *USWAG*, 901 F.3d at 427, 449. The Court expressly declined to address the impact of the Water Infrastructure Improvements for the Nation Act ("WIIN Act"), Pub. L. No. 114-322, 130 Stat. 1628 (2016) (codified at 42 U.S.C. § 6945(d), "leav[ing] it open for the EPA to address on remand the relevance of the [Act], the Act's express incorporation of the EPA regulations published at 40 C.F.R. Part 257, and its definition of 'sanitary landfill.'" *Id.* at 426.

One aspect of the court's decision warrants particularly careful attention for purposes of this Petition. As discussed above, the Court concluded that RCRA requires EPA to regulate inactive impoundments at inactive facilities. In reaching this conclusion, the Court rejected the industry petitioners' argument that inactive impoundments that contain solid waste, but no longer receive new solid waste, cannot be considered "open dumps." *Id.* at 439. Industry petitioners asserted that RCRA's definition of "open dump[s]" is limited to locations where solid waste "is disposed of." *Id.* In other words, they contended that "the site must actively receive new waste to come within the statutory definition of a regulable waste disposal dump." *Id.* The Court disagreed, noting that the "definition of 'open dump,' which is the key term at issue, does not use the word 'disposal.'" *Id.* at 440. Instead, "[i]t uses the phrase 'is disposed of': An 'open dump' is 'any facility or site where solid waste *is disposed of*.'" *Id.* (quoting 42 U.S.C. § 6903(14)). The Court interpreted the active "is" and past participle "disposed," and concluded that "an open dump includes any facility (other than a sanitary landfill or hazardous waste disposal facility), where solid waste still 'is deposited,' 'is dumped,' 'is spilled,' 'is leaked,' or 'is placed,' regardless of when it might have originally been dropped off." *Id.* In other words, a "garbage dump is a garbage dump *until the deposited garbage is gone*." *Id.* at 441 (emphasis added). Thus, the Court set an outer boundary for RCRA's application: Following removal of the disposed-of material, RCRA no longer authorizes EPA to regulate the site.

4. WIIN Act

In 2016, Congress fundamentally amended RCRA Subtitle D with the WIIN Act. Pertinent here, the WIIN Act envisioned a state-permitting program, subject to EPA oversight and approval, to "operate in lieu of [EPA] regulation of coal combustion residuals units in the State," provided that those programs are at least as protective as the existing, or successor, EPA regulations. 42 U.S.C. § 6945(d)(1)(A). The WIIN Act also calls for EPA to create a federal permitting program to operate in the absence of an approved State program.

By directing EPA and the States into a permitting regime for CCR, Congress expressed an unequivocal intent to eschew one-size-fits-all regulation of CCR for a bespoke permitting program that can account for important differences between CCR disposal sites, including differences based on geography and geology. Yet, since adoption of the WIIN Act, EPA has approved only three State permitting programs—in Oklahoma, Georgia, and Texas—and it has yet to create the federal permitting program mandated by the Act, opting instead to address CCR disposal through the Final Rule. EPA recently rejected Alabama's proposed permitting program. 89 Fed. Reg. 48774 (June 7, 2024).

5. Final Rule

The Final Rule regulates two previously unregulated types of CCR units: legacy CCR surface impoundments and coal combustion residual management units, or CCRMUs for short. Significantly, the scope of the Final Rule is not tailored to reach merely those CCR units that have *never been closed*. Instead, its reach extends even to those CCR units that have been closed under the supervision of State regulators. It even impacts units that no longer contain CCR. The Final Rule, for the first time, subjects inactive impoundments at inactive facilities to regulation, and it does so as long as such impoundments contained both liquids and CCR as of *October 19, 2015*. This affects the former impoundments at EKPC's Dale Station that have already been "clean-closed"[1] under the supervision of the Kentucky Energy and Environment Cabinet's Division of Waste Management ("KDWM").

The Dale Station ceased generating electricity before the 2015 Rule was finalized and took effect. All the generating assets have been removed, and there is no ongoing generation at the site. The Dale Station previously contained three CCR impoundments, known as Ponds 2, 3, and 4, and referred to collectively as the former Dale Station impoundments. These Ponds were used to store and treat ash sluiced from the on-site coal-fired generation. (Note that at the time of closure, Pond 2 included both former Pond 1 and Pond 2, which were combined in the mid-1990s by removal of a dike that had separated them previously.) The three Ponds were not regulated by the 2015 CCR Rule because they were inactive impoundments (*i.e.*, no active placement of waste) at an inactive facility as of October 19, 2015.

Nevertheless, despite the lack of any regulatory obligation, EKPC decided to act expeditiously and proactively to remove all CCR from the former Dale Station impoundments. To this end, those former impoundments were closed in accordance with a closure plan approved by the KDWM on July 14, 2014, over a year before the 2015 Rule became effective, and even well before the final 2015 Rule was published on April 17, 2015. The State-approved closure plan required removal of all CCR from the former impoundments down to the level of existing soils, plus certification of removal by a third-party Professional Engineer and verification by visual inspection performed by representatives of KDWM. The CCR removed from the former Dale Station impoundments was disposed of in the State-permitted and CCR Rule-regulated CCR landfill at EKPC's J.K. Smith Station. KDWM did not require groundwater monitoring at the Dale Station as long as complete removal of CCR was verified and the CCR was properly disposed off-site. EKPC met these requirements, and KDWM issued a letter on January 17, 2019, accepting EKPC's report and certification of clean closure by removal for all three former impoundments. Despite this, the Final Rule will impose burdensome requirements pertaining to all three

[1] East Kentucky uses this term as shorthand for closure by removal of the CCR.

former impoundments—including groundwater monitoring—simply because they were not completely devoid of liquid and CCR on *October 19, 2015*.[2]

The consequences of EPA's overregulation regarding legacy impoundments are significant and harmful. Under the Final Rule, EKPC and other companies will be required to install costly groundwater monitoring systems and begin both detection and assessment monitoring. The complexities of designing and installing adequate groundwater monitoring systems have not been fully appreciated or accounted for in the rulemaking process.

REQUEST FOR AN APA § 705 STAY PENDING JUDICIAL REVIEW

EKPC filed a petition for review of the Final Rule in the U.S. Court of Appeals for the D.C. Circuit on August 2, 2024. While judicial review is pending, Section 705 of the APA authorizes EPA to stay the effective date of the rule if it "finds that justice so requires." 5 U.S.C. § 705. EKPC requests that the EPA make such a finding here.

The Final Rule takes effect on November 4, 2024. A stay is required to avoid the unnecessary expenditure of EKPC resources, EPA resources, State resources, and the resources of the public and regulated industries in complying with a Final Rule that is unlikely to be sustained in its current form. The same four-factor analysis used by courts for granting a judicial stay pending review supports the EPA issuing its own stay pending review here. Under these familiar factors, considerations include: (1) the likelihood of success on the merits of the judicial challenge; (2) irreparable harm to the applicant if a stay is not granted; (3) the potential for harm to others if the stay is granted; and (4) whether the public interest weighs in favor of granting the stay. *Ohio v. EPA*, 144 S. Ct. 2040, 2052 (2024).

1. EKPC is likely to succeed on the merits.

EKPC's petition for review is likely to be granted on the merits for at least five reasons. First, the Final Rule exceeds EPA's authority under RCRA. Second, even if the Final Rule is within EPA's authority under RCRA, it is still invalid because it is outside the federal government's authority under the Commerce Clause. Third, the Final Rule is impermissibly retroactive because it seeks to impose additional requirements for closure on impoundments that were previously closed under state programs at a time when federal law elected not to regulate such impoundments. Fourth, the Final Rule flouts the WIIN Act's directive for EPA to develop and

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[2] After EKPC filed its initial petition to stay, further diligence confirmed that Dale Station Pond 3, as well as Ponds 2 and 4, was not completely rid of CCR and liquids as of October 19, 2015. EKPC withdrew its August 7th petition and replaced it with this amended petition to update that information and to provide more accurate information regarding the anticipated cost of compliance.

implement a more State-centric, site-specific permitting program for CCR regulation. Fifth, the Final Rule is arbitrary and capricious. It suffers from myriad arbitrary-and-capricious flaws, including the retroactive re-closure requirements discussed above, departures from Congressional authority under RCRA for areas where solid waste is not "disposed of," and maintaining a self-implementing approach when the WIIN Act requires consideration of site-specific risks—just to name a few.

a. The Final Rule exceeds EPA's authority under RCRA.

"[A]n agency literally has no power to act . . . unless and until Congress confers power upon it." *Louisiana Pub. Serv. Comm'n v. FCC*, 476 U.S. 355, 374 (1986). This "is axiomatic." *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208 (1988); *see also Loper Bright Enters., Inc. v. Raimondo*, 45 F.4th 359, 373 n.15 (D.C. Cir. 2022) (Walker, J., dissenting) (collecting cases), *rev'd* 144 S. Ct. 2244 (2024). RCRA does not authorize EPA to regulate sites where solid waste is no longer disposed of. The D.C. Circuit made this point perfectly clear in *USWAG*. *See* 901 F.3d at 441. EPA must operate "within th[e] boundaries" set by Congress. *Loper Bright Enters.*, 144 S.Ct. at 2263.

Subtitle D of RCRA distinguishes between two types of sites: sanitary landfills and open dumps. 42 U.S.C. §§ 6944, 6945. But the Final Rule regulates sites that are neither, including EKPC's Dale Station site. In that way, the Rule exceeds EPA's statutory authority.

The D.C. Circuit held that RCRA Subtitle D extends to sites where waste was once disposed of, even if those sites no longer receive new solid waste. *USWAG*, 901 F.3d at 440. But the Court also held that Subtitle D's reach is at its end when the waste is cleared from a site: "A garbage dump is a garbage dump until the deposited garbage is gone." *Id.* at 441.

By that definition, the former impoundments at the Dale Station (Ponds 2, 3, and 4) are not garbage dumps; they are clean-closed units that contain no waste. *See* EKPC Comments on Proposed Rule, *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments,* 88 Fed. Reg. 31982, at 1 (July 17, 2023) (hereafter, "EKPC Comments") (warning that the Rule would "unfairly and unnecessarily capture numerous sites where former surface impoundments were properly clean-closed by removal under then-applicable State regulations"). In other words, no solid waste "is disposed of" at the former Dale Station impoundments. 42 U.S.C. § 6903(14). All liquids were removed from those former impoundments nearly a decade ago, and in 2019, the KDWM certified that EKPC completely removed all CCR from the former impoundments and properly disposed of it. As a result, RCRA Subtitle D does not apply to any of the former Dale Station impoundments, or any other like sites where the waste has been cleared. Therefore, EPA's Final Rule exceeds RCRA's scope by purporting to govern clean-closed sites that contain no waste. The plain language of RCRA permits no other conclusion. *See Loper Bright Enters.*, 144 S. Ct. at 2266 ("In the business of statutory interpretation, if it is not the best, it is not permissible."). The statute applies to sites where solid waste "is disposed of," 42 U.S.C. § 6903(14), not sites where solid waste is disposed of *or once was disposed of*. *Cf. Garland v. Cargill*, 602 U.S. 406, 423 (2024) (setting aside ATF's regulation of bump stocks because the statutory definition of "machinegun" "asks only whether a weapon fires more than one shot 'by a single function of the trigger,'" not whether it fires more than one shot by a single pull of the trigger *or* any "analogous motions").

Moreover, with an asserted "breadth of the authority" so vast and the "economic and political significance" so consequential, there is "reason to hesitate before concluding that" RCRA Subtitle D supports EPA's regulatory undertaking of such expanse. *West Virginia v. EPA*, 597 U.S. 697, 721 (2022) (quoting *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 159–160 (2000)). EPA attempted to implement a comparably expansive rule based on its interpretation of the term "air pollutant" in the Clean Air Act, but the Supreme Court prevented EPA from "seizing expansive power that" that no statute granted. *Utility Air Regul. Grp. v. EPA*, 573 U.S. 302, 324 (2014). And the assertion of authority in that case was far more "textual[ly] plausibl[e]" than EPA's assertion here that waste is still disposed of where no waste has been for years. *West Virginia*, 597 U.S. at 722. Significantly, "a colorable textual basis" was not enough to justify that regulation under the Clean Air Act. *Id.* Instead, the Court required EPA to "point to 'clear congressional authorization' for the power it claims." *Id.* at 723 (quoting *Utility Air*, 573 U.S. at 324). EPA should have to do the same here, and it cannot. To the contrary, the authority EPA asserts in the Final Rule is directly contrary to the plain language of RCRA.

Because RCRA Subtitle D does not authorize EPA's attempted regulation of sites like the former Dale Station impoundments—in which no waste remains—the Final Rule must be stayed.

b. The Final Rule violates the Commerce Clause.

The Final Rule asserts regulatory authority beyond the reach of the Commerce Clause. *See* U.S. Const. art. I, § 8 (Congress shall have power "[t]o regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes."). The CCR at issue here is a waste product that was generated in Kentucky and disposed of in Kentucky. Neither the CCR nor the units in which it is—or was—disposed are channels of interstate commerce or instrumentalities of interstate commerce, nor do they substantially affect interstate commerce.[3] *See United States v. Morrison*, 529 U.S. 598, 609, 613 (2000) (rejecting attenuated arguments that criminal statute could substantially affect interstate commerce through "costs of crime" and "national productivity").

Further, the Final Rule seeks to regulate sites—like the former Dale Station impoundments—that have already been clean-closed, and therefore have no potential for *any* negative environmental effects, much less negative *interstate* environmental effects. EPA has not linked the scope of its asserted regulatory authority to any interstate environmental effects in any way.

Finally, EPA should not construe RCRA to extend to the outer boundaries of Congressional authority with respect to purely intrastate activities without clear Congressional direction. *See Solid Waste Agency of N. Cook Cnty. v. U.S. Army Corps of Engineers*, 531 U.S. 159, 172 (2001) (rejecting EPA's interpretation of the Clean Water Act because the Agency's interpretation of the Act to cover isolated, purely intrastate ponds would "invoke[] the outer limits of Congress' power."). Such direction does not exist here.

c. The Final Rule is impermissibly retroactive.

EPA's Final Rule imposes a retroactive element to RCRA's definition of "open dump" that cannot be reconciled with the language used by Congress. But even setting that aside, retroactivity itself remains a problem here. "Retroactivity is not favored in the law," and "congressional enactments and administrative rules will not be construed to have retroactive effect unless their language requires this result." *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208 (1988). Thus, "a statutory grant of legislative rulemaking authority will not, as a general matter, be understood to encompass the power to promulgate retroactive rules unless that power is conveyed by Congress in express terms." *Id.* And no such terms exist here.

Impermissible retroactivity is found when the action "would impair rights a party possessed when he acted, increase a party's liability for past conduct, or impose new duties with respect to transactions already completed." *Celtronix Telemetry, Inc. v. FCC*, 272 F.3d 585, 588 (D.C. Cir. 2001) (quoting *Landgraf v. USI Film Prods.*, 511 U.S. 244, 280 (1994)). Stated differently, "[a] retroactive rule forbidden by the APA is one which 'alter[s] the past legal consequences of a past actions.'" *Celtronix*, 272 F.3d at 588. This implicates "the 'familiar considerations of fair notice, reasonable reliance, and settled expectations . . . ." *Nat'l Petrochemical & Refiners Ass'n v. EPA*, 630 F.3d 145, 160 (D.C. Cir. 2010) (quoting *Landgraf*, 511 U.S. at 270).

[3] East Kentucky does not concede that the "substantial effects" test that has been applied by the courts is an appropriate measure of the federal government's interstate commerce power. *See Morrison*, 529 U.S at 627 (Thomas, J., concurring).

Here, EPA's Final Rule is impermissibly retroactive in several ways as applied to EKPC's clean-closed units at the Dale Station. First, the Final Rule impairs the rights that EKPC had when it acted because EKPC's prior cleanup of CCR under State oversight afforded EKPC with legal rights, and those protections have now been removed even though federal law under the 2015 Rule did not cover such features. Second, the Final Rule imposes new duties on completed transactions by requiring EKPC to re-open and re-close the previously clean-closed impoundments and comply with other requirements. Finally, the Final Rule increases liability for past conduct by requiring EKPC to incur new and additional costs or face penalties unless EKPC follows EPA's new program for closure of these units. If EKPC had known that groundwater monitoring would be required when it closed the former impoundments at the Dale Station years ago, it would have conducted the grading and earth-moving aspects of the project differently to better facilitate such monitoring. But now it will have to undo some of its prior work and redo it at additional cost.

Further, there is no clear statement here that Congress permitted retroactive regulations, and basic principles of fair notice and reliance compel prospective application, especially when EPA held the opposite position as recently as the 2015 Final Rule (*i.e.*, no regulation of these sites). As Courts have concluded, RCRA generally "operates prospectively," not retrospectively. *Nova Chemicals, Inc. v. GAF Corp.*, 945 F. Supp. 1098, 1104 (E.D. Tenn. 1996) (noting that, "[w]hen President Carter signed CERCLA into law [years after RCRA's enactment], Representative Florio remarked 'Prospectively we have ... [RCRA], and therefore we should have no new Love Canals being created. And [CERCLA], of course, is the second part, which is to go back and clean up what, unfortunately, has been done over the last number of years.'"); *United States v. Price*, 577 F. Supp. 1103, 1109 (D.N.J. 1983) ("RCRA is 'prospective and applies to past sites only to the extent that they are posing an imminent hazard.'") (quoting H.R. Rep. No. 1016, 96th Cong.2d Sess., pt. 1 at 18, reprinted in U.S. Code Cong. & Ad. News 6119, 6125).

In support of its position that the text of RCRA supports retroactive application, EPA offered merely the statement that "inactive impoundments are 'open dumps,'" *i.e.*, "facilities 'where solid waste is disposed of,' 42 U.S.C. § 6903(14) . . . ." 89 Fed. Reg. at 38985. However, this language cannot be interpreted to apply to units—like the former impoundments at the Dale Station—from which the solid waste has been removed and the unit has been clean-closed under State supervision; the solid waste is not "disposed of" there. As discussed elsewhere below, the statutory language certainly falls short of a "clear statement" that Congress intended retroactive application. To the contrary, the language in fact indicates that Congress did *not* intend for retroactive application.

d. The Final Rule is contrary to RCRA Subtitle D, as modified by the WIIN Act.

The Final Rule uses a one-size-fits-all, self-implementing approach to CCR regulation in violation of the WIIN Act's directive for EPA to develop and implement a site-specific permitting program for CCR regulation. In *USWAG*, the D.C. Circuit observed that EPA had historically relied on a "self-implementing" framework for subtitle D—*i.e.*, a framework of standards that come into effect automatically and uniformly, without the need for tailored approaches based on state- or site-specific considerations. However, the D.C. Circuit explained that the WIIN Act changed matters: "[a]lthough a one-size-fits-all national standard might have been necessary for the self-implementing [2015 Rule], more precise risk-based standards are both feasible and enforceable under the individualized permitting programs and direct monitoring provisions authorized by the WIIN Act." *USWAG*, 901 F.3d at 437.

The WIIN Act modified RCRA Subtitle D and requires the EPA to implement a federal permitting program (or to approve State-permitting plans) governing disposal of CCR. *See, e.g.*, 42 U.S.C. § 6945(d)(1)(B) (stating that the Administrator "*shall* approve" a State permit program if certain conditions are met) (emphasis added); *id.* § 6945(d)(2)(B) (subjecting "nonparticipating" States to a federal permitting program that, if certain conditions are met, the Administrator "shall implement"). But EPA has ignored Congress's mandate—for 8 years, despite having funding for the project[4]—and has let a permitting plan languish so it can attempt to regulate CCR via brand-new, self-implementing CCR rules that create wholly new categories of CCR. 89 Fed. Reg. 39035 (CCRMUs); *id.* at 38951 (Surface

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[4] *USWAG*, 901 F.3d at 437 n.7 ("On March 23, 2018, the Consolidated Appropriations Act of 2018 was signed into law. Pub. L. No. 115-141, 132 Stat. 348. It allocates funds to the EPA to 'implement[] a coal combustion residual permit program under' the WIIN Act. *Id.* at Division G, Title II. Accordingly, with its recently acquired funding, the EPA is to 'implement a permit program' in non-participating states. 42 U.S.C. § 6945(d)(2)(B)."); National Rural Electric Cooperative Association, Comment on Proposed Rule, *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments,* 88 Fed. Reg. 31892, at 2 (July 17, 2023) (citing "Consolidated Appropriations Act, 2023, Pub. L. No. 117-328, Div. G, Tit. II (2022); Consolidated Appropriations Act of 2022, Pub. L. No. 117-103, Div. G. Tit. II, 136 Stat. 49, 380 (2022); Consolidated Appropriations Act, 2021, Pub. L. No. 116-260, Div. G, Tit. II, 134 Stat. 1182, 1508 (2020); Further Consolidated Appropriations Act, 2020, Pub. L. No. 116-94, Div. D, Tit. II, 133 Stat. 2534, 2715 (2019); Consolidated Appropriations Act, 2019, Pub. L. No. 116-6, Div. E, Tit. II, 133 Stat. 13, 234 (2019); and Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, Div. G, Tit. II, 132 Stat. 348, 662 (2018)") ("Congress has appropriated funding to implement a federal CCR permit program every year since 2018.").

Impoundments). The Final Rule is thus not a "successor regulation," but something entirely new, regulating surface impoundments (as newly defined) and CCRMUs (a whole new unit). *Id.*; *see also* 42 U.S.C. § 6945(d)(3) (explaining that "part 257 of title 40, [C.F.R.] (or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title)" apply to CCR units that do not have a state permit).

The WIIN Act does not authorize EPA to ignore its congressional mandate to adopt a permitting program and elect instead to broaden its authority via one-size-fits-all, self-implementing rules. To be sure, the WIIN Act does permit EPA regulations to govern non-participating states until EPA enacts a federal-permitting program or approves a State program. In this way, the WIIN Act gives EPA some runway to develop its federal permitting program and allows the *existing* 2015 CCR rule to govern either until a State permitting program is adopted (for participating States) or a federal permitting program is developed by EPA (for non-participating States). *See* 42 U.S.C. § 6945(d)(2)(B). But the WIIN Act's structure makes clear that Congress intended EPA to replace a one-size-fits-all, self-implementing regime with a permitting program—whether administered by a State or the EPA itself. *See generally, id.* § 6945. The State- or EPA-permit requirements could be tailored to a site consistent with the WIIN Act mandate, resulting in requirements appropriate to the environmental risk, or lack thereof, at hand.

In *USWAG*, the D.C. Circuit expressly left it for EPA to consider how the WIIN Act has changed the regulatory framework. *USWAG*, 901 F.3d at 426 ("We leave it open for the EPA to address on remand the relevance of the WIIN Act, the Act's express incorporation of the EPA regulations published at 40 C.F.R. Part 257, and its definition of 'sanitary landfill.'"). But rather than acknowledge that the WIIN Act has, in fact, changed the regulatory framework, EPA has plowed ahead in disregard of the WIIN Act. Now, six years after *USWAG*, and eight years after the WIIN Act was adopted, EPA explains in the Final Rule that the risk CCRMUs and CCR units pose justifies regulation under the "self-implementing" framework rather than waiting "several years" until every unit is permitted under the WIIN Act's mandated federal permitting program. 89 Fed. Reg. 39025, 39059.

This is a "crisis" of EPA's own making. EPA has sat on its hands for eight years, ignoring Congress's mandate to develop a permitting program. The Final Rule flouts Congress's will and reveals nothing less than EPA's efforts to turn the WIIN Act into a dead letter. Given the Final Rule's plain incompatibility with the WIIN Act, EPA should stay the rule pending judicial review.

e. The Final Rule is arbitrary and capricious.

In a challenge to an agency rule, the reviewing court must "hold unlawful and set aside agency action . . . found to be . . . arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," or that is "unsupported by substantial evidence." 5 U.S.C. § 706(2)(A), (E). A rule fails under that standard "if it is not 'reasonable and reasonably explained.'" *Ohio*, 144 S. Ct. at 2053 (quoting *FCC v. Prometheus Radio Project*, 592 U. S. 414, 423 (2021)). Courts will find agency action "arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Motor Vehicles Mfrs. Ass'n v. State Farm*, 463 U.S. 29, 43, (1983).

An agency action is also arbitrary and capricious "if it rests upon a factual premise that is unsupported by substantial evidence." *Genuine Parts Co. v. EPA*, 890 F.3d 304, 312 (D.C. Cir. 2018) (*quoting Ctr. For Auto Safety v. Fed. Highway Admin.*, 956 F.2d 309, 312 (D.C. Cir. 1992)). To determine whether an agency action was based on substantial evidence, the court "must consider the whole record upon which an agency's factual findings are based, including" evidence that "'fairly detracts' from the evidence supporting the agency's decision." *Id.* (*quoting Universal Camera Corp. v. NLRB*, 340 U.S. 474, 487–88 (1951)).

i. The Final Rule is arbitrary and capricious because EPA seeks to reopen long-completed transactions that were undertaken with State oversight.

As discussed above, the Final Rule is illegally retroactive. However, it is also arbitrary and capricious because it "alter[s] future regulation in a manner that makes worthless substantial past investment incurred in reliance upon the prior rule." *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 220, (1988) (Scalia, J., concurring) ("a rule is an agency statement 'of future effect,' not 'of future effect and/or reasonable past effect.'"). For example, if EKPC had known in 2015 what was going to happen, it would have closed the former Dale Station impoundments differently. In particular, its engineering practices would have deployed a substantially different approach to the final grading plan by providing roadbed materials and a path to install groundwater monitoring wells. To go back and do this now will require much greater cost than if EKPC had done this work while initially closing the former impoundments. The Final Rule places into question the status of these past investments to close impoundments like those at the Dale Station. Thus, the Final Rule threatens to "make[] worthless" much of the prior investments that were made in reliance on the prior regulatory status of these impoundments. *Id.* At minimum, "the agency failed to supply 'a satisfactory explanation for its action.'" *Ohio*, 144 S. Ct. at 2053 (citation omitted).

ii. Requiring re-closure of previously closed CCR units that do not contain CCR is arbitrary and capricious.

EPA has not provided any evidence that legacy CCR surface impoundments that were dewatered and clean-closed under State supervision—like those at EKPC's Dale Station, which were dewatered and clean-closed almost a decade ago—could pose any "reasonable probability" of harm. *See* 89 Fed. Reg. 38984; *see also USWAG*, 901 F.3d at 441 ("A garbage dump is a garbage dump until the deposited garbage is gone."). EPA may regulate "open dumps" under RCRA Subtitle D, but not a facility where "there is no reasonable probability of adverse effects." 42 U.S.C. § 6944(a).

To support its surface impoundment definition as applied to legacy CCR surface impoundments, EPA relies on speculation that these sites formerly had "groundwater contamination present" before closure, and that it is "possible … contaminated soil remains, which can serve as a source of further contamination." 89 Fed. Reg. 38984. EPA provides insufficient evidence to support this speculative finding.

iii. EPA's application of a self-implementing approach to CCR regulation in the Final Rule is arbitrary and capricious in light of the WIIN Act.

As explained above, Congress intended for new CCR regulatory controls promulgated after the WIIN Act to be implemented through federal and State permitting programs that consider site-specific risks. This means the Final Rule's "one-size-fits-all" approach to regulating CCR is arbitrary and capricious.

In *USWAG*, the D.C. Circuit explained that "more precise risk-based standards are both feasible and enforceable under the individualized permitting programs and direct monitoring provisions authorized by the WIIN Act" than the traditional one-size-fits-all, self-implementing approach. *USWAG*, 901 F.3d at 437; *see also Natural Res. Def. Council, Inc. v. SEC,* 606 F.2d 1031, 1053 (D.C. Cir. 1979) (explaining that agencies must consider "reasonably obvious alternative" when rulemaking and "explain its reasons for rejecting alternatives in sufficient detail"). EPA did not sufficiently explain its reasons for creating national criteria for CCRMUs and legacy impoundments and declining to use a site-specific approach to regulate CCR according to Congress's expressed desire. Congress clearly contemplated that new CCR regulatory controls should occur through State or federal permitting processes, not a one-size-fits-all regulation. EPA cannot justify its approach on the fact that the federal permitting program is not yet established after EPA waited eight years to create it.[5] That problem is one of EPA's own making.

iv. The Final Rule is arbitrary and capricious because it penalizes owners that have responsibly and diligently maintained oversight of their facilities.

The Final Rule inexplicably defines "legacy CCR surface impoundment" in a manner that is internally inconsistent and that penalizes owners of impoundments who have responsibly and diligently maintained oversight of their facilities. It does this by exempting legacy impoundments that do not currently contain CCR and liquids if their owners do not have sufficient records or information to show whether the impoundments contained CCR and liquids as of October 14, 2015. *See* 89 Fed. Reg. at 39106. In other words, a records-keeping gap coupled with a *current* (2024) absence of CCR and liquid will exempt a site from the Final Rule. But if an owner's records show that their impoundments contained liquids on October 19, 2015—regardless of the CCR- and liquid-status today—the Final Rule applies. This unfairly penalizes owners who have been responsible and diligent in their records maintenance and in the oversight of their impoundments.

In its definitions section, the Final Rule provides that a "legacy CCR surface impoundment" means a "CCR surface impoundment that no longer receives CCR but contained both CCR and liquids on or after October 19, 2015, and that is located at an inactive electric utility or independent power producer." 89 Fed. Reg. at 39100. Elsewhere, however, the Final Rule provides an inconsistent definition—*i.e.*, that a legacy CCR surface impoundment is one that no longer has both CCR and liquids (presumably, as of November 4, 2024, the Final Rule's effective date). *Id.* at 39106.

The inconsistency stems from the fact that some regulated entities might not know whether their legacy impoundments contained liquids on October 19, 2015. Thus, the Final Rule's preamble provides:

> EPA recognizes that some owners and operators of inactive impoundments may not currently have records to demonstrate whether their inactive impoundment contained both CCR and liquids on or after October 19, 2015. In such cases, one option would be for the facility to conduct a field investigation to assess whether free liquids are currently present in the unit.

Id. at 39008. The actual regulatory text of the Final Rule then provides:

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[5] In the preamble to the Final Rule, EPA explained that it "disagrees" that a one-size-fits-all approach is not "appropriate," in part because the federal permitting program is not established. 89 Fed. Reg. 39059.

> ***If the owner or operator determines that the unit does not contain both CCR and liquids during implementation of the written field investigation work plan***, the owner or operator must prepare a notification stating that the field investigation has concluded and that the owner or operator has determined that the unit does not contain both CCR and liquids and ***does not meet the definition of a legacy CCR surface impoundment***.

Id. at 39106 (emphasis added). In other words, if a regulated entity conducts a field investigation and determines that a unit does not *presently* contain liquids, then the unit does not meet the definition of a legacy CCR surface impoundment regardless of whether it did so on October 19, 2015. There are at least three problems with this exemption.

First, not only is it flatly contrary to the definition of "legacy CCR surface impoundment," but it is arbitrarily so. If the risk of harm from legacy CCR surface impoundments is so great that any impoundment that contained liquids on October 19, 2015, must be regulated, then it makes no sense to exclude presently dry impoundments simply because it is not clear whether they contained liquids on that date. EPA's position effectively concedes that health and safety concerns do not actually require reaching all the way back to October 19, 2015. Otherwise, one would expect every regulated entity to bear the burden of proving that its units contained no liquids on that date, and if a regulated entity could not meet that burden, then the CCR unit in question would have to be considered a legacy CCR surface impoundment. The Final Rule's treatment of units whose histories are not well documented shows that the purported risks do not justify reaching back to 2015.

Second, it is unclear exactly how the exemption will operate. For example, because EKPC has maintained responsible and diligent oversight of the Dale Station, it knows that the former Dale Station impoundments were not completely devoid of both CCR and liquids on October 19, 2015. Does this knowledge mean that it is unable to take advantage of the field-investigation process provided by the Final Rule? Perhaps. But it is not clear. This ambiguity will likely lead to arbitrary application of the Final Rule.

Third, if the exemption does not apply to owners and operators like EKPC, then it penalizes entities that have responsibly and diligently maintained oversight of their facilities, and it will benefit less meticulous owners and operators or those who just so happened to acquire properties after October 19, 2015. This obviously provides perverse incentives. Rather than applying a more burdensome standard to those who provided the most careful oversight of their units, EPA should apply the same standard to everyone. Everyone should be evaluated based on the current state of their impoundments, not just those who lack records showing their condition on

October 19, 2015. But EPA has not acted in this reasonable and logical manner, opting instead for an arbitrary and capricious path.

2. The Final Rule will cause irreparable harm.

The Final Rule is also certain to cause irreparable harm. *See Nken v. Holder*, 556 U.S. 418, 434 (2009).

The cost to comply with the Final Rule is astronomical. EKPC will be forced to alter its property, spend tremendous sums of money, and endure constitutional injuries that cannot be remedied. Further, the Final Rule forces EKPC into the unenviable dilemma of immediately incurring costs to comply with the rule or exposing itself to liability. *See Morales v. Trans World Airlines, Inc.,* 504 U.S. 374, 381 (1992) ("irreparable injury" existed when states planned to enforce law and plaintiffs faced "Hobson's choice" of "expos[ing] themselves to potentially huge liability" or "suffer[ing] the injury of obeying" law); *Am.'s Health Ins. Plans v. Hudgens,* 742 F.3d 1319, 1334 (11th Cir. 2014) ("[a]bsent an injunction, [plaintiffs] will be forced either to incur the costs of compliance with a preempted state law or face the possibility of penalties"). And, ultimately, Kentucky's most vulnerable and impoverished citizens will bear the costs of these harms.

a. Alterations to Real Property

Complying with the Final Rule will require EKPC to alter its land permanently, which cannot be undone. For all of EKPC's CCR units—including the long-closed legacy impoundments at the Dale Station—compliance necessitates installing groundwater-monitoring wells and associated equipment. In other words, EKPC will have to undertake "a permanent physical occupation authorized by government." *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 426 (1982). Significantly, the groundwater monitoring wells will almost certainly have to be installed before litigation on the merits of the Final Rule will conclude. Perhaps even more significantly, the Final Rule provides multiple pathways for complying with its requirements as to legacy surface impoundments, and the least burdensome pathway requires that EKPC install groundwater-monitoring systems and demonstrate that it meets the applicable groundwater standards by November 8, 2024. *See* 89 Fed. Reg. 39107. This deadline is practically impossible for EKPC to meet. Indeed, even if EKPC had begun the process of installing groundwater-monitoring systems as soon as the Final Rule was promulgated, it is highly unlikely that it would have been able to install the systems and complete the necessary sampling and testing in time to meet the November 8, 2024 deadline.

Finally, it is important to point out that once EKPC starts these efforts, they cannot be undone. Such impositions on private property create "irreparable harm."

Alabama Ass'n of Realtors v. DHS, 594 U.S. 758, 765 (2021) (per curiam); *see also Ohio*, 144 S. Ct. at 2053.

b. Compliance Costs

These structural alterations would come at great—and unrecoverable—cost. Altogether, EKPC will likely need to spend tens (possibly hundreds) of millions of dollars to comply with the Final Rule. That expenditure "can[not] be remedied through subsequent legal action." *In re NTE Connecticut, LLC*, 26 F.4th 980, 990 (D.C. Cir. 2022). "Financial injury is . . . irreparable where no 'adequate compensatory or other corrective relief will be available at a later date, in the ordinary course of litigation.'" *Mexichem Specialty Resins, Inc. v. EPA*, 787 F.3d 544, 555 (D.C. Cir. 2015) (quoting *Wisconsin Gas Co. v. FERC*, 758 F.2d 669, 674 (D.C.Cir.1985)). As then-Judge Kavanaugh explained in *Mexichem*, "the high costs to comply" with unlawful EPA action constitutes "irreparable harm." *Id.* at 562 (Kavanaugh, J., dissenting); *see also Thunder Basin Coal Co. v. Reich*, 510 U.S. 200, 220–21 (1994) (Scalia, J., concurring) ("complying with a regulation later held invalid almost *always* produces the irreparable harm of nonrecoverable compliance costs").

EKPC will need to begin taking measures to comply with the Final Rule almost immediately, including—among other things—assessing its CCR units, developing required plans and reports, installing groundwater-monitoring systems, and potentially re-closing long-closed units. All this will entail significant costs.

The most immediate costs of compliance will be incurred at the Dale Station. Even though the former impoundments at the Dale Station have contained neither liquids nor CCR for nearly a decade, the Final Rule imposes many burdensome requirements on them, including the installation of groundwater-monitoring systems and other compliance activities, all of which could cost $16.5 million, and perhaps more.[6]

c. Constitutional Injuries

Finally, the Final Rule's constitutional infirmities impose *per se* irreparable harm. "[T]he loss of constitutional freedoms, 'for even minimal periods of time, unquestionably constitutes irreparable injury.'" *Archdiocese of Washington v. Washington Metro. Area Transit Auth.*, 897 F.3d 314, 334 (D.C. Cir. 2018) (citation omitted); *Roman Catholic Diocese of Brooklyn v. Cuomo*, 592 U.S. 14, 19 (2020) (per curiam). EKPC should not have to comply with a regulation that is outside the

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[6] EKPC estimated its compliance costs at $6.925 million in its initial stay petition. Further inquiry places that figure higher. These estimates are fluid and evolving and could change further.

federal government's authority under the Commerce Clause and that violates principles of due process by its unlawful retroactivity.

3. Private and public interests favor a stay.

The final factors—harm to the opposing party and the public interest in a stay—"merge when the Government is the opposing party." *Nken*, 556 U.S. at 435. And they decidedly favor staying the Final Rule. Because the Final Rule "will force [EKPC] to incur [m]illions of dollars in unrecoverable compliance costs," "[t]he equities" favor staying the Final Rule. *NFIB v. OSHA*, 595 U.S. 109, 120 (2022) (per curiam).

The "public [has no] interest in the perpetuation of unlawful agency action." *League of Women Voters of U.S. v. Newby*, 838 F.3d 1, 12 (D.C. Cir. 2016). The public interest lies with EPA operating within the boundaries set by "by the federal laws that govern [its] existence and operations." *Id.*

The private interests are even weightier. EKPC serves some of the Commonwealth's—indeed, the Nation's—most vulnerable citizens. EKPC generates electrical energy to cooperatives that distribute it across Kentucky. EKPC is the energy wholesaler, and its owner-members are retailers. Some 93% of end users of the power generated by EKPC are residential customers, many of whom live in communities afflicted with severe poverty. Increasing the cost of electricity—as the Final Rule will assuredly require—will only make Kentuckians worse off. In fact, the increase in electricity costs may even harm public health, given that many citizens may longer be able to afford to air condition or heat their homes. The population EKPC serves can ill afford a price hike that provides no environmental benefit.

CONCLUSION

EPA should stay the Final Rule pending review in the D.C. Circuit.

Dated: August 16, 2024

/s/ S. Chad Meredith

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IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

EAST KENTUCKY POWER COOPERATIVE, INC., Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY and MICHAEL S. REGAN, Administrator, United States Environmental Protection Agency, Respondents.	))))))))))))	Case No. 24-1267

PETITION FOR REVIEW

Pursuant to 42 U.S.C. § 6976(a), 5 U.S.C. §§ 702 and 706, Rule 15 of the Federal Rules of Appellate Procedure, and Rule 15 of the Circuit Rules of the United States Court of Appeals for the District of Columbia Circuit, East Kentucky Power Cooperative, Inc., hereby petitions this Court for review of the final agency action taken by Respondents United States Environmental Protection Agency and Michael S. Regan, Administrator, United States Environmental Protection Agency, entitled "Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface

Impoundments," and published at 89 Fed. Reg. 38950 (May 8, 2024). A copy of that final rule is attached.

Dated: August 2, 2024

Respectfully submitted,

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Attorneys for Petitioner

IN THE UNITED STATES COURT OF APPEALS
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EAST KENTUCKY POWER COOPERATIVE, INC., Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY and MICHAEL S. REGAN, Administrator, United States Environmental Protection Agency, Respondents.	))))))))))))	Case No. 24-1267

RULE 26.1 CORPORATE DISCLOSURE STATEMENT

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure, and Rule 26.1 of the Circuit Rules of the United States Court of Appeals for the District of Columbia Circuit, Petitioner East Kentucky Power Cooperative, Inc. ("East Kentucky"), submits the following statement:

East Kentucky is a corporation organized under the laws of the Commonwealth of Kentucky, and its corporate headquarters are located at 4775 Lexington Road, Winchester, Kentucky 40392. East Kentucky is owned by 16 rural electric cooperatives: Big Sandy Rural Electric Cooperative, Blue Grass Energy Cooperative, Clark Energy Cooperative, Cumberland Valley Electric, Farmers Rural Electric Cooperative, Fleming-Mason Energy Cooperative, Grayson Rural Electric Cooperative, Inter-County Energy, Jackson Energy Cooperative, Licking Valley Rural Electric Cooperative, Nolin Rural Electric Cooperative, Owen Rural Electric Cooperative, Salt River Electric Cooperative, Shelby Energy Cooperative, South Kentucky Rural Electric Cooperative, and Taylor County Rural Electric Cooperative. No publicly held corporation owns 10% or more of East Kentucky's stock.

Dated: August 2, 2024

Respectfully submitted,

/s/S. Chad Meredith

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Attorneys for Petitioner

CERTIFICATE OF SERVICE

I certify that I have caused a true and correct copy of the foregoing Petition for Review and Corporate Disclosure Statement to be served on the following by First Class U. S. Mail on August 2, 2024:

Hon. Michael S. Regan
Office of the Administrator (1101A)
United States Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Correspondence Control Unit
Office of General Counsel (2311)
United States Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Hon. Merrick Garland
Attorney General of the United States
United States Department of Justice
950 Pennsylvania Avenue, N.W.
Washington, D.C. 20530-0001

Todd Kim
Assistant Attorney General
U.S. Department of Justice
Environment and Natural Resources Division
950 Pennsylvania Avenue, N.W.
Washington, DC 20530-00001

/s/ S. Chad Meredith
S. Chad Meredith

EXHIBIT A

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9 and 257

[EPA–HQ–OLEM–2020–0107; FRL–7814–04–OLEM]

RIN 2050–AH14

Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: On April 17, 2015, the Environmental Protection Agency (EPA or the Agency) promulgated national minimum criteria for existing and new coal combustion residuals (CCR) landfills and existing and new CCR surface impoundments. On August 21, 2018, the United States Court of Appeals for the District of Columbia Circuit vacated the exemption for inactive surface impoundments at inactive facilities (legacy CCR surface impoundments) and remanded the issue back to EPA to take further action consistent with its opinion in *Utility Solid Waste Activities Group, et al.* v. *EPA.* This action responds to that order and establishes regulatory requirements for legacy CCR surface impoundments. EPA is also establishing requirements for CCR management units at active CCR facilities and at inactive CCR facilities with a legacy CCR surface impoundment. Finally, EPA is making several technical corrections to the existing regulations, such as correcting certain citations and harmonizing definitions.

DATES: This final rule is effective on November 4, 2024.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–HQ–OLEM–2020–0107. All documents in the docket are listed on the *http://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: For questions concerning this proposal, contact Michelle Lloyd, Office of Resource Conservation and Recovery, Materials Recovery and Waste Management Division, Environmental Protection Agency, 1200 Pennsylvania Avenue NW, MC: 5304T, Washington, DC 20460; telephone number: (202) 566–0560; email address: *Lloyd.Michelle@epa.gov,* or Taylor Holt, Office of Resource Conservation and Recovery, Materials Recovery and Waste Management Division, Environmental Protection Agency, 1200 Pennsylvania Avenue NW, MC: 5304T, Washington, DC 20460; telephone number: (202) 566–1439; email address: *Holt.Taylor@epa.gov.* For more information on this rulemaking, please visit *https://www.epa.gov/coalash.*

SUPPLEMENTARY INFORMATION:

Table of Contents

List of Acronyms

ACM Assessment of Corrective Measures
ANPRM Advance Notice of Proposed Rulemaking
ARAR applicable or relevant and appropriate requirements
ASD alternative source demonstration
CAA Clean Air Act
CBI Confidential Business Information
CBR closure by removal
CCR coal combustion residuals
CCRMU coal combustion residuals management unit
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
CIP closure in place
CFR Code of Federal Regulations
COALQUAL U.S. Geological Survey coal quality database
CWA Clean Water Act
DOE Department of Energy
EAP Emergency Action Plan
EIA Energy Information Administration
EIP Environmental Integrity Project
EJ environmental justice
ELG Effluent Limitation Guidelines
EPA Environmental Protection Agency
EPACMTP EPA Composite Model for Leachate Migration with Transformation Products
EPRI Electric Power Research Institute
FER Facility Evaluation Report
FERC Federal Energy Regulatory Commission
FGD flue gas desulfurization
FR Federal Register
GWMCA groundwater monitoring and corrective action
GWPS groundwater protection standard
HQ hazard quotient
HSWA Hazardous and Solid Waste Amendments
ICR Information Collection Request
IRIS Integrated Risk Information System
LEAF Leaching Environmental Assessment Framework
MCL maximum contaminant level
MDE Maryland Department of the Environment
MNA monitored natural attenuation
MODFLOW–USG Modular Three-Dimension Finite-Difference Ground-Water Flow Model
MSW Municipal Solid Waste
MW Megawatts
NAICS North American Industry Classification System
NERC North American Electric Reliability Corporation
NODA notice of data availability
NPDES National Pollution Discharge Elimination System
NPL National Priorities List
NTTAA National Technology Transfer and Advancement Act
OAFU Other Active Facilities
OLEM Office of Land and Emergency Management
OMB Office of Management and Budget
OSHA Occupational Safety and Health Administration

P.E. Professional Engineer
PM particulate matter
PRA Paperwork Reduction Act
PRG preliminary remediation goal
PUC Public Utility Commission
QA/QC quality assurance/quality control
RCRA Resource Conservation and Recovery Act
RIA Regulatory Impact Analysis
RME reasonable maximum exposure
RTO Regional Transmission Organizations
SMCL secondary maximum contaminant level
SSI statistically significant increase
SSL statistically significant level
TDS total dissolved solids
TSCA Toxic Substances Control Act
TSDF Transportation Storage and Disposal Facility
TVA Tennessee Valley Authority
UMRA Unfunded Mandates Reform Act
USGS U.S. Geological Survey
USWAG Utility Solid Waste Activities Group
WIIN Water Infrastructure Improvements for the Nation
WQC water quality criteria

I. General Information

A. Does this action apply to me?

This rule applies to and may affect all CCR generated by electric utilities and independent power producers that fall within the North American Industry Classification System (NAICS) code 221112. The reference to NAICS code 221112 is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This discussion lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not described here could also be regulated. To determine whether your entity is regulated by this action, you should carefully examine the applicability criteria found in 40 CFR 257.50 of title 40 of the Code of Federal Regulations. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

B. What action is the Agency taking?

EPA is amending the regulations governing the disposal of CCR in landfills and surface impoundments, codified in subpart D of part 257 of Title 40 of the Code of Federal Regulations (CFR) (CCR regulations). Specifically, the Agency is establishing regulatory requirements for inactive CCR surface impoundments at inactive utilities (''legacy CCR surface impoundment'' or ''legacy impoundment''). This action is being taken in response to the August 21, 2018, opinion by the U.S. Court of Appeals for the District of Columbia Circuit in *Utility Solid Waste Activities Group* v. *EPA,* 901 F.3d 414 (D.C. 2018) (''*USWAG* decision'' or ''*USWAG*'') that vacated and remanded the provision exempting legacy impoundments from the CCR regulations. This action includes adding a definition for legacy CCR surface impoundments and other terms relevant to this rulemaking. It also requires that legacy CCR surface impoundments comply with certain existing CCR regulations with tailored compliance deadlines.

While this action is responsive to the D.C. Circuit's order, it is also driven by the record, which clearly demonstrates that regulating legacy CCR surface impoundments will have significant quantified and unquantified public health and environmental benefits. As EPA concluded in 2015, the risks posed by unlined CCR surface impoundments are substantial, and the risks from legacy impoundments are at least as significant. EPA's 2014 Risk Assessment concluded that the cancer risks from unlined surface impoundments ranged from 3×10^{-4} for trivalent arsenic to 4×10^{-5} for pentavalent arsenic. Non-cancer risks from these same units also significantly exceeded EPA's level of concern, with estimated Hazard Quotients (HQ) of two for thallium, three for lithium, four for molybdenum and eight for trivalent arsenic. In addition, as described in Unit III.A.1 of this preamble, information obtained since 2015 indicates that the risks for legacy CCR surface impoundments are likely to be greater than EPA originally estimated. Finally, based on the demographic composition and environmental conditions of communities within one and three miles of legacy CCR surface impoundments, this final rule will reduce existing disproportionate and adverse effects on economically vulnerable communities, as well as those that currently face environmental burdens. For example, in Illinois the population living within one mile of legacy CCR surface impoundment sites is over three times as likely compared to the State average to have less than a high school education (35.66% compared to 10.10%, see Regulatory Impact Analysis (RIA) exhibit ES.14), and that population already experiences higher than average exposures to particulate matter, ozone, diesel emissions, lifetime air toxics cancer risks, and proximity to traffic, Superfund sites, Risk Management Plan sites, and hazardous waste facilities (see RIA exhibit ES.15). Consistent with the directive in section 4004(a) to ensure that the statutory standard is met at all regulated sites, including the most vulnerable, this final rule will help EPA further ensure that the communities and ecosystems closest to coal facilities are sufficiently protected from harm from groundwater contamination, surface water contamination, fugitive dust, floods and impoundment overflows, and threats to wildlife.

EPA is also establishing requirements to address the risks from currently exempt solid waste management that involves the direct placement of CCR on the land. EPA is extending a subset of the existing requirements in 40 CFR part 257, subpart D to CCR surface impoundments and landfills that closed prior to the effective date of the 2015 CCR Rule, inactive CCR landfills, and other areas where CCR is managed directly on the land. In this action, EPA refers to these as CCR management units, or CCRMU. The final rule expands the CCRMU requirements to a set of active facilities that were not regulated by the 2015 CCR rule because they had ceased disposing of CCR in their on-site disposal units, and they did not have an inactive surface impoundment. Accordingly, this rule applies to all CCRMU at active CCR facilities and inactive facilities with a legacy CCR surface impoundment.

EPA is also finalizing alternative closure provisions to allow a facility to complete the closure by removal in two stages: first, by completing all removal and decontamination procedures; and second, by completing all groundwater remediation in a separate post closure care period.

Finally, EPA is making a number of technical corrections to the existing regulations, such as correcting certain citations and harmonizing definitions.

EPA intends the provisions of the rule to be severable. In the event that any individual provision or part of the rule is invalidated, EPA intends that this would not render the entire rule invalid, and that any individual provisions that can continue to operate will be left in place. For example, EPA intends that the provisions governing each class of facilities—legacy CCR inactive surface impoundments, CCR management units, other active facility units, and regulated CCR landfills containing waste in contact with groundwater—to be independently severable from one another as each set of requirements operates independently from the other.

Likewise, the provisions regulating existing units at active facilities, including those units at non-fossil-fuel-fired facilities generating energy, are severable from the other substantive requirements—each provision may continue operating even if one of the others is invalidated. EPA also intends that, within each set of provisions for legacy CCR surface impoundments and for CCR management units, the substantive requirements be severable from each other. For example, if any of the closure requirements were to be set aside (*e.g.,* the requirement that CCRMU initiate closure within 48 months of publication), the groundwater monitoring and corrective action requirements can continue to fully and effectively operate. These requirements function independently from each other, address environmental concerns through different means, and are not dependent on the others; they are therefore severable from each other. Lastly, as set forth below, EPA has deferred the dates by when some units in some circumstances must comply with the substantive standards governing legacy CCR surface impoundments and CCR management units. If any of the deferrals were to be set aside, EPA intends that the substantive standards would remain in place because the rationale for and effectiveness of each set of substantive standards is not dependent on any of the deferrals.

For the reader's convenience, EPA has provided a background description of existing requirements in several places throughout this preamble.

C. What is the Agency's authority for taking this action?

EPA is publishing this notice under the authority of sections 1008(a), 2002(a), 3007, 4004, and 4005(a) and (d) of the Solid Waste Disposal Act of 1970, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA) and the Water Infrastructure Improvements for the Nation (WIIN) Act of 2016, 42 U.S.C. 6907(a), 6912(a), 6927, 6944, 6945(a) and (d).

RCRA section 1008(a) authorizes EPA to publish ''suggested guidelines for solid waste management.'' 42 U.S.C. 6907(a). RCRA defines solid waste management as ''the systematic administration of activities which provide for the collection, source separation, storage, transportation, transfer, processing, treatment, and disposal of solid waste.'' 42 U.S.C. 6903(28).

Pursuant to section 1008(a)(3), the guidelines are to include the minimum criteria to be used by the States to define the solid waste management practices that constitute the open dumping of solid waste or hazardous waste and are prohibited as ''open dumping'' under section 4005. Only those requirements promulgated under the authority of section 1008(a)(3) are enforceable under section 7002 of RCRA.

RCRA section 4004(a) generally requires EPA to promulgate regulations containing criteria distinguishing ''sanitary landfills,'' which may continue to operate, from ''open dumps,'' which are prohibited. 42 U.S.C. 6944(a); *see id.* 6903(14), (26); 6945(a). The statute directs that, ''at a minimum, the criteria are to ensure that units are classified as sanitary landfills only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid wastes at such facility.'' 42 U.S.C. 6944(a).

RCRA section 4005(a), entitled ''Closing or upgrading of existing open dumps,'' prohibits any solid waste management practices or disposal of solid waste that does not comply with EPA regulations issued under RCRA section 1008(a) and 4004(a). 42 U.S.C. 6945(a). See also 42 U.S.C. 6903(14) (definition of ''open dump''). This prohibition takes effect ''upon promulgation'' of any rules issued under section 1008(a)(3) and is enforceable either through a citizen suit brought pursuant to section 7002, or through an EPA enforcement action brought pursuant to section 4005(d)(4)(A). See 42 U.S.C. 6945(a), (d)(4)(A) (authorizing EPA to use the authority under RCRA section 3008(a) to enforce the open dumping prohibition for CCR). RCRA section 4005(a) also directs that open dumps (*i.e.,* facilities out of compliance with EPA's criteria), must be closed or upgraded. See 42 U.S.C. 6945(a).

RCRA section 4005(d)(3) specifies that the regulations in 40 CFR part 257, subpart D ''(or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title), shall apply to each CCR unit'' unless a permit issued by an approved State or by EPA is in effect. Similarly, section 4005(d)(6) [1] provides that:

> a CCR unit shall be considered to be a sanitary landfill for purposes of this chapter, including subsection (a), only if the coal combustion residuals unit is operating in accordance with [a permit issued by EPA or an approved State] or 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).

1. Regulation of Solid Wastes Under RCRA Subtitle D

Solid wastes that are neither a listed nor characteristic hazardous waste are subject to the requirements of RCRA subtitle D. Subtitle D of RCRA establishes a framework for Federal, State, and local government cooperation in controlling the management of nonhazardous solid waste. The Federal role is to establish the overall regulatory direction by providing minimum nationwide standards that will protect human health and the environment. States may, but are not required to, adopt these requirements into their State programs.

Under RCRA section 4005(a), upon promulgation of criteria under section 1008(a)(3), any solid waste management practice or disposal of solid waste that constitutes the ''open dumping'' of solid waste is prohibited. The Federal standards apply directly to the facility (are self-implementing) and facilities are directly responsible for ensuring that their operations comply with these requirements.

RCRA section 4005(d) establishes an additional regulatory structure, applicable exclusively to the solid waste management of CCR, that builds on the provisions in sections 1008(a)(3), 4004, and 4005(a), without restricting the scope of EPA's authority under those sections. See, 42 U.S.C. 6945 (d)(7). Under 4005(d), States may seek EPA approval of a State permitting program under which individualized facility permits would ''operate in lieu of [EPA] regulation of coal combustion residuals units in the State.'' 42 U.S.C. 6945(d)(1)(A). EPA is also directed to ''implement a permit program,'' which would operate in absence of an approved State program. 42 U.S.C. 6945(d)(2). However, the statute makes clear that facilities must continue to comply with the Federal regulations until a permit issued by either EPA or an approved State is in effect. 42 U.S.C. 6945(d)(3), (6).

RCRA sections 1008(a)(3) and 4004(a) delegate broad authority to EPA to establish regulations governing the management of solid waste. Under section 4004(a) EPA is charged with establishing requirements to ensure that facilities will be classified as sanitary landfills and not an open dump ''only if there is no reasonable probability of adverse effects on health or the environment from the disposal of solid waste'' at the facility. Or in other words, under section 4004(a) EPA is charged with issuing regulations to address all ''reasonable probabilities of adverse effects'' (*i.e.,* all reasonably anticipated risks) to health and the environment from the disposal of solid waste. Section 1008(a)(3) expands EPA's authority to address the risks from any of the activities identified as ''solid waste management'' in RCRA section

[1] 42 U.S.C. 6945(d)(6).

1004(28). Specifically, EPA is authorized to establish requirements applicable to ''storage, transportation, transfer, processing, treatment, and disposal of solid waste.'' (42 U.S.C. 6907(a), 6903(28)). Under RCRA, EPA sets these requirements without taking cost into account as a factor. See *USWAG et al.* v. *EPA,* 901 F.3d at 448–49 (citing RCRA section 4004(a)).

The statute is clear that EPA is authorized to issue regulations to address the current risks from previous solid waste management activities. EPA explained at length the basis for this conclusion as part of the Agency's rationale for regulating inactive impoundments. See, 80 FR 21344—21347. See also *USWAG,* 901 F.3d at 440. Among other provisions, the statutory definition of an ''open dump'' conclusively resolves the question. RCRA defines an ''open dump'' as ''any facility or site where solid waste is disposed of . . . .'' 42 U.S.C. 6903(14). As the D.C. Circuit explained,

> Importantly, while the ''is'' retains its active present tense, the ''disposal'' takes the form of a past participle (''disposed''). In this way, the disposal itself can exist (it ''is''), even if the act of disposal took place at some prior time . . . . Properly translated then, an open dump includes any facility (other than a sanitary landfill or hazardous waste disposal facility), where solid waste still ''is deposited,'' ''is dumped,'' ''is spilled,'' ''is leaked,'' or ''is placed,'' regardless of when it might have originally been dropped off. *See* 42 U.S.C. 6903(3), (14). In other words, the waste in inactive impoundments ''is disposed of'' at a site no longer receiving new waste in just the same way that it ''is disposed of'' at a site that is still operating.

901 F.3d at 440. See also *In re Consolidated Consol. Land Disposal Regulation Litig.,* 938 F.2d 1386, 1389 (D.C. Cir. 1991) (EPA's reading of the term ''disposal'' in RCRA's subtitle C, 42 U.S.C. 6924, to include ''the continuing presence of waste'' was reasonable); *USWAG,* 901 F.3d at 453–54 (Henderson, J., concurring) (same). By the same logic, these provisions would authorize EPA to regulate closed units that continue to pose risks to health or the environment, for example by requiring the owners or operators of such units to remediate any contamination from these units, or to take action to prevent such contamination.

The 2016 amendments further confirm EPA's authority over these activities. In section 4005, Congress referenced the 2015 regulations in the statute, and expressly stated that the amendments in 4005(d) were not intended to limit or restrict the authority already provided under sections 1008(a)(3) and 4004(a). See, 42 U.S.C. 6945(d)(3), (6), (7). By incorporating the rule into the statute without modification, Congress has affirmed the Agency's authority to impose the kind of requirements established in part 257 (*e.g.,* corrective action to remediate groundwater contamination). Moreover, Congress made clear that EPA retains the authority to modify or expand these requirements as necessary to ensure that the standard in section 4004(a) will continue to be met. See, *e.g.,* 42 U.S.C. 6945(d)(1)(A)(i), (3), (6) (referencing ''or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title'').

EPA interprets the standard in section 4004(a) to apply equally to criteria issued under sections 1008(a)(3) and 4004(a); namely that the criteria must ensure that a facility is to be classified as a sanitary landfill, and thus allowed to continue to operate, ''only if there is no reasonable probability of adverse effects on health or the environment'' from either the disposal or other solid waste management practices at the facility. Thus, under the combined authority conferred by sections 1008(a)(3) and 4004(a), a facility is an ''open dump'' if it engages in any activity involving the management of solid waste that does not meet the standard in section 4004(a); or in other words, any activity involved with the management of solid waste that presents a reasonable probability of causing adverse effects on health or the environment. EPA also interprets these provisions to authorize the establishment of criteria that define the manner in which facilities upgrade or close, consistent with the standard in section 4004(a), to ensure there will be no reasonable probability of adverse effects on health or the environment.

D. What are the incremental costs and benefits of this action?

As noted previously, EPA establishes the requirements under RCRA sections 1008(a)(3) and 4004(a) without taking cost into account. See, *USWAG,* 901 F.3d at 448–49. The following cost estimates are presented in the RIA and summarized in this preamble for compliance with OMB Circular A–4, E.O. 12866, and E.O. 14094. The requirements in this rule do not rely on these cost estimates.[2]

The RIA estimates that the annualized monetized costs of this action will be approximately $214–$240 million per year when discounting at 2%. Of this, $123–$135 million is attributable to the requirements for legacy CCR surface impoundments, which are subject to the D.C. Circuit's order in *USWAG,* $79–$92 million is attributable to the requirements for CCRMU, an additional $8–$9 million is attributable to the requirements for CCRMU at Other Active Facilities (OAFUs) (a term used in the RIA) that are discussed in Unit III.C.2.e of the preamble, and $4 million is attributable to requirements for landfills. The costs of this final rule are discussed further in the RIA and include the costs of unit closure, corrective action, fugitive dust controls, structural integrity inspections, and recordkeeping and reporting.

The RIA estimates that the annualized monetized benefits attributable to this action will be approximately $53–$80 million per year when discounting at 2%. Of this, $43–$57 million is attributable to the requirements for legacy CCR surface impoundments, $9–$21 million is attributable to the requirements for CCRMU, $1–$2 million is attributable to the requirements for CCRMU at ''other active facilities,'' or OAFUs. Requirements for landfills account for a de minimis amount of benefits.

In addition to monetized benefits, the RIA describes ten categories of non-monetized benefits. These include human health effects from lead exposure such as ADHD, cardiovascular mortality, and increased cancer risk. They also include ecosystem benefits from avoided exposure to the heavy metals in CCR effluent. The RIA describes several property-related benefits including increased property values near closed and remediated CCR units, and option values for remediated land. The RIA also contextualizes the final rule within EPA's broader efforts to regulate air and surface water pollution from coal fired power plants.

Further information on the economic effects of this action can be found in Unit V of this preamble.

[2] Although EPA did not consider costs in developing this rule, if the Agency had considered costs, the final rule would not have been different. As discussed in greater detail later in this preamble and in the RIA, the monetized benefits are based on only a subset of adverse health effects from a single constituent. EPA monetized the benefit from two additional human health endpoints associated with that single constituent in a sensitivity analysis and estimated an additional $19 million per year when discounting at 2% from that single contaminant. The RIA also describes a number of important benefits that cannot currently be quantified or monetized due to data limitations or limitations in current methodologies. Based on these estimates EPA believes that after considering all unquantified and distributional effects, the public health and welfare gains that will result from the proposed alternative would justify the rule's costs.

II. Background

A. 2015 CCR Rule

On April 17, 2015, EPA finalized national minimum criteria for the disposal of CCR as solid waste under Subtitle D of RCRA titled, ''Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities'' (80 FR 21302) (2015 CCR Rule). The 2015 CCR Rule, codified in 40 CFR part 257, subpart D, established regulations for existing and new CCR landfills, as well as existing and new CCR surface impoundments (including all lateral expansions of CCR units). The criteria consist of location restrictions, design and operating criteria, groundwater monitoring and corrective action requirements, closure and post-closure care requirements, recordkeeping, notification, and internet posting requirements.

The 2015 CCR Rule also imposed requirements on inactive surface impoundments at active facilities. A CCR surface impoundment is a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR. The 2015 CCR Rule defined an ''inactive CCR surface impoundment'' as ''a CCR surface impoundment that no longer receives CCR on or after October 19, 2015, and still contains both CCR and liquids on or after October 19, 2015.'' 40 CFR 257.53. The rule defined ''active facility or active electric utilities or independent power producers'' as ''any facility subject to the requirements of this subpart that is in operation on October 19, 2015. An electric utility or independent power producer is in operation if it is generating electricity that is provided to electric power transmission systems or to electric power distribution systems on or after October 19, 2015. An off-site disposal facility is in operation if it is accepting or managing CCR on or after October 19, 2015.'' 40 CFR 257.53.

The 2015 CCR Rule did not impose any requirements on inactive facilities. EPA explained that this was consistent with past decisions under RCRA subtitle C. See, 80 FR 21344 (April 17, 2015). EPA further raised concerns that it would be difficult to identify the owners or other parties responsible for such facilities, as well as concerns that the present owner of the land on which an inactive facility was located might have no connection (other than present ownership of the land) with the prior disposal activities. *Id.* Consequently, EPA exempted those units at § 257.50(e).

B. 2018 USWAG Decision

The 2015 CCR Rule was challenged by several parties, including coalitions of regulated entities and environmental organizations (''Environmental Petitioners''). See *USWAG et al.* v. *EPA,* 901 F.3d 414 (D.C. Cir. 2018). Environmental Petitioners raised two challenges that are relevant to this final rule. First, they challenged the provision at § 257.101(a)(1) that allowed existing, unlined surface impoundments to continue to operate until they exceeded the groundwater protection standard. They contended that EPA failed to show how continued operation of unlined impoundments met RCRA's baseline requirement that any solid waste disposal site pose ''no reasonable probability of adverse effects on health or the environment.'' 42 U.S.C. 6944(a). Second, Environmental Petitioners challenged the exemption at § 257.50(e) for inactive surface impoundments at inactive power plants (*i.e.,* ''legacy ponds''). Environmental Petitioners argued that legacy ponds are at risk of unmonitored leaks and catastrophic structural failures.

On August 21, 2018, the U.S. Court of Appeals for the D.C. Circuit upheld most of the 2015 CCR Rule but decided in favor of Environmental Petitioners on these two claims. The Court held that EPA acted ''arbitrarily and capriciously and contrary to RCRA'' in failing to require the closure of unlined surface impoundments [3] and in exempting inactive surface impoundments at inactive power plants from regulation. The Court vacated these provisions and remanded the matter back to the Agency for further action consistent with its opinion.

In overturning the exemption for legacy ponds, the Court evaluated the evidence in the rulemaking record and reached specific conclusions about the risks that legacy ponds pose based on the record for the 2015 CCR Rule. The Court pointed to evidence that legacy ponds are most likely to be unlined and unmonitored and that such units have been shown to be more likely to leak than units at utilities still in operation. 901 F.3d at 432. The Court also determined that legacy ponds:

> . . . pose the same substantial threats to human health and the environment as the riskiest Coal Residuals disposal methods, compounded by diminished preventative and remediation oversight due to the absence of an onsite owner and daily monitoring. *See* 80 FR at 21343 through 21344 (finding that the greatest disposal risks are ''primarily driven by the older existing units, which are generally unlined''). Notably, this very Rule was prompted by a catastrophic legacy pond failure that resulted in a ''massive'' spill of 39,000 tons of coal ash and 27 million gallons of wastewater into North Carolina's Dan River. . . .
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> [T]here is no gainsaying the dangers that unregulated legacy ponds present. The EPA itself acknowledges the vital importance of regulating inactive impoundments at active facilities. That is because, if not properly closed, those impoundments will ''significant[ly]'' threaten ''human health and the environment through catastrophic failure'' for many years to come. 75 FR at 35,177; *see also* 80 FR at 21,344 n. 40.
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> The risks posed by legacy ponds are at least as substantial as inactive impoundments at active facilities. *See* 80 FR at 21,343–21, 344 (finding ''no [ ] measurabl[e] differen[ce]'' in risk of catastrophic events between active and inactive impoundments). And the threat is very real. Legacy ponds caused multiple human and environmental disasters in the years leading up to the Rule's promulgation. *See* 75 FR at 35,147 (proposed rule discusses multiple serious incidents). For example, a pipe break at a legacy pond at the Widows Creek plant in Alabama caused 6.1 million gallons of toxic slurry to deluge local waterways. *Id.* Another legacy pond in Gambrills, Maryland caused the heavy metal contamination of local drinking water. *Id.* And the preamble to the Rule itself specifically points to the catastrophic spill at the Dan River legacy pond in North Carolina. 80 FR at 21,393–21,394.

Id. at 432–433. Relying on this evidence, the Court concluded there was no logical basis for distinguishing between the inactive impoundments at active facilities that were regulated and the legacy impoundments that were exempt. *Id.* at 434. Consequently, the Court vacated the provision of the 2015 CCR Rule (§ 257.50(e)) that specifically exempted inactive impoundments at inactive facilities from regulation and remanded the matter back to EPA for further action consistent with its opinion. Notwithstanding the vacatur of § 257.50(e), until EPA amended the regulations to effectuate the Court's order, facilities were not legally obliged to take any action to comply with the Federal CCR regulations. This is because, as originally drafted, legacy CCR surface impoundments did not fall within the scope of the rule, as defined in § 257.50. The specific provision in § 257.50(e) exempting legacy impoundments merely identified the units that were not covered by § 257.50(b). Because the vacatur of § 257.50(e) did not amend § 257.50(b), legacy impoundments remained exempt.

[3] After the Court's ruling, the closure of unlined CCR surface impoundments was addressed in a separate regulatory action that was published on August 28, 2020 (85 FR 53516).

C. 2020 Part B Proposed Rule

In the March 3, 2020 proposed rule, Hazardous and Solid Waste Management System: Disposal of CCR; A Holistic Approach to Closure Part B: Alternate Demonstration for Unlined Surface Impoundments; Implementation of Closure (85 FR 12456), EPA proposed revisions to the 2015 CCR Rule, including: procedures to allow facilities to request approval to use an alternate liner for CCR surface impoundments; two alternative proposed options to allow the use of CCR during unit closure; an additional closure option for CCR units being closed by removal of CCR; and requirements for annual closure progress reports. On November 12, 2020, EPA finalized the procedures to allow facilities to request approval to use an alternate liner for CCR surface impoundments. 85 FR 72506. In this final rule, the Agency is taking final action on the proposed closure option for units being closed by removal of CCR, which action is discussed in Unit III.D of this preamble. EPA is still considering provisions from the proposed rule that are not addressed in this rule and may be addressed in a subsequent action.

D. 2020 Advance Notice of Proposed Rulemaking

On October 14, 2020, EPA published an Advance Notice of Proposed Rulemaking (ANPRM) (85 FR 65015). In that action, EPA requested information related to legacy CCR surface impoundments to inform a future rulemaking. The Agency requested input on its regulatory authority, input on a potential definition of a legacy CCR surface impoundment and specific information on the types of inactive surface impoundments at inactive facilities that might be considered legacy CCR surface impoundments. Specifically, EPA requested information on how many of these units exist, the current status of these units (*e.g.,* capped, dry, closed according to State requirements, still holding water), and the names, locations, and closure dates of former power plants that may have these units. Finally, the Agency took comment on which CCR regulations should apply to legacy CCR surface impoundments and on suggestions for compliance deadlines.

During the 60-day public comment period, the Agency received over 15,000 comments from environmental groups, four States, one Tribe, individual utilities, and industry trade associations. The topics raised in comments included a potential definition of a legacy CCR surface impoundment, EPA's regulatory authority, the scope and applicability of the legacy impoundment rule, and regulatory requirements to propose. Moreover, the comments generally agreed that EPA must prescribe timeframes for coming into compliance with the regulations and they recommended timeframes that are shorter than compliance timeframes in the 2015 CCR Rule.

As noted in the ANPRM, EPA took comment on whether, in light of the Court's opinion in *USWAG,* the Agency could reconsider whether it has the authority to regulate inactive impoundments under RCRA subtitle D. 85 FR 65017–65018 (October 14, 2020). The general consensus from commenters on the ANPRM was that, because the Court resolved the question based on the plain meaning of the statute, EPA does not have the discretion to reinterpret its authority. In addition, no commenter identified a factual basis for not regulating legacy CCR surface impoundments that addressed the Court's concern about the risks these units pose. *Id.* at 65018. Consequently, EPA is not revisiting the question of whether it may regulate inactive or legacy CCR surface impoundments.

E. 2023 Proposed Rule and Comments

On May 18, 2023, EPA proposed revisions to the CCR regulations (88 FR 31982) (''the proposed rule'' or ''2023 proposed rule''). These revisions included establishing regulations specifying that legacy CCR surface impoundments are subject to 40 CFR part 257, subpart D and specifying that owners or operators of legacy CCR surface impoundments comply with all the appropriate requirements applicable to inactive CCR surface impoundments at active facilities. In addition, EPA proposed to establish requirements to address the risks from currently exempt solid waste management that involves the direct placement of CCR on the land. EPA proposed to extend a subset of the existing requirements in part 257, subpart D to CCRMU, which was proposed to include CCR surface impoundments and landfills that closed prior to the effective date of the 2015 CCR Rule, inactive CCR landfills, and other areas where CCR is managed directly on the land. This proposal would apply to all active CCR facilities and all inactive facilities with legacy CCR surface impoundments. Lastly, EPA proposed to make several technical corrections to the CCR regulations. These are: (1) To clarify the definitions of ''feasible'' and ''technically feasible''; (2) To correct the CFR reference in the definition of wetlands at § 257.61(a); (3) To correct a reference in the groundwater monitoring scope section; (4) To standardize the references to CCR websites throughout the CCR regulations; and (5) EPA requested comment on extending the period for document retention and posting.

The Agency received over 33,500 comments on the proposed rule, with over 600 unique comments. Commenters included individual electric utilities and independent power producers, national trade associations, State agencies, public interest and environmental groups, private citizens, and entities involved with the beneficial use of CCR. All public comments submitted in response to the proposal can be found in the docket for this action. Most commenters focused on the scope of the proposed rule, definitions, compliance deadlines, and EPA's statutory authority to regulate CCRMU. Most commenters also requested that EPA adopt additional requirements to address the risks from CCR units. EPA's responses to the comments on the proposed rule are addressed either in this preamble or in a response to comment document available in the docket to this final rule.

EPA conducted two public hearings on the proposed rule. EPA held an in-person public hearing in Chicago, Illinois on June 28, 2023. At this hearing there were 87 speakers and a total of 150 registered attendees. EPA also held a virtual public hearing on July 12, 2023, using an internet-based software platform. The platform allowed the public hearing participants to provide oral testimony using a microphone and speakers connected to their computers or using a phone. It provided the ability for any person to listen to the public hearing via their computer. At the virtual hearing, there were 93 speakers and a total of 353 registered attendees. Testimony at both public hearings focused generally on EPA's proposed amendments, and on the following topics: whether to further expand regulation to all CCR, regardless if it was onsite of a regulated facility; whether to regulate structural fill and other beneficial uses; enforcement of the CCR regulations; requests for more engagement with communities; and requests for EPA to amend other regulations to strengthen corrective action and limit the use of alternative source demonstrations (ASD). Finally, some commenters discussed site-specific concerns of facilities near their homes, or health effects witnessed in communities close to CCR sites, and general concerns about the health and environmental risks from CCR.

Transcripts for both public hearings are included in the docket for this action.

F. 2023 Notice of Data Availability

On November 14, 2023, EPA published a notice of data availability (NODA), to solicit comments on additional information and statistics developed in response to comments on the Agency's May 18, 2023 proposed rule. 88 FR 77941. Some of the information contains data or analysis obtained directly from comments submitted during the May 18, 2023 proposed rule's comment period, which might aid in the formulation of the final rule. EPA also solicited comments on a supplemental risk assessment EPA conducted in response to comments raised on the proposed rule. This risk assessment builds on the findings of the previous Human and Ecological Risk Assessment of Coal Combustion Residuals (2014 Risk Assessment) [4] and better quantifies the specific risks that may result from placement of CCR in legacy CCR surface impoundments and CCRMU. EPA requested comment on all aspects of the assessment including the validity and propriety of relying on the new information, data, and analyses contained in the updated risk assessment to inform the final rule.

EPA also sought further information on legacy CCR surface impoundments and CCRMU, including information on the location, presence, condition, history, and risk associated with any of the potential legacy CCR surface impoundments or any of the potential CCRMU within the docket. EPA also requested any information regarding the presence of water, distance to surface water bodies, proximity to floodplains, unit size, CCR volume, depth to groundwater, date of CCR placement, closure status, any corrective action associated with the unit, and any groundwater monitoring data. EPA also requested comment on the accuracy of the information that was submitted regarding potential legacy CCR surface impoundments or potential CCRMU. Furthermore, EPA sought similar information on any other potential legacy CCR surface impoundments or potential CCRMU of which EPA may not be aware or for which we may have incomplete information.

EPA accepted public comment on the NODA until December 11, 2023. The Agency received over 70 comments on the NODA. Commenters included individual electric utilities and independent power producers, national trade associations, State agencies, public interest and environmental groups, private citizens, and entities involved with the beneficial use of CCR. All public comments submitted in response to the NODA can be found in the docket for this action. The majority of commenters focused on the supplemental risk assessment; some focused on the request for additional information on the universe of legacy CCR surface impoundments and CCRMU. EPA's responses to comments received on the NODA are addressed either in an updated risk assessment (the 2024 Risk Assessment), this preamble, or in the response to comment document available in the docket to this final rule.

III. What final action is the Agency taking?

In response to the *USWAG* decision, EPA is finalizing a provision at § 257.50(e), specifying that legacy CCR surface impoundments are subject to 40 CFR part 257, subpart D. EPA is also requiring owners or operators of legacy CCR surface impoundments to comply with the following existing requirements in the CCR regulations: installation of a permanent marker, history of construction, hazard potential classification, structural stability and factors of safety assessments, emergency action plan (EAP), air criteria, inspections, groundwater monitoring and corrective action, closure and post-closure care, recordkeeping, and notification and CCR website requirements. EPA further is establishing new compliance deadlines for these newly applicable regulatory requirements to ensure the owners or operators of these units have time to come into compliance.

In addition to the revisions EPA proposed to address the *USWAG* decision, EPA is establishing requirements to address the risks from currently exempt solid waste management that involves the direct placement of CCR on the land. EPA is extending a subset of the existing requirements in 40 CFR part 257, subpart D to CCRMU, which are CCR surface impoundments and landfills that closed prior to the effective date of the 2015 CCR Rule, inactive CCR landfills, and other areas where CCR is managed directly on the land. These additional requirements apply to all active CCR facilities, all inactive facilities with legacy CCR surface impoundments subject to this final rule, and those active facilities (*i.e.,* facilities producing electricity for the grid as of October 19, 2015) that ceased placing CCR in onsite CCR units prior to the effective date of the 2015 CCR Rule.

EPA is also finalizing alternative closure provisions to allow a facility to complete the closure by removal in two stages: first, by completing all removal and decontamination procedures; and second, by completing all groundwater remediation in a separate post closure care period.

Lastly, EPA is finalizing several technical corrections to the CCR regulations. These are: (1) to clarify the definitions of ''feasible'' and ''technically feasible''; (2) to correct the CFR reference in the definition of wetlands at § 257.61(a); (3) to correct a reference in the groundwater monitoring scope section; (4) to standardize the references to CCR websites throughout the CCR regulations; and (5) to extend the period for document retention and posting.

A. Risks From Legacy CCR Surface Impoundments and CCR Management Units

1. Summary of May 2023 Proposal

The proposal largely relied on the model results from the 2014 Risk Assessment, as EPA considered the results were equally applicable to legacy CCR surface impoundments and CCRMU.[5] This determination was based on the fact that many of these unregulated units are similarly constructed, manage the same types of ash, and are frequently located either at the same or nearby facilities as their regulated counterparts. In particular, some unregulated units are known to be located directly adjacent to or beneath currently regulated units.

The 2014 Risk Assessment concluded that the management practices that EPA believed were generally in use in 2014 at surface impoundments and landfills were likely to pose risks to human health through groundwater exposure within the range that EPA typically considers warrants regulation. For highly exposed individuals, the cancer risks from arsenic due to the operation of surface impoundments were as high as 2×10^{-4}, while noncancer risks were as high as an HQ of 5 for arsenic, 2 for lithium, and 2 for molybdenum. Cancer risks associated with the operation of landfills were estimated to be as high as 5×10^{-6} from the ingestion of arsenic-contaminated drinking water. In 2015, EPA relied on this risk assessment to support the regulation of both active CCR units and inactive CCR surface

[4] U.S. EPA. 2014. ''Human and Ecological Risk Assessment of Coal Combustion Residuals.'' RIN 2050–AE81. Office of Solid Waste and Emergency Response. Washington, DC. December.

[5] U.S. EPA. 2014. ''Human and Ecological Risk Assessment of Coal Combustion Residuals.'' RIN 2050–AE81. Office of Solid Waste and Emergency Response. Washington, DC. December.

impoundments at active facilities. The 2014 Risk Assessment reported risks for the units that were anticipated to be subject to the 2015 CCR Rule and therefore drew no conclusions about the older units excluded from the scope of that rule. Nevertheless, information available in the record supports the conclusion that these older units can pose risks at least as high as reported in the 2014 Risk Assessment.

EPA further proposed to find that the risks associated with legacy impoundments and CCRMU may be even higher than EPA modeled on a national scale in the 2014 Risk Assessment for active units. First, the proposal explained that these units have been present onsite for longer and had more time to leak. In addition, EPA explained that there are several management practices that have the potential to result in higher leakage, but that were previously modeled either less frequently for active units—based on a belief that the practices had declined over time—or not at all—due to data constraints on a national scale. These include: (1) The greater prevalence of unlined units; (2) The greater likelihood of co-management of CCR with coal refuse and other wastes in surface impoundments, making the overall waste pH far more acidic and (3) The potential for the units to be constructed below the water table or to have become inundated with groundwater after construction. The proposal estimated that the solid waste management practices associated with legacy impoundments and CCRMU could pose lifetime cancer risks from arsenic as high as 2×10^{-5} to 1×10^{-3} (*i.e.,* 2 to 100 cases of cancer for every 100,000 individuals exposed), and non-cancer risks for cobalt as high as an HQ of 13, mercury up to an HQ of 13, lithium up to an HQ of 3, molybdenum up to an HQ of 4, and thallium up to an HQ of 2, depending on the specific management practice. Finally, EPA explained that each of these practices individually can pose greater risks than those previously modeled for the currently regulated universe of CCR units, and a combination of these practices could push risks even higher.

2. 2023 Draft Risk Assessment

A number of commenters claimed that the 2014 Risk Assessment did not adequately capture various factors associated with legacy CCR surface impoundments and CCRMU that the commenters believed will result in significantly different risks than those posed by currently regulated units. In response to these comments, EPA conducted a supplemental risk assessment to determine the potential for some of these factors to affect national risks. This risk assessment built on the findings of the 2014 Risk Assessment and better quantified the specific risks that may result from placement of CCR in legacy CCR surface impoundments and CCRMU.

The 2023 draft supplemental assessment consisted of: (1) Additional modeling of inactive and closed CCR landfills and surface impoundments that was actually conducted in 2014 using the same methodology and data. These results were ultimately not included in the original 2014 Risk Assessment because the units were not regulated under the final 2015 rule, and (2) Some further model runs relying on some updated data. In addition, EPA modeled the placement of CCR in smaller quantities than would typically be found in a CCR surface impoundments or landfill (*i.e.,* smaller CCRMU placements or CCRMU fills) to determine the potential for these smaller CCRMU placements to contaminate groundwater. Through this modeling, EPA identified potential for these fills to contaminate onsite groundwater. Model results indicated potential for exceedance of groundwater protection standards (GWPS) at the fill boundary under both high-end and moderate conditions. These results also showed potential for substantial spread of the resulting groundwater plume. Under high-end conditions, these plumes are large and persistent enough to sustain exposures for over a century or more at average risks of 2×10^{-5} or higher.

Finally, EPA assessed the potential for exposure to radiation from CCR remaining in the soil (subsurface). EPA found the amount of radon emitted by CCR is not distinguishable from background soil and so did not retain this pathway for further consideration. EPA also found greater potential for risk from gamma radiation as CCR comes to be located closer to the ground surface due to a reduction in shielding. An additional sensitivity analysis identified potential for further risk if CCR becomes mixed with surface soil. Accumulation of CCR can result in elevated cancer risk from incidental ingestion of arsenic and radium, in addition to direct exposure to gamma radiation from radium. For high-end waste concentrations, an eight percent mixture of CCR in surface soil was found to result in risk on the order of 1×10^{-4}.

The 2023 draft risk assessment was made available for public comment as part of a NODA released on November 14, 2023.

3. Response to Comments on the Proposal and the NODA

The following subsection provides a summary of comments received on either the proposed rule or NODA that are germane to the risk record for legacy impoundments and CCRMU. EPA considered these comments as it worked to finalize the supplemental risk assessment (''2024 Risk Assessment''). The Agency also received a number of general comments, which were either editorial in nature or expressed general support or disapproval for the risk assessment methodology, data, or results. However, these comments did not provide any specific technical recommendations or data that could otherwise be used to update the risk assessment. These general comments did not provide EPA with a basis to alter or otherwise re-evaluate the risk assessment in response.

a. Comments Related to Applicability of 2014 Risk Assessment

Comment: Several commenters generally affirmed the Agency's risk basis for regulating historical and inactive disposal units. However, other commenters argued the Agency's risk record is inadequate to support regulation of certain legacy impoundments or any CCRMU. Others contended that because the 2014 Risk Assessment supported regulation of active landfills and surface impoundments, it is not appropriate to apply that record to disposal units that previously ceased receipt of waste. In particular, commenters pointed to the current lack of ponded water and/or the presence of a cap and vegetative cover that would reduce infiltration through certain units. Some commenters noted that State programs may include requirements for unit design, monitoring, and closure that ensure a cover is present. Commenters stated these factors must be accounted for through an updated risk assessment.

EPA Response: Claims that the results of the 2014 Risk Assessment are applicable only to active units represent a fundamental misunderstanding of scope of the 2014 Risk Assessment. EPA did not only model units during operation. Instead, the risk assessment modeled the specific stage of the unit lifecycle anticipated to contribute the most to long-term risk. For surface impoundments this was during operation, but for landfills it was after closure. EPA modeled the leakage that occurred over this one lifecycle stage and tracked the subsequent migration through groundwater over time. The risks to downgradient receptors resulting from the modeled leakage were used to represent risk over the entire unit lifecycle. Consideration of a single lifecycle stage was necessary because of model constraints and the high computational burden of tracking shifting configurations for every single unit.

Both landfills and surface impoundments progress through similar lifecycle stages from construction to closure. Thus, the fact that some historical and inactive units may no longer contain ponded water or may have installed a soil cover only places these units in a different stage of that lifecycle. That does not differentiate the long-term risks of those units from those previously modeled. In particular, existing groundwater contamination does not vanish once a unit ceases operation. As one State commenter noted, ''[g]roundwater contamination is an important aspect to legacy impoundment closure and should not be overlooked simply because the impoundment does not contain liquid or CCR at the date of the final rule.''

By contrast, the 2014 Risk Assessment only modeled landfills after closure; in other words, EPA assumed that no leakage occurred prior to closure, while the landfill was operating. EPA only modeled landfills after closure because based on the assumption that this stage of the landfill lifecycle would have the greatest contribution to long-term risk for offsite receptors because the unit would be filled to capacity and the post closure stage represented the greater period of time over which leakage can occur. EPA modeled unlined units with a soil cap and vegetative cover equivalent to the surrounding native soils and found risks from arsenic as high as 2×10^{-5} for receptors up to a mile away. Even assuming some landfills have been closed in a manner more consistent with the existing CCR regulations (*i.e.,* with some kind of composite cover system), this is unlikely to change the overall conclusions of the risk assessment. This is because, regardless of the cover that is ultimately installed, higher leakage can occur throughout the active life of the unit when the landfill face is open and able to intercept more precipitation. This conclusion is reinforced by the fact that facility monitoring reports document that around 20% of currently active landfills have triggered corrective action. Additionally, EPA has seen no evidence to suggest that the closure of older units has been consistently more protective than EPA modeled in 2014. As discussed in Unit III.B.2.g.iii(a) of the preamble, as part of developing the 2015 CCR Rule, EPA reviewed State statutes and regulations, with a more detailed focus on the 16 States responsible for approximately 74% of the CCR generated in 2009. See 80 FR 21324. The Agency's review of State programs prior to 2015 found that oversight of these wastes and the overall protectiveness of particular programs varied widely. For example, EPA estimated that in 2015, approximately 20% of the net disposable CCR was entirely exempt from State regulatory oversight. Similarly, a 2006 joint Department of Energy (DOE) and EPA study reported that only 19% (three out of 19) of the surveyed surface impoundment permits included requirements addressing GWPS (*i.e.,* contaminant concentrations that cannot be exceeded) or closure/post-closure care. Furthermore, some of the photographs and descriptions of these older units provided by commenters indicate extensive growth of trees and other woody vegetation that can compromise the integrity of any cap present and increase the rate of infiltration into the unit. For these reasons, the 2014 Risk Assessment is equally representative of the national risks from historical and inactive landfills.

The 2014 Risk Assessment modeled all surface impoundments during the active stage of their lifecycle. This was based on the presumption that the highest rates of leakage would occur while wastewater is ponded above the ash, because this water creates a large and sustained hydraulic head that serves to drive leachate into the subsurface. Although the current configuration of historical and legacy impoundments may vary, all these units previously held ponded water during the active stage of their lifecycle. And, in the case of legacy impoundments, ponded water may still be present. As a result, the current configuration of the unit is immaterial to the releases that occurred during operation. For this reason, the modeling approach relied upon in the 2014 Risk Assessment is equally applicable to historical and legacy impoundments.

The 2014 Risk Assessment also accurately represents the potential risks that remains for units that were closed consistent with the 2015 CCR Rule. If the cover system is not adequately maintained after closure, degradation over time from human or animal activity, natural settling, freeze-thaw cycles, flooding and other extreme weather events, and other factors can result in greater leakage from the unit than designed. In some cases, groundwater monitoring may provide the only clear evidence the cap is not performing as designed. Thus, the 2014 Risk Assessment accurately describes the risks that can result if these units are not adequately maintained and monitored in line with regulatory requirements.

Comment: Multiple commenters argued that historical and inactive disposal units will generally have a smaller footprint than those modeled in the 2014 Risk Assessment. For example, some commenters noted the average sizes of landfills and surface impoundments modeled in the 2014 Risk Assessment were around 120 acres and 50 acres, respectively, while the estimated average sizes of CCRMU and legacy impoundments in the proposed rule were both closer to 30 acres. Others cited to the sizes of individual units that at their facilities to contend that these units are much smaller than average. These commenters contended that a smaller footprint would result in a lower mass loading of groundwater and lower associated risk.

EPA Response: EPA disagrees that the referenced data indicate that older disposal units are significantly smaller in size than the units EPA modeled in 2014. The 2014 Risk Assessment relied on data submitted by facilities in the EPA Surveys to estimate an average active landfill size of around 120 acres from over 310 landfills and an average active impoundment size of around 50 acres from over 735 impoundments. The RIA summary referenced by commenters relies only on data that could be independently verified by data from posted facility reports and recent public comments. From the final list of 195 CCRMU and 194 legacy impoundments, EPA identified data for only one landfill with a size of 90 acres and 47 historical or legacy impoundments with an average size of 44 acres. Thus, when CCRMU are separately grouped as landfills and impoundments, the differences in size are not as substantial as indicated by commenters.

EPA also disagrees that any differences that do exist would result in substantially lower risks than previously modeled. As part of the 2014 Risk Assessment, EPA modeled 122 landfills and 163 impoundments that were excluded from the reported risk results because these units were determined to not be subject to that rule. These excluded units represent some combination of legacy impoundments, inactive landfills, and historical disposal units. The average sizes of these previously excluded units are 77 acres for the landfills and 28 acres for the impoundments. These sizes are approximately half the size of the units identified in the 2014 Risk Assessment or more recent data collection efforts. However, as discussed in Section 3 of the 2024 Risk Assessment, the risks associated with these older units are substantially the same as those for currently regulated units. Therefore, there is no evidence that these differences in size have a meaningful impact on national risks, or that the results of the 2014 Risk Assessment are nor equally applicable to legacy impoundments and CCRMU. While there may be individual disposal units at these sites that are smaller than average, the model results summarized in the 2024 Risk Assessment model include landfills as small as 2 acres and impoundments as small as 0.01 acres. Therefore, there is no indication based on the data provided that the overall distribution of unit sizes has not been adequately reflected in the national model.

Finally, EPA notes that individual unit size is not necessarily a reliable metric to draw conclusions about the overall risk from CCR disposal at electric utilities. The 2014 Risk Assessment modeled the risks from each landfill and impoundment separately because it was difficult to confirm the relative locations and orientations of different units with data from the EPA Surveys. However, the Agency is now aware of many sites where multiple units, both landfills and impoundments, are located immediately adjacent to one another. As a result, there is potential the 2014 Risk Assessment underestimated site risk to some degree by not evaluating the combined leakage over the full contributing area of these adjacent disposal units.

Comment: One commenter stated the 2014 Risk Assessment did not specifically characterize the risks from impoundments that do not contain fly ash. This commenter argued that historical and legacy impoundments are more likely to only contain bottom ash or boiler slag, as the process of capturing fly ash was not common prior to the 1970s. Therefore, this commenter concluded that the 2014 Risk Assessment does not adequately characterize the risks for these older units.

EPA Response: EPA disagrees that the 2014 Risk Assessment does not address the risks associated with these impoundments. The risk assessment incorporated porewater data from impoundments that contained only bottom ash, but EPA did not separately break out risks for this subset of units because the amount of data available was inconsistent across the set of modeled constituents. However, available porewater data show the potential for certain constituents, such as molybdenum, to leach from bottom ash at levels as high as from fly ash.

Additionally, available monitoring reports for currently regulated units posted on facility websites document that these units have a similar potential to contaminate groundwater as units containing other types of CCR. Of the units designated as managing bottom ash, 32% of surface impoundments and 38% of landfills have triggered corrective action. Of the units designated as managing slag, 38% of surface impoundments have triggered corrective action. No landfills were identified as dedicated to slag. For comparison, 48% of remaining surface impoundments and 21% of remaining landfills have triggered corrective action. Therefore, there is no indication that these types of units are overall less likely to result in groundwater contamination.

Comment: One commenter claimed that a nationwide assessment should not be used to make determinations about the risks at individual sites or to support national requirements. This commenter stated that, unlike individual damage cases, the Agency's groundwater model does not adequately represent the specific conditions at each individual unit. However, this commenter provided no data to support their broad claims. One other commenter pointed to data they had identified to contend that the model does not reflect the specific environmental conditions at their facility.

EPA Response: The modeling conducted for both the 2014 and 2024 Risk Assessments utilized a probabilistic, site-based approach that combined site-specific data with more regional and national data sources. The model incorporated data about the specific location, dimensions, and liner status of individual disposal units where available. The aim of this approach is not to assign an exact risk to each individual unit, but to provide an overall accurate picture of the potential risks posed by these types of units on a national scale. Indeed, many of the findings from the 2014 Risk Assessment were supported by available damage cases. The commenters did not articulate why they believe the risks associated with individual units fall far outside the broader distribution of modeled units. But as acknowledged by the one commenter who did submit data, there is overlap between the range of conditions modeled and those they identified as present at their particular facility. EPA does acknowledge that there are some site conditions that the 2014 and 2024 Risk Assessments were not able to adequately model, such as waste below the water table. However, this is why the Agency separately relied on damage cases to identify additional constituents of potential concern for groundwater monitoring.

Comment: One commenter stated that EPA should not rely on the findings of the Environmental Integrity Project's report, ''Poisonous Coverup: The Widespread Failure of the Power Industry to Clean Up Coal Ash Dumps'' without independently validating the quality of analyses conducted for each site.

EPA Response: EPA recognizes that the method used in the cited report to identify potential exceedances of GWPS is not the same as the regulatory standard for triggering corrective action. For this and other reasons, the Agency does not rely on the report as a primary basis for the current rulemaking or to draw any conclusions about the monitoring status of any individual unit. Instead, EPA previously referenced the report as a supplementary source of information that further supports the findings of the 2014 Risk Assessment. Specifically, the fact that the constituents identified as risk drivers in the 2014 Risk Assessment are the same ones detected most frequently above GWPS indicates that the fate and transport modeling conducted by EPA was able to correctly identify the constituents most likely to be released and migrate at environmentally significant concentrations. While high background concentrations may be present at some of these sites, many have already triggered corrective action and the Agency believes that number will increase as more facilities come into compliance with the rule requirements. Because this report does not form a basis for the rule, it is not discussed further in the preamble to the rule or the 2024 Risk Assessment outside of responses to other comments that cite to the same or similar reports.

b. Comments Related to Draft 2023 Supplemental Risk Assessment Conceptual Model

Comment: Multiple commenters broadly argued that the draft 2023 risk assessment relied on data and assumptions that represent maximum values or otherwise reflect worst-case scenarios that could never occur, and therefore do not represent a ''reasonable probability'' of adverse impacts and so is not an appropriate basis for regulatory action.

EPA Response: EPA disagrees that the design of the risk assessment is inappropriately conservative. Consistent with EPA's long-standing practice under RCRA (as well as other agency programs), an individual with *reasonable* maximum exposure (RME) provides the principal basis for evaluating potential human health risks. An RME scenario is intended to be conservative, while remaining within the range of possible high-end exposures.[6] Specifically, ''high end'' has been defined as the part of the exposure distribution that falls above the 90th percentile, but below the 99.9th percentile.[7] Reliance on this type of scenario is intended to protect sensitive populations. Selection of the data and assumptions incorporated in the 2024 Risk Assessment is in line with this objective. Further critiques about the potential for the specific data and assumptions to overestimate risk are addressed in subsequent responses.

Comment: Multiple commenters argued that it was inappropriate for EPA to consider future onsite residential exposures as a basis for evaluating the potential risks associated with onsite CCR disposal. One commenter claimed that the estimates of existing populations living near these facilities used in the 2024 Risk Assessment was both overestimated and inconsistent with estimates from the Agency's RIA. One commenter acknowledged that older units tend to be located closer to population centers. However, others argued that this proximity to existing populations or water bodies would not make them overall more likely to become residential in the future. One commenter stated that EPA should have surveyed the intended land use for facilities or otherwise directly assessed the likelihood of residential land use.

EPA Response: EPA disagrees that consideration of a population within a five-mile radius overstates the likelihood of residential development. Five miles away from a population center is a small distance for residential development to expand, even in the near future. Nevertheless, the Agency has updated the population estimates in the 2024 Risk Assessment to more closely align with reporting in the RIA and to include both one- and three-mile radii. EPA also disagrees that consideration of a future residential land use scenario is inappropriate or unrealistic. The substantial populations already living near many facilities and the generally higher property value of land near water bodies are two indicators of the potential for land to be attractive for future residential land use. Facilities do not dictate the ultimate use of a property after the land has been sold for redevelopment. These types of facilities can include considerable tracts of land beyond that dedicated to waste disposal that may be considered for a range of different uses. EPA is currently aware of 22 examples in which former electric utilities have been proposed for residential development, 19 of which are known to have burned coal.[8] Thus, there is evidence of community interest in residential land use at these types of facilities.

Although future residential use is considered as the RME scenario in the 2024 Risk Assessment, that does not mean it is the only scenario EPA considered or on which this final rule is based. Depending on their location, leakage of Appendix IV constituents from individual CCRMU fill may migrate off-site at levels of concern. In addition, even if the constituents from a single CCRMU do not migrate off-site, the modeling conducted in 2024 confirms that smaller CCRMU fills can meaningfully contribute to groundwater contamination across a facility. Concentrations from a single CCRMU can combine with contamination from other CCRMU, currently regulated CCR units, or legacy CCR surface impoundments that are also present on the same site. Although EPA did not model the aggregate or cumulative risk associated with these potential sources of co-located contamination, at a minimum, EPA expects that the presence of multiple sources of potential contamination at the same facility would increase the likelihood of a contaminant plume that could migrate off-site at levels of concern.

Nor is residential use the only scenario where exposures present concern. One commenter described donating property to a local government for recreational uses. Several other commenters described redeveloping sites as nature preserves. Even under these non-residential land uses, the is a reasonable potential for exposure (and consequently risk) to human and ecological receptors if the ash is subsequently disturbed. For example, as discussed in Section 6 the 2024 Risk Assessment, concentrations of certain contaminants may also pose risk to wildlife if ash becomes intermingled with surface soil.

Comment: Commenters asserted that consideration of residential land use is inconsistent with various EPA guidance documents[9 10 11] and Agency cleanup programs. These commenters argued such guidance instructs EPA to assume that facilities surrounded by operating industrial facilities will remain industrial unless there is clear evidence otherwise. These commenters further argued that guidance instructs EPA to account for institutional controls, such as State or local zoning laws, that would make residential development or resulting exposures at individual sites unlikely. Some commenters cited to specific State requirements they assert would prevent residential land use or prohibit future use of site groundwater as a source of drinking water. Others claimed that due diligence reviews would be adequate to identify and address any remaining sources of contamination before exposures could occur.

EPA Response: EPA disagrees that consideration of future residential land use at these facilities is inconsistent with applicable guidance and cleanup programs. First, the risk assessment was conducted to establish minimum national criteria rather than to clean up an individual site. To determine whether the section 4004(a) standard will be met at all sites nationwide, as the statute requires, the Agency needs to evaluate the risks associated with full range of reasonable scenarios. As discussed in the previous response, there are numerous examples in the record of instances in which these kinds of sites have been redeveloped for residential use.

Moreover, as the commenters have acknowledged, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and other cleanup programs only address contamination that has already occurred. In contrast, national standards for waste management developed under RCRA section 4004(a) are to prevent environmental releases

[6] U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I—Part A, Human Health Evaluation Manual.'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

[7] U.S. EPA. 2004. ''An Examination of EPA Risk Assessment Principles and Practices.'' EPA/100/B–04/00. Prepared by the Office of the Science Advisor. Washington, DC. March.

[8] Memorandum to the Docket: Compilation of News Articles on Future Land Uses for Electric Utilities.

[9] U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A).'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

[10] U.S. EPA. 1991. ''Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals).'' Publication 9285.7–01B. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

[11] U.S. EPA. 1995. ''Land Use in the CERCLA Remedy Selection Process.'' OSWER Directive No. 9355.7–04. Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. May.

before they occur. See, *USWAG,* 901 F.3d at 429–431. As EPA has previously explained, groundwater contamination is a concern, even if the aquifer is not currently used as a source of drinking water. Sources of drinking water are finite, and future users' interests must also be protected. See, 44 FR 53445–53448.

EPA further disagrees that the risk assessment failed to appropriately account for existing State and local requirements for institutional controls that would limit residential exposure. The purpose of a baseline risk assessment is to provide ''. . . an analysis of the potential adverse health effects (current or future) caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (*i.e.,* under an assumption of no action).'' [12] Thus, the intent of the risk assessment is to characterize the harm that could result if institutional and other controls are not implemented. This provides a consistent basis to understand the risks to be controlled and define appropriate national requirements such as a national requirement for deed restrictions at all sites at which CCRMU fills will remain in place. The Agency did not assume that all facilities will ultimately be used for residential purposes as a consequence of these factors in developing this final rule.

Furthermore, as several commenters have acknowledged, facilities have not historically been required to identify smaller placements of ash as a form of disposal and consequently have not maintained reliable records of where such placements are located. Indeed, most commenters have acknowledged that they are currently unable to identify all CCRMU at their existing facilities. These commenters do not explain how due diligence assessments would reliably identify such placements in the absence of such records, as such assessments typically rely on available site records to guide further investigation. Nor do commenters explain how existing State programs would reliably identify such placements or otherwise prevent exposures, when the facilities themselves cannot identify the presence of the ash on-site. This is reinforced by EPA's review of State programs, which found that the specific requirements, level of oversight over these wastes, and the overall protectiveness of individual programs varied widely among States. See, 80 FR 21324. As a result, EPA currently lacks a record to conclude that currently unidentified CCRMU fills located across a facility would be subject to the same institutional controls that are required for the disposal units the commenters reference. Given the current absence of national requirements, and that commenters have generally acknowledged that they have not reliably kept records of the existence of CCRMU, it is appropriate to evaluate the risks that can reasonably arise in the absence of institutional controls.

Comment: One commenter argued that EPA had already considered the practice of disposal below the water table because it had been discussed in previous risk assessments. Another commenter asserted the Agency's conceptual model assumed all legacy impoundments were in contact with the water table. Another commenter stated that EPA cannot use information about active units to make assumptions about which historical and inactive units at the same sites are in contact with the water table, due to differences in unit construction and location. By contrast, a number of other commenters agreed that because EPA cannot model the effects of waste below the water table, EPA had previously underestimated the risks associated with CCR units. Other commenters argued the conceptual model for surface impoundments did not adequately distinguish between the types of water that may be present in an impoundment. These commenters asserted that any residual water remaining after the unit has been initially drained would not exert the same hydraulic head within the unit that would drive leachate into the subsurface during unit operation, and so leakage would more closely resemble a landfill.

EPA Response: The conceptual models for landfills and surface impoundments in the 2014 and 2024 Risk Assessments did not evaluate contact with groundwater. Although these assessments both acknowledged that this could occur, the scenario could not be incorporated into groundwater fate and transport modeling as a result of data and model constraints. Because the 2014 and 2024 Risk Assessments did not directly model the effects of disposal below the water table, neither assessment incorporates any assumptions about the prevalence of this practice in the conceptual model. EPA has acknowledged that its inability to reliably model the effects of this practice means that its risk estimates on a national scale underestimate the risks associated with higher rates of leaching and/or formation of strongly reducing conditions.

EPA acknowledges the rates of leakage from surface impoundments will generally decrease after ponded wastewater has been allowed to drain, reducing the overall hydraulic head across the unit. As such, discussion in the 2024 Risk Assessment has been updated to clarify the distinction between water ponded above the ash and porewater within an impoundment. However, any free liquids that remain within the unit can still result in higher leakage than would occur if the unit were fully dewatered. And the amount of ''residual water remaining'' can sometimes be substantial; in some cases, closed impoundments remain saturated by 20–54 feet of groundwater. See, *e.g.,* 88 FR 31982–319873, 55236.

In addition, regardless of the current configuration of an impoundment, it is appropriate for the conceptual models in the 2024 Risk Assessment to consider the stage of the unit lifecycle anticipated to contribute the most to long-term risk. For surface impoundments, this is when the units are in operation due to the presence of wastewater ponded above the ash. Subsequent draining of the unit does nothing to remediate any adverse impacts that occurred during operation. Furthermore, to the extent that impoundments leak at rates more similar to landfills after ponded wastewater has been drained, EPA notes the 2014 Risk Assessment previously modeled the risks from dry management in landfills and found the potential for unacceptable risk from these units. Therefore, continued leakage from drained units still has the potential to sustain releases.

Comment: One commenter affirmed that ''EPA is likely correct in its observations and assumptions that CCRMU fills 'will remain in place when ownership of the property changes,' and that, 'in the absence of land use restrictions, there is no guarantee [that] engineering controls will remain in place when the property is redeveloped.' '' However, multiple commenters argued the conceptual model for CCRMU fills does not adequately account for the full diversity of CCRMU that may be present onsite. Various commenters stated that a conceptual model for fills does not adequately address specific types of placements, such as use in the construction or closure of CCR disposal units, storage in waste piles, construction of roadways and railroads, or spreading on roadways for snow and ice control. Another asserted that reliance on the similar conceptual models in the 2014 Risk Assessment to

[12] U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A).'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

evaluate the disposal units and CCRMU fills is inappropriate because the CCRMU fills will tend to be smaller than the disposal units modeled in 2014.

EPA Response: EPA disagrees that the conceptual model for CCRMU fills does not adequately address the configurations of these units. The majority of the units described by commenters have a concentrated footprint, such as placement beneath a parking lot. Some of the specific alternate examples raised by commenters are either already regulated under the existing regulations (*e.g.,* waste piles) or are outside the scope of the current rulemaking. For others, there is little to no information available about the manner or frequency of such placements that could be used to characterize the units. Therefore, these types of placements are not considered as part of the conceptual model for CCRMU fills in the 2024 Risk Assessment.

The commenters do not explain how placement of CCR in a landfill or impoundment in service of construction or closure of that unit would be substantially different than the disposal scenarios previously modeled and found to pose risk. Finally, EPA has proposed and is finalizing the definition of CCRMU to exclude CCR used in roadbed and associated embankments.

There is little data that could be used to develop a conceptual model for diffuse placements, which may occur on a periodic basis. Nor do commenters provide any data on the manner or frequency of such placements. As a result, the 2024 Risk Assessment did not model these types of placements. This represents a source of uncertainty in the assessment. However, EPA notes that even small placements of CCR can contribute to broader leakage and have the potential to leak Appendix III constituents and influence nearby groundwater monitoring. Therefore, it is still necessary to identify where these types of onsite placements have occurred.

EPA also disagrees that applying a similar conceptual model for CCR landfills and CCRMU fills is inappropriate. Specifically, the conceptual model does not make any upfront assumptions regarding the sizes of these fills. As described in Section 4 of the 2024 Risk Assessment, EPA considered a range of potential sizes for these fills that were smaller than landfills reported in the EPA Surveys.

Comment: One commenter stated that it is inappropriate for the 2024 Risk Assessment to rely on similar data sources as the 2014 Risk Assessment to characterize environmental parameters, claiming these data are outdated. Another argued that the conceptual model does not adequately account for the presence of alternative liners, such as thick natural clay beneath the units.

EPA Response: First, EPA notes that the 2024 Risk Assessment does incorporate more recent weather data available from the most recent version of the Hydrologic Evaluation of Landfill Performance Model, updated in 2020. As explained in the 2014 Risk Assessment, EPA found the remaining data sources provide the most recent and representative data to characterize environmental conditions on a national basis. Commenters provide no explanation why these data should be considered outdated. For example, why the soil type present at a site would have changed substantially since 2014. EPA notes that to the extent that there is natural clay soil present in the vicinity of a facility, that would already be reflected through the environmental data.

c. Comments Related to Supplemental Risk Assessment Groundwater Model

Comment: Some commenters asserted that modeled leachate concentrations are unrealistically high. One commenter specifically argued that the LEAF data is unable to accurately reflect field leaching concentrations, citing two EPRI reports comparing LEAF and field leachate data both collected from the same units.[13] [14] They separately compared the leachate concentrations modeled in the risk assessment to field samples collected from around a number of different landfills. Based on this comparison, the commenter asserted that the high-end concentrations modeled in the risk assessment were substantially higher than measured in the field and so unrepresentative of actual leaching behavior. For these reasons, this commenter concluded that porewater data provide better representation of leaching in the field and so EPA should rely on that type of data to model leakage from CCRMU fills.

EPA Reponse: EPA disagrees that leachate concentrations modeled in the 2024 Risk Assessment are unrealistically high. EPA has previously demonstrated that the LEAF laboratory leaching tests are ''effective for estimating the field leaching behavior for a wide range of materials under both disposal and use conditions.'' [15] The two studies cited by commenters do not contradict these findings. Indeed, one of the cited reports concludes that LEAF Method 1313 measurements tended to only underestimate porewater concentrations of lithium and molybdenum and did not consistently overestimate or underestimate porewater concentrations of arsenic and thallium. These conclusions are consistent with previous Agency findings that LEAF Method 1313 measurements (1) can underestimate leakage of highly soluble constituents, such as lithium and molybdenum, if not adjusted to properly account for the sample liquid to solid ratio and (2) can over or underestimate leakage of redox sensitive contaminants, such as arsenic, if not further adjusted with geochemical speciation modeling. In response to these findings, the Agency has established general recommendations for how to address these issues.[16] Modeling of highly soluble constituents in both the 2014 and 2024 Risk Assessment are consistent with these recommendations. Sufficient data are not yet available on the prevalence or magnitude of reducing conditions to allow EPA to adequately model the effects of these conditions on leaching behavior at a national scale. However, given that the 2024 Risk Assessment identified potential for extensive groundwater contamination with overall risks as high as 1×10^{-4} for the less mobile pentavalent speciation of arsenic, this uncertainty is unlikely to affect the conclusions of the risk assessment.

EPA also disagrees that the field data presented by commenters demonstrates that the modeled concentrations are unrealistic. As a general matter, these commenters did not make available the underlying data for the graphs presented or the reports from which the graphs were drawn. Therefore, it is not possible to fully evaluate these graphs, as EPA cannot determine how and where these data were collected, how many individual samples are represented, and how the data were compiled. Based on

[13] EPRI. 2020. ''Leaching, Geotechnical, and Hydrologic Characterization of Coal Combustion Products from a Closed Coal Ash Impoundment.'' Palo Alto, CA. June.

[14] EPRI. 2021. ''Leaching, Geotechnical, and Hydrologic Characterization of Coal Combustion Products from an Active Coal Ash Management Unit.'' Palo Alto, CA. February.

[15] U.S. EPA. 2014. ''Leaching Test Relationships, Laboratory-to-Field Comparisons and Recommendations for Leaching Evaluation using the Leaching Environmental Assessment Framework.'' EPA 600/R–14/061. EPA Office of Research and Development. Research Triangle Park, NC. October.

[16] U.S. EPA. 2019. ''Leaching Environmental Assessment Framework (LEAF) How-To Guide: Understanding the LEAF Approach and How and When to Use It.'' SW–846 Update VII. Prepared by the EPA Office of Land and Emergency Management. Washington, DC. May.

the limited description provided, it appears that the graphs summarize data on the average leachate concentrations collected from around different landfills. Thus, the cited median values would represent a median of the average measurements from each landfill. This type of summary does not provide a meaningful understanding of the leaching potential of CCR. For example, landfills can contain mixtures of different CCR types and other wastes, which may result in variable leaching profiles over the footprint of the unit. An average of measured leachate concentrations can mask regions of higher leaching potential over many acres. This potential for variable leaching is one reason why groundwater monitoring wells are required to be spaced along the entire downgradient boundary of these units. In contrast, CCRMU fills are smaller in size and more likely to be constructed with a single source of ash. Additionally, there is no indication of how long the waste has been present in these landfills prior to sampling. More soluble constituents can become depleted over time. For example, Modular Three-Dimension Finite-Difference Ground-Water Flow Model (MODFLOW) runs conducted for the 2024 Risk Assessment showed that molybdenum can deplete from the ash anywhere from several years to a few decades after leaching first began. Thus, these graphs could understate the full leaching potential of CCR.

Commenters also mischaracterize the results of the probabilistic analysis. The 90th percentile of all model inputs for leachate concentration is not the same as the 90th percentile of modeled risks. There are a number of other model parameters that will influence contaminant release and subsurface transport. As a result, the model runs with the highest initial leachate concentrations are not always the same as those with the highest downgradient concentrations. EPA reviewed a subset of model runs around the 90th percentile risk result reported in the 2024 Risk Assessment, representing 1% of all model runs at 1,000 feet from the waste boundary. This review found the median leachate concentration representative of these runs was closer to 0.31 mg/L for arsenic and 35 mg/L for molybdenum. There are multiple samples in the record of porewater or leaching tests with concentrations of the same order-of magnitude or higher than these concentrations. Therefore, EPA concludes that the methods used to generate model inputs do not result in unrealistically high leachate concentrations.

EPA maintains that LEAF leachate provides the most realistic estimate of long-term leaching potential from CCR placed in fills. There is little field leachate data for dry-managed CCR available in the record, as it can be difficult to collect representative samples from landfills. Additionally, field samples would reflect the specific waste mixtures and chemistry of these disposal units. Instead, LEAF provides data on the leaching behavior of individual CCR under a range of relevant environmental conditions. EPA did consider using impoundment porewater data to supplement the data on leaching of lithium because of the lack of LEAF data for this contaminant, and because lithium is a highly soluble, monovalent ion expected to be less influenced by specific impoundment chemistry. However, this constituent was not modeled in the 2024 Risk Assessment due to other data limitations. The uncertainties associated with exclusion of lithium are discussed in Section 6 of the 2024 Risk Assessment.

Comment: One commenter asserted that the distribution of leachate pH values used to represent CCRMU fills is unrepresentative. In particular, the commenter took issue with the prevalence at which acidic conditions were modeled within CCR fills. This commenter pointed to field data collected from CCR landfills to assert that leachate from fills would rarely be acidic.

EPA Response: EPA disagrees that the modeled leachate pH is unrepresentative of conditions at smaller CCRMU fills. Modeled leachate pH is based on the natural pH (or ''own pH'') of the ash sample measured with LEAF. Thus, these data represent the properties of real ash samples. Landfills can contain a mixture of different CCR types and other related waste streams and so it is reasonable that the average pH of larger landfills may differ from that of individual CCR. At the same time, regions of individual landfills can be more acidic than average, which can be masked by consideration of only average values. The potential for such variations is part of the reason that placement of monitoring wells is required across the full downgradient boundary of these landfills. Smaller CCRMU fills are more likely to be constructed with a single ash type and so it is most appropriate to consider the pH of individual ash samples, rather than broader landfill conditions. The uncertainties associated with the modeling of pH are discussed in Section 6 of the 2024 Risk Assessment.

Comment: One commenter stated that use of a five-mile radius to draw environmental data for purposes of groundwater modeling is not adequately justified and inconsistent with both the 2014 Risk Assessment and Draft 2023 RIA.

EPA Reponse: EPA has reviewed and updated the sampling radius for environmental and population data. Based on this review, EPA established the sampling radius for environmental data at two kilometers (1.2 miles). This is consistent with the methodology applied in the 2014 Risk Assessment, which the Agency previously found adequately represented the environmental conditions near units for which a more precise location at the facility property could not be determined. EPA established the sampling radii for population data to be consistent with the rationale outlined in the 2024 RIA.

Comment: Multiple commenters criticized the Agency's use of soil-water partitioning coefficients (*i.e.,* Kd values) to model contaminant sorption in the subsurface. These commenters argued that use of individual Kd values was inappropriate and unable to reflect the variability of subsurface transport conditions. They also stated that the Kd values used in the risk assessment for arsenic were biased low and likely to underestimate retention on soil. These commenters cited field measurements collected at various locations to assert that actual values for arsenic are likely to be higher. One commenter cited an alternative set of Kd values they had calculated to contend that actual values for arsenic would be orders-of-magnitude different than used in the risk assessment.

EPA Response: These commenters are incorrect; EPA did not rely only on individual Kd values for the risk assessment. As part of the 2014 Risk Assessment, EPA previously developed sorption isotherms for each modeled constituent, which represent the distribution of individual Kd values calculated and reflect the range of anticipated subsurface conditions and specific CCR waste characteristics. Each individual model run in the EPA Composite Model for Leachate Migration with Transformation Products (EPACMTP) samples from that distribution based on the key factors for that run (*e.g.,* leachate concentration, pH, ionic strength). No individual model run will precisely represent conditions at a particular site. Instead, the model runs collectively capture the variability of conditions that can occur across sites. Thus, EPA relies on the model runs in aggregate to draw conclusions about the potential for risk nationwide.

EPA also disagrees that the specific Kd values used in MODFLOW are unrepresentative. The limited number of MODFLOW runs are intended to further characterize the subset of high-end scenarios modeled in EPACMTP. Thus, it is entirely reasonable that these model runs are those more likely to reflect scenarios where pentavalent arsenic is more mobile in the environment.

The field data shared by commenters for specific CERCLA sites or agricultural fields are not representative of conditions at CCR disposal units. As previously noted, the calculated sorption isotherms reflect the properties of CCR leachate, which can be vastly different from precipitation infiltrating through soil. In particular, both the high ionic strength and variable pH of this leachate are expected to result in different sorption behavior. EPA is also unable to fully review the Kd values calculated by commenters or compare them with Agency values because the commenters provided insufficient information regarding whether and how specific key environmental factors were considered. Nevertheless, EPA notes that the range of values presented by commenters falls within the full distribution of Kd values developed for arsenic in 2014. The full distribution of values is summarized in Appendix H of the 2014 Risk Assessment, and is the full range of values EPA sampled from to model groundwater transport in the 2024 Risk Assessment.

Comment: One commenter stated that any CCR material placed beneath the soil would become naturally compacted. Another commenter asserted that the pozzolanic nature of some ash would result in far lower hydraulic conductivity than EPA modeled.

EPA Response: In the absence of periodic inspections and a well-maintained cap, there is no guarantee that any ash placed in the ground will remain undisturbed by human or animal activity, natural settling or freeze-thaw cycles, flooding and other extreme weather events, or other unforeseen factors. Given that such disturbances can result in increased permeability, it was not possible to develop a fixed probabilistic distribution of conductivities. Instead, EPA modeled conductivity based on the dominant soil megatexture as described in Appendix B of the 2014 Risk Assessment. As such, the model assumes the ash has been subjected to a similar degree of compaction as the surrounding soil. EPA acknowledges that some fly ash is pozzolanic in nature. Yet, the commenter provided no information that would indicate how common it is for this type of ash, which can be marketed for use in concrete, to be placed in CCRMU fills. EPA is also not aware of any information that could be used to represent the long-term conductivity of this ash when left in the field and exposed to the elements.

Comment: One commenter contended that EPA had not adequately demonstrated that consideration of more recent weather data drawn from the latest version of the Hydrologic Evaluation of Landfill Performance model would result in consistently higher infiltration rates than previously modeled in 2014 for CCR landfills.

EPA Response: The 2023 Draft Risk Assessment proposed that the higher rates of infiltration modeled for certain soil types with the new HELP data indicates the potential for higher leaching and risk to groundwater than previously modeled in 2014. However, because EPA found that the model results from the 2014 Risk Assessment are sufficient to support the current rulemaking, the Agency did not conduct the additional modeling that would be necessary to refine this draft analysis. As a result, EPA does not rely on this particular analysis to support the final rule and so it is not included in the 2024 Risk Assessment.

Comment: Several commenters stated that consideration of a limited subset of contaminants for groundwater modeling would result in an underestimation of risk. These commenters further assert that EPA further underestimated risk by not accounting for the effects of cumulative exposure to multiple contaminants.

EPA Response: EPA disagrees that the selection of constituents for groundwater modeling resulted in lower risks than would have otherwise been identified. The constituents selected for groundwater modeling were those found to be risk drivers for unlined surface impoundments in the 2014 Risk Assessment, as these are considered the most likely to also result in the greatest risks for unlined landfills and comparable management units. EPA notes that some of the additional constituents raised by commenters had been previously identified as risk drivers only for specific CCR types, such as flue gas desulfurization (FGD) wastes, which are considered far less likely to be used in CCRMU fills. The commenters presented no new information that could alter the previous model results and so there is no expectation that inclusion of these additional constituents would identify risks higher than those already modeled for the relevant CCR types. Some other additional constituents raised by commenters lack health benchmarks within the Office of Land and Emergency Management (OLEM) hierarchy and so could not be quantitatively evaluated. See, 85 FR 72526. Uncertainties associated with the selection constituents for modeling is further discussed in Section 6 of the 2024 Risk Assessment.

Comment: Several commenters argued that a modeling horizon of up to 10,000 years was unrealistic. These commenters stated that such a long time frame is not consistent with identifying a reasonable probability of adverse effects because there is no reliable way to predict whether any receptors will exist that far in the future.

EPA Response: EPA ran the groundwater model until either the observed groundwater concentration at the receptor point reached a peak and then fell below a model-specified minimum concentration (1×10^{-16} mg/L), or the model had been run for a time period of 10,000 years. This is the same modeling horizon applied in the 2014 Risk Assessment. The text in the 2024 Risk Assessment has been updated to make it clear that the selection of a maximum 10,000-year time horizon does not mean that it typically took that long for contamination be identified or that all model simulations continue for the full 10,000 years. EPA also notes that the time to first exceedance of selected risk criteria is typically considerably less than the time to the greatest exceedance.

EPA acknowledges that future groundwater use patterns may shift over time as the number and location of receptors changes, and that it is unknown whether or how future shifts in receptor locations and other surface conditions might affect risk. However, EPA notes that all the contaminants associated with CCR are inorganic and so will remain present in the environment over the full modeling horizon. As such, a longer modeling horizon can provide useful information about the potential duration of groundwater contamination in the absence of regulation. EPA found that contaminant plumes modeled in MODFLOW did not fully dissipate for around 2,300 years for arsenic V and 100 years for molybdenum.

Comment: Multiple commenters argued that EPA was inconsistent with the 2014 Risk Assessment and overestimated risks for CCRMU fills by not evaluating the interception of groundwater by surface water.

EPA Response: EPA did not explicitly evaluate interception by surface water on groundwater fate and transport in the

2024 Risk Assessment. As acknowledged by commenters elsewhere, facilities have generally not maintained reliable records about the location or construction of all CCRMU fills. As a result, it is not possible for EPA to develop a representative, probabilistic distribution of the distance from these fills to downgradient water bodies or offsite receptors. However, given the diversity of reasons for such placements listed by commenters, there are few limitations as to where these fills might be located onsite. As a result, there is greater potential for these fills to be located further away from water bodies than disposal units, allowing for further contaminant spread prior to any interception. Therefore, the 2024 Risk Assessment evaluated the potential magnitude and extent of onsite groundwater contamination that could occur in the absence of interception. It is considered unlikely that further quantitative evaluation of interception would affect the conclusions of the 2024 Risk Assessment. The reductions in modeled risks attributed interception in the 2014 Risk Assessment were predominantly for median risks. However, the 2014 Risk Assessment still identified high-end risks to offsite receptors, and it was these risks that formed the basis for the 2015 CCR Rule. Thus, it is similarly unlikely that quantitative evaluation of surface water interception would affect the high-end risks reported in the 2024 Risk Assessment, especially because the current assessment considers onsite groundwater quality prior to discharge to a water body. Furthermore, as discussed in the 2024 Risk Assessment and in response to comments elsewhere, the fact that a contaminant plume that has migrated off-site is intercepted by surface water does not mean that there is no potential for risk or no need for further action to address the presence of groundwater contamination onsite.

Comment: Some commenters requested clarification on the prevalence of different types of liners modeled for the landfills and surface impoundments previously excluded from the 2014 Risk Assessment. Citing to data relied upon in the 2014 Risk Assessment, one commenter asserted that a majority of modeled landfills had some form of liner and that national regulations should be based on the risks for all units, rather than those that are unlined.

EPA Response: The handling of liner status for these units was described in Section 5 of the 2014 Risk Assessment. Of the units evaluated in the 2014 Risk Assessment, approximately 42% of landfills and 65% of surface impoundments were modeled as having no engineered liner system. Of the previously excluded units summarized in the 2024 Risk Assessment, approximately 71% of landfills and 57% of surface impoundments were modeled as having no engineered liner system. EPA has updated the discussion of this issue in the 2024 Risk Assessment to better distinguish the specific liner status modeled for these different units. Differences in the national risks reported in 2014 and 2024 are largely attributed to the relative prevalence of engineered liners modeled for each. Modeled risks in both assessments are nearly the same for the subset of units with no engineered liner.

Far from being an isolated practice, a substantial fraction of the currently operating landfills across the country have no engineered liner. Although the 2014 Risk Assessment did model a majority of landfills as having some form of engineered liner, data that has become available since then indicates a greater proportion of operating units lack an engineered liner than EPA previously understood. Furthermore, the 2014 Risk Assessment modeled the performance of both clay and composite liners based on the assumption of good construction practices. However, it has become clear since then that some liner systems do not perform as modeled. For example, facility reporting shows that around 10% of composite and alternate-lined units have already entered into corrective action. Therefore, it is considered likely that national risks for both landfills and surface impoundments (including the inactive landfills and legacy impoundments subject to this final rule) are more similar to those unlined units than previously modeled.

Nevertheless, the 2014 and 2024 Risk Assessments, which provided much of the basis for this final rule, modeled the risks associated with both lined and unlined units. Under RCRA sections 1008(a)(3) and 4004(a), EPA establishes national criteria; because the criteria are national in scope EPA must evaluate the full range of conditions. In addition, EPA must establish requirements that will achieve the statutory standard at all sties subject to the criteria—including those that pose the greatest risk. Under these provisions, the criteria may authorize a CCR unit to continue operating ''only if there is no reasonable probability of adverse effects on health and the environment from the disposal [or other solid waste management] of solid waste at such facility.'' 42 U.S.C. 6903(a)(3), 6944(a). Given the requirement that the standard be met at each facility covered by the regulation, it is not particularly surprising that the final requirements are driven by the higher end risks associated with unlined units—especially as the overwhelming majority of legacy impoundments and CCRMU are expected to lack the composite liner that would largely mitigate the risks of CCR units. But that does not mean that the national regulations are not based on the risks for all units.

Comment: One commenter argued that modeled groundwater concentrations and associated risk downgradient of smaller CCRMU fills are unrealistic because they are higher than previously modeled for landfills and surface impoundments. Other commenters contended that modeled groundwater concentrations were unrealistic, citing comparisons to monitoring data for all regulated units in a report by the Environmental Integrity Project (EIP) [17] or for some smaller subset of units. These commenters calculated summary statistics from concentrations reported for site groundwater monitoring wells to assert that modeled concentrations were an order of magnitude higher or more than the concentrations that have occurred in the field.

EPA Response: The 2014 Risk Assessment modeled risks from landfills and surface impoundments to receptors located up to a mile away from these units. The 2024 Risk Assessment modeled the magnitude and extent of contamination extending from smaller CCRMU fills, including the likelihood of exceedance of GWPS at the waste boundary of the unit. It is entirely reasonable that concentrations and risk closer to the waste boundary are higher than EPA modeled in 2015 up to a mile away from a unit.

EPA disagrees that the modeled groundwater concentrations are contradicted by available monitoring data. First and foremost, EPA modeled the long-term potential for groundwater contamination that may occur in the absence of regulatory action. Thus, monitoring data from units of variable age and operational status do not represent a one-to-one comparison. Second, field monitoring data can diverge from model results as a result of improper well installation. As just one example, EPA is aware of multiple instances where monitoring wells are located far from the waste boundary, in some cases, hundreds of feet away. See, for example, 88 FR 55239. Third, EPA used EPACMTP to model

[17] EIP. 2022. ''Poisonous Coverup: The Widespread Failure of the Power Industry to Clean Up Coal Ash Dumps.''

concentrations along the centerline of the plume and to provide a best estimate of contaminant transport potential to inform further modeling with MODFLOW. Even if all wells in a network were properly installed and spaced, there is no guarantee that any individual well will intersect with the exact point of highest concentration; some wells may not intersect with the plume at all. Finally, the 90th percentile concentration modeled is not intended to correspond precisely to a 90th percentile of well concentrations. Instead, it reflects an RME scenario that is conservative, while remaining within the range of possible high-end exposures. The EIP dataset cited by commenters do show multiple instances of well concentrations at individual landfills of the same order of magnitude as modeled in the 2024 Risk Assessment or even higher. Further, in the case of arsenic, modeled GWPS exceedances between 26 and 19 for arsenic III and V are of a similar magnitude as the exceedance of 16 estimated by one commenter based on the EIP report. Therefore, EPA maintains that the magnitude of modeled groundwater concentrations is realistic.

Comment: Some commenters claimed that EPA had not justified modeling groundwater concentrations at fixed distances along the centerline of the plume or within the upper five feet of the aquifer and had not demonstrated how this approach compares with the 2014 Risk Assessment, which modeled concentrations within the top 30 feet of the aquifer.

EPA Response: The goal of modeling with EPACMTP was to identify the potential magnitude of GWPS exceedances at the waste boundary and potential for contaminant spread to support further modeling with MODFLOW. For both goals, a sampling along the centerline of the plume and to a depth of five feet was determined to be most relevant portion of the aquifer for consideration for the reasons documented in the 2024 Risk Assessment. Because different scenarios were modeled in the two risk assessments, a comparison with the results of 2014 Risk Assessment is not relevant here.

Comment: EPA received several comments regarding a graph from the 2023 Draft Risk Assessment, which summarized modeled risks from the 2014 Risk Assessment for unlined landfills as a function of unit size. Commenters stated that it demonstrated that risks consistently decline below a certain acreage and that smaller units do not warrant regulation because they pose less risk. One commenter stated that the underlying model runs for the 2014 Risk Assessment were not made available alongside the graph and so its validity could not be confirmed.

EPA Response: One purpose of the referenced graph was to demonstrate that risks remain above levels of concern over a broad range of unit sizes modeled in the 2014 Risk Assessment. However, upon further review, EPA has determined that the graph incorrectly summarized model results for receptors of all age cohorts into one figure. This has the potential to bias the plotted risks low. However, filtering the model runs for only (1) unlined landfills, (2) where drinking wells are located closer than surface water bodies, and (3) where an adult was exposed results in a relatively small number of model runs. EPA is concerned that this number of runs is not sufficient to reflect national variability or support broader conclusions about risk. As such, EPA does not rely on this line of evidence to support the final rule and so it is not included in the 2024 Risk Assessment.

EPA cautions the data presented in the graph was for landfills and so use of this graph to draw conclusions about the risks from surface impoundments is not appropriate. EPA further cautions that it is not appropriate to use the referenced graph to identify a specific unit size below which landfill risks are not possible. The graph summarized the results of the 2014 Risk Assessment, which modeled risks to offsite receptors up to a mile away from the waste boundary. The risks identified based on these receptors provided a robust basis for the 2015 CCR Rule. Yet, this does not mean these are the only relevant risks. EPA's longstanding and consistent policy (across numerous regulatory programs) has been that groundwater contamination is a significant concern that merits regulatory action in its own right, whether or not the aquifer is currently used as a source of drinking water. The 2024 Risk Assessment identifies the potential for CCRMU fills to contaminate groundwater above levels of concern. Where CCR landfills and surface impoundments are located at the same sites even more extensive contamination can occur as a result of their larger size. As such, these disposal units warrant regulation to protect groundwater resources, regardless of their size.

Comment: One commenter questioned why MODFLOW—Unstructured Grid (USG) was used to model groundwater transport, stating that MODFLOW 6 is more commonly used. This commenter also inquired why the model was not run in steady-state mode. They further argued that insufficient information had been provided to allow for evaluation of the design of MODFLOW model runs. Finally, the commenter identified a potential discrepancy in the reported model inputs for EPACMTP and MODFLOW.

EPA Response: MODFLOW–USG was selected for its ability to: (1) Simulate flow and transport in both the unsaturated and saturated zones without the need for additional modeling packages and (2) Simulate groundwater flow and transport sequentially without the need for reading cell by cell flow and transport. Steady state simulations were not used because they do not provide a time series representation of plume evolution. EPA has reviewed the model documentation to ensure that this and other relevant information raised by commenters was made clear in the 2024 Risk Assessment. However, EPA notes that this and much of the other specific information raised by commenters was previously described in the 2023 Draft Risk Assessment. EPA did not incorporate the full output files for all MODFLOW model runs because the file size would become prohibitively large to manage. The level of documentation of model inputs and outputs is consistent with that provided for EPACMTP. The identified discrepancy between EPACMTP and MODFLOW inputs were the result of a typo, which has been corrected.

Comment: One commenter stated that EPA had not provided sufficient evidence to support its conclusion that the location of legacy facilities that were not modeled in 2014 could result in somewhat higher risks for this subset of units compared to those previously modeled units.

EPA Response: EPA previously found that the locations of legacy facilities were clustered in the eastern half of the country. As a result, the rates of precipitation at these facilities will tend to be higher than modeled for the nation as a whole. Higher precipitation can result in greater vertical infiltration and subsequent leakage down to groundwater. The Agency has not conducted further sensitivity analyses to support this contention, as this argument is not central to the findings of either the risk assessment or the rulemaking. Instead, discussion in the 2024 Risk Assessment has been updated to clarify that the primary finding is that there is no indication based on geography that these additional units would be exposed to substantially different environmental conditions than EPA modeled in 2014.

Comment: Multiple industry commenters argued that modeled arsenic risks do not warrant regulation because the associated concentrations often fall below the current maximum contaminant limit (MCL). One commenter noted that 70 percent of runs identified peak arsenic concentrations below the MCL at the unit boundary. In contrast, environmental advocacy groups stated that cancer risks within the OLEM risk range can occur at even lower levels. Another asserted it was inappropriate for EPA to identify risk based on modeled concentrations above GWPS because corrective action requires ''a statistically significant level exceeding the groundwater protection standard.''

EPA Response: First, EPA notes that arsenic is only one of the contaminants modeled. Molybdenum was found to be above the associated GWPS on a more frequent basis. Indeed, EPA identified exceedances for this contaminant at both the 90th and 50th percentile results. EPA disagrees that risks identified below MCLs do not pose a concern. MCLs are not purely risk-based and can incorporate other considerations, such as the technical feasibility of reliably achieving even lower levels. As environmental commenters have pointed out, the arsenic MCL in particular represents a concentration that can fall outside the OLEM risk range. As such, these standards should be understood as values that corrective action must achieve and not levels that never warrant concern. Indeed, EPA established GWPS at the unit boundary with the intent to limit downgradient transport of contamination above this level and prevent the same magnitude of risk identified in the risk assessment.

EPA also disagrees that a statistically significant increase above GWPS is an appropriate standard for risk modeling. It is not clear, nor do commenters articulate, how such a statistical analysis would be conducted as part of the model. Thus, EPA believes this comment represents a general misunderstanding of both groundwater monitoring programs and probabilistic analysis. Statistical analysis is used in groundwater monitoring programs because factors, such as natural fluctuations in groundwater and uncertainty from sampling or laboratory analysis procedures, can introduce variability into the broader dataset. In this context, statistical analysis allows evaluation of the broader data and identification of an exceedance of GWPS with a specified level of certainty. However, numerical models are not subject to the same constraints. A model tracks the fate and transport of all contaminant mass from the point of release to the point of exposure. Therefore, no additional steps required to confirm that an identified exceedance of GWPS resulted from leakage from the modeled unit.

Comment: Several commenters stated that the toxicity value used for arsenic underestimated risks from groundwater, citing draft values they assert would increase modeled arsenic risks by an order of magnitude or more.

EPA Response: The Agency's current risk estimates are based on the same cancer slope factor of 1.5 mg/kg/d^{-1} for arsenic in EPA's Integrated Risk Information System (IRIS). EPA is currently in the process of reviewing this slope factor and has released a draft toxicological review, which, if finalized without revision, would increase the individual risk estimates for arsenic by a factor of approximately 35. See, 88 FR 71360. However, the Agency has not yet finalized this updated IRIS reassessment, and EPA cannot base a final decision on a draft IRIS value that is subject to revision. Nor did EPA receive any other information during the development of this final rule that would help to resolve this uncertainty. The current IRIS values thus represent the best data available to the Agency until the IRIS reassessment is complete.

d. Comments Related to Supplemental Risk Assessment Soil Model

Comment: One commenter contended that radionuclides and non-radionuclides have different health endpoints and so it is not appropriate to treat the resulting risks as additive.

EPA Response: EPA disagrees that it is inappropriate to consider the cumulative risk from chemical and radiological contaminants. EPA policy is to treat the risk resulting from exposure to multiple carcinogens as additive.[18] Agency policy is also to evaluate the risks from exposure to radionuclides in the same manner as chemical contaminants.[19] Therefore, it is appropriate to evaluate the cumulative cancer risk from chemical and radiation contaminants. However, EPA notes that considering chemical and radiological risks separately would not alter the overall conclusions of the analysis, as each have demonstrated potential to individually result in risk exceeding EPA's levels of concern. Uncertainties associated with umulative risk is further discussed in Section 6 of the 2024 Risk Assessment.

Comment: EPA received comments that argued the U.S. Geological Survey coal quality (COALQUAL) database does not adequately account for several factors that may affect bulk content of the resulting ash, such as: CCR type, regional variability, coal rank, mining practices, coal preparation prior to combustion, and the presence of unburnt carbon remaining after combustion. Another commenter stated that because the risk assessment addresses historical disposal of CCR, sampling of the COALQUAL database should be updated to reflect production over time, rather than current production. Finally, one commenter argued that differences identified between activity calculated from COALQUAL data and measured elsewhere in the literature demonstrates that handling of COALQUAL data is likely to overestimate concentrations in the ash.

EPA Response: The Agency acknowledges that the bulk contaminant content of specific CCR samples can be influenced by a range of factors, such as the manner in which a coal sample is prepared and combusted. As detailed in Section 6 of the 2024 Risk Assessment, EPA considered the information provided by commenters on the potential for mining practices, residual unburnt carbon, and coal washing to affect estimated ash concentrations and concluded these factors are likely to have a minimal or inconsistent effect on overall distribution of concentrations. EPA did determine that concentrations of some contaminants are sensitive to differences in region and coal rank and so reviewed the Energy Information Administration (EIA) coal production reports referenced by commenters when updating the weighting of available samples.

For purposes of modeling groundwater exposure, EPA did not use the COALQUAL database to estimate the leachable content of CCR in the 2024 Risk Assessment. Previous reviews of EPACMTP summarized in the 2014 Risk Assessment did not identify leachable content as among the sensitive model parameters. Even at lower bulk concentrations, there is often sufficient soluble mass present to support sustained leaching. Instead, EPA represented leachable content using available LEAF data in a manner

[18] U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A).'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response, Washington, DC. December.

[19] U.S. EPA. 2014. ''Radiation Risk Assessment at CERCLA Sites: Q&A.'' OSWER 9285.6–20. Prepared by the Office of Land and Emergency Response. Washington, DC. June.

consistent with the 2014 Risk Assessment and Agency guidance.[20]

For purposes of modeling soil exposure, EPA retained use of the COALQUAL database in the 2024 Risk Assessment to calculate the bulk content of thorium and uranium of CCR. In this instance, use of COALQUAL provides information about the relative levels of each contaminant, which allowed for a more refined estimate of cumulative exposure that provides a more direct comparison with relevant benchmarks. As discussed in Section 6 of the 2024 Risk Assessment, EPA also considered available EIA data when updating the calculation of bulk content for these two contaminants and found that concentrations of both are less sensitive than other contaminants to regional geography. Therefore, further efforts to refine these calculations are considered unlikely to result in changes that would affect the overall conclusions of the evaluation.

The bulk contaminant content calculated from COALQUAL represents a mixture of fly ash and either bottom ash or boiler slag, collectively referred to in the 2024 Risk Assessment as the ''whole ash.'' Because fly ash is generated in the greatest volumes during coal combustion, the calculated bulk content primarily reflects this type of CCR. However, other available data sources indicate that the activity of fly ash and bottom ash are not substantially different. EPA has seen no indication that the activity of boiler slag would differ markedly from that of bottom ash. The whole ash does not include any CCR generated by scrubber systems and similar pollution control technologies. However, these CCR types are not considered relevant to the evaluation of CCRMU fills. EPA further discusses the uncertainties associated with these different types of CCR in Section 6 of the 2024 Risk Assessment.

Based on the comments received, EPA reviewed the available data on radioactivity drawn from the literature. This review led to the removal of several samples that were determined to be duplicative and removed all the data for one study because it was determined to not be representative of the broader ash generated at the facility. Altogether, the data removed represent a small fraction of the overall dataset. This review also identified some inaccuracies in how samples were described and averaged to avoid biasing the overall dataset toward individual facilities that reported a greater number of samples. This had resulted in more samples being averaged together than was intended. The database presented as part of the 2024 Risk Assessment has been updated along with a summary of these updates. Following these corrections, the updated summary statistics for thorium align more closely with those calculated with COALQUAL. Therefore, there is general agreement between these two datasets. It is inevitable there will be some differences between datasets developed through different methodologies. In particular, any individual study may not reflect the full variability of coal produced over time. However, the magnitude of differences between activities drawn from COALQUAL and the broader literature are small on an absolute basis and consequently would not affect the overall conclusions of the risk assessment. Therefore, EPA concludes that COALQUAL can provide a reasonable estimate of both median and high-end ash activity.

Comment: One commenter critiqued multiple individual model inputs used in RESRAD as likely to overestimate potential for radon exposure. They also stated that the risk assessment should consider an additional scenario with RESRAD of CCR disposed at the ground surface to provide a consistent frame of reference to compare risk results obtained from RESRAD and the preliminary remediation goal (PRG) calculator. Other commenters separately commented that the assumed presence of some soil cover is inappropriate, referencing one CCRMU purported to have been placed with the intent to level out the ground surface and without any additional soil cover.

EPA Response: EPA has not established default parameters for modeling of radon fate and transport. Nor is there currently enough information available on a national scale to develop distributions that could be sampled probabilistically. Instead, EPA previously conducted a deterministic analysis for radon exposure by specifying high, moderate, and/or low values for model inputs to capture the range of potential exposure. EPA first modeled risk with all inputs set to moderate values to identify a baseline risk more representative of the central tendency. From this baseline, EPA adjusted each individual input to lower or higher values to better understand which inputs exert the greatest influence on modeled risks and support development of an RME scenario. However, EPA ultimately concluded that the rate of radon emanation from CCR is not distinguishable from background soil and so the Agency did not develop this RME scenario or draw final conclusions about risk from radon exposure. For this same reason, EPA did not retain the quantitative evaluation of radon in the 2024 Risk Assessment.

Some CCRMU fills may currently be uncovered, but EPA was not able to confirm the status of the specific unit identified by the commenter based on the information provided. Nevertheless, EPA maintains it is unlikely that future residential construction would occur in the absence of some initial soil cover. It is generally anticipated residential construction sites will cover any exposed land with topsoil or turf to support uniform lawn growth. However, this does not guarantee this soil cover will be adequately maintained by residents into the future. As such, EPA agrees it is appropriate to evaluate a scenario of CCR without any soil cover to provide a bounding estimate of potential risk and a more direct link between the primary and sensitivity analyses. This updated scenario is discussed in Section 6 of the 2024 Risk Assessment.

Comment: Some commenters raised concerns about the sensitivity analysis conducted with the PRG calculator. One commenter asserted that the PRG calculator is intended for use with contaminated soils and is inappropriate for comparison against undiluted CCR. This commenter further argued that the sensitivity analysis conducted with the PRG calculator is overly generic and did not incorporate scenario-specific inputs, such as the potential for greater soil cover, shorter exposure duration, and ability of radon to emanate from CCR. Finally, this commenter stated that the degree of mixing of soil with CCR would not result in activities higher than either background or applicable or relevant and appropriate requirements (ARARs), concluding that the evaluation of radiation risk should consider contributions from background soils when presenting risk results. Another commenter stated that the ARAR was only exceeded around the 90th percentile concentrations and that regulation based on 90th percentile concentrations is not appropriate.

EPA Response: EPA disagrees that the PRG calculator is not applicable to the modeled scenario of CCR intermixed with soil. The commenters provide no rationale for this assertion beyond the fact that the PRG calculator nominally identifies soil as an environmental media of interest. This is reasonable as it would quickly become overwhelming to identify a comprehensive list of sludges, sediments, and other soil-like

[20] U.S. EPA. 2019. ''Leaching Environmental Assessment Framework (LEAF) How-To Guide: Understanding the LEAF Approach and How and When to Use It.'' SW–846 Update VII. Prepared by the EPA Office of Land and Emergency Management. Washington, DC. May.

materials that might be encountered at cleanup sites. EPA notes that the exposure assumptions incorporated into the PRG calculator are equally relevant for CCR intermixed with soil. CCR consist of small particulates that can be readily intermixed with the soil and result in exposures through the exact same routes, specifically incidental ingestion and direct exposure to gamma radiation.

EPA also disagrees that the analysis of exposure to CCR mixed with soil is overly simplistic. First, the presence of additional cover soil is already considered in the main analysis and is not relevant to the types of exposures explicitly considered in the sensitivity analysis. Second, because EPA concluded the rate of radon emanation from CCR and soil were not distinguishable, the sensitivity analysis explicitly does not incorporate risk from inhalation of radon gas. Only a relatively small fraction of the radon generated from fly and bottom ash is expected to escape into the ambient air and these losses can be counteracted by upward migration from deeper ash. Therefore, it is unlikely that further consideration of radon emanation would have substantial impacts on exposures through incidental ingestion or direct gamma exposure. Third, the model parameters used to characterize exposure to gamma radiation in the PRG calculation are generally the same as in RESRAD and other available models. Finally, exposure factors selected for use in the PRG calculator are consistent with Agency policy for characterizing an RME scenario and many of the remaining parameters are based on extensive modeling.[21 22 23]

EPA generally only considers contributions from disposed wastes to risk when conducting national risk assessments under RCRA. Background concentrations may contribute to risk when present and can sometimes be higher than concentrations modeled in a risk assessment. Although constituent concentrations in undisturbed environmental media can be highly variable, they are often relatively low in concentration. As a result, consideration of these concentrations would generally have no impact on the overall conclusions of a national risk assessment. Therefore, consideration of background concentrations is more appropriate on a site-specific basis when risk managers are determining the need for and scope of corrective action. EPA recognizes that a focus on background is more common for discussion of radioactivity, particularly when providing context for the associated risks to the broader public. However, as one point of reference, EPA has found that the median activities of fly and bottom ashes already fall close to the standard of 5 pCi/g radium-226+228 above background soil, which has been adopted as an ARAR for some cleanups under Superfund and State programs (*i.e.,* around 4.3 pCi/g higher).[24] Additionally, EPA has found that high-end radium-226+228 activity in CCR has the potential to be nearly 10 pCi/g higher than typical background soil. Thus, there is real potential for mixing of CCR with soil to further increase any risk already associated with background.

Commenters are correct that mixing small quantities of CCR with soil may not result in a surface soil activity above the ARAR. For high-end CCR activity, this would require a roughly equal mixture of soil and ash. However, risks are still possible at activities below the ARAR. The PRG calculator estimates that an increase of only 1.13 pCi/g of the thorium-232 decay chain or 1.45 pCi/g of the uranium-238 decay chain in surface soils could increase cancer risk for residential receptors by 1×10^{-4}. Such risks can result from relatively low mixtures of CCR and soil, which are possible if ash beneath the soil surface is disturbed. As a result, EPA has identified ARAR of 5 pCi/g above background as equally applicable to subsurface contamination that may be disturbed in the future and concluded ''it would not generally be appropriate to allow backfilling with material with concentration higher than 5 pCi/g.'' Uncertainties associated with background concentrations are further discussed in Section 6 of the 2024 Risk Assessment.

Comment: One industry commenter presented an analysis they had conducted comparing the concentrations of certain inorganic constituents in CCR to soil screening levels. The commenter contended this analysis demonstrated that ''even daily direct contact to trace elements in coal ash would not pose a significant risk to human health.''

EPA Response: EPA did not evaluate the potential soil risks for human health associated with many of the constituents considered in the cited analysis. The Agency believes that any risk from additional constituents would be mitigated by the rule requirements that address the risks identified for radionuclides. However, EPA notes that the cited analysis is not sufficient to demonstrate a lack of risk for these additional constituents on a national scale. The ash concentrations reported for some constituents are already near or above the health benchmarks, indicating some potential for risk. Further, the reported ash concentrations are based on samples from a limited number of geographically constrained facilities. As a result, the reported concentrations may not reflect the broader variability of potential concentrations from across the region or country. In particular, EPA notes there is evidence in the regulatory record of arsenic concentrations approaching an order of magnitude higher than considered in this analysis.

Comment: Several commenters argued that EPA underestimated risk by not considering other potential exposure pathways, specifically inhalation of loose CCR.

EPA Response: EPA selected direct exposure gamma radiation and incidental ingestion of soil as the pathways for evaluation because these represent the most direct routes of exposure to contamination in the soil. EPA agrees that inhalation is another pathway through which future receptors could be exposed if CCR becomes intermixed with surface soil. Quantitative evaluation of this pathway would require additional model inputs that could further increase the uncertainty of results on a national scale, such as the degree of vegetative cover and mean wind speed. However, EPA notes the default PRGs for inhalation of the uranium-238 decay chain in secular equilibrium is nearly three orders of magnitude higher than for external exposure to gamma radiation and two orders of magnitude higher than for incidental ingestion of soil. As a result, it is unlikely consideration of this pathway would substantially increase calculated risk. Therefore, this pathway does not represent a major source of uncertainty in the evaluation. EPA acknowledges that there may be other exposure pathways that could occur if CCR is mixed with surface soil. These are further discussed in Section 6 of the 2024 Risk Assessment.

[21] Oak Ridge National Laboratory. 2014. ''Area Correction Factors for Contaminated Soil for Use in Risk And Dose Assessment Models.'' ORNL/TM–2013/00. Oak Ridge, TN. September.

[22] Oak Ridge National Laboratory. 2014. ''Gamma Shielding Factors for Soil Covered Contamination for Use in Risk and Dose Assessment Models.'' ORNL/TM–2013/00. Oak Ridge, TN. September.

[23] Oak Ridge National Laboratory. 2020. ''Bateman Equation Adaptation for Solving and Integrating Peak Activity into EPA ELCR and Dose Models.'' ORNL/TM–2020/1780. Oak Ridge, TN. September.

[24] U.S. EPA. 1998. ''Use of Soil Cleanup Criteria in 40 CFR part 192 as Remediation Goals for CERCLA Sites.'' OSWER Directive 9200.4–25. Office of Emergency and Remedial Response and Office of Radiation and Indoor Air. Washington, DC. February.

e. Comments Related to Site Monitoring Data

Comment: Some commenters stated that, as part of any further risk assessment efforts, EPA should incorporate data that have been collected as part of the monitoring programs required by either the 2015 CCR Rule or prior State programs. Such data might include site hydrogeology from borings around the units and groundwater quality sampled from monitoring wells. These commenters claimed these data are more recent and more relevant to characterizing the actual nature and extent of contaminant release at individual sites.

EPA Response: There are multiple reasons why it is neither practical nor prudent to incorporate site-specific monitoring data into national fate and transport modeling. First, there are documented concerns about the quality and reliability of these data. For example, EPA has identified significant deficiencies in the monitoring networks at each facility for which the Agency has completed reviews under the Part A (85 FR 53516, August 28, 2020) and Part B (85 FR 72506, November 12, 2020) Rules. It is unlikely such deficiencies are isolated to this specific subset of facilities. Monitoring wells that are located too far apart, installed in the wrong aquifer, or otherwise inadequately installed would result in data that are incomplete or unrepresentative of relevant site conditions. Thus, use of these data would require thorough review prior to use. Much of the site characterization data are not required to be posted on facility websites and so would take substantial time to compile and review for the over 1,000 individual landfills and surface impoundments. Further, it is highly unlikely that any identified deficiencies could be remedied within a reasonable timeframe.

Second, the hydrogeologic data that have been collected in support of well installation can provide an incomplete or erroneous picture of site conditions for the purpose of fate and transport modeling. For example, at sites with lower conductivity soils, EPA has previously raised concerns that collection of hydrogeologic data with a focus on characterizing the predominant soil type can underestimate the prevalence of more localized deposits of higher conductivity soil and other discontinuities that can serve as preferential flow pathways to groundwater. See, 85 FR 72519. Therefore, the current approach to probabilistic characterization of soil and aquifer characteristics using more local data sources is believed to provide the most reliable means to capture the potential variability of conditions across different facilities and represent contaminant fate and transport on a national scale. Furthermore, EPA notes that consideration of more site-specific data would not be expected to change the fact many units are known to be constructed on relatively permeable soils. As a result, further refinements on the hydrogeology modeled at each individual site is unlikely to alter overall model results, which show contaminants can escape from these units and spread considerable distances through groundwater.

Third, groundwater monitoring only provides a snapshot in time of groundwater concentrations at each well location. It is not obvious, nor do commenters articulate, how these data would be applied to model long-term unit leakage. Factors such as natural fluctuations in background groundwater concentrations make it difficult to apportion measured concentrations from individual sampling events into the specific contributions from background and unit leakage. That is why groundwater monitoring programs rely on statistical analysis of data across numerous sampling events to make a binary determination whether or not contaminant concentrations downgradient of a unit have increased above background and GWPS. Even if it were practical to utilize these monitoring data, groundwater samples do not provide broader information about the progression of leakage over time. Specifically, groundwater samples do not provide information on the magnitude of source leachate concentrations, how long the unit has been leaking, or any indication of the potential magnitude and extent of contamination in the future. EPA modeling previously showed that the magnitude and extent of a plume may not peak until decades or centuries after the unit first beings to leak. As a result, incorporation of groundwater monitoring samples into a model would require a number of additional assumptions about the site characteristics and conditions that could substantially increase the overall uncertainty of model results.

Finally, EPA is not aware of similar site-specific data available for the subset of smaller CCRMU intended for purposes other than disposal. As several commenters have acknowledged, facilities have not typically maintained reliable records of the locations of all these smaller units. Thus, any modeling of these units must, by necessity, draw on other datasets to characterize the potential for environmental release and subsequent contaminant fate and transport.

f. Comments Related to Additional Risk Drivers

Comment: Multiple commenters asserted that risks higher than those modeled in the 2014 Risk Assessment are unlikely for landfills. One commenter stated that the previous risks modeled for unlined landfills are ''only slightly above'' the point of departure at 2×10^{-5} and so, even if most CCRMU landfills are unlined, it would not result in risks higher than this value.

EPA Response: The national risks reported in the 2014 Risk Assessment were based on the understanding of relative liner prevalence at the time of that assessment. However, it has since become clear that an even greater proportion of regulated unit have no engineered liner and there is no evidence that CCRMU landfills are lined to any greater degree. Additionally, EPA notes that the 2014 Risk Assessment modeled both clay-lined and composite-lined units under the assumption of good construction practices that achieved the regulatory performance standard. However, it has become clear since then that some liner systems do not achieve this standard. For example, facility reporting shows that around 10% of regulated units with composite or alternate liners have already entered into corrective action. Therefore, even for those units that do have some form of engineered liner, there is potential for national risks to be higher than previously modeled. For all these reasons, national risks for both currently regulated and CCRMU landfills are only expected to be more similar to those previously modeled for unlined landfills. Furthermore, EPA has identified additional factors that have the potential to result in even higher risks than modeled, but that could not be fully quantified as part of either the 2014 or 2024 Risk Assessment. These include co-disposal with coal refuse and disposal in contact with the water table. The greater prevalence of unlined units makes it even more likely these additional factors will occur at unlined units. The combination of these factors has the potential to result in national risks even higher than previously modeled.

Comment: One commenter acknowledged that the 2014 Risk Assessment had demonstrated the potential for co-disposal with coal refuse to increase risk from surface impoundments. However, multiple others argued that the same assessment shows that neither co-disposal with coal refuse nor extreme pH conditions increase risks for landfills. Specifically, commenters pointed to one sensitivity analysis summarized in Table 5–6 of the 2014 Risk Assessment that concluded modeled risks did not exceed the point of departure for any subset of the modeled pH conditions. One commenter argued the Agency's conclusions are not based on actual observations of CCR porewater and groundwater quality at sites where coal refuse is managed. This commenter stated that not all units that accepted coal refuse will contain enough to affect the broader chemistry of the unit and not all coal refuse will contain enough pyrite to influence pH. This commenter further argued that, where acidic conditions and higher leachate concentrations do occur, it will not necessarily result in higher downgradient groundwater concentrations due to other site-specific factors. To support this argument, the commenter summarized findings from multiple EPRI reports that analyzed field samples from around several landfills and surface impoundments believed to have accepted coal refuse.

Response: These commenters misrepresent the findings of the referenced sensitivity analysis. This analysis represents a parsing of groundwater model runs conducted in 2014 as a function of leachate pH. This analysis incorporates model results for a substantial number of lined units, which can mask the effects of leachate pH due to the low overall leakage rates from these units. As such, this sensitivity analysis does not support any conclusions about the impacts of pH on risks from unlined units. Further, very few model runs were conducted at highly acidic pH; the sensitivity analysis did not summarize any results for a pH lower than around 4. Thus, this analysis also does not support any conclusions about the risks associated with highly acidic conditions.

Available LEAF leachate data used to model landfills show that many constituents, including arsenic, can leach at highest concentrations near one or both extremes of the pH scale. The effects of these higher concentrations are reflected in the sensitivity analysis, with higher risks observed around a highly basic pH of 13. Therefore, this sensitivity analysis is consistent with the broader risk record and shows that extreme pH conditions can result in higher risk.

The commenters are also incorrect that the risk record is not based on observations of CCR porewater. EPA relied on empirical measurements of porewater to support modeling of surface impoundments in 2014, which included samples co-disposed with coal refuse. As acknowledged by some commenters, these data supported identification of higher risks from these co-disposed wastes in impoundments. Corresponding pH data are not available for every porewater sample, but available data do show the potential for highly acidic pH around 1, roughly equivalent to stomach acid. The cited EPRI reports do not contradict the finding that co-disposal can affect CCR leaching behavior. As summarized by the commenter, these reports found that a third of units had impacts to unit pH and porewater chemistry. Individual units had potential or confirmed impacts on groundwater quality, causing at least one to trigger remedial measures by the facility. EPA further notes that these reports provide only a snapshot in time of the environmental impacts associated with disposal in this subset of disposal units. As a result, there remains potential for future releases beyond the waste boundary if these conditions persist.

Comment: Multiple commenters asserted that waste disposed below the water table would not result in higher risks from surface impoundments than previously modeled in the 2014 Risk Assessment. These commenters generally argued the hydraulic head present in an operating impoundment from ponded wastewater will result in greater leakage than groundwater flowing through a unit. One commenter presented a hypothetical comparison of the relative hydraulic flux from a unit due to ponded water, infiltrating precipitation, and contact with groundwater to argue that the presence of a ponded water would result in higher leakage. Others pointed to analyses from the 2014 Risk Assessment, which compared leakage from surface impoundments before and after dewatering, to argue that risks from impoundments remaining in groundwater would be lower. Others further argued that the lower hydraulic conductivity of some ash would limit flow through the impoundment and cause groundwater to preferentially flow around the unit.

Several commenters presented data from groundwater monitoring conducted at individual units to assert that risks are more likely to result from the hydraulic head in active impoundments than the intersection of waste with the water table. The presented data depict concentrations of boron, a highly soluble constituent that one commenter noted was selected for its ''insensitivity to redox conditions.'' These plots generally show concentrations of boron to decrease over time after the impoundments were taken out of service, though that pattern was not universal. Some commenters went further, concluding that eliminating the hydraulic head in the unit would allow any prior groundwater contamination to naturally attenuate. Conversely, other commenters pointed to a documented case study where groundwater concentrations increased after ponded water was drained to contend that contact with the water table can result in higher releases.[25]

EPA Response: A number of the commenters misconstrue the findings of the 2014 Risk Assessment, which did not include any assessment of the effects of CCR disposal within the water table. EPA was unable to quantitatively model the risks associated with this management practice because there was little data on how common the practice was or the extent to which it would affect groundwater chemistry. Instead, these commenters are referring to a comparison of the risks resulting from surface impoundments during operation and post-closure (*i.e.,* after free liquids had been eliminated consistent with § 257.102(d)(2)(i)) that was undertaken to understand if only modeling these units only during operation might underestimate peak risks. EPA only concluded that continued leakage after elimination of free liquids and closure would rarely result in higher peak risks. Thus, this assessment did not consider the effects of disposal below the water table or draw any conclusions about the risks associated with this practice.

When waste is managed above the water table, any leakage out of the unit must first infiltrate down through unsaturated subsurface soils and then mix with groundwater before it can flow beyond the waste boundary. As a result, downgradient groundwater concentrations can end up substantially lower than the original leachate concentration. In contrast, when waste is disposed below the water table, the entire volume of groundwater in contact with the CCR and all water infiltrating from above would become undiluted leachate. As the thickness of CCR below the water table increases, the volume of leachate generated can increase substantially based on the sheer size of these disposal units. There is no evidence the properties of CCR would reliably limit transport of this leachate away from the unit. Rather, the hydraulic gradient of the aquifer will continue to drive continued flow

[25] EPRI. 2001. ''Evaluation and Modeling of Cap Alternative at Three Unlined Coal Ash Impoundments.''

through the unit. The hydraulic conductivity of different CCR overlaps with that of common aquifer materials. Even in instances where the average conductivity within a unit is lower than the surrounding aquifer, these units often contain different ash types and other wastes. This can lead to stratification within the unit that creates regions of higher conductivity and allows for greater flow. For all these reasons, there is potential for sustained leakage from units when waste is disposed below the water table. Whether or not the magnitude of this continued leakage is greater than from water ponded in an impoundment does not address the potential for such leakage to cause a release or sustain one that began when water was still ponded in the unit. Such comparisons also ignore that the waste would also be in contact with groundwater while the unit operates, greatly increasing the likelihood of groundwater mounding around the impoundment and increased contaminant transport in all directions.

It is not feasible to draw conclusions based on the small and curated sample of units presented by commenters. Various factors can complicate any interpretation of the presented graphs. First, boron is a highly soluble constituent that can washout at high concentrations into small amounts of water. Thus, the extent to which decreases in concentration over timeframes of a long as a decade or more simply represent the depletion of this highly soluble constituent from the ash is unclear. Second, unit geometry may not be uniform and consistently intersect with the groundwater table, resulting in more spatially isolated releases that cause higher concentrations in some wells and not others. Third, at sites with intermittent contact with groundwater, predefined sampling dates may not align with periods when contact with groundwater occurs. Therefore, it is not possible to draw meaningful conclusions, either at these sites or more broadly, based on the data provided. As pointed out by other commenters, there are also examples available where sustained contract with groundwater after a unit is drained resulted in increased groundwater concentrations of other Appendix III constituents.

The fact that downgradient concentrations have decreased at some impoundments after the unit was drained despite ongoing contact with groundwater does not prove such reductions will be sustained or further groundwater releases will not occur. As one EPRI report concluded, ''the existence of saturated ash will greatly reduce the effectiveness of any cap design when the facility is underlain by geologic materials with high hydraulic conductivity, because groundwater will continue to leach ash constituents.'' [26] Thus, removal of ash from groundwater may be the only reliable means of source control for these units.

Comment: Several commenters agreed that use of porewater to represent leakage from impoundments is appropriate. However, these commenters also raised concerns that available porewater data collected during the active life of an impoundment may underestimate the risks associated with legacy impoundments because it may not accurately reflect leachate concentrations after the unit has ceased operation. As one example, they cited potential for reducing conditions to form through prolonged contact between waste and groundwater.

By contrast, one commenter asserted that elevated arsenic concentrations identified in the two journal articles EPA referenced in the proposal are only representative of that one site and that the majority of available impoundment porewater data have lower concentrations than reported in those articles.[27] [28] The commenter also noted the data presented in the journal articles were collected in support of an EPRI report, which found these concentrations had not translated to exceedances of GWPS in downgradient wells.[29] Based on this finding, the commenter concluded leachate concentrations alone are not a reliable indicator of which units will cause groundwater contamination due to variable site geochemistry and hydrogeology.

EPA Response: EPA agrees that porewater samples remain the best available data to represent leakage from operating surface impoundments. These field samples provide empirical data on leakage from various mixtures of CCR and other wastes managed under consistently saturated conditions. EPA also acknowledges there can be uncertainties associated with field data submitted to the Agency, which might lead to an underestimation of concentrations in the field. One example is the potential for stronger reducing conditions to form after a unit has been closed as a result of less oxygenated water infiltrating through the unit. As acknowledged by commenters, however, there is not sufficient data to characterize the magnitude or extent of such conditions on a national basis. Therefore, the impact of this uncertainty is not known.

EPA disagrees that the arsenic concentrations identified in the referenced studies should be considered an isolated occurrence. These studies clearly demonstrate that: (1) Sustained contact with groundwater can result in stronger reducing conditions than dry management, (2) Reducing conditions can cause higher leaching of arsenic, and (3) LEAF methods can underestimate actual leaching from CCR under reducing conditions by as much as an order of magnitude. Given that disposal beneath the water table is a more common practice than previously understood, there exists the real potential for higher leachate concentrations in the field than previously modeled, particularly at landfills modeled with LEAF data.

EPA does agree that initial leachate concentrations are not the sole determining factor for contaminant fate and transport. As discussed in response to previous comments, this fact is reflected in Agency modeling. Individual model runs with the highest leachate concentrations are not always those with the highest risk. However, factors that will tend to push the overall distribution of leachate concentrations higher will also tend to push modeled nationwide risks higher because of the greater likelihood that higher leachate concentrations will occur at sites where these concentrations can more readily spread. Thus, the greater prevalence of units in contact with groundwater has the potential to result in higher risks on a national scale than previously modeled.

Finally, EPA notes that groundwater monitoring only represents a snapshot in time and does not necessarily provide any indication of the potential for future contamination. In the case of the studied unit, it is not known whether reducing conditions formed during or after operation. As such, there remains potential for future releases if the unit remains in contact with groundwater

[26] EPRI. 2001. ''Evaluation and Modeling of Cap Alternative at Three Unlined Coal Ash Impoundments.''

[27] Wang, X., A.C. Garrabrants, Z. Chen, H.A. van der Sloot, K.G. Brown, Q. Qiu, R.C. Delapp, B. Hensel, and D.S. Kosson. 2022. ''The Influence of Redox Conditions on Aqueous-Solid Partitioning of Arsenic and Selenium in a Closed Coal Ash Impoundment.'' Journal of Hazardous Materials. 428:128255.

[28] Wang, X., H.A. van der Sloot, K.G. Brown, A.C. Garrabrants, Z. Chen, B. Hensel, and D.S. Kosson. 2022. ''Application and Uncertainty of a Geochemical Speciation Model for Predicting Oxyanion Leaching from Coal Fly Ash under Different Controlling Mechanisms.'' Journal of Hazardous Materials. 438:129518.

[29] EPRI. 2020. ''Leaching, Geotechnical, and Hydrologic Characterization of Coal Combustion Products from a Closed Coal Ash Impoundment.''

and continues to leak such elevated arsenic concentrations.

g. Comments Related to Complete Exposure Pathways

Comment: Multiple commenters asserted that EPA must demonstrate the existence of a complete exposure pathway to justify regulatory action, which some defined as exposures that have already occurred. Specifically, commenters stated that ''the presence of groundwater contamination alone does not constitute a risk'' and ''in many cases no one is drinking the water or contacting the CCR materials.'' One commenter presented a summary of analyses that had been conducted across 27 sites, which concluded that groundwater risks do not exist at most sites because no drinking water wells are currently present. Another commenter asserted that the high-end risks identified in the 2014 Risk Assessment assumed that receptors were exposed immediately downgradient of the disposal units. This commenter went on to state that complete exposures would not occur at the many sites adjacent to water bodies because groundwater contamination would be intercepted by surface water first and that the 2014 Risk Assessment found no risks warranting regulation for surface water. Several other commenters also claimed that groundwater quality should be measured at the facility boundary because that would be more representative of a complete exposure pathway.

EPA Response: Section 4004(a) of RCRA requires EPA to establish requirements that will ensure no reasonable probability of adverse effects both to human health *and* the environment. See, 42 U.S.C. 6944(a). EPA therefore disagrees that only the presence of receptors within the impact sphere of a contaminating facility merits consideration. EPA's longstanding and consistent policy (across numerous regulatory programs) has been that groundwater contamination is a significant concern that merits regulatory action in its own right, whether or not the aquifer is not currently used as a source of drinking water.

Once a potentially harmful constituent has leached from a disposal unit into groundwater, whether the constituent ultimately causes further damage by migrating into drinking water wells does not diminish the significance of the environmental damage caused to the groundwater under the site, even where it is only a potential future source of drinking water. As EPA explained in the preamble to the original 1979 subtitle D criteria, EPA is concerned with groundwater contamination even if the aquifer is not currently used as a source of drinking water. Sources of drinking water are finite, and future users' interests must also be protected. See, 44 FR 53445–53448. (''The Act and its legislative history clearly reflect Congressional intent that protection of groundwater is to be a prime concern of the criterion. . . . EPA believes that solid waste activities should not be allowed to contaminate underground drinking water sources to exceed established drinking water standards. Future users of the aquifer will not be protected unless such an approach is taken.''). See also, 80 FR 21453.

The commenters' approach is also inconsistent with Agency guidance, which states that a ''. . . pathway is complete if there is (1) a source or chemical release from a source, (2) an exposure point where contact can occur, and (3) an exposure route by which contact can occur.'' [30] The guidance goes on to state that ''. . . exposure assessments are concerned with current and future exposures.'' Thus, a key consideration in evaluating risk is the potential for future exposure. If it were necessary to wait for exposures to occur as a prerequisite for action, an untold number of receptors could be subject to potential harm. Further, implementation of corrective action is not instantaneous and so this harm could persist for some time after receptor exposures are first identified. Commenters do not explain how such delayed action could be considered protective of human health and the environment, and so meet RCRA's standard. See, *USWAG,* 901 F3d at 429–431.

Commenters also misrepresent the findings of the 2014 Risk Assessment regarding surface water interception. EPA modeled a distribution of distances for both groundwater wells and surface water bodies, accounting for interception whenever a water body was located closer than a well. Thus, reported high-end risks do not include any assumptions about the proximity of receptors to the units. Even if direct exposure to groundwater from use as a drinking water source is considered unlikely due to the potential for interception by nearby surface water, that does not justify no further action. EPA did identify the potential risks from individual disposal units to ecological receptors present in these water bodies and human receptors who fish from those water bodies, as well as associated damage cases, which is why constituents, such as cadmium and mercury, were added to the Appendix IV list of constituents. Additionally, surface water bodies are large and highly interconnected systems that are likely to have multiple electric utilities, as well any number of other industrial sources, located along their banks. If all these facilities were allowed to freely discharge to a water body solely because no individual release posed risk, the cumulative impacts can result in risk to surface water resources and nearby receptors. The 2015 CCR Rule addresses the potential for such risk by specifying corrective action must ''remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible.'' 40 CFR 257.97(b)(3). Thus, dilution of a groundwater plume into surface water could not be considered a presumptive remedy. This requirement is consistent with guidance for OLEM programs that specify the need to prevent groundwater contamination above GWPS from contaminating other aquifers or environmental media.[31]

EPA also disagrees that a point of compliance at the facility boundary would provide a better estimate of actual risk than the waste boundary. Again, the commenter disregards that the contamination of the aquifer is an adverse effect on the environment, not simply a potential risk to subsequent receptors. Consequently, the regulations require facilities to address the contamination at the first available point, that is, when it first leaves the unit. There are several additional reasons that the waste boundary is the appropriate point of compliance. First, a point of compliance at the facility boundary would result in greater potential for current residences or water bodies immediately adjacent to the facility boundary to be exposed before the presence of contamination can be confirmed. Second, the facility boundary may be a significant distance away from the waste boundary, which would allow contamination to increase and spread for some time before triggering corrective action. The further contamination is allowed to increase and spread, the more difficult it may become to clean it up due to factors such as complex contaminant chemistry and site hydrogeology. This may render

[30] U.S. EPA. 1989. ''Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A).'' EPA/540/1–89/002. Prepared by the Office of Emergency and Remedial Response. Washington, DC. December.

[31] U.S. EPA. 2009. ''Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration.'' OSWER Directive 9283.1–33. Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. June.

large volumes of groundwater unusable for drinking water or other purposes. Finally, EPA has previously documented numerous instances where, once the contaminant plume has migrated off-site and impacted private water wells, a utility has purchased these properties, thereby rendering the off-site contamination, ''on-site,'' further delaying corrective action. See, 80 FR 21456. For all these reasons, EPA considers the waste boundary to provide the most consistent and protective basis on which to establish evidence of a release.

4. 2024 Final Risk Assessment

EPA identified risks to groundwater from active CCR landfills and surface impoundments, as well as to inactive CCR surface impoundments at active utilities in the 2014 Risk Assessment, which are now regulated under the 2015 CCR Rule. The results of EPA's further analyses in the final 2024 Supplemental Risk Analysis confirm that the findings on the risk from active units from the 2014 Risk Assessment are equally applicable to units that ceased receipt of waste prior to 2015 and either closed or became inactive. This final rule therefore relies upon the 2014 Risk Assessment, the additional data and analysis presented in the March 2023 proposal indicating that the legacy CCR surface impoundments and CCRMU would be expected to have risks even higher than previously modeled, and the 2024 Supplemental Risk Assessment. Each of these is discussed in turn below.

a. Summary of 2014 Risk Record

In the 2014 Risk Assessment EPA conducted a national-scale, probabilistic analysis that characterized potential risks to human and ecological receptors associated with leakage from CCR surface impoundments and landfills in operation at that time. A combination of models was used to predict fate and transport of contaminants through the environment, receptor exposures, and the resulting risks to human and ecological receptors. The specific exposure routes evaluated were: (1) Human inhalation of particulate matter blown from open management units, (2) Human ingestion of crops and livestock raised on nearby fields, (3) Human ingestion of groundwater used as a source of drinking water, (4) Human ingestion of fish caught from freshwater streams, and (5) Ecological contact with and ingestion of surface water and sediment. Site-specific data were used where available, supplemented by regional and national data to fill data gaps, to capture the variability of waste management practices, environmental conditions, and receptor behavior. EPA reported risks for both highly exposed individuals and more moderately exposed individuals. Risks to highly exposed individuals represent a reasonable maximum estimate that members of the general population might be exposed to, which were calculated as the 90th percentiles of all probabilistic model results. Risks to moderately exposed individuals represent a more typical estimate that members of the general population might be exposed to, which were calculated as the 50th percentiles of all probabilistic model results.

Under RCRA, EPA typically relies on a risk range to determine the point at which regulation is appropriate. This policy was first developed in the context of determining whether to regulate (or ''list'') wastes as hazardous under subtitle C of RCRA. See 80 FR 21449; 59 FR 66075–66077, December 22, 1994. However, over the years EPA has relied on this risk range more broadly to determine whether regulation is warranted under both subtitles C and D of RCRA. See 75 FR 35193 (''Although the statutory standards under subsections C and D differ, EPA has historically interpreted both statutory provisions to establish a comparable level of protection, corresponding to an acceptable risk level ranging between 1×10^{-4} and 1×10^{-6}.'').

Thus, to determine whether there is a reasonable probability of adverse effects on health or the environment from the disposal or other solid waste management of solid waste, EPA typically uses as an initial cancer risk ''level of concern'' a calculated risk level of 1×10^{-5} (one in one hundred thousand) or an HQ above 1.0 for any noncarcinogenic risks. See, 80 FR 21,449. For example, wastestreams or activities for which the calculated high end individual cancer-risk level is 1×10^{-5} or higher generally are considered candidates for regulation. Wastestreams or activities with risks calculated to be 1×10^{-4} (one in ten thousand) or higher generally will be considered to pose a reasonable probability of adverse effects on health or the environment and generally will be regulated. Wastestreams or activities for which these risks are calculated to be 1×10^{-6} (one in one million) or lower, and lower than 1.0 HQ or environmental risk quotients for any noncarcinogens, generally will be considered not to pose a reasonable probability of adverse effects on health or the environment, and generally will not be regulated. Id.

EPA first evaluated national-scale risks in the 2014 Risk Assessment, which provides a snapshot in time of potential risks across the country. This was accomplished by weighting risks from individual management practices in proportion to the anticipated prevalence of those practices. National-scale risks provide important context as to whether risks are a systemic issue that warrant national regulations or are limited in scope and better addressed through more targeted actions. The Agency's evaluation found that the management practices that EPA believed were generally in use in 2014 at surface impoundments and landfills were likely to pose risks to human health through groundwater exposure within the range that EPA typically considers warrants regulation. For highly exposed individuals, the cancer risks from arsenic due to the operation of surface impoundments were as high as 2×10^{-4}, while noncancer risks were as high as an HQ of 5 for arsenic, 2 for lithium, and 2 for molybdenum. Cancer risks associated with the operation of landfills were estimated to be as high as 5×10^{-6} from the ingestion of arsenic-contaminated drinking water. In contrast, all risks for moderately exposed individuals fell below EPA's risk range. This was largely attributed to the fact that many facilities are located next to major water bodies and so contaminant plumes were frequently intercepted by these water bodies before they could reach private wells.

EPA next evaluated the risks associated with individual management practices at surface impoundments and landfills. This was accomplished by filtering the national-scale model runs to focus only on those that included the practice of interest and using the filtered set of runs to calculate risks associated with that specific practice. These individual risks provide important context about the range of contaminants and practices that could pose risk at individual sites. The Agency's evaluation identified two specific management practices that could lead to risks higher than those identified in the national risk estimates.

The first practice EPA evaluated was the disposal of CCR in unlined and clay-lined units. Management in unlined surface impoundments resulted in cancer risks for arsenic up to 3×10^{-4}, as well as noncancer risks for lithium up to an HQ of 3, molybdenum up to an HQ of 4, and thallium up to an HQ of 2. Management in unlined landfills resulted in cancer risks for arsenic up to 2×10^{-5}. The larger increase in arsenic risks identified for unlined landfills above those for national-scale landfills (2×10^{-5} vs. 5×10^{-6}) compared to unlined and national-scale impoundments (3×10^{-4} vs. 2×10^{-4}) is because a larger proportion of landfills nationwide were initially modeled as having a liner. Since promulgation of the 2015 CCR Rule, it has become clear that more units are unlined than originally estimated. Thus, it is anticipated that national-scale risks for landfills would actually be closer to those for unlined landfills (2×10^{-5}), rather than the lower nation-wide estimates reported in the 2014 Risk Assessment.

Although clay-lined units tended to have lower risks than unlined units, they still had potential to result in risks within the range that EPA considers for regulation under RCRA. Management in clay-lined impoundments with a liner thickness of three feet resulted in cancer risks for arsenic of up to 7×10^{-6} and noncancer risks for lithium up to an HQ of 2, while management in similarly unlined landfills resulted in cancer risks for arsenic up to the 1×10^{-5}. The larger increase in arsenic risks for unlined impoundments above those for clay-lined impoundments (1×10^{-5} vs. 7×10^{-6}) compared to unlined and clay-lined landfills (2×10^{-5} vs. 1×10^{-5}) is because the layer of low conductivity clay counteracts the hydraulic head in impoundments that would otherwise freely drive greater volumes of leachate into the subsurface.[32] In contrast, leachate generation in both types of landfills is limited far more by the rate of precipitation. As a result, EPA further considered how reducing the modeled clay liner thickness of impoundments to the minimum allowable standard of two feet would affect arsenic risk and found it would increase to as high as 2×10^{-5}.

The second practice evaluated was the management of wastes with an extreme pH. In particular, empirical porewater data revealed that co-disposal of CCR with other wastes in surface impoundments had the potential to result in a highly acidic pH, cancer risks for arsenic up to 1×10^{-3}, and noncancer risks for cobalt and mercury up to an HQ of 13 and 5, respectively. Laboratory leaching test data also indicated that highly acidic and basic CCR wastes have the potential to leach similarly high arsenic concentrations, up to an order of magnitude higher than under more neutral conditions. Only a small number of previous landfill model runs considered acidic conditions based on the information available about conditions in active units; identified risks for these units were driven by more basic conditions. Thus, to the extent that conditions at either extreme of the pH scale are more prevalent than previously estimated, it is likely that overall risks from disposal in both surface impoundments and landfills would be even higher than modeled.

EPA acknowledged in the 2014 Risk Assessment that there were some additional management practices that could result in higher risk at individual sites, but that could not be quantitatively modeled with the data available at the time. One specific example provided was of CCR disposal below the water table. 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. Because EPA could not quantitatively model these management practices (and because the Agency had no information to indicate that it was a current, widespread management practice), EPA noted only that, based on its review of damage cases, the damage from the placement of CCR in sand and gravel pits was almost always associated with CCR being placed in contact with water, which indicated that the placement of CCR in contact with water can lead to higher risks than from dry disposal. 80 FR 21352. EPA further explained that ''in this situation, the sorption that occurs in the unsaturated zone of the risk assessment model does not occur in the field. This and other site-specific risk factors could lead to additional contamination beyond what was modeled nationwide.'' 2014 Risk Assessment at pages 5–48. As a consequence, EPA specifically included sand and gravel pits that received CCR in the definition of CCR landfills covered by the regulations. 80 FR 21354.

The above model results from the 2014 Risk Assessment are equally applicable to legacy CCR surface impoundments and CCRMU. Many of these unregulated units are similarly constructed, manage the same types of ash, and are frequently located either at the same or nearby facilities as their regulated counterparts. In particular, some unregulated units are known to be located directly adjacent to or beneath currently regulated units. The fact that some of these unregulated units no longer contain water ponded above the ash surface or have installed some form of cover system does not meaningfully distinguish the long-term risks of these units from those previously modeled. This is because all landfills and surface impoundments progress through similar lifecycle stages. Progression toward closure does not remediate any releases that occurred during operation of the unit. Furthermore, if a unit is not closed with an effective cover system or remains in contact with the groundwater table, the higher rates of leakage that can result could sustain releases long after the unit has ceased operation. It is expected that legacy impoundments and CCRMU have been present for longer than currently operating units and so would have had more time to leak. As a result, previous and ongoing releases from these units have the potential to be greater and to have migrated further than those from the currently regulated universe of units.

The risks associated with legacy impoundments and CCRMU may be even higher than EPA modeled on a national scale in the 2014 Risk Assessment. The 2014 Risk Assessment aimed to provide a static snapshot of waste management practices at that time based on the available data. As such, it did not reflect the greater prevalence of some practices at older closed and inactive units based on the understanding those practices had declined over time. Nor did it reflect some ongoing practices for which there was not enough data to characterize prevalence on a national scale. The Agency is now aware of several practices that are more common than were modeled in 2014 and have the potential to result in higher leakage. However, because the 2014 Risk Assessment identified baseline risks that warrant regulation, the national risk record does not depend on the greater prevalence of these practices to justify the need for regulation of closed and inactive units. Instead, the potential for even higher risk from these practices at individual units, which are discussed below, only reinforces the basis for regulation.

First, a greater number of units lack an adequate liner system than EPA previously understood. For example, in the 2014 Risk Assessment, EPA estimated that 65% of impoundments had no engineered liner (*i.e.,* do not meet the regulatory standard for either a clay or composite liner) based on surveys conducted by EPA between 2009 and 2010 (''EPA Surveys'').[33] It has since become clear that even fewer impoundments are actually lined. EPA's review of available liner demonstration documents posted on facilities' CCR websites indicates closer to 83% of impoundments have no engineered liner. Similar reporting is not available

[32] The somewhat higher risks identified for clay-lined landfills compared to similarly lined impoundments are likely related to site-specific conditions, such as where in the country these units are located.

[33] U.S. EPA. 2014. ''Human and Ecological Risk Assessment of Coal Combustion Residuals.'' RIN 2050–AE81. Office of Solid Waste and Emergency Response. Washington, DC. December.

on the liner prevalence for older units. However, EPA is also not aware of any evidence that these older units have been lined at higher rates, particularly those constructed prior to the promulgation of minimum standards for disposal in RCRA subtitle D landfills in 1991. See, 40 CFR part 257, subpart A and part 258. Indeed, most coal-fired utilities in the United States were constructed before 1990.[34] Even when units do report having an engineered liner, they may not perform as well as previously modeled. The 2014 Risk Assessment modeled both clay and composite liners based on the presumption both would achieve regulatory performance standards. Yet, facility reports show that around 10% of landfills and surface impoundments with a composite liner have already entered into corrective action. Thus, many units previously modeled as lined are now believed to either have no engineered liner or to perform more like an unlined unit. For these reasons, EPA anticipates that national risks for both currently regulated units and those newly covered under this rulemaking will be closer to those previously modeled for unlined units. For landfills, this could increase national risks by up to an order of magnitude, as high as 2×10^{-5} for arsenic. That risk is twice the level that EPA typically considers for regulation and is the same level of risk as those associated with the clay-lined CCR surface impoundments that the D.C. Circuit required to close.

Second, a greater number of older units co-disposed CCR with the wastes generated from coal preparation activities, collectively referred to as ''coal refuse.'' These activities may have included coal handling by conveyor systems, coal washing for removing mineral matter, and coal ''sizing'' to reduce the average particle size of coal. Co-disposal with coal refuse can have a pronounced effect on the leaching behavior of CCR because of the potential for the refuse to make the overall waste pH far more acidic. Available Leaching Environmental Assessment Framework (LEAF) leaching data considered in the 2014 Risk Assessment show that multiple Appendix IV constituents are most soluble under extreme pH conditions and thus able to leak at higher rates. EPA found modeled risks are highest when CCR was disposed in surface impoundments with coal refuse. The modeled cancer risks for the co-disposal of ash and coal refuse in surface impoundments ranged between 1×10^{-3} for trivalent arsenic to 4×10^{-4} for pentavalent arsenic. Non-cancer risks were similarly high, ranging between and an HQ of 13 for cobalt and HQ of 14 for pentavalent arsenic to 26 for trivalent arsenic, based on the ingestion of contaminated drinking water.

The practice of co-disposal with coal refuse has declined over time. A survey conducted by Electric Power Research Institute (EPRI) in 1995 showed 34% of unlined landfills and 68% of unlined surface impoundments actively managed CCR with coal refuse.[35] In contrast, EPA Surveys indicated that, by 2014 this management practice had declined to around 5% of active units. EPA's 2014 national-scale modeling was based on the 5% reported in the EPA Surveys, and as a consequence, this practice had minimal influence on the overall nationwide risk estimates in the 2014 Risk Assessment. However, it is clear from the EPRI data that management of CCR with coal refuse used to be far more common prior to 1995. Of the 283 disposal units that were previously excluded from the 2014 Risk Assessment and that reported a start year in the EPA Surveys, around 91% had already begun operation by 1995. Therefore, the risks associated with these older disposal units are likely to be higher than the national scale risks reported in the 2014 Risk Assessment.

Finally, it has become apparent since promulgation of the 2015 CCR Rule that the practice of disposing of CCR below the water table is more common than EPA previously understood. EPA was aware of this practice in 2014 and raised it as an uncertainty in the risk assessment, but had little information about the frequency of this practice. EPA's review of the location restriction demonstrations posted on facilities' CCR websites found that approximately 31% of active CCR surface impoundments had waste below the water table. Similar statistics are not currently available for landfills, though it is clear from previously identified damage cases that this practice is not unique to impoundments. Nor is EPA aware of any evidence that would indicate older units are less likely on the whole to have been constructed within the water table. EPA was unable to model the effects of disposal in the water table in 2014 due to constraints on data availability and modeling capabilities.

Disposal beneath the water table, either continuously or intermittently, will result in conditions that mirror those previously found to drive risk from active surface impoundments. Specifically, saturation of disposed CCR provides a larger reservoir of leachate and the hydraulic gradient across the aquifer maintains a hydraulic head that serves to drive this leachate away from the unit. The implications for landfills are particularly significant, as the potential for greater contaminant transport from these units can result in higher risks to groundwater than previously modeled under dry conditions. Further, because these landfills leak directly to groundwater, there is potential for these risks to remain long after the unit has ceased operation. This is equally true for impoundments. Even if the hydraulic head within the aquifer is not as great as from ponded water, it can still sustain higher rates of leakage than if the unit were fully dewatered. As a result, removal of the saturated ash may be the only reliable means to control the source of contamination.

Since promulgation of the 2015 CCR Rule, EPA has identified evidence of another way in which disposal below the water table could result in greater risk. This disposal practice has the potential to alter groundwater chemistry in ways that increase either the solubility or mobility of some CCR contaminants. This is due to the residual, unburnt organic matter in CCR serving as a carbon source (*i.e.,* substrate, electron donor) for bacteria in the soil. Bacteria preferentially use any dissolved oxygen (O_2) for oxidation of organic matter (*i.e.,* electron transfer from the organic matter to oxygen) because this yields the greatest energy returns for the bacteria. With a sufficient source of biodegradable organic matter, bacterial consumption of oxygen can outpace replenishment of dissolved oxygen that occurs through diffusion from the atmosphere and infiltration of precipitation. Depletion of oxygen is more likely to occur in saturated soils because the constant presence of water allows biological activity to proceed unimpeded by periods of drying, the relatively slow flow rate of groundwater does not transport dissolved oxygen from the upgradient side of the unit fast enough to outpace consumption across the footprint of the unit, and sustained saturation of the soil limits oxygen exchange with the atmosphere. In the absence of oxygen, bacteria will instead use nitrate, manganese, iron, sulfate, and other compounds for reduction of organic matter (*i.e.,* electron transfer to

[34] United States Energy Information Administration. 2017. ''Most Coal Plants in the United States were Built Before 1990.'' Accessed online at: *https://www.eia.gov/todayinenergy/detail.php?id=30812*.

[35] EPRI. 1997. ''Coal Combustion By-Products and Low-Volume Wastes Comanagement Survey.'' Palo Alto, CA. June.

organic matter from other compounds). Such reducing conditions will not affect all constituents equally, serving to mobilize some and immobilize others. However, reducing conditions can mobilize arsenic, the primary source of risks identified in the 2014 Risk Assessment.

Research conducted since the 2014 Risk Assessment has better documented the potential effects of disposal below the water table on leakage from CCR units. Studies published in 2022 examined, among other things, the degree to which environmental conditions can differ within the same closed impoundment, both above and below the water table.[36 37] Specifically, arsenic concentrations measured in the water intermingled with CCR beneath the water table were as high as 4,100 mg/L due to the presence of reducing conditions and a near neutral pH of 8. That concentration is substantially higher than 20 mg/L, measured from the same ash with LEAF Method 1313 at a similar pH, or 780 mg/L, which is the 90th percentile of all impoundment porewater measurements previously compiled by EPA. This indicates that the porewater and LEAF data relied on the 2014 Risk Assessment may significantly underestimate the magnitude of leakage from CCR units under reducing conditions.

The extent to which the porewater data EPA used to model surface impoundments in 2014 reflect strong reducing conditions is not known, as this information was not commonly reported. Such conditions might occur during operation as a result of sustained saturation or might evolve after an impoundment has been drained of ponded water and capped, thereby decreasing mixing of oxygen within the unit. However, it is known that the LEAF data used to model landfills does not reflect reducing conditions. All standardized leaching tests tend to reflect oxidizing conditions due to contact between the sample and the atmosphere during sample collection and laboratory analysis. As such, it has since been recognized that further analysis of leachate data with geochemical speciation models may be warranted when field conditions diverge from those present in the laboratory setting (*e.g.,* reducing conditions).[38] Therefore, there is clear potential for significantly higher leachate concentrations than modeled if a landfill is in contact with groundwater.

b. 2024 Risk Assessment and Results

As noted above, a number of commenters argued the 2014 Risk Assessment does not adequately capture various factors associated with legacy impoundments and CCRMU that the commenters believe will result in significantly different risks than those posed by currently regulated units. In response, EPA prepared a supplemental risk assessment to determine the potential for some of these factors to affect national risks (''2023 Draft Risk Assessment''). EPA began by reviewing available information about the characteristics and locations of legacy impoundments and CCRMU to determine whether there was any potential for the risks from these units to be meaningfully different from currently regulated units. This included a review of groundwater model results previously excluded from the 2014 Risk Assessment because the units were ultimately not covered by the 2015 CCR Rule.

As part of this review, EPA grouped legacy impoundments and CCRMU disposal units into different categories based on unit type: (1) Historical and inactive landfills and (2) Historical and legacy impoundments. The 2024 Risk Assessment defines historical units as those that have steps taken toward closure, but that may or may not meet all the requirements of § 257.102(d). Additionally, EPA further considered the influence of unit size on risk and conducted additional modeling for the subset of CCRMU that is smallest in size, those used as fill or for similar purposes (hereafter ''CCRMU fills''). Because facilities have not historically regarded such placement as disposal units or necessarily maintained associated records, EPA believes there is potential for exposures different than those previously considered for landfills and surface impoundments. Specifically, EPA evaluated the potential for risk from onsite exposure to contaminated groundwater or CCR accumulations in the soil under a future residential land use scenario.

i. Problem Formulation

EPA first developed conceptual models to illustrate a generalized layout of legacy impoundments and CCRMU, the different pathways through which constituents may be released from CCR and migrate through the environment, and the risks to human health and the environment that could result. The conceptual models for landfills and impoundments were the same as used in the 2014 Risk Assessment/EPA determined that a second model was warranted for CCRMU because some smaller placements have not historically been regarded as disposal by facilities and so have not been reliably tracked or maintained over time. These smaller placements may be disturbed after land use changes, which can result in additional release pathways. Therefore, EPA prepared a second conceptual model for smaller units (*i.e.,* CCRMU fills). These conceptual models provide the basis for subsequent modeling efforts.

When CCR are placed on the ground for any purpose, they may leach metals and other inorganic contaminants to groundwater. Once mixed with groundwater, contamination may migrate downgradient to private wells where it is ingested by receptors who rely on groundwater as their primary source of drinking water. But a receptor does not need to be presently exposed for there to be a reasonable probability of adverse effects on health or the environment. EPA evaluated this exposure pathway in the 2014 Risk Assessment and identified a set of constituents most likely to pose risk to offsite receptors living up to a mile away. The 2024 assessment builds on those model results and identifies arsenic, lithium, molybdenum, and thallium as constituents that warranted further evaluation. These are the constituents found in the 2014 Risk Assessment to pose the greatest risk for unlined surface impoundments and have the greatest demonstrated potential to spread and pose risk on a national scale. These 2014 model results therefore also provide a reasonable screen to identify the most likely risk drivers for receptors living even closer to these types of units.

When CCR is placed in fills and left unmonitored, the ash can be disturbed in the future when land use changes. In the absence of records of the presence of CCR, and in the absence of inspection and maintenance, any engineering controls currently present that might serve to limit exposure cannot reasonably be assumed to remain in place in perpetuity. For this reason, EPA

[36] Wang, X., A.C. Garrabrants, Z. Chen, H.A. van der Sloot, K.G. Brown, Q. Qiu, R.C. Delapp, B. Hensel, and D.S. Kosson. 2022. ''The Influence of Redox Conditions on Aqueous-Solid Partitioning of Arsenic and Selenium in a Closed Coal Ash Impoundment.'' Journal of Hazardous Materials. 428:128255.

[37] Wang, X, H.A. van der Sloot, K.G. Brown, A.C. Garrabrants, Z. Chen, B. Hensel, and D.S. Kosson. 2022. ''Application and Uncertainty of a Geochemical Speciation Model for Predicting Oxyanion Leaching from Coal Fly Ash under Different Controlling Mechanisms.'' Journal of Hazardous Materials. 438:129518.

[38] U.S. EPA. 2019. ''Leaching Environmental Assessment Framework (LEAF) How-To Guide: Understanding the LEAF Approach and How and When to Use It.'' Office of Land and Emergency Management. Washington, DC. May.

considered the potential for additional exposure pathways that could occur under a future residential land use scenario. The 2014 Risk Assessment did not evaluate risks from direct placement of CCR in the soil. However, EPA previously identified radium as a constituent of concern in the 2015 CCR Rule and included two radioisotopes on the Appendix IV list for groundwater monitoring, radium-226 and radium-228. These radioisotopes are part of larger, naturally occurring decay chains that begin with uranium-238 and thorium-232, respectively. Even if some form of cover remains over the ash, future receptors who live on or around a fill may be exposed to radiation through direct exposure to gamma radiation or inhalation of radon gas. Therefore, EPA considered potential for exposure to the full decay chains of these radium isotopes as the primary risk driver for this pathway.

ii. Disposal Unit Groundwater Risk

All disposal units pass through the same lifecycle stages, ranging from initial construction to final closure. As a result, there is potential for historical and inactive disposal units to result in the same types of environmental releases as currently regulated units over the course of their lifecycle. The fact some historical and inactive units may have since drained ponded wastewater or installed some form of cover system does nothing to remediate any prior releases. EPA conducted a review of the available data on these historical and inactive units to understand whether the associated risks would be expected to differ from those previously modeled for regulated units.

The 2014 Risk Assessment modeled risks for a total of 122 landfills and 163 impoundments that were ultimately excluded from the final summary of national risks because it was determined that these units fell outside the scope of the 2015 CCR Rule. These units were excluded because they were anticipated to cease receipt of waste prior to the effective date of the rule. Therefore, model results for these previously excluded units directly address the historical and inactive units subject to the current rulemaking. EPA reviewed model results for these previously excluded units to better understand whether the associated risks were any different from those of currently regulated units. For highly exposed individuals, landfills were estimated to pose cancer risks as high as 7×10^{-6} from arsenic III, while surface impoundments were estimated to pose cancer risks as high as 8×10^{-5} from arsenic III and noncancer HQs as high as 2 for arsenic III, 2 for lithium, and 1 for molybdenum.

Differences between these risks and those for currently regulated units are attributed primarily to differences in the prevalence of engineered liners modeled for the two sets of units. The previously excluded units were modeled as having no engineered liner at 71% of landfills and 57% of impoundments, compared to 42% of landfills and 65% of impoundments for currently regulated units. For unlined units, the arsenic III risk from previously excluded units was 1×10^{-5} for landfills and 2×10^{-4} for surface impoundments, while corresponding risk from regulated units were 2×10^{-5} for landfills and 3×10^{-4} for surface impoundments. Since all of this modeling was completed in 2014, it has been discovered through facility reporting that a greater percentage of regulated units has no engineered liner than EPA previously modeled. For example, in the 2014 Risk Assessment, EPA estimated that 65% of impoundments had no engineered liner based on the EPA Surveys.[39] It has since become clear that even fewer impoundments are actually lined. EPA's review of available liner demonstration documents posted on facilities' CCR websites indicates closer to 83% of have no engineered liner. EPA has seen no evidence that would indicate older historical and inactive units would be lined at any greater frequency. Thus, EPA concludes that the national risks for regulated and previously excluded units will fall closer to those modeled for unlined units.

EPA reviewed available data on facility location to understand whether environmental conditions (*e.g.,* precipitation, soil type) at inactive and active facilities could be substantially different than previously modeled. Such conditions can affect the rate of leakage from a unit and subsequent transport of that leachate through the subsurface. This review found that around 80% of the active and inactive facilities that were not subject to the 2015 CCR Rule had already been modeled as part of the 2014 Risk Assessment and so are already reflected in the risk results for those previously excluded units. The remaining 20% of facilities are located an average distance of 26 miles from the nearest modeled facility. Therefore, EPA concludes that the 2014 Risk Assessment adequately captures the effects of facility location on national risk.

[39] U.S. EPA. 2014. ''Human and Ecological Risk Assessment of Coal Combustion Residuals.'' RIN 2050–AE81. Office of Solid Waste and Emergency Response. Washington, DC. December.

Commenters stated that the smaller size of historical and inactive disposal units would result in lower volumes of leakage and could not sustain plumes of the same magnitude as from larger regulated units. EPA reviewed data from the EPA Surveys to determine whether the sizes of previously excluded units are substantially different than EPA modeled for currently regulated units. This comparison indicates that excluded units do tend to be somewhat smaller. The average size modeled for excluded units was 77 acres for landfills and 28 acres for impoundments. The average size modeled for regulated units was 107 acres for landfills and 47 acres for impoundments. Despite these differences, there remains a great deal of overlap in the range of sizes for both sets of units. Further, as described above, similar risks were identified for both sets of units. Thus, there is no indication that size differences of this magnitude have any notable effect on national risk. Nor is there any information available about the units not captured in the EPA Surveys that would indicate these remaining units are significantly smaller. Therefore, EPA concludes that the 2014 Risk Assessment adequately captures the effects of unit size on national risk.

iii. CCRMU Fill Groundwater Risk

EPA conducted national-scale modeling of CCRMU fills to understand the potential groundwater risks that could result from these smaller placements of CCR. The exposure route evaluated for was human ingestion of groundwater used as a source of drinking water. The evaluation incorporated many of the same data sources used in the 2014 Risk Assessment to characterize the variability of site conditions. Two models were used to evaluate contaminant fate and transport, EPACMTP and MODFLOW–USG. EPACMTP was run first at specified distances along the centerline of the plume to understand the potential for releases to occur and spread further downgradient. MODFLOW–USG was then run for a subset of the conditions to understand the broader magnitude and extent of these plumes.

Groundwater concentrations modeled with EPACMTP at the waste boundary were first compared to respective GWPS to understand the potential for fills to impact groundwater quality to an extent that would trigger corrective action at regulated landfills. The 90th percentile concentrations exceeded GWPS by factors of 26 for arsenic III, 19 for arsenic V, 156 for molybdenum, and 19 for thallium. The 50th percentile concentrations exceeded GWPS by a factor of two for molybdenum. Based on these results, EPA finds that CCRMU fills can meaningfully contribute to groundwater contamination across a facility.

Groundwater concentrations modeled with EPACMTP at 500 and 1,000 feet away from the waste boundary were used calculate risks to individual RME receptors exposed to these concentrations. The 90th percentile concentration of each modeled constituent exceeded at least one risk benchmark at 1,000 feet. This indicates potential for leakage from fills to spread at environmentally significant concentrations. However, because these model runs represent concentrations at a fixed location, they do not provide broader information about the magnitude and extent of the plume. As a result, EPA does not rely primarily on these results to draw direct conclusions about overall risk. Instead, the Agency retained a subset of these model runs for both arsenic V and molybdenum from around the 90th percentile concentrations modeled at 1,000 ft. EPA selected pentavalent arsenic because it is the less mobile species and so provides a reasonable bounding on the high-end concentrations that can result for this contaminant. These runs were retained for further modeling with MODFLOW–USG to characterize the full magnitude and extent of each plume over time.

The MODFLOW–USG runs were designed with the same inputs as corresponding EPAMCTP runs. Altogether, these model runs reflect a range of conditions that collectively resulted in high-end groundwater concentrations 1,000 feet from the fill. These corresponding placements of CCR range from around 3,500 to 70,000 tons placed over areas between 0.15 to 2.0 acres. EPA calculated the midpoint across these runs to define values representative of the 90th percentile model runs. For arsenic V, the model identified a peak risk of 1×10^{-4} averaged over 32 million gallons (Mgal) of groundwater and a peak volume of 147 Mgal with an average risk of 7×10^{-5}. The same leakage of arsenic V would result in a peak GWPS exceedance of three averaged over a plume volume of 1.2 Mgal and a peak plume volume of 8 Mgal with an average exceedance of 2 times GWPS. It would take around 2,300 years from the time of first exceedance for the plume to fully dissipate. For molybdenum, the peak exceedance of both risk benchmark and GWPS was 10 averaged over a plume volume of 27 Mgal and a peak plume volume of 80 Mgal with an average exceedance of 4 times GWPS. It would take around 100 years from the time of first exceedance for the plume to fully dissipate. Plumes of these size and duration could readily sustain exposures for typical residential receptors that are anticipated to use around 80 gallons of water a day for all indoor household needs, resulting in less than 0.8 Mgal of use over 26 years of exposure.

iv. CCRMU Fill Soil Risk

EPA modeled of CCRMU fills to understand the potential risks that could result from CCR present in the soil. Exposure routes initially considered for evaluation were human inhalation of radon gas and direct exposure to gamma radiation emitted from the CCR. However, based on a preliminary review of available data, EPA determined that radon emanation from CCR (*i.e.,* fraction of radon able to escape into the surrounding air) is generally lower than from most soils. Despite the higher overall activity of CCR, the resulting radon emanation from the ash is not distinguishable from that of most surface soils. Therefore, EPA did not retain exposure to radon for further consideration.

Modeling of exposure to gamma radiation was conducted with the EPA PRG calculator. EPA evaluated the potential for direct exposure to gamma radiation from CCR under a soil cover ranging in thickness from 60 to 20 cm (2 to 0.66 feet). EPA compared the combined activity of the uranium-238 and thorium-232 decay chains in the CCR to the health benchmarks for each cover thickness to calculate the risks that could result from receptors living on or near the fill. Both 90th and 50th percentile activities have potential to result in cancer risks at or above 1×10^{-5} with a cover of 40 cm. The 90th percentile activity resulted in a cancer risk of 1×10^{-4} with a cover of 20 cm. This indicated the potential for even higher risk if the cover were to be disturbed and the CCR brought to the ground surface. However, evaluation of this scenario would require additional assumptions about the degree of mixing, which could be a major source of uncertainty on a national scale. Therefore, EPA retained this scenario for further consideration as part of a separate sensitivity analysis.

v. Uncertainty and Sensitivity Analyses

EPA reviewed the models used, as well as the data and assumptions input into the models, to better understand the potential sources of uncertainty inherent in the model results. The Agency qualitatively and, to the extent possible, quantitatively analyzed these sources to understand the potential effects each may have on modeled risks. EPA also conducted further sensitivity analyses to understand how the modeled national risks vary in response to changes in sensitive parameters and to evaluate the potential for risks through exposure pathways that could not be fully modeled on a national scale.

The major source of uncertainty identified for the groundwater model is the potential for greater risk from multiple units located in close proximity. The EPA Surveys did not provide information on the relative location or orientation of different landfills and impoundments at any given facility and so the 2014 Risk Assessment modeled risks from each unit individually. However, the Agency is now aware of many instances where multiple units are located directly adjacent to one another, resulting in a larger total area over which leakage can occur. This could result in greater cumulative risk to offsite receptors than predicted based on contributions from each individual unit. Furthermore, there is potential for legacy impoundments and CCRMU (disposal units and fill) to confound groundwater monitoring programs when located upgradient of a regulated unit. Ongoing leakage from these unregulated units has the potential to skew the characterization of background groundwater quality. Under these circumstances, any leakage from a regulated unit would need to progress even further and faster to be distinguishable from that skewed background. This could delay or entirely prevent a regulated unit from entering into corrective action, resulting in risk to downgradient receptors.

EPA conducted a sensitivity analysis to determine whether there is a unit size below which adverse impacts to groundwater quality are unlikely and monitoring is not warranted. This analysis found exceedances of GWPS are possible for placements below 1,000 tons. Thus, such placements can meaningfully contribute to groundwater contamination at these facilities. It was not possible to identify a limit much lower than this tonnage because of the few model runs conducted at smaller amounts. Extrapolation beyond available model runs could introduce a great deal of uncertainty into any specific limit identified. The extent to which any identified limit could shift higher or lower in response to further modeling around these lowest tonnages is not known. Therefore, the Agency could not identify a lower limit based on the current modeling.

EPA conducted further sensitivity analyses to better characterize the risks to human health that may result from mixing of CCR with the soil. There is little data available to predict the likelihood of different degrees of mixing that could occur across the country. Instead, EPA considered the incremental contributions from CCR through increased mixing with soil to identify the point at which accumulation would raise concern. This analysis focused on radionuclides previously identified as potential risk drivers for soil, but also considered contributions from arsenic that may further contribute to cancer risk. The exposure pathways considered were incidental ingestion of the CCR and soil mixture and direct exposure to gamma radiation. For radionuclides, cancer risks above $1 \times ^{10-4}$ are possible for residential receptors at mixing of more than 11% for 90th percentile activity and 21% for 50th percentile activity. For arsenic, cancer risks above $1 \times ^{10-4}$ are possible at mixing of more than 33% for 90th percentile concentration, but would not occur at any degree of mixing for 50th percentile concentration. Both radionuclides and arsenic also occur naturally in soil; however, levels in CCR can be markedly higher than typical background levels. In particular, EPA has identified the potential for CCR to have a combined radium activity nearly 10 pCi/g above typical background soils. This is greater than the ARAR that has been applied at some cleanups for surface and subsurface soils under Superfund and State programs. As such, consideration of the incremental increase above background does not alter the overall results of this analysis. Therefore, EPA concludes that accumulation of CCR within the soil column can result in risks within the range that EPA considers or regulation.

EPA separately considered the potential for risk to ecological receptors that may result from mixing of CCR with the soil based on comments received that a future use for these facilities could be as a nature preserve. EPA calculated the incremental contributions from CCR as described above and compared the resulting concentrations to available ecological benchmarks. This analysis focused on constituents for which ecological soil screening levels are available. This comparison indicates that antimony, selenium, and vanadium are most likely to drive risk and require further evaluation at both high-end and median ash concentrations. In some cases, ecological benchmarks are lower than typical background soil levels. However, consideration of the incremental increase above background does not alter overall results. Therefore, the potential for risk from accumulation of CCR within the soil column remains even if future residential land use is not anticipated.

vi. Final Conclusions

Based on the analyses summarized in the current risk assessment, EPA concludes that there is a reasonable probability of adverse effects on health and the environment due to leakage from legacy CCR surface impoundments and CCRMU. EPA's assessment estimates that the risks that leakage from these units would adversely impact groundwater quality and pose risk to future receptors fall within the range EPA typically considers warrants regulation under section 4004(a) (*i.e.,* cancer risks greater than 1×10^{-5} and non-cancer risks exceeding an HQ of 1). Older historical and inactive disposal units can pose risks to offsite receptors substantially the same as previously reported for currently regulated units. Smaller CCRMU fills can pose risk to onsite receptors and materially contribute to broader groundwater contamination across the facility. Depending on the location of these fills, they can also pose risk to offsite receptors. The risks identified for CCRMU fills are also believed to provide a bounding estimate on the risks posed by disposal units, as leakage from these larger units would generally be expected to result in more extensive releases than modeled for fills. Risks to human health from groundwater are anticipated to be driven by ingestion of arsenic, lithium, molybdenum, and/or thallium. Health effects associated with arsenic ingestion are an increase in the risk of cancer in the skin, liver, bladder, and lungs, as well as nausea, vomiting, abnormal heart rhythm, and damage to blood vessels. Health effects associated with ingestion of lithium are neurological and psychiatric effects, decreased thyroid function, renal effects, cardiovascular effects, skin eruptions, and gastrointestinal effects Health effects associated with molybdenum ingestion are higher levels of uric acid in the blood, gout-like symptoms, and anemia. Health effects associated with thallium ingestion are hair loss, ocular effects, and behavioral changes.

EPA also concludes the unmonitored accumulation of CCR in surface and subsurface soils has the potential to result in risk to future human and ecological receptors in the range OLEM typically considers for regulation. Potential human health risks are driven by incidental ingestion of ash mixed with the soil and direct exposure to gamma radiation from radium and its associated decay chains. Health effects attributed to radium exposure include increased risk of several types of cancer, particularly lung and bone cancer. Potential ecological risks are driven by exposure to antimony for mammals, selenium for plants and mammals, and vanadium for birds from ash mixed with the soil. Health effects attributed to these exposures are decreased reproduction, growth, or survival. EPA did not seek to identify a comprehensive list of other contaminants that might also contribute to risk as part of the current assessment; however, any further risk would be equally addressed by controls put in place to mitigate the identified soil risks.

B. Legacy CCR Surface Impoundment Requirements

The Agency is amending the CCR regulations in 40 CFR part 257, subpart D to require legacy CCR surface impoundments to comply with the same regulations that apply to inactive CCR impoundments at active facilities, except for the location restrictions (at §§ 257.60–257.64) and liner design criteria (at § 257.71). EPA is also establishing new requirements to address issues specific to legacy CCR surface impoundments. Finally, EPA is establishing new compliance deadlines for legacy CCR surface impoundments.

1. Definition of a ''Legacy CCR Surface Impoundment''

EPA is finalizing the proposed definition of a ''legacy CCR surface impoundment'' without revision. A legacy CCR surface impoundment must meet three criteria: (1) The unit meets the definition of a CCR surface impoundment; (2) The unit contains both CCR and liquids on or after October 19, 2015; and (3) The unit is located at an inactive electric utility or independent power producer. An inactive impoundment must meet all three criteria to be a legacy CCR surface impoundment. This definition is codified in § 257.53.

EPA estimates there are 194 legacy CCR surface impoundments located at 85 facilities that will be subject to the requirements of this final rule.[40] This estimate also takes into account the information received in response to the Agency's lists of potential legacy CCR surface impoundments published in the dockets with the proposed rule and

[40] An updated list of potential legacy CCR surface impoundments can be found in the docket for this action. See document titled ''Universe of Legacy CCR Surface Impoundments. April 2024.''

subsequent notice of data availability. This estimate is an increase from the 127 legacy CCR surface impoundments located at 59 facilities identified in the proposed rule. 88 FR 32028.

The sections below briefly explain what EPA proposed, summarize the public comments received, and provide the Agency's responses.[41] The Agency addresses several aspects of the definition in the following order: (1) Date for determining applicability; (2) The requirement to contain both CCR and liquids; and (3) The requirement to be located at an inactive facility.

a. Legacy CCR Surface Impoundment—Date for Determining Applicability

EPA explained in the proposed rule that the 2015 CCR Rule exempted ''inactive surface impoundments at an inactive facility'' and codified definitions of an ''inactive CCR surface impoundment'' and an ''active facility or active electric utility.'' The Agency further stated that in developing a definition of a ''legacy CCR surface impoundment'' two separate components need to be addressed: (1) The definition of an ''inactive CCR surface impoundment''; and (2) The definition of an ''inactive facility or electric utility.'' 88 FR 31989.

At proposal, the Agency relied on the existing definitions of an ''inactive CCR surface impoundment'' and ''active facility or active electric utilities or independent power producers,'' as well as the 2018 *USWAG* decision to inform the options discussed. Specifically, EPA explained that both terms establish applicability based in part on the effective date of the 2015 CCR Rule—a unit is an ''inactive CCR surface impoundment'' if it does not receive CCR on or after October 19, 2015, and still contains both CCR and liquids on or after October 19, 2015, and an ''active facility or active electric utilities or independent power producers'' is only active if it was in operation on or after October 19, 2015. 40 CFR 257.53.

The Agency proposed to define a legacy CCR surface impoundment, in part, as a surface impoundment that contained both CCR and liquids on or after October 19, 2015. EPA explained in the proposed rule, that using October 19, 2015 as the date to determine applicability was most consistent with the *USWAG* decision; first because legacy CCR surface impoundments would be regulated the same as the currently regulated inactive impoundments at active facilities. Second, an October 19, 2015 applicability date would restore the status quo, as intended by court's decision to vacate the exemption. EPA also concluded that this was the most protective option. 88 FR 31990–31991. However, as an alternative, the Agency also solicited comment on defining a legacy impoundment as a unit that contains both CCR and liquids on or after the effective date of this final rule in 2024. 88 FR 31991–92.[42]

Several commenters opposed the proposed applicability date of October 19, 2015, stating that the only legally defensible and workable approach is to establish an applicability date based on the effective date of this final rule. Some of these commenters argued that an applicability date of October 19, 2015, would constitute a retroactive rule, which they considered to be both legally impermissible and unreasonable. These commenters stated that establishing an applicability date based on the effective date of this final rule would honor the bedrock administrative principle that ''rules should apply prospectively absent express statutory grant'' consistent with *Bowen* v. *Georgetown Univ. Hosp.,* 488 U.S. 204, 208–09 (1988).

Other commenters stated that EPA was overreading the *USWAG* decision and inappropriately interpreting the court's decision. These commenters stated that the court did not specify how legacy impoundments should be regulated, or the appropriate applicability date and regulatory controls that should apply to the units but remanded those issues to EPA to address through rulemaking. These commenters further stated that the court's ruling was based on the administrative record for the 2015 CCR Rule, which they claimed is very different than the current record for the facilities that would be covered by the proposal. According to these commenters, the court was focused only on those legacy impoundments for which significant risks remained, which they characterized as exclusively CCR surface impoundments with a hydraulic head. These commenters argue that, by contrast, the proposal will also apply to CCR surface impoundments for which EPA has failed to demonstrate any significant level of risk, which they characterized as (1) CCR impoundments that contain ''any amount of water,'' but no hydraulic head; and (2) CCR impoundments that are in the process of closing or have completed closure.

Several commenters similarly raised concern that the proposal ignores that there have been numerous changes since the court issued its decision in 2018. For example, some commenters stated that facilities have proactively worked with their States to close these impoundments and have invested substantial resources to close these units in compliance with existing regulatory requirements and thus these units should not be considered legacy impoundments. According to these commenters, the final rule should take into account the significant closure and corrective action work that has been undertaken since the 2015 CCR Rule was promulgated, rather than assuming the landscape has not changed over subsequent years.

In addition, a number of commenters noted that the proposed definition would capture numerous sites where former legacy CCR surface impoundments were closed by removal under then-applicable State regulations and where no CCR remains. These commenters raised concern that EPA lacks jurisdiction under RCRA to impose requirements at a site once all CCR has been removed. Many of these commenters further asserted that EPA should accept such closure as sufficient to protect the environment and not seek to impose an unnecessary set of requirements. Finally, some commenters explained that some of these sites have subsequently been restored and are now home to established natural ecosystems, and thus it would be counterproductive to require them to be disturbed.

By contrast, a number of commenters asserted that the record has not significantly changed since the court issued its opinion. These commenters stated that all legacy impoundments, including those that have been dewatered or completed closure, pose significant risks to human health and the environment that warrant regulation under RCRA. Citing the *USWAG* decision and EPA's findings from the 2015 CCR Rule and the proposal, these commenters stated that the risks associated with legacy impoundments are greater than currently regulated units because they are more likely than regulated ponds to be unlined, more likely not to have been designed by a professional engineer, and more likely to contain a mix of ash and coal refuse, all of which increase the potential for groundwater contamination. The commenters further noted that harm from contaminant releases from legacy ponds worsens as time passes, citing the

[41] EPA's responses to public comments can be found either in this preamble or the Response to Comments document available in the docket.

[42] EPA also published an ANPRM on October 14, 2020 (85 FR 65015). The Agency solicited input on a potential definition of a legacy CCR surface impoundment in the ANPRM and addressed comments to the ANPRM in the subsequent proposal. 88 FR 31989–91.

finding in EPA's 2014 Risk Assessment that peak contaminant releases from CCR surface impoundments will not occur until 70 years after waste placement.

These commenters also estimated that close to half a million people live within 1 mile of the 417 active and inactive coal-fired power plants in 44 States and Puerto Rico that have reported coal ash units. Using the Council on Environmental Quality's (CEQ) Climate and Economic Justice Screening Tool (CEJST), the commentor estimated that approximately half (213) of the facilities are located within a mile of a disadvantaged community, while over 70% of the facilities (297 of 417) are located near a community that has higher-than-State average levels of low-income populations or populations of color. These commenters also estimated that many of the communities living nearby may experience cumulative impacts from other threats. CEJST offers data at the census tract-level on $PM_{2.5}$ exposure, diesel particulate matter, traffic proximity, abandoned mine land, formerly used defense sites, hazardous waste site proximity, Superfund site proximity, underground storage tanks and releases, wastewater discharge, and Risk Management Plan site proximity. According to the commentor, using CEJST, more than half of the 417 power plants with historic or active ash units (214) are within one mile of a census tract that experiences pollution from at least two of these additional sources to a degree higher than that of 75% of all census tracts in the United States.

The commenters also discussed several individual legacy impoundments with longstanding groundwater contamination, noting that for several plants, due to lack of Federal regulation and oversight, little or no action has been taken to remediate clearly documented contamination. Among those they highlighted were:

- At the Muskingum River Power Plant, where onsite groundwater has exceeded the primary EPA MCLs for barium and gross alpha as well as EPA secondary MCLs (SMCLs) for iron, sulfate, and Total Dissolved Solids. According to the commenter no remediation has occurred to date.
- At the retired Dynegy Vermilion Power Station in Oakwood, Illinois, 70-year-old unstable pits with more than 3 million tons of CCR are leaking CCR constituents into Illinois' only National Scenic River. The pits run along the river for a half-mile where kayaking and other recreational activities are common.
- At American Electric Power's retired Tanners Creek in Lawrenceburg, Indiana, leaking ash pits at the plant are contaminating groundwater with high levels of boron within 500 feet of public drinking water wells and the Ohio River.
- At Georgia Power's retired Plant Arkwright, the unlined abandoned ash ponds have been leaking chemicals, such as boron, at levels above health standards into the groundwater and nearby Ocmulgee River for nearly 20 years, according to a peer-reviewed study.[43]

According to these commenters, substantial risks to human health and the environment remain even where the impoundment has been dewatered or closed. In support of this conclusion, the commenters pointed to EPA's explanation in the proposal that even if impoundments have been at least partially dewatered or have undergone some type of closure, the current risks to human health and the environment can still be significant, due to contamination remaining at the site from releases that occurred while the unit was operating. Referencing data that legacy impoundments are, on average, 55 years old, the commenters also pointed to the proposal's explanation that the potential magnitude of releases from older units are greater than for currently regulated CCR units due to a number of factors, including (1) the likely absence of a liner in older impoundments; (2) the mixture of coal ash with coal refuse, which was a common disposal practice in older units; and (3) the older a CCR unit is, the longer it has had to leak and for hazardous constituents to migrate further from the unit. The commenters also discussed the results of a report, ''Assessment of Legacy Surface Impoundments'' by Gordon Johnson, M.Sc., P.Eng., which examined ten CCR surface impoundments at inactive facilities that were not on EPA's list of potential legacy ponds and do not appear to contain standing water, and concludes that all posed significant risks to health and the environment.

As a consequence, these commenters criticized EPA's proposed definition of a legacy impoundment as one that contains liquid on or after October 19, 2015. These commenters argue that this would exclude surface impoundments at inactive plants that pose a reasonable probability of adverse effects on health and environment, whether or not they contain liquid.

[43] J.S. Harkness et al., Evidence for Coal Ash Ponds Leaking in the Southeastern United States. Environmental Science & Technology, 50(12): 6583–6592 (2016).

Several commenters also supported EPA's proposal to regulate units at sites that are heavily vegetated or redeveloped on the surface with established natural ecosystems, stating that the possibility that conducting a proper closure might disrupt the current land use is outweighed by the fact that inadequately closed units pose ongoing threats to health and the environment. These commenters also supported coverage of legacy impoundments that had completed or were undergoing closure pursuant to State programs, citing EPA's review of State programs as part of the 2015 CCR Rule, which concluded that significant gaps remain in many State programs, and discussing specific examples of problematic State permits.

Some commenters also stated that the proposed applicability date of October 19, 2015, presents serious practical challenges to implementation because it requires facilities to look back more than eight years to determine the historical status of legacy impoundments. Commenters explained that this extended look-back period could prove to be an impossible task for sites where power plant operations ceased decades ago. Furthermore, the proposed applicability date illegally requires actions by facilities that are physically impossible. For example, operating records, construction and inspection reports, groundwater monitoring data, and employee testimonials may not exist for some facilities that ceased generating power decades ago. In addition, commenters pointed out that historic aerial photography will not inform whether liquids are present beneath the surface of the inactive impoundments. Finally, some commenters stated that EPA's proposed approach is particularly challenging to small public power utilities given their size, staffing levels, and record retention policies once a facility is closed.

After considering the comments and all of the information in the record, this final rule adopts the proposed date of October 19, 2015, for determining applicability for legacy CCR surface impoundments. This applicability date is justified for two independently sufficient reasons. First, it most effectively targets the risks to human health and environment posed by legacy impoundments. Second, it is consistent with the *USWAG* decision. Accordingly, this final rule specifies that an inactive impoundment at an inactive facility that contained both CCR and liquids on or after October 19, 2015, is a legacy CCR surface impoundment subject to the requirements of this final rule. The definition of a legacy CCR surface impoundment is codified in § 257.53.

This option best addresses the risks legacy impoundments pose to human health and the environment. EPA's record for this rule, which includes the 2015 rulemaking record, supplemented by new information, establishes that that the environmental risks posed by legacy impoundments are greater than or similar to those posed by operating impoundments. EPA acknowledges that it is not bound by the 2015 rulemaking record that the court reviewed in *USWAG*—and, as just stated, in fact has supplemented that record with new information for this rulemaking. EPA further acknowledges that since the 2015 CCR Rule and the *USWAG* decision some units have closed or have begun to close in accordance with State permits, or on their own initiative in response to the D.C. Circuit's ruling. But EPA disagrees that the record shows that the risks to human health and the environment posed by the legacy impoundments regulated under this final rule are significantly or meaningfully lower than the risks the court found to be unacceptable in *USWAG.* In fact, as described in III.A.4 of this preamble, the record instead demonstrates that the totality of the risks is potentially greater than EPA estimated in 2014.

A subset of legacy impoundments is identical to those described in *USWAG;* the impoundments are structurally unstable and pose significant risk of contaminating groundwater because they are unlined, with a hydraulic head promotes the continual leaching of contaminants from the CCR and drives the resulting leachate into underlying soils and potentially into the underlying aquifer. No commenter disagreed that these legacy impoundments warrant regulation under part 257.

Another subset, on which many of the commenters largely focused, have been fully or partially dewatered, or have completed some form of closure. In response to the proposal, EPA received information that since October 19, 2015, 22 surface impoundments at inactive facilities have closed by removal or are in the process of closing by removal, and 10 surface impoundments have closed with waste in place, either with oversight from a State agency or on their own initiative in response to the *USWAG* decision. These commenters claimed that, as a consequence of dewatering their units, the units no longer pose any appreciable risk.

EPA agrees that once the water in the impoundment has been reduced the likelihood of structural failure will also have been reduced; and if the liquid and or CCR have been entirely removed there will be no appreciable risk of structural failure. But these units nevertheless continue to present significant risk to human health and the environment as a consequence of existing—and in some cases, continuing—groundwater contamination. This contamination can exist even where CCR has been entirely removed from the disposal unit. First, in many cases facilities have only removed some of the free liquids in the impoundment; that is, have only partially dewatered. As described in Unit III.B.2.g of this preamble, many commenters claimed that under the existing closure regulations they are only required to eliminate free liquids to the extent necessary to support heavy machinery or other construction activities (*i.e.,* to the extent necessary to support the cover system), rather than to eliminate free liquids without qualification, as the regulation requires. Such units present essentially the same environmental and human health risks the *USWAG* court was concerned with. Second, to the extent a unit intersects with groundwater, free liquids will remain (because the groundwater is continually saturating the CCR), and the unit will continue to present significant risks, because the same conditions that promote the rapid leaching of contaminants in operating units are present, and will persist indefinitely. Finally, at many of these sites the existing contamination resulting from when the unlined impoundment was operating has not been addressed. Each of these are discussed further below.

Contrary to the commenters' claims, the partial dewatering they describe does not, as they claim, ''eliminate'' either the hydraulic head from a unit or the risk of groundwater contamination. Until the water (liquid) is fully removed, gravity will continue to exert downward pressure on the water in the saturated waste until it reaches equilibrium with the water table. Thus, although reducing the water in the unit also reduces hydraulic head, hydraulic head will be present as long as water remains in the unit.

Hydraulic head represents the energy to move a liquid. Liquid flows from locations of higher hydraulic head to locations of lower hydraulic head. A simple illustration of hydraulic head is the water percolating through (*i.e.,* exerting downward pressure on) coffee grounds into the cup below. As the water moves through the solids, particles of the solids combine with the water (create leachate) and drain downward. Even after the water is no longer visible above or among the coffee grounds, liquids continue to drain into the cup below.

In a diked impoundment located above the water table, after the removal of free standing (or ''ponded'') water, the CCR in the unit would still remain saturated with liquids (*i.e.,* the free liquid [44] and/or porewater). Once the CCR material is saturated, some liquids may remain bound within the CCR due to retention forces. However, the remaining (free) liquids will drain in response to gravity and hydraulic head. Because the saturated waste is at a higher elevation than the normal water table, the free liquids within the saturated waste would continue to drain toward the normal water table (''exert downward pressure'') even if the unit no longer contained ponded water on top of the CCR. Until the water is eliminated from the CCR, gravity will continue to exert downward pressure on the water in the saturated waste, but at some point, gravity will be insufficient to overcome the retention forces in the CCR. Until that point, free liquids will continue to drain until they reach the water table. Continued contact with free liquids causes the metals and other constituents to leach out of the CCR, and the downward pressure of the hydraulic head drives the resulting leachate toward the bottom and sides of the unit. In an unlined unit, which the overwhelming majority of legacy impoundments are likely to be, any remaining free liquids saturating the CCR in the impoundment will eventually leak out of the unit into the surrounding soil and/or into the aquifer, along with any CCR constituents that have leached from the waste in the interim. As mentioned previously, it is important to note that after this draining occurs, some liquids will remain bound within the pore spaces of the CCR material and will not readily drain under ambient temperature and pressure. Consequently, these residual liquids are not free liquids. Because any remaining residual liquids (*e.g.,* bound porewater or potential leachate) will not continue to drain from the unit absent other forces, further releases of these residual liquids are not likely.

By contrast, when some portion of the unit has been constructed in or below the water table, even if the hydraulic head is reduced by the removal of free-standing or ponded water, hydraulic head remains present as long as groundwater flows through the unit

[44] Free liquids are any liquids that readily separate from the solid portion of a waste at ambient temperature and pressure. § 257.53. In the example described above, free liquids are the liquids that drain from the coffee into the cup below.

from higher groundwater elevations to lower groundwater elevations. And even where the CCR above the water table in such a unit has been partially or fully dewatered, the ''conditions that promote rapid leaching of contaminants'' still remain as a consequence of the continued saturation of CCR in the unit from groundwater infiltrating the unit.

As EPA explained in Unit III.A.2 of this preamble, a CCR landfill saturated with water during operation, either continuously or intermittently, would behave more like an operating CCR surface impoundment even though such a unit would not have the level of hydraulic head from ponded water present in an operating impoundment. The same is true of a dewatered legacy impoundment constructed in or below the water table. See also 88 FR 32011. The hydraulic head from the ponded water in an operating impoundment unit allows for continual leaching of contaminants from CCR and drives the resulting leachate into the underlying soils and potentially into the underlying aquifer. However, where any part of the unit is actually constructed below the water table, the conditions caused by the continuous saturation of the CCR by the groundwater flowing in and out of the unit allow the contaminants to continuously leach directly into the nearby ground and surface waters even without any downward pressure from hydraulic head pushing leachate out of the unit. Id.

The record shows that significant numbers of the currently regulated CCR surface impoundments were constructed such that the base of the unit intersects with groundwater,[45] and that many inactive, or even ''closed,'' impoundments continue to impound water below the water table (*i.e.,* contain liquids).

In any event, even if an impoundment has been completely dewatered, the current absence of impounded water does not remediate the releases that occurred during operation of the unit. In general, legacy impoundments are likely to have been present for longer than the currently operating units: For example, one commenter presented information to demonstrate that legacy impoundments are, on average, 55 years old; by comparison, EPA estimated in 2015 that most currently operating surface impoundments were between 20 and 40 years old. See 80 FR 21327. This is significant in two regards: (1) The older the impoundment the greater the likelihood it is unlined; and (2) The more time the unlined unit would have to leak and for hazardous constituents to migrate further from the unit. Consequently, previous and ongoing releases could potentially be greater and have migrated further from the unit than releases from the universe of currently regulated units. In this regard, it is notable that EPA estimated in its 2014 Risk Assessment that peak contaminant releases from CCR surface impoundments will not occur until 70 years after waste placement. This is further confirmed by the modeling originally conducted in 2014 for legacy impoundments.

Furthermore, as described in Unit III.A there are a number of additional reasons to believe that the potential magnitude of releases is even greater than EPA originally estimated in 2014. These include: (1) The likely absence of a liner at older impoundments; and (2) The greater likelihood that coal ash was managed with coal refuse, which was a common disposal practice in older units.

Finally, defining a legacy impoundment as one that contains both CCR and liquid on or after October 19, 2015, retains oversight of units that may have been dewatered but have not yet completed closure. In any unit without an effective cover system, precipitation can continue to freely migrate into the unit, and any leachate generated as a result would be a potential ongoing source of contamination, particularly where the unit is already leaking or in contact with groundwater. Further, significant risks can remain if a unit is not closed properly; for example, a closure that leaves that millions of tons of CCR saturated with groundwater and only a cover system to control downward infiltration of precipitation will not protect human health and the environment. And, as discussed in further detail in the next section, even at sites where the CCR has been completely removed from the impoundment it is possible that, in addition to the likely significant groundwater contamination present at the site, contaminated soil remains, which can serve as a source of further contamination. See, Unit III.B.1.b.ii.(a).

EPA acknowledges that some of these units may be closing pursuant to State laws that provide for a significant degree of State involvement and oversight, but that is not universally the case. As EPA concluded in 2015, there is a wide range of protectiveness in State programs. Clear deficiencies were present in some State regulatory programs, and questions remained with respect to others. See, 80 FR 21326–21327, 21456 and Unit III.B.g.iii. EPA is aware that some State programs have been substantially revised since 2015, and some individual States provided additional information regarding their programs in their comments, but again this is not universal. For example, some commenters documented recent State approved closures that were deemed complete despite the absence of any groundwater monitoring to determine whether groundwater contamination remained at the site. The absence of a consistent, sufficiently protective approach among all State programs reinforces the need for a single, protective Federal standard.

EPA also continues to believe that an applicability date of October 19, 2015, is the most consistent with the *USWAG* decision. See, 88 FR 31991. The Court expressly found that EPA's record for the 2015 CCR Rule demonstrated that legacy ponds ''pose the same substantial threats to human health and the environment as the riskiest Coal Residuals disposal methods, compounded by diminished preventative and remediation oversight due to the absence of an on-site owner and daily monitoring.'' 901 F.3d at 432. EPA agrees with this conclusion that legacy ponds ''pose substantial risk to human health and the environment.'' Id. Consistent with that determination, the final rule imposes essentially the same requirements on legacy CCR surface impoundments that currently apply to inactive impoundments at active facilities. In addition, as EPA explained in the proposed rule, D.C. Circuit's decision setting aside the exemption for inactive impoundments meant that these impoundments were similarly situated to the impoundments regulated by the 2015 CCR Rule. EPA thus had an obligation to address the substantial environmental risks from those impoundments through regulation. By setting aside, rather than simply remanding the exemption back to the Agency for further explanation, the Court made clear that the existing record was sufficient for these units to be regulated.

Nor is EPA persuaded by the commenters' remaining objections to the applicability date of October 19, 2015. EPA disagrees that reliance on the effective date of the 2015 CCR Rule would constitute a retroactive application of law. A regulation is impermissibly retroactive where, absent clear Congressional intent, the rule changes the past legal consequences of past conduct. See *Bowen* v. *Georgetown Univ. Hosp.,* 488 U.S. 204, 208 (1988). This is generally referred to as primary

[45] EPA's review of the location restrictions demonstrations posted on facilities' CCR websites found that approximately 31% of operating impoundments have waste below the water table. There is no reason to believe that this percentage is not also representative of legacy impoundments.

retroactivity. See *Bergerco Canada, a Div. of Conagra, Ltd.* v. *U.S. Treasury Dep't, Off. of Foreign Assets Control,* 129 F.3d 189, 192 (D.C. Cir. 1997). Rules can also affect the legal rights flowing from past acts. See *Bergerco,* 129 F.3d at 192. This is referred to a secondary retroactivity. *Id.* Such effects are common, and permissible so long as they are not arbitrary or capricious. The D.C. Circuit in *Bergerco* noted that a rule may be arbitrary or capricious if it ''makes worthless substantial past investment incurred in reliance upon the prior rule.'' Id.

Here EPA is merely relying on a past fact to support the future application of regulations. And because EPA has established future compliance dates, no facility would be subject to penalties solely because one of its legacy CCR surface impoundments was out of compliance with the regulatory requirements prior to the effective date of this final rule. Thus, the rule is not primarily retroactive.

To the extent the rule has secondary retroactive effects in upsetting parties' expectations of regulation of legacy CCR surface impoundments and CCMRU, such effects are permissible. First, the D.C. Circuit considered and rejected this same argument in *Util. Solid Waste Activities Grp.* v. *Env't Prot. Agency,* 901 F.3d 414 (D.C. Cir. 2018). There, industry petitioners argued that EPA lacked statutory authority to regulated legacy CCR surface impoundments because such regulation would be retroactive. The D.C. Circuit held that ''straightforward reading of the statute's language allows for the regulation of inactive sites.'' Id. at 439. In short, as facilities ''where solid waste is disposed of,'' 42 U.S.C. 6903(14), inactive impoundments are ''open dumps,'' And no one denies that the EPA has authority to regulate (and to prohibit) ''open dumps.'' Id. at 441.

Moreover, as explained in detail below, EPA rationally explained why regulation was necessary and appropriate here notwithstanding facilities' reliance interests. EPA understands that facilities may have closed legacy impoundments and treated CCMRU in compliance with State law requirements, or otherwise made business decisions premised on the absence of Federal regulation. EPA has taken these reliance interests into account in developing the regulations here. As explained below, EPA surveyed State regulation of legacy impoundments and CCMRU and concluded that, on the whole, such regulations were not sufficiently protective, and did not meet RCRA's standard. Uniform, national regulation was therefore necessary to ensure adequate protection of human health and the environment. To be sure, EPA recognizes that it is possible that some legacy impoundments, for example, may have been closed in a manner that is protective. But, due to the absence of adequate groundwater monitoring and other data, the adequacy of such closures cannot be verified. EPA has also accounted for other reliance interests, including renewable facilities' use of land containing CCRMU, in establishing compliance deadlines, and allowing for deferrals of additional closure measure where appropriate. EPA also notes that regulated entities have been on notice since the D.C. Circuit's 2018 decision in *USWAG* that Federal regulation of legacy CCR surface impoundments was forthcoming, 901 F.3d at 414.

A number of commenters also claimed that their units are heavily vegetated or developed and that reopening or other removal/remediation activities may disrupt the current use of the site. EPA acknowledges some old units may be heavily vegetated. However, no commenter submitted any data or analysis to demonstrate that, over the short or long term, removal or remediation activities would be more detrimental to health and the environment than either cleaning up the contaminated groundwater or taking measures to prevent the legacy CCR surface impoundment from contaminating groundwater.

Moreover, the fact that some impoundments have become heavily vegetated or redeveloped does not resolve the risks these unlined legacy CCR surface impoundments continue to pose. As discussed above, the risks associated with such units can be substantial. See Unit III.A of this preamble for more information. Consequently, the current record does not support an exemption for units that still contain both liquid and CCR even if the closure or remediation may disrupt the current use of the land.

As discussed in more detail in the subsequent section, EPA also disagrees that the removal of CCR from a disposal unit necessarily demonstrates that EPA lacks jurisdiction over the site. EPA's jurisdiction rests on the presence of solid waste that ''is disposed of'' at the site, not solely the presence of CCR. To the extent any CCR leachate or CCR constituents remain in the soil or in the aquifer at the site, solid waste remains at the site and EPA retains jurisdiction. However, as EPA stated in the proposal, the Agency agrees that it lacks jurisdiction over a site where the owner or operator can document that it meets the standard for closure by removal in § 257.102(c). Accordingly, the final rule retains the provision specifying that any facility that documents that this standard has been met will not be subject to any further requirements. See Units III.B.2.b.iii and III.B.2.g of this preamble for further discussion.

The Agency disagrees that adopting an applicability date of October 19, 2015, requires actions that are physically impossible or that the implementation challenges cannot be addressed. The final rule does not require owners and operators to acquire historical operating records, construction and inspection reports, groundwater monitoring data, and employee testimonials where they no longer exist, or where they have never existed. EPA acknowledges that such information will not be available in some situations. Rather, EPA expects owners and operators of inactive impoundments at inactive facilities to develop a strategy to gather readily available and reliable information to determine whether the unit meets the definition of a legacy CCR surface impoundment. If, after making a good faith effort a facility is genuinely unable to obtain information to document that the impoundment contained both CCR and liquids on October 19, 2015, the unit would not be regulated as a legacy impoundment. See Unit III.B.2.b.i of the preamble for an explanation of the actions the Agency expects owners and operators to take to determine whether the inactive impoundment meets the definition of a legacy CCR surface impoundment.

Nevertheless, EPA agrees that the final rule should account for the significant closure work that has taken place at some legacy CCR surface impoundments between October 19, 2015, and the effective date of this final rule. For example, as noted, commenters provided several examples of closures that were completed prior to the effective date of this final rule. The final rule accounts for this not by exempting these units but by modifying the applicable requirements. A facility that can document that it has met the criteria in § 257.102(c) would be subject only to the requirement to document that they had met those standards. Similarly, a facility that completed closure with waste in place before the effective date of this final rule would only be subject to the closure performance standards in § 257.102(d), and the post-closure care requirements (*i.e.,* groundwater monitoring and corrective action, if necessary). In addition, a facility that completed closure under a regulatory authority's oversight and approval, such as pursuant to a Federal or State cleanup order could be subject to even fewer requirements. Provided certain conditions have been met EPA is deferring a decision on the adequacy of such closures to a subsequent permitting authority to determine on an individual site-specific basis, whether the completed closure meets the Federal performance standards in § 257.102 or is equivalent to (*i.e.,* is as protective as) such a closure. In the interim, these units would be subject only to the requirements of a post closure care permit (*i.e.,* groundwater monitoring and corrective action, if necessary). See Unit III.B.2 of the preamble for further explanations of these provisions. As EPA stated in the proposal, units that contain liquid present different risks than those that do not, and the applicable requirements should differentiate among them accordingly on that basis. See 88 FR 31993.Consistent with that logic, while EPA agrees that legacy impoundments that were dewatered or closed prior to October 19, 2015 can still pose significant risks to human health and the environment, as discussed in the next section, the final rule retains the approach described in the proposal, and requires that an impoundment contain both liquid and CCR on or after October 19, 2015 to be regulated as a legacy impoundment.

b. Legacy CCR Surface Impoundment—Definition of an Inactive Impoundment—Contains Both Liquid and CCR

The final rule requires that to be considered a ''legacy CCR surface impoundment'' a CCR surface impoundment must have contained both CCR and liquids on or after October 19, 2015. In addition, the final rule further defines what it means to contain both CCR and liquid by reference to § 257.102(d)(2)(i). In this Unit of the preamble, the Agency briefly explains what was proposed, summarizes the public comments received, and provides EPA's responses. EPA first discusses what it means for an impoundment to ''contain liquids'' followed by what it means to ''contain CCR.''

i. What does it mean to contain liquid?

Consistent with the definition of an inactive CCR surface impoundment at active facilities under the existing regulations, EPA proposed in the May 2023 proposed rule that a legacy impoundment would be required to have contained liquids on or after October 19, 2015, in order to be subject to the requirements of this rule. In the proposed rule, EPA also responded to comments previously raised in response to the ANPRM, alleging that the phrase ''contains both CCR and liquids'' was impermissibly vague. These commenters were concerned that the definition might not include those units whose bases are in contact with groundwater or that no longer have visible, standing water at the surface. EPA further responded to questions whether, based on the existing definition of an inactive CCR surface impoundment, the following would be considered a legacy CCR surface impoundment: (1) Where, prior to October 19, 2015, the facility has decanted the surface water, but, because the base of the impoundment intersects with the groundwater, water continues to flow through the impoundment and permeate the waste in the base of the unit; (2) Impoundments that contained both CCR and liquids in the past but are now closed; (3) Impoundments that contained CCR and liquids in the past but are in the process of closing on the effective date of the legacy rulemaking; and (4) Impoundments that once contained CCR and liquids but have been fully dewatered and are now maintained so as to not contain liquid.

EPA explained that the answers to these questions turn on the meaning of the terms ''contain'' and ''liquids'' in the definition of an inactive impoundment in § 257.53. Relying on dictionary definitions, EPA explained that the term ''liquids'' includes the free water, porewater, standing water, and groundwater in the unit, because once any are present in the unit, they have the same potential to create leachate, as well as to contribute to hydraulic head and drive flows propelled by hydraulic gradients. 88 FR 31992. EPA also explained that based on dictionary definitions an impoundment ''contains'' liquid if there is liquid in the impoundment, that is, it *has* water within it, even if water continues to leak from the unit. EPA also stated that as a factual matter, a surface impoundment that has only decanted the surface water would normally still contain liquid if the CCR was still saturated with water.

Accordingly, EPA explained that to the extent the unit still contains liquids on or after October 19, 2015, it is considered an inactive impoundment under the existing definition in § 257.53. EPA proposed that such units would also be considered legacy CCR surface impoundments, when located at inactive facilities. EPA also explained that under the proposal, such an impoundment would be considered a legacy CCR surface impoundment: (1) Even if it is considered ''closed'' under State law; (2) It is in the process of closing on the effective date of this rule; or (3) The unit is only fully dewatered and can no longer impound liquid after October 19, 2015.

EPA further explained that to determine whether an impoundment has been dewatered, EPA relies on the existing requirements in § 257.102(d)(2)(i) (''Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues''). EPA explained that this provision requires a facility to eliminate both the standing liquid in the surface of the impoundment and the separable porewater in any sediment located in the base of the impoundment, regardless of the source of the standing water or porewater (*i.e.,* whether it was present in the impoundment due to surface water infiltration, intentionally added sluice water, or groundwater intrusion).

EPA also solicited comment on whether to adopt a regulatory definition of the term ''liquids'' to clarify that the term includes free water, porewater, standing water, and groundwater.

Finally, the Agency explained that under the existing regulations, an impoundment that did not contain liquids prior to October 19, 2015, whether because it was closed in accordance with existing State requirements or for other reasons, is not an inactive impoundment. Similarly, a unit that still contains both CCR and liquid after that date would still be considered an inactive unit even if it was closed in accordance with the requirements in effect at the time (*e.g.,* has a cover). Consistent with this definition, EPA proposed not to expand the definition of a legacy CCR surface impoundment to include units that no longer contained any liquid on October 19, 2015. 88 FR 31993.

(a) Pending Litigation Over EPA's Regulatory Interpretations

A number of commenters claimed that the interpretation of ''liquids'' presented in the preamble was first announced in connection with proposed Part A determinations in January 2022, and is currently being litigated in the D.C. Circuit Court of Appeals in multiple cases combined under the name, *Electric Energy, Inc., et al.* v. *EPA, Case Nos. 22–1056 and 23–1035.*[46] These

[46] On January 11, 2022, EPA issued determinations on demonstrations submitted by facilities for extensions to the cease receipt of waste deadline per 40 CFR 257.103(f)(1) and 257.103(f)(2), which the Agency refers to as ''Part A determinations'' or ''Part A''. The CCR Part A Final Rule (85 FR 53516, August 28, 2020), grants facilities the option to submit a demonstration to EPA for an extension to the deadline for unlined

commenters complained that EPA makes no mention of this litigation in the proposed rule, even as it claims that its interpretation is ''sufficiently clear that a definition is not necessary.'' According to these commenters, EPA must acknowledge (and make a good faith attempt to reconcile) the competing interpretations of key terms of art in the 2015 CCR Rule before extending them into this final rule. One commenter further stated that if EPA ultimately elects to adopt regulatory definitions of those terms, it should wait until the court rules so that the definitions are informed by and consistent with any such ruling.

EPA disagrees that it is necessary to wait until the court issues its decision in the pending litigation (*Electric Energy, Inc., et al.* v. *EPA, Case Nos. 22–1056 and 23–1035).* The central issue Petitioners raised in that case was exclusively procedural—whether EPA effectively amended the 2015 CCR Rule without going through notice and comment. Even if the D.C. Circuit addresses this procedural question, it would not resolve the substantive question EPA posed in the proposal, of whether the inclusion of a definition for the term ''liquids'' would provide further clarity.

Finally, EPA considers that it has more than met any obligation to ''acknowledge (and make a good faith attempt to reconcile) the competing interpretations of key terms of art in the 2015 regulation,'' in the proposal and again in this final rule. EPA has repeatedly explained its construction of the regulations in documents held out for public comment, including in the May 2023 proposal, and most recently, in the proposal to deny Alabama's application for approval of its CCR permit program. See, *e.g.,* 88 FR 31992–31993, 32025–32026, 55236–55238. EPA has also repeatedly responded to public comments, addressing each of the commenters' alternative interpretations, and explaining in detail the reasons for the Agency's disagreement. See, *e.g.,* 88 FR 55237; U.S. EPA. Denial of Alternative Closure Deadline for General James M. Gavin Plant, Cheshire, Ohio. November 18, 2022. pp 14–42, Response to Comments on Proposed Denial (Docket ID No. EPA–HQ–OLEM–2021–0590). November 2022. EPA has again responded to the commenters' alternative interpretations throughout this preamble and in the Response to Comments document in the docket. And even though EPA remains entirely unconvinced by the commenters' alternative interpretations, and without exception, considers that they are inconsistent with the plain language of the provisions at issue, EPA has responded to them by incorporating definitions of ''liquids'' and ''infiltration'' that reflect EPA's existing construction of the regulations. Neither RCRA nor the APA requires anything further.

(b) Comments on the Definition of an ''Inactive CCR Surface Impoundment'' and the Meaning of ''Contains Liquids''

All commenters agreed that, consistent with the existing definition of an inactive surface impoundment, any impoundment that ''contains both liquids and CCR'' at an inactive facility should be classified as a legacy CCR Surface impoundment. However, commenters disagreed on the correct interpretation of the phrase ''contains. . .liquids.'' Several commenters agreed with EPA's explanation in the proposal that to the extent an impoundment still contains liquids on or after October 19, 2015, it is properly considered an inactive impoundment under the existing definition in § 257.53, even if (1) The unit had ''closed'' under State law; (2) The unit is in the process of closing on the effective date of this rule; or (3) After October 19, 2015 the unit is fully dewatered and can no longer impound liquid. These commenters also agreed that such units should also be considered legacy CCR surface impoundments when located at inactive facilities.

But other commenters objected to proposal's construction of the regulation. These objections fell generally into two categories. First, a number of commenters argued that the discussion in the proposed rule reflected a ''new'' interpretation that expanded the meaning of the terms ''CCR surface impoundment'' and ''inactive surface impoundment'' by interpreting the phrase ''contains liquids'' to reach units that the commenters believe EPA never intended to cover in 2015. In support of this argument, these commenters objected to the statement in the proposal that free water, porewater, standing water, and groundwater are liquids under the existing regulation defining inactive CCR surface impoundments, arguing that this expands the existing definition of liquids to sources of water that the commenters assert ''are not demonstrated to be contributing to hydraulic head creating the potential for impoundment failure and spread of contaminated water.'' These commenters further claimed that the existing definition of an ''inactive impoundment'' does not include: (1) Units ''with any amount of water;'' (2) Impoundments that closed prior to the effective date of the 2015 CCR Rule; and (3) ''Dewatered'' impoundments. These commenters contend therefore, that none of these units should be considered legacy CCR surface impoundments either. Second, a number of commenters raised concerns about the merits or wisdom of the approach. Many of these commenters also offered alternative definitions.

In addition, as discussed in the preceding section, a number of commenters objected to EPA's proposal not to expand the definition of a legacy CCR surface impoundment to include units that no longer contained any liquid on October 19, 2015. These commenters argued that the proposed definition failed to address the full universe of surface impoundments at inactive plants that pose a reasonable probability of adverse effects on health and environment. In support of their contention, these commenters referenced EPA damage cases documenting harm to groundwater and/or surface water from impoundments that may not have contained liquid on or after 2015. The commenters also referenced a report, ''Assessment of Legacy Surface Impoundments'' by Gordon Johnson, M.Sc., P.Eng., that examines ten CCR surface impoundments at inactive facilities that were not on EPA's list of potential legacy impoundments and do not appear to contain standing water. According to the commenter, the report shows that unacceptable levels of risk may still be present for historical impoundments that have been dewatered and/or capped.

(1) What is a ''liquid''?

The May 2023 proposed rule explained that free water, porewater, standing water, and groundwater are liquids under the existing regulation. The source of the liquid does not impact its basic and fundamental designation as a liquid and its contribution to the risk posed by an impoundment. It therefore does not matter whether the liquid in the surface impoundment comes from the rain, waters the facility deliberately places in the unit, floodwaters from an adjacent river, or from groundwater—all are liquids, and once present in the unit, they have the same potential to create leachate (another type of liquid), and to contribute to hydraulic head and drive flows driven by hydraulic gradients. 88 FR 31992.

CCR surface impoundments to stop receiving waste. Facilities had until November 30, 2020 to submit demonstration to EPA for approval.

Several commenters agreed that the final rule should reflect EPA's existing interpretation that an impoundment containing any of the following types of liquid would be considered to contain liquid: free water, porewater, standing water, and groundwater without regard to their source.

However other commenters disagreed that under the existing regulations the term ''liquids'' includes free water, porewater, standing water, and groundwater in CCR units, and disagreed that EPA should adopt such a definition. Many of these commenters argued that EPA should not focus on ''liquids'' but on ''free liquids,'' which they interpret to exclude groundwater. For example, one commenter asserted that ''the term liquids, which is used in the definition of ''free liquids,'' is not defined in the CCR Rule, and that the term ''free liquids'' was never used in relation to groundwater.'' Another commenter objected that the existing regulations establish two separate definitions of free liquids and groundwater, which they claim do not reference each other or refer to overlapping concepts. The commenter further argued that free liquids are ''liquids that readily separate from the solid portion of a waste under ambient temperature and pressure,'' but ''groundwater'' is ''water below the land surface in a zone of saturation,'' and that these are different things from a technical perspective.

These commenters urged that regulating based on the presence of free liquids would be consistent with EPA's philosophy for regulating CCR surface impoundments because free liquids contribute to hydraulic head and hydraulic gradients regardless of their origin and impounded water must be removed from the impoundment to create a stable subgrade for the final cover system. Another commenter stated that this would be consistent with the 2015 CCR Rule, because even a unit closed under the existing regulatory criteria may contain some liquids after closure, so long as they are not free liquids.

The final rule continues to define ''liquids'' in accordance with its plain language meaning, consistent with the ordinary dictionary definition. Reliance on the ordinary meaning here is the default, as neither RCRA nor the existing part 257 regulations include a definition of the term ''liquids.'' *FTC* v. *Tarriff,* 584 F.3d 1088, 1090 (D.C. Cir. 2009) (*quoting Williams* v. *Taylor,* 529 U.S. 420, 431 (2000)) (''It is fixed law that words of statutes or regulations must be given their 'ordinary, contemporary, common meaning.' ''). This reflects EPA's existing construction of the current regulations. As discussed in greater detail in Unit III.B.1.b.i.(b)(4), the final rule incorporates this definition into § 257.53.

The dictionary definition encompasses all of the various types of liquid that may be present in a CCR unit, including water that was sluiced into the impoundment along with the CCR, precipitation, surface water, and groundwater that has migrated into the impoundment, which may be found as free liquids, free water or standing water ponded above the CCR or porewater intermingled with the CCR. These definitions are consistent with the surrounding regulatory text and structure of the regulation as a whole, as well as the wider context in which the terms are employed. As a consequence, the term functions effectively in all of the various contexts in which it is used in part 257. This is particularly true of the term ''liquids,'' which plays a critical role in determining both whether a unit is subject to the regulations and in the performance standards that apply to impoundments closing with waste remaining on-site at § 257.102(d).

Further, reliance on this definition best achieves the statutory purpose of protecting human health and the environment. By accounting for all liquids, regardless of the source, the regulation ensures that the risks that legacy CCR surface impoundments pose will be addressed—both by focusing on the impoundments that pose the greatest risks and by ensuring that all sources of risk are addressed in closing an impoundment. As explained in the proposal, the source of the liquid does not determine its basic and fundamental properties. It therefore does not matter whether the liquid in the surface impoundment comes from the rain, waters the facility deliberately places in the unit, floodwaters from an adjacent river, or from groundwater. All liquids, once present in the impoundment have the same potential to become free liquids and promote contaminant leaching and contribute to structural instability or failure, by contributing to the creation of leachate (another type of liquid), and hydraulic head.

Contrary to the commenters' contentions there is no inconsistency between the regulatory definitions of groundwater and free liquids. By their terms the definitions of free liquids and groundwater are not mutually exclusive; rather, the term ''free liquids'' encompasses the term ''groundwater.'' Nor is there any inconsistency in applying both of these terms in this context. First, the word ''liquid,'' which appears both in the existing definitions of an inactive CCR surface impoundment and free liquids, is broad enough that it can encompass groundwater, which has been defined in § 257.53 since 2015. Not all liquids are groundwaters, but all groundwater (water) is a liquid. And, where the water in the surface impoundment sits ''below the land surface in a zone of saturation,'' the water in the unit meets the regulatory definition of groundwater. 40 CFR 257.53. Moreover, nothing in the definition of free liquids restricts the source of the liquid. It therefore does not matter whether the liquid in the surface impoundment comes from rain, waters that the facility deliberately places in the unit, floodwaters from an adjacent river, or from groundwater—all are liquids. The only test the regulation establishes for free liquids is whether the liquid readily separates from the solid portion of the wastes under ambient temperature and pressure. Id.

However, EPA generally agrees that regulating based on the presence of free liquids, albeit not based on the commenters' misinterpretation of the term, would be consistent with the existing regulations and the risks associated with CCR surface impoundments. As described in Unit III.A above, the risks are largely driven by the presence of free liquids in the unit, as these are the liquids that causes the metals and other constituents to leach out of the CCR, and that will eventually leak out of the unit into the surrounding soil and/or into the aquifer, along with any CCR constituents that have leached from the waste in the interim. Although some liquids will remain bound within the pore spaces of the CCR material and will not readily drain under ambient temperature and pressure, these residual liquids (*e.g.,* bound porewater or potential leachate) will not continue to drain from the unit, absent other forces, and exposure to these residual liquids is therefore not likely.

As discussed in the next section, EPA has adopted an approach based on whether free liquids are present in the impoundment.

(2) What does it mean to contain liquid?

The proposal explained that under the existing regulations, EPA determined whether an impoundment ''contains liquids'' by reference to a combination of the dictionary definition of ''contains,'' and the dewatering standard in § 257.102(d)(2)(i). In essence, if liquids are present in an impoundment, the unit ''contains liquid.'' However, EPA considers a unit that met the performance standard in

§ 257.102(d)(2)(i) to have been dewatered. Several commenters supported this proposal.

However, numerous other commenters raised concerns about relying on the plain language meaning of the phrase. For example, some commenters stated that all units contain some liquid, explaining that a landfill ''contains'' rain after a heavy rainfall event. Similarly, a commenter argued that that under EPA's interpretation, a fully closed unit with ponded water on the cover resulting from precipitation or from fugitive dust control activities, and closed units with an engineered capability to impound water atop their covers would potentially be subject to the CCR regulations. The commenter stated that in all of these cases, the ponded water would seem to pose no risk.

Commenters also separately questioned whether EPA had real risk concerns from units that contained ''any amount'' of liquid. For example, one commenter asserted that EPA has not demonstrated that units with any amount of water, no matter how small an amount or without regard to whether the liquid is separable from the CCR will present sufficient risks to warrant regulation under RCRA section 4004(a). This commenter contended that EPA cannot rely on the 2014 Risk Assessment to support regulating such units because the assessment showed only that surface impoundments with a hydraulic head exceed that risk threshold. Several of these commenters recommended that EPA regulate based on whether the impoundment contains free liquids rather than liquids.

Another commenter raised concern that relying on the plain language meaning would present a number of technical challenges. These included how owners can determine whether a previously closed and dewatered surface impoundment at an active (or inactive) facility still contains ''liquids.'' The commenter explained that in some cases, State regulators confirmed that a site no longer had the capacity to impound water and therefore indicated that the site was no longer subject to the State's dam safety and impoundment rules. The commenter also asked whether EPA would accept use of the paint filter test, the detection of water in piezometers, or some other method to determine whether sufficient separable porewater is present for an impoundment to be considered to ''contain liquids.'' The commenter also asked what kinds of samples would be required—individual or composite—as well as how many and at what locations, to determine if an impoundment ''contains liquids.'' The commenter believed these questions need to be resolved in the numerous situations in which a formerly closed impoundment may contain some porewater as a result of periodic rainfall infiltration but is not in contact with the uppermost aquifer.

By contrast commenters generally supported reliance on § 257.102(d)(2)(i) to determine whether a unit contains liquid; although they disagreed over what that provision requires. Several commenters agreed with the proposal's explanation of these existing closure requirements, stating that the discussion was fully consistent with EPA's long-held position under the largely identical hazardous waste regulations, citing to EPA documents from 1982 and 1988.

But numerous other commenters argued that EPA had misinterpreted § 257.102(d)(2)(i), and consequently was proposing to regulate impoundments that the commenters believed had been dewatered, and therefore posed little risk. According to these commenters, § 257.102(d)(2)(i) does not require the elimination of all liquids, or even all free liquids, but only requires the removal of liquid wastes to the extent necessary to support the cover system. These commenters also contended that ''the plain language of the 2015 CCR Rule does not require facilities to address groundwater as part of the closure performance standards under 40 CFR 257.102(d),'' based in part on the claim that regulatory definition of free liquids does not encompass groundwater. These commenters urged EPA adopt the same approach to determining whether an impoundment contains liquid.

Several commenters also raised concern that the proposal failed to explain or provide clear guidance on how much water an impoundment must contain to be regulated as a legacy impoundment under the 2023 proposed rule. Many of these commenters requested EPA to clearly define a reasonable threshold associated with what it means to ''contain liquids,'' to aid the regulated community in determining when the performance standard has been met. One commenter noted that the Agency had attempted to fix this problem by relying on the closure standard in § 257.102(d)(2)(i), which requires the elimination of ''free liquids,'' but the commenter considered this approach to be insufficient because EPA had not articulated how to determine whether free liquids have been eliminated.

The final rule largely adopts the approach laid out in the proposal, relying on a combination of the plain language meaning of the phrase and the performance standard in § 257.102(d)(2)(i) to determine whether an impoundment ''contains liquid.'' Under the ordinary meaning, an impoundment ''contains liquid'' if liquid is present in the impoundment, even if the impoundment does not prevent the liquid from migrating out of the impoundment. In other words, it ''contains'' water if it has water within it. See, *USWAG, supra* at 454 n. 23 (''The EPA's regulatory definition of ''impoundment'' is consistent with the dictionary definition of the verb ''impound,'' which manifests continuing action,'' citing Impound, Webster's Third New International Dictionary 1136 (3d ed. 1993) (''[T]o confine or store (water)[.]'')). Accordingly, under the final rule, if liquids are present in the unit, it will be considered to contain liquids, unless the facility can demonstrate that free liquids have been eliminated. Simply put, if a facility can document that free liquids were permanently eliminated prior to October 19, 2015, the unit will not be considered a legacy impoundment.

Relying on § 257.102(d)(2)(i) in this context is reasonable and protective. Both the definition of an inactive CCR surface impoundment and the closure performance standard are designed to address the same issues (the presence or removal of liquid wastes) and are designed for the same purpose (to ensure the risks from the co-management of CCR and liquid are adequately addressed). Once the free liquids have been eliminated from the impoundment, any remaining liquids do not present a reasonable probability of contaminating the aquifer. Thus, EPA does not intend an operator to removal all moisture from an impoundment, but only the free liquids required under § 257.102(d)(2)(i), because of free liquids' contribution to risk.

Contrary to some commenters' claims, the existing text in § 257.102(d)(2)(i) requires a facility to eliminate both the standing liquid in the surface of the impoundment and all readily separable porewater in any sediment located in the base of the impoundment. Free liquids are currently defined at § 257.53 to mean ''liquids that readily separate from the solid portion of a waste under ambient temperature and pressure.'' This definition encompasses both standing liquids in the impoundment as well as any readily separable porewater (*i.e.,* porewater that readily separates under ambient temperature and pressure) in any sediment or CCR. As EPA explained in the proposal, the existing regulation does not differentiate between the sources of the liquid in the impoundment (*e.g.,* surface water infiltration, sluice water intentionally added, groundwater intrusion). This is further supported by the fact that the performance standard at § 257.102(d)(2)(i) was modeled on the regulations that apply to interim status hazardous waste surface impoundments, which are codified at § 265.228(a)(2)(i). EPA's guidance on these interim status regulations clarifies that these regulations require both the removal of standing liquids in the impoundment and sediment dewatering. See, ''Closure of Hazardous Waste Surface Impoundments,'' publication number SW–873, September 1982. EPA previously discussed the subtitle C regulations at length beginning on page 29 in the Final Decision on Request For Extension of Closure Date Submitted by Gavin Power, LLC, 87 FR 72989 (November 15, 2022), as well as in the associated Response to Comments document located in the docket.[47] And the definition of liquid included in this final rule removes any misunderstanding.

The commenters are also mistaken that the existing regulation only requires the elimination of free liquids to the extent necessary to support the unit's final cover system, The provision does not state that the facility must ''eliminate free liquids to the extent necessary to support the final cover system,'' or anything comparable. Given that § 257.102(d)(2)(ii) does specify that ''waste must be stabilized sufficient to support the final cover system,'' the absence of any similar text in paragraph (d)(2)(i) is dispositive. Compare § 257.102(d)(2)(i) and (ii).

EPA disagrees that it is not taking into account whether the water in the unit poses risk. And for the same reasons EPA disagrees that it has failed to demonstrate that the units subject to regulation under this rule warrant regulation under RCRA section 4004(a).

Impoundments with free liquids do in fact pose significant risk for the reasons discussed above. In the proposal, EPA discussed two examples of units that still ''contain liquids'': (1) A unit constructed such that the CCR in the unit was continually saturated by water flowing freely through the unlined impoundment; and (2) Where the facility has removed only the standing water from the impoundment. As EPA explained, as a purely factual matter, a surface impoundment that has only decanted the surface water would normally still contain free liquids if the waste in the unit was still saturated with water. Neither of these examples—which in actuality, likely represent the overwhelming majority of legacy impoundments subject to the final rule—have eliminated free liquids or involve trivial amounts of water. As explained in the preceding sections, such impoundments still contain hydraulic head and are otherwise essentially indistinguishable from the impoundments described in the 2015 CCR Rule preamble and modeled in the 2014 Risk Assessment. And as EPA explained in the proposal, these units retain the conditions that cause a heightened risk of contaminating the aquifer. That is true even if the unit is considered ''closed'' under State law, is in the process of closing, or at some subsequent point, the unit is fully dewatered and no longer contains liquid.

Moreover, as several commenters confirmed, it has apparently been a common practice to maintain CCR impoundments in a dewatered state. Even assuming these commenters meant that they had done more than merely remove the standing water, which seems unlikely given their comments on § 257.102(d)(2)(i), without an effective cover system many ''dewatered'' impoundments can nevertheless contain significant volumes of water simply as a consequence of the amount of precipitation that continually percolates through the unit. Based on an online USGS Rainfall Calculator Tool,[48] the example unit will receive a total of 27,154 gallons of water per acre during a single 1-inch rainfall event. Taking that a step further, a 50-acre impoundment in Atlanta, Georgia typically receives an average of 50 inches of rain a year, which equates, on a yearly average, to 67,885,000 gallons of water per year.[49] In the absence of any action taken to remove the water, over time it will continue to accumulate in the unit.

Thus, in many areas of the country (*e.g.,* the Southeast), CCR surface impoundments without an effective cover system may contain free liquids and meet the definition of a legacy impoundment due to the amount of annual rainfall.[50] But this approach is intended to also clarify that contrary to the commenters' contention, a unit whose periodic rainfall does not result in free liquids (*e.g.,* is readily absorbed into the CCR) would not be regulated as a legacy CCR surface impoundment.

Finally, with respect to the small number of units that may have been completely dewatered after October 19, 2015, these units likely pose significant (and unacceptable) risks to human health and the environment that warrant regulation under RCRA section 4004(a), based solely on the expected presence of contamination that occurred while the impoundment was operating. See Unit III.A.2 of this preamble.

This approach also largely addresses commenters' request for a clear standard, and many of their technical concerns. For example, the clarification that EPA is concerned with the presence of readily separable porewater, (that is, free liquids), which can be easily verified by technical equipment such as piezometers, thus resolves the commenters' concern that that porewater may be difficult to measure as it is held in the interstices or pore spaces between particles of soil, sediment, and/or CCR material and may not flow readily or be easily quantified using field or laboratory methods. EPA has also developed a memorandum describing the current methods and tools that are available to determine whether free liquids have been eliminated, which is available in the docket for this rulemaking. EPA has provided a brief summary of the memorandum in the next four paragraphs below.

Many of the tools and methods to identify and eliminate free liquids are already widely used by industry to investigate and close surface impoundments. For example, tools currently used to identify free liquids include soil borings and cone penetrometers to map the stratigraphy of the CCR unit and characterize the geotechnical and hydraulic properties of the various CCR layers, as well as the installation of traditional piezometers, monitoring wells and vibrating wire piezometers to monitor pore pressures and water levels. Properly constructed

[47] The Final Decision and Response to Comments documents can be found in the docket for that action. See docket items EPA–HQ–OLEM–2021–0590–0100 and EPA–HQ–OLEM–2021–0590–0099, respectively.

[48] Found at *https://www.usgs.gov/tools/usgs-rainfall-calculator.* Found at *https://www.usgs.gov/tools/usgs-rainfall-calculator.*

[49] Based on 30-year average rainfall from National Weather Service data.

[50] The frequency and severity of future rainfall events may be amplified by the effects of climate change. On average this would result in more water percolating through, and accumulating in, legacy CCR surface impoundments, which may further increase the risk of these units contaminating their underlying aquifers. More frequent and more severe rainfall events may also increase the risk that legacy CCR impoundments flood, overtop, and experience structural failures leading to potentially catastrophic releases of CCR into the surrounding environment. Many legacy CCR surface impoundments are located in 100-year floodplains which suggests that they are particularly vulnerable to rainfall driven flooding. Unit V of this preamble and the RIA accompanying this final rule describe this scenario in more detail.

wells and piezometers screened in the appropriate locations and depths have a prominent role in networks of instruments used to assess free liquids, as their design directly measures water levels under ambient conditions. Fundamentally, water levels in properly constructed and developed wells and piezometers are indicative of free liquids at that location. Conversely, networks of spatially discretized wells and piezometers can be used as part of a program to determine or confirm that free liquids no longer exist.

Similarly, tools and methods to eliminate free liquids within the CCR, such as rim ditches, underdrain systems, pumping wells, manifolded extraction wellpoints, etc., are also currently widely employed by industry. These elimination technologies can also provide diagnostic and confirmatory insights into the presence and nature of free liquids at a given CCR unit, *e.g.,* rim ditches and open excavations enable direct observation of free liquids.

EPA recommends that a demonstration of whether free liquids are present rely on a holistic evaluation of all information collected from site-wide monitoring networks (*e.g.,* piezometers and vibrating wire piezometers), as well as data collected from actual dewatering efforts. EPA further recommends that monitoring networks include points of sufficient density to independently verify dewatering performance determined from implementation of elimination technologies.

The memorandum also provides general guidance on considerations for developing successful site-specific strategies and approaches to identify, measure, monitor and eliminate free liquids. The elimination of free liquids relies on a well resolved understanding of the character and variability of the site-specific geology and hydrology, as well as the CCR materials themselves. Such information is frequently compiled into a Site Conceptual Model (CSM), and the memorandum also discusses some considerations related to the elements needed to construct a CSM if one does not already exist, or to augment a weak or poorly resolved CSM.

EPA has adopted this approach rather than the commenters' suggestion to define a legacy CCR surface impoundment as a CCR surface impoundment that ''contains CCR and free liquids''—even though EPA expects the effect will be the same in almost all cases—because it represents the best balance of several competing considerations. First reliance on the broad dictionary definition is the most protective because all liquids have the potential to become the free liquids that create leachate and contribute to hydraulic head. This approach also maintains consistency with the existing definition of an inactive CCR surface impoundment.

At the same time, EPA acknowledges that once the free liquids have been eliminated from the impoundment, any remaining liquids typically do not present a reasonable probability of contaminating the aquifer. EPA is also mindful of not establishing criteria that blur the lines between landfills and impoundments, EPA agrees with commenters that it would not be appropriate to designate a CCR landfill as a CCR surface impoundment based solely on periodic rainfall that is readily absorbed into the CCR and does not result in free liquids.

The regulation reflects this balance by placing the burden on the owner or operator to demonstrate that the standard in in § 257.102(d)(2)(i) has been met. In other words, the absence of free liquids is an affirmative defense, and therefore any uncertainty as to whether the standard in § 257.102(d)(2)(i) has been met is to be construed in favor of regulation because of the risks of environmental harm from free liquids in contact with CCR.

Although, consistent with the 2015 CCR Rule, EPA is not requiring facilities to post documentation to demonstrate that no legacy impoundment is present at the site, EPA recommends that facilities develop and retain records to support any determination that a particular unit meets this exception. Finally, as discussed in Unit III.B.2.b.i of this preamble, EPA has provided additional time to allow a facility to determine that it has eliminated free liquids as part of its applicability report.

(3) Whether the Proposal Reflected a ''New'' Interpretation

To support their claim that EPA had adopted new definitions of ''liquid'', ''CCR surface impoundment'' and ''inactive CCR surface impoundment,'' a number of the commenters identified aspects of the 2015 CCR Rule or preamble that they believe to be inconsistent with the May 2023 proposed rule preamble. First, several of these commenters claimed that statements in the proposed rule are inconsistent with the requirement in the existing definition of a CCR surface impoundment that the unit must be ''designed to hold an accumulation of CCR and liquids.'' 40 CFR 257.53. For example, some commenters stated that an impoundment that was dewatered and closed or is otherwise maintained so as not to impound liquids is no longer ''designed to hold an accumulation of CCR and liquids,'' and therefore, cannot be considered an inactive or legacy impoundment. Several commenters also claimed that the 2015 CCR Rule preamble, explained that the phrase, ''designed to hold an accumulation of CCR and liquids,'' means *only* units that ''contain a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants.'' According to these commenters, although a dewatered or closed impoundment may ''contain liquid'' as EPA defined it in the May 2023 proposal, no hydraulic head would be present. Or as one commenter stated, ''The Proposed Rule definition of liquids was expanded to include sources of water that are not demonstrated to be contributing to hydraulic head, or creating the potential for impoundment failure and spread of contaminated water.'' These commenters argue that facilities had relied on this guidance in good faith, and that ''simply citing the dictionary definitions of a 'liquid' and 'contains' eight years after the 2015 CCR Rule published and without context is not a sufficient rationale or appropriate.''

Several of these same commenters raised concern that EPA was proposing to regulate units that do not present the same risks on which the original rule was based. These commenters stated that in 2015 EPA did not strictly interpret ''liquids'' as precipitation, porewater, or groundwater without considering the associated force of liquids on the unit's embankment. According to the commenters, the 2015 CCR Rule was based on—and the current rulemaking should continue to be concerned with only—''the risk of excessive hydraulic head and the potential for structural failure of embankments from impounded water.'' The commenters further stated that the maintenance of CCR impoundments in a dewatered state significantly reduces the risk of structural failure, reduces the contact time with larger quantities of CCR, and reduces constituent concentrations and overall risk of impact to groundwater.

Other commenters pointed to statements in the 2015 CCR Rule preamble that EPA did not intend the term ''inactive impoundments'' to include units that are closed, or to require closed units to reclose. Several of these commenters quoted the following discussion:

> EPA did not propose to require ''closed'' surface impoundments to ''reclose.'' Nor did

EPA intend, as the same commenters claim, that ''literally hundreds of previously closed. . .surface impoundments—many of which were properly closed decades ago under state solid waste programs, have changed owners, and now have structures built on top of them—would be considered active CCR units.'' Accordingly, the final rule does not impose any requirements on any CCR surface impoundments that have in fact ''closed'' before the rule's effective date—*i.e.,* those that no longer contain water and can no longer impound liquid.

80 FR 21343.

Another commenter asserted that based on the proposal's ''strict interpretation,'' all CCR landfills and all CCRMU would (inappropriately) be considered inactive or legacy CCR surface impoundments. As the commenter explained, a CCR landfill could contain liquids, especially after heavy rainfall, but as it was not designed to hold an accumulation of CCR and liquid it is not a CCR surface impoundment.

A number of commenters also argued that the interpretation in the proposal of ''contains liquids'' is inconsistent with the decision in 2015 to define sand and gravel pits as a CCR landfill. According to the commenters, if EPA intended inactive CCR surface impoundments to broadly encompass CCR in contact with groundwater, without hydraulic head, sand and gravel pits would have instead been added to the definition of CCR surface impoundment. The commenters base this on EPA's statement in the proposed rule that ''the damage from the placement of CCR in sand and gravel pits was almost always associated with CCR being placed in contact with water, which indicated that the placement of CCR in contact with water can lead to higher risks than from dry disposal.'' See, 80 FR 32010.

Finally, a commenter raised concern that owners of inactive facilities that dewatered a CCR surface impoundment before October 19, 2015, but completed the removal of CCR at some time after October 19, 2015, could be subject to the CCR legacy rules because of what the commenter characterizes as the modification to the definitions of liquid and contains. This commenter also raised concern that some former coal-fired power plant properties were sold based on EPA's prior guidance that dewatered surface impoundments were not regulated, and asked whether these non-utilities will be required to comply with the documentation requirements.

As discussed above, this final rule defines a legacy CCR surface impoundment as a CCR surface impoundment at an inactive facility that ''contains both CCR and liquid,'' as EPA discussed that phrase in the proposal. EPA continues to believe that the appropriate construction of the phrase is to rely on its plain language meaning, consistent with the ordinary dictionary definitions those terms, in combination with the dewatering standard in § 257.102(d)(2)(i). EPA is also promulgating a definition of this term in this final rule. As discussed above, some commenters have asserted that this definition is ''new.'' EPA disagrees. Regardless, even if it were new, it is permissible for EPA to define the term here in this rulemaking—EPA is not bound to any prior definition, and fully explained its rationale for the definition herein. In addition, the definition of liquids is not in any way inconsistent with other definitions in § 257.53 or any other provisions from the 2015 CCR Rule.

EPA agrees that a legacy CCR surface impoundment must meet the existing definition of a CCR surface impoundment in § 257.53. That definition contains three criteria: (1) The unit must be ''a natural topographic depression, manmade excavation or diked area;'' (2) The unit must be ''designed to hold an accumulation of CCR and liquid;'' and (3) The unit ''treats, stores or disposes of CCR.'' 40 CFR 257.53. None of these require the presence of a particular amount of water or hydraulic head—or indeed any. Rather, the unit must be ''designed''—that is, intended to—hold an accumulation of CCR and liquid. Although EPA expected that, based on its understanding of the utilities' current management practices, water would be present as a consequence of the treatment, storage, or disposal occurring in the unit, nothing in the text of the definition requires it, let alone requires a minimum amount. The requirement that liquid actually be present in the unit appears in the definition of an ''inactive surface impoundment'' (or ''legacy CCR surface impoundment''), which as discussed, requires that the unit ''contains both CCR and liquids.'' 40 CFR 257.53.

With this understanding, EPA disagrees with the commenter who asserted that based on the proposal's ''strict interpretation,'' all CCR landfills and all CCRMU would be considered inactive or legacy CCR surface impoundments. The commenter explained that, for example, a CCR landfill could contain liquids, especially after heavy rainfall, and the commenter believed that the construction of the regulation outlined in the proposal would mean that this unit would be classified as a CCR surface impoundment even though the unit was not ''designed to hold an accumulation of both CCR and liquid.'' EPA agrees that a unit that meets the definition of a CCR landfill would not become a CCR surface impoundment merely because it contained liquid; as the commenter noted, such a unit would not have been ''designed to hold an accumulation of both CCR and liquid.'' Ordinarily there should be clear indications that the unit was not intended or designed to function as an impoundment; for example, if the facility placed only dry CCR into a unit, or had designed or constructed the unit as a CCR landfill (*e.g.,* it was constructed or operated with a leachate collection and removal system that meets the requirements of § 257.70(d)). It was for this reason that EPA included sand and gravel pits within the definition of a CCR landfill; all of those instances involve the placement of exclusively dry CCR into the sand and gravel pits with no indication that they were designed to hold liquids.

For the same reason, EPA disagrees that an impoundment that has been dewatered and closed or is otherwise now maintained so as not to impound liquids should no longer be considered ''designed to hold an accumulation of CCR and liquids,'' and therefore, should not be considered an inactive or legacy impoundment. Just as a landfill would not suddenly become ''designed to hold an accumulation of both CCR and liquids'' based on the temporary presence of precipitation, removing liquids from a unit that was constructed as a surface impoundment and that operated as a surface impoundment by managing both CCR and liquids for decades, does not suddenly mean that the unit is no longer ''designed to hold an accumulation of CCR and liquids.'' Even assuming all free liquids had been removed from the unit, which as discussed below is unlikely, the subsequent removal of liquids as part of closing the unit does not change either the original design or use of the unit; the commenters do not intend to retrofit the unit for subsequent use as a landfill, but are merely in the process of complying with the requirements applicable to the closure of CCR surface impoundments. Nor does the subsequent dewatering change the present risks arising from the original design and long-term operation of the unit as an impoundment. To avoid any confusion on this point, EPA has deleted the phrase ''which is'' from the existing definition of a CCR surface impoundment.

EPA also disagrees that the proposed (and now final rule) expanded the existing definition of a CCR surface impoundment—either by regulating different kinds of units as surface impoundments than are currently regulated as surface impoundments, or by regulating units that present substantially different kinds or level of risks. These commenters have misunderstood the 2015 CCR Rule and preamble.

EPA did not limit surface impoundments to units ''containing a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants.'' The definition of a CCR impoundment is discussed in the 2015 preamble at 80 FR 21357–21358. Reading the discussion as a whole, rather than the single sentence from the preamble that the commenters reference, clearly demonstrates that the 2015 CCR Rule was concerned with more than the risks associated with the force of impounded water on the embankment structure and included the risks of contamination when water travels from the impoundment to the surrounding are, and that EPA did not limit the CCR surface impoundments regulated under the 2015 CCR Rule to those that contain a particular amount of water or degree of hydraulic head.

It is clear from the complete discussion that what determines whether a unit is considered a CCR surface impoundment are the three criteria [51] (discussed above) actually in § 257.53, rather than a finding that the particular unit ''contain[s] a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants.''

In addition, the critical issue in crafting the definition was the quantity of CCR in the unit, not the quantity of water. Thus EPA explained that it was modifying the proposed definition to address concerns that it would capture ponds that contain only *de minimis* levels of CCR, because it agreed with commenters that the rule as proposed could inadvertently capture units that present significantly lower risks, such as process water or cooling water ponds that ''although they will accumulate any trace amounts of CCR that are present, they will not contain the significant quantities that give rise to the risks modeled in EPA's assessment.'' 80 FR 21357. EPA then stated that by contrast, ''units that are designed to hold an accumulation of CCR and in which treatment, storage, or disposal occurs *will contain substantial amounts of CCR and consequently are a potentially significant source of contaminants.*'' Id. (*Emphasis added*).

These points are best illustrated by the specific examples discussed in the preamble of the 2015 CCR Rule. First, in each example EPA explained whether the units would be considered CCR surface impoundments exclusively by reference to the criteria in the regulation. 80 FR 21357. Second, the units in each of the examples contained varying degrees of water and therefore hydraulic head. The final example was a diked area in which wet CCR is placed in order to remove the water for future transport to a CCR landfill or beneficial use. EPA explained that:

> [t]he unit is accumulating CCR, while allowing for the evaporation or removal of liquid (no free liquids) to facilitate transport to a CCR landfill or for beneficial use. In this instance, the unit again meets all three definition criteria, it is a diked area (*i.e.,* there is an embankment), it is accumulating CCR for ultimate disposal or beneficial use; and it is removing any free liquids, (*i.e.,* treatment). As such, this unit would meet the definition of CCR surface impoundment.

80 FR 21357. The impoundment in this example contains far lower amounts of liquid than would be found in an operating impoundment because it is used to remove liquid from CCR. In essence such units would likely not contain significantly more liquid than the partially dewatered impoundments that the commenters now claim are exempt based on their supposed lack of a hydraulic head. 80 FR 21357–21358.

More to the point, the units that the commenters argue should be exempt do still contain a hydraulic head ''that promotes the rapid leaching of contaminants'' and the consequent increased risks of leachate contaminating groundwater.

Based on their comments on the closure performance standards, what these commenters mean by ''dewatered'' is merely the removal of: (1) Only the standing liquid or the free liquid visible at the surface of the impoundment; or (2) Free liquids in the CCR only to the depth needed to safely work with heavy machinery and to expedite the closure process. Properly characterized, this is merely partial dewatering. As previously discussed, because they are not removing free liquids beyond this depth, this eliminates neither the ''liquid,'' the hydraulic head in the unit, or the conditions that create the heightened risk of leachate contaminating ground or surface water. Although this will reduce the hydraulic head, until the water is eliminated, gravity will continue to exert downward pressure on the saturated waste. Continued contact with free liquids will continue to cause metals and other constituents to leach from the CCR, and the downward pressure of the hydraulic head will continue to drive the leachate toward the bottom of the unit into the surrounding soil and/or into the aquifer, along with any CCR constituents that have leached from the waste.

It is clear from the 2015 preamble that the situation described by the commenters is not what EPA intended when it explained that the regulations did not apply to ''closed'' units. In the paragraphs preceding the commenters' selective quotation, EPA defined inactive surface impoundments as ''those that contain both CCR and water, but no longer receive additional wastes.'' 80 FR 21343. EPA further explained that ''By contrast, a 'closed' surface impoundment *would no longer contain water,* although it may continue to contain CCR (or other wastes), and would be capped or otherwise maintained.'' Id. (emphasis added). See also, Id. (3d col) (''Accordingly, the final rule does not impose any requirements on any CCR surface impoundments that have in fact 'closed' before the rule's effective date—*i.e., those that no longer contain water and can no longer impound liquid.*'') (emphasis added). Note that EPA stated that a closed unit would not contain ''water,'' without qualification or limitation. Nowhere in this discussion (or the rest of the preamble) did EPA distinguish between water, free water, porewater, or groundwater, or expressly suggest that any of those might appropriately remain in the unit after closure.

EPA thus agrees that, as in the 2015 CCR Rule, ''an impoundment that no longer contains liquid prior to October 19, 2015'' would not be considered either an inactive impoundment or a legacy impoundment.[52] EPA acknowledges that CCR surface impoundments that contained liquids prior to October 19, 2015, can still be associated with significant environmental and human health risks. As discussed in Unit III.A.1 of this preamble, many if not all of these impoundments lacked a composite liner system, and therefore likely leached contaminants into the soil and underlying aquifer during operation. Eliminating the liquid from the impoundment will not remediate these releases—which at some sites may be significant—although it may substantially reduce or eliminate a source of additional or continuing

[51] The existing definition of a CCR surface impoundment contains three criteria: (1) The unit must be ''a natural topographic depression, manmade excavation or diked area;'' (2) The unit must be ''designed to hold an accumulation of CCR and liquid;'' and (3) The unit must ''treat[ ], store[ ] or dispose[ ] of CCR.'' 40 CFR 257.53.

[52] EPA also discusses its interpretation of ''impound liquid'' in Unit III.B.2.g of this preamble.

contamination. And to the extent the unit lacks an effective cover system, the unit may still be leaching contaminants, albeit at a reduced rate. Consequently, although such units would not be considered inactive or legacy impoundments, some will be regulated as a CCR management unit, as described in the next section.

However, the proposal by some commenters to regulate any impoundment that has ever contained CCR and liquids would represent a significant expansion of the regulations, in that it would essentially capture every CCR surface impoundment that ever operated in the United States. To illustrate the potential implications of such a revision: approximately 533 surface impoundments and 239 landfills are regulated under the 2015 Rule. EPA estimates that as a consequence of this final rule, an additional 194 (legacy) surface impoundments will be regulated. By contrast, as one commenter calculated, approximately 2,170 surface impoundments were operating in 1973 alone.[53] EPA, however, is not prepared at this juncture to expand the regulation so dramatically without first obtaining at least some basic information about the kinds of sites that would be regulated. Instead, EPA is proceeding to address the effects of past CCR management one step at a time, and is focusing here on a narrower universe of regulated units.

The Agency is not required to address every aspect of a problem immediately; courts have long recognized that it can be appropriate to address complex problems in stages. This final rule expands oversight to approximately 194 legacy CCR surface impoundments, and as discussed in Unit III.C, closes gaps in the existing regulations that currently fail to require facilities to remediate known contamination resulting from the operation of their CCR units. EPA expects to shortly publish a final permit rule and to begin issuing permits to bring facilities into full compliance. While the Agency works to address the risks from this current universe, EPA will also continue to collect information to better understand the full extent of the potential problem posed by the universe of abandoned sites that remain unregulated. In the interim, authority under RCRA section 7003 and CERCLA section 106 remains available to address any imminent and substantial threats to human health or the environment that these unregulated sites may present. 42 U.S.C. 6873 and 9606.

EPA also agrees that as a consequence of the plain language meaning of the phrase ''contains liquid,'' the owners of inactive facilities that dewatered a CCR surface impoundment before October 19, 2015, but completed the removal of CCR at some time after October 19, 2015, would be subject to this final rule if only the standing water had been removed from the impoundment by this date. As EPA explained in the proposal, as a purely factual matter, a surface impoundment that has only removed visible surface water would normally still contain liquids if the waste lower in the unit was still saturated with water. However, this issue is also discussed further in the next section. Because the regulation applies exclusively to the current owners and operators, if such a facility had been sold to a non-utility, the new owner, rather than the previous owner, will be required to comply with the any applicable requirements.

(4) Adding a Definition to the Regulations

As noted previously, EPA solicited comments on whether adopting a definition of ''liquids'' into part 257 would provide greater clarity. The preamble discussed various possible definitions, including from Merriam-Webster and a technical definition. The proposal also explained that the term ''liquids'' encompasses all the various types of liquid that may be present in a CCR unit, including water that was sluiced into the impoundment along with the CCR, precipitation, surface water, and groundwater that has migrated into the impoundment due to the construction of the unit, which may be found as free water or standing water ponded above the CCR or porewater intermingled with the CCR. 88 FR 31992. Although there was widespread disagreement about what the definition should be, most commenters appeared to support including a definition in the regulations. Several commenters supported including a definition of ''liquids'' in the final rule to prevent future disputes over the meaning of the term. Some of these commenters stated that ''given the clear, plain language of the CCR Rule's closure provisions and EPA's longstanding implementation of the regulations, codifying a regulatory definitions [sic] of the plain term 'liquid(s)' should be unnecessary.'' However, the commenters also stated that ''in light of industry's apparent preference to litigate the reality that groundwater is liquid in favor of properly closing its leaking, unlined ponds, EPA should codify its longstanding, plain meaning definitions of key terms in the hope of avoiding unnecessary and costly future litigation and ensuring timely, proper closure.''

By contrast several commenters opposed including a definition in the regulations, suggesting that EPA should instead continue to rely on how the commenters believed those terms have been used in the 2015 CCR Rule and historically applied in implementing RCRA requirements. Some of these commenters stated that EPA has not provided adequate notice to the public of a new regulatory definition of ''liquids,'' and claimed that EPA therefore could not adopt a regulatory definition of ''liquids'' in a final rule. Finally, a commenter opposed adding a definition of ''liquids'' to the regulations, arguing that it would not change the definition of ''free liquids,'' which the commenter believes is a distinct, technical regulatory term that does not encompass groundwater, or the performance standard in § 257.102(d)(2)(i), which, according to the commenter, only requires the removal of liquid wastes and stabilization of remaining wastes to support the cover system.

Several commenters recommended that in the absence of a statutory definition of ''liquid(s)'' and consistent with the CCR regulatory definition of ''free liquids'' and EPA's longstanding implementation of the predecessor hazardous waste closure regulations, EPA should codify a definition of ''liquid'' based on the dictionary definitions as set forth in the Proposed Rule. They also suggested that the definition should make clear that the term encompasses free water, porewater, standing water, and groundwater without regard to their source.

Commenters also offered numerous alternatives. For example, several commenters offered technical definitions from various sources. One of those commenters raised concern that the technical definition discussed in the proposal had the potential to be confusing. According to this commenter, bulk particulate solids, such as fly ash, exhibit the physical properties of a liquid identified in the technical definition: specifically, dry fly ash flows when poured from container to container and conforms to the shape of a container—retaining its volume but not its shape. Instead, this commenter suggested that soil mechanics might provide useful information on which to base a definition.

As noted above, numerous commenters also suggested that EPA should focus on ''free liquids'' rather

[53] GenOn Comments at 5–6. Estimate based on the number of coal-fired generating units operating in 1973 according to the U.S. Energy Information Administration (1,839) and assuming 1.2 surface impoundments per plant, consistent with operations in 2010.

than ''liquids.'' Several of these commenters recommended that the final rule adopt the definition in 40 CFR 258.28(c)(1), which relies on the Paint Filter Liquids Test to determine whether liquids are present. The commenters recommended that the CCR and MSW landfill programs be consistent as both reside under RCRA subtitle D. However, one of these commenters also raised concern that it is unclear how far back in time this would reach and how EPA or the States would be expected to regulate inactive utilities that no longer exist but may have closed units that meet the definition. By contrast, other commenters raised concern about a definition that relied on the Paint Filter Liquids Test, stating that facilities had experienced difficulties implementing the test in the field.

Another commenter explained that focusing on porewater, rather than the separable porewater covered by the definition of free liquids would cause technical difficulties. According to this commenter, porewater may be difficult to measure as it is held in the interstices or pore spaces between particles of soil, sediment, and/or CCR material and may not flow readily or be easily quantified using field or laboratory methods. Consequently, the commenter believed that it would not be feasible to identify whether liquids inclusive of all porewater (whether separable or not) were present in an impoundment or landfill closed prior to October 19, 2015, or in other words, to demonstrate the absence of liquids eight years ago.

Similarly, one commenter stated that EPA should adopt a definition in the context of material in the ''liquid state'' such as free liquids and materials that behave as liquids and can be readily separated from the ''solid'' matrix and should not include those materials that are bound within the matrix and not readily separable. And another commenter recommended that EPA define a legacy impoundment based on the presence of free liquids and data to support that the free liquids have impacted groundwater.

EPA continues to strongly believe that the plain text of the regulation clearly communicates the Agency's positions laid out above, and that in light of the dictionary definition a regulatory definition is not strictly necessary. However, in light of the different understanding of the regulations among commenters, EPA is incorporating the existing requirements into the definitions in § 257.53. Accordingly, the final rule includes a definition of ''liquids'' based on the definition from Merriam-Webster discussed in the proposal. The new definition, codified at § 257.53, provides that ''Liquids means any fluid (such as water) that has no independent shape but has a definite volume and does not expand indefinitely and that is only slightly compressible. This encompasses all of the various types of liquids that may be present in a CCR unit, including water that was sluiced into an impoundment along with CCR, precipitation, surface water, groundwater, and any other form of water that has migrated into the impoundment, which may be found as free water or standing water ponded above CCR or porewater intermingled with CCR.

In addition, the final rule includes in § 257.53 a definition of the phrase ''contains both CCR and liquids,'' consistent with the discussion above and in the proposal. The definition reflects both the dictionary definition of ''contains'' and EPA's explanation that it relies upon the closure standard in § 257.102(d)(2)(i) to determine whether a unit contains liquids.

The definition states that ''Contains both CCR and liquids means that both CCR and liquids are present in a CCR surface impoundment, except where the owner or operator demonstrates that the standard in § 257.102(d)(2)(i) has been met.''

These definitions reflect EPA's construction of the existing regulations. In addition, codifying these definitions definitively confirms that an impoundment saturated by groundwater or continually inundated by surface water is an inactive or legacy impoundment. It also provides greater clarity that all kinds of liquid are relevant to determining whether an impoundment is subject to part 257 and has properly closed.

Consequently, EPA decided not to adopt either the technical definition of liquid discussed in the proposal or any of the suggested alternatives. EPA agreed that the technical definition in the proposal had the potential to be confusing given that fly ash can sometimes exhibit the physical properties of a liquid identified in the technical definition. While EPA also agrees that CCR is a porous material similar to soil, EPA did not adopt the commenter's suggestion to rely on soil physics to craft an alternative. CCR is not a soil, and EPA is concerned more with the hydraulic characterization of CCR that involves other considerations in addition to soil physics.

EPA also chose not to adopt the definition in 40 CFR 258.28(c)(1), which relies on the Paint Filter Liquids Test, or to otherwise mandate reliance on the Paint Filter Liquids Test. First, a number of other commenters raised technical concerns about relying on this test in this context. In addition, EPA would not generally recommend using the Paint Filter Liquids Test in this context. There can be physical effects from obtaining the sample that could affect the representativeness of the sample (vibration, heat from the drilling bit, etc.) and that can result in false negatives. Consequently, although it might provide relevant information to confirm the presence of water in a sample, EPA does not generally consider the results to be sufficiently reliable to confirm the absence of free liquids.

EPA disagrees that the public had insufficient notice of a potential definition. EPA explained the subjects and issues the agency would consider in reaching its decision, and provided examples of possible definitions. In general, to provide adequate notice an agency must ''provide sufficient factual detail and rationale for the rule to permit interested parties to comment meaningfully.'' *Florida Power & Light Co.* v. *United States,* 846 F.2d 765, 771 (D.C. Cir. 1988). As demonstrated in the preceding section, numerous other entities were able to effectively provide comments, for example raising concerns about the definitions discussed in the preamble, and offering potential alternatives. No commenter has indicated what further information is necessary to be able to comment effectively on the issue.

EPA agrees that adopting these definitions will not change the performance standard in § 257.102(d)(2)(i), but for very different reasons than those proffered by the commenters. Incorporating these definitions into the part 257 regulations merely reaffirms the plain language meaning of the term ''liquids,'' which, as previously explained, is the status quo. But because the term ''liquids'' is used in the definition of ''free liquids,'' defining liquids to expressly encompass all of the various types that may be present in a CCR unit, including groundwater, removes any misunderstanding that such liquids cannot be considered to be free liquids when they otherwise meet the definition, that is, they readily separate from the solid potion of CCR at ambient temperature and pressure.

However, the commenters are correct that it will not address their misconstruction of § 257.102(d)(2)(i), which attempts to limit the requirement based on text that does not appear in the provision. Further discussion of § 257.102(d)(2)(i) can be found in Unit III.B.2.g.

In conclusion, under this final rule the surface impoundments discussed in the proposal would still be considered legacy impoundments, as all would still contain free liquids. Specifically this includes (1) Any impoundment where, on or after October 19, 2015, water flowed or continues to flow through the impoundment, permeating the waste in the unit, such as where the base of the impoundment intersects with the groundwater; (2) A surface impoundment where only the surface water has been decanted; here too the impoundment would normally still contain free liquids if the waste in the unit was still saturated with water; and (3) Any impoundment that still contains free liquids: (a) even if it is considered ''closed'' under State law; (b) it is in the process of closing on the effective date of this rule; or (c) the unit has been fully dewatered and can no longer impound liquid only after October 19, 2015 (*i.e.,* it contained free liquids on October 19, 2015).

ii. What does it mean to ''contain'' CCR?

In the proposal, EPA explained that under the existing regulation, an inactive CCR surface impoundment must contain CCR to be subject to the rule. 40 CFR 257.53. EPA further explained that it was not proposing to revise that aspect of the legacy impoundment definition. EPA proposed that, consequently, a legacy impoundment that had closed by removal in accordance with the performance standards in § 257.102(c) before October 19, 2015, would not be considered an inactive (and therefore not a legacy) CCR surface impoundment.

EPA also proposed that an impoundment at an inactive facility that was still in the process of closing by removal on October 19, 2015, would be considered a legacy CCR surface impoundment subject to the final rule requirements. EPA proposed that facilities with such a unit would be required to certify and post documentation that they have met the existing standard for closure by removal in § 257.102(c) on their CCR website (*i.e.,* ''certification requirement''). However, if a facility could not demonstrate that the closed impoundment meets the existing performance standards in § 257.102(c), the unit would be considered a legacy impoundment subject to the rule. EPA further explained that because the impoundment contained liquid and CCR on October 19, 2015, it would meet the definition of a legacy CCR surface impoundment, and that EPA had no basis to exempt it, because EPA had no factual basis to conclude that a legacy CCR surface impoundment that was in the process of closing posed no risk. However, EPA explained that depending on when the impoundment completed closure, some individual requirements may no longer be applicable to the legacy CCR surface impoundment (*i.e.,* when the compliance date in the final rule falls after the date closure is completed for the impoundment).

No commenter opposed the proposal to exclude impoundments that did not contain any CCR prior to the effective date of the 2015 CCR Rule, although several commenters believe that additional impoundments should also be excluded. For example, many commenters stated that EPA does not have jurisdiction under RCRA over impoundments from which all CCR was removed between October 19, 2015, and the effective date of this final rule. As one of these commenters explained:

> As proposed, a closed unit would still be regulated under the final rule if all CCR has been removed but groundwater monitoring shows exceedances of the groundwater protection standard constituents listed in Appendix IV. RCRA's juridical boundaries are exceeded under this interpretation. The *USWAG* decision explained that RCRA gives EPA the authority to regulate past disposal of CCR based on the continued presence of CCR. Once the CCR is removed, CCR is no longer disposed of, and EPA does not have the ability to regulate based on the previous existence of CCRs.

Commenters also provided examples of the type of facility they believe that EPA cannot regulate. For example, one commenter described a closure of three interconnected CCR surface impoundments associated with the Richard H Gorsuch Power Plant. According to the commenter,

> the closure was permitted by the state of Ohio, along with a redesign of one of the impoundments to control stormwater runoff post-closure. The closure of these impoundments included dewatering and removal of all CCR materials to clean soil prior to filling with clean soil and grading. All CCR was transported to the associated off-site fly ash landfill. No groundwater monitoring was required, all the CCR was removed, and the site is adjacent to an existing RCRA corrective action (Union Carbide) with known groundwater impacts.

Some of these commenters further stated that EPA cannot rely on any residual contamination left in groundwater to support jurisdiction because EPA has made clear that groundwater (as well as other environmental media containing contaminants) is not a solid waste. Finally, some commenters asserted that EPA has no data showing that there is a reasonable probability of adverse impact from historical CCR units that have been closed by removing the CCR, and as a consequence, EPA cannot regulate such units.

By contrast, a number of commenters requested that EPA clarify that its statement in the Proposed Rule that EPA ''no longer has jurisdiction over a former unit that has closed by removal in accordance with § 257.102(c)''—is based on the complete absence of CCR, and requires not only removal of CCR from and decontamination of the unit but completing all groundwater cleanup and other remedial measures and then adequately documenting, with at least two years of post-removal or decontamination groundwater monitoring, that GWPS are reliably achieved by removal prior to the effective date of the final rule.

EPA disagrees that it lacks jurisdiction over a site at which the owner has removed CCR from the impoundment after October 19, 2015. Many of the commenters misunderstand the *USWAG* decision, as well as the legal structure applicable to these units.

First, the *USWAG* decision did not limit EPA's authority to sites where CCR remains, but to sites where *solid waste* is present. See, *USWAG,* 901 F.3d at 440–441 (''Properly translated then, an open dump includes any facility (other than a sanitary landfill or hazardous waste disposal facility), where *solid waste* still ''is deposited,'' ''is dumped,'' ''is spilled,'' ''is leaked,'' or ''is placed,'' regardless of when it might have originally been dropped off.'') (emphasis added).

Second, in the example EPA presented in the proposal, even though the facility may have removed all CCR from the surface impoundment, solid waste still remains on site because groundwater monitoring continues to detect statistically significant levels of one or more Appendix IV constituents. These monitoring results demonstrate the continued presence of CCR leachate [54]—which is a solid waste under the definition in 42 U.S.C. 6903(27)—in groundwater, and, potentially, in soil at the site. As discussed in greater detail below, this is sufficient to demonstrate that EPA retains jurisdiction over the site, under the plain language of the statutory definitions of solid waste and disposal.

EPA also considers that it has authority to regulate as part of this rule, sites similar to the one presented by the

[54] Leachate is produced when liquids, such as rainwater or groundwater, percolate through wastes stored in a disposal unit. The resulting fluid will contain suspended components drawn from the original waste.

commenter above. As discussed in more detail below, the rulemaking record supports a presumption that solid waste remains at the site, even assuming the facility had removed all CCR from the impoundment. The rulemaking record demonstrates the high likelihood that the impoundment will have leaked during its operation. As a consequence, at any site that closed without groundwater monitoring, such as the one described in the comment above, or that has not undertaken any remediation, there is every reason to believe that leachate (and, therefore, solid waste) will remain on site. In addition, the measures that facilities have described taking to remove all CCR from the impoundment would in fact leave CCR leachate remaining in soils at many sites.

(a) Definition of Solid Waste

EPA's jurisdiction over sites at which CCR leachate remains is clear from the plain language of the statutory definitions of solid waste and disposal.

Under the CCR regulations, the statutory definition of solid waste applies, rather than any of the various narrower subtitle C regulatory definitions in 40 CFR part 261. Section 257.53 specifically provides that ''Terms not defined by this section have the meaning given by RCRA.'' Part 257 does not include a definition of ''solid waste'' or ''waste,'' which therefore takes the broader statutory definition of the term. See also the § 257.53 definition of disposal, which references ''solid waste as defined in section 1004 (27) of the Resource Conservation and Recovery Act.''

The subtitle C regulations are equally clear that they do not apply to subtitle D wastes. See, *e.g.,* 40 CFR 260.1(a) (''This part provides definitions of terms, general standards, and overview information applicable to parts 260 through 265 and 268 of this chapter.''); § 261.1 (a) (''This part identifies those solid wastes which are subject to regulation as hazardous wastes under parts 262 through 265, 268, and parts 270, 271, and 124 of this chapter and which are subject to the notification requirements of section 3010 of RCRA.'').

Under RCRA the term ''solid waste'' means:

> any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 1342 of title 33, or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923) [42 U.S.C. 2011 *et seq.*].

42 U.S.C. 6903(27). The plain meaning of the word ''discarded'' in this definition is ''disposed of,'' ''thrown away,'' or ''abandoned.'' See, *e.g., American Mining Congress* v. *U.S. EPA,* 824 F.2d 1177, 1184 (D.C. Cir. 1987) (citations omitted) (''*AMC I*''); *American Petroleum Institute* v. *EPA,* 906 F.2d 729, 740–741 (D.C. Cir. 1990) (per curiam). Such materials are ''part of the waste disposal problem'' that Congress enacted RCRA to address. *AMC I,* 824 F.2d at 1193. In other words, under the statute if something has been disposed of, as that term is defined in the statute, it is a solid waste.[55]

Any CCR leachate left behind as soil and groundwater contamination after CCR removal would clearly constitute material that has been ''abandoned'' or ''discarded'' and is thus subject to regulation under subtitle D without further activity. EPA has long considered material that has spilled or leaked onto the soil and not been cleaned up to have been ''abandoned'' or ''discarded.'' See, *e.g., Chemical Waste Management* v. *EPA,* 869 F.2d 1526, 1539 (D.C. Cir. 1989); *Connecticut Coastal Fishermen Ass'n* v. *Remington Arms Co.,* 989 F. 2d 1305, (2d Cir 1993).

The conclusion that the CCR leachate contaminating soil and groundwater is a solid waste is also consistent with EPA's long-held interpretation (discussed at length in the 2015 CCR rule preamble) that leaking or passive migration of leachate constitutes the disposal of solid waste. 80 FR 21342–21347, quoting 43 FR 58954 (''This is an important issue, however, because some, and perhaps most, inactive facilities may still be 'disposing of waste' within the meaning of that term in Section 1004(3) of RCRA. . . . Many inactive facilities may well be leaking solid or hazardous waste into groundwater and thus be 'disposing' under RCRA.''). See also, *e.g., In re Consolidated Land Disposal Litigation,* 938 F2d 1386, 1388–1389 (D.C. Cir. 1991).

And even under the narrower regulatory definition of solid waste in subtitle C, EPA has long considered leachate (*i.e.,* the leaked constituents) from previously disposed hazardous wastes to be a hazardous (and therefore, solid) waste. See, *e.g.,* 40 CFR 261.3(c)(2)(i) (''any solid waste generated from the treatment, storage, or disposal of a hazardous waste, including any . . . leachate . . . is a hazardous waste.''). 45 FR 33096 (May 19, 1980) (''As a practical matter, this means that facilities which store, dispose of or treat hazardous waste must be considered hazardous waste management facilities for as long as they continue to contain hazardous waste and *that any wastes removed from such facilities—including spills, discharges or leaks*—must be managed as hazardous wastes.'')(*emphasis* added). See, also, *Chemical Waste Management,* 869 F.2d at 1539.

Moreover, as discussed above, one factor the D.C. Circuit has considered in determining whether a substance is properly considered a waste is whether ''the materials are 'part of the waste disposal problem' Congress intended to address in enacting RCRA.'' *AMC I, quoting* House Committee Report, H.R. Rep. No. 1491, 94th Cong., 2d Sess. at 2, U.S. Code Cong. & Admin. News 1976, p. 6240. If so, it falls under EPA's authority in RCRA to address. See, *American Mining Congress* v. *EPA,* 907 F.2d 1179, 1186–87 (D.C. Cir. 1990) (deferring to EPA's focus on potential environmental harm in determining whether material is discarded) (*AMC II*). The contamination from legacy impoundments (even when the CCR has been removed from the impoundment) remains a threat to human health and the environment that stemmed from discarded materials, and thus is ''part of the waste disposal problem'' RCRA was enacted to address.

As discussed in more detail in Unit III.A.3, EPA estimates that groundwater contamination at sites with legacy impoundments could pose lifetime cancer risks from arsenic as high as 2×10^{-5} to 1×10^{-5} (*i.e.,* 2 to 100 cases of cancer for every 100,000 individuals exposed), depending on the specific management practices and site conditions. In addition, EPA estimated noncancer risks well in excess of an HQ of one for a wide variety of CCR constituents, depending on the management practices and site conditions; for example, the high-end of noncancer risks for lithium ranged between two to three; for molybdenum up to an HQ of four; thallium up to an HQ of two, and for cobalt and mercury up to an HQ of 13 and five, respectively. Moreover, in the absence of any groundwater remediation, there is no reason to believe that the removal of CCR from the impoundment mitigates these risks. Although the unit may no longer continue to contribute additional contamination, removal of the CCR does not address the release of and risk from the metals or other CCR constituents in any contaminant plume.

[55] As EPA explained in the 2015 preamble, ''placement in a landfill or surface impoundment is prima facie evidence of discard.'' 80 FR 21348.

The leachate from a CCR surface impoundment or landfill is therefore unquestionably a solid waste under the broader statutory definition in 42 U.S.C. 6903(27). And to the extent the leachate remains in soil or groundwater, that is sufficient to support jurisdiction over that site, even though all CCR may have been removed from the disposal unit. The risks from the leachate-contaminated groundwater also clearly establish a reasonable probability of adverse impacts on health and the environment from legacy impoundments that have been closed by removing only the CCR.

EPA disagrees with the commenters who stated that the Agency should not presume that there have been impacts to groundwater from an area where the ash has been fully removed, absent specific evidence to the contrary. The record from both the 2015 CCR Rule and the current rulemaking supports a strong presumption that solid waste remains on-site at these facilities. As the D.C. Circuit noted, legacy impoundments have been shown to be even more likely to leak than units at utilities still in operation. 901 F.3d at 432.

Data collected as part of the 2015 rulemaking shows that the majority of the older operating (pre-1994) waste units lack liners; 63% and 24% of older surface impoundments have either no liners or clay liners, respectively. 80 FR 21326. Thus far, no commenter has identified a legacy impoundment with a composite liner.

Analysis of the information from the damage cases also demonstrates that unlined surface impoundments typically operate for 20 years before they begin to leak. Id. at 21326–21327. As discussed previously, commenters submitted data indicating that on average legacy impoundments are 55 years old. The following examples discussed in the 2015 CCR rule preamble further demonstrate the high probability that legacy impoundments will have leaked, and that in the absence of remediation measures leachate is highly likely.

In the wake of the 2008 TVA Kingston CCR spill, Illinois and North Carolina for the first time required utilities to install groundwater monitoring. Illinois required facilities to install groundwater monitoring downgradient from their surface impoundments. As a result, within only about two years, Illinois reported that seven facilities had detected instances of primary MCL exceedances, and five additional facilities had reported exceedances of secondary MCLs. The data for all 12 sites were gathered from onsite; it appears none of these facilities had been required to monitor groundwater off-site, so whether the contamination had migrated off-site was unknown. Similarly, North Carolina required facilities to install additional down gradient wells. In January 2012, officials from the North Carolina Department of Environment and Natural Resources disclosed that elevated levels of metals were found in groundwater near surface impoundments at all the State's 14 coal-fired power plants. 80 FR 21455.

It is also highly unlikely that removal of CCR would also have removed all areas affected by releases at many (if not most) sites. In their comments, facilities have described relying on visual inspection or in some cases microscopic inspection of soil material to determine whether all CCR have been removed from the impoundment. In such cases, the practical depth limit of such investigations is generally just beneath (*e.g.,* a foot or less) the visually observed maximum depth of CCR. However, it is not likely this practice would be sufficient at many legacy sites to remove all areas affected by releases of CCR leachate.

At a minimum, for units with bases above the groundwater, the soil column beneath the unit from the base of the unit to at least the depth of the lowest water levels recorded in the aquifer, would typically need to determine whether the zone of water table fluctuation constitutes a residual source and may be in need of corrective action. Concentrations of contaminants at this horizon could be significantly elevated. In a case where prior site assessment and groundwater monitoring activities have not resulted in a preexisting well network capable of making this determination it may be necessary to install additional wells or to assess groundwater.

Moreover, in a unit constructed with CCR below the ambient groundwater, after decades of groundwater infiltration through the waste, the leachate generated would be expected to show elevated levels of CCR constituents of concern. This chemically altered leachate can interact with unsaturated or partially saturated soils beneath the CCR and can react with aquifer solids beneath the unit to form intermediate chemical compounds, some of which may be bound to the aquifer matrix in solid phases. Also, depending on the amount of groundwater recharge and infiltration directed through the unit, some downwardly infiltrating leachate is likely to reach the saturated zone where additional chemical reactions occur. Depending on the degree of disequilibrium with the ''ambient'' conditions such reactions can be significant and can also result in formation of mineral species that become temporarily immobilized at or beneath the water table as solid mineral phases by formation of mineral precipitates or simply adsorbed to the aquifer matrices by retardation processes. These intermediate transformation products may contain CCR constituents of concern as either major, minor or trace components of newly formed compounds. Depending on the aquifer chemistry, including redox state, pH, salinity, alkalinity, etc., some CCR constituents may remain mobile in groundwater and may continue to migrate downgradient of the unit. Consequently, in situations where the waste is below the water table, assessment efforts would generally need to penetrate a sufficient depth below the base of the waste or the lowest water levels in the aquifer, whichever is greater, to ensure that potential releases of leachate to the soil have been evaluated.

Consequently, based on the practices that facilities have stated that they use to confirm that they have removed all CCR from a site, both leachate contaminated soil and groundwater would frequently be expected to remain on site even after CCR may have been entirely removed from the impoundment. The totality of the information in the record thus supports a presumption that solid waste remains on-site. Demonstrating compliance with § 257.102(c) rebuts that presumption and documents that the site is no longer under RCRA's jurisdiction.

EPA also disagrees that reliance on the residual contamination left in groundwater to support jurisdiction is precluded by EPA's prior statements that contaminated media are not solid wastes. These commenters are referring to EPA statements made in connection with the ''contained in'' policy under the RCRA hazardous waste regulatory program. As an initial matter, the commenters have misunderstood the policy. The policy states only that with respect to contaminated soil or groundwater, the media itself–the soil or groundwater–is not a solid waste–even though it contains a hazardous waste. In other words, the contamination itself remains a solid waste, and therefore subject to EPA's jurisdiction. See, *Chemical Waste Management* v. *EPA,* 869 F.2d at 1539 (upholding EPA interpretation that hazardous waste restrictions continue to apply to waste ''contained in soil or groundwater'' as ''consistent with the derived-from and mixture rules,'' even though the rules by their terms do not apply to contaminated soil or groundwater because they are not solid wastes).

In any event, as discussed above, none of the regulations in 40 CFR parts 260–268, or 270 apply, except to the extent EPA incorporated them into part 257, subpart D. This also means that any Agency interpretations or policies adopted under those regulations, no matter how long-standing, do not automatically apply to CCR, which are regulated under part 257, subpart D. Moreover, the policies and/or interpretations the commenters identify were developed based on the text of particular statutory or regulatory provisions under subtitle C, as well as the larger statutory context in which those particular statutory or regulatory requirements operate (for example, corrective action obligations at hazardous waste treatment, storage, and disposal facilities). RCRA subtitles C and subtitle D differ greatly. For example, only under subtitle C did Congress expressly prohibit land disposal of hazardous wastes that do not meet treatment standards established in EPA regulations. 42 U.S.C. 6924(d), (g), (h), (m). Similarly, there is no analog under subtitle D to section 6925(j), which imposes detailed requirements on hazardous waste surface impoundments. It would therefore be inappropriate to simply adopt a particular interpretation or policy developed under the particular provisions of the RCRA subtitle C hazardous waste regulatory program into the CCR program without evaluating whether the policy or interpretation is consistent the statutory language in subtitle D or would achieve Congress's purposes or direction. Note that EPA explains above how its approach is consistent with subtitle D and the congressional scheme.

Finally, it is important to note that EPA is not suggesting that the management of CCR leachate is now subject to the CCR regulations. EPA has jurisdiction over CCR leachate because the material is solid waste not because it is CCR. Under the existing regulations the definition of CCR does not include leachate. See, 40 CFR 257.53. EPA did not propose to amend this regulation and does not currently intend to do so.

(b) Exclusions

Several commenters suggested a number of other exemptions. For example, one commenter suggested that the final rule exclude legacy impoundments that only contain *de minimis* quantities of CCR. According to the commenter, EPA's risk analysis from the 2015 CCR Rule supports the conclusion that up to 75,000 tons of CCR used as structural fill is generally safe. Therefore, the commenter recommended that inactive impoundments with 75,000 tons or less, be exempt from regulation. Other commenters urged EPA to clearly define what is meant by *de minimis* amounts of CCR in the context of legacy impoundments.

Other commenters requested that EPA exempt any legacy CCR surface impoundments that met State requirements for clean closure. These commenters argue that EPA cannot expect utilities who have closed legacy impoundments under State guidelines prior to this rulemaking to meet a standard that did not exist at the time of closure. These commenters also asserted that by regulating such units EPA is effectively disregarding a qualified State's regulatory authority to approve closure under the regulations and programs available to them at the time.

Other commenters suggested that EPA should allow facilities to certify that they had completed closure by removal in two additional situations. The first suggestion was to allow a facility to certify that it had complied with § 257.102(c) based solely on documentation that the facility had removed all ash by the effective date of the 2015 CCR Rule, unless EPA or the facility also had evidence (*e.g.,* from existing monitoring networks) of groundwater impacts that could impact human health or the environment. These commenters stated that EPA should not presume that there have been impacts to groundwater from an area where the ash has been fully removed years or even decades ago, absent specific evidence to the contrary. The second suggestion was that EPA exclude facilities that could certify and document that they have met the closure-in-place performance standards in § 257.102(d) by the effective date of this final rule. To support their proposal, the commenter noted that EPA has made it clear that the owner or operator of a CCR facility can close a CCR unit under either § 257.102 (c) or (d) and be in compliance with the Federal CCR regulations.

Finally, EPA received a number of comments on the kind of documentation that a facility needed to support a determination that it had closed a legacy impoundment by removal in accordance with the standards in § 257.102(c) prior to October 19, 2015. Some commenters requested that the final rule require facilities to post detailed documentation demonstrating compliance with § 257.102(c). Other commenters, however, objected to any documentation requirements, asserting that it was inconsistent with EPA's treatment of similar facilities in 2015, who were not required to provide any compliance documentation of closure requirements. These commenters requested EPA to remove the requirements under § 257.100(f)(1)(ii) and allow owners to make the closure determination.

(c) Final Requirements

Consistent with the proposal, this final rule provides that an impoundment that contained CCR (and liquids) on or after October 19, 2015 is subject to this rule. This means that if a facility closed a legacy CCR surface impoundment by removal before October 19, 2015, that site is not subject to this final rule. However, the final rule does not require such facilities to demonstrate that these units were closed ''in accordance with the performance standards in § 257.102(c).'' Under § 257.102(c) closure is complete when all CCR has been removed from the CCR unit, any areas affected by releases from the CCR unit have been removed, and groundwater monitoring concentrations do not exceed the groundwater protection standard in § 257.95(h) for Appendix IV constituents. The proposed rule incorrectly stated that EPA was proposing to impose a documentation requirement on these facilities. That statement was made in error; EPA did not intend to propose such a requirement. EPA did not propose to require a facility to document that an impoundment did not contain liquids prior to October 19, 2015. Nor did the 2015 CCR Rule require any facilities to document that they were not subject to regulation. These facilities were never subject to the exemption for inactive impoundments at inactive facilities that was vacated in the *USWAG* decision and therefore should not be regulated as part of EPA's action to implement the Court's order. Accordingly—and consistent with the 2015 CCR Rule—if all CCR and liquids have been removed from the impoundment prior to October 19, 2015, nothing further is required.

Under the definition in the final rule, a facility that initiated closure by removal prior to October 19, 2015, but whose impoundment still contained CCR and liquids on or after October 19, 2015 is considered a legacy CCR surface impoundment and regulated under this final rule, even if the facility has removed all CCR prior to the effective date of this final rule. Depending on when the impoundment completes closure, some individual requirements may no longer be applicable to the legacy CCR surface impoundment (*e.g.,* when the compliance date in the final rule falls after the date closure is completed for the impoundment); but as EPA explained in the proposal, the Agency has no basis for concluding that all legacy CCR surface impoundments that are still in the process of closing pose no risk.

The final rule retains the provision under which a facility with a CCR surface impoundment that contained CCR and liquids on October 19, 2015, but that completed closure by removal before the effective date of this rule, would only be required to post documentation on the facility's CCR website that it has met the standards in § 257.102(c) for that unit (*i.e.,* the certification of closure by removal for legacy CCR surface impoundments). To be eligible for the closure certification, the facility must document that it meets the criteria laid out in Unit III.B.2.b.iii. Namely, the facility must demonstrate that consistent with the existing standards, all CCR has been removed from the unit, any areas affected by releases from the CCR unit have been removed, and must have groundwater monitoring data demonstrating that the concentrations of each Appendix IV constituent do not exceed the relevant groundwater protection standard, which would be either the MCL or background concentration, for two consecutive sampling events.

If a facility certifies all of the legacy CCR surface impoundments on-site have met the requirements in § 257.102(c) for closure by removal before the effective date of this rule, the facility would not be subject to any further requirements under this final rule (*i.e.,* neither legacy CCR surface impoundment requirements or CCRMU requirements).

For similar reasons as explained above, EPA cannot accept the commenter's suggestion that EPA establish the same provision for facilities that closed a legacy impoundment prior to the effective date of this final rule in accordance with § 257.102(d) (closure when leaving CCR in place) and allow facilities to simply demonstrate that the closure meets the performance standards in § 257.102(d). The commenters appear to be requesting an exemption from post closure groundwater monitoring and corrective action requirements, but provided no factual basis for such an exemption. Nevertheless, as discussed in Unit III.B.2.g.iii of this preamble, if a facility can document that the closure of its unit meets the performance standards in § 257.102(d), all that would be required is compliance with the groundwater monitoring requirements in §§ 257.90–257.95, and any necessary corrective action throughout the post-closure care period (in addition to recordkeeping and posting).

The documentation requirements, procedures, and compliance deadlines for these various options are discussed further in Unit III.B.2.g of this preamble.

EPA also disagrees with the commenter that 75,000 tons is a *de minimis* amount of CCR. The commenter has misunderstood EPA's findings in 2015; EPA did not conclude that quantities of CCR lower than 75,000 tons used as fill does not pose any risk to human health or the environment. Rather EPA concluded that, while the agency has sufficient information to document that unencapsulated uses can present a hazard, based on the rulemaking record EPA lacked the information necessary to demonstrate that unencapsulated uses in amounts lower than 12,400 tons are likely to present a risk. 80 FR 21352. In any event, as discussed in Unit III.A.4, recent EPA modeling demonstrates that far lower quantities of CCR (1,000 tons) can pose significant risks to human health and the environment.

In the 2015 CCR Rule, EPA provided guidance on which impoundments would not meet the definition of a CCR impoundment because they generally do not contain significant levels of CCR. 80 FR 21357. Specifically, EPA explained that CCR surface impoundments do not include units generally referred to as cooling water ponds, process water ponds, wastewater treatment ponds, storm water holding ponds, or aeration ponds. These units do not meet the definition of a CCR surface impoundment, that is, they are not designed to hold an accumulation of CCR and treatment storage or disposal of accumulated CCR does not occur in these units. Accordingly, EPA considers that such units would also not be legacy impoundments. EPA acknowledges that it mistakenly referred to one of these units as a CCR surface impoundment in the proposal, but that was an error.

c. Legacy CCR Surface Impoundment—Requirement To Be Located at an ''Inactive Facility''

EPA proposed to define an ''inactive facility'' (or inactive electric utility or independent power producer) as one that ceased producing electricity prior to October 19, 2015, which is the effective date of the 2015 CCR Rule. EPA explained that this date is also the same date currently used in the regulation to define ''active facility'' under § 257.53, and that EPA originally used this date to define the exempted inactive units in the 2015 CCR Rule. The proposal further explained that use of this date would mean that the same universe of units that were subject to the original exemption would be regulated and that this is consistent with the Court's vacatur, as vacatur is intended to restore the status quo ante, as though the vacated provision never existed. 88 FR 31994, 32034.

Commenters supported October 19, 2015, as the operative date to be used in the definition of an inactive facility because any other date would be inconsistent with the existing definition of an ''active facility.'' However, many commenters opposed the proposed substitution of the phrase ''regardless of the fuel currently used to produce electricity'' with ''regardless of how electricity is currently being produced at the facility.'' According to these commenters, the existing definition of ''active facility'' does not extend to facilities that do not use fuel, including, for example, facilities that produce solar power, because the plain language of § 257.50(c) makes clear that, to be active, a facility must use a fuel to produce electricity. These commenters cite two preamble statements in the 2015 CCR Rule to support their allegation. The first is the applicability section of 2015 CCR Rule, which only references the NAICS 221112 (Fossil Fuel Power Generation). These commenters speculate that if EPA had intended for the term ''active facility'' to extend to facilities that do not use fuel to produce electricity, EPA would have included other NAICS codes. The second statement appears in the executive summary and explains that the rule applies to:

> Certain inactive CCR surface impoundments (*i.e.,* units not receiving CCR after the effective date of the rule) at active electric utilities or independent power producers' facilities, regardless of the fuel currently used at the facility to produce electricity (*e.g.,* coal, natural gas, oil), if the CCR unit still contains CCR and liquids.

80 FR 21303.

The commenters contended that EPA's proposal represents a significant change that will subject renewable generation to the CCR regulations (*e.g.,* a former coal-fired power plant that was retired, closed and dismantled well in advance of the 2015 CCR Rule that had new renewable generation built at the facility), creating strong disincentives to renewable repowering at those sites. These commenters further added that such a change in position requires EPA to take reliance interests into account. To address this, the commenters made two suggestions. The first was that EPA should establish an exemption from regulation for inactive facilities that generate 50 megawatt (MW) or less to the grid (all from renewable energy). The 50 MW threshold is consistent with the small generating units subcategory under the Federal effluent limitations guidelines and standards (ELG) regulations.[56] In addition, the commenters believed that this would also account for sites that have utilized renewable energy (*e.g.,* solar panels) for the primary purpose of powering the remaining infrastructure, but may potentially supply very limited amounts to the grid on occasion.

The second suggestion was that EPA confirm that this is a prospective change and provide a pathway for compliance for facilities that would be newly subject to the CCR Rule. According to those facilities relied in good faith on the explanatory statements in the 2015 CCR Rule preamble and the plain meaning of the term ''fuel,'' believed they were inactive facilities and did not have units subject to requirements of the CCR Rule, and accordingly should be allotted a separate new compliance timeframe.

EPA disagrees that the phrase ''regardless of the fuel currently used to produce electricity'' under § 257.50(c) indicates that EPA meant to limit the rule to facilities that combust fossil fuels. As EPA stated in the proposed rule, the definition of an active facility at § 257.53 does not include any limitation related to how the facility generates electricity. The clause, ''regardless of the fuel currently used to produce electricity'' in § 257.50(c) does not limit coverage only to facilities that use fuel to generate electricity. The plain language of the clause actually states the opposite; that coverage applies *without regard to the fuel used* to produce electricity. Or in other words, without regard to the type of fuel used or indeed whether any fuel is used to produce electricity.

EPA also disagrees that either of the cited preamble statements demonstrate a contrary intent. As the commenters themselves acknowledge, the discussion of affected entities expressly states that it ''may not be exhaustive; other types of entities not listed could also be affected.'' 80 FR 21302. In addition, EPA expressly stated that ''[t]o determine whether your facility, company, business, organization, etc., is affected by this action, you should refer to the applicability criteria discussed in Unit VI.A of this document.'' Id. Similarly, the parenthetical description ''(*e.g.,* coal, natural gas, oil)'' uses the abbreviation *e.g.,* which indicates that it is not comprehensive.

[56] 80 FR 67838 (November 3, 2015).

Consequently, EPA disagrees that facilities have any reliance interest in a less expansive definition. Generally, a reliance interest may be implicated if an agency issues a policy, a party takes an action based on that policy, and the agency subsequently changes its policy. *DHS* v. *Regents of the Univ. of Cal.,* 140 S. Ct. 1891, 1913 (2020). Here, EPA never changed its position, and there can be no legitimate reliance on a non-existent past position.

Even if the regulatory amendment reflected a changed in policy, EPA issued a proposal and solicited comment from affected entities on the substance of the policy that would be in place in the final action. The commenters had an opportunity to provide EPA with information detailing their reliance interests, although they failed to do more than allege that they had reliance interests in remaining exempt. EPA has explained why, notwithstanding those interests, the agency believes that this is the better policy. No more is required. *DHS* v. *Regents of the Univ. of Cal., supra* at 1913.

Nevertheless, EPA is sensitive to not creating disincentives to renewable repowering at those sites. In addition, EPA acknowledges that although commenters' interpretation is not the best reading of the provision, it is a plausible one. Accordingly, EPA has adopted the commenters' suggestion that the Agency provide a pathway to compliance for facilities that believed they were inactive facilities and did not have units subject to the requirements of the 2015 CCR Rule. This final rule provides that facilities producing electricity through renewables (*i.e.,* non-fuels) are subject to the same applicable compliance deadlines for these units. See § 257.100(a)(1).

EPA is rejecting the commenters' suggestion that EPA exempt inactive facilities that generate 50 megawatt (MW) or less to the grid. This is because an exemption for small generating units based on current operations, such as renewable generation with a capacity of 50 MW or less, do not necessarily correlate to the current risks resulting from past coal-fired generation operations.

d. Innocent Owners

EPA proposed not to establish an ''innocent owner'' provision in the CCR regulations, in part because EPA had no factual basis to establish one. 88 FR 31994–95. The Agency received comments both opposing and supporting such a provision. Most commenters opposed the inclusion of an innocent owner provision in the final rule. Some of these stated that there is no statutory basis for uniformly excluding existing owners and operators from any RCRA regulations applicable to legacy impoundments. According to these commenters, the concept of an ''innocent owner'' does not apply to legacy impoundments because only the owner of the regulated unit can fulfill obligations involving affirmative regulatory controls.

Other commenters stated that relevant parties may allocate liability among themselves through various agreements and arrangements. These commenters explained that liability should not be rigidly limited only to the current owner, that liability should honor existing agreements (*e.g.,* purchase and sale agreement), and that it may be appropriate under some circumstances for shared responsibility between the current owner and the utility. Another commenter stated that each of the utilities and each transferee should remain responsible for rule compliance regardless of how responsibility is currently allocated.

Other commenters supported adoption of an innocent owner provision in the regulations. These commenters claimed that EPA is responsible for creating a new class of innocent owner when it changed the 2015 CCR regulations. Consequently, these commenters urged EPA to develop an innocent landowner provision that would allow both the utilities and developers to come to a mutual agreement as to who has the environmental and financial responsibility of these newly regulated units. Finally, another commenter suggested EPA take time to evaluate the different types of innocent property owners and then consider adding an innocent owner provision to the regulations.

EPA has not included an innocent owner provision in the final rule. EPA explained in the proposal that its analysis of inactive facilities found that most inactive facilities are owned by companies that are already regulated by the CCR regulations. The analysis presented in the proposed rule indicated that approximately 80% of potential legacy impoundments (*i.e.,* 126 of the 156 identified potential units) are owned by companies the Agency knows as already having units subject to the CCR regulations. 88 FR 31994. As a consequence, EPA proposed it had no factual basis to establish an innocent owner provision. 88 FR 31995. EPA has updated the ownership analysis based on an updated list of potential legacy impoundments. The revised analysis continues to indicate that most inactive facilities are owned by companies that are already regulated by the CCR regulations. The 194 potential legacy impoundments identified in the final rule are associated with 52 different unique corporate parents. Of the 194 impoundments, 142 units (or 73%), are owned by 28 companies the Agency knows own facilities currently subject to the CCR regulations. The remaining 52 impoundments are owned by 24 different companies, with each company generally having just one location/site with legacy CCR surface impoundments (with two exceptions, that each own two sites).

EPA is also aware of a number of instances in which parties have allocated liability among themselves through various agreements and arrangements. EPA infers from this that an innocent landowner provision is not necessary to allow utilities and developers to come to a mutual agreement on how best to allocate environmental and financial responsibility. EPA has no interest in taking actions that could potentially inhibit or interfere with these private arrangements. For all these reasons EPA continues to believe that an innocent owner provision is not currently needed and has not included such a provision in the final rule.

2. Applicable Requirements for Legacy CCR Surface Impoundments and Compliance Deadlines

This Unit of the preamble first provides a general overview of how EPA determined the applicable requirements and compliance deadlines for legacy CCR surface impoundments. Then, EPA discusses each of the existing requirements for CCR surface impoundments and explains: (1) Why EPA is (or is not) applying them to legacy CCR surface impoundments; and (2) The rationale for the compliance deadline EPA is finalizing for each requirement.

a. General Overview

i. Applicable Requirements for Legacy CCR Surface Impoundments

EPA proposed to apply all of the existing requirements in 40 CFR part 257, subpart D that are currently applicable to inactive CCR surface impoundments to legacy CCR surface impoundments, except for the location restrictions at §§ 257.60 through 257.64, and the liner design criteria at § 257.71. EPA also proposed one revision to the existing groundwater monitoring requirements and three new requirements specific to legacy CCR surface impoundments: a reporting requirement; a new security requirement to restrict public access to these sites; and a closure certification. As explained in the proposed rule, EPA proposed to exclude the location restrictions and the liner design criteria requirements because EPA believed they would not be necessary if EPA took final action on the proposed requirement that all legacy CCR surface impoundments initiate closure no later than 12 months after the effective date of the final rule. Furthermore, the proposed rule explained that the record for the 2015 CCR Rule demonstrated that ''there is little difference between the potential risks of an active and inactive surface impoundment; both can leak into groundwater, and both are subject to structural failures that release the wastes into the environment, including catastrophic failures leading to massive releases that threaten both human health and the environment.'' 80 FR 21343. As discussed in Unit II.B of this preamble, the D.C. Circuit came to the same conclusion, and on that basis, vacated the exemption for legacy CCR surface impoundments. See, *USWAG* at 901 F.3d at 434. Based on the record, EPA considered that it has limited discretion to establish requirements for legacy CCR surface impoundments that are significantly different than those currently applicable to inactive CCR impoundments. This is also consistent with how the *USWAG* court viewed the 2015 record. Accordingly, EPA proposed that in most cases the existing requirements in 40 CFR part 257, subpart D applicable to inactive CCR surface impoundments would apply to legacy CCR surface impoundments.

EPA received numerous comments on the proposed rule regarding the requirements applicable to legacy CCR surface impoundments. Several commenters generally supported the regulatory approach, although some suggested that legacy CCR surface impoundments be subject to all the existing CCR regulations, including the location restrictions at §§ 257.60 through 257.64 and the liner design criteria at § 257.71. Other commenters stated that the inspections at § 257.83 were only relevant for operating CCR units and therefore should not be applied to legacy CCR surface impoundments. A few commenters suggested EPA create additional requirements for legacy CCR surface impoundments such as zero discharge limits, new reporting requirements, financial assurance measures, and beneficial reuse restrictions. Other commenters suggested that EPA revise the existing requirements applicable to inactive impoundments, including by adding requirements to the fugitive dust, closure, and post-closure care requirements; further revising the groundwater monitoring requirements to ban intrawell data comparisons; mandating closure by removal; and using a risk-based approach for corrective action and closure requirements.

EPA still considers that based on the record (as described in III.A of this preamble), EPA has limited discretion to establish requirements for legacy CCR surface impoundments that are significantly different than those currently applicable to inactive CCR impoundments. For that reason and those laid out in the preamble of the proposed rule, EPA did not adopt any of the new requirements, such as zero discharge limits, new reporting requirements, financial assurance measures, or new beneficial use restrictions suggested by commenters. The final rule contains only one additional revision of the existing requirements for inactive CCR surface impoundments beyond the four included in the proposed rule: the deferral to permitting of certain closure activities. The rationale for the final requirements is detailed in subsequent sections in this Unit.

For the reasons detailed in the proposed rule, except for certain legacy impoundments, EPA is finalizing the requirement for legacy CCR surface impoundments to comply with the existing regulations in 40 CFR part 257, subpart D applicable to inactive CCR surface impoundments except for the location restrictions at §§ 257.60 through 257.64, and the liner design criteria at § 257.71. EPA is also finalizing the revision to the existing groundwater monitoring requirements, combining detection and assessment monitoring for legacy CCR surface impoundments and the two new requirements specific to legacy CCR surface impoundments: the applicability documentation (§ 257.100(f)(1)(i)) and the site security requirement (§ 257.100(f)(3)(iii)).

The final rule also establishes a tailored subset of requirements applicable to legacy CCR surface impoundments that were closed prior to the effective date of this rule, including those impoundments whose closures qualify for deferral because they were conducted in accordance with substantially equivalent State or Federal requirements. See Unit III.B.2.g.iii.(b) of this preamble for further discussion of the deferral.

(a) Applicable Requirements for Legacy CCR Surface Impoundments Closed by Removal

EPA is finalizing a tailored subset requirements for legacy CCR surface impoundments that have completed closure by removal before the effective date of this final rule but are not able to complete the certification of closure by removal (see, Unit III.B.2.b.iii). For the reasons detailed in this Unit and in the following Units of the preamble (Units III.B.2.b–III.B.2.h), the owner or operator of such units must comply with the following requirements: the applicability report, installation of a permanent marker, all groundwater monitoring and corrective action (including combined detection monitoring and assessment monitoring), recordkeeping, notification, and website posting. In addition, if a CCRMU is discovered onsite during the course of complying with the Facility Evaluation Report (FER), the owner or operator of these units must develop a fugitive dust control plan (see Unit III.C.3).

While EPA acknowledges that these closed units are unlikely to have any ongoing activities that would create fugitive dust, EPA determined that requiring these units to comply with the fugitive dust requirement was appropriate because these units are subject to the CCRMU requirements and there is a reasonable likelihood that CCR fugitive dust would be generated as part of the actions required to comply with those requirements (*e.g.,* field work to determine the presence or absence of CCRMU, CCRMU closure). As such, if a CCRMU is discovered onsite of a facility with a legacy CCR surface impoundment that has closed by removal, the owner or operator must complete a fugitive dust plan no later than six months after the FER is due (*i.e.,* no later than 33 months after becoming subject to these requirements).

EPA determined that the site security requirements applicable to other legacy CCR surface impoundments would not be relevant for this subset of units as the CCR has been removed from the unit and the land may be being used for another purpose (*e.g.,* nature preserve, agricultural land, redevelopment). However, EPA expects legacy CCR surface impoundments that closed by removal to protect the monitoring equipment and monitoring wells, similar to other legacy CCR surface impoundments.

EPA is also not requiring these units to comply with any other design criteria or operating criteria, aside from the installation of the permanent marker and the fugitive dust requirements, as noted above. EPA has determined that the other design and operating criteria are not applicable to units that have closed by removal and therefore no longer contain CCR in the unit on the effective date of this final rule. For example, the requirement to prepare and maintain an EAP is not relevant when CCR is no longer present in the unit nor is the requirement to conduct weekly inspections of the legacy impoundment.

(b) Applicable Requirements for Legacy CCR Surface Impoundments That Closed With Waste in Place

EPA is finalizing a tailored subset of requirements for legacy CCR surface impoundments that, by the effective date of this final rule, have completed: (1) closure with waste in place or (2) a closure eligible for deferral to permitting as described in Unit III.2.g.iii(b). For the reasons detailed in this Unit and in the following sections (Units III.B.2.b–III.B.2.h), the owner or operator of such units must comply with the following requirements: applicability report, site security, installation of the permanent marker, history of construction, fugitive dust control plan, annual fugitive dust control report, all groundwater monitoring and corrective action (including combined detection monitoring and assessment monitoring), written post-closure care plan, post-closure care, recordkeeping, notification, and website posting. In addition, the final rule requires the facility to provide information on the completed closure of the legacy CCR surface impoundment, along with supporting documentation to demonstrate that the closure meets the performance standards in § 257.102(d) or the standards specified in § 257.101(g).

While EPA acknowledges that these closed units are unlikely to have any ongoing activity that would create fugitive dust, EPA determined that requiring these units to comply with the fugitive dust requirement was appropriate because these units are subject to the CCRMU requirements and there is a reasonable likelihood that CCR fugitive dust would be generated as part of the actions required to comply with those requirements (*e.g.,* field work to determine the presence or absence of CCRMU, CCRMU closure). As such, if a CCRMU is discovered onsite of a facility with a legacy CCR surface impoundment that has closed by removal, the owner or operator must complete a fugitive dust plan no later than six months after the FER is due (*i.e.,* no later than 33 months after becoming subject to these requirements).

EPA is also finalizing the requirement for this subset of legacy CCR surface impoundments to comply with the site security requirements applicable to other legacy CCR surface impoundments. EPA determined that the site security requirements are needed to minimize the potential for the unauthorized entry of people or animals to disturb the final cover system, as these units are unlikely to be monitored. EPA also expects facilities that closed legacy CCR surface impoundments with waste in place to protect the monitoring equipment and monitoring wells, similar to other legacy CCR surface impoundments.

This final rule also requires the owners and operators of these units to complete the history of construction in accordance with § 257.73(c). The history of construction provides information regarding the original site conditions, as well as the unit's original design and construction, such as cross sections of the length and width of the CCR unit. It would also include information on subsequent revisions, such as the design and construction of any lateral expansions. This information is relevant to designing (and evaluating) the groundwater monitoring system, unit closures, and corrective actions. For example, the history of construction would normally include the elevations of the unit base and the CCR in the unit (*i.e.,* the ground elevation contours within the footprint prior to unit construction); this information, in conjunction with the site characterization developed under § 257.90 to design the groundwater monitoring system can be used to determine whether the unit intersects with the groundwater (*i.e.,* the unit's ability to sufficiently contain CCR and contaminants that may leach from CCR). This information remains relevant in evaluating closure, when addressing any contamination coming from the unit, and throughout the post-closure care period. Therefore, EPA is requiring this subset of legacy CCR surface impoundments to comply with the history of construction requirement.

EPA has determined that the other design and operating criteria (all those besides the permanent marker, site security, history of construction, and fugitive dust requirements) are not applicable to units that have completed closure in accordance with § 257.102(d) by the effective date of this final rule. For example, the requirement to prepare an inflow design flood control system plan is not relevant for units that have installed a final cover system, as post-closure care requires a final cover system to be maintained and groundwater monitoring to continue. Additionally, periodic assessments, such as the hazard potential classification assessment and the structural stability assessments, are intended to address risks from unclosed unit and therefore, consistent with the requirements for units that have completed closure under the 2015 CCR Rule, are not applicable to units that have closed with waste in place.

ii. Compliance Deadlines for Legacy CCR Surface Impoundments

EPA proposed to establish new compliance dates for legacy CCR surface impoundments. The proposed rule explained that the 2015 CCR Rule compliance deadlines were based on the amount of time determined to be necessary to implement the requirements and the proposed compliance dates for legacy CCR surface impoundments were determined using the same approach. The proposed rule further explained that some factors considered in determining the 2015 CCR Rule compliance deadlines were not relevant for legacy CCR surface impoundments, such as the need coordinate compliance deadlines with the then recently promulgated ELG rule. In addition, EPA anticipated most facilities would already be familiar with the existing regulations, and therefore the proposed requirements for legacy CCR surface impoundments, and fewer facilities and units would need to come into compliance, as compared to the 2015 CCR Rule. Consequently, EPA proposed generally expedited deadlines based on the expected shortest average amount of time needed to complete the necessary activities to meet the requirements. In the proposed rule, EPA requested comment on the proposed compliance deadlines and the feasibility to meet the proposed compliance timeframes for legacy CCR surface impoundments.

EPA received numerous comments regarding the proposed compliance deadlines. Several commenters expressed support for the proposed compliance deadlines for legacy CCR surface impoundments. Generally, these commenters stated that expedited compliance was appropriate due to the increased risk posed by these units, the likelihood that these units are actively contaminating groundwater, and the urgent need for corrective action to address that contamination for the protection of human health and the environment. Some of these commenters echoed the proposed rule, stating that owner's or operator's familiarity with the existing requirements, along with the fact that these units are no longer in use and therefore would not need time to cease receipt of waste, further justified the expedited deadlines.

Many other commenters stated the proposed compliance deadlines were infeasible and should, at a minimum, allow as much time for compliance as the 2015 CCR Rule deadlines, although several commenters expressed that even the 2015 CCR Rule deadlines were inadequate, and that the insufficient timeframes were likely a factor in the gap between EPA's expectations and facilities' good faith efforts and utilization of best practices in developing groundwater monitoring networks, sampling and analysis plans, corrective action programs, and closure plans. Commenters pointed to several factors that they believed EPA did not fully incorporate into the proposed deadline calculations that make compliance with the proposed deadlines infeasible: the large number of CCR units (*i.e.,* existing CCR units, legacy CCR surface impoundments, CCRMU) competing for limited resources to meet overlapping compliance deadlines; the limited number of qualified contractors available to conduct necessary activities to reach the compliance deadlines; the nationwide labor shortage exacerbated by impacts from the COVID–19 pandemic; limited existing alternative disposal options; overlapping regulatory requirements (*e.g.,* State drilling permits, timing restrictions related to protected habitats, State CCR permits, Consent Decrees/Orders); seasonality impacts in different regions across the nation; and accessibility and completeness, or lack thereof, of historical documentation and information. One commenter provided specific information regarding typical delays experienced during the implementation of the 2015 CCR Rule caused by third-party availability and backlogs: two to four weeks for contractor mobilization; two to six weeks for site clearing; two to three weeks for surveys; three to 12 weeks for environmental drillers; and three to four weeks for laboratory analyses. These commenters also said EPA grossly underestimated the amount of time needed to hire a contractor, locate and review historical information, access a legacy CCR surface impoundment site, characterize and delineate a site, comply with the groundwater monitoring requirements, and conduct quality control or quality assurance on data and reports. Several of these commenters expressed the belief that the proposed deadlines would result in unintentional non-compliance despite facilities' best efforts to comply due to the constraints listed above. Finally, a few commenters suggested EPA create alternative deadlines or mechanisms for extensions based on site-specific characteristics.

In response to comments, EPA reevaluated the compliance deadlines for legacy CCR surface impoundments. EPA reconsidered the impact of the following on the amount of time facilities needed to complete the activities involved in meeting the requirements: accessibility and abundance, or lack thereof, of historical documentation; seasonality; clearing restrictions and required local and State approvals to clear vegetation or drill wells; existing disposal options; impact of the national labor shortage and contractor and laboratory backlogs; and overlapping compliance deadlines for CCRMU, existing units (*i.e.,* groundwater monitoring, closure, and post-closure care), and legacy CCR surface impoundments. Overall, EPA found the information provided regarding the infeasibility of the proposed deadlines convincing. Specifically, EPA agrees that the shortage of qualified contractors and laboratory resources has persisted, if not increased, since the 2015 CCR Rule and that the increasing demand on these finite resources from new and existing CCR units, legacy CCR surface impoundments, and CCRMU complying with overlapping requirement deadlines will likely increase the time needed to come into compliance. EPA acknowledges that the proposed deadlines did not adequately account for those nationwide impacts of seasonality and extreme weather events; necessary coordination with outside parties (*e.g.,* State agencies, local governments); locating disposal capacity for those units closing by removal; the need to comply with overlapping regulatory requirements, such as State drilling permits or timing restrictions related to protected habitats; or necessary quality assurance and quality control in calculating the proposed deadlines. Therefore, as detailed in Units III.B.2.b through h, EPA extended the deadlines for legacy CCR surface impoundments to provide at least as much time facilities had to come into compliance with the 2015 CCR Rule. In some cases, EPA extended the deadlines for legacy CCR surface impoundments even further to mitigate factors mentioned by commenters that convinced EPA the 2015 compliance deadlines would be infeasible for legacy impoundments. Overall, most of the comments EPA received supported deadlines that allowed at least as much time as EPA originally provided in the 2015 CCR Rule. While some units regulated by the 2015 CCR Rule were able to come into compliance before the 2015 deadlines, the majority of units used all the time allowed by the 2015 CCR Rule.

Note that all deadlines herein are framed by reference to the effective date of the rule; the final rule will be effective six months after publication of the final rule. Accordingly, facilities will have an additional six months beyond the deadlines to come into compliance. The Agency has included a document in the docket for this rule that summarizes the finalized compliance deadlines.[57]

TABLE 1—FINAL COMPLIANCE TIME FRAMES FOR LEGACY CCR SURFACE IMPOUNDMENTS

40 CFR Part 257, Subpart D requirement	Description of requirement to be completed	Deadline (months after effective date of this final rule)	Date
Applicability Report (§ 257.100)	Complete applicability report	0	Friday, November 8, 2024.
Internet Posting (§ 257.107)	Establish CCR website	0	Friday, November 8, 2024.
Site Security (§ 257.100(f)(3)(iii))	Implement site security measures	0	Friday, November 8, 2024.
Operating Criteria (§ 257.80)	Prepare fugitive dust control plan	0	Friday, November 8, 2024.
Operating Criteria (§ 257.80, 257.82, 257.83).	Initiate weekly inspections of the CCR unit.	0	Friday, November 8, 2024.
Operating Criteria (§ 257.80, 257.82, 257.83).	Initiate monthly monitoring of CCR unit instrumentation.	0	Friday, November 8, 2024.
Design Criteria (§ 257.73)	Install permanent marker	2	Wednesday, January 8, 2025.
Operating Criteria (§ 257.80, 257.82, 257.83).	Complete initial annual inspection of the CCR unit.	3	Monday, February, 10, 2025.
Operating Criteria (§ 257.80)	Complete initial annual fugitive dust report.	14	Thursday, January 8, 2026.
Design Criteria (§ 257.73)	Compile history of construction	15	Monday, February 9, 2026.
Design Criteria (§ 257.73)	Complete initial hazard potential classification assessment.	18	Friday, May 8, 2026.
Design Criteria (§ 257.73)	Complete initial structural stability assessment.	18	Friday, May 8, 2026.
Design Criteria (§ 257.73)	Complete initial safety factor assessment.	18	Friday, May 8, 2026.
Design Criteria (§ 257.73)	Prepare emergency action plan	18	Friday, May 8, 2026.
Operating Criteria (§ 257.82)	Complete initial inflow design flood control system plan.	18	Friday, May 8, 2026.
GWMCA (§§ 257.90–257.95)	Install the groundwater monitoring system, develop the groundwater sampling and analysis program, initiate the detection monitoring and assessment monitoring. Begin evaluating the groundwater monitoring data for SSIs over background levels and SSLs over GWPS.	30	Monday, May 10, 2027.
GWMCA (§ 257.90(e))	Complete initial annual GWMCA report.	January 31, 2027	January 31, 2027.
Closure (§§ 257.100–257.101)	Prepare written closure plan	36	Monday, November 8, 2027.
Post-Closure Care (§ 257.104)	Prepare written post-closure care plan.	36	Monday, November 8, 2027.
Closure and Post-Closure Care (§ 257.101).	Initiate closure	42	Monday, May 8, 2028.

b. New Requirements Specific to Legacy CCR Surface Impoundments

i. Applicability Report for Legacy CCR Surface Impoundments

EPA proposed to require the owner or operator of a legacy CCR surface impoundment to prepare an applicability report for any legacy CCR surface impoundment at that facility no later than the effective date of the final rule. This requirement would apply to all legacy CCR surface impoundments, including incised impoundments and impoundments that do not meet the height and storage volume cutoffs specified in § 257.73(b). EPA proposed that this applicability report would include information to identify the unit, delineate the unit boundaries, include a figure of the facility and where the unit is located at the facility, the size of the unit, its proximity to surface water bodies, and the current site conditions. EPA also proposed that the applicability report include the facility address, latitude and longitude, and contact information of the owner and/or operator of the legacy CCR surface impoundment with their business phone number and email address. EPA proposed that the report should document whether the legacy CCR surface impoundments are incised and whether the units meet the height and storage volume thresholds specified in § 257.73(b). EPA also proposed that the owner or operator of the legacy CCR surface impoundment notify the Agency

[57] A document ''Final Rule Compliance Deadlines for Legacy CCR Surface Impoundments. April 2024.'' is available in the docket for this action.

after a legacy impoundment is identified and the facility's CCR website is established, using the procedures currently in § 257.107(a) via the ''contact us'' form on EPA's CCR website. 88 FR 31998.

EPA received a few comments on the applicability report. Several commenters said the deadline to complete requirements of the applicability report could not be achieved. One commenter requested 24 months to complete the report. Another commenter presented several clarifying questions and said they could not estimate a compliance deadline without understanding these clarifications. This commenter asked if EPA will allow affected utilities to rely on information previously submitted to State regulatory authorities to satisfy the facility description requirements; what does EPA mean by the term ''current site conditions'' in the context of facility site descriptions; when EPA refers to providing a site identification number as previously provided to the State, is this intended only to apply in States that have achieved CCR Rule delegation, or in all States in which there is some level of State oversight over a legacy CCR surface impoundment; and if EPA can further determine what it considers to be ''reasonably and readily available information'' concerning history of construction. The commenter appreciates EPA's recognition that most of this information is likely ''unknown or lost to time,'' but seeks additional guidance on the scope of investigation that should be conducted to meet the ''reasonably and readily available'' standard.

EPA believes that as part of the applicability report, an owner or operator of an inactive CCR facility can include information previously submitted to State regulatory authorities to describe the facility conditions. If, however, any changes have been made since the owner or operator last prepared that information or that information does not address all the issues inherent in an applicability determination, then updated or additional information should be included. The current site conditions should include, for example, when the facility operated, when it ceased generating electricity, the size of the facility property, a visual description of how the legacy impoundment looks on the effective date of the final rule (*e.g.,* ponded water, approximate size, vegetation, incised), a description of any nearby geological or hydrologic features (*i.e.,* rivers, lakes, streams, karst topography), and any other relevant information about the facility. The State identification number can be for a previously issued solid waste, water, or other permit under State program, but does not have to be as part of an EPA-approved State CCR permit program.

EPA addressed the term ''reasonably and readily available'' at 80 FR 21380, ''[t]herefore, in this rule, EPA is using the phrase 'to the extent available' and clarifying that the term requires the owner or operator to provide information on the history of construction only to the extent that such information is reasonably and readily available. EPA intends facilities to provide relevant design and construction information only if factual documentation exists. EPA does not expect owners or operators to generate new information or provide anecdotal or speculative information regarding the CCR surface impoundment's design and construction history.''

Based on the comments about the infeasibility to complete the proposed requirements by the effective date of the final rule, EPA is not requiring that the applicability report include the size of the unit, its proximity to surface water bodies, or delineation of the unit boundaries. The size of the unit and delineation of the unit boundaries will be determined through the history of construction and groundwater monitoring requirements. Proximity to surface water bodies is not required by the 2015 CCR Rule, and EPA determined it is not feasible to determine the distance to surface water bodies before the unit boundaries are delineated, which would not be done by the effective date of the final rule. Therefore, EPA is not requiring proximity to surface water bodies to be completed in the applicability report.

Some commenters agreed with the proposed requirements on the applicability report and urged EPA to require additional information, including an EPA identification number, determination and public disclosure of whether legacy CCR surface impoundments contained both CCR and liquids, location and elevation of any 100-year floodplain within one mile, elevation and depth of CCR waste in the impoundment, proximity to public water supply wells or private water wells within two miles, proximity to wetlands, results of all environmental sampling, and owner/operator certification of the documentation. A commenter also said the applicability report should include a full investigation including the use of appropriate instrumentation to determine water levels, a report documenting the results certified by a qualified professional engineer, and the publication of the report on a CCR website.

EPA considered these comments and decided not to require additional information since the recommended information would not be feasible to collect by the effective date of the final rule, especially given the limitations discussed in Unit III.B.2.a.i of this preamble. As stated previously, commenters discussed how delineating the unit boundaries and determining the exact location of the legacy CCR surface impoundment could not feasibly be completed by the deadline.

EPA is finalizing with revisions the proposed requirement for the owner or operator of a legacy CCR surface impoundment to prepare applicability reports for all legacy CCR surface impoundments at that facility no later than the effective date of the final rule. This requirement applies to all legacy CCR surface impoundments, including incised impoundments and impoundments that do not meet the height and storage volume cutoffs specified in § 257.73(b). This is codified in the regulatory text at § 257.100(f)(1)(i). The applicability report must include information to identify the unit, a figure of the facility and where the unit is located at the facility, and the current site conditions. The applicability documentation must also include the facility address, latitude and longitude, and contact information of the owner and/or operator of the legacy CCR surface impoundment with their phone number and email address. EPA is also finalizing the requirement that the owner or operator of the legacy CCR surface impoundment notify the Agency of the establishment of the facility's CCR website using the procedures currently in § 257.107(a) via the ''contact us'' form on EPA's CCR website.

Further, EPA is finalizing a requirement that a certification of the applicability report must be signed by the owner or operator or an authorized representative similar to the certification that is required at § 257.102(e) and § 257.102(f) for existing units undergoing closure. EPA proposed this requirement in § 257.75(c) for the FER and determined after reviewing the comments that a similar requirement should apply to the applicability report. This requirement is codified in the regulatory text at § 257.100(f)(1)(ii)(C).

For any legacy impoundments that have completed closure by removal or closure in place of the unit pursuant to a State permit or order that meets the requirements of § 257.101(g) prior to the effective date of this final rule, EPA is requiring the owner or operator to attach such documentation to the applicability report required by § 257.100(f)(1) and post this documentation to its CCR website. This information will be evaluated by EPA permitting authorities at a future time to determine what further action, if any, is needed with the unit.

As discussed in Unit III.B.1.b.i.(b)(4) of this preamble, EPA is establishing a new definition of the phrase ''contains both CCR and liquids'' in the final rule. Under this definition CCR and liquids are present in a CCR surface impoundment except where the owner or operator has demonstrated that free liquids have been eliminated from the unit consistent with the performance standard in § 257.102(d)(2)(i). EPA recognizes that some owners and operators of inactive impoundments may not currently have records to demonstrate whether their inactive impoundment contained both CCR and liquids on or after October 19, 2015. In such cases, one option would be for the facility to conduct a field investigation to assess whether free liquids are currently present in the unit. To facilitate such investigations, the final rule establishes procedures to provide owners or operators with additional time to complete the legacy impoundment applicability report, should the owner or operator elect to conduct a field inspection to assess the unit for the presence or absence of free liquids. See § 257.100(f)(1)(v). To be clear, facilities are not required to conduct field testing to determine whether their unit is a legacy CCR surface impoundment. If records are available to allow the owner or operator to make that determination, this final rule does not require them to conduct field testing to confirm that information. However, to the extent facilities would prefer to rely on field investigations to supplement, or lieu of, a purely record-based investigation this final rule provides that option.

In order to obtain additional time to complete the legacy impoundment applicability report required under § 257.100(f)(1), an owner or operator must prepare an ''applicability extension report'' by the effective date of the final rule. The extension report consists of three parts. First, the extension report must include general identifying information about the potential legacy impoundment, including, the name associated with the unit, the identification number of the unit if one has been assigned by the State, and information about the location of the unit at the facility. This information is same as the first three elements of the applicability report under § 257.100(f)(1)(i)(A) through (C).

Second, the extension report must include a statement by the owner or operator that available information does not provide a sufficient basis to determine that the inactive impoundment contained free liquids on or after October 19, 2015. Owners or operators that cannot make this statement are not eligible for this extension and must comply with the applicable requirements for legacy impoundments. For example, an owner or operator who knows that the unit currently contains liquids, or has aerial photographs from 2018 showing that the inactive impoundment contained standing or free water would not be eligible to make use of these extension provisions because the unit contained free liquids since October 19, 2015.

Finally, the extension report must contain a written field investigation workplan. The purpose of this plan is to describe the approach the owner or operator intends to follow to determine whether the inactive impoundment contains free liquids. The written field investigation workplan must contain the following elements:

- A detailed description of the approach to characterize the physical, topographic, geologic, hydrogeologic, and hydraulic properties of the CCR in the unit and native geologic materials beneath and surrounding the unit, and how those properties will be used to investigate for the presence of free liquids in the CCR unit.
- A detailed description of the methods and tools that will be employed to determine whether the inactive impoundment contains free liquids, the rationale for choosing these methods and tools, and how these methods and tools will be implemented, and at what level of spatial resolution at the CCR unit to identify and monitor the presence of free liquids.
- A detailed description of how groundwater elevations will be determined, and at what level of spatial resolution, in relation to the sides and bottom of the CCR unit and how any interaction of the groundwater table with the CCR unit will be evaluated, and at what level of spatial resolution.
- A plan for evaluating stormwater flow over the surface of the unit, stormwater drainage from the unit, and stormwater infiltration into the unit and how those processes may result in the formation of free liquids in the CCR unit. This plan must include a current topographic map showing surface water flow and any pertinent natural or man-made features present relevant to stormwater drainage, infiltration and related processes.
- An estimated timeline to complete the workplan and make a determination if the CCR unit contains free liquids.
- A narrative discussion of how the results from implementing the workplan will determine whether the unit contains free liquids specified.
- A narrative discussion describing any anticipated problems that may be encountered during implementation of the workplan and what actions will be taken to resolve the problems, and anticipated timeframes necessary for such a contingency.

The final rule allows an owner to operator to obtain as many as three 6-month extensions (or 18 months from the effective date of the final rule) to complete the field investigation. Each six-month time extension must be supported by an updated extension report to justify the need for additional time. If the owner or operator needs either of the additional 6-month extensions, the subsequent extension report must be prepared no later than six months after completing the preceding extension report. Each prepared extension report must be placed in the facility's operating record as required § 257.105(k)(2) and posted to the owner or operator's CCR website.

Once the owner or operator determines that an inactive impoundment contains CCR and liquids the applicability report required by § 257.100(f)(1) must be completed within 14 days of the determination. EPA believes 14 days is a sufficient amount of time to complete the applicability report because the information will be known to owners or operators at this point. Following preparation of the applicability report, the inactive impoundment is subject to the requirements for legacy impoundments under § 257.100(f)(2) through (5), but with compliance deadlines adjusted by the length of the extension. These new timeframes are calculated on a unit-by-unit basis because the date the applicability report was prepared can vary by unit.

This following example illustrates how the new compliance timeframes are calculated for one of the design criteria for legacy impoundments. Section 257.100(f)(2)(i) requires that the permanent identification marker must be placed on or immediately adjacent to the legacy impoundment no later than 2 months after the effective date of the rule. If the owner or operator determines 10.5 months after the effective date of the rule that free liquids are present in the inactive impoundment, the owner or operator must prepare the legacy impoundment applicability report with 14 days of that date. The new deadline for the owner or operator to install the permanent marker is 11 months after the original deadline (or in this case, 13 months from the effective date of the final rule (2+ 10.5 + 0.5 months)).

Finally, if the owner or operator determines that the unit does not contain liquids, the owner or operator must prepare a notification stating that the field investigation has concluded and that the owner or operator has determined that the inactive impoundment does not contain CCR and liquids. This notification informs the public, States and EPA that the unit is not a legacy CCR surface impoundment. The final rule also provides that if the owner or operator does not complete the field investigation work within the timeframes specified in § 257.100(f)(1)(iv)(B), the inactive impoundment shall be considered a legacy CCR surface impoundment and must comply with all applicable requirements under the new timeframes specified under § 257.100(f)(1)(iv)(E).

ii. Site Security for Legacy CCR Surface Impoundments

Active facilities generally have guards and fencing to control access to the facility, but inactive CCR facilities may not have such security controls in place at the facility. To minimize that risk, EPA proposed that owners or operators establish security controls to restrict access to legacy CCR surface impoundments. The proposed security requirements are written in terms of a performance standard, as opposed to a prescriptive set of technical standards, such as specific signage, barriers and fencing, or surveillance techniques. EPA chose this approach because it would allow the owner or operator to identify the most appropriate means of providing site security for the impoundment based on site-specific circumstances.

Commenters generally supported performance-based site security measures rather than having EPA prescribe specific technical standards. Some commenters agreed that such requirements are necessary because legacy CCR impoundments are located at inactive power plants, and unlike impoundments at operating power plants, they almost certainly lack the oversight and protection afforded by significant numbers of on-site personnel. These commenters stated that the integrity of impoundments and berms and the safety of nearby residents depend on robust security measures to ensure that people are not—whether intentionally or unknowingly—entering the site and taking actions (such as all-terrain vehicle driving, dirt biking, or similar activities) that endanger the integrity of the impoundment or expose trespassers to health risks. Some commenters added that EPA should consider that some sites may not need security measures, for example, sites with closed legacy impoundments that closed under State programs, especially where CCR have been removed. EPA did not receive comments about the deadline to complete the site security requirements and is therefore finalizing as proposed.

EPA is adopting the proposed site security performance standard without revision from the proposal. Accordingly, the site security performance standard in the final rule requires the owner or operator to prevent the unknowing entry of people onto the legacy CCR surface impoundment and to minimize the potential for the unauthorized entry of people or livestock onto the impoundment. This is codified in the regulatory text in § 257.100(f)(3)(ii). The Agency generally modeled the requirements on the existing regulations that apply to interim status hazardous waste surface impoundments, which are codified at § 265.14(a). EPA recognizes that some facilities may already have facility-wide access controls in place, and in this case, the facility-wide controls would satisfy the requirement to limit public access to the legacy CCR surface impoundment. The Agency is finalizing the requirement for the facility to restrict access to the area containing the legacy CCR surface impoundment no later than the effective date of the final rule.

iii. Certification of Closure by Removal for Legacy CCR Surface Impoundments

EPA proposed that legacy CCR surface impoundments that completed closure by removal of CCR in accordance with the performance standards in § 257.102(c) after October 19, 2015, but before the effective date of the final rule would be subject to no further requirements under 40 CFR part 257, subpart D, provided the owner or operator completed certain actions.[58] 88 FR 31998 and proposed § 257.100(f)(1)(ii). Specifically, EPA proposed that the owner or operator would be required to post documentation on their CCR website showing that the legacy impoundment was closed in accordance with the closure by removal standards in § 257.102(c). EPA further proposed to require that the closure certification be certified by a qualified P.E. Finally, EPA proposed to require that the certified demonstration be completed and placed in the operating record no later than the effective date of this final rule.

A number of commenters requested that EPA expand the certification to cover all State-approved closures by removal—including those in which all CCR was removed from the unit or site, but the State approved the closure without requiring any groundwater monitoring. The only factual basis these commenters offered to support their request was that EPA should rely on the State's determination that the closure was protective.

Other commenters raised concern that the information needed to support a certification may not be readily available, and as a consequence these units would be subject to all of the other requirements of the final rule, including groundwater monitoring, preparation of plans, filing of reports, and closure and post-closure activities. These commenters stated such an outcome is not necessary to protect human health and the environment.

Other commenters stated that the proposed closure certification under § 257.100(f)(1)(ii) was not sufficient to allow EPA, States, and the public to determine whether the facility has actually complied with the closure performance standards under § 257.102(c). These commenters requested that the final rule require owners/operators certifying closure by removal to specify, with supporting documentation all of the following:

- The nature and volume of CCR and all other materials in the unit prior to closure;
- All releases from the unit to the soil, surface water, groundwater, and atmosphere during the operation of the unit, during its inactive period(s), and prior to completion of closure activities;
- The nature and extent of all soil, groundwater, surface water, and other contamination associated with releases from the unit throughout its history, including active and inactive periods;
- The methods to be employed (in closure plans) and actually employed (in closure completeness certifications) to ensure complete removal of all CCR and other contaminated materials from the unit, including but not limited to post-removal sampling and analysis;
- Documentation that all CCR and other contaminated materials were in fact removed from the unit, including but not limited to post-removal sampling and analysis;

[58] These impoundments contained both CCR and liquids on or after October 19, 2015, and subsequently completed closure of the impoundment before the effective date of this final rule.

• The methods to be employed (in closure plans) and actually employed (in closure completeness certifications) to ensure complete decontamination of all areas affected by releases from the unit, including but not limited to post-decontamination sampling and analysis; and

• Documentation that all areas affected by releases from the unit were in fact decontaminated and that all groundwater affected by releases has achieved groundwater protection standards, including but not limited to a minimum of two years of post-removal/decontamination detection and assessment groundwater monitoring data collected pursuant to the CCR Rule's groundwater monitoring performance standards and analyzed pursuant to its sampling and analysis requirements, 40 CFR 257.91 and 257.93, to reliably demonstrate compliance with groundwater protection standards in order to certify the completion of closure in accordance with 40 CFR 257.102(c).

EPA is unable to adopt the commenters' suggestion to expand the certification to all State-approved closures by removal. Without any record of the factual and legal bases for the States' decisions, EPA cannot conclude that all State-approved closures by removal pose no reasonable probability of adverse effects on health or the environment, as it is required to do under RCRA section 4004(a). This is particularly true with respect to closures that were approved without any groundwater monitoring or other information to demonstrate that ''groundwater . . . concentrations do not exceed the groundwater protection standard established pursuant to § 257.95(h),'' 40 CFR 257.102(c). Given the high probability that these impoundments were unlined and leaked, the most likely conclusion is that contamination remains at the site. In the absence of any further information, it is not apparent how EPA could support approving such closures in a nationwide rulemaking. See also Unit III.B.2.g.iii of this preamble for further discussion of State programs.

EPA agrees that certifications under this paragraph need to include sufficient supporting data so that EPA, States, and the public can determine whether the facility has actually complied with the performance standards in § 257.102(c). However, EPA disagrees that all of the information the commenters suggest is necessary to achieve that goal. As described below, the final rule requires that a facility support its certification with information that would have been routinely developed as part of closing the unit; either because the information is routinely required by State permit authorities or because the facility would have developed the information as part of the normal construction processes. Specifically, the final rule requires facilities to include the following supporting information with their certification:

(1) The type and volume of CCR and all other materials in the unit prior to closure;

(2) The methods used to verify complete removal of all CCR and other contaminated materials from the unit, including any post-removal sampling and analysis;

(3) Documentation that all CCR and other contaminated materials were removed from the unit, including, the results of any post-removal sampling and analysis that was conducted;

(4) The methods used to verify complete decontamination of all areas affected by releases from the unit, including but not limited to post-decontamination sampling and analysis; and

(5) Documentation that all areas affected by releases from the unit were decontaminated and that all groundwater affected by releases has achieved groundwater protection standards.

The final rule identifies the minimum information needed to support a certification, but, for the most part does not substantially restrict the analyses or factual information that can be used. This is because these units closed before they were subject to the Federal CCR regulations, or knew that they would be subject to the regulations, and EPA expects it is unlikely that facilities would necessarily have the same documentation as a currently regulated entity. State requirements specifying the information and analyses necessary to obtain approvals or permits can vary significantly. However, the final rule specifies that the facility must have groundwater monitoring data demonstrating that the concentrations of each Appendix IV constituent do not exceed the relevant groundwater protection standard, which would be either the MCL or background concentration, for two consecutive sampling events, consistent with § 257.95(e). The final rule identifies the minimum information needed to support a certification, but does not substantially restrict the analyses or factual information that can be used. Because the facility was not subject to part 257 groundwater monitoring when the monitoring was conducted, the final rule does not require a facility to demonstrate that it had installed a groundwater monitoring system that complied with all of the requirements in §§ 257.90 through 257.95. Nevertheless, the data supporting the certification must be scientifically valid and must credibly support a determination that the monitoring system would reliably detect any releases from the impoundment. Therefore, the final rule requires that owner or operator demonstrate that the groundwater monitoring system used to document the concentrations of Appendix IV constituents met a subset of the performance standards found in §§ 257.91(a) through (e), 257.93(a) through (d), and 257.93(i). Specifically, the facility needs to demonstrate that the groundwater monitoring system met the following criteria:

(1) Accurately represented background water quality unaffected by a CCR unit;

(2) Accurately represented the quality of water passing the waste boundary of the unit;

(3) Was capable of detecting contamination in the uppermost aquifer;

(4) Monitored all potential contaminant pathways;

(5) Established groundwater background concentrations for Appendix IV constituents and compared samples to those background concentrations; and

(6) Utilized wells that are (a) cased and maintained in a manner that protects the integrity of the monitoring well borehole, (b) screened or perforated and packed with gravel or sand, where necessary, to enable collection of groundwater samples, and (c) sealed between the borehole and the well casing to prevent contamination of the sample and groundwater.

Finally, the last sample used to demonstrate that no constituent in Appendix IV was detected in concentrations above the established groundwater protection standards must have been collected no earlier than one year prior to the initiation of closure.

If a facility can certify that all legacy CCR surface impoundments on-site met the standards in § 257.102(c) prior to the effective date of this rule, the facility would not be subject to any further requirements under this final rule (*i.e.,* neither legacy CCR surface impoundment requirements or CCRMU requirements). For these units, the certification of closure by removal would be due no later than the effective date of this final rule and must be placed in the facility operating record then posted on their public CCR website. See § 257.100(g).

EPA agrees that if a facility has actually met the performance standards in § 257.102(c), there is no health or environmental benefit in requiring compliance with all of subpart D simply because the facility lacks the information to support the certification. Accordingly, the final rule provides an option that allows such a facility to obtain the information necessary to support a certification. If a facility has removed all CCR from a legacy CCR surface impoundment before the effective date of this final rule but never conducted groundwater monitoring (or had a groundwater monitoring system that does not meet the criteria laid out above), the facility would initially only be required to install a groundwater monitoring system and initiate groundwater monitoring in accordance with the requirements in §§ 257.90 through 257.95, as well as the recordkeeping, notification, and website posting requirements described in Units III.B.2.f and III.B.2.h. If the owner or operator of one of these units elects to pursue a closure certification, the owner or operator must prepare a notification of intent to certify closure by the effective date of this final rule and place it in the operating record, post it on their CCR website, and submit a notification to EPA or the State or Tribal Authority. The notification must state that the facility has removed all CCR from the unit and will be installing a groundwater monitoring system compliant with §§ 257.90 through 257.95 to determine whether there is contamination coming from the unit. If no SSL above the GWPS is detected for all Appendix IV constituent in at least the first two consecutive sampling events, consistent with the existing provisions of § 257.95(e), the facility could at that time complete the closure certification, and document compliance with § 257.102(c). EPA anticipates that the requirement to conduct two consecutive sampling events will result in one sample being taken during the dry season and one in the wet season and thus capture groundwater fluctuations. If the required sampling demonstrates no exceedances of Appendix IV constituents, the owner or operator of the unit must place the closure certification in the operating record, and submit a notification to the State or Tribal Authority, and post the certification documentation on their public CCR website. At that time, the facility would not be subject to any further requirements under this final rule (*i.e.,* neither legacy CCR surface impoundment requirements or CCRMU requirements). The deadline for the completion of the certification of closure by removal for these units is no later than 42 months after the effective date of the final rule. This will provide the owner or operators of these units with the same amount of time as other legacy CCR surface impoundments to comply with the requirements to design and install a groundwater monitoring network, develop a sampling and analysis plan, collect eight baseline samples, and initiate combined detection and assessment monitoring (*i.e.,* 30 months after the effective date of the final rule) and an additional 12 months to perform at least two sampling rounds.

If, however, groundwater monitoring detects an SSL above the established GWPS of any Appendix IV constituent, the legacy CCR surface impoundment described above becomes subject to the corrective action requirements in §§ 257.96 through 257.98 and is no longer eligible to certify closure by removal under this provision. The owner or operator of the legacy impoundment must then prepare the applicability report no later than six months from the date of receiving the laboratory analysis documenting the SSL. No later than eight months from the date of receiving the laboratory analysis documenting the exceedance of the GWPS, the owner or operator must install the permanent marker. Furthermore, the facility must comply with the CCRMU requirements in Unit III.C. However, the compliance deadlines for the CCRMU requirements will be delayed by the number of months between the publication date of the rule and the date of receiving the laboratory analysis documenting the exceedance of the groundwater protection standard. For example, if a facility receives the laboratory analysis documenting an exceedance of the GWPS for any Appendix IV constituent 36 months after the effective date, the facility would add 42 months to all the CCRMU compliance deadlines. Additionally, if a CCRMU is discovered onsite, the owner or operator must prepare a fugitive dust plan no later than 6 months after the completion of the FER. For such units that are unable to certify, the final rule also includes a provision that allows a facility closing a unit by removal to complete any necessary corrective action during a post closure care period. Assuming the criteria in Unit III.B.2.g.iii are met, the facility can also elect to defer closure to permitting. However, given that the facility must comply with the groundwater monitoring and corrective actions under both options, EPA expects that most facilities will prefer to pursue certifications. See Unit III.D of this preamble for further discussion.

c. Location Restrictions and Liner Design Criteria

Under the existing CCR regulations, existing CCR surface impoundments that cannot demonstrate compliance with the location restrictions for placement of CCR above the uppermost aquifer, in wetlands, within fault areas, in seismic impact zones, or in unstable areas (specified in §§ 257.60 through 257.64) must retrofit or close. The purpose of these requirements is to ensure that units located in particularly problematic areas cease operation. EPA explained in the proposed rule that because, by definition, legacy CCR surface impoundments are not operating, and because it appears that all legacy CCR surface impoundments are unlined and will therefore be required to close, EPA believed that requiring compliance with the location restrictions would be largely redundant.

Commenters largely supported not requiring location restrictions or liner demonstrations on the grounds that location restrictions and design criteria are not relevant to this class of units, as these requirements primarily seek to ensure active units operate safely. Other commenters believed that legacy CCR surface impoundments should not be exempted from liner and structural stability requirements out of concern that requiring compliance with one or more location restrictions would provide information that would be ''critical'' to designing unit closure and any necessary corrective action.

EPA disagrees that applying location restrictions and the liner design criteria to legacy CCR surface impoundments would be appropriate. First, as explained in the proposed rule, these criteria are more appropriate for operational units or units at active facilities. Second the consequence of failing to comply with the location restrictions and liner design criteria requirements is closure by a specific date. 40 CFR 257.101(a) through (b)(1). Because legacy CCR surface impoundments are not operational and will in any event be required to close, the consequence for failure to comply with location restrictions or the liner design criteria (*i.e.,* ceased receipt of waste and closure) is moot. Additionally, the commenter failed to identify any information necessary for conducting corrective action or closure uniquely gained by complying with the location restrictions or liner design criteria. Therefore, EPA continues to conclude that, as stated in the proposed rule, information useful for corrective action or closure that would be obtained by complying with the location restrictions will be captured by compliance with the history of construction requirement, the closure plan, or in the development of the groundwater monitoring system.

EPA also continues to believe that the requirement to document whether the impoundment was constructed with a composite liner or alternative composite liner under § 257.71(a)(1) is not warranted for legacy CCR surface impoundments. The original purpose of this provision was to determine whether the unit was unlined, and consequently subject to closure. However, the available information indicates that legacy CCR surface impoundments were largely constructed well before composite liners systems were typically installed. Indeed, no commenter identified a legacy impoundment with a composite liner. For these reasons, EPA expects legacy CCR surface impoundment to be unlined and, therefore, the final rule requires all legacy CCR surface impoundments to close. As a consequence, requiring facilities to compile the information required by § 257.71(a)(1) would not provide useful information or otherwise be necessary. Therefore, EPA is not finalizing such requirement.

d. Design Criteria for Structural Integrity for Legacy CCR Surface Impoundments

EPA proposed that legacy CCR surface impoundments be subject only to the existing design criteria requirements in § 257.73, in order to help prevent damages associated with structural failures of CCR surface impoundments.

EPA received numerous comments on application of the design criteria requirements to legacy CCR surface impoundments. Most commenters on the design criteria specifically commented on the reporting/assessment requirements in § 257.73 (*i.e.,* history of construction, initial hazard potential classification, initial structural stability assessment, initial safety factor assessment). Some of these commenters supported the expedited deadline for the reports. However, most of these commenters echoed the concerns mentioned in Unit III.B.2.a.ii of this preamble, characterizing the proposed deadlines as infeasible, citing third-party availability, national labor shortage, seasonality, the need to conduct quality control and quality assurance, and the accessibility and completeness, or lack thereof, of historical documentation and data. These commenters stated that because legacy CCR surface impoundments are not operational and have not been operational since before the 2015 CCR Rule took effect, it is highly unlikely that owners or operators will have the required historical documentation or data readily available and that, for most of these facilities, documentation is likely in storage or lost to time. Commenters have stated that more time is needed for owners or operators to do their due diligence in locating and reviewing the necessary data and information.

Furthermore, these commenters stated that due to the likely lack of historical information, additional analyses will more than likely be necessary to collect information essential to meeting the standards in the CCR rule for each report. Additionally, these commenters said that EPA was incorrect in characterizing these additional analyses as minor and capable of being performed within the proposed deadline (*i.e.,* three months from the effective date of the final rule) and that some of these analyses (*e.g.,* site visits, geotechnical investigations) could be impacted by both contractor availability and seasonality. Several commenters also pointed out that Professional Engineer (P.E.) certification or approval by the Participating State Director or EPA was required for these reports (*i.e.,* hazard potential classification assessments, structural stability assessments, and safety factor assessments). These commenters said that the proposed deadline did not provide adequate time to collect and review historical information, acquire any necessary new information (*i.e.,* perform additional analyses), and conduct sufficient quality control and quality assurance of said information to ensure the report would be certifiable by a P.E. or capable of being approved by a State Director, Tribal authority, or EPA. Commenters also highlighted that the information required by § 257.73 will also be important in complying with concurrent and subsequent requirements, such as the design of the groundwater monitoring network and the closure plan. These commenters stated that providing inadequate time to generate reports under § 257.73 that meet the standards set out in the rule has an adverse ripple effect on the inputs of other requirements, undermining the adequacy of those analyses and plans. Lastly, commenters stated the estimates in the proposed rule of the amount of time needed to complete actions necessary to achieve compliance (*e.g.,* hire a contractor; generate a report) were grossly underestimated, based on the experiences of engineering firms, consultants, and owners or operators.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.73. Therefore, EPA is finalizing the application of the structural integrity requirements in § 257.73 to legacy CCR surface impoundments.

As mentioned in Unit III.B.2.a.ii of this preamble, based on the information provided by commenters regarding the impacts of third-party availability, national labor shortage, seasonality, and accessibility and completeness of historical documentation, EPA has extended the deadlines for the design criteria located at § 257.73 as described below. This is at least as much time as facilities were granted to reach compliance in the 2015 CCR Rule deadlines. As detailed below in Units III.B.d.i through III.B.d.v, EPA calculates that this additional time as compared to the proposed deadlines mitigates the seasonality concerns associated with performing any necessary analyses involving field work; accommodates for the unavoidable delays caused by backlogs and shortages currently being faced by necessary third parties; provides owners or operators time to locate and compile the relevant historical documentation that was more readily available and accessible for facilities complying with the 2015 CCR Rule; and ensures a compliance deadline feasible for facility nationwide.

i. Installation of a Permanent Marker for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments, except for ''incised CCR surface impoundments'' as defined in § 257.53, comply with § 257.73(a)(1), which requires the placement of a permanent identification marker, at least six feet high on or immediately adjacent to the CCR unit. EPA also proposed that placement of the permanent marker be completed by the effective date of the final rule.

Overall, commenters stated this deadline should align with the 2015 CCR Rule deadline (*i.e.,* two months from the effective date) to accommodate for site access issues, seasonality, and the time needed to hire necessary third parties to conduct the work. EPA acknowledges that the proposal had not accounted for the national labor shortage of contractors, or the need to factor in seasonality for site access and the installation of the permanent marker. Therefore, EPA agrees with the commenters that extending the deadline for the installation of the permanent marker to no later than two months from the effective date of the final rule provides owners or operators of legacy CCR surface impoundments would provide the necessary time to comply with the requirement at § 257.73(a)(1) while still being protective of human health and the environment.

Therefore, EPA is finalizing the requirement to install the permanent marker no later than Wednesday, January 8, 2025, which is two months after the effective date of the final rule. This is codified in the regulatory text at § 257.100(f)(2)(i).

To complete the installation of the permanent marker, owners or operators must ensure the marker is at least six feet high and displays the name of the legacy CCR surface impoundment, the name of the owner or operator of the unit, and the identification number of the CCR unit, if one has been assigned by the State.

ii. History of Construction for the Legacy CCR Surface Impoundments

Consistent with the existing regulations, EPA proposed that owners or operators of legacy CCR surface impoundments that either have: (1) A height of five feet or more and a storage volume of 20 acre-feet or more; or (2) Have a height of 20 feet or more, would be required to comply with the existing requirements to compile the history of construction of the legacy CCR surface impoundment. In the proposed rule, EPA acknowledged that information regarding construction materials, expansions or contractions of units, operational history, and history of events may be difficult for owners or operators to obtain. Therefore, EPA proposed that owners or operators would only need to provide information on the history of construction to the extent that such information is reasonably and readily available. EPA proposed a deadline of no later than three months after the effective date for owners or operators to comply with this requirement.

Overall, commenters on the proposed rule stated the proposed deadline for the history of construction was infeasible for the reasons listed in Unit III.B.2.d of this preamble; namely the limited availability of contractors, exacerbated by the number of CCR units competing for the same resources; seasonality impacts on necessary analyses; and accessibility and completeness of historical information. Some of these commenters also highlighted the importance of the history of construction requirement as an input into the design of the groundwater monitoring system, closure decisions, and other design criteria assessments; these commenters further emphasized the direct impacts of the quality of the history of construction on the quality of subsequent (*i.e.,* groundwater monitoring network design, closure plan) and interrelated requirements (*i.e.,* hazard potential classification, structural stability and safety factor assessments, inflow design flood control system plan, EAP). These commenters said that, although EPA acknowledged in the proposed rule that EPA would only require information that is reasonably and readily available, owners or operators would still likely need to conduct surveys and other analyses to ensure the report would meet the requirements in § 257.73(a)(2) and to provide sufficient information for the completion of subsequent and interrelated requirements. These commenters also stated that locating the necessary documentation to complete the history of construction would take considerable time and effort due to the age of the units, the inactivity of the facility, and the likelihood of records being located at currently unknown offsite locations. Furthermore, some of these commenters requested clarification of what EPA means by ''reasonably and readily available.'' Finally, commenters' suggested deadlines for the completion of the history of construction requirement ranged from three to 30 months.

As stated in Unit III.B.2.d of this preamble, EPA has reviewed the information provided by commenters citing the shortages and backlogs of qualified contractors, increased strain on those contractors related to the number of CCR units complying with the CCR rule simultaneously, difficulty accessing and reviewing historical documentation, and needed time to perform quality control and quality assurance, and considers it to be persuasive. EPA also acknowledges that the history of construction report ties into several subsequent requirements, including the other design criteria assessments and plan, the groundwater monitoring and corrective action requirements, and the closure and post-closure care requirements and therefore, agrees that providing sufficient time for the completion of a thorough history of construction report is important for the protection of human health and the environment.

Furthermore, as stated in Unit III.B.2.a.ii, EPA extended most deadlines to allow for as much time to come into compliance as was granted in the 2015 CCR Rule. While EPA recognizes that when coming into compliance with the 2015 CCR Rule, owners and operators had to locate historical documentation, based on information provided by commenters regarding the unknown whereabouts of the necessary records, the age and inactivity of these facilities, and the labor shortages, EPA expects it will be slightly more difficult to access and assess historical documentation for the older legacy CCR surface impoundments than it was for the units regulated by the 2015 CCR Rule. Because of the increased difficulty in locating and accessing records, the importance of the history of construction as an input into other requirements, and the high likelihood of additional analyses being needed, EPA is finalizing a deadline of no later than Monday, February 9, 2026, which is 15 months from the effective date. This deadline is an extension of three months longer than the 2015 CCR Rule deadline and is sufficient to accommodate the slight increase in difficulty in accessing legacy impoundment records. This is codified in the regulatory text at § 257.100(f)(2)(ii).

Finally, as explained in Unit III.B.2.b.i, EPA addressed the term ''reasonably and readily available'' at 80 FR 21380. When using this term, EPA intends facilities to provide relevant design and construction information only if factual documentation exists and does not expect owners or operators to generate new information or provide anecdotal or speculative information.

Compliance with the history of construction requirement at § 257.73(c) requires owners or operators of a CCR unit to compile a report that documents identifying characteristics of the unit, the history of how the CCR unit was used, specifics related to the unit's design and construction, and the unit's instrumentation. Once compiled, the report must be placed into the facility's operating record as required by § 257.105(f)(9). If the information included in the history of construction report needs to be changed at any point in time, the owner or operator must update the history of construction report and place the updated report into the operating record. A comprehensive list of information required in the history of construction is in § 257.73(c)(1).

iii. Initial Hazard Potential Classification for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments, except for incised CCR surface impoundments as defined in § 257.53, must complete the initial and periodic hazard potential classification assessments required under § 257.73(a)(2) without revision. EPA proposed a deadline of no later than three months after the effective date for the completion of the initial hazard potential classification assessment.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.73(a)(2). EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.100(f)(2)(iii).

However, EPA received numerous comments on the proposed deadline. Overall, commenters on the proposed rule stated the proposed deadline for the initial hazard potential classification was infeasible for the reasons listed in Unit III.B.2.d of this preamble, namely the limited availability of contractors exacerbated by the number of CCR units competing for the same resources; seasonality impacts on necessary analyses; accessibility and completeness of historical information, and the need for quality assurance and quality control. As mentioned in Unit III.B.2.d.ii, a few commenters noted the interrelationship and overlapping activities (*e.g.,* historical documentation review, site visit, geotechnical investigations, unit modeling) between the initial hazard potential classification and the history of construction, initial safety factor assessment, and the initial structural stability assessment. Specifically, commenters stated that the history of construction is done first and used to complete the initial hazard potential classification. Furthermore, commenters highlighted the direct dependence on the hazard potential classification for determining the design flood to use in inflow design flood control plan (§ 257.82(c)) and the trigger for the EAP requirement (§ 257.73(a)(3)). Commenters' suggested deadlines for the completion of the hazard potential classification requirement ranged from three to 24 months.

As explained in Units III.B.2.a.ii and III.B.2.d of this preamble, EPA acknowledges the need to extend the compliance deadline in consideration of the impacts of labor shortage, contractor backlogs, seasonality, accessibility and completeness of historical information, and the need for quality assurance and control. EPA further acknowledges the interrelationship of the design criteria reports and the direct dependence of the initial inflow design plan and EAP requirements on the completion of hazard potential classification. As explained in Unit III.B.2.d of this preamble, based on the information provided by commenters, EPA determined that extending the deadline for the initial hazard potential classification to allow for at least as much time to come into compliance as was granted in the 2015 CCR Rule (*i.e.,* 18 months after the effective date) is necessary to ensure the compliance deadlines are nationally feasible. Because owners or operators will be locating and compiling historical documents and information as part of the history of construction requirement, EPA assumes that historical documentation necessary for the initial hazard potential classification assessment can be located and compiled concurrently. Additionally, EPA expects necessary historical information (*e.g.,* engineering design drawings, geotechnical studies, dam hazard potential classification documents, stability assessments) and new analyses (*e.g.,* surveys or geotechnical investigations) needed for the history of construction and the initial hazard potential classification to overlap to some degree. Therefore, EPA has determined that additional time beyond that granted to come into compliance with the 2015 CCR Rule is not needed for this requirement. As such, EPA is finalizing a deadline of no later than Friday, May 8, 2026, which is 18 months from the effective date of this final rule.

To comply with the hazard potential classification requirement at § 257.73(a)(2), owners or operators of legacy CCR surface impoundments must determine the hazard potential classification of the CCR unit and justify the determination in a report. The CCR unit can be classified as a low hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a high hazard potential CCR surface impoundment. The report must be certified by a P.E. stating the hazard potential classification was conducted in accordance with the CCR regulations. Subsequent periodic hazard potential classifications are required every five years after the completion of the previous hazard potential classification as described at § 257.73(f)(3).

iv. Initial Structural Stability Assessment and Initial Safety Factor Assessment for Legacy CCR Surface Impoundments

Consistent with the existing regulations and EPA's findings from the 2009–2014 Assessment Program as described in the proposed rule, EPA proposed that owners or operators of legacy CCR surface impoundments that meet the size thresholds in § 257.73(b) and (c), must conduct two types of technical assessments: (1) Structural stability assessments; and (2) Safety factor assessments. In the proposed rule, EPA explained that these two assessments could be conducted concurrently and therefore, a deadline of no later than three months from the effective date of the final rule was proposed for both requirements.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.73(b) and (c). EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.100(f)(2)(iv).

However, EPA received numerous comments on the proposed deadline. Overall, commenters on the proposed rule stated the proposed deadlines for the initial structural stability and safety factor assessments were infeasible for the reasons outlined in Units III.B.2.a.ii and III.B.2.d of this preamble, namely, seasonality, third-party availability, national labor shortage, the need to conduct quality control and quality assurance, and the accessibility and completeness, or lack thereof, of historical documentation and data. As mentioned in Unit III.B.2.d.ii, a few commenters noted the interrelationship and overlapping activities (*e.g.,* historical documentation review, site visit, geotechnical investigations, unit modeling) between the initial structural stability and safety factor assessments and the history of construction, initial hazard potential classification, and the inflow flood control system plan. Furthermore, commenters highlighted the need to have quality information within the structural stability and safety factor assessments to inform the EAP and to make sound closure decisions. Commenters' suggested deadlines for the completion of the initial structural stability assessment and the initial safety factor assessment ranged from six to 24 months.

As explained in Units III.B.2.a.ii and III.B.2.d, EPA acknowledges the need to extend the compliance deadline in consideration of the impacts of labor shortage, contractor backlogs, seasonality, accessibility and completeness of historical information, and the need for quality assurance and control. EPA further acknowledges the interrelationship of the design criteria reports and the value of using the structural stability and safety factor assessment to develop the EAP and the closure plan for the legacy CCR surface impoundment. As explained in Unit III.B.2.d of this preamble, based on the information provided by commenters, EPA determined that extending the deadline for the initial structural stability and safety factor assessments to allow for at least as much time to come into compliance as was granted in the

2015 CCR Rule is necessary to ensure the compliance deadlines are nationally feasible. Because owners or operators will be locating and compiling historical documents and information as part of developing the history of construction, EPA assumes that historical documentation necessary for the initial structural stability and safety factor assessments can be located and compiled concurrently. Additionally, the historical information (*e.g.,* engineering design drawings, operational records) and new analyses (*e.g.,* surveys, geotechnical investigations) needed for the history of construction, initial hazard potential classification, and the initial structural stability and safety factor assessments overlap to some degree. Therefore, EPA has determined that additional time beyond that granted to come into compliance with the 2015 CCR Rule is not needed for this requirement. As such, EPA is finalizing a deadline of no later than Friday, May 8, 2026, which is 18 months from the effective date of this final rule.

To comply with the structural stability assessment and safety factor assessment requirements at § 257.73(d) and § 257.73(e), owners or operators of legacy CCR surface impoundments must conduct initial and periodic structural stability and safety factor assessments. The structural stability assessment must document whether the design, construction, operation, and maintenance of the unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater capable of being contained within the unit. Accepted good engineering practices includes, but are not limited to, stable foundations and abutments, adequate slope protection, sufficiently compacted dikes, slope protections, spillways capable of managing flow during and following peak discharge events, structurally sound and operational hydraulic structures, and structurally sound downstream slopes capable of withstanding sudden drawdown of adjacent water bodies. See 40 CFR 257.73(d).

The safety factor assessment must document whether the calculated factors of safety for the legacy CCR surface impoundment achieves the minimum safety factor specified in §§ 257.73(e)(1)(i) through (iv) for the cross section of the embankment most susceptible to structural failure determined by loading conditions and other appropriate engineering considerations. See 40 CFR 257.73(e).

The periodic assessments are required every five years after the completion of the previous assessment described at § 257.73(f)(3). Each assessment must be certified by a P.E. stating that the assessment was conducted in accordance with the CCR regulations.

v. Preparation of an Emergency Action Plan for Legacy CCR Surface Impoundments

EPA proposed that the owners or operators of legacy CCR surface impoundments that have been identified as having either a high hazard potential or a significant hazard potential would be required to comply with the same requirement as existing CCR surface impoundments under § 257.73 to prepare and maintain a written EAP. An EAP is a document that identifies potential emergency conditions at a CCR surface impoundment and specifies actions to be followed to minimize loss of life and property damage.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.73(a)(3). EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.100(f)(2)(v).

However, EPA received numerous comments on the proposed deadline. Overall, most commenters on the proposed rule stated that at a minimum, EPA should allow as much time for legacy CCR surface impoundment to come into compliance as granted existing units the 2015 CCR Rule deadlines. Several commenters pointed out the direct reliance of the EAP on the hazard potential classification assessment and noted that the history of construction, safety factor assessment, and structural stability assessment provided critical information as well. These commenters noted that if the deadlines for any of those prerequisite requirements were extended beyond the proposed compliance deadline, the EAP deadline should be extended as well. Commenters' suggestions for the deadline for the completion of the EAP ranged from 11 to 18 months.

EPA acknowledges that the EAP relies on the hazard potential classification assessment and agrees with the commenters who stated that if the deadline for the hazard potential classification assessment was extended, the deadline for the development of the EAP should be extended to no earlier than the deadline for the initial hazard potential classification assessment. As stated in Unit III.B.2.d.iv, EPA is finalizing a deadline of no later than 18 months from the effective date of this final rule for the initial hazard potential classification assessment. Furthermore, the deadlines for the initial safety factor and structural stability assessments are being finalized at no later than Friday, May 8, 2026, which is 18 months from the effective date of the final rule. This deadline also provides owners or operators the same amount of time for legacy CCR surface impoundments to comply with the requirements as was granted for existing units in the 2015 CCR Rule. Therefore, EPA is finalizing a deadline of no later than Friday, May 8, 2026, which is 18 months from the effective date of the final rule for legacy CCR surface impoundment to develop an EAP in accordance with § 257.73(a)(3).

As described above, an EAP specifies the actions to take during potential emergency conditions at a CCR surface impoundment. To prepare an EAP, the owner or operator must accurately and comprehensively identify potential failure modes and at-risk developments. See also 80 FR 21377–21379, April 17, 2015. To comply with the EAP requirement, the EAP must, at a minimum, define the events or circumstances involving the CCR unit that represent a safety emergency; describe the procedures that will be followed to detect a safety emergency in a timely manner; define responsible persons, each person's responsibilities, and notification procedures in the event of an emergency; provide contact information for emergency responders; include a map that delineates the downstream area that would be impacted by a CCR unit failure; a physical description of the CCR unit; and provisions for an annual face-to-face meeting between representatives of the owner or operator and the local emergency responders.

e. Operating Criteria for Legacy CCR Surface Impoundments

The operating criteria in §§ 257.80, 257.82, and 257.83 include air criteria for all CCR units, hydrologic and hydraulic capacity requirements for CCR surface impoundments, and periodic inspection requirements for CCR surface impoundments. These criteria address the potential risks from the day-to-day operations of CCR units and are established to prevent health and environmental impacts from CCR units. CCR surface impoundments are subject to hydrologic and hydraulic capacity requirements to ensure the unit can safely handle flood flows, which will help prevent uncontrolled overtopping of the unit or erosion of the materials used to construct the surface impoundment. The existing CCR regulations also require periodic inspections of CCR units to identify any appearance of structural weakness or other conditions that are not consistent with recognized and generally accepted good engineering standards. EPA proposed that legacy CCR surface impoundments comply with these existing requirements without revision.

Several commenters recommended that EPA provide relief from these operating requirements for legacy impoundments that have closed prior to the effective date of this rule, since these operating requirements do not make sense for units that are no longer operating. These commenters also state that the proposed rule includes relief from many requirements for legacy impoundments that have closed by removal of CCR, but does not include similar flexibility for legacy impoundments that have closed in place. Commenters said requiring an owner or operator to meet operating requirements for units that no longer contain both CCR and liquids, and therefore do not pose the same operating risks as existing CCR units, is illogical. They contended these requirements are more applicable for legacy impoundments that continue to contain both CCR and liquids as of the effective date of this final rule. They further said EPA should therefore reconsider its position and account for prior closure activities and afford flexibility to those units that have undergone, or are undergoing, State-led closure activities.

EPA disagrees that applying the operating criteria to legacy CCR surface impoundments is inappropriate even if these units are no longer receiving waste. EPA believes that applying the fugitive dust requirements reduces the risk from airborne dust and requiring inspections and inflow design flood control plan for legacy impoundments that contain both CCR and liquids will reduce the risks from structural stability concerns. EPA further addresses legacy impoundments that closed by removal or closed with waste in place under a State or Federal authority in Unit III.B.2.g of this preamble. Accordingly, EPA is finalizing the requirement that legacy CCR surface impoundments comply with these existing operating criteria requirements in §§ 257.80, 257.82, and 257.83 without revision.

i. Fugitive Dust Control Plan for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments must complete a fugitive dust control plan by the effective date of the final rule. The existing regulations require the owner or operator of a CCR unit to adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities. 40 CFR 257.80(b). To meet this requirement, the owner or operator of the CCR unit must prepare and operate in accordance with a fugitive dust control plan. *Id.* See also 80 FR 21386–21388. EPA considers that fugitive dust controls are warranted because closure activities can produce significant quantities of dust.

EPA received few comments on the fugitive dust control plan. One commenter requested that EPA amend § 257.80 to include additional requirements to protect those who work or live near CCR facilities from the risks of fugitive dust. EPA disagrees that additional fugitive dust controls are needed as EPA has no data to prove that the existing requirements are inadequate.

EPA received some comments on the compliance deadline to complete the fugitive dust control plan. Overall, commenters supported the proposed deadline. However, a couple commenters requested more time. One commenter requested three additional months for all requirements due on the effective date, including the fugitive dust plan. This commenter provided no evidence or factual basis to support this suggested deadline. Another commenter requested a deadline of 30 months for all requirements with proposed deadlines of the effective date to allow owners or operators 24 months to determine if the unit is eligible for the closure certification and prepare the certification report and then an additional 6 months to comply with other requirements, such as the dust plan and creation of a CCR website, if the unit is not eligible for the closure certification. EPA finds the requests for a deadline extension for the fugitive dust control plan to be unfounded.

The primary activities associated with this requirement are hiring a contractor who is a qualified P.E., having the contractor develop a plan based on daily operations at the unit and site conditions, and certification of the plan by a P.E. Little to no field-based activities are required to complete the fugitive dust control plan. Furthermore, this provides the same amount of time that EPA provided in the 2015 CCR Rule for facilities to develop their fugitive dust control plans. Therefore, EPA is finalizing the requirement that owners or operators of legacy CCR surface impoundments must complete a fugitive dust control plan no later than Friday, November 8, 2024, which is the effective date of this final rule. This is codified in the regulatory text at § 257.100(f)(3)(i).

ii. Initial Fugitive Dust Control Report for Legacy CCR Surface Impoundments

EPA proposed to require the initial annual fugitive dust report to be due 12 months after the effective date of the final rule. Consistent with the existing regulations, the report must document all actions taken to control CCR fugitive dust, a record of all citizen complaints, and a summary of any corrective measures taken in the previous year. As this report is primarily a summary of owner or operator activities related to fugitive dust control and does not require a P.E. certification, the report may be completed by the owner or operator without the need for a contractor. The owner or operator has completed the annual CCR fugitive dust control report when the plan has been placed in the facility's operating record.

EPA did not receive comments on the annual fugitive dust control report requirements. As described in Unit III.B.2.a.ii of this preamble, commenters requested that deadlines provide at least as much time as was granted for 2015 CCR Rule requirements. Therefore, EPA is extending the deadline from 12 months to 14 months to allow for a full year to be reported in the first report (12 months plus two months for report generation).

EPA is finalizing the requirement that the initial annual fugitive dust report be completed no later than Thursday, January 8, 2026, which is 14 months after the effective date of this final rule. This is codified in the regulatory text at § 257.100(f)(3)(vi).

iii. Weekly Inspections of the Legacy CCR Surface Impoundment and Monthly Monitoring of the CCR Unit's Instrumentation

EPA proposed that owners or operators of legacy CCR surface impoundments must initiate the inspection requirements set forth in § 257.83(a) no later than the effective date of the final rule. Under § 257.83(a), all CCR surface impoundments must be examined by a qualified person at least once every seven days for any appearance of actual or potential structural weakness or other conditions that are disrupting or that have the potential to disrupt the operation or safety of the CCR unit. The results of the inspection by a qualified person must be recorded in the facility's operating record. Weekly inspections are intended to detect, as early as practicable, signs of distress in a CCR surface impoundment that may result in larger, more severe conditions. Inspections are also designed to identify potential issues with hydraulic structures that may affect the structural safety of the unit and impact its hydraulic and hydrologic capacity. Section 257.83(a) also requires the monitoring of all instrumentation supporting the operation of the CCR unit to be conducted by a qualified person no less than once per month. See also 80 FR 21394–21395.

One commenter opposed applying the inspection requirements to legacy CCR surface impoundment, stating these requirements are intended for operational units and therefore are inappropriate for units that no longer receive waste. EPA disagrees that applying the inspection requirements to legacy CCR surface impoundments is inappropriate even if these units are no longer receiving waste. EPA believes that applying the weekly inspection requirements to legacy CCR surface impoundments that contain both CCR and liquids reduces the risks associated with structural stability concerns. Furthermore, the commenter provided no factual basis for the exclusion of legacy CCR surface impoundments from these requirements. EPA did not get any comments specifically about this deadline, thus, EPA is finalizing without revision the requirement that owners or operators of legacy CCR surface impoundments initiate the inspection requirements set forth in § 257.83(a) no later than Friday, November 8, 2024, which is the effective date of the final rule. This is codified in the regulatory text at § 257.100(f)(3)(iii).

iv. Initial Annual Inspection for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments must conduct the initial annual inspection no later than three months after the effective date of the final rule. Existing CCR surface impoundments exceeding the height and storage volume thresholds in § 257.73(b) and (c), are required to conduct annual inspections of the CCR unit throughout its operating life (§ 257.83(b)). These inspections are focused primarily on the structural stability of the unit and must ensure that the operation and maintenance of the unit is in accordance with recognized and generally accepted good engineering standards. Each inspection must be conducted and certified by a P.E. See also 80 FR 21395.

EPA received comments that said the inspections should be required for legacy impoundments, in addition to the other operating criteria. However, one commenter opposed applying the inspection requirements to legacy CCR surface impoundment, stating these requirements are intended for operational units and therefore are inappropriate for units that no longer receive waste. EPA continues to conclude that the annual inspections required by § 257.83 are relevant for legacy CCR surface impoundments even if these units are no longer receiving waste. EPA believes that applying the annual inspection requirement to legacy CCR surface impoundments that contain both CCR and liquids reduces the risks associated with structural stability concerns. Furthermore, the commenter provided no factual basis for the exclusion of legacy CCR surface impoundments from these requirements.

Annual inspections include documentation review, a visual inspection of the CCR unit, and a visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the CCR unit's dike. Documentation reviewed as part of the annual inspection include operating records, previous structural stability assessments, and the results of previous weekly, monthly, and annual inspections and can overlap with reviews needed to complete the initial structural stability assessment.

EPA proposed that owners or operators of legacy CCR surface impoundments must conduct the initial annual inspection no later than three months after the effective date of the final rule. EPA proposed that owners or operators must prepare the initial inspection report for legacy CCR surface impoundments within the same time frame—no later than three months from the effective date of the final rule—as was required for existing CCR surface impoundments in the 2015 CCR Rule. The Agency believes this time frame to prepare the initial annual inspection is similarly appropriate for legacy CCR surface impoundments as for existing impoundments. As discussed in the preamble to the 2015 CCR Rule, the three-month time frame was based on EPA's experience with its CCR Assessment Program to evaluate the structural stability and safety of existing impoundments throughout the nation. Specifically, EPA found that three months would be adequate to complete the tasks supporting an annual inspection, including retaining the services of a P.E., reviewing relevant information in the facility's operating record, conducting the field inspection, and completing the inspection report. See 80 FR 21395. EPA did not receive any comments objecting to this time frame.

EPA is finalizing the requirement without revision that owners or operators of legacy CCR surface impoundments must conduct the initial annual inspection no later than Monday, February 10, 2025, which is three months after the effective date of the final rule. This is codified in the regulatory text at § 257.100(f)(3)(iv).

v. Initial Inflow Design Flood Control System Plan for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments must prepare the inflow design flood control system plan nine months after the effective date of the final rule. Owners or operators of all CCR surface impoundments are required to design, construct, operate, and maintain hydraulic and hydrologic capacity to adequately manage flow both into and from a CCR surface impoundment during and after the peak discharge resulting from the inflow design flood, which is based on the Hazard Potential Classification of the CCR surface impoundment (§ 257.82(a)). The regulation also requires the preparation of an initial inflow design flood control system plan (§ 257.82(c)). See also 80 FR 21390–21392.

EPA did not receive any comments about this requirement. However, overall, most commenters believed that compliance deadlines should not be accelerated to be shorter than required for active units. Commenters also believed that substantial data collection efforts might be required resulting in situations where it is not feasible to meet the proposed deadline. For example, there is an ongoing shortage of contractors (*e.g.,* consultants, drillers, laboratories) to complete this work. EPA considered these comments and extended the deadline to 18 months in consideration of third-party availability and in order to match the 2015 CCR Rule.

EPA is finalizing the requirement that owners or operators of legacy CCR surface impoundments prepare the inflow design flood control system plan no later than Friday, May 8, 2026, which is 18 months after the effective date of the final rule. This is codified in the regulatory text at § 257.100(f)(3)(v).

f. Groundwater Monitoring and Corrective Action Criteria for Legacy CCR Surface Impoundments

EPA proposed to require legacy CCR surface impoundments to comply with the existing groundwater monitoring and corrective action criteria in 40 CFR 257.90 through 257.98, with one revision, to require sampling and analysis of constituents listed in Appendix IV at the same time as those listed in Appendix III. As explained in the proposed rule at 88 FR 32003, §§ 257.90 through 257.95 require owners or operators of a CCR unit to install a system of monitoring wells, specify procedures for sampling these wells, and set forth methods for analyzing the groundwater data collected to detect hazardous constituents (*e.g.,* toxic metals) and other monitoring parameters (*e.g.,* pH, total dissolved solids) released from the units. If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and post-closure care period of the CCR unit.

Several commenters expressed support for requiring legacy CCR surface impoundments to comply with these groundwater monitoring and corrective action requirements, stating CCR units can and have caused groundwater contamination. Some commenters suggested additional requirements be added to those in §§ 257.90 through 257.98, including a mandate to test groundwater quality outside the boundary of the facility and make those results public; a report documenting the unit's proximity to the closest surface water body and nearest private and public groundwater wells; a deadline for the completion of the selection of remedy required by § 257.97; and a prohibition against using intrawell groundwater data comparisons at legacy CCR surface impoundments. Other commenters stated that applying the existing corrective action requirements to historic sites, such as legacy CCR surface impoundments, is not appropriate and suggested that instead EPA incorporate site-specific risk-based corrective action into the CCR regulations.

EPA further proposed two deadlines for the groundwater monitoring requirements, as opposed to the single deadline in the 2015 CCR Rule. EPA received numerous comments on EPA's proposal to split the single deadline for groundwater monitoring requirements contained within the 2015 CCR Rule (24 months from the effective date of the final 2015 rule) into two separate deadlines (six months from the effective date of the final rule for the installation of the groundwater monitoring network and development of the groundwater sampling and analysis plan and 24 months from the effective date of the final rule for the initiation of the combined detection and assessment monitoring). A few commenters expressed support of the two separate deadlines for groundwater monitoring requirements, stating it increased accountability and ensured owners or operators were not unnecessarily delaying the installation of the groundwater monitoring system. However, overall, commenters stated that the groundwater monitoring requirements should have a single deadline as the separate deadlines made compliance with the rule infeasible. Several commenters said the proposed split deadlines eliminated the flexibility necessary for compliance that was contained within the 2015 CCR Rule's single deadline. Those commenters went on to say the single deadline allowed facilities to accommodate for delays associated with factors outside their control, such as third-party availability, weather, and required permits or approvals, by making schedule adjustments necessary to achieve compliance (*e.g.,* expedite the development of the sampling plan in the case of delays with the well installation). Other commenters said the proposed two deadlines were unnecessarily prescriptive. One commenter pointed out that the proposed rule contained no deliverables to verify compliance for the installation of wells or the development of the sampling and analysis plan.

As explained in the proposed rule, the existing groundwater monitoring and corrective action requirements are essentially the same requirements that have been applied to both hazardous waste and municipal solid waste disposal units for decades, and with the one exception discussed below, there is nothing about legacy CCR surface impoundments that makes them distinct enough to warrant separate requirements from those for other CCR surface impoundments. No commenter provided any factual basis for treating legacy impoundments differently than all the other units that currently comply with the same groundwater monitoring requirements, including other inactive CCR surface impoundments. For those commenters requesting that EPA adopt ''risk-based corrective action'' into the requirements, EPA notes that the commenters have provided no further explanation of what requirements in the existing regulations they wanted EPA to revise, what the revisions should accomplish, or why they are necessary or appropriate. As a general matter EPA considers that the corrective action regulations in §§ 257.95 through 257.98 do currently require facilities to tailor remedies to address the risks to human health and the environment, based on the conditions at the site. It is unclear what more the commenters are seeking. Accordingly, EPA is finalizing the proposal that legacy CCR surface impoundments comply with the existing groundwater monitoring and corrective action requirements with one modification, combined detection and assessment monitoring.

However, EPA agrees that having a single deadline for groundwater monitoring requirements as opposed to two deadlines allows flexibility to complete tasks, such as installing groundwater wells and collecting independent samples, which is necessary for compliance with a nationwide rule. The activities involved in achieving compliance with the groundwater monitoring requirements (*i.e.,* drilling wells, collecting samples, receiving lab results) are more susceptible to factors outside a facility's control, such as extreme weather events, shortages of qualified contractors, and permitting or approval delays, and therefore, warrant greater flexibility. Additionally, activities can be restricted dependent on the time of year and the location of the facility (*e.g.,* due to seasonality, protected species, clearing restrictions). Because the groundwater monitoring requirements build upon each other, EPA must ensure that facilities nationwide are reasonably able to achieve regulatory compliance by the deadline. Utilizing a single deadline for the groundwater monitoring requirements allows facilities to make reasonable accommodations for regional factors in a way the proposed deadlines do not, while still maintaining the same level of protection for human health and the environment. Furthermore, EPA agrees that the proposed rule does not have a clear mechanism for facilities to prove compliance or for interested parties to verify compliance with the separate deadlines for the installation of the groundwater monitoring network and the development of the groundwater sampling and analysis plan. Finally, based on the information provided by commenters, specifically the information regarding the current labor shortages and backlogs experienced by third parties necessary to accomplish tasks involved in complying with the groundwater monitoring requirements (*e.g.,* drillers for well installation, laboratories for sample analysis), time needed to obtain necessary approvals (*e.g.,* State permits to drill water wells or clear vegetation), and to accommodate for seasonality, EPA has calculated six months as the appropriate extension of the 2015 CCR Rule groundwater monitoring system deadlines. Therefore, EPA is finalizing a single deadline of no later than 30 months after the effective date of this final rule for the groundwater monitoring requirements found at §§ 257.90 through 257.95.

i. Design and Installation of the Groundwater Monitoring System for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments install the groundwater monitoring system as required by § 257.91 no later than six months from the effective date of this final rule. EPA further proposed that existing monitoring wells can be used as a part of the legacy CCR surface impoundment groundwater monitoring systems provided the wells meet § 257.91. As explained in the proposed rule, based on the amount of time most facilities needed to complete or to collect baseline sampling, EPA calculated that facilities would be able to install the necessary monitoring wells within a single year.

As mentioned above, some commenters supported the expedited deadlines. However, most commenters stated the proposed deadline of six months from the effective date of the final rule for the design and installation of the groundwater monitoring network was infeasible and should be extended to no less than 24 months from the effective date to align with the 2015 rule deadline. As explained above, many of these commenters expressed the need for a single deadline for groundwater monitoring requirements. Furthermore, as described in Unit III.B.2.a.ii of this preamble, these commenters cited seasonality restrictions, the nationwide labor shortages, limited qualified contractor availability, the need for State approvals and permits, and the number of facilities competing for limited resources as reasons for why the proposed expedited deadline is infeasible. A few commenters noted that in recent decisions on Part A demonstrations, EPA cited deficiencies in the groundwater monitoring network as a basis for non-compliance. These commenters went on to state that the proposed deadline does not facilitate the establishment of a monitoring system that would meet the standards laid out in the CCR rule or the recent proposed decisions and thus, the proposed deadline creates de facto non-compliance. One of these commenters elaborated by saying that the deadline does not allow facilities to acquire the permits that may be required to drill wells and precludes the observation of groundwater levels over time, which is needed to properly characterize groundwater flow. Other commenters stated meeting the proposed compliance deadline would prevent a facility from conducting proper site characterization, which is needed to inform well placement and depth and provide professional engineers sufficient information to certify the groundwater monitoring system. Lastly, commenters stated that contrary to EPA's assertion in the proposed rule that expediting the installation of the groundwater monitoring network is protective of human health and the environment, to meet the proposed deadline, facilities would likely be forced to design groundwater monitoring systems based on inadequate data resulting in unreliable groundwater monitoring data. Commenters provided estimates of time needed to comply with the design and installation of the groundwater monitoring system requirements ranging from 12 to 36 months.

As stated in Unit III.B.2.a.ii of this preamble, in response to comments EPA reevaluated the compliance deadline for the design and installation of the groundwater monitoring network and found the information provided regarding the general infeasibility of the proposed deadline compelling. Specifically, EPA agrees that more time is needed to account for limited third-party availability (*e.g.,* contractor shortages and laboratory backlogs), seasonality and extreme weather events, procuring a contractor, complying with overlapping regulatory requirements, and coordinating with outside parties. EPA acknowledges the importance of proper site characterization as the foundation for designing a groundwater monitoring system and is convinced that although there may be some legacy CCR surface impoundments that have sufficient historical documentation for site characterization, many of these units may need to conduct more extensive site reconnaissance and field work to obtain the necessary information. Lastly, EPA recognizes that groundwater monitoring systems designed using inadequate data would be unable to properly monitor groundwater quality coming from the unit and therefore would not be protective of human health and the environment. Therefore, because EPA is convinced by information from the commenters that facilities would be unable to conduct all the steps necessary to design and install a groundwater monitoring system capable of meeting the standards in § 257.91 by the proposed deadline, EPA has extended the deadline.

As stated in Unit III.B.2.f, based on information provided by commenters, EPA concluded that a single deadline should be used for the groundwater monitoring requirements. In the proposed rule, the latest proposed deadline for groundwater monitoring requirements was the deadline of 24 months from the effective date of this final rule for the initiation of the combined detection and assessment monitoring and the collection of the eight baseline samples. Based on information provided in response to comments on the proposed rule and as explained in Unit III.B.2.f, EPA calculated six months as the appropriate extension of the groundwater monitoring system deadlines. Therefore, EPA is finalizing a deadline for the completion of the design and installation of the groundwater monitoring system of no later than Monday, May 10, 2027, which is 30 months from the effective date of this final rule. This is codified in the regulatory text at § 257.100(f)(4)(i).

To complete the installation of the groundwater monitoring system, the owner or operator of a legacy CCR surface impoundment must ensure the monitoring system consists of sufficient number of wells both upgradient and downgradient of the CCR unit, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that accurately represent the quality of background groundwater and groundwater passing the downgradient waste boundary of the CCR unit, monitoring all potential contaminant pathways. 40 CFR 257.91(a)(1) through (2). Because hydrogeologic conditions vary so widely from one site to another, the regulations do not prescribe the exact number, location, and depth of monitoring wells needed to achieve the general performance standard. Rather the regulation requires installation of a minimum of one upgradient and three downgradient wells, as well as any additional monitoring wells necessary to achieve the general performance standard of accurately representing the quality of the background groundwater and the groundwater passing. See, 80 FR 21399. The number and placement of the monitoring wells is critical to proper characterization of the groundwater. Thus, the specific number, spacing, and depth of the monitoring wells must be determined based on site-specific information, including but not limited to the thorough characterization of aquifer thickness, groundwater flow rate, groundwater flow direction throughout seasonal and temporal fluctuations, the unit's geological setting, and the unit's hydrogeological setting.

The monitoring wells must be cased, constructed, operated, and maintained in a way that preserves the integrity of the monitoring well borehole, screened interval and other components so as to ensure the well performs to the design specifications throughout the life of the monitoring system. EPA expects owners or operators to ensure the groundwater monitoring wells are adequately protected from activities that may damage the wells or otherwise adversely impact their performance, such as accidental damage caused by livestock, vehicles, machinery, or other activities near the unit.

The owner or operator of the unit must ensure that the design, installation, development, and decommissioning of any aspect of the groundwater monitoring system is thoroughly documented and included in the operating record. Furthermore, the owner or operator must obtain a P.E. certification or approval from the Participating State Director or EPA stating the groundwater monitoring system meets the standards set out in § 257.91.

ii. Development of the Groundwater Sampling and Analysis Program for Legacy CCR Surface Impoundments

EPA proposed to require owners or operators of legacy CCR surface impoundments to comply with the existing groundwater sampling and analysis program requirements for CCR surface impoundments, including the selection of the statistical procedures that will be used for evaluating groundwater monitoring data. 40 CFR 257.93. EPA proposed a deadline of no later than six months after the effective date of the final rule for owners or operators to comply with this requirement.

One commenter suggested EPA prohibit use of intrawell groundwater data comparisons for legacy CCR surface impoundments. This commenter stated that intrawell comparisons are only appropriate when the background samples are collected before CCR was placed in the unit and therefore, since these units are likely already leaking, they would be ineligible for intrawell data comparisons. As stated in Unit III.B.2.f, the existing groundwater monitoring and corrective action requirements are essentially the same requirements that have been applied to both hazardous waste and municipal solid waste disposal units for decades, and with the one exception discussed below, there is nothing about legacy CCR surface impoundments that makes them distinct enough to warrant separate or additional requirements. Furthermore, while EPA expects legacy CCR surface impoundments to largely be unlined and potentially leaking, the commenter did not provide any evidence that would support creating a prohibition against intrawell data comparisons. Therefore, EPA did not adopt a prohibition on intrawell data comparisons at legacy CCR surface impoundments. However, EPA acknowledges that since the 2015 CCR Rule went into effect, intrawell groundwater data comparisons have been misused to a large degree. No commenters raised concern about requiring legacy CCR surface impoundments to comply with the existing requirements in § 257.93. EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.100(f)(4)(ii).

However, EPA received several comments on the proposed deadline for the development of the groundwater sampling and analysis plan. As mentioned in Unit III.B.2.a.ii, some commenters supported the expedited deadline. However, several other commenters pointed out that the sampling and analysis plan cannot be completed prior to the collection of the baseline samples, which had a proposed deadline of 24 months from the effective date. Many of these commenters went on to state that the proposed expedited deadline for the development of the sampling and analysis plan could result in too frequent sampling leading to non-independent, autocorrelated baseline samples for a large number of facilities, undermining the required statistical analysis. A few commenters further stated that EPA published decisions on Part A and Part B demonstrations citing lack of statistical independence in sampling as a basis for non-compliance, and failure for EPA to extend the deadline for the sampling and analysis plan to allow adequate time for facilities nationwide to gather independent samples would create de facto non-compliance.[59] Commenters also said that the proposed deadlines do not account for the backlogs already experienced due to the existing CCR units using the small number of laboratories qualified to conduct the specialized analyses required by the rule, coupled with the national labor shortages. The commenters predicted the backlogs with laboratories will only increase with the regulation of legacy CCR surface impoundments and CCRMU, making the proposed deadlines even more infeasible. Finally, as mentioned in Unit III.B.2.f, commenters emphasized the need for one deadline for all groundwater monitoring requirements.

EPA agrees that a sampling and analysis plan cannot reasonably be completed before the collection of baseline samples. EPA also acknowledges the adverse impact of too frequent sampling on the validity of statistical analysis and the need to account for seasonal variability in groundwater flow, groundwater levels, and constituent concentrations. EPA further acknowledges that providing insufficient time for the collection of baseline samples or the development of the sampling and analysis plan would likely result in ineffective groundwater monitoring programs that may fail to alert facilities to groundwater contamination coming from CCR units. As explained in Unit III.B.2.a.ii and Unit III.B.2.f respectively, EPA recognizes the need for more time to accommodate third-party availability and a single deadline for the groundwater monitoring requirements. As stated in Unit III.B.2.f.i, for the reasons laid out above, EPA is finalizing a single deadline for the groundwater monitoring requirements of no later than Monday, May 10, 2027, which is 30 months from the effective date of this final rule.

The owner or operator must develop the groundwater sampling and analysis program that satisfies the requirements in § 257.93 and includes a list of monitoring wells to be sampled (*i.e.,* the monitoring network), the schedule for sampling, sampling procedures and techniques, sample preservation and shipping protocols, analytical procedures including an appropriate statistical method for analysis, and quality assurance and quality control methods. The sampling and analysis plan must include all analytes listed in Appendix III and Appendix IV. Recommendations and information on how to comply with many of the

[59] On January 25, 2023, EPA proposed determinations on six Part B applications for alternate liner demonstrations (''Part B''). All six proposals are proposed denials. The CCR Part B Final Rule (85 FR 72506, November 12, 2020), allowed a limited number of facilities to demonstrate to EPA or a Participating State Director that, based on groundwater data and the design of a particular surface impoundment, the unit has and will continue to ensure there is no reasonable probability of adverse effects to human health and the environment.

requirements for the groundwater sampling and analysis program (*e.g.,* analytical procedures, QA/QC controls, sampling protocol) can be found in the following EPA guidance documents (*e.g., RCRA Groundwater Monitoring: Draft Technical Guidance,* 1992, EPA/530/R–93/001; *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures,* 1996, EPA/540/S–95/504).

iii. Detection Monitoring Program and Assessment Monitoring Program Combined

EPA proposed to require sampling and analysis of constituents listed in Appendix IV at the same time as those listed in Appendix III. The proposed rule explained that this would expedite groundwater monitoring and initiation of corrective action by at least six months at sites where units have potentially been leaking for a time, as is likely the case at unlined legacy CCR surface impoundments. The proposed rule further explained that expediting Appendix IV constituent detection and any resulting corrective action is necessary for the protection of human health and the environment. EPA proposed no other revisions to the existing groundwater monitoring requirements in §§ 257.90 through 257.95.

EPA received few comments on its proposal to combine detection and assessment monitoring. One commenter pointed out the increased demand on laboratory services, facility staff and/or contractors, and P.E.s that would result from having all legacy CCR surface impoundments comply with both monitoring programs simultaneously. Another commenter stated that by combining detection and assessment monitoring and assuming groundwater contamination, EPA has rendered detection monitoring superfluous. Further, the commenter asserted that skipping detection monitoring entirely would lose critical data regarding whether there are statistically significant increases (SSI) in groundwater constituents specifically due to the unit being monitored. Another commenter said that the justification in proposed rule regarding phased groundwater monitoring being ''best suited to situations where there is little likelihood of pre-existing contamination'' conflicts with EPA's position in the 2015 CCR Rule. According to the commenter, in the 2015 CCR Rule, the Agency was aware many CCR surface impoundments were decades old and potentially leaking; yet EPA still adopted a phased approach with detection monitoring to monitor indicators of potential groundwater contamination and assessment monitoring to determine if releases of CCR constituents of concern did occur.

As explained in the proposed rule, the phased approach in the 2015 CCR Rule is best suited to situations where there is little likelihood of pre-existing contamination, such as at a new facility or unit. As EPA explained in 2015, detection monitoring was designed to provide an early warning that a unit might be contaminating the aquifer, by first monitoring for constituents that would rapidly move through the subsurface and thus provide early detection of a potential problem before significant releases of constituents of concern (*i.e.,* those in Appendix IV) had occurred. See, 80 FR 21397. At a site without an old, unlined impoundment, or other evidence of pre-existing contamination, a graduated response to increasing evidence of leakage and potential contamination is easily justified, as it both allows facilities ample time to investigate the source of contamination as well as the environmental fate and transport characteristics of CCR constituents in groundwater, while still protecting human health and the environment. In essence, this approach rests on a presumption that the unit is not already leaking. At new sites, for example, there is no reason to expect that groundwater will have been contaminated above regulatory levels of concern prior to detection by the groundwater monitoring system.

But that presumption is largely inapposite for a universe consisting exclusively of historic unlined units, many of which have operated for decades. And at sites where leakage (and therefore, likely groundwater contamination) has been occurring for a sustained period, the need to protect human health and environment warrants the quick detection of constituents of concern and initiation of any necessary corrective action. Unlike this rule, the 2015 CCR Rule applied both to new facilities, which would be expected to have little likelihood of pre-existing contamination, and to currently operating facilities. Over the long term, EPA expected that there would eventually be a greater percentage of new units than existing units as the older units reached capacity and closed. In addition, as discussed in the proposal at 88 FR 32010 and in Unit III.A.2 of this preamble, it is clear from the data posted on facilities' websites that EPA significantly underestimated the number of unlined units (both impoundments and landfills), and consequently, significantly underestimated the number of leaking units and the extent of contamination at these sites. In light of these considerations, EPA's decision in 2015 to adopt phased monitoring was reasonable.

By contrast, there is good reason to believe that many legacy CCR surface impoundments are currently contaminating groundwater, based on the record from the 2015 CCR Rule, the results of EPA's recent modeling, and the large number of presently regulated CCR surface impoundments that have been found to be leaking, despite frequently inadequate groundwater monitoring networks. In sum, the totality of this record demonstrates that it is highly likely that the installation of groundwater monitoring at legacy impoundments will identify the presence of plumes of contaminated groundwater that have persisted or even expanded over many prior years despite a previous absence of groundwater data.

As a practical matter, EPA expects combining Appendix III and Appendix IV constituents into a unified sampling and analysis plan and approach will likely have only minor effects on schedules, as this change will not require additional field mobilizations or sampling events and will only require collection of a slightly larger number of sample containers at each monitoring well to allow for analysis for both Appendix III and IV constituents. As such, no additional shipments of samples to the analytical laboratory will be required. However, EPA acknowledges that combining Appendix III and Appendix IV constituents into a unified sampling and analysis plan may increase the total throughput burden on analytical laboratories and related services. Similarly, while combined monitoring may require additional evaluation (*e.g.,* concentration and trend analysis of data concerning both Appendix III and Appendix IV constituents), this incremental increase is unlikely to significantly increase the overall reporting level of effort, as the number of reports will be essentially unchanged.

Nevertheless, as discussed in Units III.B.2.a.ii and III.B.2.f of this preamble, EPA acknowledges the commenters' concerns regarding existing and projected labor shortages, backlogs, and third-party availability, and agrees this has the potential to affect facilities' ability to comply with the proposed deadlines for groundwater monitoring requirements. EPA is therefore extending the deadline, as well as building in flexibility for facilities to accommodate for delays, by finalizing a single deadline for groundwater monitoring requirements in lieu of the proposed split deadlines.

However, EPA disagrees that combining detection and assessment monitoring will render detection monitoring redundant, and that critical data would be lost, by sampling for Appendix IV constituents at the same time as Appendix III constituents (*i.e.,* by collecting more information). The commenters provided no further explanation of what information they thought would be lost, but under the combined monitoring, the facility would collect the same information on Appendix III constituents that is collected under the detection monitoring in § 257.94. Given that under the existing assessment monitoring provisions, facilities must simultaneously analyze samples for all parameters in Appendix III and for any Appendix IV constituent detected in the initial sampling, it is not apparent why the commenter believes that requiring simultaneous monitoring more broadly is appreciably different. 40 CFR 257.95(d)(1).

As stated in the previous paragraph, concurrent monitoring for Appendix III and Appendix IV constituents provides considerably more information and enables a more complete understanding of the geochemical nature, fate, and transport of any detected releases. Additionally, simultaneously collecting samples for Appendix III and Appendix IV constituents will still provide the basis for determining SSIs, should they exist, so no information will be lost. Contrary to the commenter's concern, additional information will be gained in an expedited manner (*e.g.,* the potential spatial and temporal correlation of Appendix III SSIs with exceedances of statistically significant levels (SSLs) for Appendix IV constituents). Furthermore, EPA disagrees that its explanation that phased groundwater monitoring is ''best suited to situations where there is little likelihood of pre-existing contamination'' fundamentally conflicts with EPA's decision to adopt phased monitoring in the 2015 CCR Rule. Unlike this final rule, the 2015 CCR Rule applied to both new facilities, which would be expected to have little likelihood of pre-existing contamination, and to existing facilities. Over the long-term, EPA expected that there would eventually be a greater percentage of new units than existing units as the older units reached capacity and closed. In addition, as discussed in the proposal at 88 FR 32010 and in Unit III.A.2 of this preamble, it is clear from the data posted on facilities' websites that in 2015 EPA significantly underestimated the number of unlined units (both impoundments and landfills), and consequently, significantly underestimated the number of leaking units and the extent of contamination at these sites.

If an alternate source is causing an exceedance of an Appendix III constituent, it may also be the source of any SSL detected for any Appendix IV constituents; in such a case, a facility may simply prepare a single ASD that covers constituents from both appendices. The sole difference between phased monitoring and combined monitoring is if the alternate source is only responsible for the Appendix III constituent, but the unit actually is releasing one or more Appendix IV constituents. In such a case, under a phased approach detection of the Appendix IV constituent can be delayed or even remain undetected, because the facility would not trigger assessment monitoring absent an SSI from another Appendix III constituent. In such situations, combined monitoring can make the monitoring program more accurate; it is unclear why the commenter believes this is inappropriate.

To avoid unnecessary and potentially inappropriate delays, ASDs should only be considered in cases where there is a strong technical case for an alternate source, and technically weak or equivocal ASDs should be rejected as soon as is appropriate to minimize delays in corrective action implementation. Given the age of most inactive CCR facilities, the potential for plumes of groundwater contamination extending for significant distances downgradient of the unit boundaries where exceedances are first determined should be anticipated. Additional lateral and vertical delineation of groundwater exceedances should be conducted in conjunction with corrective action as needed.

Ultimately, the combined monitoring expedites the initiation of assessment monitoring which in turn, allows for more expeditious identification of statistically relevant exceedances of Appendix IV constituents. This will in turn expedite ASD development or corrective action, depending on the circumstances.

The phased approach in the 2015 CCR Rule provides for a graduated response to groundwater contamination as the evidence of contamination increases over time. This approach allows facilities ample time to investigate the source of contamination as well as the transport characteristics of CCR constituents in groundwater while, usually being protective of human health and the environment. However, at sites where there is a strong likelihood that groundwater contamination has been occurring for a sustained period, the advantages provided by a protracted graduated response are outweighed by disadvantages of persistent or even increasing contamination that continues to move downgradient. At these sites, the need to protect human health and the environment necessitates the quick detection of the constituents of concern in Appendix IV to expedite any necessary corrective action. See, *USWAG* 901 F.3d at 427–30. In this case, as highlighted in Unit III.A, the record provides strong reason to conclude that many legacy CCR surface impoundments are contaminating groundwater, given the large number of currently regulated CCR surface impoundments that have been found to be leaking.

Therefore, EPA is finalizing this requirement as proposed to be completed no later than Monday, May 10, 2027, which is 30 months after the effective date of this final rule. This is codified in the regulatory text at § 257.100(f)(4)(iii)(B) and (C).

iv. Detection Monitoring Program and Assessment Monitoring Program—Deadline for Collection and Analyses of Eight Independent Samples for Legacy CCR Surface Impoundments

EPA proposed that no later than 24 months after the effective date of the final rule, owners or operators of legacy CCR surface impoundments initiate the detection monitoring program by completing sampling and analysis of a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b). The proposed rule explained that within 90 days after initiation of the detection monitoring program, owners or operators must identify any SSIs over background levels for the constituents listed in Appendix III, as required by § 257.94. To expedite the time to initiate any required corrective action, EPA also proposed that by this same deadline owners or operators initiate the assessment monitoring program by establishing groundwater protection standards and staring to evaluate the groundwater monitoring data for an SSL over GWPS for the constituents listed in Appendix IV as required by § 257.95.

No commenters raised concern about requiring legacy impoundments to comply with the existing requirements in § 257.94(b). Therefore, EPA is finalizing this requirement as proposed. This is codified in the regulatory text at § 257.100(f)(4)(iii)(A).

However, EPA received several comments on the proposed deadline for the collection of the eight baseline samples. As mentioned in Unit III.B.2.a.ii, some commenters supported the expedited deadline. However, several other commenters requested that the groundwater monitoring requirement deadlines be combined into a single deadline that provided at least as much time to come into compliance as was provided in the 2015 CCR Rule deadlines (*i.e.,* 24 months after the effective date of the final rule). As stated in Unit III.B.2.f, based on information provided by commenters, EPA concluded that a single deadline should be used for the groundwater monitoring requirements. In the proposed rule, the latest proposed deadline for groundwater monitoring requirements was the deadline of 24 months from the effective date of this final rule for the initiation of the combined detection and assessment monitoring and the collection of the eight baseline samples. Based on information provided in response to comments on the proposed rule and as explained in Units III.B.2.a.ii and III.B.2.f, EPA calculated six months as the appropriate extension of the groundwater monitoring system deadlines. Therefore, EPA is finalizing a deadline for the completion of sampling and analysis of a minimum of eight independent samples for each background and downgradient well of no later than Monday, May 10, 2027, which is 30 months from the effective date of this final rule.

v. Annual Groundwater Monitoring and Corrective Action Reports for Legacy CCR Surface Impoundments

EPA proposed to apply the existing requirements in § 257.90(e) to legacy CCR surface impoundments and that owners or operators of legacy CCR surface impoundments comply no later than January 31 of the year following the calendar year after a groundwater monitoring system has been established (and annually thereafter).

One commenter suggested that the initial groundwater monitoring and corrective action report be due no later than January 31 of the year following the collection of the eight baseline samples and the first semi-annual sampling event in order to allow facilities to provide all the documentation required by § 257.90(e). EPA disagrees that the information required by § 257.90(e) would not be available to a facility upon completion of the groundwater monitoring system, as the annual report serves as an update on the activities related to the groundwater monitoring program, including the installation of groundwater monitoring wells. Additionally, when specific actions are not required by the CCR regulations (*e.g.,* a facility has not triggered corrective action), facilities are not penalized for not having any activities related to that action to discuss in the groundwater monitoring and corrective action annual report (*e.g.,* not describing progress in selecting a remedy when not in corrective action).

EPA is finalizing the requirement for owners or operators of legacy CCR surface impoundments to comply with the requirements in § 257.90(e) which mandate the preparation of an annual groundwater monitoring and corrective action report no later than January 31, 2027, and annually thereafter. This is codified in the regulatory text at § 257.100(f)(4)(iv).

The report documents the activities associated with the groundwater monitoring program and progress of any corrective action over the past year and must contain specific information identified in the regulations, including but not limited to maps; aerial images or diagrams showing the CCR unit and all upgradient (background) and downgradient wells; identification of any monitoring wells installed or decommissioned in the previous year; monitoring data collected under §§ 257.90 through 257.98; and a narrative discussion of any transition between monitoring programs (*i.e.,* detection and assessment monitoring). Annual reporting should ensure that groundwater level data collected over the reporting period is tabulated, presented, and analyzed to determine groundwater levels relative to any residual CCR left in place as well as to confirm or determine groundwater flow directions.

Upgradient and downgradient well locations and depths should be validated annually with respect to measured and mapped flow directions. Groundwater quality sampling data should be included in appendices and summarized and tabulated in the annual reports. If appropriate, exceedances (SSIs and SSLs) of Appendix III and IV constituents should be tabulated and highlighted. As mentioned in some comments, annual reports should identify the nearest downgradient surface water bodies as well as groundwater supply wells in the vicinity of the unit.

If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action as laid out in §§ 257.96 through 257.98, should be initiated as soon as possible. It is critical that annual corrective action and monitoring reports provide the basis for selection and documentation of corrective actions as early as possible well as graduated data to document initiation of corrective action activities and graduated and ongoing steps and associated data collected over the course of each year to document remedial performance, modifications, and other changes or improvements.

In addition to documenting compliance, the annual report must be posted to the unit's public CCR website which allows the public to review the groundwater monitoring results. Therefore, it is critical that the annual reports contain the basic data that informs the positions and status reported in those documents, including but not limited to boring logs, monitoring well installation diagrams, water level data, field sampling data sheets for groundwater sample collection, laboratory analytical data including QA/QC data, data validation, and others. In summary, the annual groundwater monitoring and corrective action reports should not only contain the information required by the regulations but should be organized in such a way that: (1) Compliance with the CCR regulations is evident; (2) Data supporting compliance conclusions are easily located within the document; and (3) The public is readily able to review the groundwater monitoring data and related information. Lastly, the name of the document on the public CCR website should be such that it is clear what the file is and readily printed and downloaded by the public.

vi. Corrective Action Requirements for Legacy CCR Surface Impoundments

EPA proposed to require owners or operators of legacy CCR surface impoundments to comply with the existing corrective action criteria, as applicable in §§ 257.96 through 257.98. The proposed rule explained that conducting the sampling simultaneously would expedite groundwater monitoring and, where necessary, initiation of corrective action by at least six months at sites where units have potentially been leaking for a long period, as is likely the case at many unlined legacy CCR surface impoundments. The proposed rule further explained that expediting Appendix IV constituent detection, assessment and any subsequent corrective action would protect human health and the environment.

Under the existing regulations, if groundwater monitoring demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required, as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and any post-closure care period of the CCR unit.

A commenter suggested EPA create a deadline for the completion of the selection of a remedy required by § 257.97 of 90 days after the completion of the assessment of corrective measures (ACM) with the ability to extend the deadline up to 180 days after the completion of the ACM. The commenter pointed to the failure of units regulated by the 2015 CCR Rule to select a remedy as soon as feasible after the completion of the ACM as required by the rule and the subsequent unnecessary delay in addressing contaminated groundwater. Other commenters stated that applying the existing groundwater monitoring and corrective action requirements to historic sites, such as legacy CCR surface impoundments, is not appropriate and suggested that instead EPA incorporate site-specific risk-based corrective action into the CCR regulations. One of these commenters further stated that the application of the existing CCR corrective action requirements conflict with EPA's decision-making frameworks in other programs such as RCRA and CERCLA due to lack of site-specific risk assessments to evaluate risk and drive corrective action decisions. This commenter suggested that EPA utilize site-specific, risk-based corrective action that is consistent with the guidance documents EPA has developed for RCRA and CERCLA programs.

EPA acknowledges the widespread non-compliance with the mandate to complete the selection of a remedy as soon as feasible after the completion of the ACM. However, EPA disagrees with the commenter's suggested deadline. The recommended deadline could actually have the effect of extending the deadline for the completion of the selection of a remedy beyond that in 2015 CCR Rule because ''as soon as feasible'' in many cases would likely be before 90 days after the completion of the ACM. Granting owners or operators more time to select a remedy would be less protective of human health and the environment. Regarding noncompliance with the CCR regulations, EPA has been and will continue to take action to address the non-compliance on a myriad of issues including to the failure of owner or operators to select a remedy as soon as feasible. EPA has announced that enforcing the CCR regulations is part of the ongoing set of National Enforcement and Compliance Initiatives and expects that enforcement actions taken as part of the Initiative may address, where relevant and appropriate, the concern raised by the commenter.[60]

EPA disagrees with the suggestion that the existing corrective action requirements, if triggered, are inappropriate at legacy CCR surface impoundments. As stated in Units III.B.2.a.i and III.B.2.f, the physical characteristics of legacy impoundments are not sufficiently different from currently regulated units to justify different requirements. For those commenters requesting that EPA adopt ''risk-based corrective action'' into the requirements, EPA notes that the commenters have provided no further explanation of what requirements in the existing regulations they wanted EPA to revise, what the revisions should accomplish, or why they are necessary or appropriate. As a general matter EPA considers that the corrective action regulations in §§ 257.95 through 257.98 do currently require facilities to tailor remedies to address the risks to human health and the environment, based on the conditions at the site. It is unclear what more the commenters are seeking. Furthermore, the commenter that stated that the existing corrective action regulations conflict with other EPA programs (*i.e.,* RCRA and CERCLA) failed to fully explain how the existing corrective action regulations conflict with EPA-published RCRA or CERCLA guidance documents or how they preclude corrective action decisions driven by site-specific risks. Accordingly, EPA is finalizing, without revision, its proposal that legacy CCR surface impoundments comply with the existing corrective action requirements at §§ 257.95 through 257.98.

As explained in the proposed rule at 88 FR 32003, §§ 257.90 through 257.95 require an owner or operator of a CCR unit to install a system of monitoring wells, specify procedures for sampling these wells, and set forth methods for analyzing the groundwater data collected to detect hazardous constituents (*e.g.,* toxic metals) and other monitoring parameters (*e.g.,* pH, total dissolved solids) released from the units (*i.e.,* all parameters listed in Appendices III and IV). If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and post-closure care period of the CCR unit.

When corrective action is required, it should be initiated as soon as possible. The corrective action program includes initiating an ACM to prevent further releases, to remediate any releases, and to restore affected areas to original conditions, as specified in § 257.96(a). After the ACM has been completed, the owner or operator must select a remedy that meets prescribed standards, including a requirement that the remedy attain the groundwater protection standards. See § 257.97(a) and (b). Finally, the corrective action program requires the owner or operator of the CCR unit to initiate remedial activities within 90 days of selecting a remedy. See § 257.98(a). The requirement to address releases under this requirement is identical to those requirements for any CCR unit undertaking groundwater corrective action with the additional requirement that implementation of corrective action begin during the active life of the unit.

EPA expects that when assessing corrective measures and selecting a remedy, the owner or operator of the unit will consider the impact of the corrective measures on the water quality and safety of the nearest surface water bodies and the nearest private and/or public groundwater wells.

With respect to completion of an ACM and remedy selection, § 257.96(a) requires an ACM be initiated within 90 days of determining an SSL has occurred, and then completed within another 90 days. An extension, not to exceed 60 days, may be warranted due to site-specific conditions or circumstances. This deadline to complete an ACM, 180 to 240 days after determining an SSL, was not proposed to be changed, so comments suggesting changes to these provisions are outside the scope of the rulemaking. Additionally, the commenters provided no reason why corrective measures could not be assessed and compared in an ACM and a remedy could not be selected. Prior to closure of a CCR unit, the facility has been required to characterize site conditions, including groundwater flow conditions and geology. The facility has knowledge of wastestreams and water volumes it discharges to a CCR surface impoundment. This information can be used to develop a groundwater model to predict groundwater flow conditions after wastestream disposal ceases and closure is initiated. EPA believes this

[60] EPA Enforcement Alert, National Enforcement and Compliance Initiative, Protecting Communities from Coal Ash Contamination. EPA Document #310F23002. December 2023. *https://www.epa.gov/system/files/documents/2023-12/ccr-enf-alert-2023.pdf.*

would provide sufficient characterization of post-closure conditions to assess and compare groundwater cleanup alternatives to complete an ACM. The commenters have provided no reasons or explanation why this would not be achievable.

Once the ACM is complete, a public meeting has been held, and community input has been considered, a remedy must be selected as soon as feasible. EPA agrees that a selected remedy may include closure by removal to comply with source control requirements, and that this would constitute commencing implementation of a remedy. However, the selected groundwater remediation portion of the remedy must also be implemented within a reasonable time, in accordance with the schedule established in the remedy selection report. 40 CFR 257.97(d). Implementation of the source control measure does not negate this requirement.

g. Closure and Post-Closure Care Criteria for Legacy CCR Surface Impoundments

EPA proposed to apply all of the existing closure and post-closure care requirements in §§ 257.101 through 257.104 to legacy CCR surface impoundments, except for the alternative closure requirements in § 257.103(f). The proposed rule explained that based on the data gathered since 2015 from the currently regulated CCR unit universe, the Agency considered it highly unlikely that any legacy CCR surface impoundment has a composite liner that meets the requirements of § 257.71 and therefore EPA expected legacy CCR surface impoundments to be unlined as defined by § 257.71(a)(3)(i). Consistent with the *USWAG* decision and the existing regulations in § 257.101(a) mandating that all unlined (including clay-lined) impoundments must close, EPA proposed to require that all legacy CCR surface impoundments initiate closure within 12 months of the effective date of this final rule. The proposed rule also explained that the alternative closure provisions in § 257.103(f) were not appropriate for legacy CCR surface impoundments as these units, by definition, are inactive impoundments at inactive facilities and could not therefore demonstrate the need to continue to use the disposal unit, which is a qualifying component of the alternative closure provisions.

EPA received numerous comments on its proposal to apply the existing the closure and post-closure care requirements §§ 257.100 through 257.104 to legacy CCR surface impoundments. Overall, most commenters supported or did not contest EPA's proposal. Some of these commenters agreed that requiring legacy CCR surface impoundments to comply with the existing closure requirements is necessary for the long-term protection of human health and the environment. A few of these commenters also suggested that EPA prohibit legacy CCR surface impoundments from closing with CCR in place under § 257.102(d).

Many other commenters however objected to subjecting legacy impoundments to § 257.101(a), which requires CCR surface impoundments constructed without a composite liner to close. These commenters generally argued that a national requirement to close was not appropriate for legacy CCR surface impoundments and that EPA should instead determine whether closure is warranted at each site based on a finding that the individual unit at the particular site poses unacceptable risks. These commenters largely reiterated comments previously made in response to the ANPRM, without addressing EPA's responses in the proposal. For example, some asserted that their particular legacy impoundments are not contaminating groundwater and do not pose a risk to groundwater. One claimed that the proposal was based on the upper bound of risk pulled from a sensitivity analysis of a nationwide risk assessment based on aggregated data unrepresentative of any given facility, and therefore could not support a finding that any particular site poses ''actual risks.'' This commenter also asserted that a nationwide risk assessment should not be used to impose a ''one-size-fits-all'' closure requirement or universal performance standards for closure, because it could drive closure methods that are not necessary to ensure protection of human health and the environment. Other commenters repeated their claims that the closure of legacy CCR surface impoundments would itself present greater risks than leaving the disposal unit in its existing state. For example, one commenter asserted that closing legacy impoundments could raise environmental justice issues associated with increased traffic and (consequently) decreased air quality; could risk potentially destabilizing the unit and disturbing native species and animal habitats; and would increase air emissions, water consumption, and waste generation.

These commenters asserted that a ''risk-based'' closure or corrective action program was better suited ''to address the unique nature and unknown risk of legacy CCR surface impoundments.'' For example, one commenter suggested that the risks associated with legacy CCR surface impoundments can be better managed through corrective action implemented under a permit program, which the commenter believed would make the mandate to close these units unnecessary. The commenter explained that although closure can be useful as source control in remediating contamination, as long as the exposure pathways are appropriately addressed through corrective action, nearby receptors will not be impacted by the risks, and the RCRA subtitle D protectiveness standard would be met without closing the impoundment. Similarly, another commenter argued that mandating closure for all legacy impoundments is inconsistent with other RCRA and CERCLA or State cleanup programs, which, the commenter asserts generally use site-specific risk assessments to determine whether closure is warranted. The commenter suggested that instead, the final rule should rely on the upcoming implementation of EPA's Federal permitting rule pursuant to the WIIN Act and allow a regulated entity to conduct a site-specific risk assessment to evaluate whether the historical CCR disposal areas pose ''actual risks'' and allow closure and corrective actions to be tailored to site-specific conditions and risks.

Other commenters raised concern that some legacy impoundments are now located beneath infrastructure such as pipelines or transmission lines that cannot be disturbed without disrupting operations, active CCR units, or buildings. These commenters explained that requiring closure of these impoundments could adversely impact grid reliability, business operations, or other necessary public services (*e.g.,* military infrastructure) and suggested that EPA exempt these units or at least extend the closure time frames to allow for closure of the impoundment when the other unit or structure is closed or decommissioned.[61]

[61] EPA also received comments suggesting that it examine the cumulative impact of several recently or soon-to-be finalized power sector and vehicle rules. EPA performed suggested sensitivity analysis which demonstrated 1) the cumulative impact is not expected to adversely impact resource adequacy, and 2) that, considering the power sector rules together, the cumulative effect of these rules in terms of reduction in coal steam electric generating capacity is less than the sum of each of these rules individually for 2035. The affected universe of units with significant mitigation responsibilities among the EPA rules is overlapping, not purely additive, as it largely reflects the same segment of the grid's generation portfolio. See *Resource Adequacy Analysis: Vehicle Rules, 111 EGU rule, ELG, and MATS Technical*

Several commenters expressed support for the proposed 12-month deadline to initiate closure, stating that the shorter deadlines are necessary to address the increased risk from legacy CCR surface impoundments and likelihood these units are and have been contaminating groundwater. Many other commenters characterized the proposed deadline as infeasible for the reasons mentioned in Unit III.B.2.a.ii, including seasonality, need to comply with overlapping regulatory requirements, labor shortages, and the strain on the limited resources necessary to achieve compliance (*e.g.,* contractors, laboratories, P.E.s) caused by the number of CCR units coming into compliance at the same time. Commenters also stated that compliance with the closure requirements should not be required until after the groundwater monitoring system was installed and baseline samples collected so that closure could be informed by the groundwater monitoring data. These commenters pointed to recent EPA Part A and Part B decisions as evidence of the gap between EPA's expectations and the closure and post-closure plans developed using good faith efforts by owners or operators and best practices; these commenters further stated that the proposed deadline precludes the incorporation of groundwater monitoring data in developing closure plans and is likely a contributing factor to the gap between EPA's expectation and closure and post-closure care plans submitted by owners or operators of currently regulated units. One commenter also claimed that legacy CCR surface impoundments are potentially still being used to manage non-CCR wastestreams, and that EPA consequently needed to create a mechanism for facilities to seek extensions similar to those that had been made available under § 257.103(f). Commenters' suggestions for alternative deadlines to initiate closure ranged from 24 to 34 months, or at least after the collection of the baseline groundwater monitoring samples required by § 257.94.

MEMO for more information. Also see *IPM Sensitivities MEMO.* The grid analysis did not include the proposed or final version of this rulemaking, because this CCR rule primarily addresses only disposal units that have not received CCR since before 2015, that is the disposal units are not part of ongoing operations at any facility, and consequently this rule is not expected to impact the generation of electricity. In addition, EPA continues to believe this final rule will not generally impact current utility operations, particularly due to the revisions made in the final rule to address commenters concerns, as discussed in the preamble to the final rule (*e.g.,* extended deadlines for CCRMU located under critical infrastructure).

EPA continues to believe that applying the closure and post-closure requirements in §§ 257.101 through 257.104 to legacy CCR surface impoundments is appropriate and necessary to protect human health and the environment. Based on the record compiled for the 2015 CCR Rule, EPA concluded that ''there is little difference between the potential risks of an active and inactive surface impoundment; both can leak into groundwater, and both are subject to structural failures that release the wastes into the environment, including catastrophic failures leading to massive releases that threaten both human health and the environment.'' 80 FR 21343. As discussed in Unit III.B of this preamble, the D.C. Circuit concurred, and on that basis, vacated the exemption for legacy CCR surface impoundments. See, *USWAG* at 901 F.3d at 434. EPA received no information during this rulemaking that would support a conclusion that legacy CCR surface impoundments present fewer risks than other inactive CCR surface impoundments. Indeed, as discussed in Unit III.A, more recent information continues to indicate that legacy CCR surface impoundments are more likely to contaminate groundwater and at higher levels, even in cases where the unit no longer presents structural stability concerns. Based on this record and on the specificity of the D.C. Circuit's findings in *USWAG,* EPA considers that it has limited discretion to establish requirements for legacy CCR surface impoundments that are significantly different than those currently applicable to inactive CCR surface impoundments. Accordingly, EPA in most cases instances has required legacy CCR surface impoundments to comply with the existing closure and post-closure requirements in 40 CFR part 257, subpart D, that are currently applicable to inactive CCR surface impoundments. This final rule also adopts the provisions that were originally proposed on March 3, 2020, that allow a facility closing by removal to complete required groundwater remediation during a post-closure care period, discussed in Unit III.D of this preamble.

However, in response to comments, EPA included one additional provision to account for the inception of Federal permitting. A key feature of a permit program is that, through a subsequent public process, a regulatory authority can adjudicate legal and factual issues based on the specific facts of an individual site, that would be more complex and challenging to resolve in a national rule. EPA has relied on this feature to resolve one of the more complex legal and factual issues raised in this rulemaking by deferring it to the subsequent permitting process: how to address situations where the impoundment contained CCR and liquids on October 19, 2015, but prior to the effective date of this final rule, a facility closed its legacy CCR surface impoundment in accordance with standards established by a regulatory authority that are different than the performance standards in § 257.102, but that are likely to provide equivalent protection of human health and environment. Provided certain criteria are met, EPA is deferring the requirement for the closed unit to comply with § 257.102 until a permit authority can evaluate the adequacy of the previously completed closure, and determine during permitting whether (as well as what) additional measures are necessary to ensure that the closure is as protective as § 257.102. The criteria EPA is employing are designed to ensure that the regulatory authority overseeing the closure applied standards that were substantially equivalent to the otherwise-applicable CCR rules in terms of evaluating and mitigating the risks. In such cases, EPA would therefore have reliable evidence that the risks have likely been adequately mitigated and therefore, these are unlikely to pose a reasonable probability of adverse effects pending later permitting. The final rule also includes procedures for the closure equivalency determination modeled on similar determinations made for hazardous waste interim status units under § 270.1.

EPA is currently transitioning from the exclusively rule-based program to a Federal permitting program. Although every unit in operation, closure, or corrective action will ultimately receive a permit, and EPA expects to shortly begin issuing permits, it will be several years before permits are issued for every unit. This means that, at least in the near term, most facilities will continue to operate under the current self-implementing regime, similar to units under the subtitle C hazardous waste program that initially operated under interim status prior to obtaining a permit. While this necessarily limits the degree to which this final regulation can rely on the permitting process, this is an example of a situation that is better resolved through a combination of a national rulemaking and the individualized decision making provided through permitting rather than exclusively through a national rulemaking. EPA agrees that there are examples of units closed under alternative criteria that appear to be equally as protective as the part 257 closure requirements. If EPA were to require all previously closed units to document compliance with § 257.102 immediately, several units that have likely already met the protectiveness standards would be swept in unnecessarily. Unfortunately, it is not feasible to evaluate these individual closures as part of this national rulemaking; these units are all subject to different requirements, and commenters have provided insufficient information on each individual unit for the Agency to conclude that they are in fact as protective as a closure conducted in accordance with § 257.102. If EPA were still limited to issuing minimum national criteria through rulemaking, it would be reasonable to craft a regulation that would regulate over broadly in order to ensure that the final rule achieves the statutory standard at each facility subject to the regulation. See 42 U.S.C. 6944(a)(''no reasonable probability of adverse effects on health or the environment . . . at such facility''). As EPA explained in 2015, to establish criteria under this provision, EPA must demonstrate, through factual evidence available in the rulemaking record, that the final rule will achieve the statutory standard at all sites subject to the standards based exclusively on the final rule provisions. This means that the regulations must account for and be protective of all sites, including those that are highly vulnerable. But now that Congress has granted the agency broader authority, it is reasonable in this case, where EPA can craft criteria to identify closures that may be protective and thus warrant a closer evaluation, to rely on that broader authority.

Under this provision, EPA is not exempting a facility from the requirement to demonstrate that a unit closure meets the performance standards in § 257.102, or from agency oversight, but only delaying application of the requirement until the Agency can resolve the outstanding legal and factual issues. EPA is also deferring only the requirement that a closed unit achieve compliance with the closure performance standards. To mitigate any potential risks, all other applicable requirements, including the requirements for groundwater monitoring and corrective action would continue to apply to these units. Further EPA's existing authorities to respond to urgent threats to human health or the environment also remain available, should the need arise. See, *e.g.,* 42 U.S.C. 6973.

i. Requirement for Legacy CCR Surface Impoundments To Close

The final rule continues to require legacy CCR surface impoundments to close. As EPA explained in the proposal, the *USWAG* decision has effectively resolved this issue. No commenter submitted any evidence to demonstrate that the risks associated with these units are any lower than they were in 2018 when the Court decided that closure of all unlined and clay-lined impoundments was required by RCRA section 4004(a) or that the risks posed by legacy CCR surface impoundments are any lower than those at the currently regulated inactive impoundments at active facilities. If anything, more recent information indicates that a greater number of legacy CCR surface impoundments are more likely to have leaked even higher levels of contaminants than the operating impoundments modeled in 2014. See Unit III.A.

No commenter has identified any legacy CCR surface impoundment with a composite liner that meets the requirements of § 257.71. Based on the data gathered since 2015 from the currently regulated CCR unit universe, the Agency considers it highly unlikely that any legacy CCR surface impoundment has such a liner. EPA analyzed the list of inactive CCR facilities compiled based on comments received in response to the ANPRM and this rulemaking and knows that almost all these facilities were opened prior to 1990 (one facility opened in 1996) before composite liner systems were typically installed. Unless legacy CCR surface impoundments are very different than impoundments at active facilities, EPA expects all units of this age to be unlined as defined by § 257.71.

The D.C. Circuit has also already rejected arguments that EPA can avoid requiring CCR surface impoundments to close based on claims that ''all impoundments aren't leaking.''

> The EPA and Industry Intervenors assert that the composite lining required for new units is not needed for existing units because most unlined impoundments do not leak, and an unlined impoundment that is not leaking is not dangerous. Industry Intervenors emphasize that the record suggests that ''almost two-thirds of unlined impoundments do not leak,'' and they assert that ''appropriate controls on impoundments that do leak'' suffice to meet RCRA's ''no reasonable probability'' standard. The EPA underscores that it made no finding of any ''reasonable probability that each and every unlined impoundment will, in fact, result in adverse effects on health and the environment.'' It insists that RCRA's ''no reasonable probability'' standard is met by the Rule's provisions for ''extensive monitoring of groundwater to detect constituent leaking,'' id. at 83, and ''immediate action to stop that leak,'' ''redress that leak,'' and to close the site as soon as a harmful leak is detected.

USWAG, supra at 427. The Court summarily rejected these arguments.

> It is inadequate under RCRA for the EPA to conclude that a major category of impoundments that the agency's own data show are prone to leak pose ''no reasonable probability of adverse effects on health or the environment,'' 42 U.S.C. § 6944(a), simply because they do not already leak.

Id. This holding largely rests on a legal conclusion of what RCRA section 4004(a) requires, which Congress did not alter when it amended the statute in the WIIN Act.

The Court similarly rejected arguments that reliance on the part 257 corrective action provisions to clean up releases can effectively substitute for a national requirement to close impoundments, or that corrective action alone is sufficient to meet the RCRA section 4004(a) standard. As the Court explained, that argument focuses on the wrong risks and addresses only half of the statutory standard. The contamination of a potential source of drinking water is itself an adverse effect on the environment, and the statutory requirement to ensure there will be no reasonable probability of adverse effects on health or the environment requires the Agency to take measures based on the risks to prevent this harm from occurring in the first place. It is not enough to remediate the contamination before it reaches an off-site receptor.

> In defending the Rule here, the EPA looks at too narrow a subset of risk information and applies the wrong legal test.
>
> The Final Rule's approach of relying on leak detection followed by closure is arbitrary and contrary to RCRA. This approach does not address the identified health and environmental *harms* documented in the record, as RCRA requires.
>
> . . .
>
> *RCRA requires the EPA to set minimum criteria for sanitary landfills that prevent harm to either ''health or the environment.''* The EPA's criteria for unlined surface impoundments, limited as they are to groundwater monitoring for contaminant levels keyed to human health, only partially address the first half of the statutory requirement.
>
> . . .
>
> But here, too, the EPA has failed to show how unstaunched leakage while a response is pending comports with the 'no reasonable probability' standard.

Id. at 429–430, 431 (emphasis added). None of this has changed. Nor has any commenter identified any unique characteristic of legacy impoundments that makes any of the Court's analysis irrelevant or inapplicable. Although some commenters continue to claim that their units are heavily vegetated or developed and that reopening or other removal/remediation activities may disrupt current use of the land, no commenter submitted any data or analysis to demonstrate that removal or remediation activities would be more detrimental to health and the environment than not cleaning up the contaminated groundwater in the aquifer or taking measures to prevent the legacy CCR surface impoundment from continuing to contaminate the aquifer. Moreover, the fact that some impoundments have become heavily vegetated or redeveloped does not mitigate the risks these unlined legacy CCR surface impoundments continue to pose.

The same is true for those commenters alleging that the closure of legacy CCR surface impoundments would itself present greater risks than leaving the disposal unit in its existing state; none presented any data or analysis, stating instead that possible effects were self-evident. However, EPA notes that most of these comments appear to have been premised on the assumption that closure by removal would be required. As discussed in the next section, EPA is not prohibiting legacy CCR surface impoundments from closing with waste in place, provided all of the performance standards in § 257.102(d) have been met.

EPA also cannot, as the commenters suggest, proceed exclusively on the basis of site-specific assessments and forego a nationwide risk assessment, national closure requirement, or universal performance standards for closure. When Congress amended the statute in 2016, it added a permitting component but retained without revision the requirements in RCRA sections 1008(a)(3) and 4004(a) that EPA establish minimum national standards (''criteria'') by regulation. The statute relies on these criteria in several provisions, including as the standard EPA must use to evaluate State programs, to issue permits, and to determine whether a CCR unit is a sanitary landfill or an open dump. See, 42 U.S.C. 6945(d)(1)(B), (d)(1)(D), (d)(3), (d)(6). The D.C. Circuit has also effectively confirmed the continued necessity of national criteria; if the Court believed that the WIIN Act obviated the need to comply with RCRA section 4004(a) it would have granted EPA's request for an abeyance or dismissed the case as moot. That it did neither demonstrates that the Court believed that its opinion would remain relevant. See, *USWAG,* 901 F3d at 436–437 (denying EPA's request for voluntary remand because ''this claim involves a question—the scope of EPA's statutory authority—that is intertwined with any exercise of agency discretion going forward.'')

Accordingly, the final rule requires all legacy CCR impoundments to close.

ii. Deferral for Legacy CCR Surface Impoundments Under Critical Infrastructure

As noted above, several commenters stated that some inactive facilities have been redeveloped and that the CCR surface impoundments are now located beneath critical infrastructure. These commenters claimed that requiring closure of units beneath infrastructure could adversely impact grid reliability, business operations, or other necessary public services and suggested EPA create exemptions or extensions for these units. For example, one commenter stated that closure of units located under other structures is not feasible as EPA has proposed. The commenter further explained that:

> the issue is applicable and even more pronounced with respect to legacy impoundments. By definition legacy CCR surface impoundments are located at inactive sites that in some instances have been partially or completely redeveloped. As a result, former legacy units at this stage may be completely inaccessible due to vegetation, new infrastructure like pipelines or transmission lines that cannot be disturbed without disrupting operations, active CCR units, buildings, or other obstacles to access. If EPA proceeds to issue the proposal EPA must address such accessibility issues.

Other commenters supported the decision not to propose an exemption from the closure requirements for legacy CCR surface impoundments beneath redevelopments or infrastructure, based on the risks that these sites can present, and provided specific examples of such sites. Two of the examples related to a situation in which active CCR disposal units were built on top of former CCR surface impoundments (*i.e.,* overfills). In one instance, the commenter described a site where an unlined CCR surface impoundment had been closed by partially draining the impoundment and constructing a new CCR landfill (98.9 acres), two stormwater ponds and a leachate pond (10.8 acres), and a materials handling area (4.4 acres) on top of the former impoundment. According to the commenter, the facility claimed that the closed impoundment rather than any of the active CCR units, was responsible for SSIs detected in its groundwater monitoring. The commenter referenced documents on the facility's CCR website which explained that:

> Although it has not received sluice water since 2008, the CCR in the former Main Pond continues to receive, store, and discharge water, primarily groundwater entering the CCR through the sides of the filled valley. Groundwater flow into the CCR in the former Main Pond drains downward and outward to the east through the toe drain system under the dam.

The commenters explained that overfills can increase groundwater contamination from the underlying unit by reducing the hydraulic gradient and increasing the waste and water contact time. They stated that this has been documented by both an EPRI study and groundwater monitoring at a specific overfill that showed steady to gradually increasing concentrations of CCR related constituents in the landfill monitoring wells, rather than the predicted decline in concentrations of CCR-related constituents from the closure of the underlying surface impoundment.

As an initial matter, under both the existing definitions and the definitions in the final rule a legacy CCR surface impoundment could not be located below an active CCR unit. A legacy impoundment is located at an inactive facility, and the presence of an active CCR unit means that the facility is active, not inactive. See, §§ 257.50(b), 257.53 (definition of active facility). This means that in the example described by the commenter the surface impoundment underneath the active landfill is an inactive CCR surface impoundment at an active facility, and would be considered a ''regulated unit'' subject to the existing requirements in part 257, rather than this final rule.

In any event, EPA disagrees that its proposal did not adequately account for the circumstance in which a legacy CCR surface impoundment may be challenging to access, such as where the impoundment is located beneath infrastructure or buildings. In contrast to the comments received with respect to CCRMU, no commenter provided a concrete example in which closure of a legacy CCR surface impoundment would interfere with critical infrastructure. The overwhelming majority of commenters provided concrete examples of concerns with respect to CCRMU and then concluded that EPA needed to address the issue equally for legacy CCR surface impoundments. The most concrete example of potential interference with critical infrastructure is the reference to ''new infrastructure like pipelines or transmission lines that cannot be disturbed without disrupting operations'' quoted above. But even in that case the commenter provided no explanation of the factual basis for the conclusion that over the five to 15 years the existing regulations provide to complete closure the facility could not schedule the outages necessary to move pipelines or transmission lines, and conduct the closure in stages as necessary to accommodate scheduling any necessary outages.[62] In addition, as discussed in the next Unit of the preamble, EPA has extended the deadline to initiate closure to 48 months from promulgation. The amount of time provided by these deadlines is more than adequate to account for any accessibility issues. Further, EPA has been regulating utilities under multiple environmental statutes for decades and reliability issues are often raised when regulations are promulgated, but EPA is unaware of situations where those reliability concerns have been realized in the form of electric blackouts caused by compliance with Federal environmental standards. In this case, in the unlikely event closure of a legacy CCR surface impoundment cannot occur within the regulatory timeframe without creating a demonstrated reliability concern, the Agency will work with the facility, the relevant RTO, and other relevant Federal agencies to ensure proper closure occurs without causing the power to go out.

Finally, as noted above EPA received a substantial number of comments requesting the agency not require facilities to ''re-close'' any unit that had already completed closure. This final rule does not mandate that any previously closed unit automatically re-close. But, as described in the next section, the final rule does require all legacy CCR surface impoundments to meet the performance standards in § 257.102, although as discussed above, some may not be required to do so until permitting. EPA does not consider this to be equivalent to a requirement to ''re-close'' as, depending on the site conditions, facilities may be able to implement engineering measures, such as the installation of slurry walls to prevent groundwater infiltration, to address any deficits without removing the cover system or entirely re-closing the whole impoundment.

iii. Requirement To Comply With Performance Standards in § 257.102

As discussed above, consistent with *USWAG* and the proposed rule, this final rule requires that the closure of legacy CCR surface impoundments meet the performance standards in either § 257.102(c) or (d). Under this final rule, all closures initiated after the effective date of this rule, as well as those that were not completed prior to the effective date of this rule, will need to comply with these requirements.

And in general, the same is true with respect to closures that were completed prior to the effective date of this rule. As discussed previously, a facility that can certify that its prior closure meets the performance standards in § 257.102(c) only needs to post the documentation that it meets the standard. Similarly, if a facility can demonstrate that the closed unit meets the requirements under § 257.102(d), EPA will consider them to be closed and the only requirements that will be applicable are those that apply to closed units under post-closure care—such as groundwater monitoring, and if necessary, corrective action. EPA never intended to require facilities that otherwise met the closure standards to go through the process again and re-close the unit. In addition, where the facility was subject to standards that are different than the Federal CCR closure standards (*e.g.,* if the closure were conducted as part of a CERCLA cleanup or State order) but are otherwise equivalent in terms of mitigating the risks, the requirement to meet the § 257.102 standards will be deferred to permitting, where a closure equivalency determination will be made.

In response to EPA's proposal that all legacy CCR surface impoundments comply with § 257.102, many commenters again reiterated their request that EPA exempt any unit that has either completed closure or is in the process of closing pursuant to State law (*e.g.,* solid waste permit, consent orders or decrees). Commenters also requested EPA to exempt any site that had closed as part of a cleanup conducted pursuant to another Federal requirement, such as CERCLA or RCRA subtitle C. These commenters stated that EPA had failed to demonstrate that these units posed any risk as a consequence of the lack of ponded water, and that ''re-closure'' of these previously closed units is consequently unnecessary and overly burdensome.

By contrast, several commenters supported EPA's proposal to require all legacy CCR surface impoundments to comply with the performance standards in § 257.102, even if the closure was previously approved by a State regulatory agency. These commenters pointed to EPA's conclusions in 2015 that significant gaps remain in many State programs; that some programs provide minimal or no regulatory oversight of CCR units; and that most CCR surface impoundments were permitted exclusively under NPDES or other surface water pollution prevention programs. See, 80 FR 21324–21325. The commenters also included recent examples of closures approved by various State agencies that were not consistent with the Federal closure standards including: (1) Ohio's approval of the closure of an unlined CCR surface impoundment at the Gavin Plant, which EPA subsequently estimated could be sitting in groundwater as high as 64 feet deep in some locations post closure and that as much as 8.2 million cubic yards (or as much as 40% of the CCR in the Fly Ash Resevoir) could still be saturated—and would remain so indefinitely; (2) Alabama's issuance of several permits authorizing several facilities to close unlined CCR surface impoundments with large quantities of free liquids and saturated CCR remaining in the closed units; and (3) Kentucky's permit authorizing the closure of an unlined CCR surface impoundment by partially draining the impoundment and constructing a new CCR landfill (98.9 acres), two stormwater ponds and a leachate pond (10.8 acres), and a materials handling area (4.4 acres) on top of the impoundment. The CCR in the underlying closed impoundment continues to receive, store, and discharge water, primarily groundwater entering the CCR through the sides of the filled valley, drains downward and outward to the east through the toe drain system under the dam.

Finally, several commenters requested that EPA prohibit legacy CCR surface impoundments from closing in place under § 257.102(d).

EPA disagrees that legacy CCR surface impoundments should be prohibited from closing with waste in place in accordance with § 257.102(d). The commenters did not demonstrate that legacy impoundments could never meet the performance standards in § 257.102(d) or identify unique characteristics or risks of legacy impoundments that would not be adequately addressed by compliance with those provisions. Both clean closure and closure with waste in place can be equally protective, provided that all of the requisite performance

[62] Electric generating facilities are required to schedule and agree upon boiler shutdown periods with their Regional Transmission Organization (RTO) to ensure grid reliability. Most plants have regular boiler shutdowns on an annual basis with a more substantial one every few years. Since regular boiler shutdowns are already scheduled, the facility can plan the closure construction around the already scheduled outage; however, the outage may need to be extended depending on the work. The RTOs require various lead times of consultation or notice prior to any retirements, outages, or extended periods of non-operation.

standards in § 257.102 are met. The final rule therefore requires legacy impoundments to comply with the same requirements applicable to other inactive impoundments, that is, to close in accordance with either § 257.102(c) or (d).

If all of the performance standards for clean closure and the performance standards for closure with waste in place can be met, an owner or operator may determine which alternative is appropriate for their particular unit. The regulations do not require an owner or operator to use one closure option over the other in such situations. However, the facility must meet all the performance standards for the option it has selected, and if it cannot meet all of the performance standards for one option, then it must meet all of the performance standards for the other option. 40 CFR 257.102(a) (specifying that ''[c]losure of a CCR landfill, CCR surface impoundments . . . [m]ust be completed either by leaving the CCR in place and installing a final cover system or through removal of the CCR and decontamination of the CCR unit, as described in paragraphs (b) through (j) of this section.''). For example, if the facility is unable to meet the performance standards for closure with waste in place for a particular unit (or portion of a unit), it must close the unit by removal (or that portion). Whether any particular unit or facility can meet the performance standards is a fact and site-specific determination that will ultimately depend on a number of factual and engineering considerations, such as the hydrogeology of the site, the engineering of the unit, and the kinds of engineering measures available.

As discussed in the preceding section, this final rule does not require previously closed legacy CCR surface impoundments to automatically ''re-close.'' Rather, consistent with the proposal, facilities will be required to ensure that all closed legacy CCR surface impoundments meet the performance standards in § 257.102(c) or (d). To the extent any deficit can be remedied by supplementary engineering methods, that would be all that is required.

(a) Closure of Legacy CCR Surface Impoundments Under State Law

EPA continues to disagree that it would be appropriate to exempt any legacy CCR surface impoundment that has completed closure or is currently in the process of closing pursuant to State requirements. As EPA repeatedly explained in the proposal, Congress established a specific process that would authorize State requirements to operate in lieu of the Federal CCR regulations, and it would be inappropriate for EPA to substitute its own process to achieve the same ends. Under the Congressionally mandated process, a State must obtain EPA approval, in whole or in part, of its CCR permit program, pursuant to RCRA section 4005(d). 42 U.S.C. 6945(d). Those provisions expressly identify the standard EPA must use to evaluate a State program including, where applicable, alternative technical criteria that differ from the Federal CCR regulations, along with requirements for EPA to review approved programs and, if necessary, to withdraw approval. Finally, the statute expressly provides that in the absence of a permit issued under an approved State program, the Federal criteria apply to all CCR units. 42 U.S.C. 6945(d)(6). These provisions reflect Congress' considered judgment of the appropriate legal structure and relationship between State and Federal requirements, and it is not appropriate for EPA to effectively establish its own alternative.

In any event, EPA lacks the record necessary to support a broad exemption for all closures under any State requirement. As discussed in more detail below. the information currently available does not demonstrate that all closures conducted under State authority ''ensure there is no reasonable probability of adverse effects on health or the environment.'' 42 U.S.C. 6944(a).

First, commenters' arguments appear to be premised largely on the existence of a State solid waste program with the attributes of the municipal solid waste landfill requirements adopted and approved well after those dates. But as some commenters acknowledged, many legacy impoundments closed well before any State had developed such regulations—*e.g.,* during 1970s–1990s.[63] EPA has no evidence demonstrating the protectiveness of State requirements during this period. However, the results of the joint U.S. Department of Energy (DOE) and EPA study completed in 2006, ''Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994–2004,'' are not encouraging. Only 19% (three out of 19) of the surveyed surface impoundment permits included requirements addressing groundwater protection standards (*i.e.,* contaminant concentrations that cannot be exceeded) or closure/post-closure care. The EPA/DOE report also concluded that approximately 30% of the net disposable CCR generated was potentially exempt from all State solid waste permitting requirements (EPA/DOE Report at pp 45–46). For example, at the time of the report, Alabama did not regulate CCR disposal under any State waste authority and did not have a dam safety program. Finally, the report found that a number of States only regulated surface impoundments under Clean Water Act authorities, and consequently primarily addressed the risks from effluent discharges to navigable waters, but did not require liners or groundwater monitoring.

As part of developing the 2015 CCR Rule, EPA independently reviewed State statutes and regulations, with a more detailed focus on the 16 States responsible for approximately 74% of the CCR generated in 2009. See 80 FR 21324. This review identified some programs that provided minimal or no regulatory oversight of CCR units. For example, Arizona, New Mexico, and Utah had no regulations applicable to CCR units or entirely exempted CCR from State regulations governing solid waste. Similarly, Mississippi, Montana, and Texas (the largest coal-ash producer) exempted the on-site disposal of CCR (as ''nonhazardous industrial solid waste'') from some or all key requirements, such as permits or groundwater monitoring. Such exemptions covered most of the disposal of CCR within the State, as the majority of utilities dispose of their CCR on-site. Other States, such as Florida, Indiana, Ohio and Pennsylvania, exempted CCR landfills or ''monofills'' from many requirements. For example, Indiana regulations considered surface impoundments that are dredged at least annually to be ''storage units'' that are exempt from solid waste regulations, including from corrective action requirements. Many of these States were among the leading generators of CCR wastes at the time. In total, EPA estimated that in 2015, approximately 20% of the net disposable CCR was entirely exempt from State regulatory oversight.

However, EPA concluded in 2015 that most States regulated the management of CCR to varying degrees, although the particular requirements varied significantly. Most CCR surface impoundments were permitted exclusively under NPDES or other surface water pollution prevention programs. In these States, requirements to protect groundwater, such as liners or groundwater monitoring systems, were frequently less robust than the corresponding requirements applicable to CCR landfills.

[63] As discussed previously, if an impoundment contained CCR and liquids on or after October 19, 2015, it is considered a legacy impoundment under these regulations even if the unit is considered to have been closed under state law.

EPA did not specifically evaluate State closure requirements in 2015. However, EPA's findings with respect to groundwater monitoring requirements suggests that it is unlikely States considered the extent to which a surface impoundment would remain saturated by groundwater after closure. In 2015 EPA had only limited anecdotal evidence on the status of groundwater monitoring in six States, including four States that are among the leading CCR generators. After the Kingston TVA spill in December of 2008, groundwater monitoring wells were installed at 12 of Illinois's existing surface impoundments, almost doubling the number of monitored surface impoundments in the State. However, 55 additional surface impoundments, both active and inactive, still lacked groundwater monitoring systems. In Ohio, 44 CCR units, out of a total of 57 CCR units in the State (42 surface impoundments and 15 landfills) still lacked groundwater monitoring in 2015, even though all the surface impoundments were permitted decades ago under Ohio's NPDES program. Ohio acknowledged in their comments that the extent of groundwater risks in the State was poorly documented, as 40 out of 44 unlined CCR units did not have a groundwater monitoring system. Some State programs also authorized a buffer zone or a ''zone of discharge,'' which allows the facility to defer remediation of groundwater contamination for some period of time, usually until the contaminant plume has migrated to the facility site boundary. Florida, Illinois, North Dakota, and Tennessee were among the States with such a regulatory provision.

EPA acknowledges that some States have substantially revised their programs since 2015, but this is not universal. In addition, although a few States provided further information that was not available to EPA in 2015 about their programs in response to the proposal, most did not. For the most part, commenters offered general assertions that State regulatory authorities have considered the site-specific conditions and determined that the closure or closure plan meets the necessary requirements for addressing risk, and that EPA should not second guess these decisions, but provided little, if any, evidence that would support a wholesale exemption for any closure conducted in accordance with State requirements.

At the same time, as discussed above, several commenters provided examples of recent (post-2015) State-authorized closures that are significantly less protective than § 257.102. For example, at least two States responsible for a significant percentage of the CCR generated annually, Ohio and Kentucky, recently (*i.e.,* after 2015) allowed facilities to close their impoundments by removing the CCR from the impoundment, but did not require groundwater monitoring to determine whether groundwater contamination remained at the site. Under the CCR regulations, closure by removal is only considered complete with documentation that all Appendix IV constituent concentrations are below the GWPS in two consecutive groundwater monitoring sampling events.

More to the point, as EPA explained in the proposal, the record clearly shows that significant numbers of CCR surface impoundments were constructed with at least some portion of the unit actually in the aquifer beneath it, or otherwise consistently saturated by groundwater or surface water migrating into the unlined impoundment. Many of these units were closed without addressing the liquids that continued to saturate the CCR, and the free liquids that remained or the fact that the unit continues to impound water—in some cases with full approval from the State. This is especially likely for closures that occurred prior to 2015. As noted previously, a 2006 DOE/EPA report concluded that only 19% of the surveyed surface impoundment permits included requirements addressing groundwater protection standards (*i.e.,* contaminant concentrations that cannot be exceeded) or closure/post-closure care, and approximately 30% of the net disposable CCR generated was potentially exempt. The risks associated with such closures can be substantial, as discussed in Unit III.A of this preamble. Ultimately, under the Federal CCR regulations what determines whether a unit meets the definition of an inactive CCR impoundment or a closed CCR impoundment—and what determines whether the unit continues to present a reasonable probability of adverse effects on health and the environment—are the conditions that remain and the resulting risks, rather than whether a facility or even a State regulatory authority has labeled the unit as ''closed.''

For all of these reasons, EPA cannot exempt: (1) All units that have closed consistent with State requirements, or (2) All units that have started closure or have had a closure plan approved under State requirements prior to the effective date of the final rule.

(b) Deferral of Certain Completed Closures to Permitting

A few commenters provided examples of closure that they believed were substantially equivalent to closures in accordance with § 257.102, because they involved substantial regulatory oversight, a site-specific risk assessment, and general consistency between the programs on the standards to be applied. These included closures under CERCLA and an approved State's RCRA subtitle C program. According to these commenters, it is a near certainty that there will be slight differences in the way the closure activities were designed or conducted when compared to § 257.102, but because the closure activities accomplish the same environmental goals and meet the same ultimate performance standards with respect to avoiding groundwater impacts, there is little to be gained by duplicative closure activities under the Federal CCR regulations. Another commenter provided a copy of a Consent Order entered in State court governing the closure of CCR surface impoundments at seven sites across the State. The commenter also provided copies of several human health and ecological risk assessments that were conducted to support the State's approval of the closures, along with various third-party reports. The commenter concluded that based on this factual record, it is unnecessary to subject these units to the existing closure criteria for CCR surface impoundments in §§ 257.101 and 257.102.

EPA agrees that closures conducted as part of a CERCLA or RCRA subtitle C response action would normally be expected to be consistent with the performance standards in § 257.102; the CCR closure regulations were based on the closure regulations for hazardous waste facilities, and the CCR regulations would normally be considered ARARs under CERCLA for any closure of a CCR facility after 2015. Consequently, these facilities may ultimately be able to support a certification of compliance with § 257.102. But, as the commenters noted, there can be slight variations in how the standards are applied, and a facility may consequently not be confident that it can support a certification.

Nor are these the only closures that may be substantially equivalent. As the commenters' examples demonstrate, State requirements, even where different, can result in closures that are equally as protective as those conducted in accordance with Federal requirements.

However, as the commenters noted it is a near certainty that there will be differences in the way the closure activities were designed or conducted when compared to § 257.102. EPA does not believe that it can craft an exemption that could encompass all these potential variations. Nor does EPA believe that it could develop criteria that are sufficiently precise that regulated entities could determine whether alternative requirements ultimately accomplish the same environmental goals and meet the same ultimate performance standards as the Federal requirements. But EPA has detailed criteria to identify whether a closure is potentially as protective as those conducted in accordance with § 257.102, and which therefore warrant a closer evaluation; closures that meet these criteria will be deferred until a permitting authority can evaluate the adequacy of the closure.

The closures described above all share certain features such as the risks at the site have been fully evaluated by a regulatory authority and carefully addressed with oversight by a regulatory authority. Even though the specific requirements may differ from § 257.102, there is nevertheless reason to believe that the closure will be protective, at least in the interim until a permitting authority can evaluate the adequacy of the closure to the CCR closure requirements. Based on these considerations, EPA is limiting this deferral to closures where the facility can document that it meets specific conditions. First, the deferral is limited to circumstances in which a regulatory authority played an active role in overseeing and approving the closure activities. EPA considers a ''regulatory authority'' to include a State or Federal permit, an administrative order, or consent order issued after 2015 under CERCLA or by an EPA-approved RCRA State program. The permitting or other authority must have required groundwater monitoring to ensure there was no contamination coming from the unit that is not addressed by corrective action.

Second, to support deferral of evaluation of a prior closure of a legacy CCR surface impoundment as substantially equivalent, the facility with a surface impoundment that closed with waste in place must document that free liquids have been eliminated, consistent with the standard in § 257.102(d)(2)(i). This requirement directly addresses the reason that EPA has concluded that many previously completed closures do not meet the standard in RCRA section 4004(a).

Third, a facility must document that it had installed a groundwater monitoring system and performed groundwater monitoring that meets a subset of the performance standards found in § 257.91(a). Specifically, the facility must demonstrate that the groundwater monitoring system was capable of: (1) Accurately representing background water quality; (2) Accurately representing the quality of water passing the waste boundary; and (3) Detecting contamination in the uppermost aquifer. Finally, the groundwater monitoring system must have monitored all potential contaminant pathways. These are the same subset of standards that apply to a facility certifying that its closure by removal completed prior to the effective date of this final rule meets the performance standards in § 257.102(c).

Fourth, a facility would need to demonstrate that a site-specific risk assessment was conducted or approved by the regulatory authority prior to (or as part of) approving the closure, and that the closure and any necessary corrective action has been overseen by the regulatory authority, pursuant to an enforceable requirement.

These criteria are generally consistent with the criteria a commenter suggested to identify closures under other authorities that would be equivalent to those conducted in accordance with § 257.102. These included that the facility had installed a groundwater monitoring system and performed groundwater monitoring and analysis in accordance with §§ 257.90 through 257.95 and was conducting any necessary remediation in accordance with §§ 257.96 through 257.98, pursuant to an enforceable requirement. Although the commenter proposed these to serve as a basis for an exemption, EPA considers they are equally relevant to identifying decisions that can be deferred for future evaluation.

Fifth, the facility would be required to prepare and include documentation in the applicability report and operating record, demonstrating that it has met these criteria and is eligible for deferral. This would include all relevant specifics such as State permit, order, data, groundwater monitoring results, etc. This must be certified by the owner/operator or an authorized representative using the same language in § 257.102(e).

When it comes time for the permit authority to evaluate the closure, EPA intends to rely on the permit application process as the primary mechanism to collect the information to allow a determination to be made as to whether a legacy CCR surface impoundment that closed under these alternative standards did so in compliance with the requirements of § 257.102. The permit application process is a well-established system for reviewing the types of groundwater, soil and other sampling and analytical data that will typically be required in determining the ''equivalency'' of alternative closures.

When the permit application is called in, the facility must provide sufficient information, including data on contaminant levels in groundwater, to demonstrate that the applicable § 257.102 standards have been met. EPA or a Participating State Director will review the information to determine whether the ''equivalency'' of the closure has been successfully demonstrated. If EPA determines that the closure has met the appropriate part 257 closure standard, EPA will issue a permit. If EPA or a Participating State Director determines that the closure does not meet the part 257 standards, the owner or operator will be required to submit a permit application containing all the applicable information for an operating permit, and EPA or a Participating State Director will issue a permit that contains the specific requirements necessary for the closed unit to achieve compliance with § 257.102.

iv. Closure Compliance Deadlines for Legacy CCR Surface Impoundments

(a) Initiation of Closure for Legacy CCR Surface Impoundments

EPA proposed that legacy CCR surface impoundments be subject to the existing requirement to initiate closure that are applicable to other unlined CCR surface impoundments because, as discussed in the proposed rule and in Unit III.B.2.c of this preamble, the current record indicates that legacy CCR surface impoundments are largely, if not entirely, unlined. Specifically, EPA proposed that owners or operators of legacy CCR surface impoundments initiate closure no later than 12 months after the effective date of the final rule because EPA anticipated 12 months being sufficient time for owners or operators to identify and delineate the legacy CCR surface impoundment, determine relevant engineering information (*e.g.,* structural stability), characterize the site's hydrogeology and other characteristics, and determine whether any of the uppermost aquifer has been contaminated. As explained in the proposed rule, EPA acknowledged that most of this information would be obtained through compliance with the proposed groundwater monitoring and corrective action requirements.

In the proposed rule, EPA solicited comment on whether the regulations should provide owners and operators the option to retrofit a legacy CCR surface impoundment in accordance with the retrofit requirements in § 257.102(k) as an alternative to requiring the closure of a legacy CCR surface impoundment.

As stated in Unit III.B.2.g, generally commenters on the proposed rule supported requiring legacy CCR surface impoundments to close in accordance with the existing requirements. However, some commenters disagreed that closure was appropriate for certain legacy CCR surface impoundments, including those units underneath infrastructure needed to support current activities, those that had completed or currently undergoing closure, and those units that have been demonstrated not to pose unacceptable risk.

Most commenters stated that the proposed deadline for the initiation of closure was infeasible due to the factors listed in Units III.B.2.a.ii and III.B.2.g of this preamble (*e.g.,* labor shortages, seasonality, limited contractor availability, overlapping regulatory requirements) and should be extended in consideration of those factors as well as to allow for the incorporation of the groundwater monitoring data.

No commenters provided feedback on whether the regulations should allow owners and operators to retrofit a legacy CCR surface impoundment.

For the reasons explained in the proposed rule as well as Unit III.B.2.g, EPA continues to conclude that the closure requirements in the existing rule are generally appropriate for legacy CCR surface impoundments. However, as explained in Unit III.B.2.g, EPA recognizes that in specific situations, mandatory closure of a legacy CCR surface impoundment by the deadline may cause more harm than benefits to human health and the environment. Based on information provided by the commenters and experience with the implementation of the 2015 CCR Rule (*i.e.,* regulation of inactive CCR surface impoundments), EPA finds that these situations are limited to those in which the legacy CCR surface impoundment has completed closure under a State authority and those in which the unit is beneath infrastructure necessary for current activities.

For additional closure requirements of a legacy CCR surface impoundment, the decision to require reclosure will be deferred until a permitting authority is authorized to issue CCR permits to the facility, at which point, the permitting authority will be able to look at site-specific factors and evidence to decide if reclosure is necessary to protect human health and the environment. EPA concludes that this approach will mitigate adverse impacts to local communities and the environment, including environmental justice concerns that may result from activities associated with reclosing a facility that is not contaminating groundwater or posing other risk to human health and the environment, such as increased traffic, increased greenhouse gas emissions, habitat loss, loss of native vegetation, water consumption, and additional waste generation.

When the legacy CCR surface impoundment is beneath infrastructure vital to the continuation of activities, such as beneath a substation, the initiation of closure will be deferred until the infrastructure is no longer needed or the closure of the facility, whichever is sooner. This approach protects human health and the environment while appropriately accounting for the need for operational continuity and reliability.

As explained in Unit III.B.2.g, EPA acknowledges the benefit of allowing owners or operators the time needed to incorporate groundwater monitoring data into the closure plan. Additionally, as stated in the proposed rule, EPA acknowledges the importance of using information gained by compliance with the groundwater monitoring and corrective action requirements to inform closure decisions and therefore the initiation of closure. For the reasons explained in Unit III.B.2.f, EPA is extending the deadline for the groundwater monitoring and corrective action requirements to a single deadline of no later than 30 months from the effective date of the final rule. As such, the initiation of closure is being extended as well. To ensure owners or operators have enough groundwater monitoring data to draw conclusions about seasonality impacts on groundwater levels and flow and the source of any potential groundwater contamination in the area, EPA is finalizing a deadline of no later than Monday, May 8, 2028, which is 42 months from the effective date of the final rule. This is codified in the regulatory text at § 257.101(e)(1).

EPA is finalizing the application of the existing requirements to initiate closure to legacy CCR surface impoundments as proposed except for those that fall under the deferral of closure described above (*i.e.,* units closed under State authority, units beneath critical infrastructure).

As stated in § 257.102(e), closure has been initiated once any steps necessary to implement the closure plan as described by Unit III.B.2.g.ii of this preamble have been taken, including submitting an application for any necessary State or agency permits or permit modifications and taking steps to comply with standards of any State or other agency that are a prerequisite to completing closure of a CCR unit.

(b) Preparation of a Written Closure Plan for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments comply with the existing requirements of § 257.102(b) requiring the preparation of a written closure plan no later than 12 months after the effective date of the final rule.

As mentioned above, overall commenters on the proposed rule agreed that closure requirements, including the written closure plan, would generally be appropriate for legacy CCR surface impoundments. One commenter suggested additional requirements for the content of the closure plan including the elevation of the base of the unit, groundwater information, and descriptions of compliance with § 257.102 will be achieved (*e.g.,* how free liquids would be eliminated, how waste will be stabilized, measures to minimize the need for further maintenance of the CCR unit). A few commenters supported the proposed deadline but as summarized in Units III.B.2.a.ii and III.B.2.g of this preamble, other commenters stated the proposed deadline was infeasible and inappropriate. One commenter suggested the deadline for the closure plan be extended to be concurrent with the initiation of closure. Commenters suggestions for the deadline for the completion of the closure plan ranged from 12 (the 2015 CCR Rule deadline) to 32 months, or after the collection of the eight baseline groundwater samples.

EPA disagrees with the commenter that additional requirements regarding the content of the closure plan are necessary. The information the commenter requested be included in the closure plan is 1) already required to be in the closure plan pursuant to §§ 257.102(b) or 2) readily available in other required reports (*e.g.,* the annual groundwater monitoring and corrective action reports). Furthermore, the commenter failed to fully explain how compliance with § 257.102(b) does not provide the information needed to determine if compliance with the closure performance standards will be met.

Regarding the deadline, as stated above, EPA concludes that the deadline for the closure plan should be extended from the proposed deadline to allow for owners or operators to incorporate information about groundwater quality, groundwater flows, seasonality impacts, and the migration of contaminants (if any) into the plan. Therefore, EPA is finalizing a deadline of no later than

Monday, November 8, 2027, which is 36 months after the effective date. This is codified in the regulatory text at § 257.100(f)(5)(i).

Based on comments on the proposed rule and experience from the 2015 CCR Rule, EPA expects the incorporation of this information into the closure plan will allow facilities to select a closure method that most appropriately addresses issues like waste that is in contact with groundwater, groundwater contamination, and long-term structural stability concerns. Closure plans that adequately address these issues will result in more compliant closure plans and therefore, be more protective of human health and the environment.

The closure plan describes the steps necessary to close a CCR unit at any point during the active life of the unit based on recognized and generally accepted good engineering practices. 40 CFR 257.102(b)(1). The plan must set out whether the closure of the CCR unit will be accomplished by leaving CCR in place or through closure by removal and include a written narrative describing how the unit will be closed in accordance with the section, or in other words, how the closure will meet all the performance standards in the regulations. 40 CFR 257.102(b)(1)(i). The written closure plan must also provide a schedule for completing all activities necessary to satisfy the closure criteria of the rule. See also 80 FR 21410–21425.

If the CCR is left in place, the closure plan must include a description of the final cover system and how the final cover system will achieve the regulatory performance standards. If the base of the impoundment intersects with groundwater, the closure plan would need to discuss the engineering measures taken to ensure that the groundwater had been removed from the unit prior to the start of installing the final cover system, as required by § 257.102(d)(2)(i). The closure plan would also need to describe how the facility plans to meet the requirements in § 257.102(d)(1) to ''control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters.'' This could include, for example, the installation of engineering controls that would address the post-closure infiltration of liquids into the waste from all directions, as well as any post-closure releases to the groundwater from the sides and bottom of the unit.

(c) Preparation of a Written Post-Closure Care Plan for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments would be required to comply with the existing requirement in § 257.104(d) regarding the preparation of a written post-closure no later than 12 months after the effective date of the final rule.

The comments EPA received on the proposed rule regarding the post-closure plan requirement are described in Units III.B.2.g and III.B.2.g.i and can be summarized as requests for an extension of the post-closure care deadline to allow for a more feasible deadline and the incorporation of groundwater monitoring data. For the reasons stated in Units III.B.2.g and III.B.2.g.i, EPA is finalizing a deadline of no later than Monday, November 8, 2027, which is 36 months from the effective date of the final rule to comply with the post-closure care requirement in § 257.104(d). This is codified in the regulatory text at § 257.100(f)(5)(ii).

Section 257.104(d) requires that an owner or operator of a CCR unit prepare a written post-closure plan. The contents of the P.E.-certified plan are stated in the rule at § 257.104(d)(1)(i) through (iii) and can be summarized as a description of the monitoring and maintenance activities required for the unit, the frequency that these activities will be performed, information for the point-of-contact during the post-closure care period, and planned uses of the property.

(d) Deadline To Complete Closure for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundment comply with the existing closure completion time frames in § 257.102(f).

As stated in Unit III.B.2.g of this preamble, some commenters on the proposed rule supported the proposed deadline, however, overall commenters supported applying the existing closure completion time frames as long as the proposed deadline for the initiation of closure was extended. For the reasons described throughout this section, EPA has extended the deadline for the initiation of closure. EPA expects the extension to the deadlines for the closure plan and initiation of closure, as well as the options to defer closure requirements for legacy CCR surface impoundments that have completed closure under a regulatory authority (see Unit III.B.2.g.iii.b), to address the concerns commenters expressed with the infeasibility or inappropriateness of the deadline to complete closure. Therefore, EPA is finalizing the deadline for the completion of closure of legacy CCR surface impoundments as proposed.

Section 257.102(f) generally requires an owner or operator of existing and new CCR surface impoundments to complete closure activities within five years from initiating closure. However, the regulations also establish conditions, including documentation requirements, under which owners or operators can demonstrate and receive two-year extensions of the deadline. For CCR surface impoundments of 40 acres or less, the deadline can only be extended by one two-year extension. For CCR surface impoundments larger than 40 acres, the deadline can be extended in increments of two years for no more than five times.

(e) Post-Closure Care for Legacy CCR Surface Impoundments

EPA proposed to apply the existing post-closure care requirements at § 257.104 to legacy CCR surface impoundments without revision. These criteria are essential to ensuring the long-term safety of legacy CCR surface impoundments.

No commenters raised specific concern about requiring legacy impoundments to comply with the existing requirements in § 257.104. EPA is therefore finalizing this provision without revision.

The existing post-closure care criteria require the monitoring and maintenance of units that have closed with CCR in place for at least 30 years after closure has been completed. 40 CFR 257.104. During this post-closure period, the facility would be required to continue groundwater monitoring and corrective action, where necessary.

h. Recordkeeping, Notification, and Internet Posting Criteria for Legacy CCR Surface Impoundments

EPA proposed that owners or operators of legacy CCR surface impoundments be subject to the existing recordkeeping, notification, and website reporting requirements in the CCR regulations found at §§ 257.105 through 257.107. For reasons specified in the 2015 CCR Rule, the CCR regulations require the owner or operator of a new or existing CCR unit to record specific information in the facility's operating record, maintain files of all required information (*e.g.,* demonstrations, plans, notifications, reports) that supports implementation and compliance with the rule, notify State Director and Tribal authorities, and maintain a public CCR website that hosts this information. 80 FR 21427.

A commenter on the proposed rule supported applying recordkeeping, notification, and internet posting requirements to legacy CCR surface impoundments but stated that the existing requirements were ineffective at ensuring compliance with the CCR regulations or allowing for meaningful public awareness or participation. The commenter suggested that EPA create mechanisms within the rule to ensure the public has the opportunity to participate in the decision-making processes at regulated CCR units; standardize reporting to make the report more easily understood by the public; establish organizational requirements for the CCR websites; require public notice and engagement when notifying the State Director and/or appropriate Tribal authority as required by the CCR rule; extend the period of time the files required by the CCR rule must be maintained in the operating record; and require owners or operators to certify compliance documentation for the CCR units. This commenter also suggested EPA clarify what records owners or operators are required to retain and to publish.

EPA agrees with the commenter on the importance of meaningful public participation. The current regulations allow for public participation by requiring owner or operators to hold a public meeting as part of the assessment of corrective measures in § 257.96, creating a mechanism for the public to file dust complaints in § 257.80(b), and the ''contact us'' form or specific email address on facilities' public CCR websites for questions or issues from the public as required by § 257.107(a). EPA does not have evidence to support the claim by the commenter that these opportunities for public participation are ineffective. Furthermore, EPA does not find other decision-making points in the rule appropriate for mandatory public meetings although facilities are encouraged to engage with the public and to both solicit and incorporate public input into decisions, such as closure methods, as able and appropriate.

With respect to the commenter's suggestions that EPA require the owners or operators of CCR units to certify compliance documentation and create standardized reporting and website layout requirements, as explained in the proposed rule, EPA does not have evidence that legacy CCR surface impoundments are sufficiently different than currently regulated facilities to necessitate substantially different requirements. The commenter provided no factual basis to support the suggestion that requiring owner or operator certifications would improve compliance with the regulations beyond the certifications currently required by professional engineers. When justifying the request for standardized reporting and website layout requirements, the commenter failed to explain how compliance with the public website posting requirements in § 257.107, including the requirement to ensure all information is ''clearly identifiable and must be able to be immediately printed and downloaded by anyone accessing the site'' is inadequate or a hinderance to the public accessing the required information. Therefore, EPA does not believe additional notification, certification, or public engagement requirements for legacy CCR surface impoundments would be appropriate.

EPA agrees with the commenter on the need to extend the period of time files required by the CCR rule must be maintained on the facilities' public websites and in the operating records. As described in Unit III.D.5, EPA is extending how long files must be maintained in the operating record and on the public website. While EPA believes the regulations at §§ 257.105 and 257.107 clearly lay out what records must be retained and published, EPA has included in Unit III.D.5 a table that details what records are required to be maintained in the operating record and on the public website as well as the corresponding retention periods.

EPA is finalizing the requirement that owners or operators of legacy CCR surface impoundments comply with recordkeeping, notification, and internet posting requirements at §§ 257.105 through 257.107. Owners or operators must document implementation and compliance with the rule and must place these files into the facility's operating record. Each required file must be maintained in the operating record for the entirety of the retention period specified in § 257.105 following submittal of the file into the operating record. Each file must also indicate the date the file was placed in the operating record. Files are required to be submitted into the operating record at the time the documentation becomes available or by the compliance deadline specified in the CCR regulations. Section 257.105 contains a comprehensive listing of each recordkeeping requirement and corresponding record retention periods.

Furthermore, the owner or operator of a legacy CCR surface impoundment must maintain a CCR website titled, ''CCR Rule Compliance Data and Information'' that hosts the compliance information so that it may be viewed by the public. Unless provided otherwise in the rule (see, Unit III.E.5), information posted to the publicly accessible internet site must be available for a period of no less than five years from the initial posting date for each submission. Posting of information must be completed no later than 30 days from the submittal of the information to the operating record. Owners or operators of legacy CCR surface impoundments have 30 days from the effective date of this rule to establish a CCR website and post the required applicable information.

C. CCR Management Unit Requirements

EPA is establishing requirements to address the risks from previously unregulated solid waste management of CCR that involves the direct placement of CCR on the land at CCR facilities. Information obtained since 2015 demonstrates that these exempt solid waste management practices are currently contaminating groundwater at many sites, and at others, have the potential to pose risks commensurate with the risks associated with currently regulated activities.

The closure of CCRMU of 1,000 tons or greater also provides significant risk mitigation. As laid out in Unit III.A of this preamble, CCRMU at both active facilities and inactive facilities with legacy impoundments pose risks to human health and the environment that are at least as significant as the risks presented by legacy CCR surface impoundments and the units currently regulated under the 2015 CCR Rule. In particular, for highly exposed individuals off site, landfill CCRMU were estimated to pose cancer risks as high as 7×10^{-6} from arsenic III, while surface impoundment CCRMU were estimated to pose cancer risks as high as 8×10^{-5} from arsenic III and noncancer HQs as high as 2 for arsenic III, two for lithium, and one for molybdenum. Differences in national risks between currently regulated units and these older units are attributed largely to the proportion of units that were modeled at the time as lined. However, the risks associated with these older units may be even higher than EPA modeled in the 2014 Risk Assessment for active units. These units have been present onsite longer and had more time to leak. In addition, there are several management practices that have the potential to result in higher leakage, but that were previously modeled either less frequently for active units—based on a belief that the practices had declined over time—or not at all—due to data constraints on a national scale. These include: (1) The greater prevalence of unlined units; (2) The greater likelihood of co-management of CCR with coal refuse and other wastes in surface impoundments, making the overall waste pH far more acidic and (3) The potential for the units to be constructed below the water table or to have become inundated with groundwater after the time of construction. As discussed in Unit III.A, each of these practices individually have the potential to result in nationwide risks higher than previously reported on a national basis for the currently operating universe of CCR units. For example, unlined landfill CCRMU were estimated to pose cancer risks as high as 1×10^{-5} from arsenic III, while unlined surface impoundment CCRMU were estimated to pose cancer risks ranging from 2×10^{-4} from arsenic III and noncancer HQs as high as 5 for arsenic III, 3 for lithium, 2 for molybdenum, and 1 for thallium. A combination of these practices could push risks even higher than modeled.

Based on these data, EPA is finalizing the addition of a new category of CCR units that would be subject to a set of requirements tailored to the characteristics of such units and the risks that they present. This new category of CCR units, called ''CCR management units'' or CCRMU, consists of CCR surface impoundments and landfills that were closed prior to the effective date of the 2015 CCR Rule, and inactive CCR landfills, which include inactive CCR piles. Under this final rule, CCR management units are subject to the regulations when they are located at: (1) A facility currently regulated under the 2015 CCR Rule; (2) Inactive facilities with a legacy CCR surface impoundment; and (3) Facilities that, on or after October 19, 2015, produced electricity for the grid but were not regulated under the 2015 CCR Rule because they had ceased placement of CCR in onsite CCR units and did not have an inactive CCR surface impoundment (the inclusion of these facilities are discussed in Unit III.C.2.f). EPA refers to the facilities in the above three categories in this preamble as ''covered CCR facilities.''

Owners or operators of any of covered CCR facilities are required to conduct a facility evaluation to identify and delineate any CCRMU containing one ton (or more) at the facility and document the findings in two reports. In addition, owners or operators of a covered CCR facility are required to ensure that all identified CCRMU containing 1,000 tons or more comply with the existing requirements in 40 CFR part 257, subpart D for groundwater monitoring, corrective action (where necessary), and in certain cases, closure, and post-closure care requirements. These issues are discussed in more detail in this Unit of the preamble.

EPA estimates that there are 179 CCRMU at 92 active facilities and 16 CCRMU at 12 inactive facilities that will be subject to the requirements of this final rule.[64] These areas include inactive CCR landfills, closed CCR landfills, closed CCR surface impoundments, and other solid waste management areas of CCR. EPA also identified 20 CCRMU at eight other active facilities. This estimate of CCRMU is an increase from the 134 CCRMU located at 82 facilities identified in the proposed rule. 88 FR 32028.

1. Damage Cases

EPA has a long history of considering damage cases in its regulatory decisions under RCRA. RCRA specifically directs EPA, when making a Regulatory Determination for CCR, to consider ''documented cases in which danger to human health and the environment from surface run-off or leachate has been proved,'' demonstrating that such information is to carry great weight in decisions of whether and how to regulate such wastes. 42 U.S.C. 6982(n)(4). See also 42 U.S.C. 6982(n)(3). In addition, damage cases are among the criteria EPA must consider under its regulations for determining whether to list a waste as a ''hazardous waste.'' See 40 CFR 261.11(a)(3)(ix). EPA also relied on damage cases to develop the specific requirements for CCR in part 257, subpart D. See, 80 FR 21452–21459.

Damage cases generally provide direct evidence of both the extent and nature of the potential risks to human health and the environment that have resulted from actual waste management practice. For example, in the 2015 CCR Rule, EPA relied on damage cases to identify actual management practices that resulted in harm above and beyond that already identified through modeling. Based on the damage cases, EPA identified several additional constituents (antimony, barium, beryllium, chromium, selenium, and lead) that were added to the Appendix IV list for groundwater monitoring.

For CCRMU, EPA proposed to rely on ten potential damage cases to further support the results of the modeling and 2014 Risk Assessment, and to better understand the characteristics of the sites and units, as well as the management practices, in order to develop appropriate requirements. EPA reviewed information received in response to the ANPRM as well as the documents posted on facilities' CCR websites for compliance with CCR regulations. See, 88 FR 32012. Specifically, EPA reviewed groundwater monitoring reports, assessment of corrective measures reports, corrective measures progress reports, remedy selection reports, history of construction reports, closure plans and reports, and fugitive dust control plans for facilities with CCR websites from 2018, 2019, 2020, and 2021. Through review of the groundwater monitoring and corrective action reports, EPA found many instances where the owners or operators of CCR facilities claimed that the detection of an SSI or SSL in concentrations of Appendix III or IV constituents in groundwater came from a CCRMU rather than the monitored regulated CCR unit.

Whenever a facility determines that there is an SSI over background levels for one or more of the constituents in Appendix III at a monitoring well at the downgradient waste boundary, the existing CCR regulations allow the facility an opportunity to complete an ASD showing that a source other than the unit (*i.e.,* an alternative source) was the cause of the SSI. 40 CFR 257.94(e)(2). The existing CCR regulations provide a similar opportunity whenever assessment monitoring results indicate that an SSL exceeding the GWPS has been detected at a downgradient well for any of the Appendix IV constituents. 40 CFR 257.95(g)(3). If a successful ASD for an SSL is not completed within 90 days, corrective action must be initiated.

In reviewing groundwater monitoring and corrective action reports EPA found that 42 ASDs or ACMs concluded that a Federally unregulated CCR source was responsible for the SSI or SSL. The proposed rule included ten examples (*i.e.,* damage cases) where owners or operators of CCR facilities claimed that an SSI or SSL is attributable to a CCR source rather than the Federally regulated CCR unit.

In addition to reviewing the groundwater monitoring and corrective action reports, EPA reviewed the history of construction reports, closure plans and reports, and fugitive dust control plans for facilities with CCR websites from 2018, 2019, 2020, and 2021. These documents contained either site maps, which identified currently regulated units, and in some cases, inactive or closed units at the facility, or narrative discussions of the site history, which included identification of where CCR

[64] An updated list of known potential CCRMU can be found in the docket for this action. See document titled ''Universe of CCR Management Units. April 2024.''

were previously disposed or managed at the facility.

EPA received numerous comments about the damage cases provided in the proposed rule. Some commenters provided information to demonstrate that many of EPA's listed damage cases did not meet EPA's criteria for a damage case to be considered ''a proven damage case,'' that had been developed for purposes of the Bevill Regulatory Determinations described in 65 FR 32214, 32224 (May 22, 2000). One commenter mischaracterized these criteria as ''EPA's criteria for identifying damage cases in RCRA rulemakings,'' and claimed that groundwater exceedances are not sufficient to prove that there is any risk to human health. The commenter stated that ''exceedances [must be] measured in ground water at a sufficient distance from the waste management unit to indicate that hazardous constituents had migrated to the extent that they could cause human health concerns'' citing the 2000 Regulatory Determination (65 FR 32224, May 22, 2000), and the 2010 proposed CCR Rule (75 FR 35131, June 21, 2010). The commenter asserted that without such information, none of the cases can be used to justify EPA's proposed regulation of CCR management units.

Another commenter argued that ''the damage cases are not representative of all CCRMUs, and, consequently, cannot legitimately be relied upon to develop national standards and requirements for all CCRMUs.'' The commenter claims that a report generated by Gradient documents ''many examples of CCRMUs that are not causing any GWPS exceedances, are not associated with any undue risk, and are being effectively regulated under state purview.'' Additionally, the commenter claims that the ''damage cases cited by US EPA do not demonstrate that CCRMUs are currently impacting groundwater quality and causing an unacceptable risk because EPA has not addressed whether the groundwater impacts that they have attributed to CCRMUs result from the current condition of each CCRMU or its historical operating condition.'' The commenter concludes that because EPA has provided no evidence to determine whether the impacts are being caused by the current condition of each CCRMU (potentially closed, inactive, and/or dewatered), EPA's conclusions that the damage cases provide evidence of potential risks associated with CCRMU is misguided and unsupported.

One commenter also took issue with EPA's inclusion of ''only'' ten ''hand-picked'' damage cases to justify regulation of CCRMU. The commenter complained that ''EPA's damage cases are not based on information collected by EPA, but rather are based on information compiled by advocacy groups using data collected from CCR websites, [and t]here is no indication EPA has conducted its own data collection, or verified the data that was collected.'' The commenter went on to say,

> Much of the data refers to alternative source analyses conducted for regulated CCR units, suggesting that the discussed 'CCRMU' may be the source of groundwater contamination; however, EPA makes no statements regarding whether, and conducts no analysis to determine whether, it agrees with those analyses. This is highlighted by the carefulness of EPA's declaration that its review of the third-party compiled information identified 42 areas ''potentially contaminating groundwater.'' . Potential groundwater impacts does not rise to the RCRA protectiveness level of ''reasonable probability of adverse effects on health or the environment from disposal of solid waste at such facility.

Finally, one commenter complained that of the 134 areas EPA identified where the management of CCR remain exempt, less than one third were found to potentially have groundwater impacts, yet EPA seeks to regulate the entire universe of 134 areas and more. According to this commenter, even assuming the potential groundwater impacts are real, they are not necessarily an indication that the CCR management practice creates a reasonable probability of an adverse effect on human health or the environment, as the commenter believes there are several other factors, such as the nature and extent of the CCR management practice, whether a hydraulic head is present, the hydraulic conductivity of surrounding soils, and the proximity of the material to water and the likelihood of contact with water, that must be considered before concluding a CCR management practice creates a reasonable probability of an adverse effect.

EPA disagrees that it is inappropriate to characterize the cited SSIs and SSLs as damage cases. As explained in the 2015 CCR Rule preamble, EPA has a long history of considering damage cases in its regulatory decisions under RCRA. 80 FR 21452. The statute specifically directs EPA to consider ''documented cases in which danger to human health and the environment from surface runoff or leachate has been proved,'' in reaching its Regulatory Determination for these wastes, demonstrating that such information is to carry great weight in determining whether to regulate these wastes. 42 U.S.C. 6982(n)(4). Damage cases, even if only potential damage cases, are also relevant under the third Bevill factor: ''potential danger, if any, to human health and the environment from the disposal and reuse of such materials.'' 42 U.S.C. 6982(n)(4). In addition, damage cases are among the criteria EPA must consider under its regulations for determining whether to list a waste as a ''hazardous waste.'' See 40 CFR 261.11(a)(3)(ix). Damage cases generally provide extremely potent evidence in hazardous waste listings.

As with the 2015 CCR Rule, EPA considers that both proven and potential damage cases provide information directly relevant to this rulemaking. Damage cases—whether proven or potential—provide evidence of both the extent and nature of the potential risks to human health and the environment. The primary difference between a proven and a potential damage case is whether the contamination has migrated off-site of the facility. But the mere fact that groundwater contamination has not yet migrated off-site does not change the fact that a potentially harmful constituent has leached from the unit into groundwater. Whether the constituent ultimately causes further damage by migrating into drinking water wells does not diminish the significance of the environmental damage caused to the groundwater under the site, even where it is only a future source of drinking water. As explained in the original 1979 subtitle D criteria, EPA is concerned with groundwater contamination even if the aquifer is not currently used as a source of drinking water. Sources of drinking water are finite, and future users' interests must also be protected. (See 44 FR 53445–53448.) (''The Act and its legislative history clearly reflect Congressional intent that protection of groundwater is to be a prime concern of the criterion. . . . EPA believes that solid waste activities should not be allowed to contaminate underground drinking water sources to exceed established drinking water standards. Future users of the aquifer will not be protected unless such an approach is taken.''). EPA is therefore presenting its findings with regard to damage cases because this information further supports the results of EPA's 2014 and 2024 Risk Assessments, which together provide the factual bases for the actions taken in this final rule.

EPA also disagrees with the arguments that attempt to minimize the significance of the damage case record. EPA is relying on the damage cases to evaluate the extent and nature of the risks associated with particular CCR management practices. Facts demonstrating the consequences from particular activities therefore remain relevant, particularly (although not solely) where the management practices continue to occur. In other words, what matters in this regard are facts that provide information on the reasons that unit leaked, the particular contaminants that were present, the levels of those contaminants, and the nature of any impacts caused by that contamination. This is entirely consistent with RCRA section 8002(n), which requires EPA to evaluate the ''potential danger, if any, to human health and the environment from the disposal and reuse of such materials'' in addition to ''documented'' damage cases. 42 U.S.C. 6982(n)(3)–(4).

EPA further disagrees that only the presence of receptors within the impact sphere of a contaminating facility merits consideration of a particular damage case. EPA's longstanding and consistent policy across numerous regulatory programs has been that groundwater contamination is a significant concern that merits regulatory action in its own right, whether or not the aquifer is currently used as a source of drinking water. Sources of drinking water are finite, and future users' interests must also be protected. The absence of current receptors is therefore also not an appropriate basis on which to discount damage cases. And for all the reasons discussed above, EPA also disagrees that only exceedances of health-based standards of contaminants that have migrated off-site (*i.e.,* only proven damage cases) should be accounted for as part of this rulemaking.

EPA further disagrees with commenters' assertions about the sources of information that EPA included in the proposed rule and that EPA is relying upon in this final rule. In the proposal EPA discussed information that the Agency obtained from comments submitted in response to the ANPRM, and from other sources provided by environmental groups. However, EPA conducted an independent review of information posted on facility websites, including groundwater monitoring reports, assessment of corrective measures reports, corrective measures progress reports, remedy selection reports, history of construction reports, closure plans and reports, and fugitive dust control plans for facilities with CCR websites from 2018, 2019, 2020, and 2021 to develop the record for the proposed rule. 88 FR 32012–32013.

Several commenters disagreed with EPA's characterization in the proposed rule of certain sites as damage cases because the units have now been closed or the contamination has been remediated (or is in the process of being remediated) under State oversight. For example, one commenter noted that they are ''aware of situations where over the years CCR was intermittently dispersed within fill to facilitate facility expansions (commonly referred to as ''made land''), which was a common practice along heavily industrialized shores of the Great Lakes.'' The commenter further stated that, the ''Phases I and II of the Landfill at NIPSCO's R.M. Schahfer Generating Station, is an example of how the Proposed Rule mischaracterizes the risk associated with CCRMU.'' According to the commenter Phases I and II have been closed in a manner that is protective of groundwater, and the data demonstrates that the groundwater plume resulting from Phases I and II is stable, with concentrations of constituents declining.

Another commenter similarly objected to EPA's inclusion of Reid Gardner as an example of CCRMU with identified SSIs. The commenter said EPA mistakenly assumed the historical ponds under the regulated units may be a cause of SSIs. They said these historical ponds were excavated and removed prior to 2015 so these units cannot be deemed to be a CCRMU. As a result, they said EPA's characterization of Reid Gardner as a damage case is inaccurate and inappropriate and should be removed from the final rule. In addition, they disagreed with EPA's reliance on ''standard GWPS'' equivalent to MCLs, stating that by doing so, EPA fails to consider site-specific factors such as pre-existing groundwater contamination, natural variation in groundwater, and the site conceptual model, as well as EPA guidance for statistical analysis. Finally, the commenter said that corrective actions at Reid Gardner are comprehensively regulated under the State, which governs the performance and/or completion of Environmental Contaminant characterization, the screening and selection of Corrective Action, and the implementation and long-term Operation and Maintenance of [NDEP] approved Corrective Action concerning Pollution Conditions at the Site (Nevada Division of Environmental Protection Administrative Order on Consent Reid Gardner Generating Station, I.4, page 2). According to the commenter, interim corrective actions completed under the Administrative Order have already resulted in the removal of over 2.5 million cubic yards of CCR and associated materials from the site.

The same commenter also disagreed with EPA's inclusion of Huntington as an example of a CCRMU with identified SSLs. They said EPA's statement that the plant's remedy selection report ''does not appear to address releases from the Old Landfill,'' is incorrect, as the selected remedy—a groundwater capture system—has been placed to capture groundwater from both the regulated landfill and the Old Landfill. In addition, the commenter said the Old Landfill is subject to separate State oversight and corrective action, including elimination of infiltration, capping of closed sections and capture of any seepage. As a result, they disagreed with EPA's characterization of Huntington as a damage case and stated it should be removed from the final rule.

One commenter claimed that the damage case example concerning East Kentucky Power Cooperative's Cooper Station does not support the conclusion EPA draws from it. Specifically, EPA's proposal refers to a former surface impoundment below the current landfill at the facility, but, as the proposal recognizes, the facility conducted an ASD that did not identify the former impoundment as an alternate source of groundwater impact and the unit therefore remains in detection monitoring, with no conclusion having been drawn. As such, the commenter said, ''EPA is relying on an ASD which did not identify the impoundment as an alternative source to justify more stringent regulation of CCRMU with respect to groundwater impacts that have not been found to have resulted from the unit.'' EPA agrees that this facility should not be included in the final list of damage case examples based on this comment.

Other commenters provided information about EPA's Damage Case Compendiums developed for the 2015 CCR Rule to show some of those include potential CCRMU. They also provided additional damage cases and lists of potential CCRMU for EPA to include in the record.

Except as noted above, EPA disagrees that the damage cases are not representative of CCRMU, even if the units are regulated under State programs. The data from these units shows these CCRMU are contributing to groundwater contamination, irrespective of any prior State oversight.

EPA also continues to believe that, as EPA explained in the 2015 CCR Rule, cases where contamination has been remediated remain relevant to this rulemaking. EPA is relying on the damage cases to evaluate the extent and nature of the risks associated with particular CCR management practices.

Facts demonstrating the consequences from particular activities therefore remain relevant, particularly (although not solely) where the management practices continue to occur. In other words, what matters in this regard are facts that provide information on the reasons that unit leaked, the particular contaminants that were present, the levels of those contaminants, and the nature of any impacts caused by that contamination. None of these facts are affected by whether the damage is ultimately mitigated or remedied. This is entirely consistent with RCRA section 8002(n), which requires EPA to evaluate the ''potential danger, if any, to human health and the environment from the disposal and reuse of such materials'' in addition to ''documented'' damage cases. 42 U.S.C. 6982(n)(3)–(4). Accordingly, the fact that any contamination has subsequently been remediated is not a basis for disregarding a damage case. See 80 FR 21455.

In summary, EPA continues to believe the damage cases provide extremely valuable evidence that is directly relevant to the question of whether and how to regulate CCR. For example, the damage cases provide ''real world'' evidence against which to compare EPA's risk modeling estimates, such as evidence regarding the frequency with which particular constituents leach into groundwater. 80 FR 21326. They also provide direct evidence regarding specific waste management practices at electric utilities, along with the potential consequences of those practices. Accordingly, EPA has sufficient confidence in the veracity of the collected information to rely on it in making decisions in this rule. EPA expects that additional damage cases will be discovered in response to the installation of the groundwater monitoring systems required by the final rule.

a. Examples of CCRMU With Identified SSLs

Under the existing CCR regulations, when a facility determines there is an SSL for one or more Appendix IV constituents and completes a successful ASD showing that a source other than the regulated unit is the cause of the SSL(s), the facility is not required to initiate corrective action for that particular constituent. Through reviewing the ASD posted on facility websites, EPA identified several areas at active facilities where CCR is managed outside of a regulated unit and is identified as a source of one or more Appendix IV SSL(s). The following facilities are examples of situations in which such areas have been identified as the source of an SSL and therefore support EPA's determination that such areas warrant regulation under RCRA section 4004(a).

James H Campbell Power Plant, West Olive, Michigan

The JH Campbell Power Plant, owned and operated by Consumers Energy Company, is located within a mile of Lake Michigan. The facility has five regulated CCR units, including three CCR surface impoundments (Pond A, Bottom Ash Ponds 1–2, and Bottom Ash Pond 3) and two CCR landfills. The ''wet ash ponds area'' is approximately 267 acres and is bounded by perimeter dikes with a system of internal dikes separating the individual ash ponds. In addition to the five regulated CCR units, there are at least seven other unregulated, unlined ''closed'' impoundments [65] that ceased placement of waste prior to October 19, 2015, do not have an engineered cap nor vegetative cap, and have a closure plan that was approved by the State. Based on the groundwater monitoring report reviews, there were SSIs over background at many wells at all units and some had an SSL for arsenic and selenium. At Pond A, which closed with waste in place in 2019, there are SSIs for boron and sulfate, and SSLs were identified for arsenic (13 µg/L [MCL of 10 µg/L]) and selenium [66] (143 µg/L [MCL of 50 µg/L]) for which an assessment of corrective measures was completed, and the selected remedy is source removal and final cover as the primary corrective action. In the 2021 Annual Groundwater Monitoring and Corrective Action Report posted in January 2022, Consumers Energy concluded there was an ASD for Pond A and said, ''Increases in Appendix III constituents (*e.g.* boron) and direct exceedances of the selenium GWPS in JHC–MW–15011, JHC–MW–15010, JHC–MW–15009, and JHC–MW–15008R that have not yet resulted in a statistically significant exceedance suggest a detectable influence from the immediately adjacent, upgradient, closed, pre-existing CCR units on-site. The closed, preexisting units are not regulated under the RCRA CCR Rule, but remedial action is being taken under Consent Agreement WMRPD No. 115–01–2018. A [remedial action plan] for these units was submitted to [Michigan's Department of Environment, Great Lakes, and Energy] on September 30, 2021.'' During the 2021 groundwater monitoring period for Bottom Ash Ponds 1–2, which closed by removal in 2018, SSIs were identified for boron, calcium, chloride, pH, sulfate, and total dissolved solids (TDS); also, one SSL was identified for arsenic (38 µg/L [MCL of 10 µg/L]).[67] An assessment of corrective measures has been completed for the CCR unit and the primary selected remedy is source removal and final cover. Consumers Energy also said in the 2022 semiannual progress report that the facility is reevaluating the groundwater ''monitoring system for [Bottom Ash] Ponds 1–2 to more accurately account for the influence from the closed, pre-existing units.''

New Castle Generating Station, Pennsylvania

GenOn Power Midwest LP (GenOn) operates the New Castle Generating Station located in West Pittsburg, Pennsylvania. The New Castle Generating Station has two CCR units subject to the regulations—an impoundment (North Bottom Ash Pond) and a landfill (New Castle Plant Ash Landfill). Each of these CCR units has relevance to this proposal due to other unregulated disposal units located adjacent to the regulated CCR units.

The North Bottom Ash Pond was used for the management of bottom ash until 2016 when the facility transitioned from coal to natural gas. After the transition to natural gas, GenOn initiated closure of the North Bottom Ash Pond by removing all waste from the impoundment. Closure of the impoundment was certified in 2019.[68] Groundwater monitoring associated with the impoundment while the unit was operating detected arsenic at SSL above the GWPS in all downgradient monitoring wells.[69] In accordance with the procedures in the regulations for CCR units in 40 CFR 257.94(e)(2), GenOn determined that an alternative source was responsible for these SSLs of arsenic. Specifically, the ASD found that a 120-acre unlined CCR surface impoundment located immediately adjacent to the North Bottom Ash Pond

[65] These ''closed'' impoundments (Pond B, Pond C, Pond D, Pond F, Pond G (G1 and G2), Pond H, and Pond K) are listed in a figure on page 12 of the 2021 Annual Groundwater Monitoring and Corrective Action Report, JH Campbell Power Plant Pond A, January 2022, Prepared for Consumer's Energy.

[66] JH Campbell Semiannual Progress Report—Selection of Remedy, Ponds 1–2 North and 1–2 South, and Pond A, July 30, 2022. Pages 3–4.

[67] Annual Groundwater Monitoring and Corrective Action Report, JH Campbell Power Plant Ponds 1–2 North and 1–2 South, January 2022, Prepared for Consumers Energy. Page 23.

[68] CCR Compliance, Closure Certification Report, Closure by Removal, New Castle North Bottom Ash Pond. June 2019.

[69] *Id.* At 5.

was responsible for the arsenic concentrations in the downgradient monitoring wells.[70] According to the 2019 Annual Report prepared by GenOn, there were SSLs for arsenic (0.087 mg/L [MCL of 10 μg/L]) in the downgradient monitoring wells.[71] Consequently, because the SSLs of arsenic were attributed to another source (*i.e.,* a former unlined CCR surface impoundment), GenOn concluded it was not required to remediate the arsenic contamination under the Federal CCR regulations.

GenOn also determined that there were SSIs above background levels for multiple analytes at the New Castle Plant Ash Landfill (Ash Landfill), which is the other regulated CCR unit at the New Castle Generating Station. In its most recent annual groundwater monitoring report in 2022, GenOn reported SSIs for boron, calcium, fluoride, sulfate, and total dissolved solids.[72] GenOn determined that an alternative source was responsible for these analyte increases, specifically pointing to an ''underlying historic ash impoundment and other closed stages of the landfill.'' [73] Prior to development of the 60-acre Ash Landfill, CCR was disposed in an impoundment from approximately 1939 to 1978.[74] After the impoundment was dewatered in 1978, dry CCR was disposed in this area in several stages of CCR placement up until the time Ash Landfill began operation. Since 2018, GenOn has attributed SSIs for boron, calcium, fluoride, sulfate, and TDS to this historic disposal of CCR.

Huntington Power Plant, Utah

The Huntington Power Plant in Huntington, Utah is owned and operated by PacifiCorp and has one regulated unit, the Huntington CCR Landfill. While conducting the required groundwater monitoring for the Huntington CCR Landfill, there were SSLs for chromium, cobalt, lithium, molybdenum, selenium, fluoride, and arsenic, so the owner or operator conducted assessment of corrective measures. There is also a former combustion waste landfill called the Old Landfill, which is located northwest of the regulated Huntington CCR Landfill. The ACM report [75] assumes the SSLs are the result of groundwater interactions with both the Huntington CCR Landfill and the Old Landfill. Both landfills have stormwater run-on from the area surrounding the landfill. This run-on is routed around the landfills via diversion ditches and run-off from the landfills itself is collected and retained in a sediment basin north of the Huntington CCR Landfill. The facility is implementing a remedy to address releases only from the regulated CCR Huntington Landfill, but the remedy selection report [76] does not appear to address releases from the Old Landfill.

J.B. Sims, Grand Haven, Michigan

The J.B. Sims Generating Station, owned and operated by Grand Haven Board of Light and Power, is located on Harbor Island, north of Grand Haven, Michigan. Harbor Island is bound to the north, east, and west by the Grand River and to the south by the South Channel, tributaries of Lake Michigan. The facility has two Federally regulated CCR units (Unit 1 & 2 and Unit 3), both of which are inactive, unlined surface impoundments. Unit 1 & 2 is approximately 1.2 acres and includes areas where, prior to October 19, 2015, CCR was placed in unlined impoundments and used as fill in low-lying areas of adjacent wetlands. Unit 3 is approximately 0.5 acres and was built on top of historically placed CCR. The boundary of Unit 1 & 2 was updated in an agreement with EPA and the State in January 2021,[77] to include an area that received CCR prior to 1978. Therefore, the groundwater monitoring network and closure plan are currently being updated to reflect the new boundary and better address contamination from historical CCR across the units.[78] Additionally, in March 2022, the State issued an enforcement notice [79] to J.B. Sims citing inadequate groundwater monitoring and failure to address all areas where CCR were managed (*e.g.,* stored, placed) prior to disposal during the unit's operation. As such, the facility is considering expanding Unit 3's groundwater monitoring network. The units are often partially flooded, and groundwater elevations and flow direction are influenced by precipitation and water levels in the Grand River and the South Channel.

Based on groundwater monitoring report reviews, both units have had SSIs and SSLs since groundwater monitoring was initiated in 2017. During 2021, both Unit 1 & 2 and Unit 3 had SSIs for all Appendix III constituents and SSLs for arsenic (98 μg/L [MCL is 10 μg/L]), chromium (270 μg/L [MCL is 100 μg/L]), cobalt (22 μg/L [GWPS is 6 μg/L], fluoride (13 mg/L [MCL is 4 mg/L]), and lithium (2800 μg/L [site-specific GWPS is 59 μg/L]).[80] In December 2020, J.B. Sims submitted an ASD for Unit 3's 2019 SSLs for chromium, cobalt, fluoride, lead, and lithium, pointing to the historic fill across the island as the source of the SSLs. [81] [82] Furthermore, the Fourth Quarterly 2021 Monitoring Report suggested the continued SSIs and SSLs at Unit 3 were due to historical CCR fill beneath the unit, historical fill outside of Unit 1 & 2, and waste historically placed across the site.[83] However, until the groundwater monitoring networks are finalized, the extent of groundwater contamination and the source of all contamination cannot be determined. The assessment of corrective measures for both units began in February 2019 and is ongoing, pending finalization of the groundwater monitoring networks. Based on groundwater monitoring reports, EPA has found that due to the fluctuations in groundwater elevations in response to precipitation and nearby surface water levels, portions of the facility, including Unit 1 & 2, can be inundated or partially in contact with groundwater.

[70] *Id.*

[71] CCR Compliance, Groundwater Monitoring and Corrective Action Annual Report, New Castle North Ash Pond and Ash Landfill. January 2020.

[72] CCR Compliance, Groundwater Monitoring and Corrective Action Annual Report, New Castle Ash Landfill. December 2022.

[73] *Id.* At 3.

[74] New Castle Plant Ash Landfill—Annual CCR Unit Inspection Report. January 16, 2018.

[75] Corrective Measures Assessment CCR Landfill—Huntington Power Plant Huntington, Utah. May 2019.

[76] Remedy Selection Report CCR Landfill—Huntington Power Plant, Huntington, Utah. August 2020.

[77] The meeting between Grand Haven Board of Light and Power, the State, and EPA during which the new boundaries for Unit 1 & 2 were agreed to is discussed on page 3 (PDF page 10) of the 2021 Annual Groundwater Monitoring & Corrective Action Report by Golder Associates. January 28, 2022.

[78] Letter to Grand Haven Board of Light and Power-Update To The October 14, 2019 J.B. Sims Generating Station Inactive Units ½ Impoundment And Unit 3 Closure Plan—Interim Conditions For Closure. October 22, 2021.

[79] The State of Michigan, Department of Environment, Great Lakes, and Energy (EGLE) issued an enforcement notice via email March 22, 2022, to Grand Haven Board of Light and Power, J.B. Sims.

[80] SSL concentrations can be found in Appendix B (PDF page 512) of the 2021 Groundwater Monitoring & Corrective Action Report prepared by Golder Associates on behalf of Grand Haven.

[81] 2020 Alternate Source Demonstration J.B. Sims Generating Station—Unit 3 Impoundments Submitted to: Grand Haven Board of Light and Power Submitted by Golder Associates Inc. December 28, 2020.

[82] Technical Memorandum to Michigan Department of Environment, Great Lakes, and Energy-Unit 3 Impoundments Alternate Source Demonstration Response Grand Haven Board Of Light And Power—JB Sims Power Generating Station. February 12, 2020.

[83] Memorandum to Michigan Department of Environment, Great Lakes, and Energy- Fourth Quarter 2021 Monitoring Report, Former JB Sims Generating Station, Unit 3 A&B Impoundments—Response to Comments. March 8, 2022.

b. Examples of CCRMU With Identified SSIs

Under the existing CCR regulations, when a facility determines there is an SSI for one or more Appendix III constituents and completes a successful ASD showing that a source other than the regulated unit is the cause of the SSI(s), the facility is not required to initiate assessment monitoring for that particular constituent. 40 CFR 257.94(e). Through ASD reviews, EPA identified several areas at active facilities where CCR was managed outside of a regulated unit and was identified as a source of one or more Appendix III SSI(s). As such, any groundwater contamination from these potential CCRMU have not been investigated under the existing Federal CCR regulations. The following facilities are examples of situations in which potential CCRMU have been identified as the source of an SSI and demonstrate the need to regulate CCRMU.

Reid Gardner Generating Station, Moapa Valley, Nevada

Reid Gardner Generating Station (Reid Gardner), owned and operated by NV Energy, is located adjacent to the Muddy River and the Moapa Band of Paiutes reservation, approximately 45 miles northeast of Las Vegas. Reid Gardner has seven regulated CCR units: four unlined inactive surface impoundments (Pond 4B–1, Pond 4B–2, Pond 4B–3, and Pond E–1), two active unlined surface impoundments (Pond M–5 and Pond M–7), and one partially lined landfill (Mesa Landfill). The inactive surface impoundments covered 47 acres and were closed by removal in 2017.[84] The inactive surface impoundments were constructed in 2003 (Pond E–1) and 2006 (Pond 4B–1, Pond 4B–2, and Pond 4B–3) to replace four of the eleven historical unlined evaporation ponds located at the facility that made up the evaporation pond complex (Pond 4A, Pond 4B–1, Pond 4B–2, Pond 4B–3, Pond 4C–1, Pond 4C–2, Pond D, Pond E–1, Pond E–2, Pond F, and Pond G).[85] The evaporation pond complex was built within the Muddy River floodplain and used from approximately 1974 until approximately 2002 to evaporate CCR and other process wastewaters from the facility. The two active surface impoundments (Ponds M–5 and M–7) were constructed in 2010 approximately 0.75 miles south of the historical evaporation ponds and cover 28 acres. Mesa Landfill was constructed and operational prior to the 2015 CCR Rule and has a surface area of roughly 252 acres.

Based on groundwater monitoring report reviews, the inactive surface impoundments had no Appendix III SSIs above their established background concentrations during the detection monitoring event in 2019.[86 87 88 89 90 91] However, the inactive surface impoundments did have Appendix IV constituent concentrations above the standard GWPS, including arsenic (2.52 mg/L [MCL is 0.01 mg/L]), cadmium (0.0072 mg/L [MCL is 0.005 mg/L]), cobalt (242 µg/L [standard GWPS is 6 µg/L]), fluoride (35.4 mg/L [MCL is 4.0 mg/L]), lithium (27,300 µg/L [standard GWPS is 40 µg/L]), molybdenum (6,390 µg/L [standard GWPS is 100 µg/L]), selenium (0.204 mg/L [MCL is 0.05 mg/L]), thallium (0.026 mg/L [MCL is 0.002 mg/L]), and radium 226 & 228 combined (8.02 pCi/L [MCL is 5 pCi/L]). Ponds M–5 and M–7 and the Mesa Landfill have had SSIs for fluoride every year of detection monitoring for which ASDs have been performed pointing to natural variation in groundwater quality.[92 93 94 95 96 97] ASDs were also performed for SSIs at Mesa Landfill for pH (2019 and 2021) and turbidity (2020 and 2021) that attributed the SSIs to natural variation in groundwater quality. Therefore, since ASDs have been performed for all SSIs and the active units, Reid Gardner has not moved from detection monitoring to assessment monitoring. The facility also claims the historical, co-located evaporation ponds are the source of groundwater contamination in the area and not the CCR-regulated units. Specifically, in the closure certification for the inactive surface impoundments, the facility points to documentation as far back as the 1980s that describe seepage from Pond D, the historical Pond E–1 and E–2, Pond F, and Pond G and leakage at an estimated rate of 50 acre-feet/year from Ponds 4C–1 and 4C–2 and historical Ponds 4B–1, 4B–2, and 4B–3.

Seminole Electric Cooperative, Florida

Seminole Electric Cooperative (Seminole) operates the Seminole Generating Station located in Palatka, Florida. For CCR that is not beneficially used, CCR is disposed at the facility in a landfill (Increment One Landfill), which is subject to the CCR regulations. This CCR landfill is a double-lined landfill with a leachate collection system and, because part of the Increment One Landfill overlaps with the side-slope of a former, Federally unregulated landfill, the liner system also includes a high-density polyethylene geomembrane where the two units interface.[98] Seminole determined there were SSIs above background levels for multiple analytes in one or more monitoring wells at the downgradient waste boundary in 2018, including SSIs for boron, calcium, chloride, sulfate, and TDS. Seminole determined that one or more alternative sources were responsible for these analyte increases. These sources include

[84] Reid Gardner Generating Station Inactive Coal Combustion Residual Surface Impoundments Ponds 4B–1, 4B–2, 4B–3, and E–1 Closure Certification, April 2019.

[85] Construction History, Pond E1, Reid Gardner Generating Station. April 11, 2018.

[86] Reid Gardner Generating Station Inactive CCR Surface Impoundment E–1. Coal Combustion Residual 209 Annual Groundwater Monitoring and Corrective Action Report. July 31, 2019.

[87] Reid Gardner Generating Station Inactive CCR Surface Impoundments 4B–1, 4B–2, and 4B–3. Coal Combustion Residual 2019 Annual Groundwater Monitoring and Corrective Action Report. Revision 1. May 14, 2020.

[88] Reid Gardner Generating Station Mesa Impoundments M5 and M7 Coal Combustion Residual 2019 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2020.

[89] Reid Gardner Generating Station Mesa Impoundments M5 and M7 Coal Combustion Residual 2020 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 29, 2021.

[90] Reid Gardner Generating Station Mesa Impoundments M5 and M7 Coal Combustion Residual 2021 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 28, 2022.

[91] Alternate Source Demonstration and Addendum to the Coal Combustion Residual 2017 Annual Groundwater Monitoring and Corrective Action Report Reid Gardner Generating Station Mesa CCR Surface Impoundments (Ponds M5 and M7). Prepared for NV Energy. April 13, 2018.

[92] Reid Gardner Generating Station Mesa Landfill Coal Combustion Residual 2018 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2019.

[93] Reid Gardner Generating Station Mesa Impoundments M5 and M7 Coal Combustion Residual 2018 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2019.

[94] Reid Gardner Generating Station Mesa Landfill Coal Combustion Residual 2019 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2020.

[95] Reid Gardner Generating Station Mesa Landfill Coal Combustion Residual 2020 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 31, 2021.

[96] Reid Gardner Generating Station Mesa Landfill Coal Combustion Residual 2021 Annual Groundwater Monitoring and Corrective Action Report and Alternate Source Demonstration. January 28, 2022.

[97] Alternate Source Demonstration and Addendum to the Coal Combustion Residual 2017 Annual Groundwater Monitoring and Corrective Action Report Reid Gardner Generating Station Mesa Landfill. Prepared for NV Energy. April 13, 2018

[98] Seminole Generating Station Increment One Landfill Annual Groundwater Monitoring and Corrective Action Report. January 31, 2019.

former test cells (*i.e.,* areas where CCR was placed in the 1980s for purposes of construction evaluations that are now located beneath the Increment One Landfill), a former CCR landfill adjacent to the Increment One Landfill, and several process water ponds next to the Increment One Landfill.[99] Since 2018, Seminole has attributed SSIs for these analytes to these alternative sources and therefore, has not moved from detection monitoring to assessment monitoring.

R.M. Schahfer Generating Station, Indiana

The R.M. Schahfer Generating Station, owned and operated by Northern Indiana Public Service Company, LLC (NIPSCO), has several CCR units subject to the regulations, including several CCR impoundments and a CCR landfill consisting of multiple cells or phases of operation (''Landfill''). The Landfill is of particular relevance to this proposal because includes three cells subject to Federal CCR regulations (Phases V through VII) and four landfill cells that are not (Phases I through IV). In the course of conducting the required groundwater monitoring for the regulated cells of the Landfill, in January 2018, NIPSCO determined that there were SSIs above background levels for all seven analytes in Appendix III at one or more monitoring wells at the downgradient waste boundary of the regulated CCR units. This included SSIs for boron, calcium, chloride, fluoride, pH, sulfate, and TDS.[100] Through procedures laid out in the regulations for regulated CCR units in 40 CFR 257.94(e)(2), NIPSCO determined that these groundwater SSI impacts were not due to a release from the regulated CCR landfill cells, but instead were attributable to another source. Specifically, NIPSCO has concluded that ''a release from the non-regulated, unlined portions of the landfill, Phases 1 and II, is the source of the identified SSIs.'' [101] Subsequent groundwater monitoring of the regulated Landfill cells since 2018 continues to identify SSIs and NIPSCO continues to attribute those impacts to releases from the unregulated Phase I and II cells.[102]

Landfill Phase I is a 20-acre unlined cell that received CCR (flue gas desulfurization materials and fly ash) between 1984 and 1991 and subsequently closed with a final cover system in 1999. Phase II of the Landfill is an unlined 42-acre cell where flue gas desulfurization materials and fly ash were disposed between 1991 to 1998. The Phase II cell was closed with a final cover system in 1998. CCR landfills such as the Phase I and II cells are not regulated by the existing regulations because the cells have not received CCR on or after October 19, 2015. As a result, NIPSCO has not been required under the existing Federal CCR regulations to investigate further and remediate as necessary groundwater impacts from the unlined Phase I and II cells.

Waukegan Generating Station, Illinois

An example of CCR used as fill on-site is Midwest Generation's Waukegan Generating Station in Waukegan, Illinois. There are two CCR surface impoundments named the East Ash Pond and West Ash Pond, which were used interchangeably during the facility's operational history and have a multi-unit groundwater monitoring system. The East Ash Pond has a surface area of 9.8 acres with a storage capacity of 184,000 cubic yards. The West Ash Pond has a surface area of 10 acres with a storage capacity of 223,000 cubic yards. According to the 2018 Annual Groundwater Monitoring and Corrective Action Report, there was detection of SSIs over background for Appendix III constituents, including pH and sulfate.[103] An ASD was completed that claimed other potential historic sources were the cause of the SSIs. In the 2019 Annual Groundwater Monitoring and Corrective Action Report, an ASD for Appendix III constituents identified calcium and TDS with the same claim that other potential historic sources were the cause of the SSIs.[104] The ASDs discuss that the downgradient monitoring wells were installed within the berms for the surface impoundments that consisted of a ''mixture of fill and beneficially reused coal combustion by-product''.[105] [106] The 2018 ASD also notes that a upgradient well, MW–05 which is not a part of the CCR groundwater monitoring network, has substantially higher sulfate and boron concentrations than the downgradient wells suggesting an upgradient source. Furthermore, the 2019 ASD mentions that the fluctuating TDS concentrations at downgradient well MW–16 are correlated to fluctuations in TDS at MW–05 further suggesting an upgradient source. While these ASDs suggest that the sources may be CCR within the berms and a upgradient source they do not analyze these potential sources to verify the claims. EPA did verify that the boring logs for groundwater monitoring wells MW–01 through MW–05 and MW–16 show they were installed within 11 to 20 feet of CCR in the berms surrounding the surface impoundments.[107] In addition, construction drawings in the history of construction show ''existing fill'' or CCR was used in the construction of the surface impoundment access ramps and underneath the surface impoundments liners.[108] The facility continued to use the ASDs for SSIs in 2020 and 2021, therefore, the surface impoundments remain in detection monitoring.

White Bluff Steam Electric Station, Arkansas

The White Bluff Steam Electric Station in Redfield, Arkansas is owned or operated by Entergy and has three CCR units: two CCR surface impoundments (A Recycle Pond/South Pond and B Recycle Pond/North Pond); and one CCR landfill (Existing CCR Landfill Cells 1–4). CCR previously was disposed in a 20-acre ravine,[109] which was closed and covered in accordance with the original facility State-issued permit. The active landfill was then built on top of, and adjacent to, the unlined, closed landfill. In 2018, the facility conducted intrawell monitoring of the groundwater at the facility and SSIs for pH, calcium, TDS, and boron were detected. An ASD was completed and determined that the sources of the SSIs were: (1) Releases from portions of the Coal Ash Disposal Landfill (CADL) closed before the effective date of the CCR Rule (October 19, 2015); (2) Surface water that has come into contact with on-site CCR and has migrated into the subsurface; and/or (3) Natural variation

[99] *Id.* at 20.

[100] 2018 Annual Groundwater Monitoring and Corrective Action Report—Landfill Phase V and Phase VI, NIPSCO R.M. Schahfer Generating Station. January 31, 2019.

[101] Northern Indiana Public Service Company, R.M. Schahfer Generating Station, Wheatfield, Indiana, Schahfer Landfill Phase V and Phase VI, Alternative Source Demonstration. April 13, 2018. Begins on PDF page 20 of the 2018 Annual Groundwater Monitoring and Corrective Action Report—Landfill Phase V and Phase VI. April 13, 2018.

[102] 2021 Annual Groundwater Monitoring and Corrective Action Report, Landfill Phase V, Phase VI, and Phase VII, NIPSCO LLC R.M. Schahfer Generating Station. January 31, 2022.

[103] 2018 Waukegan Generating Station Annual GWMCA Report, Appendix B, PDF pg. 100. January 2019.

[104] 2019 Waukegan Generating Station Annual GWMCA Report, Appendix B, PDF pg. 100. January 2020.

[105] 2020 Waukegan Generating Station Annual GWMCA Report. January 2021.

[106] 2021 Waukegan Generating Station Annual GWMCA Report. January 2022.

[107] Waukegan boring well logs.

[108] October 2016, Waukegan Generating Station History of Construction.

[109] Entergy Arkansas, LLC White Bluff Steam Electric Station Landfill Cells 1–4 2021 Annual Groundwater Monitoring and Corrective Action Report. January 31, 2022.

in groundwater quality. Therefore, the landfill remains in detection monitoring.

c. Examples of CCRMU With Identified SSIs or SSLs From Comments

EPA received several comments about potential damage cases from CCRMU. In addition, many comments provided additional potential CCRMU but evidence of a thorough groundwater quality investigation in this area was not presented. If there are monitoring wells at the facility, the wells are not sufficient to characterize groundwater impacts from the CCRMU. Therefore, due to lack of data, EPA and the commenters could not definitively determine if certain unregulated placement of CCR at facilities is a CCRMU or if the CCRMU could be potential damage cases. EPA presents the following additional examples of CCRMU that have adequate groundwater monitoring to show impacts.

Brandywine Ash Management Facility, Maryland

The Brandywine Ash Management Facility in Prince George's County, Maryland has a 217-acre CCR landfill. It is operated by GenOn MD Ash Management, LLC. CCR has been landfilled at the facility since approximately 1971. As of 2018, an estimated 6.8 million cubic yards, or 7 billion kilograms, of CCR were placed at the site. CCR at Brandywine has contaminated groundwater and surface water, leading to legal action by the State of Maryland. A 2013 Consent Decree resulted in the development of a Corrective Measures Plan and a Nature and Extent of Contamination Study.[110] [111] According to the Consent Decree, ''The original design of the disposal cells and operation of the disposal areas. . .has resulted in some leachate escaping the disposal cells via groundwater and constructed outfalls and entering surface waters . . .'' [112]

''Based on a review of the quarterly Discharge Monitoring Reports . . . and other quarterly and annual monitoring reports submitted by GenOn, [Maryland Department of the Environment (MDE)] has determined that wastewater discharges from monitoring points at Brandywine have at times exceeded ambient surface water quality standards for cadmium and/or selenium. MDE has also determined that leachate has entered groundwater and is causing the [maximum contaminant level (MCL)] for cadmium to be exceeded at times at certain groundwater monitoring points, as were federally recommended secondary standards for manganese, sulfate, iron, [total dissolved solids (TDS)], aluminum and chloride.'' [113]

This broader context related to State law—which is absent from documents submitted pursuant to the 2015 CCR Rule—is important for understanding the complexity of the Brandywine site and its impacts. For example, unsafe lithium levels hundreds of times higher than the default GWPS in the 2015 CCR Rule have been documented at groundwater monitoring wells, as have unsafe molybdenum levels up to approximately 80 times higher than its default GWPS. Some of these unsafe levels are found in monitoring wells not included in the network used to demonstrate compliance with the Federal CCR Rule.[114]

The Brandywine site includes four areas of interest: Historical Area 1, Historical Area 2, Phase I, and Phase II.[115] [116] Because these four areas are all part of a single landfill and in some cases overlap, they should have all been subject to the 2015 CCR Rule—even though three of the areas were closed before the rule took effect. In its filings to comply with the 2015 CCR Rule, GenOn has treated the Historical Area 1, Historical Area 2, and Phase I areas as unregulated units and has pointed to these areas as the source of pollution in its ASDs. For this reason, the site has remained in detection monitoring through at least 2021.[117]

Bull Run Fossil Plant, Tennessee

The Bull Run Fossil Plant is owned and operated by Tennessee Valley Authority (TVA) in Clinton, Tennessee and has two unregulated CCR landfills. Groundwater monitoring results show the landfills have been leaching arsenic, boron, cobalt, manganese, and molybdenum into the groundwater for decades, resulting in groundwater that exceeds health standards for these toxins by many times. In addition, a portion of one of the landfills, the Dry Fly Ash Stack, is not regulated by the 2015 CCR Rule as it ceased receipt of CCR in 2015 an interim soil cover was placed on Phase 2, and in accordance with a permit issued by the Tennessee Department of Environment and Conservation, it will be closed in conjunction with the currently operating Dry Fly Ash Stack Lateral Expansion.[118] Among other things, the 2023 Bull Run Environmental Assessment Report states that the Dry Fly Ash Stack contains 3.7 million cubic yards of coal ash, and shows that lithium and molybdenum in downgradient groundwater exceed groundwater screening levels by at least an order of magnitude.[119]

Hennepin Power Station, Illinois

The Hennepin Power Station in Hennepin, Illinois has five CCR units including four CCR surface impoundments (Ash Pond No. 2, East Ash Pond, Old West Ash Pond, and Old West Polishing Pond) and one CCR landfill (CCR Landfill). The East Ash Pond System includes Ash Pond No. 2, the East Ash Pond, and Ash Pond No. 4, which were built on top of historic CCR fill.[120] Ash Pond No. 4 was a 30-foot-deep gravel quarry where coal ash fill was disposed in the mid-1980s.[121] Groundwater downgradient of the East Ash Pond System, showed concentrations of sulfate and boron that exceeded State groundwater standards.[122] The groundwater was (and may still be) contaminated with coal ash constituents.[123]

Will County Station, Illinois

The Will County Station in Romeoville, Illinois is owned and operated by Midwest Generation Co. The facility has two CCR surface impoundments, Ash Pond 2S and Ash Pond 3S. Ash Ponds 1N and 1S were removed from service in 2010, and although they were not actively used for

[110] Consent Decree, *State of Maryland et. al* v. *Genon MD Ash Management, LLC* (No. 8:12–cv–03755–PJM, D. Md., May 1, 2013).

[111] Id.

[112] Id.

[113] Geosyntec Consultants. 2018. 2017 Annual Groundwater Monitoring And Corrective Action Report, Brandywine Ash Management Facility Phase II, Brandywine, Maryland. Prepared for GenOn MD Ash Management. January.

[114] Earthjustice et al. Legacy Proposal Comment Appendix VI. EPA–HQ–OLEM–2020–0107–0368.

[115] Geosyntec Consultants. 2018. Nature and Extent of Contamination Study, Final Report, Brandywine Ash Management Facility, Brandywine, Maryland. Prepared for GenOn MD Ash Management. June.

[116] Geosyntec Consultants. 2018. Corrective Measures Plan, Brandywine Ash Management Facility, Brandywine, Maryland. Prepared for GenOn MD Ash Management. June.

[117] Geosyntec Consultants. 2022. 2021 Annual Groundwater Monitoring and Corrective Action Report, Federal CCR Rule, Brandywine Ash Management Facility, Phase II, Brandywine, Maryland. Prepared for GenOn MD Ash Management. January.

[118] Tennessee Valley Authority. Bull Run Environmental Assessment Report. Appendix D–CCR Management Unit Cross Sections. August 2023.

[119] Tennessee Valley Authority. Bull Run Environmental Assessment Report. Bull Run Fossil Plant, Clinton, Tennessee. August 2023.

[120] U.S. EPA, Damage Case Compendium, Technical Support Document, Vol. IIa: Potential Damage Cases (Reassessed, Formerly Published), Docket ID EPA–HQ–RCRA–2009–0640–12119 (Dec. 18, 2014) at 30, ns.110.

[121] Id at 30.

[122] Id at 30.

[123] Id at 30.

waste storage, they still contained at least one inch of water in 2019 and the base of these unlined impoundments are in contact with at least one foot of groundwater.[124] In addition, through borings taken at the facility, historical CCR has been buried around the ash ponds, and the Former Slag and Bottom Ash Placement Area has been identified at the southeast corner of the station's boundary.

When constructing the groundwater monitoring system in 2010 and 2011, well borings also showed a thick layer of CCR buried along the eastern edge of the four ash ponds. MW–1, MW–2, MW–3, MW–4, and MW–6 show layers of fill between five and twelve feet thick containing CCR.[125] Historical topographic maps and aerial imagery document ponds extending from north of Pond 1N to close to the southern property boundary. These historical waste storage areas would have surrounded the current regulated ponds and the area where CCR has been found buried near the ponds. The topographic map and aerial imagery from 1962 show a large pond extending from north of Pond 1N to the southern property boundary. In 1973, waste storage areas are present in the vicinity of Ponds 2S and 3S and extend to the southern property boundary. By 1980, waste areas are depicted south of Pond 3S and surrounding Pond 1N. The series of unregulated ponds near the southern property boundary south of Pond 3S are visible on available maps until present day.[126] [127]

Historical ash in fill near the ponds is in contact with groundwater. Groundwater elevations fluctuate between 579 and 584 feet above mean sea level in this area. CCR is buried at elevations as low as 578.6 feet above mean sea level. MW–2 provides an example of ash in contact with groundwater. The boring log completed during its installation shows CCR down to 578.6 feet above mean sea level and the groundwater elevation was at 580.6 feet above mean sea level, meaning that at least two feet of groundwater was in contact with CCR at that time. Groundwater measurements at this well commonly range from 582 to 584 feet, meaning three to five feet of CCR are routinely saturated with groundwater near MW–2.[128]

The Former Slag and Bottom Ash Placement Area is located at the southeast corner of the Will County site. A Phase II Environmental Site Assessment completed in 1998 identified this location as an ash disposal area. Borings revealed coal ash mixed with gravel up to three feet below the ground surface.[129]

Groundwater monitoring completed under the 2015 CCR Rule also demonstrates groundwater contamination at Will County. SSIs for chloride, fluoride, and TDS have been identified since the inception of the monitoring program in 2017 and in 2022, SSLs for arsenic and selenium were detected.[130]

While the regulated ponds are likely contributing to groundwater contamination, historical ash at the station is also a likely culprit. Historical ash along the eastern boundary of the four ponds is not capped or lined and is thus exposed to precipitation and groundwater. The regulated and unregulated ponds are unlined and are in contact with groundwater, making these units potential sources of groundwater contamination. Groundwater contamination increases as it passes through/under the ponds. Boron and sulfate concentrations doubled between well MW–1 upgradient of Pond 1N and MW–7 downgradient of the pond in monitoring data collected between 2010 and 2018.[131]

ASDs also provide evidence of a contaminant source other than the regulated ponds. An ASD completed in 2018 following SSIs for chloride, fluoride, and TDS at the regulated units concluded that the SSIs were from ''other potential sources'' and not from the regulated units.[132]

Groundwater monitoring during 2022 identified SSIs for boron, calcium, chloride, fluoride, and TDS across the monitoring network. SSLs for selenium at one well and arsenic at two wells were also identified and resulted in initiation of an ACM for the site. Notably, the two upgradient monitoring wells are contaminated. MW–06 had an SSI for calcium and an SSI for boron and SSL for selenium were detected at MW–05. These two upgradient wells are located along the eastern edge of the ponds in the area known to contain buried ash. SSIs and SSLs in downgradient wells indicate that the regulated ponds may also be contributing to groundwater contamination.[133]

The ASD completed following identification of SSLs at regulated Pond 2S and 3S determined that Pond 3S is likely contributing to groundwater contamination. The ASD reported statistically significant decreasing trends in chloride concentrations in both upgradient monitoring wells and statistically significant increasing trends in chloride concentrations in MW–09 and MW–11, both of which are immediately downgradient of Pond 2S.[134]

The prevailing groundwater flow at the site is from the east to the west across the ponds. Because historical ash is present along the eastern boundary of the ponds, the current monitoring network is not capable of accurately measuring groundwater contamination from each potential source. Further, all the wells designated upgradient are within the likely footprint of the historical CCR disposal area described above. Thus, none of the wells can assess upgradient groundwater quality accurately.

EPA Impoundment Assessments

Commenters provided additional reviews of EPA's impoundment assessment reports that were conducted in 2011–2013. During the impoundment assessments, EPA documented eight power plants with historical ponds where coal dams were constructed in whole or part of coal ash.[135] These plants include six plants on EPA's list of potential legacy CCR surface impoundments: Glen Lyn (VA), Hutsonville (IL), Jefferies (SC), Muskigum River (OH), Philip Sporn (WV), and Tanners Creek (IN). At two additional plants where historical ponds are identified, Cape Fear (NC) and Frank E. Ratts (IN), EPA also found coal ash used in the construction of the dams. The commenters included these plants as additional potential CCRMU.

2. Applicability and Definitions Related to CCR Management Units

EPA is finalizing new definitions and revising several existing definitions necessary to implement the new requirements for CCRMU. Specifically,

[124] Interim Opinion and Order, Sierra Club et al vs. Midwest Generation, LLC, Illinois Pollution Control Board, June 20, 2019.

[125] Id.

[126] Earthjustice et al. Legacy Proposal Comment Appendix VI. EPA–HQ–OLEM–2020–0107–0368.

[127] Earthjustice Appendix II. Examples of historical satellite imagery and topographic maps are included in Figure 23, Figure 24, and Figure 25. EPA–HQ–OLEM–2020–0107–0368.

[128] Interim Opinion and Order, Sierra Club et al vs. Midwest Generation, LLC, Illinois Pollution Control Board, June 20, 2019.

[129] Id.

[130] Earthjustice et al. Legacy Proposal Comment Appendix VI. EPA–HQ–OLEM–2020–0107–0368.

[131] Earthjustice et al. Legacy Proposal Comment Appendix VI. EPA–HQ–OLEM–2020–0107–0368.

[132] Id.

[133] Id.

[134] Id.

[135] EPA, Coal Combustion Residuals Impoundment Assessment Reports (2014), *https://www.epa.gov/sites/default/files/2016-06/documents/ccr_impoundmnt_asesmnt_rprts.pdf.*

the final rule establishes new definitions for ''CCR management unit,'' ''Contains CCR and liquids,'' ''Inactive CCR landfill,'' ''Liquids,'' and ''Regulated CCR unit'' and revises existing definitions for ''CCR landfill or landfill,'' ''CCR unit,'' ''Operator,'' ''Owner,'' and ''State Director.'' Some of these definitions are discussed elsewhere in the preamble.

EPA is also revising § 257.50(d) to specify that part 257, subpart D applies to CCRMU of 1,000 tons or greater, located at facilities with a regulated CCR unit or active facilities without a regulated CCR unit. That provision also applies to CCRMU greater than or equal to one ton and less than 1,000 tons, located at active facilities or facilities legacy CCR surface impoundment are only subject to the requirements of the FER in § 257.75 until a permitting authority determines that regulation of these units, either individually or in the aggregate, is warranted and determines the applicable requirements. Under the 2015 CCR Rule, § 257.50(d) exempted from regulation those CCR landfills that had ceased receiving CCR prior to October 19, 2015. This action amends the exemption included in the 2015 CCR Rule.

The sections below briefly explain what EPA proposed, summarize the public comments received, and provide the Agency's responses. The Agency addresses new and revised definitions in the following order: (1) CCR management unit; (2) CCR unit; (3) Owner and operator; and (4) Conforming revisions to other existing definitions.

a. Definition of CCR Management Unit

EPA proposed to define a *CCR management unit* or CCRMU to capture the solid waste management practices that have been demonstrated in the 2014 and 2024 Risk Assessments and the damage cases to have the potential to contaminate groundwater. EPA proposed to define a CCRMU as any area of land on which any non-containerized accumulations of CCR are received, placed, or otherwise managed, that is not a CCR unit. EPA explained in the proposed rule that the definition of a CCRMU is based on the current definitions of a CCR pile—which is currently regulated as a CCR landfill under part 257, subpart D—and of a CCR surface impoundment, which both rely on the concept of ''accumulations of CCR.'' See, 40 CFR 257.53 and 88 FR 32018.

EPA proposed that CCRMU would include historical solid waste management units such as CCR landfills and surface impoundments that closed prior to the effective date of the 2015 CCR Rule (October 19, 2015), as well as inactive CCR landfills (including abandoned piles). The proposal stated that a CCRMU would also include any other areas where the solid waste management of CCR on the ground has occurred, such as structural fill sites, CCR placed below currently regulated CCR units, evaporation ponds, or secondary or tertiary finishing ponds that have not been properly cleaned up, and haul roads made of CCR if the use does not meet the definition of beneficial use in § 257.53. EPA explained that all of these examples involved the direct placement of CCR on the land, in sufficient quantities to raise concern about releases of hazardous constituents, and—in most, if not all cases—with no measures in place to effectively limit the contact between the CCR and liquids, and subsequent generation and release of any leachate.

EPA acknowledged that the proposed definition was broad, but the Agency did not intend that the placement of any amount of CCR would necessarily constitute a CCRMU. Accordingly, EPA proposed that the following would not be considered CCRMU: consistent with the current regulations, closed or inactive process water ponds, cooling water ponds, wastewater treatment ponds, and stormwater holding ponds or aeration ponds. EPA explained that these units are not designed to hold an accumulation of CCR, and in fact, do not generally contain a significant amount of CCR. See, 80 FR 21357. EPA also explained, consistent with the existing regulations, neither an area or unit at which exclusively non-CCR waste is managed, nor any containerized CCR, such as a silo, would be considered CCRMU because neither of these units present conditions that give rise to the risks modeled in EPA's assessment or identified in the damage cases. See, Id. at 21356.

For similar reasons, the Agency proposed that any CCR used in roadbed and associated embankments would not be considered CCRMU. As EPA explained in the 2015 rule the methods of application are sufficiently different from CCR landfills that EPA cannot extrapolate from the available risk information to determine whether these activities present similar risks. Roadways are subject to engineering specifications that generally specify CCR to be placed in a thin layer (*e.g.,* six to 12 inches) under a road. The placement under the surface of the road limits the degree to which rainwater can influence the leaching of the CCR. There are also significant differences between the manner in which roadways and landfills can potentially impact groundwater, such as the nature of mixing in the media and the leaching patterns. First, CCR landfills are typically a homogenously mixed system, and as a result, there are no spatial variations of the chemical and physical properties of the media (*e.g.,* bulk density, hydraulic conductivity and contaminant concentration). By contrast, roadways are generally constructed of several layers with different material properties (heterogeneity). This difference affects the hydraulic conductivity of a mass of CCR in a landfill, as compared to CCR placed in an embankment. Any potential leaching will tend to spread over the length of the embankment, as opposed to the leaching in a downward motion that would occur in a homogenously filled landfill. Finally, EPA is concerned that groundwater monitoring of a road may not be practicable. However, even though EPA considers that the available information does not demonstrate that use in roadbed present sufficient risk to warrant the suite of requirements applicable to CCRMU, that calculus changes in the event the CCR in roadbed is contaminating groundwater. Accordingly, EPA proposed that if a facility subsequently determines that the CCR in onsite roadbed is contributing to contamination to the aquifer, the facility would be required to address the contamination. For example, if during an ongoing corrective action, a facility identifies the roadbed as an additional source of contamination, it would be required to address that contamination as part of the ongoing remediation of the aquifer. In addition, the measures EPA proposed to require facilities to take would not be expected to identify truly de minimis quantities of CCR. As discussed in greater detail in the next section, EPA proposed that facilities would only be required to identify accumulations if records confirm the existence of the CCRMU or visual evidence of CCR placement on the ground.

In addition, EPA proposed to define the term *inactive CCR landfill* to mean an area of land or an excavation that contains CCR but that no longer receives CCR on or after the effective date of this final rule and that is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine or a cave. For purposes of this subpart, this term also includes sand and gravel pits that received CCR and abandoned CCR piles.

i. RCRA Authority

Some commenters contended that *West Virginia* v. *EPA,* 142 S. Ct. 2587, 2609 (2022) requires EPA to have clear congressional authorization to regulate CCRMU, and that Congress has not provided EPA with such authorization under either RCRA sections 4004(a) or 4005(d). The commenters are incorrect. All of the requirements adopted in this rulemaking to regulate CCRMU fall squarely within the authority Congress delegated to the Agency in RCRA sections 1008(a)(3), 4004(a), and 4005(d). Commenters' arguments to the contrary are based misunderstandings of the statutory structure and EPA's historical practice. The rule does not expand the scope of CCR regulation beyond what Congress envisioned. Further, in large part, commenters' arguments are premised on aspects of the proposal which have been revised in this final action in response to comments. Although the revisions were not necessary under *West Virginia* v. *EPA* (because EPA's exercise of authority through this rule does not implicate a major question), the revisions resolve many of the commenters' objections based on their view of the major questions doctrine. EPA addresses the comments in turn.

Some commenters based their claim that the regulation of CCRMU presents a major question on the assertion that the proposal would regulate an undefinable number of past CCR management and disposal practices, ''irrespective of risk, location, or even whether such past activities have been (or are currently being) addressed by state governments or by EPA itself under other federal authorities.'' These commenters claimed that the proposal has no bounds.

> Just as an example, the Proposal would require operating power generation facilities to identify every CCRMU within its boundaries, even if located under existing structures critical to a plant's energy production operations, and to ''close,'' and in many cases reclose, those CCRMUs under the CCR rule's closure provisions. The Proposal blithely ignores whether in fact such requirements could be met, the associated costs, and the resulting interruption to power generation activities that could be incurred in attempting to meet these requirements.

These commenters also note that Congress's failure to include the same authority for corrective action applicable to permitted hazardous waste sites found in section 3004(u) under subtitle D demonstrates that EPA lacks the authority to require CCRMU to comply with the part 257 corrective action and closure requirements.

Another commenter argued that the proposal ''would impermissibly expand EPA's role in the Subtitle D statutory regime beyond the limited role that Congress envisioned for the Agency'' based on their belief that the Congressional intent behind the WIIN Act was ''to restore the States to their historical, congressionally-intended lead role under RCRA Subtitle D in the implementation and enforcement of solid waste management programs.'' According to this commenter,

> [w]hether or not EPA should have such a ''central role'' in the regulation of CCR under RCRA Subtitle D—one that would allow the Agency to assert federal jurisdiction over any area of land in any state simply because the land was, at any time, used to manage any non-containerized accumulation of CCR, regardless of whether the land has been and is in compliance with applicable state regulations—is a major policy question of significant national economic and political magnitude that Congress has not clearly delegated EPA the authority to address. . . At its core, EPA's delegated RCRA Subtitle D authority entails only the authority to promulgate guidelines and criteria, to be implemented by the States, to prohibit open dumping and to ensure that units are classified as sanitary landfills ''only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid wastes at such facility. EPA's Proposal construes ''open dumps'' and ''sanitary landfills'' to now include historically state-regulated solid waste management and resource conservation and recovery practices that Congress never intended (clearly or otherwise) for the Agency to regulate federally, as most recently evidenced by Congress's definition of a ''sanitary landfill'' in the WIIN Act as a CCR unit that complies with a state CCR permit, or a federal CCR permit in a nonparticipating state, or the requirements of the CCR Rule applicable to CCR units in the absence of a federal CCR permitting program.

This commenter stated that the WIIN Act limited the reach of EPA's authority to '' 'CCR units,' as defined in the 2015 CCR Rule, *i.e.,* to 'any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these.' '' In addition, the commenter argued that EPA lacks the authority to now regulate units that were expressly exempted from regulation under the EPA regulations that Congress specifically incorporated by reference in the WIIN Act. According to this commenter, in 2015 EPA interpreted its RCRA Subtitle D statutory authority to regulate, as ''CCR units,'' only existing and new CCR landfills, existing and new CCR surface impoundments, and inactive CCR surface impoundments at active facilities, and Congress did not in 2016 grant the Agency any authority to regulate anything else. The commenter further claimed that EPA has acknowledged that the definition of a ''CCR unit'' does not include the areas of land that EPA proposed to regulate as CCRMU. Finally, the commenter objected that the proposal would regulate activities or sites that ''have historically been regulated under state programs, per EPA approved State Solid Waste Management Plans, and have closed or continued to operate in accordance with the State's program and plan.''

EPA disagrees that the regulation of CCRMU under this final rule is fairly characterized as an ''unprecedented'' expansion of authority under RCRA Subtitle D or otherwise presents a major question under *West Virginia* v. *EPA,* 142 S. Ct. at 2609. The commenters have mischaracterized EPA's proposal, which largely just removes regulatory exemptions adopted in 2015, and requires the owners and operators of solid waste disposal units to clean up the contamination from their disposal of solid waste (CCR). These are the same requirements that apply to the currently regulated CCR landfills and CCR impoundments—most of which are located at the same sites as the CCRMU regulated under this final rule—and that Congress incorporated into RCRA in the 2016 WIIN Act. See, *e.g.,* See, 42 U.S.C. 6945(d)(3), (6), (7). EPA has imposed these types of requirements on these kinds of entities and activities since 1980. Characterizing this as novel or unprecedented fundamentally misstates both the nature of EPA's action and the authority Congress delegated to the Agency in RCRA sections 1008(a)(3), 4004(a), and 4005(d).

(a) Types of Units and Activities Regulated

As an initial matter, these commenters have mischaracterized EPA's statements about the extent of its authority under subtitle D. EPA never stated that its authority was limited to the particular CCR units regulated by the 2015 CCR Rule. The only citation the commenter provides to support its assertion is 80 FR 21303, which is simply a factual recitation of the CCR units covered by the 2015 CCR Rule. That section contains no statement about EPA's authority to regulate; nor does any other section of the 2015 CCR Rule preamble contain such a statement.

Similarly, EPA never stated or in any way suggested in the May 2023 proposed rule that the existing regulatory definition of a CCR unit—and by implication, the statutory term in 4005(d)—does not include the ''areas of land that EPA proposed to regulate as

CCRMUs.'' Based on the pages in the proposal that the commenter cites, it appears the commenter was confused by EPA's explanation that it was proposing to use two different terms to distinguish between: (1) the CCR units that would be subject to all of the requirements in part 257 and (2) the CCR units that would subject to only a subset of the existing requirements. EPA proposed to use the terms CCR unit and CCRMU, respectively, to refer to these two categories of units. To effectuate this, EPA proposed to *revise* the existing definition of a CCR unit by adding a statement that CCR management units are not covered by the definition. If the commenter were correct that EPA did not consider CCRMU to be a type of CCR unit, EPA would not have needed to revise the definition.

But to the larger point, the CCRMU regulated under this rule clearly fall within RCRA sections 1008(a)(3), 4004(a) and 4005(d). In essence, as the commenter recognizes, CCRMU are simply CCR landfills and CCR surface impoundments that were not regulated by the 2015 Rule: inactive CCR landfills, or CCR surface impoundments and landfills that were closed prior to the effective date of the 2015 rule.[136] As EPA explained in the May 2023 proposal, the proposed definition of a CCRMU was based on the existing definitions of a CCR pile—which is currently included in the definition of a CCR landfill—and of a CCR surface impoundment, which both rely on the concept of ''accumulations of CCR.'' See, 40 CFR 257.53 and 88 FR 32018. And the record for this rulemaking documents that the CCRMU regulated under this final rule present risks at least as significant as the units regulated under the 2015 rule. CCRMU thus clearly are CCR units under both the regulations and the statute. As the commenter itself notes, when the WIIN Act was passed in 2016, and Congress incorporated the term CCR unit into the statute, the 2015 CCR Rule defined (and still defines) a CCR unit as ''*any* CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these.'' 40 CFR 257.53 (*emphasis* added).

The commenter relies heavily on the fact that CCRMU were exempt under the 2015 CCR Rule; but that is ultimately irrelevant. First, as noted above, CCRMU actually fall within the 2015 regulatory definition of a CCR unit.

More to the point, Congress did not define the term ''CCR unit,'' thereby leaving it to EPA develop a definition. Although the WIIN Act incorporates the 2015 regulations into the statute, Congress simultaneously made clear that EPA retains the authority to modify or expand those requirements as necessary to ensure that the standard in section 4004(a) will continue to be met. See, *e.g.,* 42 U.S.C. 6945(d)(1)(A)(i), (3), (6) (referencing ''or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title''). The commenters never acknowledge these provisions or address their logical implications.

Instead, the commenters focus on two aspects of the CCRMU definition to support their claims of an ''unprecedented expansion'': (1) the proposal to define a CCRMU as ''any non-containerized accumulation of CCR'' without limitation or threshold; and (2) the regulation of ''any area of land'' on which CCR ''is received, placed, or otherwise managed at any time.'' With the incorporation of the thresholds in § 257.50(d) the first issue has been rendered moot. EPA has also deleted the phrase ''at any time'' from the CCRMU definition. EPA had originally included that phrase to clarify that it did not matter when the CCR was originally placed, received, or otherwise managed, provided the CCR remained at the site. EPA deleted the phrase from the final definition because, as the D.C. Circuit explained, this concept is fully communicated by the phrase ''is placed.''

> Importantly, while the ''is'' retains its active present tense, the ''disposal'' takes the form of a past participle (''disposed''). In this way, the disposal itself can exist (it ''is''), even if the act of disposal took place at some prior time . . . . Properly translated then, an open dump includes any facility (other than a sanitary landfill or hazardous waste disposal facility), where solid waste still ''is deposited,'' ''is dumped,'' ''is spilled,'' ''is leaked,'' or ''is placed,'' regardless of when it might have originally been dropped off. *See* 42 U.S.C. 6903(3), (14).

901 F.3d at 440. The same logic applies to the phrases ''is received'' and ''is otherwise managed.'' Including the phrase ''at any time,'' is consequently at best redundant, and at worst confusing—as demonstrated by the above comments.

In any event, these aspects of the CCRMU definition were either taken directly from or largely mirror existing regulatory or statutory definitions. The phrase ''any non-containerized accumulation of CCR'' appears verbatim in the existing ''CCR pile'' definition, which as EPA previously explained, essentially mirrors the existing definition of a ''waste pile or pile'' from § 257.2 (*i.e.,* the regulation that applied to CCR facilities prior to 2015), as well as the definition in part 260 that has been in place since 1982. See 80 FR 21356. Compare, §§ 257.2, 257.53, and 260.10. More to the point, regulating the placement of non-containerized[137] CCR directly on any land is fully consistent with RCRA's definition of disposal, which is defined in part as the '' 'placing of *any* solid waste or hazardous waste into or *on any land* or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.'' 42 U.S.C. 6903(3) (*emphasis* added). Similarly, and as illustrated by the D.C. Circuit decision quoted above, the phrase ''is received, is placed, or is otherwise managed,'' flows from the statutory definition of an open dump, which RCRA defines as ''any facility or site where solid waste *is disposed* of . . . .'' 42 U.S.C. 6903(14) (*emphasis* added).

EPA responds to comments about the ''any area of land'' portion of the CCRMU definition in relevant portions of the discussions below.

(b) Extent of Requirements

The commenters complain that the proposal was ''virtually unbounded'' as it would require operating power generation facilities to identify every CCRMU within its boundaries, even if located under existing structures critical to a plant's energy production operations, and to ''close,'' and in many cases reclose, those CCRMUs under the CCR rule's closure provisions. While EPA disagrees with the commenters' characterization of the proposal, the final rule, in any event, is more limited than the proposal, and is not unbounded. Under the final rule a covered facility must still identify every CCRMU of one ton or more within its boundaries, but groundwater monitoring, corrective action, closure, and post-closure requirements apply only to CCRMU containing at least 1,000 tons of CCR. Regulation of CCRMU between one and 1,000 tons is deferred to a subsequent permitting authority who will assess the risks posed by these smaller CCRMU, individually and/or in the aggregate, and determine which, if any, requirements are appropriate for the CCRMU. In addition, this final rule defers the requirement to demonstrate

[136] The proposal described an additional category: any solid waste management that involves the placement or receipt of CCR directly on the land; such activities fall within the existing definition of a CCR pile, which is in turn defined as a CCR landfill.

[137] The phrase ''non-containerized'' means that specific measures to control exposures to human health and the environment have not been adopted. See 80 FR 21356.

compliance with § 257.102 for CCRMU that closed prior to the effective date of this rule in accordance with alternative, substantially equivalent requirements. EPA is also deferring the requirement to initiate closure where the CCRMU is located beneath critical infrastructure, such as high power electric transmission towers, air pollution control or wastewater treatment systems, or an electrical substation until the infrastructure is no longer needed, a permit authority determines closure is necessary to ensure that there is no reasonable probability of adverse effects on human health or the environment, or the closure or decommissioning of the facility, whichever occurs first.

The commenters also objected to the imposition of corrective action and closure obligations on disposal units that were closed in accordance with State law or on areas where the State considered the placement of CCR on the land to be beneficial use under State law. But the regulation under subtitle D of closed or inactive disposal units or of activities exempt under State law is neither novel nor unprecedented. Indeed, many CCR units currently regulated under the 2015 CCR rule were inactive or exempt under State law. See, 80 FR 21322–21323, 21456. And in this case EPA is only extending the part 257 regulations to activities or placements of CCR that, as discussed above, are already defined as ''disposal'' under Federal law—and that the record demonstrates present risks exceeding the threshold for regulation in section 4004(a).

Under section 4004(a), EPA is charged with issuing regulations to address all ''reasonable probabilities of adverse effects'' (*i.e.,* all reasonably anticipated risks) to health and the environment from the disposal of solid waste.[138] The statute is clear that this includes regulations to address the current risks from previous solid waste management activities (including disposal). EPA explained at length the basis for this conclusion as part of the Agency's rationale for regulating inactive impoundments. See, 80 FR 21344–21345. See also *USWAG, et al.* v. *EPA* 901 F.3d at 440. *See also In re Consolidated Consol. Land Disposal Regulation Litig.,* 938 F.2d 1386, 1389 (D.C. Cir. 1991) (EPA's reading of the term ''disposal'' in RCRA's Subtitle C, 42 U.S.C. 6924, to include ''the continuing presence of waste'' was reasonable); *USWAG,* 901 F.3d at 453–54 (Henderson, J., concurring) (same). By the same logic, these provisions authorize EPA to regulate inactive landfills and closed disposal units that continue to pose risks to health or the environment, for example by requiring the owners and operators of such units to remediate any contamination from these units, or to take action to prevent such contamination.

The 2016 WIIN Act amendments reaffirmed EPA's authority over these activities. In section 4005(d), Congress relied on the 2015 regulations, and expressly stated that the amendments were not intended to limit or restrict the authority already provided under sections 1008(a)(3) and 4004(a). See, 42 U.S.C. 6945(d)(3), (6), (7). With these amendments, Congress also affirmed the Agency's authority to impose the kind of requirements established in part 257 (*e.g.,* corrective action to remediate groundwater contamination and closure to prevent it). This rule simply extends many of those same requirements to additional areas at which disposal of CCR is occurring—often at the same sites covered by the original 2015 CCR Rule. Moreover, Congress made clear that EPA retains the authority to modify or expand the requirements in the 2015 CCR rule as necessary to ensure that the standard in section 4004(a) will continue to be met. See, *e.g.,* 42 U.S.C. 6945(d)(1)(A)(i), (3), (6) (referencing ''or successor regulations promulgated pursuant to sections 6907(a)(3) and 6944(a) of this title''). None of the commenters acknowledge these provisions or address their logical implications.

Moreover, this rule requires CCR facilities to remediate only the contamination associated with the disposal of CCR on site of a facility with other currently regulated CCR disposal units. Although expanding the corrective action obligations to other areas of CCR disposal on site may seem similar to the facility wide corrective action obligations applicable under the hazardous waste program—in that a facility will be required to clean up all of the on-site contamination caused by its disposal of CCR—the two requirements are not commensurate. For example, in contrast to a clean up under 3004(u), this rule does not require a facility to clean up any Appendix IV constituent from any source on-site, such as a spilled commercial product, unconnected to the solid waste (CCR) in the disposal unit. Rather, this rule imposes the same unit specific obligations that CCR facilities have been required to comply with since 2015, that were clearly authorized under 4004(a) and that Congress effectively affirmed in 2016 with the WIIN Act.

(c) Relationship to State Law

Finally, EPA disagrees that either the proposed or final rule expands ''EPA's role in the Subtitle D statutory regime'' or otherwise alters the Congressionally mandated relationship between EPA and the States.

The fact that EPA regulation affects the status of activities or units that were previously regulated under State law is precisely what the statute authorizes. Even under the more limited authority conferred upon the Agency prior to WIIN Act, EPA's subtitle D criteria established minimum national standards with which facilities were required to comply, irrespective of State law. See 80 FR 21310–21311.

Moreover, the commenter has misunderstood both the intent and effect of the WIIN Act. Under the legal framework in place when the 2015 CCR rule was enacted,

> EPA's delegated RCRA Subtitle D authority entails the authority to promulgate guidelines and criteria, to be implemented by the States, to prohibit open dumping and to ensure that units are classified as sanitary landfills ''only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid wastes at such facility

See 80 FR 21310–21311. Congress deliberately expanded EPA's role under that framework in 2016 when it granted EPA the authority to enforce the Federal criteria, issue permits in nonparticipating States, and to establish the minimum national standards that are both applicable directly to facilities and used to evaluate State programs. The commenter's description of the section 4005(d)(6) definition of a ''sanitary landfill'' is similarly misleading. Congress did not define a sanitary landfill as a CCR unit that complies with any State CCR permit, but a State permit issued in accordance with an EPA approved program. See 42 U.S.C. 6845(d)(6)(A)(i).

(d) Other Comments Concerning Authority To Regulate CCRMU

Other commenters stated that the proposed CCRMU definition exceeds the Agency's authority under RCRA subtitle D because EPA has failed to demonstrate that any amount of CCR placed anywhere on the land at any time presents the level of risk necessary to warrant regulation under section 4004(a). These commenters contend that the proposed CCRMU definition unlawfully eliminates the concept of risk out of the statutory definition of disposal. These commenters further asserted that the authority to regulate

[138] Although section 1008(a)(3) expands EPA's authority to address the risks from any of the listed activities, the CCRMU regulated under this final rule—consisting of CCR surface impoundments and landfills (including CCR piles) only involve disposal.

''solid waste management practices'' under section 1008(a)(3) similarly does not authorize the regulation of any amount of CCR placed anywhere on the land at any time. Finally, a commenter raised concern that the proposed definition would encompass CCR used as fill material pursuant to acts of Congress or validly issued Section 404 permits under the Clean Water Act, which commenter alleged falls outside the scope of RCRA.

EPA disagrees that it lacks the authority for any of the provisions in this final rule. The record demonstrates that the CCRMU regulated under the final rule meet the standard for regulation under section 4004(a). This rule is supported by two separate risk assessments; the final rule adheres closely to the results, and regulates only the units and activities that present risks that warrant regulation under sections 1008(a)(3) and 4004(a). Further, the results of EPA's risk assessments are consistent with the damage cases discussed in Unit III.C.1 of this preamble.

As discussed at length in Unit III.A of this preamble, leakage from CCRMU can adversely impact groundwater quality and pose risk to future receptors in the range that EPA typically considers for regulation. Closed and inactive landfills and surface impoundments pose substantially the same levels of risk to offsite receptors as those estimated in 2014 for currently regulated units. This is particularly true if the unit has not been properly closed, *e.g.,* lacks a final cover system.

In response to comments received on the proposed rule raising concerns about the adequacy of EPA's basis for regulating smaller CCRMU, EPA modeled groundwater concentrations at the boundary of smaller CCRMU fills to understand the potential for exceedance of GWPS that would trigger corrective action. The results of that 2024 Risk Assessment confirm that smaller CCRMU fills can pose risk to onsite receptors and materially contribute to broader groundwater contamination across the facility. In addition, depending on the location of these fills, they can also pose risk to offsite receptors that exceed the levels at which EPA normally regulates. On the whole, this analysis identified the potential for both moderate and high-end groundwater concentrations of molybdenum (among other Appendix IV constituents) to exceed GWPS.

EPA conducted further sensitivity analysis to better understand whether there is an amount below which there is no reasonable probability of adverse impacts to groundwater quality. EPA remodeled quantities of CCR between one ton and 78,000 tons to determine both the risks associated with the potential for groundwater contamination and radioactivity. EPA modeled only individual placements of CCR in these quantities rather than the aggregate risks from the placement of multiple small quantities of CCR co-located at the same site.

This analysis found that exceedances of the GWPS by a factor of as much as 40 are still possible for placements below 1,000 tons of CCR. Thus, such placements can meaningfully contribute to groundwater contamination at these facilities, including, for example by adding two contaminant plumes already present on site from larger placements, or in the aggregate. Although further analysis of the results indicates that there will be a tonnage that does not present a reasonable probability of adverse effects to groundwater quality, EPA was unable to identify that amount based on the available information. EPA conducted no modeling below one ton; however all indications in the existing data are that groundwater concentrations from individual quantities below one ton are very unlikely to exceed GWPSs. In other words, although EPA's modeling indicates that some amount between one ton and 1,000 tons is likely below EPA's level of concern, EPA cannot determine what that precise amount would be. It was not possible to identify a limit much lower than 1,000 tons because too few model runs were conducted at smaller amounts to support extrapolation.

To ensure that the final rule is consistent with the Agency's authority under RCRA section 4004(a), this final rule incorporates thresholds consistent with the results of its risk analyses. Accordingly, the final rule only requires CCRMU containing 1,000 tons or more of CCR to comply with the applicable requirements for CCRMU.

However, EPA estimated the risks associated with a 1,000 ton CCRMU to be an HQ of 40, which exceeds the Agency's normal level of acceptable risk by a significant margin. In addition, EPA's risk assessment may underestimate the risks at some sites. EPA modeled the risks associated with individual CCRMU of varying sizes, rather than the aggregate risks associated with numerous smaller CCRMU across the facility. It is possible that even though smaller CCRMU may not individually give rise to levels of concern, the risks may be greater when all of the CCRMU are considered together. According to many of the commenters, it is common for multiple small CCRMU to be located at a single facility. And although EPA's modeling estimated radiation risks of concern at lower quantities, EPA's concerns were based on a *future* residential use of the property (*e.g.,* after clean closure of the regulated units, but where smaller CCRMU remain on site). As several commenters noted, current exposures at existing facilities (occupational) are very different. To address these risks, as section 4004(a) requires, the final rule does not exempt CCRMU containing between one and 1,000 tons of CCR, but defers the regulation of such units to a permitting authority who will assess the risks posed by these smaller CCRMU, individually and/or in the aggregate, and determine which, if any, requirements are appropriate for the CCRMU to ensure there will be no reasonable probability of adverse effects on health or the environment. In order to facilitate this, the final rule requires facilities to identify these smaller units as part of the FER, so that this information can be submitted as part of their permit application. The facility will also continue to monitor the regulated units and larger CCRMU at the site, consistent with the requirements in this rule and the existing regulations. To the extent that these smaller unmonitored CCRMU are leaching contaminants and contributing to groundwater plumes, that should become apparent as the facility continues to monitor and conduct any necessary corrective action at the currently monitored units.

EPA has codified these provisions in the ''Scope'' section of the regulations, at § 257.50(d). The provision reads as follows:

(1) This subpart applies to CCR management units of 1,000 tons or greater, located at facilities with a regulated CCR unit or active facilities without a regulated CCR unit.

(2) CCR management units greater than or equal to 1 ton and less than 1,000 tons, located at facilities with a regulated CCR unit or active facilities without a regulated CCR unit, are only subject to the requirements of the facility evaluation report in § 257.75 until a permitting authority determines that regulation of these units, either individually or in the aggregate, is warranted and determines the applicable requirements.

Finally, the commenter is mistaken that CCR used as fill material pursuant to acts of Congress or validly issued CWA section 404 permits under the State falls outside the scope of RCRA. To support its allegation, the commenter references section 1006(a), claiming that this ''expressly carves out any activity covered by 33 U.S.C. 1251 *et seq.*'' But RCRA section 1006(a) does not bar EPA from imposing requirements under one of the listed statutes and RCRA on the same units and waste streams, unless those requirements are inconsistent with a requirement in one of the statutes. 42 U.S.C. 6906(a). This is clear from the second sentence, which provides that ''such integration shall be effected only to the extent that it can be done in a manner consistent with the goals and policies expressed in this chapter and in the other acts referred to in this subsection,'' and thus expressly contemplates that there will be situations in which EPA regulates under both RCRA and one of the listed statutes. Id. See, *Chemical Waste Management* v. *EPA,* 976 F2d 2, 23, 25 (D.C. Cir. 1992).

Numerous courts have upheld this interpretation. See, *Ecological Rights Foundation* v. *Pacific Gas & Electric Co.,* 874 F.3d 1083, 1095 (9th Cir., 2017) (''RCRA's anti-duplication provision does not bar RCRA's application unless that application contradicts a specific mandate imposed under the CWA (or another statute listed in RCRA section 1006(a))''); *Goldfarb* v. *Mayor and City Council of Baltimore,* 791 F.3d 500 510 (4th Cir. 2015) (The CWA must require something fundamentally at odds with what RCRA would otherwise require to be ''inconsistent'' under 1006(a)); *Edison Electric Institute* v. *EPA,* 996 F.2d 326, 337 (D.C. Cir.1993) (rejecting ''generalized claim'' that EPA action was barred under section 1006(a) because it interfered with ''the primary purpose'' of the Atomic Energy Act); *U.S.* v. *E.I. du Pont de Nemours & Co., Inc.,* 341 F.Supp.2d 215, 236 (W.D. N.Y. 2004) (approving EPA action as ''not inconsistent'' under RCRA where CERCLA's heightened standard would not be met by release of hazardous substance). The commenter has identified no requirement in the Clean Water Act that is inconsistent with EPA's regulation of CCRMU.

The same is true with respect to the commenter's contention regarding acts of Congress. Although the commenter refers to ''acts of Congress'' it cites only to 33 U.S.C. 59d. That provision of the Clean Water Act states only that a particular area is not a water of the United States, and authorizes the owner to place fill in the area.

> The old channel of the River Raisin in Monroe County, Michigan, lying between the Monroe Harbor range front light and Raisin Point, its entrance into Lake Erie, is declared to be not a navigable stream of the United States within the meaning of the Constitution and the laws of the United States, and the consent of Congress is hereby given for the filling in of the old channel by the riparian owners on such channel.

Regulation of CCRMU neither contradicts a specific mandate nor is fundamentally at odds with this provision, which does not require the owner to place CCR in the old channel or grant the owner an exemption from any requirement other than section 404 of the Clean Water Act.

ii. Subcategorization Is Appropriate for CCRMU Because CCRMU Are Dissimilar

Commenters stated that the proposal groups all pre-2015 CCR Rule disposal areas into one large category. According to the commenters, this approach treats many different scenarios as a worst-case by imposing burdensome requirements for all. Commenters provided examples of potential subcategories, including: past CCR disposal varies based on site location (close to a surface water body), geography (eastern vs western sites), hydrology (flow variability/distance to uppermost aquifer), regulatory status (State closed-units vs unaddressed CCR sites), and historical CCR disposal areas currently used to harvest CCR for beneficial use. By categorizing all these situations together, the commenters claimed that EPA ignores the risk profiles of these subcategories and forces actions not tailored to the issues at hand. Some of these commenters opposed including in the CCRMU definition former landfills, impoundments and other accumulations of CCR that been closed in accordance with existing Federal or State regulations and regulatory oversight that pose no risk to groundwater.

As discussed in Unit III.A, the risk record does not support the distinctions the commenters make. This final rule already imposes only a subset of the regulations in part 257 on CCRMU, consisting primarily of groundwater monitoring and closure. Corrective action is required only if triggered by site-specific determinations particular to individual units. EPA disagrees that the commenters have shown that any further differentiation is warranted.

iii. Size Threshold for a CCRMU

Many commenters stated that the proposed definition of CCRMU does not provide the regulated community with ''fair notice'' of what in fact is forbidden or required. Citing to *FCC* v. *Fox Television Stations, Inc.,* 567 U.S. 239, 253 (2012), these commenters stated that due process requires that ''laws which regulate persons or entities must give fair notice of conduct that is forbidden or required.'' According to these commenters, the proposed CCRMU definition does not give fair notice of what is regulated because it is an overly broad definition that would apply to ''*any* non-containerized *accumulation* of CCR.'' Furthermore, commenters raised concern that EPA has not provided any clarity on how much non-containerized CCR is enough to trigger regulation, nor does the proposal provide any criteria for determining significance, but instead points to examples where it does not expect this to be the case, such as closed or inactive process water ponds, cooling water ponds, wastewater treatment ponds, and stormwater holding ponds or aeration ponds. These commenters also questioned the references to evaporation ponds or secondary or tertiary finishing ponds that have not been properly cleaned up as examples of potential CCRMU, because in the 2015 CCR Rule preamble, EPA had identified these as examples of impoundments that would not be considered CCR surface impoundments because they contained only de minimis concentrations of CCR. These commenters argued that the burden is on EPA to provide the regulated community with ascertainable certainty as to what the regulation requires, a mark for which they believe the proposed CCRMU definition falls short.

Commenters also pointed out that the limitations of or exemptions from the definition were only discussed in the preamble to the proposed rule but were not reflected in the regulatory text itself. These commenters argued that the CCRMU definition must include various limitations and exceptions in the final rule, such as, specifying a *de minimis* or insignificant quantity threshold in the definition of a CCRMU. Commenters further stated that without such clarity, owners or operators would be required to consider all CCR placement as CCRMU.

As discussed in the preceding section, EPA has revised the rule to be consistent with the results of the 2024 Risk Assessment, and the final rule defers the regulation of CCRMU containing between one and 1,000 tons of CCR to a permitting authority. Only CCRMU containing 1,000 tons or more of CCR will be subject to the applicable requirements for CCRMU after the effective date of this rule. Although EPA has codified the thresholds in § 257.50(d) rather than the CCRMU definition, the effect is the same. In addition, as discussed in more detail in Unit III.C.2.a, EPA has revised the CCRMU definition in response to concerns raised by commenters that the definition was confusing and unclear. The combined effect of these revisions is more than sufficient to address the commenters' concerns about the clarity of the definition including claims that the proposed regulations would not provide regulated entities fair notice of what the regulations require.

Finally, EPA acknowledges that the reference in the proposal to evaporation ponds, or secondary or tertiary finishing ponds that have not been properly cleaned up as examples of potential CCRMU was a mistake. EPA agrees that these units would generally be expected to contain no more than a *de minimis* amount of CCR.

iv. Exemption for Beneficial Use of CCR

Several commenters stated that the CCRMU definition is too broad and does not account for the beneficial use of CCR. According to these commenters, the proposal to regulate CCRMU effectively revoked or amended the current exemption for beneficial use in § 257.50, and the broad CCRMU definition now requires previously approved beneficial uses to be reexamined for potential regulation. Several of these commenters criticized the agency for failing to address the issue in the proposal, and argued that the Agency lacked the authority to include such beneficial uses, either because neither RCRA section 1008(a)(3) nor section 4004(a) authorize EPA to regulate use or because such regulation would be inconsistent with the 2015 Regulatory Determination. These commenters recommended that the CCRMU definition be revised to exclude any beneficial use of CCR as defined by § 257.53 or as previously approved by State agencies.

By contrast, several commenters request EPA to prohibit the use of coal ash as fill unless full protective measures such as liners, monitoring, and caps are required everywhere it is placed. Commenters claimed that immediate attention to this recommendation will protect the health and environment of millions of U.S. residents by preventing the spread of toxic coal ash pollution.

EPA disagrees that the proposal to regulate CCRMU effectively revoked or amended the current exemption for beneficial use in § 257.50. The proposal merely accurately reflects the existing regulations, which these commenters have misunderstood.

Under the existing regulations, the direct placement of CCR on the land on site of a utility, with nothing to control releases is, by definition, a CCR pile and therefore not beneficial use. The examples of historical CCRMU discussed in the proposal, structural fill and CCR placed below currently regulated CCR units on-site of a utility also clearly fit that definition.

These are the same provisions that have been in place since 2015. The existing definition of a CCR pile is

> Any non-containerized accumulation of solid, non-flowing CCR that is placed on the land. CCR that is beneficially used *off-site* is not a CCR pile.

§ 257.53 (emphasis added). The second sentence expressly limits the beneficial use of CCR to ''off site,'' and thus any non-containerized CCR placed directly on the land on-site of a utility is not beneficial use.

EPA previously explained this in its August 14, 2019, proposal ''Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Enhancing Public Access to Information; Reconsideration of Beneficial Use Criteria and Piles'' to revise the definition of a CCR pile with respect to temporary piles. 84 FR 40353. Specifically, EPA proposed to establish a new set of requirements that would apply equally to temporary or ''storage piles'' located on-site and off-site of a utility. As part of the background to that proposal, EPA described the requirements under the existing regulation so that the public could fully understand what it was–and was not[139]—proposing to revise. The proposal reiterated the existing definition of a CCR pile in § 257.53, and explained that this definition closely mirrors the RCRA definition of disposal, which is defined in part as the ''placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.'' See 42 U.S.C. 6903(3). EPA further explained:

> Under this regulation, CCR piles constitute disposal and are consequently subject to all regulatory criteria applicable to CCR landfills. In contrast, activities that meet the definition of a beneficial use are not considered disposal, even if they involve the direct placement on the land of ''non-containerized'' CCR. See §§ 257.50(g) and 257.53 (definitions of CCR landfill and CCR pile); 80 FR 21327–30.
>
> The current regulation distinguishes piles of CCR on-site (at an electric utility or independent power producer site) from temporary piles of CCR off-site (at a beneficial use site), based on whether CCR from the pile could fairly be considered to be in the process of being beneficially used. See § 257.53 (definition of CCR pile); 80 FR 21356 (April 17, 2015). While the CCR from the pile on-site may someday be beneficially used, it is not currently in the process of being beneficially used . . . If CCR is not containerized, the pile is a CCR pile and subject to the same requirements as a CCR landfill. See Id.
>
> In contrast, the regulations treat CCR stored off-site at a beneficial use site in a temporary pile to be in the process of being beneficially used (even though a pile is not itself a beneficial use). If the CCR is temporarily placed at a beneficial use site and meets the regulatory definition of a beneficial use, the pile is not a CCR pile and is not subject to disposal requirements.
>
> . . . .
>
> In the current definition [of a CCR pile], EPA distinguishes between piles on-site (which were almost always regulated as landfills) and piles off-site, (which, if temporary, were generally considered to be beneficial use, subject only to the four criteria in the definition). The current regulation also distinguishes between on-site piles that are not containerized and those that are containerized. See 80 FR 21356 (April 17, 2017); § 257.53.

84 FR 40365.

Thus, under the 2015 CCR Rule the activities covered under the definition of a CCRMU (*i.e.,* permanent placement of CCR on the land, on-site of a utility, without controlling releases) were defined as disposal rather than beneficial use. In 2019, EPA did not propose to revise or reconsider that. Instead, EPA proposed to extend that existing requirement to permanent piles located off-site of a utility. EPA therefore declines to reconsider the issue here.

In the May 2023 proposed rule EPA expressly stated that it did not intend to reopen or reconsider any issue other than those on which the agency expressly solicited comment.

> In this proposal, EPA is not reconsidering, proposing to reopen, or otherwise soliciting comment on any other provisions of the existing CCR regulations beyond those specifically identified in this proposal. For the reader's convenience, EPA has provided a background description of existing requirements in several places throughout this preamble. In the absence of a specific request for comment and proposed change to the identified provisions, these descriptions do not reopen any of the described provisions.

88 FR 31984. EPA further advised the public that it would ''not respond to comments submitted on any issues other than those specifically identified in this proposal, and such comments will not be considered part of the rulemaking record.'' Id.

Nowhere in the May 2023 proposed rule did EPA solicit comment on or suggest that it was in any way reconsidering the existing definition of

[139] EPA expressly advised the public that it was ''not reconsidering, proposing to reopen, or otherwise soliciting comment on any other provisions of the final CCR rule beyond those specifically identified in this proposal.'' 84 FR 40355.

a CCR pile. The sole mention in the proposal is EPA's explanation that its proposed definition of a CCRMU was ''based on the current definitions of a CCR pile—which is currently regulated as a CCR landfill. . . .'' Id at 32018. Consistent with the interpretation that all CCR placed on the land on-site of a utility is currently regulated, EPA also characterized structural fill and CCR placed below currently regulated CCR units on-site of a utility as ''historical'' solid waste management. Id. While commenters mischaracterize such activities as beneficial use, EPA's characterization of this conduct as ''historical'' shows that the Agency assumed that facilities were complying with the existing requirement and had not continued these practices on-site.

Accordingly, EPA declines the commenters' request to reconsider the definition of a CCR pile. EPA also declines to prohibit the use of CCR structural fill as part of this rulemaking. That issue is related to the 2019 proposal [140] to revise the fourth criterion in the definition of beneficial use, which remains pending.

v. Exemption for Roadbeds and Associated Embankments

EPA proposed to exempt CCR used in roadbeds and associated embankments. EPA further proposed that if a facility subsequently determined that the CCR in onsite roadbed is contributing to contamination of the aquifer, the facility would be required to address the contamination as part of the ongoing remediation.

No commenters opposed EPA's proposal, and several commenters supported it. However, commenters pointed out that EPA had neglected to include an exemption for roadbeds and associated embankments in the proposed regulatory text.

EPA is finalizing the exemption for roadbeds as proposed, and has amended the definition of a CCRMU accordingly.

b. Revision to Definition of CCR Unit

In order to distinguish between CCR units that would be subject to all of the requirements in part 257, and those that would be subject to only a subset, EPA proposed to rely on two terms: (1) CCR unit and (2) CCR management unit. Under the proposal the term, ''CCR units'' would refer to only the units subject to all of part 257, subpart D. As defined in the proposal, the term ''CCR management unit'' would refer to the units subject only to the subset of groundwater monitoring, corrective action, closure, and post-closure requirements. To effectuate this EPA proposed to modify the definition of *CCR unit* by stating that *CCR management units* are not covered by the definition of a *CCR unit.* Under the existing regulations, CCR units are defined as ''CCR landfills and CCR surface impoundments, as well as any lateral expansion of a CCR landfill or CCR surface impoundment. In addition, the term *CCR unit* already covers inactive CCR surface impoundments at active facilities because these units are CCR surface impoundments.'' 40 CFR 257.53

Commenters raised concern about the ''circularity'' of these definitions. and requested clarification on what type of unit would be considered a CCR unit, CCRMU, CCR landfill, or CCR surface impoundment. Several commenters noted that

> ''[f]or instance, 'CCR landfill,' 'CCR management unit,' and 'CCR unit' are defined by reference to each other. For example, a 'CCR landfill is 'not a surface impoundment'' and not a 'CCRMU,' while a 'CCRMU' is ''not a CCR unit'' but includes 'inactive CCR landfills' and ''CCR units that closed prior to October 17, 2015.'' And similarly, a 'CCR unit' is ''not a CCRMU,'' but includes CCR landfills and CCR surface impoundments. Similar circular references are contained in the definitions of 'inactive CCR landfill,' 'inactive facility,' and 'legacy CCR surface impoundment.'

Commenters claimed that defining one term by exclusion of another and in turn defining the latter term by exclusion of the former provides no clarity on the boundary between the two. These commenters went on to state that ''in a context in which definitional clarity is essential for regulatory clarity—*i.e.,* what's ''in'' and what's ''out''—such ambiguity is fatal, EPA must clarify these definitions to define these terms by their essential characteristics, not by circular references to each other.'' And as discussed in a previous section, some commenters were also confused by EPA's explanation in the proposal that, because it planned to use the term ''CCR unit'' to refer only to those CCR units that would be subject to all of the regulations in subpart D, CCRMU would not be included in this term.

In light of these comments, EPA reevaluated the proposed definitions and agrees that revisions are necessary. As noted, the proposed terms were intended to categorize units according to the requirements that would eventually be applied to them. EPA hoped that as a consequence, few revisions to the regulations would be necessary, with the idea that this would be less confusing to regulated entities and the public. Unfortunately, that was not the case and as the commenters noted, the definitions were frequently circular. Consequently, the final rule relies on three definitions: *CCR unit, Regulated CCR unit,* and *CCR management unit.*

EPA has largely reverted to the existing definition of a *CCR unit.* The definition, as it was promulgated in 2015, provides that

> ''*CCR unit* means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified.

Section 257.53. To avoid any ambiguity, EPA has also added a sentence stating that ''This term includes both Regulated CCR units and CCR management units.'' This is now the broadest term under the regulations and encompasses all units subject to 40 CFR part 257, subpart D.

This final rule now also includes the term *Regulated CCR unit,* which refers to the units regulated by the 2015 CCR rule, *i.e.,* new CCR landfills and new CCR surface impoundments (which include all lateral expansions of CCR landfills and CCR surface impoundments), existing CCR landfills, existing CCR surface impoundments, and inactive surface impoundments at active facilities. It also includes legacy CCR surface impoundments. Because legacy CCR surface impoundments will be subject to the same requirements as other inactive CCR surface impoundments, using this term will allow the Agency to implement this with relatively few revisions to the regulatory text.

Finally, the final rule largely reverts to the proposed definition of a CCR management unit. This final rule defines *CCR management unit* to mean any area of land on which any noncontainerized accumulation of CCR is received, is placed, or is otherwise managed, that is not a regulated CCR unit. This term includes inactive CCR landfills and CCR units that closed prior to October 19, 2015. EPA has also included a definition of the phrase, ''closed prior to October 19, 2015,'' which provides that the term means ''the CCR landfill or surface impoundment completed closure of the unit in accordance with state law prior to October 19, 2015.''

EPA deleted the phrase ''at any time'' from the proposed definition. EPA had originally included that phrase to clarify that it did not matter when the CCR was placed, received, or otherwise managed, provided the CCR remained present at the site. EPA deleted the phrase from

[140] 84 FR 40353 (August 14, 2019).

the final definition because, as the D.C. Circuit has already explained, this concept is fully communicated by the phrase ''is placed,'' and the inclusion of the phrase ''at any time,'' is therefore redundant. In addition, several commenters were confused by the phrase, assuming it meant that if CCR had ever been placed on the land at any time, even if it is no longer present, the site would be considered a CCRMU.

These definitions are all codified in the regulatory text at § 257.53. EPA also made conforming changes throughout 40 CFR part 257, subpart D to clarify which types of CCR units are subject to which requirements. As discussed elsewhere in this preamble, consistent with the proposal, EPA is extending only a subset of the existing requirements in part 257, subpart D to CCRMU, consisting of requirements for groundwater monitoring, corrective action, closure, post-closure care, and recordkeeping.

c. Revisions to Definitions of Owner and Operator

EPA proposed revisions to the existing definitions of *Owner* and *Operator.* The existing definition of *Owner* is the ''person(s) who owns a CCR unit or part of a CCR unit.'' First, EPA proposed to revise the definition to incorporate the concept of CCRMU into the existing definition because CCRMU would otherwise be excluded from the definition of a CCR unit as discussed in the preceding Unit of the preamble. This would be accomplished by adding ''or CCR management unit'' to the existing definition. Second, the Agency proposed to revise the definition of *Owner* to include the owner(s) of the entire facility, which would be achieved by adding ''or a facility, whether in whole or in part'' to the definition. EPA did not propose to revise the definition of a ''facility,'' which under the existing regulations means ''all contiguous land, and structures, other appurtenances, and improvements on land, used for treating, storing, disposing, or otherwise conducting solid waste management of CCR. A facility may consist of several treatment, storage, or disposal operational units (*e.g.,* one or more landfills, surface impoundments, or combinations of them).'' 40 CFR 257.53.

Some commenters opposed changing the definition of *Owner.* One commenter said ''It may be the current owner is unaware he owns the newly regulated facility. The current operator may have none of those parties responsible conducting activities since the parties may have ceased to exist long ago. Or, if the current owner is unwilling to work with those who previously disposed of the ash (potentially beneficially) there are legal issues (including potential access and trespass rules) that will need to be resolved.''

Commenters agreed that it would not be appropriate to include an innocent owner provision, specifically because of the difficulty in defining complex owner structures where direct accountability is difficult to define. One commenter ''does not fully agree with this ''limited accountability'' and suggest accountability must also honor indemnity and the assignment of liability defined in a Purchase and Sale Agreement (PSA). Specifically, any entity should transition or maintain liability based on an established purchase and sale agreement, thus responsibility cannot be limited to only the current owner. In addition, it is reasonable to expect that for known active or inactive CCR Units at an active facility, the current owner should be responsible for required closure that satisfies the requirements of the 2015 CCR Rule and for corrective action that does not exceed industry standard for remediation. However, it is unreasonable to expect only current owners to be accountable for all past practices and the responsibility for the unknown, specifically for areas that were undefined and unknown and most importantly unregulated at the time of a transaction from a previous owner, most often a regulated utility.''

EPA proposed and is finalizing this revision in part to account for the more complicated ownership arrangements that exist at some utilities. EPA has found that there may be multiple owners at the same facility; for example, one entity may hold title to a single impoundment, while another entity may own the remaining disposal units at the site. Moreover, ownership can change over time, as individual units or portions of the facility are parceled off. This final rule also more accurately reflects the nature of the obligations EPA is establishing for CCRMU. For example, as discussed below, EPA is finalizing the regulations to require an investigation of the entire facility to identify CCRMU. At many sites, this would involve areas other than those encompassed by the definition of a CCR unit, extending to all areas where disposal or other solid waste management may be occurring. Moreover, relying exclusively on the ''owner'' of the CCRMU may be ambiguous in this context, as at some sites the owner may not yet be aware that a CCRMU is present (*e.g.,* because it results from the historic placement or accumulation of CCR). EPA recognizes that this final rule will apply to currently regulated facilities and newly regulated facilities, but EPA does not expect that this revision will actually amend the entities that currently are liable. EPA expects that most (if not all) utilities currently operate as though the regulation already required the owner and operator of the facility to take actions; for example, under the existing regulations owners and operators are required to conduct corrective action even where the plume has migrated beyond the footprint of the regulated unit. In addition, EPA is extending the deadlines for the CCRMU requirements, which can accommodate any issues with access to the facility in order to conduct the applicable requirements.

For similar reasons, EPA proposed to revise the definition of *Operator* to incorporate the concept of CCRMU into the existing definition by adding ''or CCR management unit'' to the existing definition. In addition, the Agency proposed revisions to account for the unique characteristics of a CCRMU. In cases where the CCRMU is closed (*i.e.,* not receiving waste or otherwise in operation) or is a historic placement or accumulation of CCR, there may not be an entity that neatly fits the normal concept of an ''operator,'' because there may not be any current or ongoing oversight or activity with respect to the continued use of the unit. To avoid any ambiguity, EPA proposed to revise the definition of ''operator'' to clarify that the term *Operator* includes those person(s) or parties responsible for disposal or otherwise actively engaged in solid waste management of CCR. It also includes those responsible for directing or overseeing groundwater monitoring, closure, or post-closure activities at a CCR unit or CCRMU.

Commenters said the revised definition of operator is ''too broad and may be interpreted to impose CCR Rule liability on individuals or contractors who are retained by owners or operators to 'actively engage' in CCR waste management. This definition should be revised to reflect the standard principles for 'operator' liability under environmental laws, which should not include employees, individuals, or contractors operating under the direction of a responsible owner or operator.'' Another commenter disagreed with the revised definition of Operator, ''which can imply the operator could have obligations under this rule. We disagree. While some owners and operators are one and the same many facilities are operated by third parties operators and in these cases, such operators should have no obligations under this proposed rule. We request EPA clarify that distinction and clearly state that third party operators have no obligation.''

Another commenter stated ''Companies actively engaged in the solid waste management of CCR'' would include the construction contractors responsible for installation of CCR units including excavation, lining, filling, regrading, covering, closure, and more. Companies ''responsible for directing or overseeing groundwater monitoring, closure or post-closure activities'' would include well drillers, the professional engineers who certify the plans for CCR units, and again, construction contractors. Contractors will no longer be willing to 'actively engage[ ] in the solid waste management of CCR' or 'direct[ ] or oversee[ ] groundwater monitoring, closure or post-closure activities' if they will consequently become liable for compliance with the CCR rule. As a result, the 'shortage of contractors' will continue and grow worse. EPA should revise the definition of 'Operator' to clarify that contractors are not Operators.''

The revision to the definition of *Operator* is not intended to include every person who is ''actively engaged in the solid waste management of CCR'' but would follow the standard ''operator'' liability under environmental regulations. Such liability would include the operator who oversees the facility to ensure compliance with the regulations.

Because multiple entities may potentially be liable, (i.e., owners and operators) EPA is providing the following guidance. Consistent with EPA's typical practice, unless otherwise provided in the regulations, as long as one responsible entity (an owner or operator) has complied with the requirements, EPA will consider the obligation satisfied as to all potentially liable parties and will initially rely on owners and operators to determine among themselves how best to ensure compliance with the requirements. See, *e.g.,* 45 FR 33295 (May 19, 1980). (''EPA has no intention to require both owner and operator to take all or even most compliance actions in tandem. EPA will regard compliance by either owner or operator with any given obligation under the permit as sufficient for both of them'').

EPA is finalizing the revisions to *Owner* and *Operator* as proposed without revision. This is codified in the regulatory text at § 257.53.

d. Conforming Revisions to Other Existing Definitions

EPA proposed revisions to eight definitions in § 257.53 to refer to CCRMU. These definitions currently refer only to CCR units and EPA proposed to add the words ''or CCR management unit'' to the definitions to incorporate the concept of CCRMU into the existing definition. The eight definitions for which EPA proposed this revision are: Active life or in operation, Active portion, Closed, CCR landfill or landfill, Qualified person, Qualified professional engineer, State Director, and Waste boundary. EPA received comments only about clarifying the definition of ''closed,'' which is discussed in the Volume II Response to Comments document. EPA did not receive comments about the other seven definitions for which EPA proposed this revision. As described in Unit III.C.2.b of this preamble, EPA has revised the definition of ''CCR unit'' in response to comments, and as a consequence the definitions for Active life or in operation, Active portion, Closed, Qualified person, Qualified professional engineer, and Waste boundary no longer need to be amended. EPA is finalizing the proposed revisions to the definitions of CCR landfill and State Director. These are codified in the regulatory text at § 257.53.

e. Scope of Regulated Facilities With CCRMU

EPA proposed to require the owners or operators of both active facilities with one or more currently regulated CCR unit(s) and inactive facilities with a legacy CCR surface impoundment to comply with the CCRMU regulations. The term active facility or active electric utilities or independent power producers is defined in § 257.53. Inactive facilities are discussed in Unit III.A.1.c of this preamble.

Some commenters on the proposed rule opposed limiting the universe to active facilities and inactive facilities with at least one CCR unit. They argued that CCR in landfills, dewatered surface impoundments, and CCRMU at other, currently unregulated, active facilities pose the same risks to groundwater, surface water, and air as facilities with CCR units. These commenters said RCRA section 4004(a) cannot be met if these leaking units are arbitrarily excluded from regulation. Other commenters said EPA does not have the authority to regulate CCRMU at all and should limit the scope of the final rule to units that pose risks.

After reviewing the comments on the proposed rule, EPA reconsidered whether the regulated universe should be expanded to include other facilities currently generating power for the electrical grid that only have CCRMU on-site. These unregulated active facilities, or ''Other Active Facilities,'' are those that: (1) On or after October 19, 2015, were producing electricity for the grid; (2) Had ceased placement of CCR in their on-site CCR units before the effective date of the 2015 CCR Rule (October 19, 2015); and (3) Had no inactive CCR surface impoundments. As such, CCRMU (*e.g.,* inactive CCR landfills, closed CCR landfills, or closed CCR surface impoundments) are located at these facilities. Commenters on the proposed rule identified 13 units at six other active facilities, based on sourced data, and these units including inactive CCR landfills, closed CCR landfills, or closed CCR surface impoundments. Based on the most recent information, including from NODA comments, EPA believes there are nine units at five other active facilities.[141]

The addition of these units provides regulatory consistency; the CCRMU at these active facilities pose the same risks to human health and the environment whether or not they are co-located with a currently regulated CCR unit or a legacy CCR surface impoundment. And with the expansion of corrective action and closure obligations to CCRMU, these facilities are more similarly situated to the currently regulated active utilities and independent power producers than they are to the inactive facilities that remain exempt under this final rule (*i.e.,* inactive facilities with only CCRMU). Moreover, in contrast to the exempt facilities, EPA was able to identify the affected facilities and evaluate the potential consequences of regulating them.

EPA disagrees that it lacks the authority to regulate these CCRMU, for the same reasons discussed in Units II.C and III.C.2.a of this preamble.

The Agency also considered whether to regulate all CCRMU at inactive power plants. But as EPA explained in Unit III.B.1.b.i.(b) of this preamble, the location and number of inactive facilities without a legacy CCR surface impoundment are unknown, as is the number and condition of the units at these facilities. Without being able to better understand the full extent of the sites and entities that could be affected, EPA is not prepared to expand the regulations to this extent at the current time. Even though CCRMU pose the same risk when located at active or inactive facilities, EPA considers that the higher priority is to ensure that active facilities address the full extent of the contamination that currently exists, and to prevent further contamination at

[141] This universe is included in ''Universe of CCR Management Units. April 2024.'' in the docket for this action.

these sites—in other word to address rather ''those ills we have, than fly to others that we know not of.''

Therefore, EPA is finalizing amendments to regulate CCRMU at all active electric utilities or independent power producers that generated power for the electrical grid on or after October 19, 2015, in addition to those facilities with legacy CCR surface impoundments. As noted, EPA refers to these facilities as ''covered facilities'' throughout this preamble. This is codified in the regulatory text at § 257.50(d).

3. Facility Evaluation for Identifying CCR Management Units

EPA proposed that owners or operators of active facilities with a currently regulated unit or inactive facilities with a legacy CCR surface impoundment would need to conduct facility evaluations. The purpose of the facility evaluation is to confirm whether any CCRMU exist on-site, and, if so, to delineate the lateral and vertical extent of the unit(s). In developing the proposal, EPA relied heavily on the RCRA subtitle C Facility Assessment process for identifying solid waste management units at a hazardous waste facility. In addition, EPA accounted for certain existing requirements in the CCR regulations; for example, under the 2015 CCR Rule, facilities were required to compile a history of construction for their existing impoundments. 40 CFR 257.73(c)(1). Facilities were generally able to obtain all information specified in § 257.73(c)(1)(i) through (ix), even for units constructed decades ago. EPA expected that facilities will similarly be able to obtain the information that EPA proposed would be required in the Facility Evaluation Report (FER).

EPA proposed that facilities prepare one report, to be completed in two consecutive steps, with a single deadline. As proposed, the first step would consist of a thorough review of available records in combination with a physical facility inspection and any necessary field work, such as soil sampling, to fill any data gaps from the information obtained from the review of available records. The second step of the facility evaluation would be to generate a FER to document the findings of the facility evaluation. EPA proposed separate deadlines to complete the investigation and to compile the report: a deadline of no later than the effective date of this final rule to initiate the facility evaluation and a deadline of no later than three months after the effective date to complete the FER. Commenters suggested that EPA follow more closely the investigation processes developed under the current RCRA and CERCLA regulatory programs, that is, RCRA Facility Assessment Guidance, CERCLA all appropriate inquiry (Phase I and Phase II) process. Commenters suggested that separating the information collection requirements from the physical evaluation requirements will provide a more thorough evaluation of existing available information to better inform the physical evaluation to fill data gaps and properly identify CCRMU.

EPA is finalizing the procedures for facility evaluation for identifying CCR management units with a few revisions from the proposal. Owners or operators of any covered facilities will need to conduct a facility evaluation. The purpose of the facility evaluation is to confirm whether any CCRMU containing one ton (or more) exist on-site, and, if so, to delineate the lateral and vertical extent of the unit(s). In developing the final rule EPA relied heavily on the investigation processes EPA developed under the current RCRA and CERCLA regulatory programs, that is, the RCRA subtitle C Facility Assessment process for identifying solid waste management units at a hazardous waste facility, and the CERCLA all appropriate inquiry (Phase I and Phase II) process.

There is a two-step process for a facility evaluation. The first step consists of a thorough review of available records. The second step of the facility evaluation is to conduct a physical facility inspection and any necessary field work, such as soil sampling, to fill any data gaps from the information obtained from the review of available records.

In response to comments, EPA examined facility evaluation processes currently being implemented under RCRA and CERCLA and concurs that creating two separate reports—one for each step of the process—is consistent with these established approaches. EPA believes this two-step approach to facility evaluation will reduce the need for rework and the overall burden for both facility owners or operators and contractors who may be hired to complete this work. Additionally, EPA concludes this approach increases transparency by allowing the public the opportunity to see the work plan developed by the owner or operator.

Therefore, the final rule creates two parts to the facility evaluation—the Part 1 FER includes the results of the available information collection and evaluation. The Part 2 FER addresses data and information gaps through a physical evaluation of the facility. Together, the Part 1 and Part 2 reports will give a complete picture of the historic use, placement and the current status of CCR at each facility, ultimately identifying any CCRMU containing 1,000 tons or more that will be required to meet the regulatory requirements of this final rule. The FER must also identify those CCRMU containing between one and 1,000 tons, whose regulations is deferred until permitting. See, Unit III.C.2.a.iii of this preamble for further discussion.

a. Final Requirements for Facility Evaluation for CCR Management Units

During the facility evaluation, the owner or operator of a covered facility will need to identify and delineate the extent, laterally and vertically, of any CCRMU containing one ton or more at the facility. To begin, the owner or operator reviews all existing records and documents reasonably and readily available to (including information that is readily and reasonably attainable by) the facility, that contain information regarding any past and present CCR management that resulted in the accumulation of CCR on the ground. Consistent with the definition of a CCRMU, in this context EPA considers the terms ''placement'' and ''receipt'' to include situations in which spilled or released CCR has been left on the ground. During this first step, the facility is required to gather and review reasonably and readily available information to identify potential locations of CCR placement at, and to determine preliminary boundaries, lateral and vertical dimensions, and estimates of volume of any CCRMU. Then, at the second step, the facility evaluation requires physical inspection of the facility. Where necessary, the physical inspection must include field investigation activities, such as conducting exploratory soil borings, geophysical assessments, or any other similar physical investigation confirmation activities to establish the location and boundaries of identified CCRMU, and to affirmatively rule out other areas of potential CCR placement at the facility that were identified during the information review. The scope of the facility evaluation is the entire facility as the term is currently defined in 40 CFR 257.53.

As noted, the facility evaluation begins with a review of all reasonably and readily available information regarding past and present placement of CCR at the facility. In this first stage, the facility must gather all reasonably and readily available existing information that may be useful to determine any locations at the facility where CCR may have been placed (including spilled) on the ground. EPA expects that in this initial phase, the facility will cast a wide net, and collect all reasonably and readily available information that could potentially contain useful information to identify the potential locations of CCR placement at the facility. Finally, to complete the information review, the investigatory process must be documented, any data gaps identified, and plans for conducting a physical inspection of the site to verify locations, boundaries, and volumes of CCR placement at the facility formalized. This information is documented in the Part 1 FER. Then, at Part 2, the physical inspection must be documented. Each step of this process is described in greater detail below.

All recorded observations and data gathered during the facility evaluation, including any conclusions regarding the status of each CCRMU containing one ton or more of CCR at the facility (*e.g.,* delineation of the lateral and vertical extent of each CCRMU and an associated site map that identifies the location of the CCRMU (including GIS coordinates)), must be assembled and incorporated into the FER.

If, after conducting a thorough document review and a visual inspection, the facility has found no evidence of any CCRMU containing one ton or greater, no further testing or sampling is required to conclude that no such CCRMU are present at the facility. Consistent with the proposal, the final rule does not require facilities to conduct widespread site sampling to prove that no such CCRMU exists on-site.

The FER must include a certification to be signed by a P.E. and the owner or operator or an authorized representative. Owners or operators of active or inactive facilities with one or more CCR unit(s) that do not contain any CCRMU would need to complete and place in the operating record a certified FER documenting the steps taken during the facility evaluation to determine the absence of any CCRMU. Both Part 1 and Part 2 of the FER must be placed in the facility operating record (§ 257.105(f)(25)), submitted to the appropriate regulating entity (§ 257.106(f)(24)), and published on the facility's website (§ 257.107(f)(24)). Further, the Agency is requiring that the FER include a certification to be signed by the owner or operator or an authorized representative similar to the certification that is required at § 257.102(e) and (f) for existing units undergoing closure.

i. Facility Evaluation Report Part 1—Information Collection, Data Gap Identification

The first step in the facility evaluation process involves the collection of reasonably and readily available information that contains any detail or information on whether CCR was either routinely and systematically placed on land, or where facility activities otherwise resulted in measurable accumulations of CCR on land. The quality and reliability of the information review will depend greatly on the owner's and operator's ability to collect relevant information. Information reviews may provide misleading results when significant sources of information are not considered. The information that must be gathered during this step should include any documents that contain information relevant to past facility operations and waste disposal processes. By the conclusion of the facility evaluation, EPA expects that the facility would be able to identify the date, locations, durations, and volumes or estimated quantities of CCR placement.

EPA expects that the amount of available written information and documentation that will be available for review during the document review phase may vary by facility. However, the following documents developed as part of complying with 40 CFR part 257, subpart D, which are reasonably and readily available to facilities, would normally contain information that can be useful in identifying CCRMU: inspection reports; history of construction reports; fugitive dust control plans; annual groundwater monitoring and corrective action reports; ASDs; ACM reports or other corrective action reports; and closure plans and reports. Further, there are other sources of reasonably and readily available data that frequently contain information relevant to past facility operations and waste disposal processes, such as facility compliance reports produced for non-CCR programs (*e.g.,* Toxic Substances Control Act [TSCA]/Occupational Safety and Health Administration [OSHA]/National Pollutant Discharge Elimination System [NPDES]/Clean Air Act [CAA]/Clean Water Act [CWA]); permits and permit applications, including NPDES, solid waste, dam safety, and air permits; historical and contemporary monitoring and reporting data, and facility operating logs and maps; and site imagery including available historical aerial photographs, site photographs, topographic maps, and/or engineering or construction drawings, including drawings for physical facility improvement projects, such as surface water control, water and power infrastructure and utilities, roads, berms, ponds and/or other physical features at the facility. EPA expects that facilities will search all reasonably and readily available records to determine whether they contain information relevant to the potential existence and locations of CCRMU containing at leat one ton of CCR.

EPA proposed that as part of this process, owners and operators must further gather information by conducting meetings with current facility personnel familiar with the facility to the extent that those persons are available and have knowledge about past and/or present facility operations. The goal of the meeting process was to help gather any information relevant to the facility operations and waste disposal processes.

Commenters objected that conducting interviews of current or former facility personnel and any available State and local officials is burdensome and will place a significant strain, specifically, on State and local agencies. In addition, commenters stated that interviews with State personnel would put the State personnel in a difficult position to verify compliance on EPA's behalf without receiving State permit approval first.

In this final rule, EPA is not requiring the owner or operator to conduct interviews of current or former facility personnel, nor any available State and local officials. The regulatory language of the final rule only requires documentation of any interviews that are conducted as part of the information collection process. Nevertheless, owner and operator interviews of current or former personnel could well assist in identification of data and information that will be helpful in identifying CCRMU, particularly at those facilities that have not been in operation recently. Consequently, EPA continues to recommend that facilities use good faith efforts to collect information through interviews where current or past personnel are willing to assist in the identification of information or data that will assist the identification of CCRMU.

During this stage, EPA is requiring that a P.E. review the documents and information gathered during the information review process to draw conclusions regarding the existence of CCRMU at the facility. At the end of this stage, EPA expects the facility to identify: (1) Any areas where the facility can affirmatively conclude based on the reasonably and readily available information that one or more CCRMU containing greater than one ton are present; and (2) Any areas where the reasonably and readily available information indicates that CCR may have been either routinely and systematically placed on the land, or where facility activities otherwise could have resulted in one ton of CCR on the land (*i.e.,* areas where the available information indicates that one or more CCRMU may be present).

Each of the information sources discussed above can provide valuable information that can be used to identify the existence and locations of CCRMU. In addition, some specific examples are provided below:

• Environmental reports for multimedia inspections contain useful information on site management practices, monitoring data, and unit conditions. These reports can also describe comprehensive monitoring evaluations at the site that can indicate where releases or areas of concern exist.

• Multimedia permit and permit applications contain large amounts of information on the facility design, waste management practices including how wastes were disposed of, and the physical characteristics of the surrounding area. These documents can contain old topographic maps, facility figures and drawings, wastestream flow diagrams, and unit and process descriptions.

• If a groundwater monitoring report for a CCR unit indicates that contaminant levels in groundwater monitoring wells are the result of CCRMU rather than the monitored CCR unit, this would need to be further investigated during the facility evaluation process to fully delineate the locations of areas where CCR was placed on the ground, including the size of the unit and other related unit details.

• Similarly, a review of aerial photographs can identify potential CCRMU at the facility at locations that have become overgrown or otherwise hidden over time. When used in conjunction with USGS topographic maps, owners or operators can look for evidence that may be indicative of placement of CCR on the ground. As an example, if aerial photographs and USGS topographic maps indicate the existence of a pond or dam system at the site, this may be enough to warrant further investigation of available documents and may require field investigation depending on the strength of information to determine if the changes were made to allow placement of CCR on the ground.

One of the primary purposes of the information review is to provide an understanding of the CCR management activities at the facility, allowing for subsequent observations during the physical site inspection to be focused to the greatest extent practical. While information obtained during the review may be insufficient to support affirmative conclusions regarding the existence or non-existence of a CCRMU, based on the information available at most facilities, EPA expects that it will be possible to determine which areas at the facility would need to be inspected, and the type of data that would be needed to draw definitive conclusions. The Agency expects that the information gathered in the information review will be relevant to determining the areas to be inspected during the physical (visual) site inspection. Further, the information gathered during the information review would be used to support any necessary field activities.

EPA notes that the amount of available written information and documentation that will be available for review during the document review phase will vary by facility. Commenters confirmed this expectation by noting that many of the facilities subject to this final rule may have ceased operations years, and sometimes decades, ago. They also stated that record retention and storage locations may be difficult to determine and require some effort to access for some facilities. Based on past experience, EPA continues to believe that sufficient information is reasonably and readily available to allow facilities to obtain the information required under the FER. For example, as discussed in the proposal, under the 2015 CCR Rule facilities were generally able to obtain all of the information needed to compile a history of construction for their existing impoundments, even for units constructed decades ago. See, 40 CFR 257.73(c)(1). Nevertheless, owners or operators are required to compile this information only to the extent it is reasonably and readily available. EPA acknowledges that there may be certain information or data that may be unknown or lost. EPA intends that facilities provide relevant information only if documentation exists or if it is obtained during the physical site inspection. EPA does not expect owners or operators to provide anecdotal or speculative information regarding the presence or absence of CCRMU. However, if data gaps exist, owners or operators subject to these provisions may need to collect additional field data to fill the gaps.

The Part 1 FER must also include a narrative that documents the data reviewed as part of the facility evaluation process, and that lists all of the data and information reviewed that indicates the presence or absence of CCR management units at the facility. Finally, the FER must identify any data gaps, and provide a plan for remedying all identified data gaps through a physical examination of the facility, including any field or laboratory work needed to remedy data gaps identified in the narrative in the Part 1 FER record. The plan must include the major milestones needed to fill each identified data gaps (*e.g.,* a physical examination of the facility, sampling of media, measurements of CCR concentrations or physical presence, delineation of CCRMU) and dates to complete the needed tasks.

EPA is finalizing that Part 1 FER must contain the following: (1) The name and address of the person(s) owning and operating the facility; the unit name associated with any regulated CCR unit and CCRMU containing one ton or more of CCR at the facility; and the identification number of each CCR unit and CCRMU if any have been assigned by the State or by the owner; (2) The location of any CCRMU identified on the most recent U.S. Geological Survey (USGS) 7.5-minute or 15-minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available, with the location of each regulated CCR unit at the facility identified. The location of each regulated CCR unit at the facility must also be identified in the same manner; (3) A statement of the purpose(s) for which each CCRMU at the facility is or was being used; (4) A description of the physical and engineering properties of the foundation and abutment materials on which each CCRMU is constructed; (5) A discussion of any known spills or releases of CCR, including any associated remediation activities, from each CCRMU and whether the spills or releases were reported to State or Federal agencies; (6) Any record or knowledge of structural instability of each CCRMU; (7) Any record or knowledge of groundwater contamination associated or potentially associated with each CCRMU; (8) The size of each CCRMU, including the general lateral and vertical dimensions and an estimate of the volume of waste contained within the unit; (9) Identification of all types of CCR in each CCRMU at the facility; (10) A narrative description of any closure activities that have occurred, including any applicable engineering drawings or reports; (11) A narrative that documents the data reviewed as part of the facility evaluation process, and that lists all data and information indication the presences or absence of CCRMU at the facility; (12) Any supporting information used to identify and assess CCRMU at the facility, including but not limited to any construction diagrams, engineering drawings, permit documents, wastestream flow diagrams, aerial photographs, satellite images, historical facility maps, any field or analytical data, groundwater monitoring data or reports, inspection reports, documentation of interviews with current or former facility workers, and other documents or sources of information used to identify and assess CCRMU at the facility; (13) narrative description of any data gaps, for information in paragraphs (c)(i) through (xiii) of this section, not available in existing information collection records and a plan for remedying identified data gaps through a physical examination of the facility, including any field or laboratory work needed to remedy data gaps in the FER Part 1 record. The plan must include the major milestones needed to fill the identified data gaps (*e.g.,* a physical examination of the facility, sampling of media, measurements of CCR concentrations in and around the unit or physical presence, delineation of CCR management unit(s)) and dates to complete such needed tasks. Also, as necessary and timely, any updates to data gap remedy plans must be added to the public record during the FER Part 1. In addition, the FER is required to include a certification from a P.E. stating that the FER meets the requirements at § 257.75(c).

ii. Facility Evaluation Report Part 2—Physical Evaluation and Remedy of Data Gaps

A facility must conduct a physical site inspection of the entire facility in all cases. The purpose of the physical site inspection is to visually inspect the entire facility for evidence of CCR placement on the land, ensure that all CCRMU containing one ton or more of CCR have been identified, and fill any data gaps identified during the initial information evaluation. To that end, EPA is finalizing without revision the requirement that the physical site inspection must consist of a visual inspection of the entire facility to look for evidence that CCR is currently being managed on the land. At a minimum, a facility is required to visually inspect the site to confirm the information obtained from the information review phase and to identify any anomalies that warrant further investigation, such as an unnatural topographic rise or depression or an area where unspecified liquid waste was applied over several years. In addition, the facility is required to conduct any field work, such as soil sampling, necessary to determine whether areas that had been identified as a potential CCRMU in fact contain at least one ton of CCR and to obtain the information required for the FER.

The complexity of past and current facility operations, combined with the amount of data that was available for review during the information review phase would impact how extensive the facility inspection must be. For example, if facility records are sparse or contain data gaps, the Agency expects that the facility inspection would be more thorough than in situations where detailed records exist. However, even in situations where detailed facility records exist, the facility must still conduct a visual inspection to ensure that all CCRMU containing one ton or more of CCR have been identified, whether or not those areas were identified in the initial document review. In addition, EPA expects that in most cases, a facility will need to conduct some sampling or other fieldwork to obtain all the information required for the FER. For example, even if the facility had as-built engineering drawings for an old landfill, EPA expects that in some cases the facility may still need to conduct some sampling to establish the lateral and vertical dimensions of the CCRMU.

A facility can use a variety of visual means to inspect the entire site (*e.g.,* physically walking the site, using motorized vehicles to inspect the site, using drone video footage to inspect the site) to confirm the information obtained from the information review in Part 1 and to identify any anomalies that warrant further investigation, such as an unnatural topographic rise or depression or an area where unspecified liquid waste was applied over several years. EPA recommends that any sampling be conducted using standard industry methods, including any relevant standards and methodologies established by State environmental agencies. The FER must also include a discussion of quality assurance procedures, sampling equipment handling, sample collection, analytical methods, and data reporting.

If, after conducting a thorough document review and a visual inspection, the facility has found no evidence of any CCRMU, no further testing or sampling would be required to conclude that there is no CCRMU present at the facility. EPA is not requiring facilities to conduct widespread site sampling to prove that no CCRMU exists on-site. All recorded observations and data gathered during the facility evaluation, including any conclusions regarding the status of each CCRMU at the facility, must be assembled and incorporated into a FER, which is described in detail below.

EPA is finalizing that Part 2 FER must contain the following: (1) The name and address of the person(s) owning and operating the facility; the unit name associated with any regulated CCR unit and CCRMU containing one ton or more of CCR at the facility; and the identification number of each CCR unit and CCRMU if any have been assigned by the State; (2) The location of any CCRMU containing one ton or greater identified on the most recent U.S. Geological Survey (USGS) 7.5-minute or 15-minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available. The location of each regulated CCR unit at the facility must also be identified in the same manner; (3) A statement of the purpose(s) for which each CCRMU at the facility is or was being used; (4) A description of the physical and engineering properties of the foundation and abutment materials on which each CCRMU was constructed; (5) Any further evidence of known spills or releases of CCR, including any associated remediation activities, of CCR from each CCRMU and whether the spills or releases were reported to State or Federal agencies; (6) Any further evidence of structural instability of each CCRMU; (7) Any further evidence of groundwater contamination associated or potentially associated with each CCRMU; (8) The size of each CCRMU, including the general lateral and vertical dimensions and an estimate of the volume of CCR contained within the unit; (9) Identification of the types of CCR in each CCRMU; (10) A narrative description of any closure activities that have occurred, including any applicable engineering drawings or reports; (11) A narrative that documents the nature and extent of field oversight activities and data reviewed as part of the facility evaluation process, and that lists all data and information that was reviewed indicating the presence or absence of CCRMU at the facility; and (12) Any additional supporting information used to identify and assess CCRMU at the facility, including but not limited to any construction diagrams, engineering drawings, permit documents, wastestream flow diagrams, aerial photographs, satellite images, historical facility maps, any field or analytical data, groundwater monitoring data or reports, inspection reports, documentation of interviews with current or former facility workers, and other documents or sources of information used to identify and assess CCRMU at the facility. In addition, the FER is required to include a certification from a P.E. stating that the FER meets the requirements at § 257.75(c).

In addition to the information described in numbers (1)-(12) in the preceding paragraph, Part 2 of the FER must include a narrative that documents the nature and extent of field oversight activities and data reviewed as part of the facility evaluation process, and that lists all data and information reviewed that indicated the absence or presence of any CCRMU containing one ton or more of CCR at the facility. The narrative must also discuss how each data gap identified in Part 1 was addressed. As many commenters stated, the physical examination and any field work will require the hiring of specialized contractors. EPA understands this level of field and laboratory work will require a detailed work plan, and EPA expects the FER Part 1 data gap remedy plan to reflect this detail, including milestones and time frames for completion. EPA also anticipates that as field activities commence, plans to address data gaps may change and/or additional field work may be necessary based on ongoing discoveries. In these cases, the owner or operators will need to update the plans accordingly and update the publicly available information in the Part 1 or Part 2 FER, depending on the timing of the update.

b. Certification of Facility Evaluation Report—Part 1 and Part 2

The Agency proposed to require that the FER include a certification from a P.E. stating that the FER meets the requirements at § 257.75(c). Further, the Agency proposed to require that the FER include a certification to be signed by the owner or operator or an authorized representative similar to the certification that is required at § 257.102(e) and § 257.102(f) for existing units undergoing closure. Commenters raised concerns that the rules were not sufficiently objective or technically precise for a P.E. to be able to certify. One commenter raised that EPA has indicated that no facility has successfully implemented the 2015 CCR Rule's requirements to date, even though facilities have secured the certification of Qualified Professional Engineers as prescribed by the 2015 CCR Rule.

These commenters have misunderstood the purpose and role of the P.E. in the FER reports. The P.E. does not make final determinations; the role of the P.E. is to act as an engineer in information collection, data gap identification, physical site inspection, and remedy of data gaps and certify accordingly. As stated in the preamble of the 2015 CCR Rule, EPA reasoned that the requirement for a P.E. maintains the most important components of any certification requirement: (1) That the engineer be qualified to perform the task based on training and experience; and (2) that she or he be a professional engineer licensed to practice engineering under the title Professional Engineer which requires following a code of ethics with the potential of losing his/her license for negligence. The final rule requirements are sufficient for an P.E. to implement the final rule and follow industry standards.

Other commenters raised that the P.E. certification requirement is overly burdensome and will extend the timeframe to complete the facility evaluation. EPA has re-structured the process for the FER by extending the time frame and separated the FER into two parts with separate and adequate time frames to prepare the reports. When determining the new compliance deadlines, EPA considered the shortages and backlogs of qualified contractors as well as the increased strain on those contractors.

Another commenter asked for EPA to modify or add language to acknowledge the good faith and due diligence efforts of a P.E., especially when considering the age and nature of the potential CCRMUs. EPA does not agree with this suggestion. As discussed above, EPA discussed in the preamble of the 2015 CCR Rule that the P.E. follows a code of ethics with the potential of losing their license for negligence. As stated in the 2015 CCR Rule preamble, the Agency maintains that an engineer is able to give fair and technical review because of the oversight programs established by the State licensing boards that will subject the professional engineer to penalties, including the loss of license and potential fines if certifications are provided when the facts do not warrant it.

EPA does not agree with suggestions to modify the certification and therefore we are finalizing the certification language as proposed.

c. Facility Evaluation Reports Deadlines

The majority of the comments related to the timing and due date of the FER report stated that EPA had not allowed sufficient time to gather the required information and conduct a physical inspection of the facility. Comments cited many concerns with the proposed time frame, *i.e.,* the time frame was too short to complete all the tasks required, for the FER, *e.g.,* the difficulty in collecting historic information/data that may or may not be accessible at the facility or place of off-site records retention, the possible extensive volume of information, reports and/or data that owner or operators would need to review, the possible iterative nature of field work and sampling, the impact of seasonal disruptions to field work, the lack of qualified field personnel and the timing to acquire their services through contracts. Commenters suggested allowing significantly more time to complete individual aspects of the FER requirements.

EPA has reviewed the information provided by commenters citing the shortages and backlogs of qualified contractors, increased strain on those contractors related to the number of CCR units complying with the CCR rule simultaneously, difficulty accessing and reviewing historical documentation, potential seasonal disruptions, and time needed to perform quality control and quality assurance, and considers it to be persuasive. After considering these factors EPA has extended the time frame and separated the FER into two parts with separate and adequate time frames to prepare the reports.

The FER Part 1 is required to be prepared and placed in the operating record and posted on the facility's website, pursuant to § 257.105(f) no later than 15 months after the effective date of the final rule. This time frame was determined based on suggestions from commenters as to the time necessary to conduct a thorough review of historic records, and, if necessary, conduct interviews of those with facility and site knowledge, and by EPA further considering the time needed under RCRA Subtitle C and CERCLA to do similar reviews for historic sites.

The FER Part 2 is required to be prepared and included in the public record no later than 27 months after the effective date of the final rule. EPA established this time frame by also considering suggestions from commenters, who gave examples of timelines to hire contractors and conduct site work, as well as EPA's own experience and timelines at RCRA Subtitle C and CERCLA sites for conducting facility investigations. EPA believes the provided limited additional time is adequate to perform all necessary tasks under the FER, Part 1 and Part 2 respectively.

After completing the information gathering part of the facility evaluation process, owners or operators of covered facilities must compile and place in the operating record information pertaining to every CCRMU containing one ton or more of CCR located at the facility no later than the deadline identified below. Both Part 1 and Part 2 of the FER must be posted to the facility's CCR publicly accessible internet site within 30 days of that date. In developing the list of items to be included in the FER, the Agency examined certain requirements from existing regulations for History of Construction reports that must be generated for existing CCR surface impoundments at § 257.73(c)(1) as well as other requirements necessary to provide basic information about each CCRMU containing one ton or more of CCR at the facility.

After gathering the information required for the FER Part 1 (*i.e.,* not including a physical evaluation of the facility), the owner or operator must prepare a Part 1 FER by placing the information required in the facility's operating record as required by § 257.105(f)(25).

4. Applicable Existing CCR Requirements for CCR Management Units and Compliance Deadlines

EPA proposed that in addition to the facility evaluation requirements discussed in Unit III.C.3 of this preamble, owners or operators of a CCR facility comply with the existing requirements in part 257 for fugitive dust, groundwater monitoring, corrective action, closure, post-closure care, recordkeeping, notification, and internet posting. As explained in the preamble of the proposed rule, these requirements are intended to address the risks posed by any existing releases of CCR or CCR constituents to the groundwater, regardless of when the CCR was placed in the units and prevent future releases. The other existing requirements in 40 CFR part 257, subpart D are not necessary for CCRMU. For example, (1) since CCRMU should not contain sufficient liquids to create a hydraulic head or to otherwise cause the conditions that might lead to a structural failure, the structural stability requirements are not appropriate; (2) similar to legacy CCR surface impoundments, since CCRMU are existing units and will be required to close, the location restriction and liner design requirements would not be appropriate. EPA proposed that the fugitive dust, groundwater monitoring, corrective action, closure, post-closure care, recordkeeping, notification, and internet posting requirements apply to all CCRMU at active facilities and at inactive facilities with one or more legacy CCR surface impoundment.

Several commenters generally supported the regulatory approach, although a commenter suggested that CCRMU be subject to more existing CCR regulations, namely the location restrictions at §§ 257.60 through 257.64, the liner design criteria at § 257.71, and the structural stability requirements at § 257.73. This commenter stated that these requirements were necessary to protect human health and the environment from the risk of failure posed by poorly constructed and sited CCRMU and to provide information ''critical'' to developing unit closure plans and any necessary corrective action.

EPA disagrees that generally applying location restrictions, the structural stability requirements, and the liner design criteria to CCRMU would be appropriate. First, as explained in the proposed rule, the structural stability criteria are more appropriate for operational units and those units that maintain a hydraulic head. Second, the consequence of failing to comply with the location restrictions and liner design criteria requirements is closure by a specific date. 40 CFR 257.101(a) through (b)(1). Except for those situations described in Unit III.C.4.e (*i.e.,* deferral for CCRMU beneath critical infrastructure and deferral for CCRMU closed under a regulatory authority), because CCRMU are not operational CCR units and will in any event be required to close, the consequence for failure to comply with location restrictions or the liner design criteria (*i.e.,* ceased receipt of waste and closure) is moot. Additionally, the commenter failed to identify any information necessary for conducting corrective action pursuant to §§ 257.96 through 257.98 or closure in accordance with §§ 257.101 and 257.102 that would be gained by requiring CCRMU to comply with the location restrictions or liner design criteria that would not be gained by compliance with the facility evaluation and groundwater monitoring requirements.

Other commenters opposed the regulation of CCRMU holistically, citing lack of authority or lack of demonstrated risk to human health or the environment from CCRMU. Other commenters opposed EPA's proposal to apply specific existing requirements to CCRMU (*i.e.,* groundwater monitoring, corrective action, closure). Several of the commenters that opposed requiring CCRMU to comply with the existing regulations stated that applying a ''one-size-fits-all'' approach to CCRMU was not appropriate due to the variety of units that would be captured in the definition of CCMRU and suggested the EPA wait to regulate these units until site-specific requirements could be developed (*i.e.,* permitting programs). Comments regarding lack of authority or lack of demonstrated risk from CCRMU are summarized and addressed in Units III.A and III.C.2.a.i of this preamble, respectively. Comments about the applicability of specific existing requirements are described and responded to in later portions of this unit (Unit III.C.4). Regarding comments about the existing regulations being what commenters characterized as a ''one-size-fits-all'' approach to the variety of CCR units captured under the definition of CCRMU, EPA disagrees that the existing regulations are not holistically appropriate to apply to CCRMU or to address the potential risk from these units. Furthermore, commenters did not provide suggestions on how to regulate these units under the existing regulatory framework (*i.e.,* self-implementing rule) and EPA, as explained in Units III.A and III.C.1, finds the risks posed by these units to be not only credible but significant enough to warrant regulation at this time (*i.e.,* under the self-implementing rule as opposed to waiting until the Federal permitting program is established).

In response to comments and for the reasons laid out below, EPA is finalizing the requirements for CCRMU to comply with fugitive dust, groundwater monitoring, corrective action, closure, post-closure care, recordkeeping, notification, and internet posting requirements. These requirements apply to all CCRMU at active CCR facilities, at inactive facilities with one or more legacy CCR surface impoundments, and at active facilities that ceased placement of CCR in onsite CCR units before October 19, 2015, regardless of how or when the CCR was placed in the CCRMU. These issues are discussed in more detail in this Unit of the preamble.

a. Compliance Deadlines for CCR Management Units

EPA proposed compliance deadlines for CCRMU that closely aligned to the proposed compliance deadlines for legacy CCR surface impoundments. The proposed rule explained that the 2015 CCR Rule compliance deadlines were based on the amount of time determined to be necessary to implement the requirements and the proposed compliance dates for legacy CCR surface impoundments, and CCRMU were determined using the same approach. The proposed rule further explained that some factors considered in determining the 2015 CCR Rule compliance deadlines were not relevant for CCRMU, such as the need to coordinate compliance deadlines with the then recently promulgated ELG rule. In addition, EPA anticipated most owners or operators of CCRMU would already be familiar with the existing regulations, and therefore most of the proposed requirements for CCRMU. Consequently, EPA proposed generally expedited deadlines, as compared to the 2015 CCR Rule deadlines, based on the expected shortest average amount of time needed to complete the necessary activities to meet the requirements. In the proposed rule, EPA requested comment on the proposed compliance deadlines and the feasibility of meeting the proposed compliance time frames for CCRMU.

EPA received numerous comments regarding the proposed compliance deadlines. Several commenters expressed support for the proposed compliance deadlines for CCRMU. Generally, these commenters stated that expedited compliance was appropriate due to significant risk posed by these units, the likelihood that these units are actively contaminating groundwater, and the urgent need for corrective action to address that contamination for the protection of human health and the environment. Some of these commenters echoed the proposed rule, stating that owners' or operators' familiarity with the existing requirements, along with the fact that these units are no longer in use and therefore would not need time to cease receipt of waste, further justified the expedited deadlines.

Many other commenters stated the proposed compliance deadlines were infeasible and should, at a minimum, allow as much time for compliance as the 2015 CCR Rule deadlines, although several commenters expressed that even the 2015 CCR Rule deadlines were inadequate, and that the insufficient time frames were likely a factor in the gap between EPA's expectations and facilities' good faith efforts and utilization of best practices in developing groundwater monitoring networks, sampling and analysis plans, corrective action programs, and closure plans. Commenters pointed to several factors that they believed EPA did not fully incorporate into the proposed deadline calculations that make compliance with the proposed deadlines infeasible: EPA's grossly underestimated number of CCRMU; the large number of CCR units (*i.e.,* existing CCR units, legacy CCR surface impoundments, CCRMU) competing for limited resources to meet overlapping compliance deadlines; the limited number of qualified contractors available to conduct necessary activities to reach the compliance deadlines; the nationwide labor shortage exacerbated by impacts from the COVID–19 pandemic; limited existing alternative disposal options; overlapping regulatory requirements (*e.g.,* State drilling permits, timing restrictions related to protected habitats, State CCR permits, Consent Decrees/Orders); seasonality impacts in different regions across the nation; and accessibility and completeness, or lack thereof, of historical documentation and information. One commenter provided specific information regarding typical delays experienced during the implementation of the 2015 CCR Rule caused by third-party availability and backlogs: two to four weeks for contractor mobilization; two to six weeks for site clearing; two to three weeks for surveys; three to 12 weeks for environmental drillers; and three to four weeks for laboratory analyses. These commenters also said EPA grossly underestimated the amount of time needed to hire a contractor, locate and review historical information, access historical or heavily vegetated portions of facilities, characterize and delineate a site, comply with the groundwater monitoring requirements, and conduct quality control or quality assurance on data and reports. Several of these commenters expressed the belief that the proposed deadlines would result in unintentional non-compliance despite facilities' best efforts to comply due to the constraints listed above. Finally, a few commenters suggested EPA create alternative deadlines or mechanisms for extensions based on site-specific characteristics.

In response to comments, EPA reevaluated the compliance deadlines for CCRMU. EPA reconsidered the impact of the following on the amount of time facilities needed to complete the activities involved in meeting the requirements: the potential size of the CCRMU universe; accessibility and abundance, or lack thereof, of historical documentation; seasonality; clearing restrictions and required local and State approvals to clear vegetation or drill wells; need to coordinate with local or State regulatory authorities; existing disposal options; impact of the national labor shortage and contractor and laboratory backlogs; and the strain on limited resources from overlapping compliance deadlines for legacy CCR surface impoundments, existing units (*i.e.,* groundwater monitoring, closure, and post-closure care), and CCRMU. Overall, EPA found the information provided regarding the infeasibility of the proposed deadlines convincing. Specifically, EPA acknowledges the potential for an underestimation of the CCRMU universe given the number of comments received regarding non-containerized CCR historically being spread across facilities. Additionally, EPA agrees that the shortage of qualified contractors and laboratory resources has persisted, if not increased, since the 2015 CCR Rule and that the increasing demand on these finite resources from new and existing CCR units, legacy CCR surface impoundments, and CCRMU complying with overlapping requirement deadlines will likely result in additional delays. EPA acknowledges that the proposed deadlines did not adequately account for those nationwide impacts of seasonality and extreme weather events; necessary coordination with outside parties (*e.g.,* State agencies, local governments); locating disposal capacity for those units closing by removal; the need to comply with overlapping regulatory requirements, such as State drilling permits or timing restrictions related to protected habitats; or necessary quality assurance and quality control in calculating the proposed deadlines. Furthermore, as detailed in Unit III.C.3.c, EPA recognizes that the proposed CCRMU deadlines did not provide sufficient time for the completion of the FER which serves as the prerequisite requirement for all other CCRMU requirements. Additionally, the concurrent deadlines for legacy CCR surface impoundments and CCRMU did not allow for inactive facilities to first determine if there is a legacy CCR surface impoundments onsite before complying with the CCRMU regulations. Therefore, as detailed in Units III.C.3 and III.C.4.c through e, EPA extended the deadlines for CCRMU to provide: (1) At least as much time facilities had to come into compliance with the 2015 CCR Rule, (2) Sufficient time for owners or operators to complete a robust FER, and (3) Additional time such that the deadlines for legacy CCR surface impoundment do not coincide with the CCRMU deadlines, with the exception of the requirement to establish a CCR website and the completion of the history of construction (for legacy CCR surface impoundments) and the FER Part 1 (for CCRMU) which can be conducted concurrently. These extended deadlines for CCRMU will mitigate factors mentioned by commenters that convinced EPA the proposed deadlines would be infeasible for CCRMU. Overall, most of the comments EPA received supported deadlines that allowed at least as much time as EPA originally provided in the 2015 CCR Rule.

Note that all deadlines herein are framed by reference to the effective date of the rule; the final rule will be effective six months after publication of the final rule. Accordingly, facilities will have an additional six months beyond the deadlines to come into compliance. The Agency has included a document in the docket for this rule that summarizes the finalized compliance deadlines.[142]

TABLE 2—FINAL COMPLIANCE TIME FRAMES FOR CCRMU

40 CFR Part 257, Subpart D requirement	Description of requirement to be completed	Deadline (months after effective date of the final rule)	Date
Internet Posting (§ 257.107)	Establish CCR website	15	Monday, February 9, 2026.
Facility Evaluation Report (§ 257.75).	Complete the Facility Evaluation Report Part 1	15	Monday, February 9, 2026.
Facility Evaluation Report (§ 257.75).	Complete the Facility Evaluation Report Part 2	27	Monday, February, 8, 2027.
GWMCA (§ 257.91)	Install the groundwater monitoring system	42	Monday, May 8, 2028.
GWMCA (§ 257.93)	Develop the groundwater sampling and analysis program.	42	Monday, May 8, 2028.
GWMCA (§§ 257.90–257.95)	Initiate the detection monitoring and assessment monitoring. Begin evaluating the groundwater monitoring data for SSIs over background levels and SSLs over GWPS.	42	Monday, May 8, 2028.
GWMCA (§ 257.90(e))	Complete the initial annual GWMCA report	January 31, 2029	January 31, 2029.
Closure (§ 257.102)	Prepare written closure plan	48	Wednesday, November 8, 2028.
Post-Closure Care (§ 257.104)	Prepare written post-closure care plan	48	Wednesday, November 8, 2028.
Closure and Post-Closure Care (§ 257.101).	Initiate closure	54	Tuesday, May 8, 2029.

b. Fugitive Dust Requirements for CCR Management Units

The air criteria in the existing regulations address the pollution caused by windblown dust by requiring the owners or operators of CCR units to minimize CCR from becoming airborne at the facility. 40 CFR 257.80. These requirements apply to the entire facility, which means that the owner or operator is required to minimize CCR fugitive dust originating not only from the CCR unit, but also from roads and other CCR management and material handling activities at the facility. Consequently, under the proposal, CCRMU would already be covered by the fugitive dust requirements in § 257.80 because CCRMU are located at facilities with a CCR unit. EPA therefore only proposed to make those changes to the fugitive dust requirements in § 257.80 that are necessary to make clear that these requirements also apply to CCRMU. Specifically, EPA proposed to amend the regulations to add ''CCRMU'' to the list of units subject to the requirements under § 257.80 and associated provisions under §§ 257.105 through 257.107. Additionally, EPA solicited comments on amending § 257.80(b)(6) to include a deadline for facilities to amend the fugitive dust control plan no later than 30 days following a triggering event, such as the closure of a CCRMU or change in facility or CCR unit operations.

No commenters raised concern about requiring CCRMU to comply with the existing requirements in § 257.80. EPA is therefore finalizing this provision without revision.

One commenter supported creating a deadline for the amendment of the fugitive dust plan no later than 30 days following a triggering event. This commenter went on to suggest that EPA further revise § 257.80 to require owners or operators to notify potentially impacted populations including residents living within three miles of the plant, populations potentially impacted by transportation of CCR, and residents living near disposal areas where CCR will be off-loaded and disposed and to require air monitoring at excavation sites and plant boundaries. The commenter was not clear on the circumstances in which owners or operators would notify potentially impacted population or what these populations would be notified of and did not provide a factual basis to support the need for air monitoring at regulated CCR units. Therefore, EPA is therefore only finalizing an amendment to § 257.80(b)(6) to require owners or operators to amend the fugitive dust plan no later than 30 days following a triggering event, such as the closure of a CCR unit or change in facility or CCR unit operations.

c. Groundwater Monitoring and Corrective Action Requirements for CCR Management Units

EPA proposed to require CCRMU to comply with the existing groundwater monitoring and corrective action criteria in 40 CFR 257.90 through 257.98, with one revision, to require sampling and analysis of constituents listed in Appendix IV at the same time as those listed in Appendix III. As explained in the proposed rule at 88 FR 32003, §§ 257.90 through 257.95 require owners or operators of a CCR unit to install a system of monitoring wells, specify procedures for sampling these wells, and set forth methods for analyzing the groundwater data collected to detect hazardous constituents (*e.g.,* toxic metals) and other monitoring parameters (*e.g.,* pH, total dissolved solids) released from the units. If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required as laid out in §§ 257.96 through 257.98. These requirements apply until closure in accordance with § 257.102(c) is

[142] A document ''Final Rule Compliance Deadlines for CCR Management Units. April 2024.'' is available in the docket for this action.

complete or the post-closure care period of the CCRMU ends.

Several commenters expressed support for requiring CCRMU to comply with these groundwater monitoring and corrective action requirements, stating CCRMU can and have caused groundwater contamination. Some commenters suggested additional requirements be added to those in §§ 257.90 through 257.98, including a mandate to test groundwater quality outside the boundary of the facility and make those results public, a deadline for the completion of the selection of remedy required by § 257.97, and a prohibition against using intrawell groundwater data comparisons at CCRMU. However, other commenters stated that applying the existing groundwater monitoring and corrective action requirements to CCRMU is not appropriate and suggested that instead EPA incorporate flexibility into the CCRMU regulations by providing for alternative groundwater monitoring standards and site-specific risk-based corrective action into the CCR regulations. These commenters suggested groundwater monitoring standards that allow owners or operators to complete evaluations to determine if Appendix IV constituents are above the GWPS instead of conducting monitoring, allowing a site-wide groundwater network, and exempting units from groundwater monitoring when owners or operators are able to demonstrate through site-specific risk assessments there is no probable risk to groundwater. These commenters said these alternative approaches are necessary to address the overburdensome nature of compliance with groundwater monitoring and corrective action when a unit has already completed closure under a State authority and when units are completing groundwater monitoring under a State or other Federal program. Some of these commenters stated that EPA does not have the record to demonstrate potential risk from these units to justify requiring groundwater monitoring and corrective action as laid out in the existing regulations, especially for units that have already completed closure under a State authority. Other commenters said that flexibility is needed due to the diversity of CCR units captured in the definition of CCRMU, age of some of the units, and overlapping State requirements.

EPA further proposed two deadlines for the groundwater monitoring requirements, as opposed to the single deadline in the 2015 CCR Rule. EPA received numerous comments on EPA's proposal to split the single deadline for groundwater monitoring requirements contained within the 2015 CCR Rule (24 months from the effective date of the final 2015 rule) into two separate deadlines (six months from the effective date of the final rule for the installation of the groundwater monitoring network and development of the groundwater sampling and analysis plan and 24 months from the effective date of the final rule for the initiation of the combined detection and assessment monitoring). A few commenters expressed support of the two separate deadlines for groundwater monitoring requirements, stating it increased accountability and ensured owners or operators were not unnecessarily delaying the installation of the groundwater monitoring system. However, overall, commenters stated that the groundwater monitoring requirements should have a single deadline as the separate deadlines made compliance with the rule infeasible. Several commenters said the proposed split deadlines eliminated the flexibility necessary for compliance that was contained within the 2015 CCR Rule's single deadline. Those commenters went on to say the single deadline allowed facilities to accommodate for delays associated with factors outside their control, such as third-party availability, weather, and required permits or approvals, by making schedule adjustments necessary to achieve compliance (*e.g.,* expedite the development of the sampling plan in the case of delays with the well installation). Other commenters said the proposed two deadlines were unnecessarily prescriptive. One commenter pointed out that the proposed rule contained no deliverables to verify compliance for the installation of wells or the development of the sampling and analysis plan.

As explained in the proposed rule, the existing groundwater monitoring and corrective action requirements are essentially the same requirements that have been applied to both hazardous waste and municipal solid waste disposal units for decades, and with the one exception discussed below, there is nothing about CCRMU that makes them distinct enough to warrant separate groundwater monitoring requirements from other CCR units. No commenter provided any factual basis for treating CCRMU differently than all of the other units that currently comply with the same groundwater monitoring and corrective action requirements. Specifically, for commenters who requested alternative groundwater monitoring requirements to allow site-wide or property-boundary groundwater monitoring due to the potential presence of CCRMU across the facility, the commenters failed to explain how the provisions at § 257.91(d), which allow for multiunit groundwater monitoring systems fail to address their concern.

Regarding the request for alternative groundwater monitoring criteria to mitigate the inappropriateness of requiring compliance with the CCR groundwater monitoring and corrective action requirements when the CCRMU has already completed closure under a State authority or when the CCRMU is already subject to another State or Federal groundwater monitoring program, the commenters did not provide any factual or specific information to support the conclusions that groundwater monitoring and corrective action is not appropriate for all CCRMU that have completed closure under a State authority or that utilizing or augmenting an existing groundwater monitoring network that may have been required as part of the State closure or other groundwater monitoring program would be infeasible or inappropriate. Furthermore, as explained in Unit III.C.4.e, EPA received comments regarding State closures during which no groundwater monitoring was required, thereby highlighting the need for groundwater monitoring and corrective action, if necessary, even in situations in which closure has been completed under a State authority.

For those commenters requesting that EPA adopt ''risk-based groundwater monitoring and corrective action'' into the requirements, EPA notes that the commenters have provided no further explanation of what requirements in the existing regulations they wanted EPA to revise, what the revisions should accomplish, or any factual basis for why they are necessary or appropriate. As a general matter EPA considers that the corrective action regulations in §§ 257.95 through 257.98 do currently require facilities to tailor remedies to address the risks to human health and the environment, based on the conditions at the site. It is unclear what more the commenters are seeking. Accordingly, EPA is finalizing the proposal that CCRMU comply with the existing groundwater monitoring and corrective action requirements with one modification, combined detection and assessment monitoring.

However, EPA agrees that having a single deadline for groundwater monitoring requirements as opposed to two deadlines allows flexibility to complete tasks, such as installing groundwater wells and collecting independent samples, that is necessary for compliance with a nationwide rule. The activities involved in achieving compliance with the groundwater monitoring requirements (*i.e.,* drilling wells, collecting samples, receiving lab results) are more susceptible to factors outside a facility's control, such as extreme weather events, shortages of qualified contractors, and permitting or approval delays, and therefore, warrant greater flexibility. Additionally, activities can be restricted dependent on the time of year and the location of the facility (*e.g.,* due to seasonality, protected species, clearing restrictions). Because the groundwater monitoring requirements build upon each other, EPA must ensure that facilities nationwide are reasonably able to achieve regulatory compliance by the deadline. Utilizing a single deadline for the groundwater monitoring requirements allows facilities to make reasonable accommodations for regional factors in a way the proposed deadlines do not, while still maintaining the same level of protection for human health and the environment. Furthermore, EPA agrees that the proposed rule does not have a clear mechanism for facilities to prove compliance or for interested parties to verify compliance with the separate deadlines for the installation of the groundwater monitoring network and the development of the groundwater sampling and analysis plan.

As stated in Unit III.C.4.a, EPA recognizes that the proposed CCRMU deadlines did not provide sufficient time for the completion of the FER and therefore extended the deadline for the completion of the FER by 24 months as detailed in Unit III.C.3.c. The FER informs the owner or operator of the presence or absence of CCRMU at the facility, which is vital information for the completion of the groundwater monitoring system requirements (*i.e.,* design and installation of the groundwater monitoring system). As such, the deadline for the groundwater monitoring requirements must be extended as well to allow owners or operators time to locate CCRMU as part of the FER. Furthermore, EPA was convinced that the deadlines for compliance with the legacy CCR surface impoundments and CCRMU requirements should be offset to mitigate impacts mentioned by commenters regarding the current labor shortages and backlogs experienced by third-parties necessary to accomplish tasks involved in complying with the groundwater monitoring requirements (*e.g.,* drillers for well installation, laboratories for sample analysis) and the need for owners or operator of inactive facilities to first determine if there are legacy CCR surface impoundments onsite. Finally, based on the above-mentioned factors and the information provided by commenters, specifically the information regarding the suspected underestimation of the CCRMU universe due to historic facility-wide placement of non-containerized CCR on land, time needed to obtain necessary approvals (*e.g.,* State permits to drill water wells or clear vegetation), and to accommodate for seasonality, EPA has calculated 18 months as the appropriate extension of the groundwater monitoring system deadlines for the latest groundwater monitoring requirement. In the proposed rule, the latest proposed deadline for groundwater monitoring requirements was the deadline of 24 months from the effective date of this final rule for the initiation of the combined detection and assessment monitoring and the collection of the eight baseline samples. Therefore, EPA is finalizing a single deadline of no later than 42 months after the effective date of this final rule for the groundwater monitoring requirements found at §§ 257.90 through 257.95.

i. Design and Installation of the Groundwater Monitoring System for CCR Management Units

EPA proposed that owners or operators of CCRMU install the groundwater monitoring system as required by § 257.91 no later than six months from the effective date of this final rule. EPA further proposed that existing monitoring wells can be used as a part of the CCRMU groundwater monitoring systems provided the wells meet the Federal criteria. As explained in the proposed rule, based on the amount of time most facilities needed to complete or to collect baseline sampling, EPA calculated that facilities would be able to install the necessary monitoring wells within a single year.

As mentioned earlier, some commenters supported the expedited deadlines. However, most commenters stated the proposed deadline of six months from the effective date of the final rule for the design and installation of the groundwater monitoring network was infeasible and should be extended to no less than 24 months from the effective date to align with the 2015 rule deadline. As explained above, many of these commenters expressed the need for a single deadline for groundwater monitoring requirements. Furthermore, as described in Unit III.C.4.a of this preamble, these commenters cited seasonality restrictions, the nationwide labor shortages, limited qualified contractor availability, the need for State approvals and permits, and the number of facilities competing for limited resources as reasons for why the proposed expedited deadline is infeasible. A few commenters noted that in recent decisions on Part A demonstrations, EPA cited deficiencies in the groundwater monitoring network as a basis for noncompliance. These commenters went on to state that the proposed deadline does not facilitate the establishment of a monitoring system that would meet the standards laid out in the CCR rule or the recent proposed decisions and thus, the proposed deadline creates de facto non-compliance. Some of these commenters elaborated by saying that the deadline does not allow facilities to acquire the permits that may be required to drill wells and precludes the observation of groundwater levels over time, which is needed to properly characterize groundwater flow. Other commenters stated meeting the proposed compliance deadline would prevent a facility from conducting proper site characterization, which is needed to inform well placement and depth and providing P.E.s sufficient information to certify the groundwater monitoring system. Lastly, commenters stated that contrary to EPA's assertion in the proposed rule that expediting the installation of the groundwater monitoring network is protective of human health and the environment, to meet the proposed deadline, facilities would likely be forced to design groundwater monitoring systems based on inadequate data resulting in unreliable groundwater monitoring data. Commenters provided estimates of time needed to comply with the design and installation of the groundwater monitoring system requirements ranging from nine to 36 months.

As stated in Unit III.C.4.a of this preamble, in response to comments EPA reevaluated the compliance deadline for the design and installation of the groundwater monitoring network and found the information provided regarding the general infeasibility of the proposed deadline compelling. Specifically, EPA agrees that more time is needed to allow inactive facilities time to determine if a legacy CCR surface impoundment is online prior to complying with the CCRMU requirements and to account for limited third-party availability (*e.g.,* contractor shortages and laboratory backlogs), seasonality and extreme weather events, procuring a contractor, complying with overlapping regulatory requirements, and coordinating with outside parties. EPA acknowledges the importance of proper site characterization as the foundation for designing a groundwater monitoring system and is convinced that although there may be some facilities that have adequate information for site characterization, many of these facilities, especially inactive facilities, may need to conduct more extensive site reconnaissance and field work to obtain the necessary information due to the widespread use of non-containerized CCR across facilities. EPA further recognizes that groundwater monitoring systems designed using inadequate data would be unable to properly monitor groundwater quality coming from the unit and therefore would not be protective of human health and the environment. Lastly, because EPA is convinced by information from the commenters that facilities would be unable to conduct all the steps necessary to design and install a groundwater monitoring system capable of meeting the standards in § 257.91 by the proposed deadline, EPA has extended the deadline.

As stated in Unit III.C.4.c, based on information provided by commenters, EPA concluded that a single deadline of 42 months from the effective date of this final rule should be used for the groundwater monitoring requirements. Therefore, EPA is finalizing a deadline for the completion of the design and installation of the groundwater monitoring system of no later than Monday, May 8, 2028, which is 42 months from the effective date of this final rule. This is codified in the regulatory text at § 257.90(b)(3)(i).

To complete the installation of the groundwater monitoring system, the owner or operator of a CCRMU must ensure the monitoring system consists of sufficient number of wells both upgradient and downgradient of the CCR unit, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that accurately represent the quality of background groundwater and groundwater passing the downgradient waste boundary of the CCR unit, monitoring all potential contaminant pathways. 40 CFR 257.91(a)(1) through (2). Because hydrogeologic conditions vary so widely from one site to another, the regulations do not prescribe the exact number, location, and depth of monitoring wells needed to achieve the general performance standard. Rather the regulation requires installation of a minimum of one upgradient and three downgradient wells, as well as any additional monitoring wells necessary to achieve the general performance standard of accurately representing the quality of the background groundwater and the groundwater passing. See, 80 FR 21399. The number and placement of the monitoring wells is critical to proper characterization of the groundwater. Thus, the specific number, spacing, and depth of the monitoring wells must be determined based on site-specific information, including but not limited to the thorough characterization of aquifer thickness, groundwater flow rate, groundwater flow direction throughout seasonal and temporal fluctuations, the unit's geological setting, and the unit's hydrogeological setting.

The monitoring wells must be cased, constructed, operated, and maintained in a way that preserves the integrity of the monitoring well borehole, screened interval and other components so as to ensure the well performs to the design specifications throughout the life of the monitoring system. EPA expects owners or operators to ensure the groundwater monitoring wells are adequately protected from activities that may damage the wells or otherwise adversely impact their performance, such as accidental damage caused by livestock, vehicles, machinery, or other activities near the unit.

The owner or operator of the unit must ensure that the design, installation, development, and decommissioning of any aspect of the groundwater monitoring system is thoroughly documented and included in the operating record. Furthermore, the owner or operator must obtain a P.E. certification or approval from the Participating State Director or EPA stating the groundwater monitoring system meets the standards set out in § 257.91.

ii. Development of the Groundwater Sampling and Analysis Plan for CCR Management Units

EPA proposed to require owners or operators of CCRMU to comply with the existing groundwater sampling and analysis program requirements for CCR units, including the selection of the statistical procedures that will be used for evaluating groundwater monitoring data. 40 CFR 257.93. EPA proposed a deadline of no later than six months after the effective date of the final rule for owners or operators to comply with this requirement.

One commenter suggested EPA prohibit use of intrawell groundwater data comparisons for CCRMU. This commenter stated that intrawell comparisons are only appropriate when the background samples are collected before CCR was placed in the unit and therefore, since these units are likely already contaminating groundwater, they would be ineligible for intrawell data comparisons. Other commenters requested EPA allow alternative groundwater monitoring requirements, such as alternative groundwater sampling procedures and statistical analysis because of the inability to collect groundwater samples unaffected by CCR at some facilities due to the number of CCRMU at the site. As stated in Unit III.C.4.c, the existing groundwater monitoring and corrective action requirements are essentially the same requirements that have been applied to both hazardous waste and municipal solid waste disposal units for decades, and with the one exception discussed below, there is nothing about CCRMU that makes them distinct enough to warrant separate or additional requirements. Furthermore, while EPA expects many CCRMU have leaked or are potentially leaking, the commenter did not provide any evidence for creating a prohibition against intrawell data comparisons. Therefore, EPA will not be finalizing a prohibition on intrawell data comparisons at CCRMU. However, EPA acknowledges that since the 2015 CCR Rule went into effect, intrawell groundwater data comparisons have been misused to a large degree. Regarding the commenter who stated that the owner or operator would be unable to accurately represent background groundwater quality due to the potential extensive presence of CCRMU across the facility, during implementation of the 2015 CCR Rule, EPA has not found a situation in which representing background groundwater quality was impossible nor does EPA believe such a situation exists, as owners or operators are allowed to collect samples as far upgradient as needed, even offsite, to ensure that the groundwater sample is not impacted by CCR. Additionally, at § 257.91(a)(1), EPA allows the owner or operator to collect background groundwater samples at other representative wells when hydrogeologic condition do not allow the determination of what wells are hydraulically upgradient wells or when other wells are more representative of background groundwater quality than upgradient wells. Furthermore, the commenter's assertion relied solely on the exhaustive presence of CCRMU at the facility as evidence of the inability to represent background water quality and did not provide any factual basis to support their claim that the requirement to establish background groundwater quality as part of the groundwater monitoring requirements is infeasible. EPA is therefore finalizing this provision without revision. This is codified in the regulatory text at § 257.90(b)(3)(ii).

EPA received several comments on the proposed deadline for the development of the groundwater sampling and analysis plan. As mentioned in Unit III.C.4.c, some commenters supported the expedited deadline. However, several other commenters pointed out that the sampling and analysis plan cannot be completed prior to the collection of the baseline samples, which had a proposed deadline of 24 months from the effective date. Many of these commenters went on to state that the proposed expedited deadline for the development of the sampling and analysis plan could result in too frequent sampling leading to non-independent, autocorrelated baseline samples for a large number of facilities, undermining the required statistical analysis. A few commenters further stated that EPA published decisions on Part A and Part B demonstrations citing lack of statistical independence in sampling as a basis for non-compliance, and failure for EPA to extend the deadline for the sampling and analysis plan to allow adequate time for facilities nationwide to gather independent samples would create de facto non-compliance.[143] Commenters also said that the proposed deadlines do not account for the backlogs already experienced due to the existing CCR units using the small number of laboratories qualified to conduct the specialized analyses required by the rule, coupled with the national labor shortages. The commenters predicted the backlogs with laboratories will only increase with the regulation of legacy CCR surface impoundments and CCRMU, making the proposed deadlines even more infeasible. Finally, as mentioned in Unit III.C.4.c, commenters emphasized the need for one deadline for all groundwater monitoring requirements.

EPA agrees that a sampling and analysis plan cannot reasonably be completed before the collection of baseline samples. EPA also acknowledges the adverse impact of too frequent sampling on the validity of statistical analysis and the need to account for seasonal variability in groundwater flow, groundwater levels, and constituent concentrations. EPA further acknowledges that providing insufficient time for the collection of baseline samples or the development of the sampling and analysis plan would likely result in ineffective groundwater monitoring programs that may fail to alert facilities to groundwater contamination coming from CCR units. As explained in Unit III.C.4.a and Unit III.C.4.c respectively, EPA recognizes the need for more time to accommodate third-party availability and a single deadline for the groundwater monitoring requirements. As stated in Unit III.C.4.c.i, for the reasons laid out above, EPA is finalizing a single deadline for the groundwater monitoring requirements of no later than Monday, May 8, 2028, which is 42 months from the effective date of this final rule. This is codified in the regulatory text at § 257.90(b)(3)(ii).

The owner or operator must develop the groundwater sampling and analysis program that satisfies the requirements in § 257.93 and includes a list of monitoring wells to be sampled (*i.e.,* the monitoring network), the schedule for sampling, sampling procedures and techniques, sample preservation and shipping protocols, analytical procedures including an appropriate statistical method for analysis, and quality assurance and quality control methods. The sampling and analysis plan must include all analytes listed in Appendix III and Appendix IV. Recommendations and information on how to comply with many of the requirements for the groundwater sampling and analysis program (*e.g.,* analytical procedures, QA/QC controls, sampling protocol) can be found in the following EPA guidance documents (*e.g., RCRA Groundwater Monitoring: Draft Technical Guidance,* 1992, EPA/530/R–93/001; *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures,* 1996, EPA/540/S–95/504).

iii. Detection Monitoring Program and Assessment Monitoring Program Combined

EPA proposed to require sampling and analysis of constituents listed in Appendix IV at the same time as those listed in Appendix III. The proposed rule explained that this would expedite groundwater monitoring and initiation of corrective action by at least six months at sites where units have potentially been leaking for a long period of time, as is likely the case at CCRMU. The proposed rule further explained that the expediting Appendix IV constituent detection and any resulting corrective action is necessary for the protection of human health and the environment. EPA proposed no other revisions to the existing groundwater monitoring requirements in §§ 257.90 through 257.95.

EPA received several comments on its proposal to combine detection and assessment monitoring. One commenter pointed out the increased demand on laboratory services, facility staff and/or contractors, and professional engineers that would result from having CCRMU comply with both monitoring programs simultaneously. Another commenter stated that by combining detection and assessment monitoring and assuming groundwater contamination, EPA has rendered detection monitoring superfluous. Further, the commenter asserted that skipping detection monitoring entirely would lose critical data regarding whether there are statistically significant increases in groundwater constituents specifically due to the unit being monitored. One commenter stated that EPA lacked the record demonstrating risk posed by CCRMU to warrant combined detection and assessment monitoring and should either maintain the approach in the existing regulations or only apply groundwater monitoring to those CCRMU that have been identified as a source of an SSI or SSL in an ASD. Another commenter said that the justification in proposed rule regarding phased groundwater monitoring being ''best suited to situations where there is little likelihood of pre-existing contamination'' conflicts with EPA's position in the 2015 CCR Rule. According to the commenter, in the 2015 CCR Rule, the Agency was aware many CCR surface impoundments were decades old and potentially leaking; yet EPA still adopted a phased approach with detection monitoring to monitor indicators of potential groundwater contamination and assessment monitoring to determine if releases of CCR constituents of concern did occur.

As a practical matter, EPA expects combining Appendix III and Appendix IV constituents into a unified sampling and analysis plan and approach will likely have only minor effects on schedules, as this change will not require additional field mobilizations or sampling events and will only require collection of a slightly larger number of sample containers at each monitoring well to allow for analysis for both Appendix III and IV constituents. As such, no additional shipments of

[143] On January 25, 2023, EPA proposed determinations on six Part B applications for alternate liner demonstrations (''Part B''). All six proposals are proposed denials. The CCR Part B Final Rule (85 FR 72506, November 12, 2020), allowed a limited number of facilities to demonstrate to EPA or a Participating State Director that, based on groundwater data and the design of a particular surface impoundment, the unit has and will continue to ensure there is no reasonable probability of adverse effects to human health and the environment.

samples to the analytical laboratory will be required. However, EPA acknowledges that combining Appendix III and Appendix IV constituents into a unified sampling and analysis plan may increase the total throughput burden on analytical laboratories and related services. Similarly, while combined monitoring may require additional evaluation (*e.g.,* concentration and trend analysis of data concerning both Appendix III and Appendix IV constituents), this incremental increase is unlikely to significantly increase the overall reporting level of effort, as the number of reports will be essentially unchanged.

Nevertheless, as discussed in Units III.C.4.a and III.C.4.c of this preamble, EPA acknowledges the commenters' concerns regarding existing and projected labor shortages, backlogs, and third-party availability, and agrees this has the potential to affect facilities' ability to comply with the proposed deadlines for groundwater monitoring requirements. EPA is therefore extending the deadline, as well as building in flexibility for facilities to accommodate for delays, by finalizing a single deadline for groundwater monitoring requirements in lieu of the proposed split deadlines.

However, EPA disagrees that combining detection and assessment monitoring will render detection monitoring redundant, and that critical data would be lost, by sampling for Appendix IV constituents at the same time as Appendix III constituents (*i.e.,* by collecting more information). The commenters provided no further explanation of what information they thought would be lost, but under the combined monitoring, the facility would collect the same information on Appendix III constituents that is collected under the detection monitoring in § 257.94. Given that under the existing assessment monitoring provisions, facilities must simultaneously analyze samples for all parameters in Appendix III and for any Appendix IV constituent detected in the initial sampling, it is not apparent why the commenter believes that requiring simultaneous monitoring more broadly is appreciably different. 40 CFR 257.95(d)(1).

As stated in the previous paragraph, concurrent monitoring for Appendix III and Appendix IV constituents provides considerably more information and enables a more complete understanding of the geochemical nature, fate, and transport of any detected releases. Additionally, simultaneously collecting samples for Appendix III and Appendix IV constituents will still provide the basis for determining SSIs, should they exist, so no information will be lost. Contrary to the commenter's concern, additional information will be gained in an expedited manner (*e.g.,* the potential spatial and temporal correlation of Appendix III SSIs with exceedances of SSLs for Appendix IV constituents). Furthermore, EPA disagrees that its explanation that phased groundwater monitoring is ''best suited to situations where there is little likelihood of pre-existing contamination'' fundamentally conflicts with EPA's decision to adopt phased monitoring in the 2015 CCR Rule. Unlike this rule, the 2015 CCR Rule applied to both new facilities, which would be expected to have little likelihood of pre-existing contamination, and to existing facilities. Over the long-term, EPA expected that there would eventually be a greater percentage of new units than existing units as the older units reached capacity and closed. In addition, as discussed in the proposal at 88 FR 32010 and in Unit III.A.2 of this preamble, it is clear from the data posted on facilities' websites that in 2015 EPA significantly underestimated the number of unlined units (both impoundments and landfills), and consequently, significantly underestimated the number of leaking units and the extent of contamination at these sites.

Under the phased approach in the current regulations, detection monitoring was intended to provide an early detection of whether groundwater was potentially being contaminated. In selecting the parameters for detection monitoring, EPA chose constituents present in CCR that would be expected to move rapidly through the subsurface and thus provide an early detection of a potential problem before significant releases of constituents of greatest concern (*i.e.,* those in Appendix IV) had occurred. This approach rests on a presumption that the unit is not already leaking and the record shows (see Unit III.C.1) that presumption is largely inappropriate for CCRMU.

If an alternate source is causing an exceedance of an Appendix III constituent, it may also be the source of any SSL detected for any Appendix IV constituents; in such a case, a facility may simply prepare a single ASD that covers constituents from both appendices. The sole difference between phased monitoring and combined monitoring is if the alternate source is only responsible for the Appendix III constituent, but the unit actually is releasing one or more Appendix IV constituents. In such a case, under a phased approach detection of the Appendix IV constituent can be delayed or even remain undetected, because the facility would not trigger assessment monitoring absent an SSI from another Appendix III constituent. In such situations, combined monitoring can make the monitoring program more accurate; it is unclear why the commenter believes this is inappropriate.

Ultimately, the combined monitoring expedites the initiation of assessment monitoring which in turn, allows for more expeditious identification of statistically relevant exceedances of Appendix IV constituents. This will in turn expedite ASD development or corrective action, depending on the circumstances.

The phased approach in the 2015 CCR Rule provides for a graduated response to groundwater contamination as the evidence of contamination increases over time. This approach allows facilities ample time to investigate the source of contamination as well as the transport characteristics of CCR constituents in groundwater, while usually being protective of human health and the environment. However, at sites where there is a strong likelihood that groundwater contamination has been occurring for a long time, the advantages provided by a protracted graduated response are outweighed by disadvantages of persistent or even increasing contamination that continues to move downgradient. At these sites, the need to protect human health and the environment necessitates the quick detection of Appendix IV constituents of concern to expedite any necessary corrective action. See, *USWAG,* 901 F.3d at 427–30. In this case, as highlighted in Unit III.A, the record provides strong reason to conclude that many CCRMU are contaminating groundwater, given the large number of currently regulated CCR units that have been found to be leaking.

Therefore, EPA is finalizing this requirement as proposed to be completed no later than Monday, May 8, 2028, which is 42 months after the effective date of this final rule. This is codified in the regulatory text at § 257.90(b)(3)(iv) and (v).

iv. Collection and Analyses of Eight Independent Samples for CCR Management Units

EPA proposed that no later than 24 months after the effective date of the final rule, owners or operators of CCRMU initiate the detection monitoring program by completing sampling and analysis of a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b). The proposed rule explained that within 90 days after initiation of the detection monitoring program, owners or operators must identify any SSIs over background levels for the constituents listed in Appendix III, as required by § 257.94. To expedite the time to initiate any required corrective action, EPA also proposed that by this same deadline owners or operators initiate the assessment monitoring program by establishing groundwater protection standards and by starting to evaluate the groundwater monitoring data for an SSL over GWPS for the constituents listed in Appendix IV as required by § 257.95.

EPA is finalizing this requirement as proposed. This is codified in the regulatory text at § 257.90(b)(3)(iii).

EPA received several comments on the proposed deadline for the collection of the eight baseline samples. As mentioned in Unit III.B.2.a.ii, some commenters supported the expedited deadline. However, several other commenters requested that the groundwater monitoring requirement deadlines be combined into a single deadline that provided at least as much time to come into compliance as was provided in the 2015 CCR Rule deadlines (*i.e.,* 24 months after the effective date of the final rule). As stated in Unit III.C.4.c, based on information provided by commenters, EPA concluded that a single deadline of 42 months after the effective date of this final rule should be used for the groundwater monitoring requirements. Therefore, EPA is finalizing a deadline for the completion of sampling and analysis of a minimum of eight independent samples for each background and downgradient well of no later than Monday, May 8, 2028, which is 42 months from the effective date of this final rule.

v. Preparation of Initial Groundwater Monitoring and Corrective Action Report for CCR Management Units

EPA proposed to apply the existing requirements in § 257.90(e) to CCRMU and require that owners or operators of CCRMU comply no later than January 31 of the year following the calendar year after a groundwater monitoring system has been established (and annually thereafter).

One commenter suggested that the initial groundwater monitoring and corrective action report be due no later than January 31 of the year following the collection of the eight baseline samples and the first semi-annual sampling event in order to allow facilities to provide all the documentation required by § 257.90(e). EPA disagrees that the information required by § 257.90(e) would not be available to a facility upon completion of the groundwater monitoring system, as the annual report serves as an update on the activities related to the groundwater monitoring program, including the installation of groundwater monitoring wells. Additionally, when specific actions are not required by the CCR regulations (*e.g.,* a facility has not triggered corrective action), facilities are not out of compliance merely because they do not have activities related to that action to discuss in the groundwater monitoring and corrective action annual report (*e.g.,* not describing progress in selecting a remedy when not in corrective action).

EPA is finalizing the requirement for owners or operators of CCRMU to comply with the requirements in § 257.90(e), which mandate the preparation of an annual groundwater monitoring and corrective action report no later than January 31, 2029 and annually thereafter. This is codified in the regulatory text at § 257.90(e).

The report documents the activities associated with the groundwater monitoring program and progress of any corrective action over the past year and must contain specific information identified in the regulations, including but not limited to maps; aerial images or diagrams showing the CCRMU and all upgradient (background) and downgradient wells; identification of any monitoring wells installed or decommissioned in the previous year; monitoring data collected under §§ 257.90 through 257.98; and a narrative discussion of any transition between monitoring programs (*i.e.,* detection and assessment monitoring). The annual reporting requirement will help ensure that groundwater level data collected over the reporting period is tabulated, presented, and analyzed to determine groundwater levels relative to any residual CCR left in place as well as to confirm or determine groundwater flow directions.

Upgradient and downgradient well locations and depths should be validated annually with respect to measured and mapped flow directions. Groundwater quality sampling data should be included in appendices and summarized and tabulated in the annual reports. If appropriate, exceedances (SSIs and SSLs) of Appendix III and IV constituents should be tabulated and highlighted. As mentioned in some comments, annual reports should identify the nearest downgradient surface water bodies as well as groundwater supply wells in the vicinity of the unit.

It is critical that annual corrective action and monitoring reports provide the basis for selection and documentation of corrective actions as early as possible. The owner or operator must not only document compliance in the annual report, but also post the annual report on the public CCR website to allow the public to review the groundwater monitoring results. It is critical that the annual reports contain the basic data which informs the positions and status reported in those documents, including but not limited to boring logs, monitoring well installation diagrams, water level data, field sampling data sheets for groundwater sample collection, laboratory analytical data including QA/QC data, data validation, etc. In summary, the annual groundwater monitoring and corrective action reports should not only contain the information required by the regulations but should be organized in such a way that: (1) Compliance with the CCR regulations is evident; (2) Data supporting compliance conclusions are easily located within the document; and (3) The public is readily able to review the groundwater monitoring data and related information. Lastly, the name of the document on the public CCR website should be such that it is clear what the file is and it must be capable of being readily printed and downloaded by the public.

vi. Corrective Action Requirements for CCR Management Units

EPA proposed to require owners or operators of CCRMU to comply with the existing corrective action criteria, as appropriate in §§ 257.96 through 257.98. The proposed rule explained that conducting the sampling simultaneously would expedite groundwater monitoring and, where necessary, initiation of corrective action by at least six months at sites where units have potentially been leaking for a long period of time, as is likely the case at many CCRMU. The proposed rule further explained that expediting Appendix IV constituent detection, assessment and any required corrective action would protect human health and the environment.

Under the existing regulations, if groundwater monitoring demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required, as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and any post-closure care period of the CCR unit.

A commenter suggested EPA create a deadline for the completion of the selection of remedy required by § 257.97 of 90 days after the completion of the assessment of corrective measures (ACM) with the ability to extend the deadline up to 180 days after the completion of the ACM. The commenter pointed to the failure of owners and operators of units regulated by the 2015 CCR Rule to select a remedy as soon as feasible after the completion of the ACM as required by the rule and the subsequent unnecessary delay in addressing contaminated groundwater. Other commenters stated that applying the existing groundwater monitoring and corrective action requirements to historic sites, such as CCRMU, is not appropriate and suggested that instead EPA incorporate site-specific risk-based corrective action or State corrective action programs into the CCR regulations. Finally, some commenters requested EPA adopt a RCRA subtitle C approach and utilize existing EPA guidance. One of these commenters further stated that the application of the existing CCR corrective action requirements conflict with EPA's decision-making frameworks in other programs such as RCRA and CERCLA due to lack of site-specific risk assessments to evaluate risk and drive corrective action decisions. This commenter suggested that EPA utilize site-specific, risk-based corrective action that is consistent with the guidance documents EPA has developed for RCRA and CERCLA programs.

EPA acknowledges the widespread non-compliance with the mandate to complete the selection of remedy as soon as feasible after the completion of the ACM. However, EPA disagrees with the commenter's suggested deadline for two reasons. First, the recommended deadline extends the deadline for the completion of the selection of remedy beyond that in 2015 CCR Rule since ''as soon as feasible'' in many cases would likely be before 90 days after the completion of the ACM and granting owners or operators more time to select a remedy would be less protective of human health and the environment. Second, EPA is taking action to address the non-compliance related to the failure of owner or operators to select a remedy as soon as feasible as part of the EPA's National Enforcement and Compliance Initiative and expects this enforcement initiative to address the concern raised by the commenter.[144]

EPA disagrees with the suggestion that existing corrective action requirements, if triggered, are inappropriate at CCRMU. As stated in Units III.A and III.C.4.d, the physical characteristics and potential risks of CCRMU are not sufficiently different from currently regulated units to justify different requirements. For those commenters requesting that EPA adopt ''risk-based corrective action'' into the requirements, EPA notes that the commenters have provided no further explanation of what requirements in the existing regulations they wanted EPA to revise, what the revisions should accomplish, or why such revisions are necessary or appropriate. As a general matter EPA considers that the corrective action regulations in §§ 257.95 through 257.98 do currently require facilities to tailor remedies to address the risks to human health and the environment, based on the conditions at the site. It is unclear what more the commenters are seeking. Additionally, regarding incorporating or allowing State corrective action programs to substitute for the existing corrective action requirements, the commenters failed to demonstrate through factual or specific information that the State corrective action programs referenced are either different than that required by the CCR regulations or adequate to address the risks posed by CCRMU. Even if individual examples were sufficient to overcome the record with respect to State programs generally, none of the examples presented by the commenters provided sufficient detail for EPA to actually evaluate the adequacy of the corrective action programs. More to the point, EPA lacks the record necessary to support a broad exemption for all CCRMU conducting corrective actions under any State requirements. Regarding comments requesting a RCRA subtitle C approach be adopted for CCRMU, a RCRA subtitle C approach is more appropriate for regulation under a permitting program than under the existing regulatory framework (*i.e.,* self-implementing) and as explained in Units III.A and III.C.1, EPA finds the risks posed by CCRMU to be not only credible but significant enough to warrant regulation at this time (*i.e.,* under the self-implementing rule as opposed to waiting until the Federal permitting program is established). Lastly, the commenter that stated that the existing corrective action regulations conflict with other EPA programs (*i.e.,* RCRA and CERCLA) failed to fully explain how the existing corrective action regulations conflict with EPA-published RCRA or CERCLA guidance documents or how they preclude corrective action decisions driven by site-specific risks. Accordingly, EPA is finalizing, without revision, its proposal that CCRMU comply with the existing corrective action requirements at §§ 257.95 through 257.98.

As explained in the proposed rule at 88 FR 32003, §§ 257.90 through 257.95 require that an owner or operator of a CCR unit to install a system of monitoring wells, specify procedures for sampling these wells, and set forth methods for analyzing the groundwater data collected to detect hazardous constituents (*e.g.,* toxic metals) and other monitoring parameters (*e.g.,* pH, total dissolved solids) released from the units (*i.e.,* all parameters listed in Appendices III and IV). If the groundwater monitoring required in § 257.95, demonstrates an exceedance of the groundwater protection standards for constituents identified in Appendix IV of part 257, corrective action is required as laid out in §§ 257.96 through 257.98. These requirements apply throughout the active life and post-closure care period of the CCRMU.

When corrective action is required, it must be initiated without delay, in accordance with the time frames laid out in the regulations. The corrective action program includes initiating an ACM to prevent further releases, to remediate any releases, and to restore affected areas to original conditions, as specified in § 257.96(a). After the ACM has been completed, the owner or operator must select a remedy that meets prescribed standards, including a requirement that the remedy attain the groundwater protection standards. See § 257.97(a) and (b). Finally, the corrective action program requires the owner or operator of the CCR unit to initiate remedial activities within 90 days of selecting a remedy. See § 257.98(a). The requirement to address releases under this requirement is identical to those requirements for any CCR unit undertaking groundwater corrective action with the additional requirement that implementation of corrective action begin during the active life of the unit.

EPA expects that when assessing corrective measures and selecting a remedy, the owner or operator of the unit will consider the impact of the corrective measures on the water quality and safety of the nearest surface water bodies and the nearest private and/or public groundwater wells.

With respect to completion of an ACM and remedy selection, § 257.96(a) requires an ACM be initiated within 90

[144] EPA Enforcement Alert, National Enforcement and Compliance Initiative, Protecting Communities from Coal Ash Contamination. EPA Document #310F23002. December 2023. *https://www.epa.gov/system/files/documents/2023-12/ccr-enf-alert-2023.pdf.*

days of determining an SSL has occurred, and then completed within another 90 days. An extension, not to exceed 60 days, may be warranted due to site-specific conditions or circumstances. Prior to closure of a CCR unit, the facilities have been required to characterize site conditions, including groundwater flow conditions and geology. The facilities have knowledge of the wastestreams and water volumes it discharges to CCR units. This information can be used to develop a groundwater model to predict groundwater flow conditions after waste stream disposal ceases and closure is initiated. Therefore, EPA believes this would provide sufficient characterization of post-closure conditions to assess and compare groundwater cleanup alternatives to complete an ACM.

Once the ACM is complete, a public meeting has been held, and community input has been considered, a remedy must be selected as soon as feasible. A selected remedy may include closure by removal to comply with source control requirements. This would constitute commencing implementation of a remedy. However, the selected groundwater remediation portion of the remedy must also be implemented within a reasonable time, in accordance with the schedule established in the remedy selection report. 40 CFR 257.97(d). Implementation of the source control measure does not negate this requirement.

d. Closure and Post-Closure Care Criteria for CCR Management Units

EPA proposed that all of the existing closure and post-closure care requirements in §§ 257.101 through 257.104 would apply to CCRMU, except for the alternative closure requirements in § 257.103(f). EPA further explained that the alternative closure provisions in § 257.103(f) were not appropriate for CCRMU as these units, by definition, are inactive impoundments at inactive facilities and could not therefore demonstrate the need to continue to use the disposal unit, which is a qualifying component of the alternative closure provisions. In addition, EPA solicited comments on two potential revisions to the existing closure standards in § 257.102(d). The first potential revision would extend the existing dewatering requirement in § 257.102(d)(2)(i) to any CCR landfill constructed in groundwater or otherwise saturated by liquids. The second potential revision would incorporate a definition of the term ''infiltration'' into § 257.102.

EPA also proposed to require that all CCRMU initiate closure within 12 months of the effective date of this final rule. While EPA proposed that the CCR unit closure requirements would apply, EPA also solicited comment on other approaches to how a facility might implement the requirement to close at a site where the CCRMU lies beneath an operating unit.

Finally, EPA proposed to apply the existing post-closure care requirements in § 257.104 to CCRMU. Each of these proposals and the comments are discussed in detail below.

EPA received numerous comments on its proposal to apply the existing closure and post-closure care requirements §§ 257.100–257.104 to CCRMU. Several commenters stated that EPA must require all CCRMU to close, because the risks EPA identified in the proposal, together with information provided by regulated facilities under the 2015 CCR Rule, indicate that CCRMU pose significant and ongoing threats of contamination if not properly closed. These commenters also identified several examples of units that the commenters believe demonstrate the need for CCRMU to close. One commenter referenced a report it submitted to support EPA's proposal to regulate CCRMU. The report focuses on six sites with both CCR units currently regulated by the CCR Rule and with CCRMU. According to the commenter the report documents significant and harmful coal ash pollution that has been allowed to persist under the 2015 CCR Rule and that would be remediated under the proposed rule.

> For example, the report analyzes the Brandywine Ash Management Facility in Maryland, which has a single landfill that its operator GenOn has treated as four distinct CCR dumpsites for purposes of the CCR Rule. This artificial division of the landfill has enabled GenOn to claim that three of the four areas of the landfill are unregulated under the CCR Rule; to attribute contamination at the site, such as molybdenum levels eighty times above the GWPS, to the three purportedly unregulated areas; and to keep the site in detection monitoring through ASDs. The Proposed Rule will compel GenOn to address all coal ash at the site. Another site that demonstrates the necessity of regulating CCRMU under the Proposed Rule is the Joliet #29 Station owned by Midwest Generation in Illinois. This site has one regulated pond, Ash Pond 2, and a number of additional units that would be treated as CCRMU under the Proposed Rule. In fact, the site was used for coal ash disposal long before it had a power plant, potentially as early as 1917, indicating the presence of unlined landfills going back decades. Midwest Generation has found statistically significant increases (''SSIs'') for TDS, sulfates, chloride, and calcium at the site, but is only monitoring the groundwater around Ash Pond 2 and two former ash ponds, and not monitoring the groundwater around three large onsite landfills.

These commenters also described a facility where, according to the commenters, two million tons of fill containing CCR sits behind corroding steel pilings on the shore of Lake Michigan, and is leaking arsenic and other hazardous chemicals into the lake, as well as into an adjacent creek commonly used for fishing and boating. These commenters also pointed to a facility with an inactive 90-acre unlined CCR landfill that, according to the commenter, is contaminating groundwater with unsafe levels of sulfate, lithium, radium, cobalt, arsenic, molybdenum and selenium. Similarly, a private citizen also provided the following example of a potential CCRMU during one of public hearings:

> My utility is City Utilities. Once the current coal ash landfill is full, CU plans to dispose of future coal ash at a temporarily closed landfill next to Lake Springfield, which feeds into the James River. Both dumps are in karst terrain. This makes them susceptible to sinkhole collapses and leakage of pollutants into the James River watershed and the area's shallow and deep aquifers. These waters affect a four-state area, including Table Rock Lake near Branson where tourism is the main industry. Safer methods of disposal exist, although they are more cumbersome and expensive, In December 2022, CU held a public meeting regarding the utility's future. After questions about pollution, one representative said he wasn't aware of any pollutants coming from the landfill. The Interdisciplinary Environmental Clinic at Washington University School of Law researched this. Twelve rounds of sampling done by CU from late 2016 to early 2018 showed 387 statistically significant increases in pollutants in every down-gradient well. Those increases included 27 out of the 35 monitored parameters. Regarding CU's dye tests at the dump site, a 2017 memo from the Missouri Department of Natural Resources stated, ''Dye is moving through the karst system and not being detected by the monitoring well network.''

These commenters also pointed to the high likelihood that many CCRMU have waste in contact with groundwater, as many are located in floodplains, wetlands, or near large rivers and lakes. According to the commenters, if EPA does not mandate closure of CCRMU, aquifer contamination would not be identified until it is too late to be prevented—in contravention of RCRA's protectiveness standard. These commenters have also argued that CCRMU are inactive units with no practical justification to avoid closure.

A number of other commenters however argued that a national requirement to close was not appropriate for CCRMU and that EPA should instead determine whether closure is warranted at each site based on a finding that the individual unit at that particular site poses unacceptable risks. Many of these commenters suggested that the risks associated with CCRMU can be better managed through corrective action implemented under a permit program, which the commenters believed would make the mandate to close these units unnecessary. For example, one commenter claimed that mandating the closure of all CCRMU as part of the proposed CCR corrective action regime is more stringent than what EPA requires under subtitle C for solid waste management units (SWMUs), and therefore any final CCRMU rule cannot impose a mandatory closure requirement on CCRMU. According to this commenter, the subtitle C process does not require the closure of SWMUs, because EPA recognizes that addressing the risks from SWMUs via the site-specific subtitle C corrective action process alone is fully protective. Many commenters also raised concern that CCRMU at their facilities are located beneath vital infrastructure, such as pipelines or transmission lines, active CCR units, or buildings and that requiring closure of these CCRMU could adversely impact grid reliability, business operations, or other necessary public services (*e.g.,* military infrastructure). These commenters suggested that EPA exempt these units or at least extend the closure time frames to allow for closure of the CCRMU when the other unit or structure is closed or decommissioned.

Numerous commenters again requested that EPA exempt any CCRMU that had been closed in accordance with State requirements. These commenters claimed that these closures were protective and that EPA should only regulate these CCRMU where the Agency has affirmative evidence that the particular unit is contaminating groundwater or otherwise presents unacceptable risks. For example, one commenter stated that a more rational approach to regulating CCRMU would be first to determine if the uses are impacting groundwater before requiring expensive closure. According to the commenter,

[i]t is not clear why EPA requires closure before groundwater data indicates there is a problem. If groundwater is impacted by the CCRMU then other corrective action measures should be taken, but only after data indicates that groundwater is being affected. As noted earlier, the 2015 CCR Rule did not require unlined landfills to close unless they failed to meet the location restrictions for unstable areas. In the event an unlined CCR landfill is the source of groundwater contamination, the unit is subject to the CCR Rule's corrective action requirements, but closure is not mandatory.

But many other commenters characterized the proposed deadline as infeasible for the reasons discussed in Unit III.B.2.a.ii, including seasonality, the need to comply with overlapping regulatory requirements, labor shortages, and the limited resources available to achieve compliance (*e.g.,* contractors, laboratories, P.E.s), which the commenters claimed would become even more limited as a consequence of the number of CCR units that would need to come into compliance at the same time. Commenters also stated that compliance with the closure requirements should not be required until after the groundwater monitoring system was installed and baseline samples collected so that closure could be informed by the groundwater monitoring data.

EPA has largely adopted the proposal, with a few significant revisions. This final rule requires CCRMU that contain 1,000 tons or greater of CCR to comply with the existing closure and post-closure care requirements in §§ 257.101 through 257.104, except for the alternative closure requirements in § 257.103(f). The final rule also extends the existing dewatering requirement in § 257.102(d)(2)(i) to any CCR landfill constructed in groundwater or otherwise saturated by liquids, and incorporates a definition of the term ''infiltration'' in § 257.53.

However, consistent with the provision adopted for legacy CCR surface impoundments, EPA is deferring, in certain cases, the requirement to demonstrate compliance with § 257.102 for CCRMU that closed prior to the effective date of this rule in accordance with alternative requirements that are likely to be as protective as the requirements in § 257.102. This is the same provision that EPA is establishing for legacy CCR surface impoundments, as EPA is not aware of a reason to treat CCRMU differently. In addition, EPA is deferring the requirement to initiate closure where the CCRMU is located beneath critical infrastructure or large buildings or structures vital to the continuation of current site activities, such as beneath high power electric transmission towers, air pollution control or wastewater treatment systems, large buildings, or an electrical substation. In this case, the potential exists for adverse, localized impacts on electric reliability (*e.g.,* voltage support, local resource adequacy) from requiring all facilities to meet these requirements on the same time frame, and EPA lacks the record to determine that such impacts are unlikely. Consequently, EPA is deferring the requirement to initiate closure of such a CCRMU until the infrastructure is no longer needed, a permit authority determines closure is necessary to ensure that there is no reasonable probability of adverse effects on human health or the environment, or the closure or decommissioning of the facility, whichever occurs first.

Finally, EPA has extended the deadline to initiate closure to Wednesday, November 8, 2028, which is 48 months the effective date of the final rule to allow groundwater monitoring data to inform closure, consistent with the approach for legacy CCR surface impoundments.

Each of these issues are discussed in greater detail in subsequent sections of this preamble.

i. Requirement To Initiate Closure

The final rule requires CCRMU containing 1,000 tons or greater of CCR to close. Closure will address the existing risks associated with these units. In addition, requiring the closure of CCRMU is consistent with the existing regulations, which require closure of all units that no longer receive waste as a preventative measure, whether or not the unit is currently leaking. See, 40 CFR 257.102(e)(1). CCRMU, which consist of inactive CCR landfills and previously closed CCR surface impoundments and CCR landfills, meet these criteria as they also no longer receive waste.

The closure of CCRMU of 1,000 tons or greater also provides significant risk mitigation. As laid out in Unit III.A of this preamble, CCRMU at both active facilities and inactive facilities with legacy impoundments pose risks to human health and the environment that are at least as significant as the risks presented by legacy CCR surface impoundments and the units currently regulated under the 2015 CCR Rule. In particular, for highly exposed individuals off site, landfill CCRMU were estimated to pose cancer risks as high as 7×10^{-6} from arsenic III, while surface impoundment CCRMU were estimated to pose cancer risks as high as 8×10^{-5} from arsenic III and noncancer HQs as high as two for arsenic III, two for lithium, and one for molybdenum. Differences in national risks between currently regulated units and these older units are attributed largely to the proportion of units that were modeled at the time as lined. However, the risks associated with these older units may be even higher than EPA modeled in the 2014 Risk Assessment for active units. These units have been present onsite longer and had more time to leak. In addition, there are several management practices that have the potential to result in higher leakage, but that were previously modeled either less frequently for active units—based on a belief that the practices had declined over time—or not at all—due to data constraints on a national scale. These include: (1) The greater prevalence of unlined units; (2) The greater likelihood of co-management of CCR with coal refuse and other wastes in surface impoundments, making the overall waste pH far more acidic and (3) The potential for the units to be constructed below the water table or to have become inundated with groundwater after the time of construction. As discussed in Unit III.A, each of these practices individually have the potential to result in nationwide risks higher than previously reported on a national basis for the currently operating universe of CCR units. For example, unlined landfill CCRMU were estimated to pose cancer risks as high as 1×10^{-5} from arsenic III, while unlined surface impoundment CCRMU were estimated to pose cancer risks ranging from 2×10^{-4} from arsenic III and noncancer HQs as high as 5 for arsenic III, 3 for lithium, 2 for molybdenum, and 1 for thallium. A combination of these practices could push risks even higher than modeled.

In addition, the modeling conducted in 2024 confirms that smaller CCRMU fills can meaningfully contribute to groundwater contamination across a facility. The 90th percentile concentrations at the waste boundary exceeded GWPS by factors of 26 for arsenic III, 19 for arsenic V, 156 for molybdenum, and 19 for thallium. The 50th percentile concentrations exceeded GWPS by a factor of two for molybdenum. EPA's modeling also confirms that any prior contamination from CCRMU is likely to still be present. EPA calculated, for example, that it could take around 2,300 years from the time of first exceedance for high-end releases of arsenic V to fully dissipate.

Depending on their location, leakage of Appendix IV constituents from individual CCRMU fills may not migrate off-site at levels of concern. However, according to the commenters it is highly unlikely that only one CCRMU would be present on-site. In addition, these concentrations can combine with contamination from other CCRMU, currently regulated CCR units, or legacy CCR surface impoundments that are also present on the same site. EPA did not model the aggregate or cumulative risk associated with these potential sources of co-located contamination, which may underestimate the risks. At a minimum, EPA expects that the presence of multiple sources of potential contamination at the same facility would increase the likelihood of a contaminant plume that could migrate off-site at levels of concern. In sum, the record confirms that, at a minimum, regulation of the smaller sized CCRMU fills is necessary for any corrective action to successfully reduce the concentrations of Appendix IV constituents in the aquifer to concentrations below the GWPS.

Available toxicological profiles indicate that ingestion of arsenic is linked to increased likelihood of cancer in the skin, liver, bladder and lungs, as well as nausea, vomiting, abnormal heart rhythm, and damage to blood vessels; ingestion of lithium is linked to neurological and psychiatric effects, decreased thyroid function, renal effects, cardiovascular effects, skin eruptions, and gastrointestinal effects; and ingestion of molybdenum is linked to higher levels of uric acid in the blood, gout-like symptoms, and anemia. 80 FR 21451. To date, groundwater monitoring required by the 2015 CCR Rule has revealed that at least 40% of currently regulated surface impoundments and landfills have identified groundwater contamination and require corrective action to mitigate the associated risks. This number is expected to increase as more facilities come into compliance with the groundwater monitoring requirements. Another 23% of existing CCR units have identified evidence of leakage and continue to monitor groundwater to ensure that contamination does not occur before the unit can be closed and source controls put in place. In many cases, CCRMU are historical landfills and surface impoundments. Thus, the relevant release pathways, exposure routes, and associated harm that can result are the same.

Given the locations of many CCRMU (located in floodplains, or wetlands, or near large surface water bodies), EPA is also concerned that the base of these units may intersect with the groundwater beneath the unit. If such CCRMU were not required to close, EPA would not adequately address the risks from those units that still contain CCR saturated with free liquids.

In general, EPA considers that closure is the only effective way to adequately address the source of potential or existing releases from these units. Although, as some commenters suggested, EPA could rely upon the existing corrective action requirements to achieve source reduction, the Agency is concerned that this will not adequately prevent harm, as the statute requires, because these requirements would only apply upon a determination that the CCRMU has contaminated the aquifer above the GWPS. In addition, the closure requirements in § 257.102 provide a uniform approach that EPA is confident will adequately protect human health and the environment.

Contrary to the commenter's contentions the regulation of CCRMU under RCRA section 4004(a) is not analogous to the corrective action requirements applicable to SWMUs under RCRA section 3004(u). Nor is the absence of a national mandate to close SWMUs as part of every corrective action under section 3004(u) based on the recognition that closure is unnecessary because the corrective action process alone is fully protective. The closure and corrective action regulations are distinct and independent requirements that generally serve different purposes. The closure requirements under both subtitle C and D are largely intended to be prevent contamination from occurring in the first place, by ensuring that the closed unit does not become a source of future contamination. See, *e.g.,* 47 FR 32318, 32321, 32323. By contrast, corrective actions are remedial or retrospective in that they are designed to clean up contamination that has already occurred. EPA has previously promulgated regulations mandating the closure of disposal units for wastes under both subtitles C and D for wastes within each subsection's jurisdiction. See, 40 CFR 264, subpart G, 258, subpart F. But the requirement for corrective action of *solid waste* management units under the provisions applicable to hazardous wastes under section 3004(u) is an anomaly; Congress has otherwise limited subtitle C to the regulation of hazardous wastes. The appropriate comparison is thus not to EPA's regulation of SWMUs under subtitle C, but rather to EPA's regulation of hazardous waste units under subtitle C, where the Agency requires hazardous waste units to comply with both closure and corrective action requirements.

In sum, the record demonstrates that closure is warranted for CCRMU, even for those that are not yet leaking. As the D.C. Circuit explained, RCRA requires EPA to set minimum criteria for sanitary landfills that prevent harm, not merely to ensure that contamination is remediated. See, *USWAG,* 901 F.3d at 430.

Consistent with the requirements for legacy CCR surface impoundments, EPA is not requiring previously closed CCRMU to automatically re-close but simply to evaluate whether the unit meets the requirements of § 257.102(d), and if they do not, to take such measures as are necessary to bring the unit into compliance.

ii. Deferral for CCRMU Under Critical Infrastructure

As noted above, many commenters stated that some CCRMU are currently located beneath critical infrastructure. For example, a number of commenters stated that CCR has historically been used on-site at generating stations for many years as structural fill, including for utility line bedding, and under site infrastructure such as switchyards, coal piles, railroad embankments, and occupied buildings. Additionally, commenters pointed to many areas at their existing facilities with CCR currently located under existing critical energy infrastructure such as generating units, cooling towers, substations, levees, dikes, on-site wastewater treatment systems, dams, transmission towers, gas lines, and solar installations.

These commenters claimed that requiring closure of CCRMU beneath infrastructure could adversely impact grid reliability, business operations, or other necessary public services and suggested EPA create exemptions or extensions for these units. According to these commenters, attempting to close any of these areas under the rule's closure standards would not only be impossible, but also would require disturbing and/or even disassembling critical components of power plant's energy infrastructure, which would only further exacerbate the pressures on grid reliability. Other commenters raised concern that remediation would require removal of existing infrastructure to access the CCR, which in some cases could present significant operational risk and potential danger. As one commenter characterized it,

> Particularly at active power plants, requiring closure of CCRMU . . . would cause massive ripple effects that need to be more carefully considered. Closure would be incredibly disruptive for these type of sites—particularly given the inadequate time for electricity resource planning—and exacerbate the grid reliability challenges that co-ops and other utilities are already facing. Moreover, EPA must consider and allow for power plant owners to follow the mandated procedures put in place by the relevant balancing authority, such as regional transmission organizations or electric utilities, and by state authorities which have a role in ensuring the reliability of the local grid.

Several commenters also expressed concern about the closure of CCRMU located under active CCR landfills, asserting that such closures pose complex challenges that EPA did not fully understand or account for in the proposed rule. Many of these commenters asserted that these closed landfill or surface impoundment CCRMU present no risks. For example, one commenter discussed a closed surface impoundment located beneath its active CCR landfill. The commenter asserted that the permitted, Federally regulated CCR landfill above the closed unit, combined with the collective effect of the CCR landfill liner and leachate collection system, runoff controls, and engineered cap, keeps the impoundment isolated from exposure to stormwater runoff and other sources of water infiltration. The commenter further asserts that there is no evidence that this former impoundment is impounding or otherwise contains any significant amount of free liquids, and that such a condition is unlikely given the overlying landfill infrastructure.

By contrast, numerous commenters supported the proposed mandate to close due to the substantial risks that these kinds of "overfill" units can pose. As one of these commenters explained,

> In this situation the underlying CCRMU serves the function of the foundation of the overlying CCR unit. The liner of the overlying CCR unit serves as a cap over the underlying CCRMU. CCR contaminants released from either the overlying CCR unit or underlying CCRMU can adversely impact groundwater quality with little potential for distinguishing between contaminants released from one or the other of these units. Each of the co-located units must be capable of containing CCR contaminants if releases to the environment are to be avoided.
> Construction of a CCR unit over a previously existing CCRMU is known to have the potential to increase concentrations of CCR groundwater contaminants. A 2001 study by the Electric Power Research Institute (EPRI) showed that reducing the hydraulic gradient beneath a CCR impoundment can induce increased contaminant concentrations when the waste is in contact with groundwater. EPRI concluded that reducing the hydraulic gradient by dewatering an impoundment slowed groundwater flow and increased contact time between the waste and groundwater. Contact time between waste and water is an important variable that influences concentrations of contaminants found in groundwater.
> Release of contaminants from the overlying unit, while possible, is not necessary to cause increasing contaminant concentrations. The bottom liner of the overlying CCR unit reduces infiltration of water from above, reducing the hydraulic gradient and increasing waste/water contact time. The increased contact time can increase contaminant concentrations in downgradient monitoring wells.

The commenters acknowledged that where the waste in the CCRMU is dry and the owner/operator can assure that separation of the waste from water (groundwater and/or infiltration from above) will be maintained the unit may be closed in place under the CCR rule without posing ongoing risks. The commenter also noted, however, that where unlined waste units are continually or periodically in contact with groundwater, more extensive closure techniques such as engineering controls designed to prevent groundwater from flowing through waste or to stabilize the waste and fix contaminants in place may be attempted, or excavation and clean closure of the unit may ultimately be necessary.

Unlike the comments received on legacy CCR surface impoundments, the overwhelming majority of commenters provided concrete examples of concerns with respect the timing of closure activities for to CCRMU. In total, these commenters have provided sufficient information to raise a legitimate question whether adverse, localized impacts on electric reliability (*e.g.,* voltage support, local resource adequacy) could result from a nationwide requirement to close all CCRMU within the deadlines under the regulations.

EPA agrees that closing CCRMU underlying critical infrastructure at active generating facilities is very different and more challenging than closing disposal units at inactive utilities. When it was developing the proposal, EPA was unaware of the extent to which facilities had historically used CCR as part of the foundation supporting generating units, cooling towers, substations, or on-site wastewater treatment systems. In some cases, it appears that in order to close these CCRMU individual facilities may need to disturb substantial portions of the entire site and disassemble critical components of the power plant's energy infrastructure, such as high power electric transmission towers, and electrical substations.

EPA agrees that its proposal did not adequately account for this circumstance. This is particularly true in the case of a CCRMU located beneath infrastructure necessary for energy production, where the potential exists for adverse, localized impacts on electric reliability (*e.g.,* voltage support, local resource adequacy). This issue arises whenever multiple facilities need to take their EGU offline for an extended period to complete construction or other compliance activities. The likelihood of an adverse impact on electric reliability can be greater if multiple facilities need to schedule outages simultaneously in order to comply with EPA's closure deadlines. EPA understands that it is also possible that in some instances temporarily taking generating units (including coal-fired units) offline could have an adverse, localized impact on electric reliability (*e.g.,* voltage support, local resource adequacy). If a generating asset were needed for local reliability requirements, the grid operator might not approve a request for a planned outage. In such instances, the owners/operators of the generating unit could find themselves in the position of either operating in noncompliance with RCRA or halting operations and thereby potentially causing adverse reliability conditions. In addition, failure of an electric transmission or generation system can lead to substantial risks to human health (*e.g.,* if an outage impairs the ability of emergency services to function properly or it causes home heating or cooling systems to fail, which increases risk, particularly for vulnerable populations).

However, such impacts are far less likely to arise from an individual facility-specific decisions, and should normally be adequately managed by the established RTO processes for scheduling outages. EPA recognizes that this final rule provides a substantial amount of time for facilities to complete these closures. In contrast with the proposal, the final rule provides facilities 54 months to initiate closure, and depending on the CCRMU, the facility may have as much as an additional seven to 15 years to complete closure. Based on the comments, however it appears that the overwhelming majority of CCRMU below critical energy production infrastructure are likely to be landfills, and therefore the seven year deadline is more likely to be applicable.

Further, this situation is not analogous to the closure of unlined and clay lined impoundments in response to the *USWAG* vacatur, and thus the information used to develop the deadline for those CCR units in the Part A rule cannot be used to develop a comparable requirement for these CCRMU. For example, there appear to be a greater number of CCRMU at these sites and the construction estimates EPA relied upon in 2020 in the Part A final rule applied exclusively to the six specific technologies that a facility might use to develop alternative disposal capacity. That rulemaking did not involve the potential effect of disturbing substantial portions of the entire site or disassembling critical components of the power plant's energy infrastructure, such as high power electric transmission towers or electrical substations, which is what some commenters have alleged will be necessary in this case.

Unfortunately, because EPA only became aware of these facts after development of the proposal the Agency has not had the time to obtain the information necessary to evaluate—or to consult with balancing authorities and other electric reliability authorities (*e.g.,* DOE or NERC) on the feasibility of mandating closure of all CCRMU within these deadlines, within the time to complete this rulemaking.[145]

EPA acknowledges that the risks associated with CCRMU above the regulatory threshold are substantial, and generally warrant a mandate to close in accordance with § 257.102. Moreover, the fact that EPA did not model the aggregate risks associated with the widespread use of small amounts of unencapsulated CCR throughout the entire facility raises questions about whether EPA may have underestimated the potential risks associated with these CCRMU. EPA also agrees that overfills can present significant risks, particularly when the closed CCR unit remains inundated by groundwater or otherwise continues to contain free liquids. EPA therefore concludes that exempting these CCRMU from the requirement to close in accordance with § 257.102 is not appropriate.

Given that EPA has the ability to rely on the permitting process to address issues on a case-by-case basis, and because doing so will allow the Agency to adequately address both the competing environmental and reliability risks presented at individual sites, it is reasonable for the Agency to choose this option. Consequently, EPA is deferring the requirement to initiate closure of CCRMU located beneath critical infrastructure until either: (1) The infrastructure is no longer essential for the activity to be successful; (2) A permit authority determines closure is necessary to ensure there will be no reasonable probability of adverse effect on health or the environment; or (3) The closure or decommissioning of the facility, whichever occurs first.

The final rule also includes an additional condition on CCRMU under active disposal units. In order for these units to qualify for the deferral, the facility must document that the CCRMU meets one of two existing performance standards: either (1) The standard in § 257.60 that the unit was constructed with a base that is located no less than 1.52 m (5 feet) above the upper limit of the uppermost aquifer, or must demonstrate that there is no intermittent, recurring, or sustained hydraulic connection between any portion of the CCR unit and the upper limit of the uppermost aquifer or surface water; or (2) The dewatering standard in § 257.102(d)(2)(i) that all free liquids have been eliminated. EPA believes the location standard in § 257.60 is likely to be more directly applicable to many CCRMU, as they are landfills that would not have been constructed or designed to hold free liquids. EPA has also included the dewatering standards in § 257.102(d)(2)(i) for those closed CCR surface impoundment CCRMU. Based on the descriptions provided by commenters EPA expects that this requirement will largely be relevant to closed CCRMU located beneath active disposal units, rather than CCRMU located beneath infrastructure vital to energy production, which are unlikely to be inundated by groundwater. Moreover, this requirement directly addresses the reason that EPA has concluded that many previously completed closures do not meet the standard in RCRA section 4004(a).

To be clear, EPA is not exempting these CCRMU from the requirement to close as commenters requested, but merely extended the deadline for compliance until the Agency can address it on an individualized basis as part of permitting. In addition, these units will be required to comply with all other requirements applicable to CCRMU, including the requirements for groundwater monitoring and corrective action, if necessary.

As noted above and discussed in the next section, in response to public comments, EPA has extended the deadline to initiate closure to Tuesday, May 8, 2029, which is 54 months after the effective date of this final rule. Based on its current schedule, EPA expects to be issuing permits before that deadline.

EPA is defining ''critical infrastructure'' as infrastructure, large buildings, or other structures vital to the success or continuation of current site operations or activities for the public welfare. This does not include infrastructure, large buildings, or other structures that solely provide commercial or financial benefit to private entities. Examples of critical infrastructure include high power electric transmission towers, large buildings, and electrical substations. The structures must be both (1) necessary for the continued generation of power or currently used for an ongoing site activity; and (2) not readily replaced or relocated. For example, a

[145] EPA is obligated to take final action on the proposal no later than May 6, 2024, pursuant to *Statewide Organizing for Community eMpowerment* v. *EPA,* No. 1:22–cv–2562–JDB (D.D.C.).

parking lot that could easily be replaced by a parking lot in a different location onsite would not qualify as critical infrastructure; but a lined industrial stormwater ponds, wind or solar farms, substations, or military infrastructure would qualify.

The owner or operator of a CCRMU located under critical infrastructure must include information documenting their eligibility for the deferral in the FER part 2 in § 257.75(d) that includes at a minimum a description of the infrastructure, its current and anticipated use(s), and the decommissioning date or anticipated active lifespan. The documentation must also demonstrate that the CCRMU complies with either § 257.60 or § 257.102(d)(2)(i). The documentation must also demonstrate that the structures are both: (1) Necessary for the continued generation of power or currently used for an ongoing site activity; and (2) Not readily replaced or relocated.

When it comes time for a permit authority to evaluate the CCRMU, EPA intends to rely on the permit application process as the primary mechanism to collect the information to allow a determination to be made as to whether to require closure of the CCRMU prior to facility closure. The permit application process is a well-established system for reviewing the types of groundwater, soil and other sampling and analytical data that will typically be required in determining the potential risks associated with the CCRMU.

When the permit application is called in, the facility must provide sufficient information, including data on contaminant levels in groundwater, to demonstrate that the criteria listed above for the deferral have been met, and for the permit authority to be able to evaluate the risks associated with the CCRMU. EPA (or other permit authority) will review the information to determine whether the criteria for deferral have been met and whether closure is necessary to mitigate unacceptable risks to human health or the environment from the CCRMU.

Finally, EPA received a substantial number of comments requesting that the Agency not require facilities to ''re-close'' any unit that already completed closure. This final rule does not mandate that any previously closed unit automatically re-close. But as described in the next section, the final rule does require all CCRMU to meet the performance standards in § 257.102, although as discussed above, some may not be required to do so until the permitting process begins for that unit. EPA does not consider this to be equivalent to a requirement to ''re-close'' as facilities may be able to implement engineering measures to address any deficits without removing the cover system or entirely re-closing the whole impoundment. Whether any particular measure will be effective is a site-specific determination, but some reasonably available engineering measures that may be effective and should be considered include the installation of physical barriers (*e.g.,* slurry walls), groundwater diversion techniques (*e.g.,* interception trench) or hydraulic containment systems (*e.g.,* groundwater extraction wells) to prevent groundwater infiltration.

iii. Requirement To Comply With Performance Standards in § 257.102

As discussed above, this final rule requires that the closure of CCRMU meet the performance standards in either § 257.102(c) or (d). Under this final rule all closures initiated after the effective date of this rule, as well as to those that were not completed prior to the effective date of this rule, will need to comply with these requirements.

And in general, the same is true with respect to closures that were completed prior to the effective date of this rule. As discussed previously, a facility that can certify that prior closure of a unit meets the performance standards in § 257.102(c) only needs to post the documentation that the closure meets the standard. Similarly, if a facility can demonstrate that the closed unit meets the requirements under § 257.102(d), EPA will consider the unit to be closed and the only requirements that will be applicable are those that apply to closed units under post closure care—that is groundwater monitoring, and if necessary, corrective action. EPA never intended to require facilities that otherwise met the closure standards to go through the process again and re-close the unit. In addition, as discussed in the next section, where the facility was subject to standards that are different than the Federal CCR closure standards—*e.g.,* if the closure was conducted as part of a CERCLA cleanup—but otherwise is equivalent in terms of mitigating the risks, the requirement to meet the § 257.102 standards will be deferred to permitting, where a closure equivalency determination will be made.

(a) Closure of CCRMU Under State Law and Deferral of Certain Completed Closures to Permitting

In response to EPA's proposal that all CCRMU comply with § 257.102, many commenters requested that EPA exempt any unit that has either completed closure or is in the process of closing pursuant to State law (*e.g.,* solid waste permit, consent orders or decrees). Commenters also requested that EPA exempt any site that closed as part of a cleanup conducted pursuant to another Federal requirement, such as CERCLA or RCRA subtitle C. For the most part, these commenters simply repeated the comments that they had made with respect to legacy CCR surface impoundments, stating that EPA had failed to demonstrate that these units posed any risk as a consequence of the lack of ponded water, and that ''re-closure'' of these previously closed units is consequently unnecessary and overly burdensome. However, several commenters also presented individual examples of CCRMU that had been closed in accordance with State requirements, which the commenters believed would demonstrate the State closures were equally as protective as those conducted in accordance with § 257.102. These included the following examples:

[A facility] has an approximately 20-acre dry stack landfill with 20 plus years of groundwater monitoring that does not show groundwater exceedances, zero potential receptors downstream (from the direction of groundwater) that use wells for drinking water (also no potable wells within a two-mile radius). The landfill construction using best practices to minimize erosion potential, including only placement of stabilized material in the landfill, perimeter ditch surrounding the entire landfill to collect any runoff that is processed before discharge, and the unit is regulated by the Florida Department of Environmental Protection that includes semi-annual groundwater monitoring results review and yearly on-site regulatory inspections.

[Another facility] had two CCRMU landfills that were closed prior to the effective date of the 2015 CCR Rule and were closed in accordance with the State of Florida's Chapter 62–701, F.A.C., for municipal and solid waste landfills. Neither landfill was built on top of a liner system. The closed landfills were subject to design criteria for cover systems and stormwater management, as well as long-term operations and maintenance provisions. The groundwater monitoring system requirements for landfills in Florida are similar to, but not the same as, those in the 2015 CCR rule. Both closed cells would be subject to corrective action if dictated by the monitoring program. Maintenance, inspections, and repair of the cover systems, as needed, are also part of the long-term care program.

[Another facility] reported closing an inactive CCR landfill in the 1980s. The 20-acre site was used to dispose of bottom and fly ash, including scrubber sludge. The owner performed monitoring of a nearby spring to demonstrate whether any ponded water was leaking. Upon visual inspection, it was determined that the bentonite/clay-lined pond remained intact throughout the active operation of the landfill. However, because of the age of the site, groundwater monitoring wells were not required.

In addition, several States provided information about their existing programs or individual closures. In some instances, the information was intended to demonstrate that the closures were equally as protective as § 257.102, and to provide factual support for an exemption for CCRMU that closed in accordance with State requirements. Other States acknowledged the risks but urged EPA to make the CCRMU requirements ''more flexible and allow for practical alternatives to closure and corrective action for units that have not impacted groundwater,'' or to provide an opportunity to demonstrate if the previous closure of the CCRMU is protective of human health and the environment.

By contrast, several commenters supported EPA's proposal to require all CCRMU to comply with the performance standards in § 257.102, even if the closure was previously approved by a State regulatory agency. These commenters also largely made the same comments they had made with respect to legacy CCR surface impoundments, pointing to EPA's conclusions in 2015 that significant gaps remain in many State programs. These commenters also identified recent examples of closures approved by various State agencies that they believed were not consistent with the Federal closure standards.

No commenter submitted any information that would support a conclusion that different provisions are warranted for CCRMU that closed prior to the effective date of this rule than EPA adopted for similarly situated legacy CCR surface impoundments. Even if individual examples were sufficient to overcome the record with respect to State programs generally, none of the examples presented by the commenters provided sufficient detail for EPA to actually evaluate the adequacy of the closures. For instance, in the three examples presented above, neither of the first two examples actually describe the groundwater monitoring that was required; while the second states that ''groundwater monitoring system requirements for landfills in Florida are similar to, but not the same as, those in the 2015 CCR rule'' it provides no further information. The third example explains that no groundwater monitoring at all was required because of the age of the unit; it is unclear why the commenter believes that this supports a finding that the State program is as protective as those in part 257.

More to the point, as EPA explained in Unit III.B.2.g of this preamble, with respect to legacy CCR surface impoundments, EPA lacks the record necessary to support a broad exemption for all CCRMU closures under any State requirement. The limited information currently available does not demonstrate that all closures conducted under State authority, particularly those completed prior to 2015, ''will ensure there is no reasonable probability of adverse effects on health or the environment.'' 42 U.S.C. 6944(a).

EPA, however, agrees that there are examples of closures that are substantially equivalent to those conducted in accordance with § 257.102. Moreover, EPA has no basis for concluding that the same considerations that warrant deferral of certain legacy CCR surface impoundments closures are not equally applicable to comparable CCRMU closures. Accordingly, EPA is deferring the requirement for a CCRMU that closed prior to the effective date of this rule to demonstrate compliance with § 257.102(d) until a permit application is required to be submitted where the facility can document that all of the following conditions have been met. First, the deferral is limited to circumstances in which a regulatory authority played an active role in overseeing and approving the closure activities. EPA considers a ''regulatory authority'' to include a State or Federal agency or department that oversaw implementation of requirements imposed through a permit, an administrative order, or consent order issued after 2015 under CERCLA or by an EPA-approved RCRA State program. The permit, order, regulatory or other authority must have required groundwater monitoring to ensure there was no contamination coming from the unit that is not addressed by corrective action until cleanup standards are achieved.

To support deferral of a prior closure of a CCRMU as substantially equivalent, the facility must also document that the CCRMU meets one of two existing performance standards: either: (1) The standard in § 257.60 that the unit was constructed with a base that is located no less than 1.52 m (5 feet) above the upper limit of the uppermost aquifer, or must demonstrate that there is no intermittent, recurring, or sustained hydraulic connection between any portion of the CCR unit and the upper limit of the uppermost aquifer or surface water; or (2) The dewatering standard in § 257.102(d)(2)(i) that all free liquids have been eliminated. This requirement directly addresses the reason that EPA has concluded that many previously completed closures do not meet the standard in RCRA section 4004(a).

In addition, a facility must document that it had installed a groundwater monitoring system and performed groundwater monitoring that meets a subset of the performance standards found in § 257.91(a). Specifically, the facility must demonstrate that the groundwater monitoring system was capable of: (1) Accurately representing background water quality, (2) Accurately representing the quality of water passing the waste boundary, and (3) Detecting contamination in the uppermost aquifer. The groundwater monitoring system must have monitored all potential contaminant pathways.

Next, a facility would need to demonstrate that a site-specific risk assessment was conducted or approved by the regulatory authority prior to (or as part of) approving the closure, and that the closure and any necessary corrective action has been overseen by the regulatory authority, pursuant to an enforceable requirement.

Finally, the facility would be required to prepare and include documentation in the applicability report and operating record, demonstrating that it has met these criteria and is eligible for deferral. The documentation must include specifics including the State permit, order, data, GWM results, etc. This must be certified by the owner/operator or an authorized representative using the same language in § 257.102(e).

When it comes time for the permit authority to evaluate the closure, EPA intends to rely on the permit application process as the primary mechanism to collect the information to allow a determination to be made as to whether a CCRMU that closed under these alternative standards did so in compliance with the requirements of § 257.102. The permit application process is a well-established system for reviewing the types of groundwater, soil and other sampling and analytical data that will typically be required in determining the ''equivalency'' of alternative closures.

When the permit application is called in, the facility must provide sufficient information, including data on contaminant levels in ground water, to demonstrate that the applicable § 257.102 standards have been met. EPA or an approved State Director (the permitting authority) will review the information to determine whether the ''equivalency'' of the closure has been successfully demonstrated. If EPA determines that the closure has met the appropriate part 257 closure standard, EPA or an approved State Director will issue a post-closure permit. If EPA or an approved State Director determines that the closure does not meet the part 257 standards, the owner or operator will be required to submit a permit application containing all the applicable information for an operating permit, and EPA will issue a permit that contains the specific requirements necessary for the unit to achieve compliance with § 257.102.

(b) Revisions to Performance Standards for Closing With Waste in Place

(1) Expansion of § 257.102(d)(2)(i) to CCR Landfills

Given the locations of many CCRMU (located in floodplains, or wetlands, or near large surface water bodies), EPA is concerned that the base of these units may intersect with the groundwater beneath the unit. As EPA has previously explained, where the base of a surface impoundment intersects with groundwater, the facility will typically need to include engineering measures specifically to address any continued infiltration of groundwater into the impoundment in order to close with waste in place consistent with § 257.102(d). See, *e.g.,* 87 FR 72989 (November 28, 2022), 85 FR 12456, 12464 (March 3, 2020). The same holds true for CCRMU that intersect with groundwater. The existing requirements in § 257.102(d)(1) and (3) apply to all CCR units and EPA proposed that these provisions would also apply to CCRMU without revision. By contrast, the existing requirements in § 257.102(d)(2), which establish performance standards for drainage and stabilization of the unit, only apply to CCR surface impoundments. These performance standards are critical to ensuring that units that contain liquids are properly and safely closed, and therefore should apply to any unit, including a CCRMU and a CCR landfill, where free liquids remain in the unit. Accordingly, EPA proposed to revise § 257.102(d)(2) so that it applies to all CCR units and CCRMU. To assist commenters, the proposal included a background discussion of the existing closure performance standards. Finally, EPA explained that if there are no liquids in the unit, the proposed revision would not require the facility to do anything to meet the performance standards.

Several commenters supported the proposed revision. For example, one commenter provided data about an unlined CCR landfill that was constructed above the groundwater table and was found to be ''impacting groundwater with high concentrations of heavy metals, with particularly high concentrations of boron fluctuating between 14 and 30 mg/L.'' The State of Michigan required closure of this landfill due to groundwater impacts and after the landfill completed closure, ''the boron concentrations returned to background concentrations approximately five years later.'' The commenter further went on to state, ''this example is provided to demonstrate that any type of water contact with CCR disposal areas can impact groundwater, causing concentrations to rise to concerning levels above water quality standards.'' Another commenter suggested that, consistent with its statement in the proposal, EPA should further revise § 257.102 to clarify that the performance standards are met if there is no liquid in the CCRMU. The commenter recommended the following revisions to § 257.102(d)(1) and (2):

(1) General performance standard. The owner or operator of a CCR unit or CCR management unit that contains liquid must ensure that, at a minimum, the CCR unit or CCR management unit is closed in a manner that will: * * *

(2) Drainage and stabilization of CCR units and CCR management units. The owner or operator of any CCR unit or CCR management unit that contains liquid must meet the requirements of paragraphs (d)(2)(i) and (ii) of this section prior to installing the final cover system required under paragraph (d)(3) of this section.

A few commenters opposed extending § 257.102(d)(2) to CCR landfills and CCRMU, asserting that EPA had failed to provide a factual basis to justify the revision. For example, one commenter stated that:

There are two purposes for free liquids removal—addressing stability and potential groundwater contamination. For long-closed units, stability is demonstrably not a concern. For groundwater, any potential contamination can be addressed through corrective action rather than closure. . . . EPA does not explain why the existing corrective action regulations—which would require corrective action and potentially source control in the event groundwater contact causes impacts to groundwater—are insufficient. In short, the proposed extension of the requirements is unnecessary and unsupported by the record.

Another commenter contested the factual basis for the ''proposed rule's assumption'' that CCR are in contact with groundwater. According to the commenter, CCR surface impoundments and CCR landfills are not located in the same hydrogeological environments and requires a site-specific evaluation to determine, which is beyond the requirements of the existing CCR regulations. One commenter criticized EPA for failing to identify the 19 landfills ''already regulated under the 2015 CCR final rule, but which have waste in contact with groundwater,'' and depriving the public of an opportunity to comment on the accuracy of that proposed finding. Another commenter said it takes a very long time to eliminate free liquids in a CCRMU or landfill, which typically happens during post-closure care.

EPA disagrees that it has failed to justify the revision. The proposed rule did not rest on an assumption but on information (*e.g.,* annual groundwater monitoring and corrective action reports, closure plans) posted to facility CCR websites showing that the bases of their CCR landfills are in contact with groundwater. EPA has included a list of these facilities in the docket for this final rule. In addition, other commenters have provided further examples of landfills that are submerged in the aquifer. Moreover, while the commenter is correct that whether groundwater is infiltrating a particular unit is a site-specific determination, the commenter failed to provide any factual basis for its assertion that CCR surface impoundments and CCR landfills are never located in the same hydrogeological environments. And contrary to the commenter's assertion EPA has repeatedly explained why it is insufficient to rely on corrective action rather than closure to address the risks associated with CCR landfills. The closure and corrective action regulations are distinct and independent requirements, each of which must be met. The closure in-place standards are designed to ensure that the waste in the closed unit has been dried out and is kept dry so that leachate cannot form in the closed unit and subsequently be released to the environment. See, *e.g.,* 47 FR 32318, 32321, 32323. For impoundments that are not yet leaking compliance with these provisions are largely designed to ensure that the closed unit does not become a source of future contamination. In other words, the closure standards are expressly designed to *prevent* groundwater contamination. By contrast, the corrective action provisions in §§ 257.96 through 257.98 contain the standards and procedures for cleaning up the contamination in the groundwater that has already leaked out of the unit. See, *e.g.,* 40 CFR 257.97(b)(2) and (4) (requiring that clean up remedies ''attain the groundwater protection standard [in] § 257.95(h)'' and ''remove from the environment as much of the contaminated material as was released from the CCR unit as feasible''). *See, USWAG,* 901 F.3d at 429–430, 431.

EPA appreciates the commenter's suggested alternative regulatory text; however, EPA is concerned that the suggested revision is effectively redundant of the new definition of ''contains CCR and liquids'' and would not clearly communicate the entities that are subject to the regulation. Therefore, EPA is finalizing this requirement as proposed. In addition, because it can take a significant amount of time to meet the performance standards in § 257.102(d)(2), EPA has extended the closure deadlines applicable to any CCR landfill that needs to meet these standards.

(2) Definition of Infiltration

EPA requested comment on whether to adopt a regulatory definition of the term ''infiltration,'' consistent with term's plain meaning and the dictionary definitions discussed in the preamble.

Several commenters agreed that EPA should adopt a regulatory definition of infiltration that explicitly recognizes the myriad ways that liquids can infiltrate CCR surface impoundments. Some commenters supported EPA's proposed definition of ''infiltration'' because industry has argued that ''the presence of groundwater in ash ponds is essentially irrelevant to closure compliance and that the CCR Rule's closure in place requirements are limited to draining the surface portion of the pond, constructing a final cover, and preventing surface water—but not groundwater—infiltration thereafter.'' Another commenter stated EPA should define ''infiltration'' to make clear that it is ''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.''

Other commenters objected to EPA's proposal to adopt a definition, citing on-going litigation in *Electric Energy, Inc., et al.* v. *EPA, Case Nos. 22–1056 and 23–1035.* These commenters complained that EPA makes no mention of this litigation in the proposed rule, even as it claims that its interpretation is ''sufficiently clear that a definition is not necessary.'' One commenter further stated that if EPA ultimately elects to adopt regulatory definitions of those terms, it should wait until the court rules so that the definitions are informed by and consistent with any such ruling.

Another commenter asserted that EPA must acknowledge (and make a good faith attempt to reconcile) the competing interpretations of key terms of art in the 2015 CCR Rule before extending them into this final rule.

One commenter argued that even if EPA adopted its proposed definition, the rule provides no criteria—in contrast to the detailed criteria for the necessary cover system—for how to ''control, minimize or eliminate to the maximum extent feasible'' horizontal groundwater ''infiltration.'' The commenter alleged that ''this type of undefined performance standard would be void for vagueness, especially when compared to the great lengths EPA went to specify the other technical criteria to address vertical infiltration in the performance standard.''

EPA also received numerous comments recommending that infiltration be defined by reference to technical definitions that define infiltration as exclusively the vertical flow of water from the surface down into the unit. These included a definition provided by the U.S. Geological Survey (''USGS''), as ''flow of water from the land surface into the subsurface.'' Also, according to the USGS: ''Water that infiltrates at land surface moves vertically downward to the water table to become ground water. The ground water then moves both vertically and laterally within the ground-water system.''

As discussed previously, EPA disagrees that it is necessary to wait until the court issues its decision in the pending litigation (*Electric Energy, Inc., et al.* v. *EPA, Case Nos. 22–1056 and 23–1035).* However, the court may rule on the procedural question at issue, it would not resolve the substantive question EPA posed in the proposal, of whether the inclusion of a definition would be useful.

EPA also disagrees that it should adopt a definition of infiltration as exclusively the vertical flow of water from the surface down into the unit. The purpose of adopting a definition is not to establish a generic definition of infiltration, but to assist in the application of standards to ensure that a CCR unit closes in a manner that will protect human health and the environment. When promulgating definitions applicable in regulatory programs, EPA relies not only on available dictionary definitions, but also the surrounding context of the regulation as a whole, as well as what will best achieve the overall purpose of the regulation, and the Agency's statutory mandate. None of the commenters address-any of these factors in recommending that EPA adopt their various technical definitions. In this case, the plain language definition of infiltration best fits within the context of the regulation as a whole, and best achieves both the purpose of the regulation and the RCRA section 4004(a) mandate to protect human health and the environment. This is because under the commenters' unnecessarily restrictive definitions the regulation would allow a significant number of sites to continue leaking hazardous constituents, such as arsenic and mercury, indefinitely.

Accordingly, the final rule adopts a definition of infiltration based on the dictionary definitions discussed in the proposal. The final rule defines infiltration to mean ''the migration or movement of liquid, such as surface water or ground water, into or through a CCR unit from any direction, including from the surface, laterally, and through the bottom of the unit.'' This definition also is consistent with two technical sources that use infiltration more broadly by incorporating lateral flow through continuous porous media. As EPRI explained in its comments, Geotechnical Aspects of Landfill Design and Construction (Qian 2002) does not contain an explicit definition of infiltration but does refer to both ''surface water infiltration'' and ''groundwater infiltration'' in its description of landfill leachate. Similarly, the National Research Council in Assessment of the Performance of Engineered Waste Containment Barriers (National Research Council 2007) does not explicitly define infiltration but uses infiltration to describe surface water and groundwater movements into waste as well as soil migration into drainage systems.

With respect to the comment requesting EPA to ''acknowledge (and make a good faith attempt to reconcile) the competing interpretations of key terms of art in the 2015 regulation,'' EPA considers that its adoption of this definition does this. As noted, the definition is consistent with both the plain language meaning of the term, and with relevant technical sources. Further, the definition fits within the context of the regulation as a whole and best achieves both the purpose of the regulation and RCRA's mandate to protect human health and the environment.

Finally, EPA disagrees that the regulation, with or without a regulatory definition of infiltration, is unconstitutionally vague. The scope of the regulatory definition is clear, and thus regulated parties have adequate notice of the rule's requirements.

In point of fact, the commenter's complaint is not that it cannot determine what is required under the regulation, but that it dislikes what the plain language clearly compels. Relying on the plain language definition of infiltration simply requires facilities that want to close an unlined CCR impoundment with waste in place to implement engineering measures to ''control, minimize, or eliminate, to the maximum extent feasible'' liquid entering the unit from the sides or the base of the unit. EPA has previously identified several reasonably available engineering measures exist that can prevent, or at least control, the flow of groundwater into the unit (and consequently the releases out of the unit). For example, EPA's 1982 guidance on the closure of hazardous waste surface impoundments, which the commenter also references, identifies several engineering controls ''to prevent the subsurface flow of ground water into the impounded waste.'' EPA Office of Solid Waste, Closure of Hazardous Waste Surface Impoundments, SW–873, p 81 (September 1982), Revised Edition (emphasis added). In other words, the regulation ''clearly proscribes'' the commenter's preferred conduct of closing its CCR impoundments without addressing the groundwater in its unit. Finally, § 257.102(d)(1)(i) is no more vague than the corresponding requirement in § 265.111(a), which has been in effect since 1982 (requiring interim status facilities to ''control, minimize or eliminate to the extent necessary to protect human health and the environment, post-closure releases of leachate . . .). The clarity of this regulation is shown by the fact that, over the past 40 years the regulation has been in effect, interim status hazardous waste facilities have been able to adequately determine what the regulation requires and comply with it. The commenter has offered nothing to distinguish the interim status requirements from those in § 257.102(d)(i).

(3) Closure in Place Performance Standards Under § 257.102(d)

The May 2023 proposal explained how the performance standards for closing with waste in place applied to a CCR surface impoundment that intersected with groundwater. EPA received a number of comments that agreed with the Agency's explanation, as well as several that opposed it. Several commenters raised objections they had previously presented in the context of prior decisions. EPA has previously responded to these comments in detail in (1) U.S. EPA. Denial of Alternative Closure Deadline for General James M. Gavin Plant, Cheshire, Ohio (November 18, 2022) in the docket at EPA–HQ–OLEM–2021–0590–0100; (2) 88 FR 31982 (May 18, 2023); and (3) 88 FR 55220 (August 14, 2023). EPA continues to be unpersuaded by the commenters objections and to avoid any confusion is reiterating below the explanation provided in the May 2023 proposal.

The CCR closure requirements applicable to closing with waste in place include general performance standards and specific technical standards that set forth individual engineering requirements related to the drainage and stabilization of the waste and to the final cover system. The general performance standards and the technical standards complement each other, and both must be met at every unit.

The specific technical standards related to the drainage of the waste in the unit require that, ''free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.'' 40 CFR 257.102(d)(2)(i). Free liquids are defined as all ''liquids that readily separate from the solid portion of a waste under ambient temperature and pressure,'' regardless of whether the source of the liquids is from sluiced water or groundwater. 40 CFR 257.53. Consequently, the directive applies to both the freestanding liquid in the impoundment and to all readily separable porewater in the impoundment, whether the porewater was derived from sluiced water, stormwater run-off, or groundwater that migrates into the impoundment. In situations where the waste in the unit is inundated with groundwater, the requirement to eliminate free liquids thus obligates the facility to take engineering measures necessary to ensure that the groundwater, along with the other free liquids, has been permanently removed from the unit prior to installing the final cover system. See, 40 CFR 257.102(d)(2)(i).

In addition to the process-specific technical requirements, all closures must meet the requirements in the general performance standard to ''control, minimize or eliminate, to the maximum extent feasible,'' both post closure infiltration of liquids into the waste and releases of CCR or leachate out of the unit to the ground or surface waters, and to ''preclude the probability of future impoundment of water, sediment, or slurry.'' 40 CFR 257.102(d)(1)(i), (ii).

In situations where the groundwater intersects an unlined CCR unit, water may infiltrate into the unit from the sides and/or bottom of the unit because the base of the unit is below the water table. In this scenario, the CCR in the unit will be in continuous contact with water. This contact between the waste and groundwater provides a potential for waste constituents to be dissolved and to migrate out of (or away from) the closed unit. In such a case, the general performance standard also requires the facility to take measures, such as engineering controls, that will ''control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste'' as well as ''post-closure releases to the groundwater'' from the sides and bottom of the unit. 40 CFR 257.102(d)(1).

Whether any particular unit can meet these performance standards is a fact and site-specific determination that will depend on a number of considerations, such as the hydrogeology of the site, the design and construction of the unit, and the kinds of engineering measures implemented at the unit. Accordingly, the fact that prior to closure the base of a unit intersects with groundwater does not mean that the unit may not ultimately be able to meet the performance standards in § 257.102(d) for closure with waste in place.

Depending on the site conditions, a facility may be able to meet these performance standards by demonstrating that a combination of engineering measures and site-specific circumstances will ensure that as a consequence of complying with the closure performance standards, the groundwater will no longer be in contact with the waste in the closed unit. As one example, where groundwater intersects with only a portion of an impoundment, the facility could close that portion of the unit by removing the CCR from that area of the unit but leaving waste in place in other areas. As another example, if the entire unit sits several feet deep within the water table, engineering controls can potentially be implemented to stop the continued flow of groundwater into and out of the waste. See, EPA Office of Solid Waste, Closure of Hazardous Waste Surface Impoundments, SW–873, p 81 (September 1982), Revised Edition.

(4) Methods and Tools for the Identification and Elimination of Free Liquids

Many commenters requested EPA provide greater clarity regarding the closure performance standard that requires that ''free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.'' 40 CFR 257.102(d)(2)(i). Commenters stated that there continues to be confusion over what technical means and methods can be implemented to meet EPA's expectations and, in particular, what design considerations must be taken into account to achieve compliance with the existing closure performance standards (as applied to both currently and newly regulated units). The commenters explained that there are no regulatory specifications for eliminating free liquids prior to installing the final cover system or controlling, minimizing or eliminating, to the maximum extent feasible, the post-closure infiltration of liquids as required by § 257.102(d)(2)(i) and (d)(1)(i), respectively.

In response to these requests, EPA is providing further information with this final rule. EPA has included in the docket to this rulemaking a document titled ''Methods and Tools for the Identification and Elimination of Free Liquids.'' A summary of some of the main points of the guidance are discussed below.

The document discusses many of the methods and tools needed to identify and eliminate free liquids that are already widely used by industry to investigate and close surface impoundments. For example, tools that may be used to identify free liquids include soil borings and cone penetrometers to map the stratigraphy of the CCR unit and characterize the geotechnical and hydraulic properties of the various CCR layers, as well as the installation of traditional piezometers, monitoring wells and vibrating wire piezometers to monitor pore pressures and water levels. Properly constructed wells and piezometers screened in the appropriate locations and depths have a prominent role in networks of instruments necessary for assessing free liquids in that their design directly measures water levels under ambient conditions. At the most basic level water levels in wells and piezometers are indicative of free liquids. Conversely, networks of wells and piezometers could be used as part of a program used to determine that free liquids no longer exist. Similarly, methods and tools to eliminate free liquids within the CCR, such as rim ditches, pumping wells, extraction wellpoints are also currently employed by industry. These technologies also provide insights into the presence and nature of free liquids at a given CCR unit, *e.g.,* rim ditches and open excavations enable direct observation of free liquids.

Finally, the document identifies considerations useful to developing successful site-specific strategies and approaches to identify, measure, monitor and eliminate free liquids. Longer term variables such as potential groundwater intrusion or other influences are also discussed. In summary, full compliance requires successful sustained attainment of performance standards over the long term. Designing successful approaches will necessarily involve careful consideration of all potential sources of free liquids, including groundwater. Owners or operators of units that contain CCR in contact with groundwater will likely need to take additional actions such as CCR removal or implement specific engineering measures applied over time frames needed to preclude groundwater from intruding back into CCR units after free liquids have been initially eliminated.

iv. Preparation of a Written Closure Plan for CCR Management Units

EPA proposed that owners or operators of CCRMU comply with the existing requirements of § 257.102(b) requiring the preparation of a written closure plan no later than 12 months after the effective date of the final rule.

As mentioned in Unit III.C.4.d, aside from those commenters that disagreed with requiring CCRMU to comply with overall closure requirements, commenters on the proposed rule agreed that the written closure plan requirement would generally be appropriate for CCRMU. One commenter suggested additional requirements for the content of the closure plan including the elevation of the base of the unit, groundwater information, and descriptions of compliance with § 257.102 will be achieved (*e.g.,* how free liquids would be eliminated, how waste will be stabilized, measures to minimize the need for further maintenance of the CCR unit). A few commenters supported the proposed deadline but as summarized in Units III.C.4.a and III.C.4.d of this preamble, other commenters stated the proposed deadline was infeasible and inappropriate. One commenter suggested the deadline for the closure plan be extended to be concurrent with the initiation of closure. Another commenter requested EPA create extension mechanisms for this requirement based on the number of CCRMU at the facility. Commenters suggestions for the deadline for the completion of the closure plan ranged from 12 (the 2015 CCR Rule deadline) to 60 months.

EPA disagrees with the commenter that additional requirements regarding the content of the closure plan are necessary. The information the commenter requested be included in the closure plan is 1) already required to be in the closure plan pursuant to §§ 257.102(b) or 2) readily available in other required reports (*e.g.,* the annual groundwater monitoring and corrective action reports). Furthermore, the commenter failed to fully explain how compliance with § 257.102(b) does not provide the information needed to determine if compliance with the closure performance standards will be met.

Regarding the deadline, for the same reasons in Units III.B.2.g and III.B.2.g.iv.b for legacy CCR surface impoundments, EPA concludes that the deadline for the closure plan should be extended from the proposed deadline to allow for owners or operators to incorporate information about groundwater quality, groundwater flows, seasonality impacts, and the migration of contaminants (if any) into the plan. Therefore, EPA is finalizing a deadline of no later than Wednesday, November 8, 2028, which is 48 months after the effective date. This final deadline extends the proposed deadline by 36 months and EPA expects that this adequately address the concern regarding the infeasibility of the deadline expressed by a commenter requesting EPA create extension based on the number of CCRMU at the facility. This is codified in the regulatory text at § 257.102(b)(2)(iii).

However, consistent with the requirements for legacy CCR surface impoundments, EPA is not requiring compliance with the written closure plan requirement for CCRMU that, by the effective date of this final rule, have completed: (1) closure with waste in place or (2) a closure eligible for deferral to permitting as described in § 257.101(g). Instead, the final rule requires the owner or operator to provide information on the completed closure of the CCRMU, along with supporting documentation to demonstrate that the closure meets the performance standards in § 257.102(d) or the standards specified in § 257.101(g). This is codified in the regulatory text at § 257.102(b)(2)(v).

Based on comments on the proposed rule and experience from the 2015 CCR Rule, EPA expects the incorporation of this information into the closure plan will allow facilities to select a closure method that most appropriately addresses issues like waste that is in contact with groundwater, groundwater contamination, and long-term structural stability concerns. Closure plans that adequately address these issues will result in better protection of human health and the environment.

The closure plan describes the steps necessary to close a CCR unit at any point during the active life of the unit based on recognized and generally accepted good engineering practices. 40 CFR 257.102(b)(1). The plan must set out whether the closure of the CCR unit will be accomplished by leaving CCR in place or through closure by removal and include a written narrative describing how the unit will be closed in accordance with the section, or in other words, how the closure will meet all the performance standards in the regulations. 40 CFR 257.102(b)(1)(i). The written closure plan must also provide a schedule for completing all activities necessary to satisfy the closure criteria of the rule. See also 80 FR 21410–21425.

If the CCR is left in place, the closure plan must include a description of the final cover system and how the final cover system will achieve the regulatory performance standards. If the base of the impoundment intersects with groundwater, the closure plan would need to discuss the engineering measures taken to ensure that the groundwater had been removed from the unit prior to the start of installing the final cover system, as required by § 257.102(d)(2)(i). The closure plan would also need to describe how the facility plans to meet the requirements in § 257.102(d)(1) to ''control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters.'' This could include, for example, the installation of engineering controls that would address the post-closure infiltration of liquids into the waste from all directions, as well as any post-closure releases to the groundwater from the sides and bottom of the unit.

v. Preparation of a Written Post-Closure Care Plan for CCR Management Units

EPA proposed that owners or operators of CCRMU would be required to comply with the existing requirement in § 257.104(d) regarding the preparation of a written post-closure no later than 12 months after the effective date of the final rule.

As mentioned in Unit III.C.4.d, aside from those commenters that disagreed with requiring CCRMU to comply with overall closure requirements, commenters on the proposed rule agreed that the written post-closure care plan requirement would generally be appropriate for CCRMU. Overall commenters requested an extension of the post-closure care deadline to allow for a more feasible deadline and the incorporation of groundwater monitoring data. Another commenter requested EPA create extension mechanisms for this requirement based on the number of CCRMU at the facility. For the same reasons in Units III.B.2.g and III.B.2.g.iv.c for legacy CCR surface impoundments, EPA is finalizing a deadline of no later than Wednesday, November 8, 2028, which is 48 months from the effective date of the final rule to comply with the post-closure care requirement in § 257.104(d). This final deadline extends the proposed deadline by 36 months and EPA expects that this adequately address the concern regarding the infeasibility of the deadline expressed by commenter requesting EPA create extension based on the number of CCRMU at the facility. This is codified in the regulatory text at § 257.104(d)(2)(iii).

Section 257.104(d) requires that an owner or operator of a CCR unit prepare a written post-closure plan. The contents of the P.E.-certified plan are stated in the rule § 257.104(d)(1)(i) through (iii) and can be summarized as a description of the monitoring and maintenance activities required for the unit, the frequency that these activities will be performed, information for the point-of-contact during the post-closure care period, and planned uses of the property.

vi. Deadline To Initiate Closure for CCR Management Units

EPA proposed that owners or operators of CCRMU initiate closure no later than 12 months after the effective date of the final rule. As explained in the proposed rule, the proposed deadline was expedited from the 2015 CCR Rule to address the risks posed from these units and EPA's estimated minimum amount of time necessary to collect the information needed to determine whether to close the unit in place or close by removal.

Several commenters expressed support for the proposed 12-month deadline to initiate closure, stating that the shorter deadlines are necessary to address the increased risk from CCRMU and likelihood these units are and have been contaminating groundwater. However, as mentioned in Unit III.C.4.d, many other commenters characterized the proposed deadline as infeasible for the reasons mentioned in Unit III.C.4.a, including seasonality, need to comply with overlapping regulatory requirements, labor shortages, and the strain on the limited resources necessary to achieve compliance (*e.g.,* contractors, laboratories, P.E.s) caused by the number of CCR units coming into compliance at the same time. Commenters emphasized the importance of the groundwater monitoring data to inform closure, stating that compliance with the closure requirements should not be required until after the groundwater monitoring system was installed and baseline samples collected. These commenters pointed to recent EPA Part A and Part B decisions as evidence of the gap between EPA's expectations and the closure and post-closure plans developed by owners or operators and best practices; these commenters further stated that the proposed deadline precludes the incorporation of groundwater monitoring data in developing closure plans and is likely a contributing factor to the gap between EPA's expectation and closure and post-closure care plans submitted by owners or operators of currently regulated units. Additionally, as described in Unit III.C.4.d.ii, several commenters requested the delays for the initiation of closure for CCRMU beneath critical infrastructure until the decommissioning or closure of the infrastructure or facility. Finally, a few commenters suggested EPA create extensions for the deadline to initiate closure to address concerns about comply with overlapping State permitting requirements or based on the number of CCRMU present at the facility. Commenters' suggestions for alternative deadlines to initiate closure ranged from 12 with extensions to 60 months, or at least after the collection of the baseline groundwater monitoring samples required by § 257.94.

Consistent with the approach for legacy CCR surface impoundments closure, EPA acknowledges the benefit of allowing owners or operators the time needed to incorporate groundwater monitoring data into the closure plan. Additionally, as stated in the proposed rule, EPA acknowledges the importance of using information gained by compliance with the groundwater monitoring and corrective action requirements to inform closure decisions and therefore the initiation of closure. For the reasons explained in Unit III.C.4.c, EPA is extending the deadline for the groundwater monitoring and corrective action requirements to a single deadline of no later than 42 months from the effective date of the final rule. As such, the initiation of closure is being extended as well. To ensure owners or operators have enough groundwater monitoring data to draw conclusions about seasonality impacts on groundwater levels and flow and the source of any potential groundwater contamination in the area, EPA is finalizing a deadline of no later than Tuesday, May 8, 2029, which is 54 months from the effective date of the final rule. This is codified in the regulatory text at § 257.101(f)(1). This final deadline extends the proposed deadline by 42 months and EPA expects that the concerns expressed by commenters requesting EPA create extensions (*i.e.,* the need to comply with State permitting requirements and the number of CCRMU at the facility) are addressed by this overall deadline extension. Finally, regarding those CCRMU under critical infrastructure, owners or operators of these units have the opportunity to defer the deadline to initiate closure until the Agency can address these units on an individual basis as part of permitting. See Unit III.C.4.d.ii.

vii. Deadline To Complete Closure for CCR Management Units

EPA proposed to apply the current CCR surface impoundment closure time frames at § 257.102(f) to CCRMU. The existing CCR regulations currently require an owner or operator of a CCR surface impoundment generally to complete closure activities within five years from initiating closure. The regulations also establish the conditions for extending this deadline, upon a showing that additional time is necessary. Consistent with the existing requirements for CCR surface impoundments, EPA proposed the amount of additional time that an owner or operator could obtain would vary based on the size (using surface area acreage of the CCR unit as the surrogate of size) of the CCRMU. For CCRMU 40 acres or smaller, the proposed maximum time extension is two years. For CCRMU greater than 40 acres, the proposed maximum time extension is five 2-year extensions (10 years), and the owner or operator must substantiate the factual circumstances demonstrating the need for each year extension.

Several commenters expressed support for the proposed deadlines to complete closure, citing the increased risk from CCRMU and likelihood these units are and have been contaminating groundwater. However, many commenters on the proposed rule requested an extension of the deadline to complete closure to allow for a more feasible deadline and to mitigate the factors mentioned in Unit III.C.4.a. Some of these commenters stated if the deadline to initiate closure was extended to no less than the time granted for CCR unit closure in the 2015 CCR Rule, then the proposed deadlines would be feasible. These commenters supported the ability of CCRMU to seek extensions of the deadline based on size. However, a few of the commenters requested longer extensions or an increase in the maximum number of extensions for CCRMU. These commenters cited factors mentioned in Unit III.C.4.a as reasons to allow for longer or more extensions (*i.e.,* third-party availability, need to comply with State permitting requirements prior to certain activities, backlogs, number of CCR units coming into compliance at the same time). One commenter stated more extensions were necessary to meet the closure performance standards in § 257.102 (*i.e.,* remove liquid from the unit and meet the groundwater protection standards).

For the reasons described throughout this Unit of the preamble, EPA has extended the deadline for the initiation of closure. EPA expects the extension to the deadlines for the closure plan and initiation of closure, as well as the options to defer closure requirements for CCRMU under critical infrastructure and those that have completed closure under a regulatory authority (see Units III.C.4.d.ii and III.C.4.d.iii.a, respectively), to address the concerns commenters expressed with the infeasibility or inappropriateness of the deadline to complete closure. Furthermore, with respect to requests for longer or more extensions for CCRMU as compared to the existing CCR regulations, EPA still concludes that as explained in the proposed rule, CCRMU closure will closely resemble CCR impoundment closures because of half of these identified potential CCRMU were associated with former, Federally unregulated CCR surface impoundments. Additionally, the requirements for former impoundments to be closed with waste in place (*i.e.,* procurement, transportation, and placement of substantial volumes of soil or borrow material), would also apply to certain CCR fill placements as well as to inactive CCR landfills where past waste disposal did not reach the landfill's design capacity (*i.e.,* landfill airspace was not fully utilized). As such, in these situations, EPA has determined the time frames to complete closure for existing CCR surface impoundments are appropriate (*i.e.,* 5 years). Finally, as discussed in proposed rule, the Agency believes that the base of at least some CCRMU may intersect with the groundwater because CCRMU may be located in floodplains or wetlands, or near large surface water bodies. EPA's experience in implementing the regulations is that such closures are generally more complex and take longer to complete. EPA thus believes the time frames to complete closure of CCRMU should be the same as the time frames provided for existing CCR surface impoundments. No commenters provided factual information or evidence to support the conclusion that CCRMU closure, apart from those CCRMU under critical infrastructure or closed under a regulatory authority mentioned above, is different enough from closure of units regulated under the 2015 CCR Rule to warrant additional extensions or separate requirements. Therefore, EPA is finalizing the deadline for the completion of closure of CCRMU as proposed. This is codified in the regulatory text at § 257.102(f).

viii. Post-Closure Care for CCR Management Units

EPA proposed to apply the existing post-closure care requirements at § 257.104 to CCRMU without revision. These criteria are essential to ensuring the long-term safety of CCRMU.

As mentioned in Unit III.C.4.d, aside from those commenters that disagreed with requiring CCRMU to comply with overall closure requirements, no commenters raised specific concern about requiring CCRMU to comply with the existing requirements in § 257.104. However, one commenter suggested that EPA allow units that have closed under a State program to either continue post-closure care under that State program or reduce the post-closure care period for these units by the number of years of post-closure care completed under the State program. As described in Unit III.C.4.d.iii(a), EPA is finalizing a provision to address closures completed under other authorities provided the closure meets specific criteria by deferring any closure activities to permitting, including the determination of when post-closure care is completed. In instances where the criteria for deferral to permitting has been met and units have conducted post-closure care under a State program for many years, the permitting authority, once authorized, will be able to look at the site-specific information, including the closure and the specific activities required by the State's post-closure care program, and determine what, if any, further closure or post-closure activities would be appropriate. EPA is therefore finalizing this provision without revision.

The existing post-closure care criteria require the monitoring and maintenance of units that have closed in place for at least 30 years after closure has been completed. 40 CFR 257.104. During this post-closure period, the facility would be required to continue groundwater monitoring and corrective action, where necessary.

e. Recordkeeping, Notification and Internet Posting for CCR Management Units

EPA proposed that, like legacy CCR surface impoundments, owners or operators of CCRMU be subject to the existing recordkeeping, notification and website reporting requirements in the CCR regulations found at §§ 257.105 through 257.107. EPA also proposed changes to add CCRMU to § 257.107(a) to require the facility to notify the Agency using the procedures for the establishment of the website no later than the effective date of the final rule. For reasons specified in the 2015 CCR Rule, the CCR regulations require the owner or operator of a new or existing CCR unit to record specific information in the facility's operating record, maintain files of all required information (*e.g.,* demonstrations, plans, notifications, and reports) that supports implementation and compliance with the rule, notify State Director and Tribal authorities, and maintain a public CCR website that hosts this information. 80 FR 21427.

A commenter supported applying recordkeeping, notification, and internet posting requirements to CCRMU but stated that the existing requirements were ineffective at ensuring compliance with the CCR regulations or allowing for meaningful public awareness or participation. The commenter suggested that EPA create mechanisms within the rule to ensure the public has the opportunity to participate in the decision-making processes at regulated CCR units; standardize reporting to make the report more easily understood by the public; establish organizational requirements for the CCR websites; require public notice and engagement when notifying the State Director and/or appropriate Tribal authority as required by the CCR rule; extend the period of time the files required by the CCR rule must be maintained in the operating record; and require owners or operators certify compliance documentation for the CCR units. This commenter also suggested EPA clarify what records owners or operators are required to retain and to publish. Other commenters suggested the website requirement not be due until the first document is required to be posted.

EPA agrees with the commenter on the importance of meaningful public participation. The current regulations allow for public participation by requiring owner or operators to hold a public meeting as part of the assessment of corrective measures in § 257.96, creating a mechanism for the public to file dust complaints in § 257.80(b), and the ''contact us'' form or specific email address on facilities' public CCR websites for questions or issues from the public as required by § 257.107(a). Public comment periods are also held as part of the determination process for Part A and Part B demonstrations; however, these demonstrations are not applicable to CCRMU. EPA does not have evidence to support the claim by the commenter that these opportunities for public participation are ineffective. Furthermore, EPA does not find other decision-making points in the rule appropriate for mandatory public meetings or public comment periods although facilities are encouraged to engage with the public and to both solicit and incorporate public input into decisions, such as closure methods, as able and appropriate.

With respect to the commenter's suggestions that EPA require the owners or operators of CCR units to certify compliance documentation and create standardized reporting and website layout requirements, as explained in the proposed rule, EPA does not have evidence that CCRMU are sufficiently different than currently regulated facilities to necessitate substantially different requirements. The commenter provided no factual basis to support the suggestion that requiring owner or operator certifications would improve compliance with the regulations beyond the certifications currently required by professional engineers. When justifying the request for standardized reporting and website layout requirements, the commenter failed to explain how compliance with the public website posting requirements in § 257.107, including the requirement to ensure all information is ''clearly identifiable and must be able to be immediately printed and downloaded by anyone accessing the site'' is inadequate or a hinderance to the public accessing the required information. Therefore, EPA does not believe additional notification, certification, or public engagement requirements for CCRMU would be appropriate.

EPA agrees with the commenter on the need to extend the period of time files required by the CCR rule must be maintained on the facilities' public websites and in the operating records. As described in Unit III.D.5, EPA is extending how long files must be maintained in the operating record and on the public website. While EPA believes the regulations at §§ 257.105 and 257.107 clearly lay out what records must be retained and published, EPA has included in Unit III.D.5. a table that details what records are required to be maintained in the operating record and on the public website as well as the corresponding retention periods. No commenters raised concerns about requiring CCRMU to comply with the existing requirements in §§ 257.105 through 257.107.

Lastly, EPA agrees with the commenters who suggested the deadline for the establishment of the website coincide with the first required document (*i.e.,* the FER Part 1). Therefore, EPA is finalizing a deadline of 15 months after the effective date for the establishment of the website.

EPA is also finalizing the requirement that owners or operators of CCRMU comply with recordkeeping, notification, and internet posting requirements at §§ 257.105 through 257.107.

As discussed in Unit III.B.2.h of this preamble, owners or operators must document implementation and compliance with the rule and must place these files into the facility's operating record. Each required file must be maintained in the operating record for the entirety of the retention period specified in § 257.105 following submittal of the file into the operating record. Each file must also indicate the date the file was placed in the operating record. Files are required to be submitted into the operating record at the time the documentation becomes available or by the compliance deadline specified in the CCR regulations. Section 257.105 contains a comprehensive listing of each recordkeeping requirement and corresponding record retention periods.

Furthermore, the owner or operator of a CCRMU must maintain a CCR website titled, ''CCR Rule Compliance Data and Information'' that hosts the compliance information so that it may be viewed by the public. Unless provided otherwise in the rule (see, Unit III.E.5), information posted to the CCR website must be available for a period no less than five years from the initial posting date for each submission. Posting of information must be completed no later than 30 days from the submittal of the information to the operating record. Owners or operators of CCRMU have 15 months from the effective date of this rule to establish a CCR website and post the required applicable information.

D. Closure of CCR Units By Removal of CCR

1. Background

On March 3, 2020, in the Proposed Rule entitled: Hazardous and Solid Waste Management System: Disposal of CCR; A Holistic Approach to Closure Part B: Alternate Demonstration for

Unlined Surface Impoundments; Implementation of Closure, EPA proposed to revise the 2015 CCR Rule to, among other things, provide facilities with an additional option for CCR units being closed by removal of CCR. 85 FR 12456. Specifically, EPA proposed to allow a facility to complete the closure in two stages: first, by completing all removal and decontamination procedures; and second, by completing all groundwater remediation in a separate post-closure care period. 85 FR 12456. In this final rule, the Agency is taking final action on this proposal.

The closure by removal regulation consists of two performance standards. In the first standard, the owner or operator must remove all CCR from the unit and decontaminate all areas affected by releases from the CCR unit. In the second standard, the regulation specifies that closure is complete when all CCR in the unit and any areas affected by releases from the CCR unit have been removed and groundwater monitoring demonstrates that there are no exceedances of any groundwater protection standard. See § 257.102(c). Importantly, the second performance standard requires groundwater corrective action of a unit to be completed in order for closure of the unit to be considered complete.

As previously discussed, the CCR regulations also establish deadlines to initiate and complete closure activities. For example, the regulations generally require owners and operators of CCR surface impoundments to complete closure activities within five years of commencing closure activities, while closure of CCR landfills must be completed within six months. See § 257.102(f)(1). Notwithstanding these deadlines to complete closure, the CCR regulations also allow for additional time provided the owner or operator can make the prescribed demonstrations that are based on site-specific circumstances beyond the facility's control. For CCR surface impoundments, the amount of additional time beyond the five years varies based on the demonstrated need and the surface area acreage of the impoundment. For impoundments 40 acres or smaller, the maximum time extension that can be obtained is two years. For impoundments greater than 40 acres, the maximum time extension is five two-year extensions (for a total extension of ten years). For CCR landfills, 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 (for a total extension of two years). To obtain additional time, owners or operators of CCR units must substantiate the factual circumstances demonstrating the need for the extension. See § 257.102(f)(2). In all instances the number of time extensions is capped to a certain number of years.

The CCR regulations also require the owner or operator of the CCR unit to obtain a certification from a qualified professional engineer or approval from the Participating State Director (or EPA where EPA is the permitting authority) verifying that closure has been completed in accordance with the written closure plan and all applicable closure requirements of § 257.102. See § 257.102(f)(3). In addition, the owner or operator must prepare a notification stating that closure of the unit has been completed. This notification must be completed within 30 days of completion of unit closure and must include the certification required by § 257.102(f)(3). See § 257.102(h). As the CCR regulations are currently structured for units closing by removal of CCR, the closure certification and notification cannot be completed until all CCR removal and decontamination activities, including groundwater corrective action,[146] are completed. Prior to this final rule, owners and operators that complete closure of a unit by removal of CCR were exempt from any other post-closure care requirements for the unit and were also exempt from the deed notation requirements upon certification that closure by removal of CCR has been completed.

2. March 2020 Proposed Rule

Under the March 2020 proposal, an owner or operator that cannot complete groundwater corrective action by the time all other closure by removal activities have been completed (*i.e.,* during the active life [147] of the CCR unit) may complete groundwater corrective action during a post-closure care period. Under this option, the owner or operator must first complete all other removal and decontamination activities within the time frames provided for completing closure. In addition, EPA proposed to require the owner or operator to have implemented the remedy selected under § 257.97 such that all components of the remedy are in place and operating as intended prior to completing all removal and decontamination activities. Upon completion of all removal and decontamination activities (except for completion of groundwater corrective action) and implementation of the selected remedy, the owner or operator would be allowed to certify that the CCR unit has been closed. Thereafter, the CCR unit would be required to continue to conduct corrective action in accordance with the existing requirements in § 257.98 and would be subject to the existing post-closure care requirements in § 257.104 until completion of groundwater corrective action. EPA did not propose any substantive revisions to the current closure standard when closing by removal of CCR under § 257.102(c), but presented the current closure standard in a slightly revised format to accommodate the proposed action.

EPA proposed this option because the Agency received new information indicating that the closure of CCR units will likely be more complex than EPA envisioned in 2015, and that more than 40% of existing CCR surface impoundments were planned to be closed by removal of CCR. In addition, available information indicated that more than 70% of all CCR surface impoundments are unlined. EPA determined that, given the number of unlined CCR units, many of which have already reported exceedances of groundwater protection standards, it was evident that many CCR units have released CCR constituents into the surrounding soils and groundwater. EPA concluded that this meant that closure would not simply be a matter of removing CCR from the unit, but would likely require a significant undertaking to remediate impacted soil and groundwater in order to achieve the current CCR removal and decontamination standards. The proposal explained that based on this new information EPA concluded that the existing timelines to complete closure by removal of CCR were not designed to also provide sufficient time to complete groundwater corrective action. The Agency explained that it was also concerned that the existing deadlines in § 257.102(c) may create a disincentive to close a unit by removal of CCR.

After considering the comments received, the same considerations discussed in the proposal remain relevant. Moreover, the groundwater monitoring installed pursuant to the 2015 CCR Rule has documented groundwater contamination that is more extensive and more frequent that EPA had originally estimated. It is now apparent not only that a greater number

[146] For purposes of this preamble discussion, the term ''groundwater corrective action: includes those actions taken to implement the selected remedy specified in § 257.98(c) to attain the groundwater protection standards in § 257.95(h).

[147] The ''active life'' of a CCR unit is defined in § 257.53 as the period of operation beginning with the initial placement of CCR in the CCR unit and ending at completion of closure activities in accordance with § 257.102.

of facilities are electing to close by removal than EPA originally estimated, but also that some facilities may need to close by removal because they are unable to meet the standards to close with waste in place due to the site conditions. And more critically, EPA is concerned that, based on the existing time frames, some facilities could not comply with either performance standard because it is not feasible to remediate the contamination within the existing deadlines in § 257.102(f). EPA has therefore incorporated this provision into this final rule.

Most of the comments EPA received on this proposal [148] related to the revised regulatory text in § 257.102, the requirement to implement the corrective action remedy during the active life of the unit and the requirement for deed notifications. One commenter also stated that there was nothing in the record to demonstrate that facilities were not able to meet the existing § 257.102(c) performance standard by deadlines in § 257.102(f). The commenter also expressed concern that the proposed option would allow exceedances of groundwater protection standards to continue indefinitely after an impoundment is closed by removal. Further, the commenter contended that the proposed change did not include any additional requirements for owners and operators to substantiate the need to take additional time following removal activities. This, they stated, could incentivize the selection of the slowest, least protective corrective measures such as ''natural attenuation,'' allowing dangerous contamination to persist for long periods of time when it could have been stopped decades earlier. They were concerned that owners or operators would unreasonably select remedies that take much longer to achieve compliance over other available options that could achieve compliance faster.

The Agency disagrees that there is no record to support the need for additional time to complete groundwater remediation within the time frames provided in § 257.102(f). For example, this same commenter submitted comments on the May 2023 proposed rule providing examples of numerous plants who have certified the removal portion of closure by removal while noting the need for additional time beyond the existing deadlines in § 257.102(f) in order to be able to certify compliance with GWPS.[149] These facilities include Duke Energy's Gibson Station, LG&E–KU's Ghent Generating Station, and Dominion Energy's Possum Point Power Station.

Additionally, EPA compiled data on remediation efforts published in the Superfund 5-Year Review Reports conducted pursuant to CERCLA § 121(c).[150] The data review focused on sites that presented releases of metals similar to those expected at CCR facilities and sites that were likely to choose remediation technologies that could also be applicable to CCR facilities. The compilation included data for 20 sites with groundwater remediation remedies in place for at least 15 years. There were eight sites that implemented a combination of remediation strategies (for example, pump and treat and vertical barrier wall in the same site). The most common remedy noted was pump and treat (14 sites), followed by monitored natural attenuation (MNA) (eight sites), barrier walls (five sites), in-situ stabilization (two sites), and permeable reactive barriers (one site). At the time of this data compilation, 18 out of 20 remedies were still ongoing with cleanup durations ranging from 15 to more than 32 years. 11 of 20 remedies exceeded 20 years of operation.

The Agency also disagrees that the proposal would allow exceedances to continue indefinitely, and the owner or operator to purposely choose the slowest, least protective groundwater remediation technology. The facility would remain subject to the existing requirements for corrective action, §§ 257.96 through 257.98, which prohibit the actions the commenter describes. Additionally, the facility must have initiated remedial activities as required by § 257.98(a) during the active life of the unit in order to be eligible for this closure alternative. The sole exception to this would be where the facility only triggered corrective action for the constituent near the end of the closure process, and the facility cannot extend the active life of the unit because it would exceed a deadline in § 257.102(f). In such a case, the facility would be required to document that (1) it was in compliance with all applicable requirements in §§ 257.96 through 257.98; and (2) that it could not extend the active life of the unit, consistent with § 257.102(f).

3. What EPA Is Finalizing Related to the March 2020 Proposed Rule

EPA is finalizing its proposal with some limited revisions adopted in response to public comments. Under this final rule and consistent with the proposal an owner or operator would be able to able to close a CCR unit by completing removal of all CCR from the unit and decontamination of all areas affected by releases from the CCR unit, except for groundwater, during the active life of the CCR unit, and completing the groundwater corrective action during post-closure care. The owner or operator will need to meet the following requirements when closing a CCR unit under this option. First, the owner or operator must complete all removal and decontamination activities, except groundwater corrective action, during the active life of the unit. Second, with one exception, the owner or operator must have begun to implement the corrective action remedy selected in accordance with §§ 257.96 through 257.97 to achieve compliance with the GWPS during the active life of the unit (*i.e.,* before completing closure). Third, groundwater corrective action must be completed during post-closure care. Fourth, the owner or operator must amend the written closure and post-closure plans to reflect this approach to close the unit. Fifth, the owner or operator must obtain the certification or approval of closure completion within the current time frames for closure in § 257.102(f). Finally, prior to the start of the post-closure care period, the owner or operator must record the notation on the deed to the property that the land has been used as a CCR unit. Each of these requirements is discussed further below. EPA is revising the regulatory text of § 257.102(c) and § 257.104(g) and (h). The revisions to § 257.104 are to make it clear that the unit must be in detection monitoring in order to complete post closure care.

a. Removal and Decontamination Activities

EPA proposed to revise the closure performance standard at § 257.102(c) to specify all of the various actions that would be required prior to certifying that closure is complete. EPA proposed that this would include removing or decontaminating all CCR and CCR residues, containment system components, contaminated subsoils, contaminated groundwater, and CCR unit structures and ancillary equipment. To qualify for the new closure by CCR removal option, owners or operators would need to complete all the specified removal and decontamination

[148] See the Response to Comments document found in the docket for this rule.

[149] EPA–HQ–OLEM–2020–0107–0368.

[150] Memorandum from RTI International to Mary Jackson, U.S. EPA, Development of Benchmark Times for Conducting the Closure of CCR Units, February 29. 2024. Superfund 5-Year Review Reports conducted pursuant to CERCLA § 121(c). Available in the docket.

activities within the closure time frame except for completing groundwater remediation. The proposal specified that to demonstrate that all CCR has been removed from the unit, the owner or operator would need to remove the entire contents of the CCR unit, including all CCR and any CCR residues. This would include, for example, the removal of any fugitive dust (CCR) discovered outside the waste unit boundary. In addition, the proposal specified that any containment system components such as a bottom liner, contaminated subsoils, and unit structures and equipment (*e.g.,* concrete outlet structures and ancillary piping) would have to be removed prior to closure of the unit. Finally, EPA proposed that any areas affected by releases from the CCR unit must have been removed (*e.g.,* impacted soils beneath the bottom liner system).

Commenters pointed out that the term ''CCR residues'' was not a defined term. They also pointed out that it may not be necessary or wise to require the removal of ancillary equipment or structures if they are not contaminated with CCR. Further, they pointed out that requiring the removal of fugitive dust outside the unit boundary would expand the closure performance standard.

One commenter was concerned that the term ''CCR unit structures,'' appears to encompass both areas impacted by CCR disposal (which should be removed) and non-contaminated disposal unit structural components, which, according to the commenter, in some cases includes CCR that has been beneficially used in the construction of the impoundment or other disposal units (which the commenter asserted need not be removed). The commenter further stated that structural components, including those structures built with beneficially reused CCR (*e.g.,* bottom ash), must be allowed to remain in place.

The Agency does not agree that components of the unit that are constructed with CCR can be left in place if the unit is in fact closing by removal of CCR. If the unit is to be ''closed by removal of CCR,'' consistent with the existing requirement to remove all CCR, the final rule requires that any components of the unit made of or including CCR must also be removed.

The regulatory text included in this final rule requires removing all CCR from the unit, including CCR mixed with soils or that are included in berms, liners or other unit structures, and either removing or decontaminating all areas affected by releases from the CCR unit. Although there are no soil cleanup standards in the CCR regulations, if the soil beneath the unit is contaminated sufficiently to serve as a secondary source of groundwater contamination, its removal may be required as part of the source control portion of a remedy selected under § 257.97. To clarify, contaminated groundwater (groundwater with constituent concentrations triggering corrective action) must be remediated through the corrective action process detailed in §§ 257.96 through 257.98.

Although the regulatory text now specifies the removal and decontamination activities to be conducted, the Agency does not consider this to be a substantive revision to § 257.102(c). The revision is intended to clearly describe the activities that must be completed prior to closure under the new alternative in § 257.102(c)(2). The regulation now expressly describes how EPA interpreted the original phrase ''CCR removal and decontamination.'' Therefore, the regulatory text for § 257.102(c) has been revised from what was proposed:

(c) *Closure by removal of CCR.* An owner or operator closing a CCR unit by removal of CCR must follow the procedures specified in either paragraph (c)(1) or (c)(2) of this section. Closure by removal activities include removing or decontaminating all CCR and CCR residues, containment system components such as the unit liner, contaminated subsoils, contaminated groundwater, and CCR unit structures and ancillary equipment.

To what is being finalized:

(c) *Closure by removal of CCR.* An owner or operator that elects to close a CCR unit by removal of CCR must follow the procedures specified in either paragraph (c)(1) or (c)(2) of this section. Closure by removal is complete when CCR has been removed; any areas affected by releases from the CCR unit have been removed or decontaminated; and groundwater monitoring concentrations of the constituents listed in appendix IV to this part do not exceed groundwater protection standards established pursuant to § 257.95(h). Removal and decontamination activities include removing all CCR from the unit, CCR mixed with soils, and CCR included in berms, liners or other unit structures, and removing or decontaminating all areas affected by releases from the CCR unit.

Under this provision, the owner or operator must complete all CCR removal activities during closure prior to transitioning to the post-closure care period which will largely consist of a groundwater cleanup activity.

b. Implementation of Selected Remedy

Under the existing regulations, if one or more constituents in Appendix IV to part 257 are detected at SSLs above the GWPS in any sampling event, the owner or operator must, among other requirements, initiate a corrective action program. See § 257.95(g). The corrective action program includes initiating an assessment of corrective measures to prevent further releases, to remediate any releases, and to restore affected areas to original conditions, as specified in § 257.96(a). After the ACM has been completed, the owner or operator must select a remedy that meets prescribed standards, including a requirement that the remedy attain the GWPS. See § 257.97(a) and (b). Finally, the corrective action program requires the owner or operator of the CCR unit to initiate remedial activities within 90 days of selecting a remedy. See § 257.98(a). EPA did not propose to revise any of these requirements as part of this option. However, under this closure option, the owner or operator must have initiated remedial activities required by § 257.98(a) prior to certifying that it has completed closure. This requirement would help ensure that impacted groundwater is returned to original conditions as soon as is feasible.

Several commenters objected to this requirement. Some of these commenters suggested that at many sites, it is not appropriate to implement a remedy before source removal is complete. Other commenters claimed that after excavation is complete at certain sites, new groundwater flow patterns may be established and/or groundwater chemistry may need to stabilize, and in these cases neither design nor implementation of a corrective measure may be practical before CCR removal is finished. A few commenters went further yet, stating that it would not be appropriate to require completion of an ACM and selection of a remedy until after CCR removal activities are complete. Finally, other commenters state that source control is required by § 257.97(b) and may be considered part of the remedy, therefore, implementation of the remedy would commence with closure by removal.

Under the existing regulations, the closure requirements and the corrective action requirements operate independent of one another, and facilities are required to comply with both. The commenters cite nothing to support their claim that closure must be completed prior to initiating corrective action. In fact, it would be inconsistent with the existing mandatory deadlines for initiating and pursuing corrective action. For example, § 257.96(a) requires an ACM to be initiated within 90 days of determining an SSL has occurred, and then completed within another 90 days. An extension, not to exceed 60 days, may be warranted due to site-specific conditions or circumstances. EPA did not propose to revise these deadlines, so comments suggesting changes to these provisions are outside the scope of the rulemaking. Additionally, the commenters provided no reason why corrective measures could not be assessed and compared in an ACM and a remedy could not be selected. Long before initiating closure of a CCR unit, the facility was required to characterize site conditions, including groundwater flow conditions and geology to design and install the groundwater monitoring system. See, *e.g.,* § 257.91(b). The facility already has knowledge of the wastestreams and water volumes it disposes into a CCR surface impoundment. This information can be used to develop a groundwater model to predict groundwater flow conditions after wastestream disposal ceases and closure is initiated, which would provide sufficient characterization of post-closure conditions to assess and compare groundwater cleanup alternatives to complete an ACM. The commenters have provided neither reasons nor explanation why this would not be feasible.

Once the ACM is complete, a public meeting has been held, and community input has been considered, a remedy must be selected as soon as feasible. EPA agrees that a selected remedy may include closure by removal to comply with source control requirements, and that this would constitute commencing implementation of a remedy. However, the selected groundwater remediation portion of the remedy must also be implemented within a reasonable time, in accordance with the schedule established in the remedy selection report. 40 CFR 257.97(d). Implementation of the source control measure does not satisfy this separate requirement.

With respect to commenters' assertion that the design and implementation of the groundwater remediation portion of the remedy is not feasible until closure by removal is complete, the commenters provided no explanation or reasons to support this claim, although one commenter identified MNA as an example of such a remedy. EPA does not agree that design or implementation of MNA would need to be delayed due to closure activities. The ACM would include identification of attenuation mechanisms and characterization of site conditions influencing them. This could be based on current site conditions and any modeled future conditions. If MNA is evaluated more favorably than other groundwater remedies and is ultimately selected, it requires no construction other than installation of additional monitoring wells to identify plume boundaries and monitor performance. This installation would occur downgradient of the unit and should not be affected by unit closure activities. The data from downgradient wells are critical to determining if MNA is working. While groundwater elevations may decrease after dewatering a surface impoundment, and therefore additional wells may need to be installed with screens at lower elevations later in the corrective action process, this would be an expected aspect of implementing MNA for a CCR unit.

Some commenters mentioned that geochemical conditions of groundwater may change during closure. The commenters did not provide specific reasons for this or the anticipated effects of excavation. While removal of CCR is not expected to remove reactants available for immobilization reactions (*i.e.,* any attenuation mechanisms) from the environment, EPA agrees that groundwater chemistry could be impacted, particularly near the excavation site. However, in the absence of evidence that permanent immobilization mechanisms are viable at the site, either under current conditions or in modeled future conditions, MNA would not meet the § 257.97(b) criteria for selection as a remedy.

The CCR regulations establish independent performance standards for corrective action and closure. The regulations do not provide for delaying corrective action while closure occurs, or vice versa. In the example of MNA or, in fact, any groundwater remedy, delaying remedy implementation until after closure is complete would be inconsistent with the requirement in § 257.98(d) to complete remedial activities within a reasonable period. This is particularly true in this example, because collecting monitoring data is the primary action required in an MNA remedy. When data collection is delayed, those data are lost. Because this monitoring can be done during closure, it is required in order to move forward with corrective action as soon as possible.

Additionally, delaying groundwater remediation would not be protective. When a release has been detected, corrective action to clean up the contamination is necessary to prevent it from migrating to downgradient receptors, both human and environmental. Because Appendix IV constituents persist in the environment, delaying corrective action increases the amount of the contamination that is released to the environment and allows existing contamination to move further downgradient. To ensure there will be no reasonable probability of adverse effect on health or the environment as EPA is required to do under RCRA section 4004(a), the final regulation requires that corrective action be implemented in accordance with the requirements of §§ 257.96 through 257.98 without unnecessary or unreasonable delays.

Further, as one commenter mentioned, in the event that measures taken to implement the remedy following closure are not proving to be effective, the remedy can be altered during corrective action. Under the existing regulations, an owner or operator is required to ''implement other methods or techniques that could feasibly achieve compliance'' if, after the remedy is implemented, it is determined that compliance is not being achieved. 40 CFR 257.98(b). If such additional measures are necessary after certification of closure, an owner/operator would have the ability to undertake those measures without impacting the facility's closure certification.

Therefore, EPA is finalizing the proposal that the owner or operator must have initiated the remedial activities as required by § 257.98(a) in order to be eligible for this closure alternative.

The sole exception would be if the facility only triggered corrective action for a constituent sufficiently late in the closure process that it would not be feasible to delay closure until a remedy could be selected. For example, if a facility first detected an SSL of antimony one week before the deadline to complete closure in § 257.102(f), it would not be possible to comply with all of the requirements in §§ 257.96–257.97 before the deadline. As explained above, the closure and corrective action obligations are independent of one another and run concurrently. To prevent placing a facility in such a position, EPA has incorporated a provision to allow the facility to demonstrate that it was not feasible to implement the corrective action remedy prior to the expiration of a deadline in § 257.102(f). In such a case, the facility must document that (1) it was in compliance with all applicable requirements in §§ 257.96 through 257.98; and (2) that it could not extend the active life of the unit, consistent with § 257.102(f).

c. Groundwater Corrective Action

For owners and operators that close a unit under this provision, the CCR unit would remain subject to the post-closure care requirements under § 257.104 until groundwater corrective action has been completed. These units would not be subject to the requirement to conduct post-closure care for 30 years; rather, these units would remain in post-closure care until all groundwater monitoring and corrective action requirements are completed, which may be longer or shorter than 30 years. EPA proposed that groundwater corrective action is complete when the groundwater monitoring concentrations do not exceed the groundwater protection standards for constituents listed in Appendix IV to part 257. EPA has reconsidered this, as the Agency did not intend to modify the existing requirement for completing post-closure care, which also applies to concluding post closure care for a unit closed with waste-in-place. The existing provision in § 257.104(c) states that post-closure care ends after 30 years unless at the end of the post-closure care period the owner or operator of the CCR unit is operating under assessment monitoring in accordance with § 257.95. If the unit remains in assessment monitoring, the owner or operator must continue to conduct post-closure care until the owner or operator returns to detection monitoring in accordance with § 257.95. This means that there can be no detections of any Appendix IV constituents for two consecutive sampling events. Therefore, the final regulatory text has been revised to account for this.

The requirement to be in detection monitoring to conclude the post-closure care is the same standard currently specified in the requirements for closure by leaving waste in place. This rule does not change any requirements of the groundwater monitoring and corrective action program. The owner or operator would need to conduct groundwater monitoring and corrective action in accordance with the requirements of §§ 257.90 through 257.98. See revised § 257.104(c).

d. Closure and Post-Closure Care Plans

The Agency is finalizing as proposed the requirement that owners and operators closing a CCR unit under this new closure alternative would need to revise their written closure plan. The closure plan describes the closure of the unit and provides a schedule for implementation of the plan. The owner or operator would need to revise the current plan and describe how the CCR unit would be closed in accordance with the revised closure options. The current CCR regulations already include procedures to amend written plans under certain circumstances, including when there is a change in the operation of a CCR unit that would substantially affect the current written plan or when unanticipated events necessitate a revision of the plan. See § 257.102(b)(3)(ii). EPA expects owners and operators to revise the current closure plan according to these existing procedures. This rule also requires owners or operators opting for this approach to prepare an initial post-closure care plan within six months of the effective date of this final rule. The post-closure care plan describes how the CCR unit will be maintained after closure of the unit is completed. Prior to this final rule, CCR units that closed by removal of CCR are exempt from any post-closure care requirements so the preparation of a post-closure care plan will be a new requirement for owners and operators closing a unit under this new option. EPA believes that six months from the effective date of this final rule, or one year from publication of this final rule is a reasonable amount of time to prepare the post-closure care plan because the owner or operator should already have prepared the closure plan for the unit and begun implementation of the corrective measures remedy.

EPA is aware that some facilities that planned to close a unit by removal of CCR nonetheless completed a post-closure care plan. In this situation, the CCR regulations already include requirements to amend written plans under certain circumstances, including when there is a change in the operation of a CCR unit that would substantially affect the current written plan or when unanticipated events necessitate a revision of the plan. See § 257.104(d)(3). EPA expects that these owners or operators would revise the existing post-closure care plan according to these existing procedures.

e. Notation on the Deed to the Property

Under the existing regulations, following the closure of a CCR unit that will be subject to post-closure care, the owner or operator must record a notation on the deed to the property, or some other instrument that is normally examined during title search, notifying any potential purchaser of the property in perpetuity that the land has been used as a CCR unit, and its use is restricted under the post-closure care requirements. See § 257.102(i). The rationale for this requirement is to ensure that prospective and subsequent owners are aware of the presence of a closed unit on the property and of the need for continued maintenance of the cover or of any ongoing corrective actions. Following that same logic, units that have closed by removal in accordance with § 257.102(c) have been exempt from the deed notation requirement, both because all waste and associated contamination have been removed, and because there is no continuing post-closure care that needs to be maintained.

Units closing under this new closure option will be required to record a deed notation because they would not have closed by removal in accordance with § 257.102(c)(1) (as corrective action would not have been completed) and because post-closure care would be required. See § 257.102(i)(4). But these units are not wholly analogous to the other units subject to a deed notation (*i.e.,* those closing with waste in place). Units falling under this new closure option will have already had all waste removed in its entirety and so would require no continued maintenance. However, groundwater remediation actions would be continuing, raising concern about potential exposures.

Therefore, EPA proposed that the owner or operator record a notation on the deed to the property (or some other instrument normally examined during a title search) until all groundwater corrective action has been completed—that is, when groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to § 257.95(h) for constituents listed in appendix IV to part 257. EPA proposed the deed notation because all removal and decontamination actions have not been completed. Given that groundwater corrective action may continue for years or decades, the deed restrictions are a practical way of limiting human exposure during a period when contamination is still present, and thereby ensuring that the statutory standard under RCRA section 4004(a) continues to be met.

As part of the post-closure care provisions under § 257.104, EPA proposed to allow removal of the deed notation, or the addition of a second notation reflecting the inapplicability of the first notation, as may be applicable under existing State or local law, when groundwater corrective action is completed for the CCR unit. Under this closure option, completion of groundwater corrective action would indicate that all removal and decontamination actions have been completed. To remove the deed notation (or add a second notation), the owner or operator would need to complete two actions. First, the owner or operator would need to demonstrate that groundwater monitoring concentrations no longer exceed any groundwater protection standard established pursuant to § 257.95(h) for constituents listed in Appendix IV to part 257. See § 257.104(g). Second, the owner or operator would need to complete the notification stating the post-closure care requirements have been met as required in § 257.104(e). Removing the deed notation upon completion of all removal and decontamination activities is consistent with the current procedures for CCR units that close by removal under § 257.102(i)(4).

The existing CCR regulations require a specific type of control (*i.e.,* deed notations) to communicate use limitations to present and future users of the land with the closed CCR unit. The Agency solicited comments on whether the use of deed restriction controls is too narrow under this new closure option and whether the CCR regulations should allow for the use of different legal mechanisms and controls to communicate limits on the activities that can safely take place at the site. Some commenters supported inclusion of more flexibility and alternative instruments to accomplish this purpose. For example, one commenter pointed out that in Colorado, the State routinely uses Environmental Use Restrictions/ Environmental Covenants. Other commenters asserted that EPA should allow the owner or operator to determine which instrument to use or allow the Participating State Director to decide. ASTSWMO commented that the proposed language requiring the use of deed restriction controls appears to be consistent with language in 40 CFR 258.60(i) as applicable to Municipal Solid Waste (MSW) Landfills, and that it might be helpful for States that the language between CCR and MSW landfills aligns.

Other commenters mentioned the importance of deed notations is that it compels impoundment owners to create a publicly accessible record attached to a property deed noting that the property is subject to ongoing groundwater corrective action requirements. Attaching such a note to the deed also ensures any subsequent owner of the property would be on notice of ongoing cleanup obligations and would be liable for following through on them. The commenter stated that any alternative to deed notification that EPA may be considering (*i.e.,* other approaches under private property law) should only be considered if they also provide these benefits of the deed notification requirement.

The Agency has decided to finalize the proposal to require that the owner or operator record a notation on the deed to the property until all groundwater corrective action has been completed. EPA agrees that a deed notation performs an important function to ensure any subsequent owner of the property is on notice of the ongoing cleanup obligations and of the liability of any subsequent owner until those obligations are completed. None of the commenters provided sufficient information for EPA to conclude that the alternative measures that they suggested would provide the same level of assurance as a deed notation. Moreover, the use of a deed notation is consistent with the requirements for MSW landfills and with CCR units closing by leaving waste in place, and therefore EPA expects the public and regulated entities will be familiar with them. Additionally, as discussed above, once the closure by removal is complete, the owner or operator can remove the deed notification.

f. Closure Certification or Approval

The Agency is adopting without revision the proposal that the owner or operator will continue to be subject to the same certification or approval requirement that is currently applicable to all CCR units as specified in § 257.102(f)(3). Under this requirement, the owner or operator must obtain a certification from a qualified P.E. or approval from the Participating State Director (or EPA where EPA is the permitting authority) verifying that closure has been completed in accordance with the written closure plan and all applicable closure requirements of § 257.102. Under this provision, the certification or approval would reflect that all removal and decontamination activities, except for groundwater corrective action, have been completed. The certification or approval would not address the remediation of the impacted groundwater because groundwater corrective action will be completed during the post-closure care period, including applicable post-closure care certification and approval requirements.

E. Technical Corrections

Through the implementation of the 2015 CCR Rule, the Agency identified several minor errors and inconsistencies. Therefore, EPA is amending the CCR regulations to clarify definitions, accurately reference the definition of wetlands, and use consistent language when referring to publicly accessible internet sites. The Agency is also amending an incorrect reference to § 257.99 in the groundwater monitoring scope section. Finally, EPA is extending the period for certain document retention and posting.

1. Definitions of ''Technically Feasible'' and ''Technically Infeasible''

EPA proposed to revise the definition of *technically feasible* to clarify that the terms *technically feasible* and *feasible* have the same meaning in the regulations. The existing regulations define *technically feasible* as ''possible to do in a way that would likely be successful.'' EPA codified this definition in 2020 when amending the alternative closure requirements for landfills and impoundments. 85 FR 53542 (August 28, 2020). As EPA explained, the definition was based on two dictionary definitions of ''feasible'': ''capable of being done or carried out'' (Merriam website (*https://www.merriam-webster.com/dictionary/feasible*)) and ''possible to do and likely to be successful'' (Cambridge English Dictionary (*https://dictionary.cambridge.org/us/dictionary/english/feasible*)). Id.

However, some rule provisions use the term *feasible.* EPA never intended to distinguish between these terms. See, *e.g.,* 80 FR 21422–21423, 85 FR 53542. Therefore, EPA proposed to add the term *feasible* to the existing definition of *technically feasible* to make clear that both terms have the same meaning in the regulations. This definition revision would be accomplished by adding ''or feasible'' to the existing definition so that the definition would read ''*Technically feasible* or *feasible* means possible to do in a way that would likely be successful.'' For similar reasons, EPA proposed to also revise the definition of *technically infeasible* to clarify that the terms *technically infeasible* and *infeasible* have the same meaning in the regulations.

EPA received comments on this issue that opposed adding ''feasible'' and ''infeasible'' as definitions. The commenters said the term ''feasible'' is used in the § 257.102(f)(2)(i) standard for obtaining extensions to the closure time frames, and that if EPA finalizes the provision as proposed, the change should not be applied retroactively to facilities that used the closure extension. Other commenters said this is not how EPA should correct regulatory errors and there is a lack of discussion on all situations and regulatory history regarding these terms.

EPA disagrees that these terms have different meanings under the CCR regulations or that this clarification will negatively impact implementation of the requirements by regulated entities. See, 85 FR 53542 (relying on dictionary definitions of ''feasible'' to define 'technically feasible'). EPA is simply clarifying the meaning of these synonymous terms. Id. Therefore, EPA is finalizing these changes as proposed. This is codified in the regulatory text at § 257.53.

2. Wetlands Reference Correction

When the 2015 CCR Rule was finalized in April 2015, § 257.61(a) referenced § 232.2, which contained a definition of wetlands. An EPA and United States Army Corps of Engineers joint final rule published June 29, 2015 (80 FR 37053) amended § 232.2 by removing the definition of wetlands. However, the reference to § 232.2 in § 257.61(a) of the 2015 CCR Rule was not updated. EPA proposed an amendment that would correct the CFR reference for the wetlands definition by referring to 40 CFR 230.41(a) (December 24, 1980, 45 FR 85344). EPA received one comment on this issue about the U.S. Supreme Court decision in *Sackett* v. *EPA, 21–454,* in which the Court substantially narrowed the scope of wetlands subject to Federal jurisdiction under the Clean Water Act. EPA reviewed the Sackett decision and determined that the wetlands definition contained in § 257.61(a) remains valid after that decision. EPA is therefore finalizing this provision as proposed. This is codified in the regulatory text at § 257.61.

3. Groundwater Monitoring and Corrective Action Applicability

EPA proposed to correct a typographical error in the initial applicability paragraph of the groundwater monitoring and corrective action regulations. In § 257.90(a), the existing regulations refer to the ''groundwater monitoring and corrective action requirements under §§ 257.90 through 257.99''; however, there are no requirements codified under § 257.99. This was brought to EPA's attention by a State interested in permit program approval. To avoid confusion with the regulations, EPA proposed to revise the section references in § 257.90(a) to read ''groundwater monitoring and corrective action requirements under §§ 257.90 through 257.98.'' EPA did not receive any comments on this issue and is therefore finalizing this provision as proposed.

4. Publicly Accessible Internet Site

EPA proposed to change several provisions using the term ''CCR website'' to ''CCR website,'' which is the term used in § 257.107(a). The inconsistent spelling of CCR website was brought to our attention by a State interested in permit program approval. To avoid confusion with the regulations, EPA proposed to correct such references in §§ 257.100(e)(1)(iii) and 257.107(b) through (j). EPA did not receive any comments on this issue and is therefore finalizing these provisions as proposed.

EPA is also revising § 257.107(b) to provide owners and operators the flexibility to maintain one website for multiple electric power sector rules. This new provision allows an owner or operator to document the facility's compliance with the requirements of other environmental rules on the same website that is used for CCR units. In order to use a combined website, the final rule requires that the owner or operator delineate the postings for each regulatory program under a separate heading on the website. For example, the required CCR rule postings must be placed under a ''CCR Rule Compliance Data and Information'' heading, while postings required by the ELG rule would be posted under a separate heading ''ELG Rule Compliance Data and Information.'' [151] EPA is providing this flexibility to reduce paperwork burden and make it easier for communities to access this information.

5. Document Retention

The CCR regulations require the production of many documents that provide information on many aspects of regulated CCR units, for example from history of construction to periodic inspections, as well as closure activity and groundwater sampling and cleanup, if necessary. These documents must be retained in the facility operating record as well as posted on the facility CCR website, generally for a five-year period. In the proposed rule, EPA requested comment on potential revision of document posting and retention times currently in the regulations. EPA raised the concern that some of the current retention times may be too short to accomplish the goals underlying the posting requirement, namely transparency and information availability. This concern stems from the fact that information that is still relevant for CCR units may reach the original retention time limit while the availability of the documents would still serve the purposes of transparency and information availability after the original retention deadline.

The comments received were largely in favor of revising the document retention periods, though those commenters who provided suggested approaches or examples of longer retention periods were not entirely consistent in the approaches offered.

One commenter opposed the concept of expanding the retention time for any documents that are required to be posted on facility websites. This commenter stated the current retention period provides clear guidance to the regulated community and that extending the retention period could add to additional redundant or outdated material on the websites. This commenter also said that the purpose of the website posting requirement has been obviated by the passage of the WIIN Act. For several reasons, EPA disagrees with this comment. First, the regulations already include provisions to decrease or eliminate redundancy or outdated postings. See, for example, § 257.107(g)(1), which requires only the most recent dust suppression plan to be maintained on the website. Second, the core principle of the website posting requirement is relevance: facilities are required to post information relevant to the operation and closure of CCR units and cleanup of any releases from those units. It is clear that a five-year retention period may not be adequate for documents that remain relevant well beyond that length of time, which is proving to be true for many of the required documents. Third, while it is true that website posting is one of several measures EPA implemented in the original rule before the WIIN Act was enacted, nothing in the WIIN Act makes the goals of transparency and information availability for communities and other interested parties obsolete.

The other commenters all agree that extensions to the website posting and retention time periods are warranted. Those comments that included actual time frame suggestions based those suggestions on the type of document and relevance to the operation, closure, and cleanup requirements of the regulations, though they varied in the exact approach and length of extensions.

EPA has decided that to accomplish the regulatory goals underlying the document preparation and retention requirements, longer retention times are required. Therefore, EPA is revising the retention periods as provided in this final rule. EPA does agree that the approach for extensions should be based on the nature of each document and the relevance of each document to demonstrating compliance with regulatory milestones. This approach was already employed in the 2015 CCR

[151] See § 423.19 for ELG rule posting requirements.

Rule for numerous documents (*e.g.,* the groundwater remedy selection document is currently required to be retained until remedy completion). See § 257.107(h)(9). In this rule, EPA is applying this same approach to other documents prepared under the regulations.

There are several related issues that are involved in the document preparation, retention and posting requirements that deserve discussion here. First, the website posting regulations in § 257.107 are companions to, and cross-reference, the operating record regulations in subpart § 257.105. The interrelation of these sections means that this revisiting of the website posting regulations necessitates a review of those regulations that address the placing and retaining of documents in the facility operating record. Accordingly, EPA is including accompanying retention time period changes to § 257.105 as appropriate and relevant to the changes to § 257.107. Additionally, as suggested by several commenters, the retention of the documents in the operating record for a longer period than retention on the website not only makes sense for some documents, but supports the Agency not requiring that every prepared document remain on the website. This is particularly true for documents that are either periodically updated or result from recurring assessments. In implementing this approach, the Agency is mindful of and in agreement with the comments that urged the Agency to not require the posting of all documents out of concern that the websites would become cluttered and confusing.

Second, a related issue arises where there may be more than one version of a document, which version of a required document must be posted or retained in the operating record. This situation arises, for example, when a required document is updated or a document is required to be prepared for recurring assessments. Where appropriate, the regulations are being revised to ensure they are clear about what version or versions of documents must be posted and retained.

A third issue is that, for some documents, the five-year retention and posting duration requirements may have expired. However, some of these documents are still relevant to an operating or closing unit, or a unit in post-closure care status or undergoing groundwater cleanup. For these documents, the purposes of retaining and posting them are still viable and there are compelling reasons to ensure these documents are available on the facility website and in the facility operating record. EPA is, therefore, requiring that documents that may have been taken down and removed from operating records are placed back in the operating records and reposted on the website. Although it is unlikely that documents that were required to be prepared under the CCR regulations, placed in the operating record, and posted on the website were destroyed or discarded after the applicable retention time ran, this requirement nonetheless includes such documents. In other words, any required documents that have been destroyed or discarded must be reproduced and placed in the operating record and reposted on the facility website. Otherwise, there could be inconsistencies among the required facility websites totally dependent upon whether a facility had elected to remove documents from the website and operating record and not otherwise retain the documents in any facility files. EPA believes that allowing this inconsistency across facility websites is an unacceptable approach to ensuring information relevant to each CCR unit is publicly available.

Finally, while the approach adopted here links retention and posting times to document relevance and the status of the CCR unit and work undertaken at the unit, EPA does not believe that the interest in information availability ends at the moment a unit's status changes or required work ends (*e.g.,* completion of closure). Therefore, EPA is requiring that documents remain available for a reasonable time period after related milestones are reached. For many documents, EPA has chosen five years as the reasonable time period for document posting and retention after work is completed or the unit's status changes. This is also consistent with timeframes offered by commenters where specific timeframes were suggested.

TABLE 3—DOCUMENT RETENTION IN THE OPERATING RECORD AND CCR WEBSITE

Document	Operating record	CCR website
Location restrictions demonstration as specified in §§ 257.60–257.64.	§ 257.105(e): 5 years after: closure by removal (CBR) or post-closure care ends.	§ 257.107(e): 5 years after: CBR or post-closure care ends.
Landfill liner and leachate collection preconstruction design certification and post construction certification as specified in § 257.70(e) and (f).	§ 257.105(f)(1): 5 years after: CBR or post-closure care ends.	§ 257.107(f)(1): 5 years after: CBR or post-closure care ends.
Documentation of liner type as specified in § 257.71(a).	§ 257.105(f)(2): 5 years after: CBR or post-closure care ends.	§ 257.107(f)(3): 5 years after: unit ends post closure care OR liner is removed.
Surface impoundment liner preconstruction design certification and postconstruction certification as specified in § 257.72(c) and (d).	§ 257.105(f)(3): 5 years after: CBR or post-closure care ends.	§ 257.107(f)(2): 5 years after: CBR or post-closure care ends OR liner is removed.
Documentation that permanent identification marker was installed as specified in §§ 257.73(a)(1) and 257.74(a)(1).	§ 257.105(f)(4): 5 years after: CBR or post-closure care ends.	N/A.
The initial and periodic hazard potential classification assessments as specified in §§ 257.73(a)(2) and 257.74(a)(2).	§ 257.105(f)(5): Retain all versions .... CBR Until closure is complete not including meeting GWPS. Closure in place (CIP): until post-closure care is complete.	§ 257.107(f)(4): Current and previous one. CBR Until closure is complete not including meeting GWPS. CIP: Until post closure care is complete.
The emergency action plan, and any revisions of it, as specified in §§ 257.73(a)(3) and 257.74(a)(3).	§ 257.105(f)(6): Retain all .... 5 years after: CBR not including meeting GWPS or unit ends post-closure care.	§ 257.107(f)(5): Current version, if EAP is required.

TABLE 3—DOCUMENT RETENTION IN THE OPERATING RECORD AND CCR WEBSITE—Continued

Document	Operating record	CCR website
Documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR unit and the local emergency responders, as specified in §§ 257.73(a)(3)(i)(E) and 257.74(a)(3)(i)(E).	§ 257.105(f)(7): Retain all 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(6): Current version, if EAP is required.
Documentation prepared by the owner or operator recording any activation of the emergency action plan, as specified in §§ 257.73(a)(3)(v) and 257.74(a)(3)(v).	§ 257.105(f)(8): Retain all 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(7): Any documentation prepared in the last five years; if no activation in the last 5 years, a statement posted relating that information.
The history of construction, and any revisions of it as specified in § 257.73(c).	§ 257.105(f)(9): Retain all 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(8): Only most recent and any revisions from the last 5 years. 5 years after: CBR or unit ends post closure care.
The initial and periodic structural stability assessments as specified in §§ 257.73(d) and 257.74(d).	§ 257.105(f)(10): Retain all CBR Until closure is complete not including meeting GWPS. CIP: Until post closure care is complete	§ 257.107(f)(9): Current and previous one. CBR Until closure is complete not including meeting GWPS. CIP: Until post closure care is complete.
The documentation detailing the corrective measures taken to remedy the structural stability deficiency for existing or new surface impoundments as specified in §§ 257.73(d)(2) and 257.74(d)(2).	§ 257.105(f)(11): Retain all 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(10): Current and any corrective measures. 5 years after: CBR or unit ends post closure care.
The initial and periodic safety factor assessments as specified in §§ 257.73(e) and 257.74(e).	§ 257.105(f)(12): Retain all 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(11): Current and previous one. 5 years after: CBR or unit ends post closure care.
The design and construction plans of the unit, and any revisions of the plans as specified in § 257.74(c).	§ 257.105(f)(13): Retain all 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(12): Current and previous one. 5 years after: CBR or unit ends post closure care.
The application and any supplemental materials submitted in support of the alternative liner demonstration application as specified in § 257.71(d)(1)(i)(E).	§ 257.105(f)(14): 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(13): 5 years after: CBR or unit ends post closure care.
CCRMU Facility Evaluation Report Document Part 1 as specified in § 257.75(c).	§ 257.105(f)(25): 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(24): 5 years after: CBR or unit ends post closure care.
CCRMU Facility Evaluation Report Document Part 2 as specified in § 257.75(d).	§ 257.105(f)(26): 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(25): 5 years after: CBR or unit ends post closure care.
The decision on the alternative liner application as specified in § 257.71(d)(2)(iii)(F).	§ 257.105(f)(19): 5 years after: CBR or unit ends post closure care.	§ 257.107(f)(18): 5 years after: CBR or unit ends post closure care.
The CCR fugitive dust control plan, or any subsequent amendment of the plan as specified in § 257.80(b).	§ 257.105(g)(1): Retain all until last CCR unit at the facility completes post closure care or CBR.	§ 257.107(g)(1): Only most recent. Retain until last unit completes post closure care or CBR.
The annual CCR fugitive dust control report as specified in § 257.80(c).	§ 257.105(g)(2): Retain all until last CCR unit at the facility completes post closure care or CBR.	§ 257.107(g)(2): Current plus last 5 years. Retain until last unit completes post closure care or CBR.
The initial and periodic run-on and run-off control system CCR landfill plans as specified in § 257.81(c).	§ 257.105(g)(3): Only most recent Until 5 years after closure of the landfill is complete not including achievement of GWPS.	§ 257.107(g)(3): Current plus any other versions from the last 5 years (if updated). Until 5 years after closure of the landfill is complete not including achievement of GWPS.
Initial and periodic inflow design flood control system CCR surface impoundment plans as specified in § 257.82(c).	§ 257.105(g)(4): Only most recent Until 5 years after closure of the landfill is complete not including achievement of GWPS.	§ 257.107(g)(4): Current plus any other versions from the last 5 years (if updated). Until 5 years after closure of the landfill is complete not including achievement of GWPS.
Documentation recording the results of each CCR surface impoundment inspection and monitoring as specified in § 257.83(a).	§ 257.105(g)(5): Retain all until 5 years after closure is complete not including achievement of GWPS.	N/A.
Annual CCR surface impoundment inspection reports as specified in § 257.83(b)(2).	§ 257.105(g)(6): Retain all until 5 years after closure is complete not including achievement of GWPS.	§ 257.107(g)(5): Current plus last 5. Retain until 5 years after closure is complete not including achievement of GWPS.
The documentation detailing the corrective measures taken to remedy the deficiency or release as specified in §§ 257.83(b)(5) and 257.84(b)(5).	§ 257.105(g)(7): Retain all until 5 years after closure is complete not including achievement of GWPS.	§ 257.107(g)(6): Any corrective measures until 5 years after closure is complete not including achievement of GWPS.
Documentation recording the results of weekly landfill structural weakness inspection as specified in § 257.84(a).	§ 257.105(g)(8): Retain all until 5 years after closure is complete not including achievement of GWPS.	N/A.
Annual landfill inspection reports as specified in § 257.84(b)(2).	§ 257.105(g)(9): Retain all until 5 years after closure is complete not including achievement of GWPS.	§ 257.107(g)(7): Current plus last 5. Retain until 5 years after closure is complete not including achievement of GWPS.

TABLE 3—DOCUMENT RETENTION IN THE OPERATING RECORD AND CCR WEBSITE—Continued

Document	Operating record	CCR website
Annual groundwater monitoring and corrective action report as specified in § 257.90(e).	§ 257.105(h)(1): Retain all until 5 years after the last CCR unit at the facility completes post-closure care or completion of CBR including achieving GWPS for 3 consecutive years.	§ 257.107(h)(1): Current plus previous 5 years. Retain until 5 years after last unit completes post-closure care or completion of CBR including achieving GWPS for 3 consecutive years.
Documentation of design, installation, development, and decommissioning of any monitoring wells, piezometers and other devices as specified in in § 257.91(e)(1).	§ 257.105(h)(2): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.	N/A.
Groundwater monitoring system certification as specified in § 257.91(f).	§ 257.105(h)(3): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.	§ 257.107(h)(2): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.
Selection of a statistical method certification as specified in § 257.93(f)(6).	§ 257.105(h)(4): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.	§ 257.107(h)(3): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.
Assessment of corrective measures as specified in § 257.96(d).	§ 257.105(h)(10): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.	§ 257.107(h)(8): 5 years after CBR and GWPS have been met or 5 years after completion of post-closure care.
Documentation recording the public meeting for the corrective measures assessment as specified in § 257.96(e).	§ 257.105(h)(11): 5 years after CBR and App IV GWPS have been met or 5 years after completion of post-closure care.	N/A.
Notification that the remedy has been completed specified under in § 257.98(e).	§ 257.105(h)(13): 5 years after completion of remedy.	§ 257.107(h)(10): 5 years after completion of remedy.
Demonstration supporting the suspension of groundwater monitoring activities as specified in § 257.90(g).	§ 257.105(h)(14): 5 years after last unit ends post closure care.	§ 257.107(h)(11): 5 years after posting.
Written closure plan, and any amendment of the plan as specified in § 257.102(b).	§ 257.105(i)(4): Only the most recent .... 5 years after CBR or 5 years after post-closure care is complete.	§ 257.107(i)(4): Only the most recent. 5 years after CBR or 5 years after post-closure care is complete.
Demonstration(s) for a time extension for initiating closure as specified in § 257.102(e)(2)(ii) and (iii).	§ 257.105(i)(5): Until notice of closure completion is posted.	§ 257.107(i)(5): Until notice of closure completion is posted.
Demonstration(s) for a time extension for completing closure as specified in § 257.102(f)(2)(i) and (iii).	§ 257.105(i)(6): 5 years after closure is complete.	§ 257.107(i)(6): 5 years after closure is complete.
Notification of intent to close a CCR unit as specified in § 257.102(g).	§ 257.105(i)(7): 5 years after closure complete	§ 257.107(i)(7): 5 years after closure complete.
Notification of completion of closure of a CCR unit as specified in § 257.102(h).	§ 257.105(i)(8): 5 years after unit ends post closure care or CBR.	§ 257.107(i)(8): 5 years after unit ends post closure care or CBR
Notification recording a notation on the deed as specified in § 257.102(i).	§ 257.105(i)(9): 5 years after unit ends post closure care.	§ 257.107(i)(9): 5 years after unit ends post closure care.
Notification of intent to comply with the alternative closure requirements for landfills as specified in § 257.103(c)(1).	§ 257.105(i)(10): 5 years after the unit completes closure.	§ 257.107(i)(10): 5 years after the unit completes closure.
Annual progress reports under the alternative closure requirements for landfills as specified in § 257.103(c)(2).	§ 257.105(i)(11): 5 years after the unit completes closure.	§ 257.107(i)(11): 5 years after the unit completes closure.
Written post-closure plan, and any amendment of the plan as specified in § 257.104(d).	§ 257.105(i)(12): 5 years after unit ends post closure care.	§ 257.107(i)(12): 5 years after unit ends post closure care.
Notification of completion of post-closure care as specified in § 257.104(e).	§ 257.105(i)(13): 5 years after unit ends post closure care.	§ 257.107(i)(13): 5 years after unit ends post closure care.
Notification of intent to comply with the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified in § 257.103(f)(1)(ix)(A).	§ 257.105(i)(14): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(14): 5 years after: CBR or unit ends post closure care.
Approved or denied demonstration for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified in § 257.103(f)(1)(ix)(B).	§ 257.105(i)(15): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(15): 5 years after: CBR or unit ends post closure care.
Notification for requesting additional time to the alternative cease receipt of waste deadline as specified in § 257.103(f)(1)(ix)(C).	§ 257.105(i)(16): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(16): 5 years after: CBR or unit ends post closure care.
Semi-annual progress reports for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified in § 257.103(f)(1)(xi).	§ 257.105(i)(17): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(17): 5 years after: CBR or unit ends post closure care.
Notification of intent to comply with the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as specified in § 257.103(f)(1)(viii).	§ 257.105(i)(18): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(18): 5 years after: CBR or unit ends post closure care.

TABLE 3—DOCUMENT RETENTION IN THE OPERATING RECORD AND CCR WEBSITE—Continued

Document	Operating record	CCR website
Approved or denied demonstration for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as specified in § 257.103(f)(2)(ix).	§ 257.105(i)(19): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(19): 5 years after: CBR or unit ends post closure care.
Annual progress report for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as specified in § 257.103(f)(2)(x).	§ 257.105(i)(20): 5 years after: CBR or unit ends post closure care.	§ 257.107(i)(20): 5 years after: CBR or unit ends post closure care.
Legacy Applicability Report as specified in § 257.100(f)(1)(i).	§ 257.105(k)(1): 5 years after: CBR or unit ends post closure care.	§ 257.107(k)(1): 5 years after: CBR or unit ends post closure care.

IV. Effect on State CCR Permit Programs

In the proposed rule, EPA discussed the effect of the amended regulations on State CCR permit programs. The revisions to the CCR regulations both establish standards for new types of units and revise existing requirements for CCR units defined in and subject to the 2015 CCR Rule. For this reason, the requirements for approval and retention of a State CCR permit program in accordance with RCRA section 4005(d) will change. How these revisions will affect States depends on whether the State has received approval for the provisions that are ultimately included in any final rule and whether the State is seeking full or partial approval of its permit program.

EPA received several comments asking for clarification on what States need to do to adopt these revisions. As EPA explained in the proposed rule, if a State has an approved program pursuant to RCRA section 4005(d), that State program will continue to operate in lieu of the portions of the Federal program adopted by the State, even if EPA revised the Federal analog of that regulation in this final action. See 42 U.S.C. 6945(d)(1)(A), (3). This means that the applicable revisions to the Federal CCR regulations will only take effect in an approved State when the State revises its program to adopt them. For this reason, RCRA requires a State to revise its program within three years of any applicable revision to the Federal CCR regulation that is more protective than the existing State program in order to maintain approval. See, 42 U.S.C. 6945(d)(1)(D)(i)(II). Conversely, the Federal requirements continue to apply directly to CCR facilities in States without an approved CCR program and in States with a partial CCR program. EPA will work with each State that is interested in adopting these regulations to ensure the State CCR permit program is at least as protective as the Federal program. If a State chooses not to adopt certain portions of this final rule, when EPA establishes a Federal CCR permit program, EPA will begin issuing permits for CCR units, legacy CCR surface impoundments, and CCRMU in nonparticipating States.

As discussed in Units III.A. and III.B of this preamble, EPA is establishing requirements for legacy CCR surface impoundments and CCRMU. Because legacy CCR surface impoundments and CCRMU are new types of Federally regulated units, no State is currently approved to issue State CCR permits to such units in lieu of the Federal CCR regulations. Thus, any State that wants approval to issue permits to such units will be required to update the State CCR regulations and go through the State CCR permit program approval process set forth in RCRA section 4005(d).

As discussed in Units III.B.g and III.D of this preamble, EPA is also revising requirements under the existing CCR regulations. The revised requirements will directly apply to affected facilities except to the extent EPA has already approved the State to issue permits for the original requirement. In such a case, the State requirement will apply in lieu of the new Federal requirement until the State program is revised. certain provisions (*i.e.,* the requirement to expand § 257.102(d)(2) to landfills that are inundated with groundwater, document retention timeframes) to be more protective

One commenter asked if a State can adopt regulations for either legacy CCR surface impoundments or CCRMU, but not both. EPA issued the Coal Combustion Residuals State Permit Program Guidance Document; Interim Final (82 FR 38685, August 15, 2017) (the ''Guidance Document'') to advise States interested in developing a State CCR permit program for approval by EPA. The Guidance Document explains the process for developing a State CCR permit program and expressly contemplates a State requesting partial approval of such a program. Thus, a State may request approval of the final rule provisions applicable to either or both the legacy CCR surface impoundments and the CCRMU requirements.

Some commenters discussed the process for approving State CCR permit programs and inquired about the number of States that EPA is currently working with and the timeframe for approval of a State program package. As noted above, the Guidance Document explains the process for States to develop of State CCR permit program. The time it takes to develop an approvable State program depends on a number of factors, including the time it takes for a State to promulgate or enact regulations that are as protective as the Federal CCR regulations. Once the State has a complete and approvable program, EPA will issue the final program determination within 180 days of determining that the State's submission is complete. EPA commits to working with States to adopt regulations that are at least as protective as the Federal CCR regulations and to review any draft application materials and provide comments to ensure the final application package can go through EPA's approval process in a timely manner. The process for approving program modifications is the same as for the initial program approval: EPA will propose to approve or deny the program modification and hold a public hearing during the comment period. EPA will then issue the final program determination within 180 days of determining that the State's submission is complete.

Finally, EPA received comments saying that EPA seems to be finalizing these regulations under the self-implementing regulatory scheme that existed when the 2015 CCR rule was promulgated. The comments further say that since then, Congress enacted the WIIN Act, which fundamentally changed the regulatory landscape and now requires implementation through

State and Federal permit programs. EPA acknowledges this Congressional mandate and is working to finalize the Federal CCR permit program in addition to approving State permit programs. States have requested that EPA finalize the legacy CCR surface impoundment provisions and other provisions that were remanded back to the Agency to allow States to apply for full program approval. EPA disagrees that the self-implementing rule is inappropriate in lieu of the WIIN Act requirements because all owners and operators of CCR units and CCRMU will need to follow the self-implementing rule until they obtain a State or Federal permit. Lastly, any permits that are issued by EPA will refer to the regulatory requirements in 40 CFR part 257, subpart D, or the equivalent State regulation in the case of State permits.

V. The Projected Economic Impact of This Action

A. Introduction

EPA estimated the costs and benefits of this action in a Regulatory Impact Analysis (RIA), which is available in the docket for this action.

B. Affected Universe

The universe of facilities and units affected by the final rule includes four categories. The first is comprised of facilities with legacy CCR surface impoundments. The RIA identifies 194 legacy CCR surface impoundments located at 84 facilities. The second component of the affected universe is composed of CCRMU. The RIA identifies 195 CCRMU at 104 facilities. The third component of the affected universe is composed of CCRMU at ''other active facilities,'' or OAFUs. The RIA identifies 15 OAFUs at six facilities. The final component of the universe is comprised of CCR landfills that are already regulated under the 2015 CCR Rule, but which have waste in contact with groundwater. The RIA identifies 39 such landfills at 33 facilities.

C. Baseline Costs

The RIA examines the extent to which baseline practices at legacy CCR surface impoundments and CCRMU address contamination in a manner consistent with the requirements of the final rule. To the extent that legacy CCR surface impoundments and CCRMU are already sufficiently addressing contamination, they are assumed to not incur costs or realize benefits under the final rule. To estimate the proportion of legacy CCR surface impoundments addressing contamination in the baseline, the RIA examines relevant Federal and State programs and determines that about 9.8% of legacy CCR surface impoundments are addressing site contamination. To estimate the proportion of CCRMU addressing contamination, the RIA examines publicly available filings from owners and operators of regulated coal-fired power plants. The RIA estimates that about 20.8% of CCRMU are undergoing sitewide corrective action and closure in a manner sufficient to meet the requirements of the final rule.

D. Costs and Benefits of the Final Rule

The RIA estimates that the annualized costs of this action will be approximately $214–$240 million per year when discounting at 2%. Of this, $123–$135 million is attributable to the requirements for legacy CCR surface impoundments, which are subject to the D.C. Circuit's order in *USWAG,* $79–$92 million is attributable to the requirements for CCRMU, $8–$9 million is attributable to the requirements for OAFUs, and $4 million is attributable to requirements for landfills. The costs of this final rule are discussed further in the RIA and include the costs of unit closure, corrective action, fugitive dust controls, structural integrity inspections, and recordkeeping and reporting.

The RIA estimates that the annualized monetized benefits attributable to this action will be approximately $53–$80 million per year when discounting at 2%. Of this, $43–$57 million is attributable to the requirements for legacy CCR surface impoundments, $9–$21 million is attributable to the requirements for CCRMU, $1–$2 million is attributable to the requirements for CCRMU at ''other active facilities,'' or OAFUs. Requirements for landfills account for a de minimis amount of benefits. The monetized benefits of this proposed rule are discussed further in the RIA, and include reduced incidents of cancer from the consumption of arsenic in drinking water, avoided intelligence quotient (IQ) losses from mercury and lead exposure, non-market benefits of water quality improvements, and the protection of threatened and endangered species. EPA also monetized the benefits of avoided impoundment failures, including both ''catastrophic'' failures and smaller-volume releases. One example of a severe impoundment failure is the Dan River Steam Station failure that occurred in 2014, when a stormwater drainage pipe under the inactive surface impoundments at the Dan River Steam Station caused the inadvertent release of 39,000 tons of CCR directly into the nearby Dan River. The resulting high-end estimate of the costs of this impoundment failure is $300 million.

The monetized benefits in the RIA are incomplete and omit categories of benefits that are known to be significant. One such category of benefits is avoided cases of lung and bladder cancers due to exposure to arsenic III and arsenic V. Inorganic arsenic is known to occur in CCRs, and can leach into drinking water from leaking CCR disposal units. The EPA IRIS Toxicological Review of Inorganic Arsenic (CASRN 7440–38–2) draft, published in October 2023, provides updated toxicity values for cancer outcomes associated with inorganic arsenic exposure. From these values the benefits of avoided cancer cases can be monetized. The RIA does not consider these avoided cancer benefits in the main analysis because the IRIS report underlying them is still draft and subject to revision. These benefits are instead monetized in a sensitivity analysis and are estimated to be $19 million per year when discounting at 2%. As these benefits are but two health endpoints from a single contaminant, they point to the possible true magnitude of benefits attributable to the final rule.

The RIA also describes a number of important benefits that cannot currently be quantified or monetized due to data limitations or limitations in current methodologies. These benefits include reducing the baseline risk of unit leakage and failure attributable to climate-change driven severe weather events. Many legacy CCR surface impoundments and CCRMU are situated close to rivers or are located along the coast. These units are vulnerable to inland or coastal flooding, which may occur at an increased frequency due to the effects of climate change. Flooding events may cause these units to overtop or catastrophically collapse, releasing CCR into the environment, exposing nearby communities to toxic contamination and necessitating potentially costly cleanup and remediation. EPA has identified 62 legacy CCR impoundments at medium or high risk from climate change-driven flooding, and 74 CCRMU at medium or high risk from climate change driven-flooding.

Another set of benefits outside the scope of quantification include reducing the instance of negative human health impacts such as cardiovascular mortality, neurological effects, and cancers (separate from the quantified cancer benefits) brought on by exposure to toxins found in coal ash. Either through leaking impoundment sites or release events, many pollutants from legacy CCR surface impoundments are likely to contaminate nearby water bodies, affecting surface waters, local fish populations, and drinking water reservoirs. Because known transport pathways exist between these release events and human health endpoints, EPA expects the proposed rule to cause risk reductions for various categories that are not yet quantifiable. Toxins such as thallium, molybdenum, and lithium, while all present in CCR, lack the data to create dose-response relationships between ingestion rates and specific health endpoints, and thus precludes EPA from quantifying associated benefits.

The RIA describes several surface water quality benefits such as the improved health of ecosystems proximate to CCR disposal units, and the avoided costs of treating public drinking water impacted by CCR contamination. EPA expects leakages or releases of effluent from any CCR surface impoundment site to contaminate nearby surface waters and environments. Introduction of arsenic, selenium, and other heavy metals associated with CCR surface impoundment contents are shown to accumulate in sediments of nearby stream and lake beds, posing risks and injury to organisms and consequently ecosystems. Although surface waters are broadly protected from high levels of contaminants under EPA's regulations and Water Quality Criteria (WQC), complex interactions from trace amounts of heavy metals and other toxins known to be released from legacy CCR surface impoundment sites have displayed measurable impact to aquatic animals and ecosystems.[152]

The RIA discusses how the final rule may result in avoided drinking water treatment costs and drinking water quality improvements at public water systems. First, by reducing the risk of CCR leakage events and impoundment failures, the proposed rule will help avoid costs of water quality treatment at public intake sources. Second, by preventing release events the proposed rule has the potential to reduce the incidence of eutrophication in source waters for public drinking supplies. Eutrophication is primarily caused by an overabundance of nitrogen and phosphorus. It causes foul tastes and odors, which require additional treatment, and commensurate expenditure, to remove.

The RIA discusses potential impacts on the market for the beneficial use of CCR as a substitute for virgin materials. Future uses of CCR are unknown. Research on the recovery of rare earth elements and yttrium from coal fly ash is ongoing but currently only at laboratory scale. It is possible that in the future, the availability of additional CCR may reach an equilibrium price that encourages demand, particularly as coal plants retire and the supply of ''new'' CCR falls. However, the quality of CCR in legacy CCR surface impoundments and CCRMU may limit their value. Older, closed impoundments or other CCR storage areas are less likely to have CCR material of a known and reliable composition.

The RIA also discusses potential reductions in fugitive dust emanating from legacy CCR surface impoundments, which will benefit fence line communities by reducing the amount of resuspended ash from legacy CCR surface impoundments that could otherwise lead to respiratory health hazards for communities surrounding a given legacy impoundment.

The RIA discusses the benefits of improved property values near closed and remediated sites. Neighborhoods located near hazardous waste sites often experience depressed property values due to health risks posed by contaminant exposure pathways, potential reductions in ecological services, unsightly aesthetics of the disposal unit site, and potential stigma associated with proximity to a disposal site. Almost a million households, and over 2.5 million people are located within three miles of legacy CCR surface impoundments and CCRMU. Approximately 75,000 households and 200,000 people are located within a mile. Improvements in home values resulting from the proposed rule have the potential to bestow welfare gains to homeowners located near legacy CCR surface impoundments and CCRMU.

The RIA also discusses the value of reusing land formerly occupied by legacy CCR surface impoundments, and CCRMU. Once legacy CCR surface impoundments and CCRMU are closed by removal, landfills are properly capped, or corrective action activities are completed, the land is more likely to move into alternative, economically productive purposes. For example, these land reuse projects might include industrial redevelopment or implementation of green energy generation which can utilize the existing electricity grid infrastructure.

Finally, based on the demographic composition and environmental conditions of communities within one and three miles of legacy CCR surface impoundments, the final rule will reduce existing disproportionate and adverse effects on economically vulnerable communities, as well as those that currently face environmental burdens. For example, in Illinois the population living within one mile of legacy CCR surface impoundment sites is over three times as likely compared to the State average to have less than a high school education (35.66% compared to 10.10%, see RIA exhibit ES.14), and that population already experiences higher than average exposures to particulate matter, ozone, diesel emissions, lifetime air toxics cancer risks, and proximity to traffic, Superfund sites, Risk Management Plan sites, and hazardous waste facilities (see RIA exhibit ES.15).

The RIA also discusses the interaction of the CCR rules with Office of Air rules governing emissions at power plants. Following on the significant progress EPA has made over many decades to reduce dangerous pollution from coal-fired electric utilities' stack emissions and effluents, this proposed rule will help EPA further ensure that the communities and ecosystems closest to coal facilities are sufficiently protected from harm from groundwater contamination, surface water contamination, fugitive dust, floods and impoundment overflows, and threats to wildlife. The volume and toxicity of CCR at many sites persisted or increased over past decades even as coal-fired units' air and water emissions decreased, and this proposed rule will help EPA fulfill the promise of substantial public health and welfare gains from its full suite of regulations aimed at reducing the harms from coal-combustion pollution.

As noted previously, EPA establishes the requirements under RCRA sections 1008(a)(3) and 4004(a) without taking cost into account. *See, USWAG,* 901 F.3d at 448–49. Although EPA has accordingly designed its proposal based on its statutory factors and court precedent and has not relied on this benefit-cost analysis in the selection of its proposed alternative, EPA believes that after considering all unquantified and distributional effects, the public health and welfare gains that will result from the proposed alternative would justify the rule's costs.

VI. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be found at *https://www.epa.gov/laws-regulations/laws-and-executive-orders.*

[152] Brandt, Jessica E., et al. ''Beyond selenium: coal combustion residuals lead to multielement enrichment in receiving lake food webs.'' Environmental science & technology 53.8 (2019): 4119–4127.

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 14904: Modernizing Regulatory Review

This action is a ''significant regulatory action'' under section 3(f)(1) of Executive Order 12866, as amended by Executive Order 14094. Accordingly, the EPA submitted this action to the Office of Management and Budget (OMB) for review. Any changes made in response to recommendations received as part Executive Order 12866 review have been documented in the docket. The EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis, Regulatory Impact Analysis: Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments, is available in the docket and is briefly summarized in Unit V.

B. Paperwork Reduction Act (PRA)

The information collection activities in this rule will be submitted for approval to the Office of Management and Budget (OMB) under the PRA. EPA submitted the proposed rule ICR to OMB for approval on March 25th, 2024, triggering a 30-day public comment period for this proposed information collection. EPA anticipates the final ICR will be approved by the effective date of this final rule. If EPA receives any new and substantive comments on proposed collection, *i.e.,* substantive comments that were not received during the 60 day public comment period on the rule (from May 18, 2023–July 17, 2023), EPA will address those comments in a revision to the ICR via the standard PRA approval process. The Information Collection Request (ICR) document that the EPA prepared has been assigned EPA ICR number 2761.01. Due to the concurrent timing of this rulemaking and the timing of the renewal of the collection of information 2050–0223, *Disposal of Coal Combustion Residuals From Electric Utilities,* EPA is requesting a temporary OMB control number for this rulemaking collection, which will be assigned upon approval of the proposed ICR by OMB. EPA will submit a request to merge this rulemaking collection into the existing ICR for the program, 2050–0223, once the final rulemaking ICR and renewal for 2050–0223 are approved by OMB. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here. The information collection requirements are not enforceable until OMB approves them.

The final rule requires legacy CCR surface impoundments to comply with the reporting and recordkeeping requirements already in place for regulated CCR units. Many of these requirements are one-time requirements that will occur soon after the promulgation of the rule, while several are ongoing. The final rule also requires legacy CCR surface impoundments to submit an applicability report, unique to this universe of units, which will provide stakeholders with essential site characteristic and contact information for the unit.

Respondents/affected entities: Inactive electric utility plants with inactive CCR surface impoundments (legacy CCR surface impoundments), electric utility plants with CCRMU, electric utility plants with OAFUs, and electric utility plants with landfills already subject to regulation under the 2015 final CCR rule, but which have waste in contact with groundwater.

Respondent's obligation to respond: The recordkeeping, notification, and posting are mandatory as part of the minimum national criteria promulgated under Sections 1008(a), 2002(a), 4004, and 4005(a) and (d) of RCRA.

Estimated number of respondents: 2,083.

Frequency of response: one-time and annually.

Total estimated burden: 172,909 hours (per year). Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: $11.2 million (per year), includes $11.2 million annualized capital or operation and maintenance costs.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the Agency will announce that approval in the **Federal Register** and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities contained in this final rule.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. The small entities subject to the requirements of this action are owners and operators of coal fired electric utility plants in NAICS code 221112 and firms that own property on which an inactive/retired coal fired power plant is located. The Agency has identified 175 small entities subject to the final rule. The Agency estimates that the average annual cost to a small entity will be approximately $0.31 million; the vast majority of these entities do not own legacy CCR surface impoundments, CCRMU, or OAFUs, and must only complete the evaluation report requirements of the final rule. EPA has identified 15 small entities owning legacy CCR surface impoundments, CCRMU, and/or OAFUs; EPA assumes that small entities will not be able to pass on any compliance costs to ratepayers. This assumption, in EPA's opinion, constitutes a high-end scenario. In total, these 15 small entities are estimated to incur approximately $52.1 million in annual costs. The Agency has determined that five small entities may experience an impact greater than 3% of annual revenues. Details of this analysis are presented in the Regulatory Impact Analysis, which can be found in the docket for this action.

D. Unfunded Mandates Reform Act (UMRA)

This action contains a Federal mandate under UMRA, 2 U.S.C. 1531–1538, that may result in expenditures of $100 million or more for State, local and Tribal governments, in the aggregate, or the private sector in any one year. Accordingly, the EPA has prepared a written statement required under section 202 of UMRA. The statement is included in the docket for this action and briefly summarized here.

The RIA estimates that the proposed rule may affect 194 legacy CCR surface impoundments at 84 facilities, 195 CCRMU at 104 facilities, 15 OAFUs at six facilities, and 39 landfills already regulated under the 2015 final rule. The final rule will extend the existing requirements of the 2015 CCR final rule, found in 40 CFR part 257, subpart D, to these units.

In preparing the 2015 CCR final rule, and consistent with the intergovernmental consultation provisions of section 204 of the UMRA, EPA initiated pre-proposal consultations with governmental entities affected by the rule. In developing the regulatory options for the 2015 CCR Rule, EPA consulted with small governments according to EPA's UMRA interim small government consultation plan developed pursuant to section 203 of UMRA. The details of this consultation can be found in the preamble to the 2015 CCR final rule. Consistent with section 205 of UMRA, EPA identified and considered a reasonable number of regulatory alternatives, and adopted the least-costly approach (*i.e.,* a modified version of the ''D Prime'' least costly approach presented in the 2010 proposed CCR rule). The final rule merely extends the provisions of the 2015 final rule to four additional classes of facilities.

This action is not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. The threshold amount established for determining whether regulatory requirements could significantly affect small governments is $100 million annually. The RIA estimates annual average costs of $7 million total for the four local governments identified as owning units subject to the final rule. These estimates are well below the $100 million annual threshold established under UMRA. There are no known Tribal owner entities of facilities that would incur substantial direct costs under the final rule.

E. Executive Order 13132: Federalism

This action does not have Federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have Tribal implications as specified in Executive Order 13175. For the ''Final Rule: Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities'' published April 17, 2015 (80 FR 21302), EPA identified three of the 414 coal-fired electric utility plants (in operation as of 2012) as being located on Tribal lands. To the extent that these plants contain CCRMU subject to the proposed rule, the impacts to Tribes will be limited to document review and walking the site. As these are not substantial direct costs, this action does not impose substantial direct compliance costs or otherwise have a substantial direct effect on one or more Indian Tribes, to the best of EPA's knowledge. Neither will it have substantial direct effects on the relationship between the Federal Government and Indian Tribes, or on the distribution of power and responsibilities between the Federal Government and Indian Tribes. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045 directs Federal agencies to include an evaluation of the health and safety effects of the planned regulation on children in Federal health and safety standards and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives. This action is subject to E.O. 13045 (62 FR 19885, April 23, 1997) because it is a significant regulatory action under section 3(f)(1) of E.O. 12866, and EPA believes that the environmental health or safety risks addressed by this action may have a disproportionate effect on children. In addition, EPA's Policy on Children's Health applies. Accordingly, EPA evaluated the environmental health or safety effects of CCR constituents of potential concern on children. The results of this evaluation are contained in the Human and Ecological Risk Assessment of Coal Combustion Wastes available in the docket for this action.

As ordered by E.O. 13045 Section 1–101(a), EPA identified and assessed environmental health risks and safety risks that may disproportionately affect children in the revised risk assessment. Pursuant to U.S. EPA's Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants, children are divided into seven distinct age cohorts: 1 to <2 yr, 2 to <3 yr, 3 to <6 yr, 6 to <11 yr, 11 to <16 yr, 16 to <21 yr, and infants (<1 yr). Using exposure factors for each of these cohorts, EPA calculated cancer and non-cancer risk results in both the screening and probabilistic phases of the assessment. In general, risks to infants tended to be higher than other childhood cohorts, and also higher than risks to adults. However, for drinking water cancer risks, the longer exposure periods for adults led to the highest risks over a standard adult lifetime. Screening risks exceeded EPA's human health criteria for children exposed to contaminated air, soil, and food resulting from fugitive dust emissions and run-off. Similarly, 90th percentile child cancer and non-cancer risks exceeded the human health criteria for the groundwater to drinking water pathway under the full probabilistic analysis (Table 5–17 in the Human and Ecological Risk Assessment of Coal Combustion Wastes). The closure, groundwater monitoring and corrective action required by the rule will reduce risks from currently unregulated legacy CCR surface impoundments, and CCRMU. Thus, EPA believes that this rule will be protective of children's health.

In general, because the pollution control requirements under the CCR rule will reduce health and environmental exposure risks at all coal-fired electric utility plants, the CCR rule is not expected to create additional or new risks to children.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use

This action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution or use of energy. Because the final rule addresses management of CCR and pertains mainly to inactive CCR units (legacy CCR surface impoundments at inactive facilities and CCRMU at facilities already regulated under the 2015 CCR rule), this final rule will have no effect on the production of crude oil, coal, fuel, or natural gas. In addition, the final rule will have no direct effect on electricity production, generating capacity, or on foreign imports or exports of energy.

Electricity price effects on the price of energy are only possible because in some cases, utilities may attempt to pass the costs of managing CCR under the proposed rule on to ratepayers in the form of increased electricity rates through Public Utility Commissions (PUCs). As a result, the final rule may indirectly affect electricity prices within the energy sector. To estimate what the electricity price effects of this final rule may be on a national level, EPA compared the expected costs of this rule to the expected costs and effects resulting from three previously conducted IPM runs for three previous RIAs, the 2015 CCR Rule, the 2015 ELG Rule (which included the costs of the 2015 CCR Rule in its baseline), and the 2019 ELG Rule, which was a deregulatory rule. Extrapolating from these IPM runs, EPA estimates that the effect of the current action on electricity prices will be between 0.060% and 0.156%. Since these effects fall below the 1% threshold, EPA concludes that this rule is not expected to generate significant adverse energy effects. The full energy impacts analysis is available in the Regulatory Impact Analysis that accompanies this action.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking involves technical standards. The EPA has decided to use technical standards in this rule as the existing CCR regulations rely on the following: (1) RCRA Subpart D, Section 257.70 liner design criteria for new CCR landfills and any lateral expansion of a CCR landfill includes voluntary consensus standards developed by ASTM International and EPA test methods such as SW–846, (2) Section 257.71 liner design criteria for existing CCR surface impoundments includes voluntary consensus standards developed by ASTM International and EPA test methods such as SW–846, (3) Section 257.72 liner design criteria for new CCR surface impoundments and any lateral expansion of a CCR surface impoundment includes voluntary consensus standards developed by ASTM International and EPA test methods such as SW–846, and (4) Section 257.73 structural stability standards for new and existing surface impoundments use the ASTM D 698 and 1557 standards for embankment compaction. In this rulemaking, EPA expands the application of § 257.73 structural stability standards, which as noted, rely on the ASTM D 698 and 1557 standards for embankment compaction, to facilities with legacy CCR surface impoundments. This rulemaking does not adopt or otherwise involve any additional technical standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All

EPA believes that the human health or environmental conditions that exist prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on communities with environmental justice concerns.

EPA conducted a demographic screening analysis for all facilities subject to the rule to determine the composition of populations living within one and three miles of facilities with these units. Specifically, EPA looked at the percentages of the relevant populations that are identified as minority/people of color, households below the Federal poverty level, population with less than high school education (among those 25 years and older), and populations characterized by linguistic isolation. EPA chose to look at radii of one and three miles because they represent the areas most likely to be affected by groundwater contamination and surface water impacts from legacy CCR surface impoundments and CCRMU. EPA compared the demographic profile within these radii to national and State averages to assess the extent to which marginalized groups are disproportionately affected by CCR-related contamination in the baseline.

To more fully explore the conditions in communities and populations surrounding facilities subject to the 2024 final rule, EPA expanded the demographic proximity analysis to include a suite of metrics that represent baseline health and social factors that are likely to be affected by, or interact with, changes in the management of facilities as a result of the rule. This analysis also focuses on populations within one mile of legacy CCR surface impoundments and CCRMU sites, but includes a combination of eight baseline indicators from the CDC Environmental Justice Index (EJI) and EPA's EJScreen that document community conditions that (a) suggest potential environmental justice concerns and (b) are relevant to actions resulting from the 2024 final rule. These include:

- CDC EJI Indicators: Lack of internet access, prevalence of disabilities, cancer, poor mental health, high blood pressure, asthma, and diabetes.
- EJScreen Indicators: $PM_{2.5}$ concentrations and low life expectancy.

This specific subset of indicators captures health-related risks, environmental burdens, and access to information that affect a substantial number of communities living near the universe of facilities to provide a clearer picture of the baseline conditions. To assess the extent to which facilities affected by the final rule are located within communities with high baseline risks, the analysis specifically identifies, for each indicator, communities that fall in the highest (most at risk) 40 percent, or top two quintiles of communities nationwide. In other words, the analysis only identifies instances where a community is more at risk or more burdened than 60 percent of all communities in the U.S. For each indicator, the analysis calculates the number of communities within one mile of legacy CCR surface impoundments, CCRMU, and OAFU facilities that are in the top two quintiles.

Many of the health-related indicators appeared in communities with high percentiles for other health-related indicators, especially combinations of high blood pressure, diabetes, and asthma. Communities with high populations of people with disabilities were also likely to have high prevalence of high blood pressure, asthma, diabetes, poor mental health, and cancer. Additionally, high prevalence of poor mental health and lack of internet accompanied prevalence of morbidities besides cancer.

EPA also identified lack of internet access, which is generally associated with poverty but also is a distinct factor in ensuring that information about regulated facilities and units that is required by the 2024 final rule is accessible to the people in surrounding communities. Half of the facilities with a lack of internet access in surrounding communities were also above two times the State average for households below the national poverty level, but the other half are not, suggesting that this barrier to information may be more widespread and less predictable in the 2024 rule context. In addition to the income-related implications, lack of internet access has consequences for information access that are pertinent to the 2024 final rule, which requires facilities to publish information online for public access. Therefore, a lack of internet access is a key barrier for communities who may be unable to receive important information.

These analyses found that of the roughly 182 sites in the regulated universe, more than half are located in areas with environmental justice concerns in surrounding communities. These communities are likely to face existing environmental burdens, economic stressors, and health conditions that put their residents and ecosystems at greater cumulative risk from the impacts associated with proximity to legacy impoundments. Because the final rule is designed to both prevent future contamination and eliminate existing contamination from CCR units that are near these already-vulnerable communities, EPA believes that the rule is likely to incrementally reduce existing disproportionate and adverse effects on communities with EJ concerns. EPA believes that the rule is particularly likely to reduce disproportionate and adverse effects on people of color and populations who experience low income. The rule improves overall environmental quality for all exposed communities and populations by ensuring protection and remediation of groundwater, resulting in avoided health effects (including cancer) from drinking water exposures to arsenic and other contaminants, and by reducing releases of CCR from impoundments into the surface waters, ecosystems, and air surrounding the facilities. The final rule is equity-enhancing in that it addresses EJ concerns present in the communities and populations near many of the facilities by reducing environmental and health burdens that contribute to the cumulative impacts experienced by these communities, including the often-costly burdens associated with health effects. Moreover, the rule requires that facilities make information about their contamination and remediation actions available on public websites; this provides all interested members of the public, including communities with EJ concerns, improved access to information related to their environment or health, supporting effective community involvement.

Overall, EPA found that facilities affected by the rule are often located near populations of color with higher rates of poverty and linguistic isolation, and lower levels of education. Of the roughly 182 sites in the regulated universe, more than half are located in areas with environmental justice concerns in surrounding communities. These communities are likely to face existing environmental burdens, economic stressors, and health conditions that put their residents and ecosystems at greater cumulative risk from the impacts associated with proximity to legacy impoundments. Because the final rule is designed to both prevent future contamination and eliminate existing contamination from CCR units that are near these already-vulnerable communities, EPA believes that the rule is likely to incrementally reduce existing disproportionate and adverse effects on communities with EJ concerns. EPA believes that the rule is particularly likely to reduce disproportionate and adverse effects on people of color and populations who experience low income.

The information supporting this Executive Order review is contained in the accompanying Regulatory Impact Analysis, which can be found in the docket for this action.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action meets the criteria set forth in 5 U.S.C. 804(2).

List of Subjects

40 CFR Part 9

Environmental protection, Reporting and recordkeeping requirements.

40 CFR Part 257

Environmental protection, Beneficial use, Coal combustion products, Coal combustion residuals, Coal combustion waste, Disposal, Hazardous waste, Landfill, Surface impoundment.

Michael S. Regan,
Administrator.

For the reasons set out in the preamble, title 40, chapter I, of the Code of Federal Regulations is amended as follows:

PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

■ 1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 *et seq.,* 136–136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601–2671; 21 U.S.C. 331j, 346a, 31 U.S.C. 9701; 33 U.S.C. 1251 *et seq.,* 1311, 1313d, 1314, 1318, 1321, 1326, 1330, 1342, 1344, 1345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971–1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–1, 300j–2, 300j–3, 300j–4, 300j–9, 1857 *et seq.,* 6901–6992k, 7401–7671q, 7542, 9601–9657, 11023, 11048.

■ 2. Amend § 9.1 by adding an undesignated center heading and an entry for ''257.50–257.107'' in numerical order to read as follows:

§ 9.1 OMB approvals under the Paperwork Reduction Act

* * * * *

40 CFR citation	OMB control No.
* * * * *	
Disposal of Coal Combustion Residuals From Electric Utilities	
257.50–257.107	2050–0223
* * * * *	

* * * * *

PART 257—CRITERIA FOR CLASSIFICATION OF SOLID WASTE DISPOSAL FACILITIES AND PRACTICES

■ 3. The authority citation for part 257 is revised to read as follows:

Authority: 42 U.S.C. 6907(a)(3), 6912(a)(1), 6927, 6944, 6945(a) and (d); 33 U.S.C. 1345(d) and (e).

Subpart A [Amended]

■ 4. Amend § 257.1 by revising paragraph (c)(12) to read as follows:

§ 257.1 Scope and purpose.

* * * * *

(c) * * *

(12) Except as otherwise specifically provided in subpart D of this part, the criteria in subpart A of this part do not apply to CCR units, as that term is defined in subpart D of this part. CCR units are instead subject to subpart D of this part.

Subpart D [Amended]

■ 5. Amend subpart D by removing the phrase ''Web site'' and adding in its place the word ''website'' wherever it appears.

■ 6. Amend § 257.50 by revising paragraph (c), (d), and (e) to read as follows:

§ 257.50 Scope and purpose.

* * * * *

(c) This subpart also applies to inactive CCR surface impoundments at active electric utilities or independent power producers, regardless of how electricity is currently being produced at the facility.

(d) (1) This subpart applies to CCR management units containing 1,000 tons or greater of CCR, located at active facilities or facilities with a legacy CCR surface impoundment.

(2) CCR management units containing greater than or equal to 1 ton and less than 1,000 tons of CCR, located at active facilities or facilities with a legacy CCR surface impoundment, are subject only to the requirements of the facility evaluation report in § 257.75 until a permitting authority determines that regulation of these units, either individually or in the aggregate, is warranted and determines the applicable requirements.

(e) This subpart applies to electric utilities or independent power producers that ceased producing electricity prior to October 19, 2015 and have a legacy CCR surface impoundment onsite.

* * * * *

§ 257.51 [Removed and Reserved]

■ 7. Amend subpart D by removing and reserving § 257.51.

■ 8. Revise § 257.52 to read as follows:

§ 257.52 Applicability of other regulations.

(a) Compliance with the requirements of this subpart does not affect the need for the owner or operator of a CCR unit to comply with all other applicable federal, state, tribal, or local laws or other requirements.

(b) Any CCR unit continues to be subject to the requirements in §§ 257.3–1, 257.3–2, and 257.3–3.

■ 9. Amend § 257.53 by:

■ a. Revising the definition of ''Active facility or active electric utilities or independent power producers'';

■ b. Adding in alphabetical order the definition of ''Closed prior to October 19, 2015'';
■ c. Revising the definition of ''CCR landfill or landfill'';
■ d. Adding in alphabetical order the definition of ''CCR management unit'';
■ e. Revising the definitions of ''CCR surface impoundment or impoundment'' and ''CCR unit'';
■ f. Adding in alphabetical order the definitions of ''Critical infrastructure'', ''Contains both CCR and liquids'' and ''Inactive CCR landfill'';
■ g. Revising the definition of ''Inactive CCR surface impoundment'';
■ h. Adding in alphabetical order the definitions of ''Inactive facility or inactive electric utility or independent power producer'', ''Infiltration'', ''Legacy CCR surface impoundment'', and ''Liquids'';
■ i. Revising the definitions of ''Operator'' and ''Owner'';
■ j. Adding in alphabetical order the definition of ''Regulated CCR unit'';
■ k. Revising the definition of ''State Director'';
■ l. Removing the definitions of ''Technically feasible'' and ''Technically infeasible''; and
■ m. Adding in alphabetical order the definitions of ''Technically feasible or feasible'' and ''Technically infeasible or infeasible''.

The revisions and additions read as follows:

§ 257.53 Definitions.

* * * * *

Active facility or *active electric utilities or independent power producers* means any facility subject to the requirements of this subpart that is in operation on or after October 19, 2015. An electric utility or independent power producer is in operation if it is generating electricity that is provided to electric power transmission systems or to electric power distribution systems on or after October 19, 2015. An off-site disposal facility is in operation if it is accepting or managing CCR on or after October 19, 2015.

* * * * *

Closed prior to October 19, 2015 means the CCR landfill or surface impoundment completed closure of the unit in accordance with state law prior to October 19, 2015.

* * * * *

CCR landfill or landfill means an area of land or an excavation that contains CCR and which is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave. For purposes of this subpart, a CCR landfill also includes sand and gravel pits and quarries that receive CCR, CCR piles, and any practice that does not meet the definition of a beneficial use of CCR.

CCR management unit means any area of land on which any noncontainerized accumulation of CCR is received, is placed, or is otherwise managed, that is not a regulated CCR unit. This includes inactive CCR landfills and CCR units that closed prior to October 19, 2015, but does not include roadbed and associated embankments in which CCR is used unless the facility or a permitting authority determines that the roadbed is causing or contributing to a statistically significant level above the groundwater protection standard established under § 257.95(h).

* * * * *

CCR surface impoundment or *impoundment* means a natural topographic depression, man-made excavation, or diked area, designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR.

CCR unit means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR landfill or CCR surface impoundment, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified. This term includes CCR management units and legacy CCR surface impoundments.

Contains both CCR and liquids means that both CCR and liquids are present in a CCR surface impoundment, except where the owner or operator demonstrates that the standard in § 257.102(d)(2)(i) has been met.

Critical infrastructure means physical structures, such as buildings, railways, bridges, or tunnels, that are not readily replaced or relocated and are either:

(1) Necessary for the continued generation of power, or

(2) Vital to the success or continuation of other on-going site activity for the public welfare. Examples of critical infrastructure include high power electric transmission towers, air pollution control or wastewater treatment systems, active CCR units, buildings, or an electrical substation. Buildings or other structures that exclusively provide commercial or financial benefit to private entities are not critical infrastructure.

* * * * *

Inactive CCR landfill means an area of land or an excavation that contains CCR but that no longer receives CCR on or after October 19, 2015 and that is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave. This term also includes sand and gravel pits that contain CCR and CCR piles, which have not received CCR on or after October 19, 2015, and abandoned or inactive CCR piles.

Inactive CCR surface impoundment means a CCR surface impoundment located at an active facility that no longer receives CCR on or after October 19, 2015, and still contains both CCR and liquids on or after October 19, 2015.

Inactive facility or *inactive electric utility or independent power producer* means any electric utility or independent power producer that ceased providing power to electric power transmission systems or to electric power distribution systems before October 19, 2015. An off-site disposal facility is inactive if it ceased accepting or managing CCR prior to October 19, 2015.

* * * * *

Infiltration means the migration or movement of liquid, such as surface water or ground water, into or through a CCR unit from any direction, including from the surface, laterally, and through the bottom of the unit.

* * * * *

Legacy CCR surface impoundment means a CCR surface impoundment that no longer receives CCR but contained both CCR and liquids on or after October 19, 2015, and that is located at an inactive electric utility or independent power producer.

* * * * *

Liquids means any fluid (such as water) that has no independent shape but has a definite volume and does not expand indefinitely and that is only slightly compressible. This encompasses all of the various types of liquids that may be present in a CCR unit, including water that was sluiced into an impoundment along with CCR, precipitation, surface water, groundwater, and any other form of water that has migrated into the impoundment, which may be found as free water or standing water ponded above CCR or porewater intermingled with CCR.

* * * * *

Operator means the person(s) responsible for the overall operation of a CCR unit. This term includes those person(s) or parties responsible for disposal or otherwise actively engaged in the solid waste management of CCR. It also includes those responsible for directing or overseeing groundwater monitoring, closure or post-closure activities at a CCR unit.

* * * * *

Owner means the person(s) who owns a CCR unit or part of a CCR unit, or a facility, whether in full or in part.

* * * * *

Regulated CCR unit means any new CCR landfill, existing CCR landfill, new CCR surface impoundment, existing CCR surface impoundment, inactive CCR surface impoundment, or legacy CCR surface impoundment. This term does not include CCR management units.

* * * * *

State Director means the chief administrative officer of the lead state agency responsible for implementing the state program regulating disposal in CCR units.

* * * * *

Technically feasible or *feasible* means possible to do in a way that would likely be successful.

Technically infeasible or *infeasible* means not possible to do in a way that would likely be successful.

* * * * *

■ 10. Amend § 257.61 by revising the introductory text of paragraph (a) to read as follows:

§ 257.61 Wetlands.

(a) New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located in wetlands, as defined in § 230.41(a) of this chapter, unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that the CCR unit meets the requirements of paragraphs (a)(1) through (5) of this section.

* * * * *

■ 11. Amend § 257.73 by revising the introductory text of paragraph (a) to read as follows:

§ 257.73 Structural integrity criteria for existing CCR surface impoundments.

(a) The requirements of paragraphs (a)(1) through (4) of this section apply to all existing CCR surface impoundments and legacy CCR surface impoundments, except for those that are incised CCR surface impoundments.

* * * * *

■ 12. Add § 257.75 to read as follows:

§ 257.75 Requirements for identifying CCR management units.

(a) *Applicability.* The requirements of this section apply to owners and operators of active facilities or facilities with a legacy CCR surface impoundment.

(b) *Facility evaluation.* The owner or operator of an active facility or a facility with a legacy CCR surface impoundment must conduct a facility evaluation to identify all CCR management units at the facility in accordance with paragraphs (c) through (e) of this section. At a minimum, the presence or absence of CCR management units at the facility must be confirmed and documented through a thorough evaluation of reasonably and readily available records that contain the information needed to prepare the Facility Evaluation Reports Part 1 and Part 2 required by paragraphs (c) and (d) of this section. The facility evaluation must also include a physical inspection of the facility. Where necessary, the physical inspection must include field investigation activities to fill data gaps, such as conducting exploratory soil borings, geophysical assessments, or any other similar physical investigation activities to establish the location and boundaries of potential or likely CCR management units, and to affirmatively rule out other areas of potential CCR placement at the facility that were identified during the information review or physical inspection. The facility evaluation must identify all CCR management units at the facility regardless of when the CCR management unit came into existence.

(c) *Facility Evaluation Report Part 1.* (1) No later than Monday, February 9, 2026, the owner or operator of an active facility or a facility with a legacy CCR surface impoundment must prepare a Facility Evaluation Report Part 1, which shall contain, to the extent reasonably and readily available, the information specified in paragraphs (c)(1)(i) through (xiv) of this section. The owner or operator has prepared the Facility Evaluation Report Part 1 when the report has been placed in the facility's operating record as required by § 257.105(f)(25).

(i) The name and address of the person(s) owning and operating the facility; the unit name associated with each regulated CCR unit and CCR management unit at the facility; and the identification number of each regulated CCR unit and CCR management unit if any have been assigned by the state or by the owner.

(ii) The location of any CCR management unit identified on the most recent U.S. Geological Survey (USGS) 7½ minute or 15-minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available. The location of each regulated CCR unit at the facility must also be identified in the same manner.

(iii) A statement of the purpose(s) for which each CCR management unit at the facility is or was used.

(iv) A description of the physical and engineering properties of the foundation and abutment materials on which each CCR management unit is constructed.

(v) A discussion of any known spills or releases of CCR, including any associated remediation activities, from each CCR management unit and whether the spills or releases were reported to state or federal agencies.

(vi) Any record or knowledge of structural instability of each CCR management unit.

(vii) Any record or knowledge of groundwater contamination associated or potentially associated with each CCR management unit.

(viii) The size of each CCR management unit, including the general lateral and vertical dimensions and an estimate of the volume of waste contained within the unit.

(ix) Dates when each CCR management unit first received CCR and when each CCR management unit ceased receiving CCR.

(x) Identification of all types of CCR in each CCR management unit at the facility.

(xi) A narrative description of any closure activities that have occurred, including any applicable engineering drawings or reports.

(xii) A narrative that documents the data reviewed as part of the facility evaluation process, and that lists all data and information indicating the presence or absence of CCR management units at the facility.

(xiii) Any supporting information used to identify and evaluate CCR management units at the facility, including but not limited to any construction diagrams, engineering drawings, permit documents, wastestream flow diagrams, aerial photographs, satellite images, historical facility maps, any field or analytical data, groundwater monitoring data or reports, inspection reports, documentation of interviews with current or former facility workers, and other documents used to identify and evaluate CCR management units at the facility.

(xiv) A narrative description of any data gaps for information in paragraphs (c)(i) through (xiii) of this section, not available in existing information collection records and a plan for remedying identified data gaps through a physical examination of the facility, including any field or laboratory work needed to remedy data gaps in the Facility Evaluation Report Part 1 record. The plan must include the major milestones needed to fill the identified data gaps (*e.g.,* a physical examination of the facility, sampling of media, measurements of CCR concentrations in and around the unit or physical presence, delineation of CCR management unit(s)) and dates to complete such needed tasks. Also, as necessary and timely, any updates to data gap remedy plans must be added to the public record during the Facility Evaluation Report Part 1.

(2) The owner or operator of any facility regulated under this subpart must obtain a certification from a qualified professional engineer stating that the Facility Evaluation Report Part 1 meets the requirements of paragraph (c)(1) of this section.

(3) The owner or operator of any facility regulated under this subpart must certify the Facility Evaluation Report Part 1 required by paragraph (c)(1) of this section with the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(4) No later than Monday, February 9, 2026, the owner or operator must notify the Agency of the establishment of a CCR website using the procedures in § 257.107(a) via the ''contact us'' form on EPA's CCR website.

(5) The owner or operator of any facility regulated under this subpart that does not contain any CCR management unit must submit Facility Evaluation Report Part 1 documenting the steps taken during the facility evaluation to determine the absence of any CCR management unit. The Facility Evaluation Report Part 1 must include the certifications required under paragraph (c)(3) of this section.

(d) *Facility evaluation report part 2.* (1) No later than Monday, February 8, 2027, the owner or operator of an active facility or a facility with a legacy CCR surface impoundment must prepare a facility evaluation report part 2, which shall contain, to the extent not provided in the Facility Evaluation Report Part 1 under paragraph (c) of this section, the information specified in paragraphs (d)(1)(i) through (xiii) of this section obtained from a physical evaluation of the facility, including where necessary field sampling. The owner or operator has prepared the facility evaluation report part 2 when the report has been placed in the facility's operating record as required by § 257.105(f)(26).

(i) The name and address of the person(s) owning and operating the facility; the unit name associated with each regulated CCR unit and CCR management unit at the facility; and the identification number of each regulated CCR unit and CCR management unit if any have been assigned by the state or by the owner.

(ii) The location of any CCR management unit identified on the most recent U.S. Geological Survey (USGS) 7½ minute or 15-minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available. The location of each regulated CCR unit at the facility must also be identified in the same manner.

(iii) A statement of the purpose(s) for which each CCR management unit at the facility is or was used.

(iv) A description of the physical and engineering properties of the foundation and abutment materials on which each CCR management unit was constructed.

(v) Any further evidence of known spills or releases, including any associated remediation activities, of CCR from each CCR management unit and whether the spills or releases were reported to state or federal agencies.

(vi) Any further evidence of structural instability of each CCR management unit.

(vii) Any further evidence of groundwater contamination associated or potentially associated with each CCR management unit.

(viii) The size of each CCR management unit, including the general lateral and vertical dimensions and an estimate of the volume of CCR contained within the unit.

(ix) Identification of the types of CCR in each CCR management unit.

(x) A narrative description of any closure activities that have occurred, including any applicable engineering drawings or reports.

(xi) A narrative that documents the nature and extent of field oversight activities and data reviewed as part of the facility evaluation process, and that lists all data and information that was reviewed indicating the presence or absence of CCR management units at the facility.

(xii) Any additional supporting information used to identify and evaluate CCR management units at the facility, including but not limited to any construction diagrams, engineering drawings, permit documents, wastestream flow diagrams, aerial photographs, satellite images, historical facility maps, any field or analytical data, groundwater monitoring data or reports, inspection reports, and other documents used to identify and assess CCR management units at the facility. Additionally, as necessary and timely, any updates to the part 1 data gap remedy plan must be added to the record during the facility evaluation report part 2 timeframe.

(xiii) The Facility Evaluation Report Part 2 must explain how each data gap identified in Facility Evaluation Report Part 1 was addressed.

(xiv) A description of each CCR management unit for which regulation under this subpart is deferred for allowable reasons as specified in § 257.101(g) or (h). The owner or operator must provide documentation in the Facility Evaluation Report Part 2 to substantiate that the requirements § 257.101(g) or (h) have been met.

(2) The owner or operator of any facility regulated under this subpart must obtain a certification from a qualified professional engineer stating that the Facility Evaluation Report Part 2 meets the requirements of paragraph (d)(1) of this section.

(3) The owner or operator of any facility regulated under this subpart must certify the Facility Evaluation Report Part 2 required by paragraph (d)(1) of this section with the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(4) The owner or operator of any facility regulated under this subpart that does not contain any CCR management unit must submit Facility Evaluation Report Part 2 documenting the steps taken during the facility evaluation to determine the absence of any CCR management unit. The Facility Evaluation Report Part 2 must include the certifications required under paragraph (d)(3) of this section.

(e) The owner or operator of the facility must comply with the recordkeeping requirements specified in § 257.105(f), the notification requirements specified in § 257.106(f), and the internet requirements specified in § 257.107(f).

■ 13. Amend § 257.80 by revising paragraphs (a) and (b)(6) to read as follows:

§ 257.80 Air criteria.

(a) The owner or operator of a CCR unit must adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

(b) * * *

(6) *Amendment of the plan.* The owner or operator subject to the requirements of this section may amend the written CCR fugitive dust control plan at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(g)(1). The owner or operator must amend the written plan no later than 30 days whenever there is a change in conditions that would substantially affect the written plan in effect, such as the construction and operation of a new CCR unit.

* * * * *

■ 14. Amend § 257.82 by revising the introductory text of paragraph (a) to read as follows:

§ 257.82 Hydrologic and hydraulic capacity requirements for CCR surface impoundments.

(a) The owner or operator of an existing or new CCR surface impoundment, legacy CCR surface impoundment, or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.

* * * * *

■ 15. Amend § 257.83 by revising the introductory text of paragraphs (a)(1) and (b)(1) to read as follows:

§ 257.83 Inspection requirements for CCR surface impoundments.

(a) * * *

(1) All CCR surface impoundments, including legacy CCR surface impoundments, and any lateral expansion of a CCR surface impoundment must be examined by a qualified person as follows:

* * * * *

(b) * * *

(1) If the existing or new CCR surface impoundment or any lateral expansion of the CCR surface impoundment or legacy CCR surface impoundments is subject to the periodic structural stability assessment requirements under § 257.73(d) or § 257.74(d), the CCR unit must additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:

* * * * *

■ 16. Revise and republish § 257.90 to read as follows:

§ 257.90 Applicability.

(a) *Applicability.* All CCR units are subject to the groundwater monitoring and corrective action requirements under §§ 257.90 through 257.98, except as provided in paragraph (g) of this section.

(b) *Initial timeframes*—(1) *Existing CCR landfills and existing CCR surface impoundments.* No later than October 17, 2017, the owner or operator of the CCR unit must be in compliance with the following groundwater monitoring requirements:

(i) Install the groundwater monitoring system as required by § 257.91;

(ii) Develop the groundwater sampling and analysis program to include selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by § 257.93;

(iii) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well as required by § 257.94(b); and

(iv) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of this part as required by § 257.94.

(2) *New CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units.* Prior to initial receipt of CCR by the CCR unit, the owner or operator must be in compliance with the groundwater monitoring requirements specified in paragraph (b)(1)(i) and (ii) of this section. In addition, the owner or operator of the CCR unit must initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background well as required by § 257.94(b).

(3) *CCR management units.* No later than Monday, May 8, 2028, the owner or operator of the CCR management unit must be in compliance with the following groundwater monitoring requirements:

(i) Install the groundwater monitoring system as required by § 257.91.

(ii) Develop the groundwater sampling and analysis program to include selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by § 257.93.

(iii) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b).

(iv) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of this part, as required by § 257.94.

(v) Begin evaluating the groundwater monitoring data for statistically significant levels over groundwater protection standards for the constituents listed in appendix IV of this part as required by § 257.95.

(c) *Requirement to conduct groundwater monitoring and corrective action.* Once a groundwater monitoring system and groundwater monitoring program has been established at the CCR unit as required by this subpart, the owner or operator must conduct groundwater monitoring and, if necessary, corrective action throughout the active life and post-closure care period of the CCR unit.

(d) *Responding to a release from a CCR unit.* In the event of a release from a CCR unit, the owner or operator must immediately take all necessary measures to control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of contaminants into the environment. The owner or operator of the CCR unit must comply with all applicable requirements in §§ 257.96, 257.97, and 257.98.

(e) *Annual groundwater monitoring and corrective action report.* For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For CCR management units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31, 2029, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

(1) A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

(2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

(3) In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

(4) A narrative discussion of any transition between monitoring programs (*e.g.,* the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

(6) A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:

(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

(iii) If it was determined that there was a statistically significant increase over background for one or more constituents listed in appendix III to this part pursuant to § 257.94(e):

(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and

(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.

(iv) If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in appendix IV to this part pursuant to § 257.95(g) include all of the following:

(A) Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;

(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;

(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and

(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.

(v) Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and

(vi) Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

(f) *Recordkeeping, notification, and internet requirements.* The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the internet requirements specified in § 257.107(h).

(g) *Suspension of groundwater monitoring requirements.*(1) The Participating State Director or EPA where EPA is the permitting authority may suspend the groundwater monitoring requirements under §§ 257.90 through 257.95 for a CCR unit for a period of up to ten years, if the owner or operator provides written documentation that, based on the characteristics of the site in which the CCR unit is located, there is no potential for migration of any of the constituents listed in appendices III and IV to this part from that CCR unit to the uppermost aquifer during the active life of the CCR unit and the post-closure care period. This demonstration must be certified by a qualified professional engineer and approved by the Participating State Director or EPA where EPA is the permitting authority, and must be based upon:

(i) Site-specific field collected measurements, sampling, and analysis of physical, chemical, and biological processes affecting contaminant fate and transport, including at a minimum, the information necessary to evaluate or interpret the effects of the following properties or processes on contaminant fate and transport:

(A) Aquifer Characteristics, including hydraulic conductivity, hydraulic gradient, effective porosity, aquifer thickness, degree of saturation, stratigraphy, degree of fracturing and secondary porosity of soils and bedrock, aquifer heterogeneity, groundwater discharge, and groundwater recharge areas;

(B) Waste Characteristics, including quantity, type, and origin;

(C) Climatic Conditions, including annual precipitation, leachate generation estimates, and effects on leachate quality;

(D) Leachate Characteristics, including leachate composition, solubility, density, the presence of immiscible constituents, Eh, and pH; and

(E) Engineered Controls, including liners, cover systems, and aquifer controls (*e.g.,* lowering the water table). These must be evaluated under design and failure conditions to estimate their long-term residual performance.

(ii) Contaminant fate and transport predictions that maximize contaminant migration and consider impacts on human health and the environment.

(2) The owner or operator of the CCR unit may renew this suspension for additional ten year periods by submitting written documentation that the site characteristics continue to ensure there will be no potential for migration of any of the constituents listed in Appendices III and IV of this part. The documentation must include, at a minimum, the information specified in paragraphs (g)(1)(i) and (ii) of this section and a certification by a qualified professional engineer and approved by the State Director or EPA where EPA is the permitting authority. The owner or operator must submit the documentation supporting their renewal request for the state's or EPA's review and approval of their extension one year before the groundwater monitoring suspension is due to expire. If the existing groundwater monitoring extension expires or is not approved, the owner or operator must begin groundwater monitoring according to paragraph (a) of this section within 90 days. The owner or operator may continue to renew the suspension for

ten-year periods, provided the owner or operator demonstrate that the standard in paragraph (g)(1) of this section continues to be met for the unit. The owner or operator must place each completed demonstration in the facility's operating record.

(3) The owner or operator of the CCR unit must include in the annual groundwater monitoring and corrective action report required by § 257.90(e) or § 257.100(e)(5)(ii) any approved no migration demonstration.

■ 17. Amend § 257.95 by revising paragraph (b) to read as follows:

§ 257.95 Assessment monitoring program.

* * * * *

(b) (1) Within 90 days of triggering an assessment monitoring program, and annually thereafter:

(i) Except as provided by paragraph (b)(1)(ii) of this section, the owner or operator of the CCR unit must sample and analyze the groundwater for all constituents listed in appendix IV to this part.

(ii) The owner or operator of a CCR management unit must sample and analyze the groundwater for all constituents listed in appendix IV to this part no later than Monday, May 8, 2028.

(2) The number of samples collected and analyzed for each well during each sampling event must be consistent with § 257.93(e), and must account for any unique characteristics of the site, but must be at least one sample from each well.

* * * * *

■ 18. Revise and republish § 257.100 to read as follows:

§ 257.100 Inactive CCR surface impoundments and Legacy CCR surface impoundments.

(a) *General.* (1) Inactive CCR surface impoundments are subject to all of the requirements of this subpart applicable to existing CCR surface impoundments, except that an active electric utility or independent power producer that generates electricity without the use of fuel is subject to the compliance deadlines applicable to legacy CCR surface impoundments, provided the facility has not generated electricity using fuels on or after October 19, 2015.

(2) Legacy CCR surface impoundments are subject to all of the requirements of this subpart applicable to existing CCR surface impoundments, except for the requirements in §§ 257.60 through 257.64 and 257.71.(b) through (d) [Reserved]

(e) *Timeframes for certain inactive CCR surface impoundments.* (1) An inactive CCR surface impoundment for which the owner or operator has completed the actions by the deadlines specified in paragraphs (e)(1)(i) through (iii) of this section is eligible for the alternative timeframes specified in paragraphs (e)(2) through (6) of this section. The owner or operator of the CCR unit must comply with the applicable recordkeeping, notification, and internet requirements associated with these provisions. For the inactive CCR surface impoundment:

(i) The owner or operator must have prepared and placed in the facility's operating record by December 17, 2015, a notification of intent to initiate closure of the inactive CCR surface impoundment pursuant to § 257.105(i)(1);

(ii) The owner or operator must have provided notification to the State Director and/or appropriate Tribal authority by January 19, 2016, of the intent to initiate closure of the inactive CCR surface impoundment pursuant to § 257.106(i)(1); and

(iii) The owner or operator must have placed on its CCR website by January 19, 2016, the notification of intent to initiate closure of the inactive CCR surface impoundment pursuant to § 257.107(i)(1).

(2) *Location restrictions.* (i) No later than April 16, 2020, the owner or operator of the inactive CCR surface impoundment must:

(A) Complete the demonstration for placement above the uppermost aquifer as set forth by § 257.60(a), (b), and (c)(3);

(B) Complete the demonstration for wetlands as set forth by § 257.61(a), (b), and (c)(3);

(C) Complete the demonstration for fault areas as set forth by § 257.62(a), (b), and (c)(3);

(D) Complete the demonstration for seismic impact zones as set forth by § 257.63(a), (b), and (c)(3); and

(E) Complete the demonstration for unstable areas as set forth by § 257.64(a), (b), (c), and (d)(3).

(ii) An owner or operator of an inactive CCR surface impoundment who fails to demonstrate compliance with the requirements of paragraph (e)(2)(i) of this section is subject to the closure requirements of § 257.101(b)(1).

(3) *Design criteria.* The owner or operator of the inactive CCR surface impoundment must:

(i) No later than April 17, 2018, complete the documentation of liner type as set forth by § 257.71(a) and (b).

(ii) No later than June 16, 2017, place on or immediately adjacent to the CCR unit the permanent identification marker as set forth by § 257.73(a)(1).

(iii) No later than October 16, 2018, prepare and maintain an Emergency Action Plan as set forth by § 257.73(a)(3).

(iv) No later than April 17, 2018, compile a history of construction as set forth by § 257.73(b) and (c).

(v) No later than April 17, 2018, complete the initial hazard potential classification, structural stability, and safety factor assessments as set forth by § 257.73(a)(2), (b), (d), (e), and (f).

(4) *Operating criteria.* The owner or operator of the inactive CCR surface impoundment must:

(i) No later than April 18, 2017, prepare the initial CCR fugitive dust control plan as set forth in § 257.80(b).

(ii) No later than April 17, 2018, prepare the initial inflow design flood control system plan as set forth in § 257.82(c).

(iii) No later than April 18, 2017, initiate the inspections by a qualified person as set forth by § 257.83(a).

(iv) No later than July 19, 2017, complete the initial annual inspection by a qualified professional engineer as set forth by § 257.83(b).

(5) *Groundwater monitoring and corrective action.* The owner or operator of the inactive CCR surface impoundment must:

(i) No later than April 17, 2019, comply with groundwater monitoring requirements set forth in §§ 257.90(b) and 257.94(b); and

(ii) No later than August 1, 2019, prepare the initial groundwater monitoring and corrective action report as set forth in § 257.90(e).

(6) *Closure and post-closure care.* The owner or operator of the inactive CCR surface impoundment must:

(i) No later than April 17, 2018, prepare an initial written closure plan as set forth in § 257.102(b); and

(ii) No later than April 17, 2018, prepare an initial written post-closure care plan as set forth in § 257.104(d).

(f) *Timeframes for legacy CCR surface impoundments.* Owners and operators of legacy CCR surface impoundments are subject to the requirements of paragraphs (f)(1) through (5) of this section, except as provided in paragraphs (g) through (i) of this section.

(1) *Legacy CCR surface impoundment applicability report.* (i) Except as provided in paragraph (f)(1)(iii) of this section, owners and operators of legacy CCR surface impoundments must prepare a report for each legacy CCR surface impoundment no later than Friday, November 8, 2024. The owner or operator has prepared the applicability report when the report has been placed in the facility's operating record as required by § 257.105(k)(1). At a minimum, the report for each legacy

CCR surface impoundment must contain:

(A) The name and address of the person(s) owning and operating the legacy CCR surface impoundment with their business phone number and email address.

(B) The name associated with the legacy CCR surface impoundment.

(C) Information to identify the legacy CCR surface impoundment, including a figure of the facility and where the unit is located at the facility, facility address, and the latitude and longitude of the facility.

(D) The identification number of the legacy CCR surface impoundment if one has been assigned by the state. (E) A description of the current site conditions, including the current use of the inactive facility.

(ii) (A) The owner or operator of any legacy CCR surface impoundment must certify the applicability report required by paragraph (f)(1)(i) of this section with the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(B) The owner or operator must notify the Agency of the establishment of the facility's CCR website and the applicability of the rule, using the procedures in § 257.107(a) via the ''contact us'' form on EPA's CCR website.

(iii) (A) Notwithstanding the deadline to complete the applicability report under paragraph (f)(1)(i) of this section, an owner or operator may secure additional time to complete the report for the sole reason of determining through a field investigation whether the unit contains both CCR and liquids. The amount of additional time that can be secured is limited as specified in paragraph (f)(1)(iii)(B) of this section. For owners and operators following the procedures of this paragraph (f)(1)(iii), the compliance timeframes for the requirements specified under paragraphs (f)(2) through (5) of this section are adjusted by the length of the extension(s) justified under this paragraph (f)(1)(iii). To qualify for additional time, the owner or operator must prepare an applicability extension report consisting of the following:

(*1*) The information specified in paragraph (f)(1)(i)(A) through (C) of this section;

(*2*) A statement by the owner or operator that to the best of their knowledge or belief, existing and available information does not provide a sufficient basis to determine that the unit contained free liquids on or after October 19, 2015; and

(*3*) The details of a written field investigation work plan, including of the following:

(*i*) A detailed description of the approach to characterize the physical, topographic, geologic, hydrogeologic, and hydraulic properties of the CCR in the unit and native geologic materials beneath and surrounding the unit, and how those properties will be used to investigate for the presence of free liquids in the CCR unit.

(*ii*) A detailed description of the methods and tools that will be employed to determine whether the unit contains free liquids, the rationale for choosing these methods and tools, how these methods and tools will be implemented, and at what level of spatial resolution at the CCR unit to identify and monitor for the presence of free liquids.

(*iii*) A detailed description of how groundwater elevations will be determined, and at what level of spatial resolution, in relation to the sides and bottom of the CCR unit and how any intersection of the groundwater table with the CCR unit will be evaluated, and at what level of spatial resolution.

(*iv*) A plan for evaluating stormwater flow over the surface of the unit, stormwater drainage from the unit, and stormwater infiltration into the unit and how those processes may result in the formation of free liquids in the CCR unit. This plan must include a current topographic map showing surface water flow and any pertinent natural or man-made features present relevant to stormwater drainage, infiltration and related processes.

(*v*) An estimated timeline to complete the workplan and make a determination if the CCR unit contains free liquids.

(vi) A narrative discussion of how the results from implementing the workplan will determine whether the unit contains free liquids specified.

(*vii*) A narrative discussion describing any anticipated problems that may be encountered during implementation of the workplan and what actions will be taken to resolve the problems, and anticipated timeframes necessary for such a contingency.

(*viii*) The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer stating that the field investigation work plan meets the requirements of paragraph (f)(1)(iii)(A)(*3*) of this section.

(B) The maximum amount of additional time that can be secured under paragraph (f)(1)(iii) of this section is 18 months, secured in 6-month increments, provided each 6-month increment is supported by an applicability extension report.

(C) Owners and operator must prepare the initial applicability extension report no later than Friday, November 8, 2024. Subsequent applicability extension reports must be prepared no later than 6 months after completing the preceding applicability extension report. The owner or operator has prepared the applicability extension report when the report is placed in the facility's operating record as required by § 257.105(k)(2).

(D) No later than Friday, November 8, 2024, the owner or operator must notify the Agency of the establishment of a CCR website using the procedures in § 257.107(a) via the ''contact us'' form on EPA's CCR website.

(E) If the owner or operator determines that the unit contains free liquids during implementation of the written field investigation workplan, the owner or operator must cease operating under these extension provisions and prepare the applicability report required by paragraph (f)(1) of this section within 14 days of determining that the unit contains free liquids. The owner or operator must comply with the requirements specified under paragraphs (f)(2) through (5) of this section under new timeframes. The new timeframes are determined by adding the total length of the extension(s) justified under paragraph (f)(1)(iii) of this section to each of the deadlines specified under paragraphs (f)(2) through (5) of this section.

(F) If the owner or operator determines that the unit does not contain both CCR and liquids during implementation of the written field investigation work plan, the owner or operator must prepare a notification stating that the field investigation has concluded and that the owner or operator has determined that the unit does not contain both CCR and liquids and does not meet the definition of a legacy CCR surface impoundment. The owner or operator has prepared the notification when the report is placed in the facility's operating record as required by § 257.105(k)(3).

(G) If the owner or operator does not complete the field investigation work within the timeframes specified in paragraph (f)(1)(iii)(B) of this section, the unit shall be considered a legacy CCR surface impoundment and must comply with the requirements under paragraphs (f)(2) through (5) of this section pursuant to the timeframes specified under paragraph (f)(1)(iii)(E) of this section.

(2) *Design criteria.* The owner or operator of a legacy CCR surface impoundment must:

(i) Except for legacy CCR surface impoundments that are incised, no later than Wednesday, January 8, 2025, place on or immediately adjacent to the CCR unit the permanent identification marker as set forth by § 257.73(a)(1).

(ii) Except for legacy CCR surface impoundments that do not exceed the height and/or storage volume thresholds under § 257.73(b), no later than Monday, February 9, 2026, compile a history of construction as set forth by § 257.73(c).

(iii) Except for legacy CCR surface impoundments that are incised, no later than Friday, May 8, 2026, complete the initial hazard potential classification assessment as set forth by § 257.73(a)(2) and (f).

(iv) Except for legacy CCR surface impoundments that do not exceed the height and/or storage volume thresholds under § 257.73(b), no later than Friday, May 8, 2026, complete the structural stability and safety factor assessments as set forth by § 257.73(d), (e), and (f).

(v) Except for legacy CCR surface impoundments that are incised, no later than Friday, May 8, 2026, prepare and maintain an Emergency Action Plan as set forth by § 257.73(a)(3).

(3) *Operating criteria.* The owner or operator of the legacy CCR surface impoundment must:

(i) No later than Friday, November 8, 2024, prepare the initial CCR fugitive dust control plan as set forth in § 257.80(b).

(ii) No later than Friday, November 8, 2024, prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the legacy CCR surface impoundment.

(iii) No later than Friday, November 8, 2024, initiate the inspections by a qualified person as set forth by § 257.83(a).

(iv) No later than Monday, February 10, 2025, complete the initial annual inspection by a qualified professional engineer as set forth by § 257.83(b).

(v) No later than Friday, May 8, 2026, prepare the initial inflow design flood control system plan as set forth in § 257.82(c).

(vi) No later than Thursday, January 8, 2026, prepare the initial annual fugitive dust control report as set forth in § 257.80(c).

(4) *Groundwater monitoring and corrective action.* No later than Monday, May 10, 2027, the owner or operator of the legacy CCR surface impoundment must:

(i) Install the groundwater monitoring system as required by § 257.91.

(ii) Develop the groundwater sampling and analysis program, including the selection of the statistical procedures, that will be used for evaluating groundwater monitoring data as required by § 257.93.

(iii) Be in compliance with the following groundwater monitoring requirements:

(A) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b).

(B) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of this part, as required by § 257.94.

(C) Begin evaluating the groundwater monitoring data for statistically significant levels over groundwater protection standards for the constituents listed in appendix IV of this part as required by § 257.95.

(iv) No later than January 31, 2027, prepare the initial groundwater monitoring and corrective action report as set forth in § 257.90(e).

(5) *Closure and post-closure care.* Except as provided in § 257.102(g), the owner or operator of the legacy CCR surface impoundment must:

(i) No later than Monday, November 8, 2027, prepare an initial written closure plan as set forth in § 257.102(b); and

(ii) No later than Monday, November 8, 2027, prepare an initial written post-closure care plan as set forth in § 257.104(d).

(g) For owners and operators of legacy CCR surface impoundments that completed closure of the CCR unit by removal of waste prior to Friday, November 8, 2024, no later than Friday, November 8, 2024, complete a closure certification that includes the following supporting information:

(1) The type and volume of CCR and all other materials in the unit prior to closure;

(2) The methods used to verify complete removal of all CCR and other contaminated materials from the unit, including any post-removal sampling and analysis;

(3) Documentation that all CCR and other contaminated materials were removed from the unit, including, the results of any post-removal sampling and analysis that was conducted;

(4) The methods used to verify complete decontamination of all areas affected by releases from the unit, including but not limited to post-decontamination sampling and analysis;

(5) Documentation that all areas affected by releases from the unit were decontaminated and that all groundwater affected by releases has achieved groundwater protection standards; and

(6) Document that groundwater monitoring concentrations do not exceed the groundwater protection standards established pursuant to § 257.95(h) for constituents listed in appendix IV to this part. The documentation must also include a demonstration that the groundwater monitoring system has met all of the following:

(i) Was capable of accurately representing background water quality unaffected by a CCR unit;

(ii) Was capable of accurately representing the quality of water passing the waste boundary of the unit;

(iii) Was capable of detecting contamination in the uppermost aquifer;

(iv) Monitored all potential contaminant pathways;

(v) Established groundwater background concentrations for appendix IV constituents and compared samples to those background concentrations;

(vi) Monitoring wells must have been cased in a manner that maintains the integrity of the monitoring well borehole. This casing must have been screened or perforated and packed with gravel or sand, where necessary, to enable collection of groundwater samples. The annular space (*i.e.,* the space between the borehole and well casing) above the sampling depth must have been sealed to prevent contamination of samples and the groundwater; and

(vii) The last groundwater monitoring sample used to document that the standard in paragraph (g)(3) of this section has been met must have been collected no earlier than one year prior to the initiation of closure.

(h) If the owner or operator of a legacy CCR surface impoundment is unable to complete the closure by removal certification by the date listed in paragraph (f)(1)(i) of this section, they may elect to conduct groundwater monitoring in accordance with §§ 257.90 through 257.95 to demonstrate there are no exceedances of the groundwater protection standards. If the owner or operator meets all the requirements of paragraph (h)(1) of this section, no further requirements under this subpart apply. If the owner or operator does not meet the requirements of paragraph (h)(1) of this section by Monday, May 8, 2028 or if one or more constituents in appendix IV to this part are detected at statistically significant levels above the groundwater protection standard established under § 257.95(h), they must proceed in accordance with paragraph (h)(2) of this section.

(1) In order to comply with this paragraph (h)(1), the owner or operator must complete all of the following:

(i) Prepare a notification of intent to certify closure no later than Friday, November 8, 2024. The owner or operator has prepared the notification when the report is placed in the facility's operating record as required by § 257.105(k)(4).

(ii) Conduct groundwater monitoring in accordance with §§ 257.90–257.95 for at least two consecutive sampling events to demonstrate that all constituents in appendix IV of this part have concentrations that do not exceed the groundwater protection standards listed in § 257.95(h).

(iii) Complete a closure by removal certification documenting compliance with paragraphs (g)(1) through (5) and (h)(1)(ii) of this section no later than Monday, May 8, 2028.

(2) If the owner or operator does not meet the requirements of paragraph (h)(1) of this section (*e.g.,* by the date or they detect an SSL of an appendix IV constituent), they must comply with all of the following:

(i) If a statistically significant level is detected, the corrective action provisions and proceed in accordance with § 257.102(c)(2).

(ii) The permanent marker requirements in § 257.73(a)(1) no later than 8 months from the date they became subject to this requirement.

(iii) The applicability report requirements of paragraph (f)(1)(i) of this section no later than 6 months from the date they became subject to this requirement.

(iv) The facility evaluation provisions for CCR management units under § 257.75 no later than 33 months from the date they became subject to this requirement.

(v) If any CCR management unit is discovered after completing the facility evaluation report, the fugitive dust requirements of § 257.80(b) no later than 6 months from the date of the facility evaluation report.

(vi) The groundwater monitoring requirements for CCR management units under § 257.90(b)(3)(i) through (iv) no later than 48 months from the date they became subject to this requirement.

(vii) The requirement to prepare an initial written closure plan for CCR management units consistent with the requirements specified in § 257.102(b)(1) no later than 54 months from the date they became subject to this requirement.

(viii) The requirement to prepare an initial post-closure plan for CCR management units consistent with the requirements specified in § 257.104(d)(2)(iii) no later than 54 months from the date they became subject to this requirement.

(ix) The requirement to initiate the closure of CCR management units in accordance with the requirements of § 257.102 no later than 60 months from the date they became subject to this requirement.

(i) Owners and operators of legacy CCR surface impoundments that completed closure of the unit in accordance with § 257.102(d) or that meet the requirements in § 257.101(g) prior to Friday, November 8, 2024 must only:

(1) Prepare the applicability report as set forth by § 257.100(f)(1);

(2) Prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the legacy CCR surface impoundment as set forth in § 257.100(f)(3)(ii);

(3) Place on or immediately adjacent to the unit the permanent identification marker as set forth by § 257.73(a)(1);

(4) Compile a history of construction as set forth by § 257.73(c);

(5) Prepare the initial CCR fugitive dust control plan as set forth in § 257.80(b);

(6) Prepare the initial annual fugitive dust control report as set forth in § 257.80(c);

(7) (i) Install the groundwater monitoring system as required by § 257.91;

(ii) Develop the groundwater sampling and analysis program, including the selection of the statistical procedures, that will be used for evaluating groundwater monitoring data as required by § 257.93;

(iii) Be in compliance with the following groundwater monitoring requirements:

(A) Initiate the detection monitoring program to include obtaining a minimum of eight independent samples for each background and downgradient well, as required by § 257.94(b);

(B) Begin evaluating the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III of this part, as required by § 257.94;

(C) Begin evaluating the groundwater monitoring data for statistically significant levels over groundwater protection standards for the constituents listed in appendix IV of this part as required by § 257.95;

(8) Include in the applicability report specified in § 257.100(f)(1) information on the completed closure, along with supporting documentation to demonstrate that the closure meets the performance standards in § 257.102(d) or the standards specified in § 257.101(g);

(9) Prepare an initial written post-closure care plan as set forth in § 257.104(d);

(10) Conduct post-closure care as set forth in § 257.104(b); and

(11) Comply with applicable recordkeeping, notification, and website posting requirements as set forth by §§ 257.105 through 257.107.

(j) The owner or operator of the legacy CCR surface impoundment must comply with the recordkeeping requirements specified in § 257.105(k), the notification requirements specified in § 257.106(k), and the internet requirements specified in § 257.107(k).

■ 19. Amend § 257.101 by adding paragraphs (e), (f), (g) and (h) to read as follows:

§ 257.101 Closure or retrofit of CCR units.

* * * * *

(e) Except as provided in paragraph (g) of this section, the owner or operator of a legacy CCR surface impoundment is subject to the requirements of paragraphs (e)(1) and (2) of this section.

(1) No later than Monday, May 8, 2028, an owner or operator of a legacy CCR surface impoundment must initiate the closure of the legacy CCR surface impoundment in accordance with the requirements of § 257.102.

(2) An owner or operator of a legacy CCR surface impoundment that closes in accordance with paragraph (e)(1) of this section must include a statement in the notification required under § 257.102(g) that the legacy CCR surface impoundment is closing under the requirement of paragraph (e)(1) of this section.

(f) Except as provided in paragraphs (g) and (h) of this section, the owner or operator of a CCR management unit must comply with the requirements of paragraphs (f)(1) and (2) of this section.

(1) No later than Tuesday, May 8, 2029, an owner or operator of a CCR management unit must initiate the closure of the CCR management unit in accordance with the requirements of § 257.102.

(2) An owner or operator of a CCR management unit that closes in

accordance with paragraph (f)(1) of this section must include a statement in the notification required under § 257.102(g) that the CCR management unit is closing under the requirements of paragraph (f)(1) of this section.

(g) Deferral to permitting for closures conducted under substantially equivalent regulatory authority. Notwithstanding the provisions of paragraphs (e) and (f) of this section, the owner or operator of a CCR management unit or a legacy CCR surface impoundment need not demonstrate compliance with the performance standards in § 257.102(c) or (d) provided they demonstrate that the closure of the CCR unit met the standards specified in paragraphs (g)(1) through (g)(6) of this section.

(1) The owner or operator of the CCR unit must document that a regulatory authority played an active role in overseeing and approving the closure and any necessary corrective action, pursuant to an enforceable requirement. This includes a State or Federal permit, an administrative order, or consent order issued after 2015 under CERCLA or by an EPA-approved RCRA State program.

(2) The owner or operator of the CCR unit must document that the regulatory authority required or conducted a site-specific risk assessment prior to (or as part of) approving the closure and any necessary corrective action.

(3) The owner or operator of the CCR unit must document that it installed a groundwater monitoring system and performed groundwater monitoring that meets all of the following:

(i) Was capable of accurately representing background water quality;

(ii) Was capable of accurately representing the quality of water passing the waste boundary;

(iii) Was capable of detecting contamination in the uppermost aquifer; and

(iv) Monitored all potential contaminant pathways.

(4) Must document that the closed unit meets either:

(i) The performance standard in § 257.60; or

(ii) The performance standard in § 257.102(d)(2)(i).

(5) The owner or operator must include the following statement, signed by the owner or operator or an authorized representative, in the facility evaluation report for CCR management units specified in § 257.75 or applicability report for legacy CCR surface impoundments specified in § 257.100(f)(1) along with all information required by paragraphs (g)(1) through (4) of the section:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(6) Closure equivalency determination at permitting. The owner or operator must submit the following documentation to the permit authority.

(i) A permit application that contains sufficient information, including data on contaminant levels in groundwater, to demonstrate that the applicable § 257.102 standards have been met.

(ii) EPA will review the information to determine whether the ''equivalency'' of the closure has been successfully demonstrated. If EPA or a Participating State Director determines that the closure has met the appropriate part 257 closure standard, EPA or a Participating State Director will issue a permit to require compliance with applicable post-closure requirements. If EPA or a Participating State Director determines that the closure does not meet the part 257 standards, the owner or operator will be required to submit a complete permit application and obtain a permit that contains the specific requirements necessary for the closed unit to achieve compliance with § 257.102.

(h) Deferral for CCR management units under critical infrastructure. Notwithstanding the provisions of paragraph (f)(1) of this section, the owner or operator of a CCR management unit located beneath critical infrastructure need not initiate closure until the infrastructure is no longer needed, EPA or a Participating State Director determines closure is necessary to ensure that there is no reasonable probability of adverse effects on human health or the environment, or the closure or decommissioning of the facility, whichever occurs first. Owners and operators of CCR management units under active disposal units must meet either:

(1) Demonstrate that the CCR management unit complies with the performance standard in § 257.60; or

(2) Demonstrate that the CCR management unit complies with the performance standard in § 257.102(d)(2)(i).

■ 20. Revise and republish§ 257.102 to read as follows:

§ 257.102 Criteria for conducting the closure or retrofit of CCR units and closure of CCR management units.

(a) *General.* Closure of a CCR unit must be completed either by leaving the CCR in place and installing a final cover system or through removal of the CCR and decontamination of the CCR unit, as described in paragraphs (b) through (j) of this section. Retrofit of a CCR surface impoundment must be completed in accordance with the requirements in paragraph (k) of this section.

(b) *Written closure plan*—(1) *Content of the plan.* The owner or operator of a CCR unit must prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The written closure plan must include, at a minimum, the information specified in paragraphs (b)(1)(i) through (vi) of this section.

(i) A narrative description of how the CCR unit will be closed in accordance with this section.

(ii) If closure of the CCR unit will be accomplished through removal of CCR from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section.

(iii) If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with paragraph (d) of this section, and the methods and procedures to be used to install the final cover. The closure plan must also discuss how the final cover system will achieve the performance standards specified in paragraph (d) of this section.

(iv) An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit.

(v) An estimate of the largest area of the CCR unit ever requiring a final cover as required by paragraph (d) of this section at any time during the CCR unit's active life.

(vi) A schedule for completing all activities necessary to satisfy the closure criteria in this section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including identification of major milestones such as coordinating with and obtaining necessary approvals and permits from other agencies, the dewatering and stabilization phases of CCR surface impoundment closure, or installation of the final cover system, and the estimated timeframes to complete each step or phase of CCR unit closure. When preparing the written closure plan, if the owner or operator of a CCR unit estimates that the time required to complete closure will exceed the timeframes specified in paragraph (f)(1) of this section, the written closure plan must include the site-specific information, factors and considerations that would support any time extension sought under paragraph (f)(2) of this section.

(2) *Timeframes for preparing the initial written closure plan*—(i) *Existing CCR landfills and existing CCR surface impoundments.* No later than October 17, 2016, the owner or operator of the CCR unit must prepare an initial written closure plan consistent with the requirements specified in paragraph (b)(1) of this section.

(ii) *New CCR landfills and new CCR surface impoundments, and any lateral expansion of a CCR unit.* No later than the date of the initial receipt of CCR in the CCR unit, the owner or operator must prepare an initial written closure plan consistent with the requirements specified in paragraph (b)(1) of this section.

(iii) *CCR management units.* Except as provided for in paragraph (b)(2)(v) of this section, no later than November 8, 2028, the owner or operator of the CCR management unit must prepare an initial written closure plan consistent with the requirements specified in paragraph (b)(1) of this section.

(iv) *Recordkeeping.* The owner or operator has completed the written closure plan when the plan, including the certification required by paragraph (b)(4) of this section, has been placed in the facility's operating record as required by § 257.105(i)(4).

(v) *Closure documentation for certain CCR management units.* Owners and operators of a CCR management unit that completed closure of the unit in accordance with § 257.102(d) prior to Friday, November 8, 2024 or that meet the requirements in § 257.101(g) must include in the facility evaluation report specified in § 257.75 information on the completed closure, along with supporting documentation to demonstrate that the closure meets the performance standards in § 257.102(d) or the standards specified in § 257.101(g).

(3) *Amendment of a written closure plan.* (i) The owner or operator may amend the initial or any subsequent written closure plan developed pursuant to paragraph (b)(1) of this section at any time.

(ii) The owner or operator must amend the written closure plan whenever:

(A) There is a change in the operation of the CCR unit that would substantially affect the written closure plan in effect; or

(B) Before or after closure activities have commenced, unanticipated events necessitate a revision of the written closure plan.

(iii) The owner or operator must amend the closure plan at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise an existing written closure plan. If a written closure plan is revised after closure activities have commenced for a CCR unit, the owner or operator must amend the current closure plan no later than 30 days following the triggering event.

(4) *Certification or approval.* The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority that the initial and any amendment of the written closure plan meets the requirements of this section.

(c) *Closure by removal of CCR.* An owner or operator that elects to close a CCR unit by-removal of CCR must follow the procedures specified in either paragraph (c)(1) or (2) of this section. Closure by removal is complete when CCR has been removed; any areas affected by releases from the CCR unit have been removed or decontaminated; and groundwater monitoring concentrations of the constituents listed in appendix IV to this part do not exceed groundwater protection standards established pursuant to § 257.95(h). Removal and decontamination activities include removing all CCR from the unit, CCR mixed with soils, and CCR included in berms, liners or other unit structures, and removing or decontaminating all areas affected by releases from the CCR unit.

(1) *Complete all removal and decontamination activities during the active life of the CCR unit.* Within the timeframes specified in paragraph (f) of this section the owner or operator must do all of the following:

(i) Complete removal of CCR and decontamination of all areas affected by releases from the CCR unit;

(ii) Document that the standards in paragraph (c) of this section have been met. Documentation that groundwater protection standards have been met for the constituents listed in appendix IV to this part must consist of groundwater monitoring results that show no constituents were detected at statistically significant levels above the groundwater protection standards for either:

(A) Two consecutive monitoring events; or

(B) Three years, in accordance with § 257.98(c); and

(iii) Obtain the completion of closure certification or approval required by paragraph (f)(3) of this section.

(2) *Complete removal and decontamination activities during the active life and post-closure care period of the CCR unit.* The owner or operator may close a CCR unit by completing all removal and decontamination activities, except for groundwater corrective action, during the active life of the CCR unit and by completing groundwater corrective action during the post-closure care period pursuant to the following procedures:

(i) Within the timeframes specified in paragraph (f) of this section, document that CCR has been removed from the unit and any areas affected by releases from the CCR unit have been removed or decontaminated;

(ii) Within the timeframes specified in paragraph (f) of this section, begin implementation of the remedy selected in accordance with § 257.97 such that all components of the remedy are constructed, or otherwise in place, and operating as intended unless the owner or operator documents both that:

(A) All applicable requirements in §§ 257.96 through 257.98 have been met; and

(B) The active life of the unit could not be extended until implementation of the remedy consistent with § 257.102(f);

(iii) Complete groundwater corrective action as a post-closure care requirement as specified in § 257.104(g);

(iv) Amend the written closure plan required by paragraph (b) of this section and the written post-closure care plan required by § 257.104(d);

(v) Within the timeframes specified in paragraph (f) of this section, obtain the completion of closure certification or approval required by paragraph (f)(3) of this section; and

(vi) Within the timeframes specified in paragraph (f) of this section, record the notation on the deed to the property required by paragraph (i) of this section.

(d) *Closure performance standard when leaving CCR in place*—

(1) *General performance standard.* The owner or operator of a CCR unit must ensure that, at a minimum, the CCR unit is closed in a manner that will:

(i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;

(ii) Preclude the probability of future impoundment of water, sediment, or slurry;

(iii) Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period;

(iv) Minimize the need for further maintenance of the CCR unit; and

(v) Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.

(2) *Drainage and stabilization of CCR units.* The owner or operator of any CCR unit must meet the requirements of paragraphs (d)(2)(i) and (ii) of this section prior to installing the final cover system required under paragraph (d)(3) of this section.

(i) Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.

(ii) Remaining wastes must be stabilized sufficient to support the final cover system.

(3) *Final cover system.* If 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, and at a minimum, meets the requirements of paragraph (d)(3)(i) of this section, or the requirements of the alternative final cover system specified in paragraph (d)(3)(ii) of this section.

(i) The final cover system must be designed and constructed to meet the criteria in paragraphs (d)(3)(i)(A) through (D) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.

(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.

(ii) The owner or operator may select an alternative final cover system design, provided the alternative final cover system is designed and constructed to meet the criteria in paragraphs (d)(3)(ii)(A) through (C) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.

(A) The design of the final cover system must include an infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (d)(3)(i)(A) and (B) of this section.

(B) The design of the final cover system must include an erosion layer that provides equivalent protection from wind or water erosion as the erosion layer specified in paragraph (d)(3)(i)(C) of this section.

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

(iii) The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority that the design of the final cover system meets the requirements of this section.

(e) *Initiation of closure activities.* Except as provided for in paragraph (e)(4) of this section and § 257.103, the owner or operator of a CCR unit must commence closure of the CCR unit no later than the applicable timeframes specified in either paragraph (e)(1) or (2) of this section.

(1) The owner or operator must commence closure of the CCR unit no later than 30 days after the date on which the CCR unit either:

(i) Receives the known final receipt of waste, either CCR or any non-CCR waste stream; or

(ii) Removes the known final volume of CCR from the CCR unit for the purpose of beneficial use of CCR.

(2)(i) Except as provided by paragraph (e)(2)(ii) of this section, the owner or operator must commence closure of a CCR unit that has not received CCR or any non-CCR waste stream or is no longer removing CCR for the purpose of beneficial use within two years of the last receipt of waste or within two years of the last removal of CCR material for the purpose of beneficial use.

(ii) Notwithstanding paragraph (e)(2)(i) of this section, the owner or operator of the CCR unit may secure an additional two years to initiate closure of the idle unit provided the owner or operator provides written documentation that the CCR unit will continue to accept wastes or will start removing CCR for the purpose of beneficial use. The documentation must be supported by, at a minimum, the information specified in paragraphs (e)(2)(ii)(A) and (B) of this section. The owner or operator may obtain two-year extensions provided the owner or operator continues to be able to demonstrate that there is reasonable likelihood that the CCR unit will accept wastes in the foreseeable future or will remove CCR from the unit for the purpose of beneficial use. The owner or operator must place each completed demonstration, if more than one time extension is sought, in the facility's operating record as required by § 257.105(i)(5) prior to the end of any two-year period.

(A) Information documenting that the CCR unit has remaining storage or disposal capacity or that the CCR unit can have CCR removed for the purpose of beneficial use; and

(B) Information demonstrating that that there is a reasonable likelihood that the CCR unit will resume receiving CCR or non-CCR waste streams in the foreseeable future or that CCR can be removed for the purpose of beneficial use. The narrative must include a best estimate as to when the CCR unit will resume receiving CCR or non-CCR waste streams. The situations listed in paragraphs (e)(2)(ii)(B)(*1*) through (*4*) of this section are examples of situations that would support a determination that the CCR unit will resume receiving CCR or non-CCR waste streams in the foreseeable future.

(*1*) Normal plant operations include periods during which the CCR unit does not receive CCR or non-CCR waste streams, such as the alternating use of two or more CCR units whereby at any point in time one CCR unit is receiving CCR while CCR is being removed from a second CCR unit after its dewatering.

(*2*) The CCR unit is dedicated to a coal-fired boiler unit that is temporarily idled (*e.g.,* CCR is not being generated) and there is a reasonable likelihood that the coal-fired boiler will resume operations in the future.

(*3*) The CCR unit is dedicated to an operating coal-fired boiler (*i.e.,* CCR is being generated); however, no CCR are being placed in the CCR unit because the CCR are being entirely diverted to beneficial uses, but there is a reasonable likelihood that the CCR unit will again be used in the foreseeable future.

(*4*) The CCR unit currently receives only non-CCR waste streams and those non-CCR waste streams are not generated for an extended period of time, but there is a reasonable likelihood that the CCR unit will again receive non-CCR waste streams in the future.

(iii) In order to obtain additional time extension(s) to initiate closure of a CCR unit beyond the two years provided by paragraph (e)(2)(i) of this section, the owner or operator of the CCR unit must include with the demonstration required by paragraph (e)(2)(ii) of this section the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(3) For purposes of this subpart, closure of the CCR unit has commenced if the owner or operator has ceased placing waste and completes any of the following actions or activities:

(i) Taken any steps necessary to implement the written closure plan required by paragraph (b) of this section;

(ii) Submitted a completed application for any required state or agency permit or permit modification; or

(iii) Taken any steps necessary to comply with any state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the closure of a CCR unit.

(4) The timeframes specified in paragraphs (e)(1) and (2) of this section do not apply to any of the following owners or operators:

(i) [Reserved]

(ii) An owner or operator of an existing unlined CCR surface impoundment closing the CCR unit as required by § 257.101(a);

(iii) An owner or operator of an existing CCR surface impoundment closing the CCR unit as required by § 257.101(b);

(iv) An owner or operator of a new CCR surface impoundment closing the CCR unit as required by § 257.101(c); or

(v) An owner or operator of an existing CCR landfill closing the CCR unit as required by § 257.101(d).

(f) *Completion of closure activities.*

(1) Except as provided for in paragraph (f)(2) of this section, the owner or operator must complete closure of the CCR unit:

(i) For existing and new CCR landfills and any lateral expansion of a CCR landfill, within six months of commencing closure activities.

(ii) For existing and new CCR surface impoundments and any lateral expansion of a CCR surface impoundment, within five years of commencing closure activities.

(iii) For CCR management units, within five years of commencing closure activities.

(2)(i) *Extensions of closure timeframes.* The timeframes for completing closure of a CCR unit specified under paragraphs (f)(1) of this section may be extended if the owner or operator can demonstrate that it was not feasible to complete closure of the CCR unit within the required timeframes due to factors beyond the facility's control. If the owner or operator is seeking a time extension beyond the time specified in the written closure plan as required by paragraph (b)(1) of this section, the demonstration must include a narrative discussion providing the basis for additional time beyond that specified in the closure plan. The owner or operator must place each completed demonstration, if more than one time extension is sought, in the facility's operating record as required by § 257.105(i)(6) prior to the end of any two-year period. Factors that may support such a demonstration include:

(A) Complications stemming from the climate and weather, such as unusual amounts of precipitation or a significantly shortened construction season;

(B) Time required to dewater a CCR unit due to the volume of CCR contained in the CCR unit or the characteristics of the CCR in the unit;

(C) The geology and terrain surrounding the CCR unit will affect the amount of material needed to close the CCR unit; or

(D) Time required or delays caused by the need to coordinate with and obtain necessary approvals and permits from a state or other agency.

(ii) *Maximum time extensions.* (A) CCR surface impoundments of 40 acres or smaller may extend the time to complete closure by no longer than two years.

(B) CCR surface impoundments larger than 40 acres may extend the timeframe to complete closure of the CCR unit multiple times, in two-year increments. For each two-year extension sought, the owner or operator must substantiate the factual circumstances demonstrating the need for the extension. No more than a total of five two-year extensions may be obtained for any CCR surface impoundment.

(C) Except as provided in paragraph (f)(2)(ii)(D) of this section, CCR landfills may extend the timeframe to complete closure of the CCR unit multiple times, in one-year increments. For each one-year extension sought, the owner or operator must substantiate the factual circumstances demonstrating the need for the extension. No more than a total of two one-year extensions may be obtained for any CCR landfill.

(D) CCR landfills that intersect with groundwater are eligible for the time extensions available to CCR units in paragraph (f)(2)(ii)(B) of this section, provided the owner or operator documents that groundwater intersects the CCR unit in the closure plan.

(E) CCR management units of 40 acres or smaller may extend the time to complete closure by no longer than two years.

(F) CCR management units larger than 40 acres may extend the timeframe to complete closure of the CCR management unit multiple times, in two-year increments. For each two-year extension sought, the owner or operator must substantiate the factual circumstances demonstrating the need for the extension. No more than a total of five two-year extensions may be obtained for any CCR management unit.

(iii) In order to obtain additional time extension(s) to complete closure of a CCR unit beyond the times provided by paragraph (f)(1) of this section, the owner or operator of the CCR unit must include with the demonstration required by paragraph (f)(2)(i) of this section the following statement signed by the owner or operator or an authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(3) Upon completion, the owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority verifying that closure has been completed in accordance with the closure plan specified in paragraph (b) of this section and the requirements of this section.

(g) *Notification of intent to close.* No later than the date the owner or operator initiates closure of a CCR unit, the owner or operator must prepare a notification of intent to close a CCR unit. The notification must include the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority for the design of the final cover system as required by § 257.102(d)(3)(iii), if applicable. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(i)(7).

(h) *Notification of completion of closure.* Within 30 days of completion of closure of the CCR unit, the owner or operator must prepare a notification of closure of a CCR unit. The notification must include the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority as required by § 257.102(f)(3). The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(i)(8).

(i) *Deed notations.* (1) Except as provided by paragraph (i)(4) of this section, following closure of a CCR unit, the owner or operator must record a notation on the deed to the property, or some other instrument that is normally examined during title search.

(2) The notation on the deed must in perpetuity notify any potential purchaser of the property that:

(i) The land has been used as a CCR unit; and

(ii) Its use is restricted under the post-closure care requirements as provided by § 257.104(d)(1)(iii).

(3) Within 30 days of recording a notation on the deed to the property, the owner or operator must prepare a notification stating that the notation has been recorded. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(i)(9).

(4) An owner or operator that closes a CCR unit in accordance with paragraph (c)(1) of this section is not subject to the requirements of paragraphs (i)(1) through (3) of this section.

(j) *Recordkeeping, notification, and internet requirements.* The owner or operator of the CCR unit must comply with the closure recordkeeping requirements specified in § 257.105(i), the closure notification requirements specified in § 257.106(i), and the closure internet requirements specified in § 257.107(i).

(k) *Criteria to retrofit an existing CCR surface impoundment.* (1) To retrofit an existing CCR surface impoundment, the owner or operator must:

(i) First remove all CCR, including any contaminated soils and sediments from the CCR unit; and

(ii) Comply with the requirements in § 257.72.

(iii) A CCR surface impoundment undergoing a retrofit remains subject to all other requirements of this subpart, including the requirement to conduct any necessary corrective action.

(2) *Written retrofit plan*—(i) *Content of the plan.* The owner or operator must prepare a written retrofit plan that describes the steps necessary to retrofit the CCR unit consistent with recognized and generally accepted good engineering practices. The written retrofit plan must include, at a minimum, all of the following information:

(A) A narrative description of the specific measures that will be taken to retrofit the CCR unit in accordance with this section.

(B) A description of the procedures to remove all CCR and contaminated soils and sediments from the CCR unit.

(C) An estimate of the maximum amount of CCR that will be removed as part of the retrofit operation.

(D) An estimate of the largest area of the CCR unit that will be affected by the retrofit operation.

(E) A schedule for completing all activities necessary to satisfy the retrofit criteria in this section, including an estimate of the year in which retrofit activities of the CCR unit will be completed.

(ii) *Timeframes for preparing the initial written retrofit plan.* (A) No later than 60 days prior to date of initiating retrofit activities, the owner or operator must prepare an initial written retrofit plan consistent with the requirements specified in paragraph (k)(2) of this section. For purposes of this subpart, initiation of retrofit activities has commenced if the owner or operator has ceased placing waste in the unit and completes any of the following actions or activities:

(*1*) Taken any steps necessary to implement the written retrofit plan;

(*2*) Submitted a completed application for any required state or agency permit or permit modification; or

(*3*) Taken any steps necessary to comply with any state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the retrofit of a CCR unit.

(B) The owner or operator has completed the written retrofit plan when the plan, including the certification required by paragraph (k)(2)(iv) of this section, has been placed in the facility's operating record as required by § 257.105(j)(1).

(iii) *Amendment of a written retrofit plan.* (A) The owner or operator may amend the initial or any subsequent written retrofit plan at any time.

(B) The owner or operator must amend the written retrofit plan whenever:

(*1*) There is a change in the operation of the CCR unit that would substantially affect the written retrofit plan in effect; or

(*2*) Before or after retrofit activities have commenced, unanticipated events necessitate a revision of the written retrofit plan.

(C) The owner or operator must amend the retrofit plan at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the revision of an existing written retrofit plan. If a written retrofit plan is revised after retrofit activities have commenced for a CCR unit, the owner or operator must amend the current retrofit plan no later than 30 days following the triggering event.

(iv) *Certification or approval.* The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer or an approval from the Participating State Director or an approval from EPA where EPA is the permitting authority that the activities outlined in the written retrofit plan, including any amendment of the plan, meet the requirements of this section.

(3) *Deadline for completion of activities related to the retrofit of a CCR unit.* Any CCR surface impoundment that is being retrofitted must complete all retrofit activities within the same time frames and procedures specified for the closure of a CCR surface impoundment in § 257.102(f) or, where applicable, § 257.103.

(4) *Certification or approval.* Upon completion, the owner or operator must obtain a written certification from a qualified professional engineer or an approval from the Participating State Director or an approval from EPA where EPA is the permitting authority verifying that the retrofit activities have been completed in accordance with the retrofit plan specified in paragraph (k)(2) of this section and the requirements of this section.

(5) *Notification of intent to retrofit.* No later than the date the owner or operator initiates the retrofit of a CCR unit, the owner or operator must prepare a notification of intent to retrofit a CCR

unit. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(j)(5).

(6) *Notification of completion of retrofit activities.* Within 30 days of completing the retrofit activities specified in paragraph (k)(1) of this section, the owner or operator must prepare a notification of completion of retrofit activities. The notification must include the certification from a qualified professional engineer or an approval from the Participating State Director or an approval from EPA where EPA is the permitting authority has is required by paragraph (k)(4) of this section. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by § 257.105(j)(6).

(7) *Cease retrofit and initiation of closure.* At any time after the initiation of a CCR unit retrofit, the owner or operator may cease the retrofit and initiate closure of the CCR unit in accordance with the requirements of § 257.102.

(8) *Recordkeeping, notification, and internet requirements.* The owner or operator of the CCR unit must comply with the retrofit recordkeeping requirements specified in § 257.105(j), the retrofit notification requirements specified in § 257.106(j), and the retrofit internet requirements specified in § 257.107(j).

■ 21. Amend § 257.104 by:
■ a. Revising paragraphs (a) and (c)(1);
■ b. Adding paragraph (c)(3);
■ c. Revising paragraph (d)(2); and
■ d. Adding paragraph (g).

The additions and revisions read as follows:

§ 257.104 Post-closure care requirements.

(a) *Applicability.* (1) Except as provided by paragraph (a)(2) of this section, § 257.104 applies to the owners or operators of CCR units that are subject to the closure criteria under § 257.102.

(2) An owner or operator of a CCR unit that elects to close a CCR unit by removing CCR as provided by § 257.102(c)(1) is not subject to the post-closure care criteria under this section.

* * * * *

(c) * * *

(1) Except as provided by paragraph (c)(2) and (3) of this section, the owner or operator of the CCR unit must conduct post-closure care for 30 years.

* * * * *

(3) An owner or operator closing a unit pursuant to § 257.102(c)(2) must complete groundwater corrective action in accordance with § 257.98(c).

(d) * * *

(2) *Deadline to prepare the initial written post-closure plan*—(i) *Existing CCR landfills and existing CCR surface impoundments.* No later than October 17, 2016, the owner or operator of the CCR unit must prepare an initial written post-closure plan consistent with the requirements specified in paragraph (d)(1) of this section.

(ii) *New CCR landfills, new CCR surface impoundments, and any lateral expansion of a CCR unit.* No later than the date of the initial receipt of CCR in the CCR unit, the owner or operator must prepare an initial written post-closure plan consistent with the requirements specified in paragraph (d)(1) of this section.

(iii) *CCR management units.* No later than Wednesday, November 8, 2028, the owner or operator of a CCR management unit must prepare an initial written post-closure care plan as set forth in paragraph (d)(1) of this section.

(iv) *Recordkeeping.* The owner or operator has completed the written post-closure plan when the plan, including the certification required by paragraph (d)(4) of this section, has been placed in the facility's operating record as required by § 257.105(i)(4).

* * * * *

(g) *Removal of a deed notation.* The owner or operator of a CCR unit closed pursuant to §§ 257.102(c)(2) and 257.104 may remove the notation from the deed specified in § 257.102(i) upon:

(1) Completion of groundwater corrective action demonstrating that any areas affected by releases from the CCR unit do not exceed the groundwater protection standards established pursuant to § 257.95(h) for constituents listed in appendix IV to this part; and

(2) Completion of the notification of completion of post-closure care period required by paragraph (e) of this section.

* * * * *

■ 22. Revise § 257.105 to read as follows:

§ 257.105 Recordkeeping requirements.

(a) *Operating Record.* Each owner or operator of a CCR unit subject to the requirements of this subpart must date and maintain files of all information required by this section in a written operating record at their facility. Each file must indicate the date the file was placed in the operating record.

(b) *Document Retention.* Unless specified otherwise, each file must be retained for at least five years following the date of each occurrence, measurement, maintenance, corrective action, report, record, or study.

(c) *Recordkeeping for multiple CCR units.* An owner or operator of more than one CCR unit subject to the provisions of this subpart may comply with the requirements of this section in one recordkeeping system provided the system identifies each file by the name of each CCR unit. The files may be maintained on microfilm, on a computer, on computer disks, on a storage system accessible by a computer, on magnetic tape disks, or on microfiche.

(d) *State Director and/or appropriate Tribal authority notification.* The owner or operator of a CCR unit must submit to the State Director and/or appropriate Tribal authority any demonstration or documentation required by this subpart, if requested, when such information is not otherwise available on the owner or operator's CCR website.

(e) *Location restrictions.* The owner or operator of a CCR unit subject to this subpart must place the demonstrations documenting whether or not the CCR unit is in compliance with the requirements under §§ 257.60(a), 257.61(a), 257.62(a), 257.63(a), and 257.64(a), as it becomes available, in the facility's operating record, except each location restrictions demonstration must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g).

(f) *Design criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The design and construction certifications as required by § 257.70(e) and (f), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(2) The documentation of liner type as required by § 257.71(a), except each liner type documentation must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(3) The design and construction certifications as required by § 257.72(c) and (d), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in

accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(4) Documentation prepared by the owner or operator stating that the permanent identification marker was installed as required by §§ 257.73(a)(1) and 257.74(a)(1), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or until completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(5) The initial and periodic hazard potential classification assessments as required by §§ 257.73(a)(2) and 257.74(a)(2), except each hazard potential classification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(6) The emergency action plan (EAP), and any amendment of the EAP, as required by §§ 257.73(a)(3) and 257.74(a)(3), except each EAP must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(7) Documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR unit and the local emergency responders as required by §§ 257.73(a)(3)(i)(E) and 257.74(a)(3)(i)(E), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(8) Documentation prepared by the owner or operator recording all activations of the emergency action plan as required by §§ 257.73(a)(3)(v) and 257.74(a)(3)(v), except each documentation of EAP activations must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(9) The history of construction, and any revisions of it, as required by § 257.73(c), except each history of construction must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(10) The initial and periodic structural stability assessments as required by §§ 257.73(d) and 257.74(d), except each structural stability assessment must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(11) Documentation detailing the corrective measures taken to remedy the deficiency or release as required by §§ 257.73(d)(2) and 257.74(d)(2), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(12) The initial and periodic safety factor assessments as required by §§ 257.73(e) and 257.74(e), except each safety factor assessment must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(13) The design and construction plans, and any revisions of it, as required by § 257.74(c), except the design and construction plans must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(14) The application and any supplemental materials submitted in support of the application as required by § 257.71(d)(1)(i)(E), except each application and supplemental materials must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(15) The alternative liner demonstration as required by § 257.71(d)(1)(ii)(D).

(16) The alternative liner demonstration extension request as required by § 257.71(d)(2)(ii)(D).

(17) The documentation prepared for the preliminary demonstration as required by § 257.71(d)(2)(ii)(E).

(18) The notification of an incomplete application as required by § 257.71(d)(2)(iii)(B).

(19) The decision on the application as required by § 257.71(d)(2)(iii)(F), except each decision must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(20) The final decision on the alternative liner demonstration as required by § 257.71(d)(2)(vii).

(21) The alternative source demonstration as required under § 257.71(d)(2)(ix)(A)(*4*).

(22) The final decision on the alternative source demonstration as required under § 257.71(d)(2)(ix)(A)(*5*).

(23) The final decision on the trend analysis as required under § 257.71(d)(2)(ix)(B)(*3*).

(24) The decision that the alternative source demonstration has been withdrawn as required under § 257.71(d)(2)(ix)(C).

(25) The facility evaluation report part 1 as required by § 257.75(c), except the facility evaluation report part 1 must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(26) The facility evaluation report part 2 as required by § 257.75(d), except the facility evaluation report part 2 must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(g) *Operating criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The CCR fugitive dust control plan, and any subsequent amendment of the plan, required by § 257.80(b), except each fugitive dust control plan must be maintained for five years after closure by removal in accordance with § 257.102(c)(1) or (2) or completes post-closure care in accordance with § 257.104(e) or (g) is completed at the last CCR unit at the facility irrespective of the time requirement specified in paragraph (b) of this section.

(2) The annual CCR fugitive dust control report required by § 257.80(c), except each fugitive dust control report must be maintained for five years after closure by removal in accordance with § 257.102(c)(1) or (2) or post-closure care in accordance with § 257.104(e) or (g) is completed at the last CCR unit at the facility irrespective of the time requirement specified in paragraph (b) of this section.

(3) The initial and periodic run-on and run-off control system plans as required by § 257.81(c), except each plan must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(4) The initial and periodic inflow design flood control system plan as required by § 257.82(c), except each plan must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(5) Documentation recording the results of each inspection and instrumentation monitoring by a qualified person as required by § 257.83(a), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(6) The periodic inspection report as required by § 257.83(b)(2), except each inspection report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(7) Documentation detailing the corrective measures taken to remedy the deficiency or release as required by §§ 257.83(b)(5) and 257.84(b)(5), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(8) Documentation recording the results of the weekly inspection by a qualified person as required by § 257.84(a), except each inspection report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(9) The periodic inspection report as required by § 257.84(b)(2), except each inspection report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(h) *Groundwater monitoring and corrective action.* The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The annual groundwater monitoring and corrective action report as required by § 257.90(e), except each annual groundwater monitoring and corrective action report must be maintained for five years after the last CCR unit at the facility either completes closure by removal in accordance with § 257.102(c)(1) or completes post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(2) Documentation of the design, installation, development, and decommissioning of any monitoring wells, piezometers and other measurement, sampling, and analytical devices as required by § 257.91(e)(1), except each document must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(3) The groundwater monitoring system certification as required by § 257.91(f), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(4) The selection of a statistical method certification as required by § 257.93(f)(6), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(5) Within 30 days of establishing an assessment monitoring program, the notification as required by § 257.94(e)(3).

(6) The results of appendices III and IV to this part constituent concentrations measured as required by § 257.95(d)(1).

(7) Within 30 days of returning to a detection monitoring program, the notification as required by § 257.95(e).

(8) Within 30 days of detecting one or more constituents in appendix IV to this part at statistically significant levels above the groundwater protection standard, the notifications as required by § 257.95(g).

(9) Within 30 days of initiating the assessment of corrective measures requirements, the notification as required by § 257.95(g)(5).

(10) The completed assessment of corrective measures as required by § 257.96(d), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(11) Documentation prepared by the owner or operator recording the public meeting for the corrective measures assessment as required by § 257.96(e), except each certification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(12) The semiannual report describing the progress in selecting and designing the remedy and the selection of remedy report as required by § 257.97(a), except that the selection of remedy report must be maintained until the remedy has been completed.

(13) Within 30 days of completing the remedy, the notification as required by § 257.98(e), except each notification must be maintained for five years after completion of the remedy selected pursuant to § 257.97 irrespective of the time requirement specified in paragraph (b) of this section.

(14) The demonstration, including long-term performance data, supporting the suspension of groundwater monitoring requirements as required by § 257.90(g), except each document must be maintained for five years after the last unit at the facility completes post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(i) *Closure and post-closure care.* The owner or operator of a CCR unit subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The notification of intent to initiate closure of the CCR unit as required by § 257.100(c)(1).

(2) The annual progress reports of closure implementation as required by § 257.100(c)(2)(i) and (ii).

(3) The notification of closure completion as required by § 257.100(c)(3).

(4) The written closure plan, and any amendment of the plan, as required by § 257.102(b), except that only the most recent closure plan must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(5) The written demonstration(s), including the certification required by § 257.102(e)(2)(iii), for a time extension for initiating closure as required by § 257.102(e)(2)(ii), except each demonstration must be maintained until notice of completion of closure is placed in the operating record in accordance with § 257.102(h) irrespective of the time requirement specified in paragraph (b) of this section.

(6) The written demonstration(s), including the certification required by § 257.102(f)(2)(iii), for a time extension for completing closure as required by § 257.102(f)(2)(i), except each demonstration must be maintained for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (b) of this section.

(7) The notification of intent to close a CCR unit as required by § 257.102(g), except each notification must be maintained for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (b) of this section.

(8) The notification of completion of closure of a CCR unit as required by § 257.102(h), except each notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(9) The notification recording a notation on the deed as required by § 257.102(i), except each notification must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(10) The notification of intent to comply with the alternative closure requirements as required by § 257.103(c)(1), except each notification must be maintained for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (b) of this section.

(11) The annual progress reports under the alternative closure requirements as required by § 257.103(c)(2), except each report must be maintained for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (b) of this section.

(12) The written post-closure plan, and any amendment of the plan, as required by § 257.104(d), except that only the most recent post-closure plan must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(13) The notification of completion of post-closure care period as required by § 257.104(e), except each notification must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (b) of this section.

(14) The notification of intent to comply with the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as required by § 257.103(f)(1)(ix)(A), except each notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(15) The approved or denied demonstration for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as required by § 257.103(f)(1)(ix)(B), except each approval or denial must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(16) The notification for requesting additional time to the alternative cease receipt of waste deadline as required by § 257.103(f)(1)(ix)(C), except each notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(17) The semi-annual progress reports for the site-specific alternative to initiation of closure due to development of alternative capacity being infeasible as required by § 257.103(f)(1)(xi), except each semi-annual progress report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(18) The notification of intent to comply with the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.103(f)(2)(viii), except each notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(19) The approved or denied demonstration for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.103(f)(2)(ix), except each demonstration must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(20) The annual progress report for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.103(f)(2)(x), except each annual progress report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or (2) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(k) *Legacy CCR surface impoundments.* In addition to the information specified in paragraphs (e) through (j) of this section, the owner or operator of a legacy CCR surface impoundment subject to this subpart must place the following information, as it becomes available, in the facility's operating record:

(1) The applicability report required by § 257.100(f)(1), including the certification required by § 257.100(f)(1)(i), except each report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(2) The applicability extension reports required by § 257.100(f)(1)(iii)(C), except each report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(3) The notification of field investigation conclusion required by § 257.100(f)(1)(iii)(F), except the notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (b) of this section.

(4) The notification of intent to certify closure required by § 257.100(h)(1)(i), except the notification must be maintained for five years after completion of closure by removal in accordance with § 257.100(h)(1) or § 257.102(c)(2) irrespective of the time requirement specified in paragraph (b) of this section.

■ 23. Amend § 257.106 by:

■ a. Revising paragraphs (a), (b), (c), and (d);

■ b. Adding paragraphs (f)(24) and (25) and (k).

The revisions and additions read as follows:

§ 257.106 Notification requirements.

(a) *Deadline to submit notification to the relevant State Director and/or appropriate Tribal authority.* The notifications required under paragraphs (e) through (i) of this section must be sent to the relevant State Director and/or appropriate Tribal authority before the close of business on the day the notification is required to be completed. For purposes of this section, *before the close of business* means the notification must be postmarked or sent by electronic mail (email). If a notification deadline falls on a weekend or federal holiday, the notification deadline is automatically extended to the next business day.

(b) *Notifications to Tribal authority.* If any CCR unit is located in its entirety within Indian Country, the notifications of this section must be sent to the appropriate Tribal authority. If any CCR unit is located in part within Indian Country, the notifications of this section must be sent both to the appropriate State Director and Tribal authority.

(c) *Combining notifications.* Notifications may be combined as long as the deadline requirement for each notification is met.

(d) *Notification deadline after placement in operating record.* Unless otherwise required in this section, the notifications specified in this section must be sent to the State Director and/or appropriate Tribal authority within 30 days of placing in the operating record the information required by § 257.105.

* * * * *

(f) * * *

(24) Provide notification of the availability of the facility evaluation report part 1 as specified by § 257.105(f)(25).

(25) Provide notification of the availability of the facility evaluation report part 2 as specified by § 257.105(f)(26).

* * * * *

(k) *Legacy CCR surface impoundments.* In addition to the information specified in paragraphs (e) through (j) of this section, the owner or operator of a legacy CCR surface impoundment subject to this subpart must notify the State Director and/or appropriate Tribal authority when information has been placed in the operating record and on the owner or operator's publicly accessible internet site. The owner or operator must:

(1) Provide notification of the availability of the applicability documentation as specified under § 257.105(k)(1).

(2) Provide notification of the availability of the applicability extension report as specified under § 257.105(k)(2).

(3) Provide notification of the availability of the notification as specified under § 257.105(k)(3).

(4) Provide notification of the availability of the intent to certify closure by removal certification as specified under § 257.105(k)(4).

■ 24. Revise and republish § 257.107 to read as follows:

§ 257.107 Publicly accessible internet site requirements.

(a) *CCR website requirement.* Each owner or operator of a CCR unit subject to the requirements of this subpart must maintain a publicly accessible internet site (CCR website) containing the information specified in this section. The owner or operator's website must be titled ''CCR Rule Compliance Data and Information.'' The website must ensure that all information required to be posted is immediately available to anyone visiting the site, without requiring any prerequisite, such as registration or a requirement to submit a document request. All required information must be clearly identifiable and must be able to be immediately printed and downloaded by anyone accessing the site. If the owner/operator changes the web address (*i.e.,* Uniform Resource Locator (URL)) at any point, they must notify EPA via the ''contact us'' form on EPA's CCR website and the state director within 14 days of making the change. The facility's CCR website must also have a ''contact us'' form or a specific email address posted on the website for the public to use to submit questions and issues relating to the availability of information on the website.

(b) *CCR website for multiple CCR units or combined websites for multiple regulatory programs.*

(1) An owner or operator of more than one CCR unit subject to the provisions of this subpart may comply with the requirements of this section by using the same internet site for multiple CCR units provided the CCR website clearly delineates information by the name or identification number of each unit.

(2) An owner or operator may maintain one website combining the postings required under this subpart with the postings required by other regulatory programs (*e.g.,* the ''ELG Rule Compliance Data and Information'' website required pursuant to § 423.19 of this chapter), provided the postings required for each regulatory program are delineated under a separate heading on the website.

(c) *Document retention on a CCR website.* Unless otherwise required in this section, the information required to be posted to the CCR website must be made available to the public for at least five years following the date on which the information was first posted to the CCR website.

(d) *Website posting deadline after placement in operating record.* Unless otherwise required in this section, the information must be posted to the CCR website within 30 days of placing the pertinent information required by § 257.105 in the operating record.

(e) *Location restrictions.* The owner or operator of a CCR unit subject to this subpart must place each demonstration specified under § 257.105(e) on the owner or operator's CCR website except each location restrictions demonstration must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(f) *Design criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) Within 60 days of commencing construction of a new unit, the design certification specified under § 257.105(f)(1) or (3), except each certification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(2) No later than the date of initial receipt of CCR by a new CCR unit, the construction certification specified under § 257.105(f)(1) or (3), except each certification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g), or until the liner is removed irrespective of the time requirement specified in paragraph (c) of this section, whichever is later.

(3) The documentation of liner type specified under § 257.105(f)(2), except each document must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g), or until the liner is removed irrespective of the time requirement specified in paragraph (c) of this section, whichever is later.

(4) The initial and periodic hazard potential classification assessments specified under § 257.105(f)(5), except only the two most recent hazard potential classification assessments must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(5) The emergency action plan (EAP) specified under § 257.105(f)(6), except that only the most recent EAP must be maintained on the CCR website irrespective of the time requirement specified in paragraph (c) of this section.

(6) Documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR unit and the local emergency responders specified under § 257.105(f)(7), except only the most recent documentation must be posted on the CCR website irrespective of the time requirement specified in paragraph (c) of this section.

(7) Documentation prepared by the owner or operator recording any activation of the emergency action plan specified under § 257.105(f)(8); if no activation in the last five years, documentation that includes that information irrespective of the time requirement specified in paragraph (c) of this section.

(8) The history of construction, and any revisions of it, specified under § 257.105(f)(9), except the history of constructions, and any revisions of it, must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(9) The initial and periodic structural stability assessments specified under § 257.105(f)(10), except only the two most recent structural stability assessments must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(10) The documentation detailing the corrective measures taken to remedy the deficiency or release specified under § 257.105(f)(11), except each document must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(11) The initial and periodic safety factor assessments specified under § 257.105(f)(12), except only the two most recent safety factor assessments must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(12) The design and construction plans, and any revisions of them, specified under § 257.105(f)(13), except each plan must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(13) The application and any supplemental materials submitted in support of the application specified under § 257.105(f)(14), except each application must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(14) The alternative liner demonstration specified under § 257.105(f)(15).

(15) The alternative liner demonstration specified under § 257.105(f)(16).

(16) The documentation prepared for the preliminary demonstration specified under § 257.105(f)(17).

(17) The notification of an incomplete application specified under § 257.105(f)(18).

(18) The decision on the application specified under § 257.105(f)(19), except each decision must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(19) The final decision on the alternative liner demonstration specified under § 257.105(f)(20).

(20) The alternative source demonstration specified under § 257.105(f)(21).

(21) The final decision on the alternative source demonstration specified under § 257.105(f)(22).

(22) The final decision on the trend analysis specified under § 257.105(f)(23).

(23) The decision that the alternative source demonstration has been withdrawn specified under § 257.105(f)(24).

(24) The facility evaluation report part 1 as specified under § 257.105(f)(25), except each report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(25) The facility evaluation report part 2 as specified under § 257.105(f)(26), except each report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(g) *Operating criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The CCR fugitive dust control plan, or any subsequent amendment of the plan, specified under § 257.105(g)(1) except that only the most recent plan must be maintained on the CCR website irrespective of the time requirement specified in paragraph (c) of this section until the last CCR unit at the facility completes closure by removal in accordance with § 257.102(c) or completes post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(2) The annual CCR fugitive dust control report specified under § 257.105(g)(2). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(3) The initial and periodic run-on and run-off control system plans specified under § 257.105(g)(3), except each plan must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(4) The initial and periodic inflow design flood control system plans specified under § 257.105(g)(4), except each plan must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(5) The periodic inspection reports specified under § 257.105(g)(6). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(6) The documentation detailing the corrective measures taken to remedy the deficiency or release specified under § 257.105(g)(7). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final documentation must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(7) The periodic inspection reports specified under § 257.105(g)(9). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(h) *Groundwater monitoring and corrective action.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The annual groundwater monitoring and corrective action report specified under § 257.105(h)(1). Each report must be posted for the duration specified in paragraph (c) of this section, except that the final report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(2) The groundwater monitoring system certification specified under § 257.105(h)(3), except each certification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(3) The selection of a statistical method certification specified under § 257.105(h)(4), except each certification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(4) The notification that an assessment monitoring programs has been established specified under § 257.105(h)(5).

(5) The notification that the CCR unit is returning to a detection monitoring program specified under § 257.105(h)(7).

(6) The notification that one or more constituents in appendix IV to this part have been detected at statistically significant levels above the groundwater protection standard and the notifications to land owners specified under § 257.105(h)(8).

(7) The notification that an assessment of corrective measures has been initiated specified under § 257.105(h)(9).

(8) The assessment of corrective measures specified under § 257.105(h)(10), except each assessment must be posted for five years

after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(9) The semiannual reports describing the progress in selecting and designing remedy and the selection of remedy report specified under § 257.105(h)(12), except that the selection of the remedy report must be maintained until the remedy has been completed.

(10) The notification that the remedy has been completed specified under § 257.105(h)(13), except each notification must be posted for five years after completion of the remedy selected pursuant to in § 257.97 irrespective of the time requirement specified in paragraph (c) of this section.

(11) The demonstration supporting the suspension of groundwater monitoring requirements specified under § 257.105(h)(14), except each demonstration must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(i) *Closure and post-closure care.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The notification of intent to initiate closure of the CCR unit specified under § 257.105(i)(1).

(2) The annual progress reports of closure implementation specified under § 257.105(i)(2).

(3) The notification of closure completion specified under § 257.105(i)(3).

(4) The written closure plan, and any amendment of the plan, specified under § 257.105(i)(4), except that only the most recent closure plan must be posted on the CCR website irrespective of the time requirement specified in paragraph (c) of this section and each closure plan must be maintained for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(5) The demonstration(s) for a time extension for initiating closure specified under § 257.105(i)(5), except each demonstration must be posted until notice of completion of closure is placed in the operating record in accordance with § 257.102(h) irrespective of the time requirement specified in paragraph (c) of this section.

(6) The demonstration(s) for a time extension for completing closure specified under § 257.105(i)(6), except each demonstration must be posted for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (c) of this section.

(7) The notification of intent to close a CCR unit specified under § 257.105(i)(7), except each notification must be posted for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (c) of this section.

(8) The notification of completion of closure of a CCR unit specified under § 257.105(i)(8), except each notification must be posted for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(9) The notification recording a notation on the deed as required by § 257.105(i)(9), except each notification must be posted for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(10) The notification of intent to comply with the alternative closure requirements as required by § 257.105(i)(10), except the notification must be posted for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (c) of this section.

(11) The annual progress reports under the alternative closure requirements as required by § 257.105(i)(11), except the notification must be posted for five years after completion of closure in accordance with § 257.102(c) or (d) irrespective of the time requirement specified in paragraph (c) of this section.

(12) The written post-closure plan, and any amendment of the plan, specified under § 257.105(i)(12), except that only the most recent post-closure plan must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(13) The notification of completion of post-closure care specified under § 257.105(i)(13), except that only the most recent post-closure plan must be maintained for five years after completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(14) The notification of intent to comply with the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified under § 257.105(i)(14), except each notification must be posted for five years after completion of closure by removal in accordance with § 257.102(c)(1) or completion of post-closure care in accordance with § 257.104(e) irrespective of the time requirement specified in paragraph (c) of this section.

(15) The approved or denied demonstration for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as required by as specified under § 257.105(i)(15), except each approval or denial must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(16) The notification for requesting additional time to the alternative cease receipt of waste deadline as required by § 257.105(i)(16), except the notification must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(17) The semi-annual progress reports for the site-specific alternative to initiation of closure due to development of alternative capacity infeasible as specified under § 257.105(i)(17), except the progress report must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(18) The notification of intent to comply with the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as specified under § 257.105(i)(18), except the notification

must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(19) The approved or denied demonstration for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.105(i)(19), except the approval or denial must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(20) The annual progress report for the site-specific alternative to initiation of closure due to permanent cessation of a coal-fired boiler(s) by a date certain as required by § 257.105(i)(20), except the progress reports must be maintained for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(j) *Retrofit criteria.* The owner or operator of a CCR unit subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The written retrofit plan, and any amendment of the plan, specified under § 257.105(j)(1).

(2) The notification of intent to comply with the alternative retrofit requirements as required by § 257.105(j)(2).

(3) The annual progress reports under the alternative retrofit requirements as required by § 257.105(j)(3).

(4) The demonstration(s) for a time extension for completing retrofit activities specified under § 257.105(j)(4).

(5) The notification of intent to retrofit a CCR unit specified under § 257.105(j)(5).

(6) The notification of completion of retrofit activities specified under § 257.105(j)(6).

(k) *Legacy CCR surface impoundments.* In addition to the information specified in paragraphs (e) through (j) of this section, the owner or operator of a legacy CCR surface impoundment subject to this subpart must place the following information on the owner or operator's CCR website:

(1) The applicability report as specified under § 257.105(k)(1), except each report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(2) The applicability extension reports as specified under § 257.105(k)(2), except each report must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(3) The notification of field investigation conclusion as specified under § 257.105(k)(3), except each notification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

(4) The notification of intent to certify closure as specified under § 257.105(k)(4), except each notification must be posted for five years after completion of closure by removal in accordance with § 257.102(c) or until completion of post-closure care in accordance with § 257.104(e) or (g) irrespective of the time requirement specified in paragraph (c) of this section.

[FR Doc. 2024–09157 Filed 5–7–24; 8:45 am]
BILLING CODE 6560–50–P

EXHIBIT 1

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

EAST KENTUCKY POWER COOPERATIVE, INC.,	)	
Petitioner,	)	
v.	)	Case No. 24-1267
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, *et al.*,	)	
Respondents.	)	

DECLARATION OF JERRY PURVIS

I, Jerry Purvis, declare as follows:

1. My name is Jerry Purvis. I am the Vice President of Environmental Affairs at East Kentucky Power Cooperative ("EKPC"). I am over the age of 18 years, and I am competent to testify concerning the matters in this declaration. I have personal knowledge of the facts set forth in this declaration, and if called and sworn as a witness, could and would competently testify to them.

2. I have 30 years of experience in electricity generation. I have been employed at EKPC since 1994. I hold a Bachelor's degree in Chemistry from Morehead State University and in Chemical

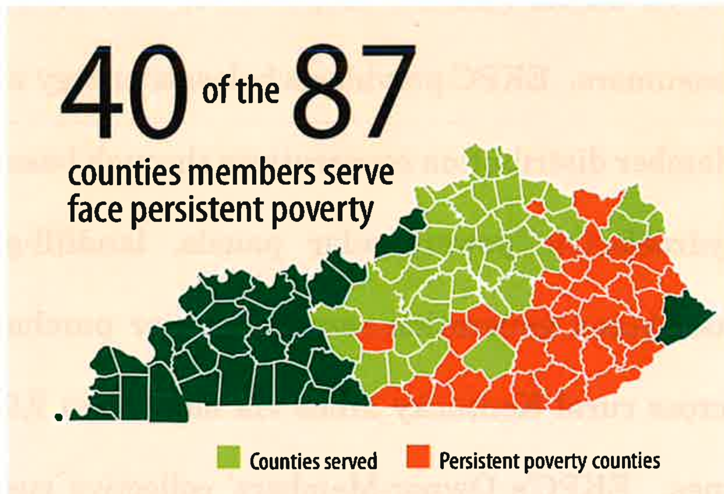
Engineering from the University of Kentucky. I also hold a Master of Business Administration degree from Morehead State University. As Vice President of Environmental Affairs, I am responsible for promoting proactive environmental policies, implementing comprehensive compliance strategies, and supporting EKPC's sustainability goals. I manage EKPC's staff and outside consultants in pursuit of these goals.

3. This declaration is submitted in support of EKPC's Petition for Review and Motion for Stay of EPA's Rule entitled, "Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments," 89 Fed. Reg. 38950 (May 8, 2024) (the "Rule"). I am familiar with EKPC's operations, including generation and transmission, regulatory compliance, workforce management, management and disposal of coal combustion residuals ("CCR"), and electric markets in general. I also am familiar with the Rule, and I am familiar with how the Rule will affect EKPC and its members, customers, and employees.

4. EKPC is a not-for-profit corporation that is owned, operated, and governed by its member cooperatives, who use the energy and

services EKPC provides. These Owner-Member cooperatives provide energy to 520,000 homes, farms, and businesses across 87 counties in Kentucky. EKPC's purpose is to generate electricity and transmit it to the 16 Owner-Member cooperatives that distribute it to retail, end-use consumers. EKPC provides wholesale energy and services to the Owner-Member distribution cooperatives through baseload units, peaking units, hydroelectric power, solar panels, landfill-gas-to-energy units, and distributed generation resource power purchases. It transmits power across rural Kentucky areas via more than 2,900 miles of transmission lines. EKPC's Owner-Members' collective customer base is comprised largely of residential customers (93%). And, in 2019, 57% of EKPC's Owner-Member retail sales were to the residential class. Electricity is the primary method for water heating and home heating for this class of customers.

5. EKPC is the voice for a substantial number of end users of electricity in its service territory who live in impoverished communities. These communities place a high value on affordable energy costs. EKPC's service territory includes rural areas with some of the lowest economic demographics in the United States. In these areas, families are faced with a daily choice between food, electricity, and medicine. Of the counties that EKPC's Owner-Member cooperatives serve, 40 counties experience persistent poverty, as reported by the USDA.



6. Many of these hardworking Americans have been plagued by unemployment from mines, trucking companies, restaurants, and other businesses. The unemployment rate is 60% higher than the national average. They rely on government assistance to survive; anywhere from 30% to 54% of total income in most of the counties that EKPC serves

comes from governmental-assistance programs. Forty-two percent of these electricity users are elderly (65 years or older). Many are on fixed incomes and reside in energy-inefficient mobile homes. Brutally cold weather in recent years has caused their monthly electric bills to skyrocket. EKPC has a strong interest in keeping energy affordable to assist its 16 Owner-Member cooperatives in serving people facing the harsh realities of today's economy.

EKPC'S ENVIRONMENTAL COMMITMENTS

7. EKPC and its Owner-Member cooperatives have a strong commitment to environmental excellence, which is underscored by a record of environmental over-compliance, investments in air quality-control and wastewater-treatment technologies, closure of ash ponds by removal, management of waste, and renewable diversification. EKPC has ensured that its efforts sustain excellent air quality, clean water, and properly disposed waste in accordance with—and beyond—regulatory minimums. EKPC is a leader in environmental stewardship in Kentucky. The Kentucky Energy and Environment Cabinet awarded EKPC its Beacon Award, the highest Environmental Stewardship award

in Kentucky, in 2023. In addition, EKPC has created a Strategic Sustainability Plan with goals and investments through 2035 and 2050. EKPC developed, permitted, and built the first renewable energy sources in Kentucky. Since that time, EKPC launched a 60-acre photovoltaic solar array in Winchester, Kentucky, and EKPC continues to utilize landfill gas generation assets and to support hydroelectricity (Wolf Creek and Laurel Dams) via Southeastern Power Administration ("SEPA") contracts. And EKPC just announced plans to construct an additional 136 MWs of solar capacity.

8. EKPC has one of the cleanest, best environmentally-controlled fleets in the country. EKPC's company-wide commitment to environmental excellence extends to compliance and a financial commitment to pollution-control improvements at its generation facilities. EKPC and its 16 Owner-Member cooperatives **have invested over $1.8 billion** since 2000 to reduce environmental impacts at its fossil generation facilities. Specifically, EKPC installed Best Available Control Technology ("BACT") to control NOx, SO_2, and particulate matter (PM) emissions at its Spurlock and Cooper Plants. Those efforts have

significantly lowered SO_2 (by 95%), NOx (by 78%), PM (by over 98%), and CO_2 (by 5.5%) since 2005. Since 2008, EKPC has devoted substantial resources to ensure compliance with EPA Rules including the stringent Mercury and Air Toxics ("MATS") requirements. In fact, many of the units in its coal-fired fleet have qualified for low-emitting EGU ("LEE") status. EKPC prides itself on installing state-of-the art emissions controls at its generation systems.

EKPC'S PROACTIVE APPROACH TO CCR

9. EKPC has also been on the cutting edge of mitigating and protecting against environmental harm from the disposal of CCR.

10. Historically, EKPC has generated power primarily by burning fossil fuels, particularly coal. Thus, EKPC has a long history of handling and safely disposing of CCR. State oversight of coal ash disposal has been in place for over 30 years under the Kentucky Special Waste statute, KRS 224.50-760.

11. Among its other electricity-generating assets, EKPC presently generates electricity through two coal-fired plants: the H.L.

Spurlock Station near Maysville, Kentucky, and the John Sherman Cooper Station near Burnside, Kentucky.

12. EKPC disposes of CCR produced by the Spurlock and Cooper Stations by depositing it at the following sites:

a. two CCR landfills located at the Spurlock Station.

b. a CCR landfill located at the Cooper Station; and

c. a CCR landfill located at the J.K. Smith Station (which generates electricity using natural-gas-fired turbines), where CCR from the former Dale Station was disposed, and which also serves as a back-up to the CCR landfill operations at the Spurlock and Cooper Stations.

13. EKPC also formerly disposed of CCR at a CCR impoundment located at the Spurlock Station. That impoundment is in the process of closure by removal of all CCR from the impoundment, and the closure is nearing completion.

14. CCR generated by the combustion of coal at the Spurlock and Cooper Stations does not cross state lines when being transported to any of the sites listed above in Paragraphs 12 or 13, nor do any of the sites

listed above in Paragraphs 12 or 13 receive CCR from any out-of-state sources.

15. EKPC has a track record of proactively exceeding regulatory requirements when it comes to the disposal of CCR.

16. Even though it had no obligation to do so, EKPC de-watered and removed all CCR from its former impoundments at the William C. Dale Station, located near Winchester, Kentucky, and disposed of this CCR at a new State-permitted, CCR Rule-compliant landfill at the J.K. Smith Station, which is located in Trapp, KY.

IMPACTS OF THE RULE ON EKPC'S FORMER SURFACE IMPOUNDMENTS AT THE DALE STATION

17. The Dale Station contained three impoundments (Ponds 2, 3, and 4) that were used to store and treat ash sluiced from the on-site coal-fired electricity generation. EKPC began the process of closure by removal for those impoundments (*i.e.*, closing the impoundments by removing all CCR from them) in 2014. At that time, Pond 2 included both the former Pond 1 and Pond 2, which were combined in the mid-1990s by removal of a dike that had separated them previously.

18. The process of closure by removal was overseen by the Kentucky Division of Waste Management ("KDWM"), which is a State agency within the Kentucky Energy and Environment Cabinet. KDWM oversaw this process of closure through field inspections and written correspondence with EKPC, according to a KDWM-approved closure plan. Pursuant to that plan, EKPC:

a. removed all CCR in the impoundments down to the level of the underlying existing soil;

b. had the CCR removal and closure certified by a third-party Professional Engineer and verified by visual inspection performed by KDWM representatives;

c. transported all the removed CCR to the CCR landfill at the J.K. Smith Station for disposal;

d. re-graded the areas in which the former CCR impoundments were previously located to remove any dike or depression after all CCR was removed;

e. submitted Construction Progress Reports to KDWM documenting both the closure of individual cells and the completion of the closure by removal project as a whole; and

f. received a termination letter from KDWM certifying that the final Construction Progress Reports had been accepted and approved.

See Ex. A & B. A true and accurate copy of KDWM's approval of the closure plan for the former Dale Station impoundments is attached to this Declaration as Exhibit A, and a true and accurate copy of the letter from KDWM noting final acceptance and termination of the work performed by EKPC in accordance with that plan is attached to this Declaration as Exhibit B.

19. KDWM did not require groundwater monitoring as long as complete removal of CCR was verified by visual inspection performed by KDWM representatives and the CCR was properly disposed of off-site in the State-permitted J.K. Smith Landfill.

20. When the 2015 Rule, 80 Fed. Reg. 21302, was finalized, the Dale Station was no longer generating electricity. Because all three former Dale Station impoundments had ceased receiving CCR before the

October 19, 2015, effective date of the rule and were located at a facility that was no longer generating electricity (i.e., not an active facility), they were not subject to the 2015 Rule.

21. Even though the 2015 Rule did not apply to the former Dale Station impoundments, EKPC acted of its own initiative to close those impoundments by removal of the CCR under KDWM oversight. Before the 2015 Rule was even issued, EKPC had voluntarily commenced closure activities at all three former Dale Station impoundments under the oversight of KDWM.

22. On the effective date of the 2015 Rule, the former Dale Station impoundments still contained CCR and some liquids. The former impoundments were fully dewatered shortly after the effective date of the 2015 Rule.

23. KDWM certified by letter in January 2019 that it accepted and approved EKPC's final Construction Progress Reports documenting its activities in closing the former Dale Station impoundments by removal of the CCR. *See* Ex. B.

24. Thus, it has been nearly five-and-a-half years since the Commonwealth of Kentucky certified that EKPC successfully closed the former Dale Station impoundments by removal, and longer than that since any of the former Dale Station impoundments held any liquids or CCR. The former Dale Station impoundments presently contain no CCR, which was excavated and removed to the level of the native soils.

25. EKPC spent approximately $27 million clean-closing the former Dale Station impoundments.

26. The Rule defines a "legacy CCR surface impoundment" as "a CCR surface impoundment that no longer receives CCR but contained both CCR and liquids on or after October 19, 2015, and that is located at an inactive electric utility or independent power producer." 89 Fed. Reg. 39100. The former Dale Station impoundments no longer received CCR on that date, but they contained both CCR and some liquids on or after October 19, 2015. EKPC, therefore, believes that the former Dale Station impoundments are now regulated under the Rule as legacy CCR Surface Impoundments. *See id.*

27. EKPC's closure of the former Dale Station impoundments has long been completed, under State oversight, but the Rule will force EKPC to "re-open" that completed regulatory process and will mandate that EKPC "re-close" the former Dale Station impoundments that no longer exist. It does so even though the former Dale Station impoundments are no longer sites where CCR is disposed of and, further, are sites that do not contain any CCR or liquids.

28. The Rule contains multiple potential compliance pathways for legacy CCR surface impoundments. To satisfy the least burdensome compliance pathway and avoid having to satisfy the full gamut of CCR Rule requirements with respect to the former Dale Station impoundments, EKPC would need to provide a closure certification pursuant to 40 C.F.R. § 257.100(g). Under this option, EKPC would have to install one or more groundwater-monitoring systems at Dale Station that meets the CCR Rule standards and demonstrate compliance with the applicable groundwater-protection standards by November 8, 2024. *See* 89 Fed. Reg. 39107. It is impossible in any practical sense to meet this deadline.

29. There was not enough time between May 8, 2024, and November 8, 2024, to design and install the groundwater-monitoring system and perform the multiple sampling events needed to establish background water quality, as well as identify appropriate statistical methods and perform the sampling and statistical analyses necessary to demonstrate whether the groundwater meets groundwater-protection standards.

30. The next least burdensome compliance option to avoid having to meet the full requirements of the 2015 Rule is found in 40 C.F.R. § 257.100(h). To satisfy this compliance option, EKPC would, among other things, need to install and operate a groundwater-monitoring system (as described in the previous paragraph), satisfy the full gamut of requirements found in 40 C.F.R. §§ 257.90 through 257.95, and demonstrate no exceedances of the groundwater-protection standards by May 8, 2028. *See* 89 Fed. Reg. 39107. This option would require EKPC to engage qualified environmental professionals to perform hydrogeologic studies of the site, prepare reports of the results of those studies, perform investigatory drilling, design, install, develop and certify the

groundwater-monitoring system, and perform the sampling and statistical analyses necessary to demonstrate that there are no exceedances of the groundwater-protection standards by May 8, 2028. EKPC has already begun work to satisfy these requirements. Completing this extensive series of activities by the May 2028 deadline will, in the absence of a stay, require EKPC to begin construction activities no later than March 2025.

31. If EKPC cannot satisfy either of the foregoing compliance options, it will need to satisfy the full requirements of the Rule for the former Dale Station impoundments. Those requirements include, among other things, performing groundwater monitoring (including detection and assessment monitoring), preparing closure and post-closure plans, performing corrective action (if needed), and re-closing the impoundments. EKPC would also then be required to evaluate the Dale Station site for the presence of CCRMUs and comply with the Rule's CCRMU requirements for any CCRMUs identified.

32. The Rule will thus subject the former Dale Station impoundments to numerous and burdensome requirements even though

those former impoundments have not contained either CCR or liquids for several years. *See, e.g.*, 89 Fed. Reg. 39105–08.

33. If EKPC had known when it initially closed the former Dale Station impoundments that EPA would subsequently force it to install groundwater-monitoring systems for those former impoundments, it would have performed the closure work differently. Among other things, it would have performed the grading and earth-moving work in ways that would be more conducive to the future installation of groundwater-monitoring systems. If it is forced to install such systems as a result of the Rule, it will have to undo, and then redo, much of the work that it performed nearly a decade ago when it initially closed those former impoundments.

34. The Rule thus directly harms EKPC.

IMPACT OF THE RULE ON EKPC AND CONSUMERS

35. The Rule will have significant negative impacts on EKPC. These impacts will ultimately fall most heavily on rural Kentucky ratepayers, many of whom cannot afford to pay more for energy.

36. EKPC estimates that compliance with the Rule as to the Dale Station will cost in excess of $16.5 million. This is in addition to the

approximately $27 million that EKPC previously spent to clean-close the former Dale Station impoundments.

37. Costs to comply with the Rule ultimately would be borne by the Owner-Members in the form of ultimately higher electricity costs. Many of their ratepayers live in poverty and cannot afford higher energy costs.

38. All the near-term costs associated with the Rule will begin flowing immediately to EKPC's members and, ultimately, to its end-users in rural communities and communities of poverty, who depend on EKPC for reliable, affordable power.

39. These costs cannot be deferred or delayed until the courts reach a final determination on the merits of the Petition for Review. EKPC expects that could take several years. If the Rule remains in effect while EKPC's challenge is pending, EKPC will have no choice but to incur significant non-refundable compliance costs as well as to shoulder the many other substantial, immediate, and irreparable harms described above. Even if the Rule is overturned, the direct costs to EKPC, its

member cooperatives, and end users cannot be recouped once spent. These damages are permanent.

*   *   *

I declare under penalty of perjury under the laws of the United States of America, pursuant to 28 U.S.C. § 1746, that the foregoing is true and correct to the best of my knowledge.

Executed on this 19th day of August, 2024, in Winchester, Kentucky.

Jerry B. Purvis, Vice President
Environmental Affairs

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EXHIBIT A

Steven L. Beshear
Governor

Leonard K. Peters
Secretary

ENERGY AND ENVIRONMENT CABINET
Division of Waste Management
200 Fair Oaks, 2nd Floor
FRANKFORT, KY 40601
TELEPHONE: 502-564-6716
FACSIMILE: 502-564-3492
waste.ky.gov

July 14, 2014

Mr. Jerry Purvis, Environmental Affairs Director
East Kentucky Power Co-operative, Inc.
P.O. Box 707
Winchester, Kentucky 40392-0707

Certified Mail No. 7013 1090 0000 6758 2443

RE: Closure Coal Combustion By-Product Surface Impoundments (Ash Ponds 1, 2, 3 and 4)
William C. Dale Station
Agency Interest No. 809
Clark County, Kentucky

Dear Mr. Purvis:

Based on our meeting at the facility on June 27, 2014, the Kentucky Division of Waste Management (DWM) is in agreement with East Kentucky Power Co-operative's (EKPC) approach for conducting closure of existing Coal Combustion By-Product Surface Impoundments 1, 2, 3 and 4 at Dale Station. Per discussion with Tammi Hudson, P.E. and myself, EKPC intends to pursue clean closure of the four surface impoundments by removing all waste for disposal at J.K. Smith Station Landfill. To summarize our discussions, the closure will consist of the following elements:

1. Remove all fly ash and bottom ash materials in the surface impoundments to the level of underlying existing soils. A permit is not required from the DWM to remove coal combustion residuals from the Dale Station Coal Combustion By-Product Surface Impoundments.

2. For compliance with KRS 224.50-760, utility waste is considered to include incidental soil, rock, or other materials excavated as part of coal combustion residuals removal. Incidental material may remain comingled during transportation and disposal.

3. Ash removal will be certified by a third party Professional Engineer, and verified by visual inspection performed by DWM representatives. No sampling will be required.

4. The removed utility waste will be transported to J.K. Smith Station Landfill for disposal.

5. Groundwater monitoring will not be required if waste is verified as removed from the Coal Combustion By-Products Surface Impoundments and properly disposed off-site.

6. The facility will comply with their KPDES permit to control surface water impacts during construction activities.

7. After ash materials have been removed, the impoundments will be re-graded using on-site soils and soils transported from J.K. Smith Station Landfill borrow areas.

8. Upon project completion, EKPC will submit a Construction Progress Report (CPR) documenting the closure construction activities.

9. DWM will issue a termination letter to EKPC once the CPR is accepted and approved.

If you need clarification or additional information, please contact Tammi Hudson, P.E. at (502) 564-6716, extension 4660.

Sincerely,

R. D. Gruzesky

Ronald D. Gruzesky, P.E.
Manager, Solid Waste Branch

RDG/tbh

EXHIBIT B

MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ANTHONY R. HATTON
COMMISSIONER

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601
TELEPHONE: 502-564-2150
TELEFAX: 502-564-4245

Rec'd
Jan 22, 2019
JSP

January 17, 2019

Mr. Jerry Purvis
East Kentucky Power Cooperative, Inc.
P.O. Box 707
Winchester, KY 40392

Certified Mail No. 7010 1870 0000 9172 9570

RE: Construction Progress Report: Ash Ponds 2, 3 & 4 - Closure by Removal
EKPC - Dale Station
Agency Interest No. 809
Application No. APE20180003
Clark County

Dear Mr. Purvis:

The Kentucky Division of Waste Management (DWM), Solid Waste Branch has reviewed the above-referenced report, received on November 16, 2018 and the addendum received January 10, 2019. DWM hereby accepts the report. The permit-by-rule activities pursuant to 401 KAR 45:060 are hereby terminated and are known as Ash Ponds 2, 3, and 4 (ACTV0003, ACTV0005, and ACTV0006).

Be advised that if you consider yourself aggrieved by the issuance of this action, you have the right, pursuant to KRS 224.10-420(2) to file a petition demanding a hearing with the Cabinet. This right shall be limited to a period of thirty (30) days from the issuance of this action. The petition should be filed with The Office of Administrative Hearings located at 211 Sower Blvd., Frankfort, KY 40601. See http://oah.ky.gov for additional information. Should you have any questions, please contact me at (502) 782-6305 or Ken Melton at (502) 782-6325 or Jamie Nielsen at (502) 782-6426.

Sincerely,

Danny Anderson

Danny Anderson, P.E.
Manager, Solid Waste Branch

DA/jn

c: Mr. Jerry Purvis via email: jerry.purvis@ekpc.coop
Mr. Tim Oakes via email: toakes@kenvirons.com

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Subsec. (a)(4) to (11). Pub. L. 98–616, § 101(b)(2), struck out par. (4) which provided for regulating the treatment, storage, transportation, and disposal of hazardous wastes which have adverse effects on health and the environment, added pars. (4) to (7), and redesignated former pars. (5) to (8) as (8) to (11), respectively.

Subsec. (b). Pub. L. 98–616, § 101(b)(1), added subsec. (b).

§ 6903. Definitions

As used in this chapter:

(1) The term ''Administrator'' means the Administrator of the Environmental Protection Agency.

(2) The term ''construction,'' with respect to any project of construction under this chapter, means (A) the erection or building of new structures and acquisition of lands or interests therein, or the acquisition, replacement, expansion, remodeling, alteration, modernization, or extension of existing structures, and (B) the acquisition and installation of initial equipment of, or required in connection with, new or newly acquired structures or the expanded, remodeled, altered, modernized or extended part of existing structures (including trucks and other motor vehicles, and tractors, cranes, and other machinery) necessary for the proper utilization and operation of the facility after completion of the project; and includes preliminary planning to determine the economic and engineering feasibility and the public health and safety aspects of the project, the engineering, architectural, legal, fiscal, and economic investigations and studies, and any surveys, designs, plans, working drawings, specifications, and other action necessary for the carrying out of the project, and (C) the inspection and supervision of the process of carrying out the project to completion.

(2A) The term ''demonstration'' means the initial exhibition of a new technology process or practice or a significantly new combination or use of technologies, processes or practices, subsequent to the development stage, for the purpose of proving technological feasibility and cost effectiveness.

(3) The term ''disposal'' means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

(4) The term ''Federal agency'' means any department, agency, or other instrumentality of the Federal Government, any independent agency or establishment of the Federal Government including any Government corporation, and the Government Publishing Office.

(5) The term ''hazardous waste'' means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may—

(A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or

(B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

(6) The term ''hazardous waste generation'' means the act or process of producing hazardous waste.

(7) The term ''hazardous waste management'' means the systematic control of the collection, source separation, storage, transportation, processing, treatment, recovery, and disposal of hazardous wastes.

(8) For purposes of Federal financial assistance (other than rural communities assistance), the term ''implementation'' does not include the acquisition, leasing, construction, or modification of facilities or equipment or the acquisition, leasing, or improvement of land.

(9) The term ''intermunicipal agency'' means an agency established by two or more municipalities with responsibility for planning or administration of solid waste.

(10) The term ''interstate agency'' means an agency of two or more municipalities in different States, or an agency established by two or more States, with authority to provide for the management of solid wastes and serving two or more municipalities located in different States.

(11) The term ''long-term contract'' means, when used in relation to solid waste supply, a contract of sufficient duration to assure the viability of a resource recovery facility (to the extent that such viability depends upon solid waste supply).

(12) The term ''manifest'' means the form used for identifying the quantity, composition, and the origin, routing, and destination of hazardous waste during its transportation from the point of generation to the point of disposal, treatment, or storage.

(13) The term ''municipality'' (A) means a city, town, borough, county, parish, district, or other public body created by or pursuant to State law, with responsibility for the planning or administration of solid waste management, or an Indian tribe or authorized tribal organization or Alaska Native village or organization, and (B) includes any rural community or unincorporated town or village or any other public entity for which an application for assistance is made by a State or political subdivision thereof.

(14) The term ''open dump'' means any facility or site where solid waste is disposed of which is not a sanitary landfill which meets the criteria promulgated under section 6944 of this title and which is not a facility for disposal of hazardous waste.

(15) The term ''person'' means an individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, State, municipality, commission, political subdivision of a State, or any interstate body and shall include each department, agency, and instrumentality of the United States.

(16) The term ''procurement item'' means any device, good, substance, material, product, or other item whether real or personal property which is the subject of any purchase, barter, or other exchange made to procure such item.

(17) The term ''procuring agency'' means any Federal agency, or any State agency or agency

of a political subdivision of a State which is using appropriated Federal funds for such procurement, or any person contracting with any such agency with respect to work performed under such contract.

(18) The term ''recoverable'' refers to the capability and likelihood of being recovered from solid waste for a commercial or industrial use.

(19) The term ''recovered material'' means waste material and byproducts which have been recovered or diverted from solid waste, but such term does not include those materials and byproducts generated from, and commonly reused within, an original manufacturing process.

(20) The term ''recovered resources'' means material or energy recovered from solid waste.

(21) The term ''resource conservation'' means reduction of the amounts of solid waste that are generated, reduction of overall resource consumption, and utilization of recovered resources.

(22) The term ''resource recovery'' means the recovery of material or energy from solid waste.

(23) The term ''resource recovery system'' means a solid waste management system which provides for collection, separation, recycling, and recovery of solid wastes, including disposal of nonrecoverable waste residues.

(24) The term ''resource recovery facility'' means any facility at which solid waste is processed for the purpose of extracting, converting to energy, or otherwise separating and preparing solid waste for reuse.

(25) The term ''regional authority'' means the authority established or designated under section 6946 of this title.

(26) The term ''sanitary landfill'' means a facility for the disposal of solid waste which meets the criteria published under section 6944 of this title.

(26A) The term ''sludge'' means any solid, semisolid or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effects.

(27) The term ''solid waste'' means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 1342 of title 33, or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923) [42 U.S.C. 2011 et seq.].

(28) The term ''solid waste management'' means the systematic administration of activities which provide for the collection, source separation, storage, transportation, transfer, processing, treatment, and disposal of solid waste.

(29) The term ''solid waste management facility'' includes—

(A) any resource recovery system or component thereof,

(B) any system, program, or facility for resource conservation, and

(C) any facility for the collection, source separation, storage, transportation, transfer, processing, treatment or disposal of solid wastes, including hazardous wastes, whether such facility is associated with facilities generating such wastes or otherwise.

(30) The terms ''solid waste planning'', ''solid waste management'', and ''comprehensive planning'' include planning or management respecting resource recovery and resource conservation.

(31) The term ''State'' means any of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

(32) The term ''State authority'' means the agency established or designated under section 6947 of this title.

(33) The term ''storage'', when used in connection with hazardous waste, means the containment of hazardous waste, either on a temporary basis or for a period of years, in such a manner as not to constitute disposal of such hazardous waste.

(34) The term ''treatment'', when used in connection with hazardous waste, means any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste or so as to render such waste nonhazardous, safer for transport, amenable for recovery, amenable for storage, or reduced in volume. Such term includes any activity or processing designed to change the physical form or chemical composition of hazardous waste so as to render it nonhazardous.

(35) The term ''virgin material'' means a raw material, including previously unused copper, aluminum, lead, zinc, iron, or other metal or metal ore, any undeveloped resource that is, or with new technology will become, a source of raw materials.

(36) The term ''used oil'' means any oil which has been—

(A) refined from crude oil,

(B) used, and

(C) as a result of such use, contaminated by physical or chemical impurities.

(37) The term ''recycled oil'' means any used oil which is reused, following its original use, for any purpose (including the purpose for which the oil was originally used). Such term includes oil which is re-refined, reclaimed, burned, or reprocessed.

(38) The term ''lubricating oil'' means the fraction of crude oil which is sold for purposes of reducing friction in any industrial or mechanical device. Such term includes re-refined oil.

(39) The term ''re-refined oil'' means used oil from which the physical and chemical contaminants acquired through previous use have been removed through a refining process.

(40) Except as otherwise provided in this paragraph, the term ''medical waste'' means any solid waste which is generated in the diagnosis, treatment, or immunization of human beings or

animals, in research pertaining thereto, or in the production or testing of biologicals. Such term does not include any hazardous waste identified or listed under subchapter III or any household waste as defined in regulations under subchapter III.

(41) The term ''mixed waste'' means waste that contains both hazardous waste and source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.).

(Pub. L. 89–272, title II, § 1004, as added Pub. L. 94–580, § 2, Oct. 21, 1976, 90 Stat. 2798; amended Pub. L. 95–609, § 7(b), Nov. 8, 1978, 92 Stat. 3081; Pub. L. 96–463, § 3, Oct. 15, 1980, 94 Stat. 2055; Pub. L. 96–482, § 2, Oct. 21, 1980, 94 Stat. 2334; Pub. L. 100–582, § 3, Nov. 1, 1988, 102 Stat. 2958; Pub. L. 102–386, title I, §§ 103, 105(b), Oct. 6, 1992, 106 Stat. 1507, 1512; Pub. L. 113–235, div. H, title I, § 1301(b), Dec. 16, 2014, 128 Stat. 2537.)

Editorial Notes

REFERENCES IN TEXT

The Atomic Energy Act of 1954, referred to in pars. (27) and (41), is act Aug. 1, 1946, ch. 724, as added by act Aug. 30, 1954, ch. 1073, § 1, 68 Stat. 919, which is classified principally to chapter 23 (§ 2011 et seq.) of this title. For complete classification of this Act to the Code, see Short Title note set out under section 2011 of this title and Tables.

PRIOR PROVISIONS

Provisions similar to those in this section were contained in section 3252 of this title, prior to the general amendment of the Solid Waste Disposal Act by Pub. L. 94–580.

AMENDMENTS

1992—Par. (15). Pub. L. 102–386, § 103, inserted before period at end ''and shall include each department, agency, and instrumentality of the United States''.

Par. (41). Pub. L. 102–386, § 105(b), added par. (41).

1988—Par. (40). Pub. L. 100–582 added par. (40).

1980—Par. (14). Pub. L. 96–482, § 2(a), defined ''open dump'' to include a facility, substituted requirement that disposal facility or site not be a sanitary landfill meeting section 6944 of this title criteria for prior requirement that disposal site not be a sanitary landfill within meaning of section 6944 of this title, and required that the disposal facility or site not be a facility for disposal of hazardous waste.

Par. (19). Pub. L. 96–482, § 2(b), defined ''recovered material'' to cover byproducts, substituted provision for recovery or diversion of waste material and byproducts from solid waste for prior provision for collection or recovery of material from solid waste, and excluded materials and byproducts generated from and commonly reused within an original manufacturing process.

Pars. (36) to (39). Pub. L. 96–463, § 3, added pars. (36) to (39).

1978—Par. (8). Pub. L. 95–609, § 7(b)(1), struck out provision stating that employees' salaries due pursuant to subchapter IV of this chapter would not be included after Dec. 31, 1979.

Par. (10). Pub. L. 95–609, § 7(b)(2), substituted ''management'' for ''disposal''.

Par. (29)(C). Pub. L. 95–609, § 7(b)(3), substituted ''the collection, source separation, storage, transportation, transfer, processing, treatment or disposal'' for ''the treatment''.

Statutory Notes and Related Subsidiaries

CHANGE OF NAME

''Government Publishing Office'' substituted for ''Government Printing Office'' in par. (4) on authority of section 1301(b) of Pub. L. 113–235, set out as a note preceding section 301 of Title 44, Public Printing and Documents.

Executive Documents

TRANSFER OF FUNCTIONS

Enforcement functions of Administrator or other official of Environmental Protection Agency related to compliance with resource conservation and recovery permits used under this chapter with respect to preconstruction, construction, and initial operation of transportation system for Canadian and Alaskan natural gas transferred to Federal Inspector, Office of Federal Inspector for the Alaska Natural Gas Transportation System, until first anniversary of date of initial operation of Alaska Natural Gas Transportation System, see Reorg. Plan No. 1 of 1979, eff. July 1, 1979, §§ 102(a), 203(a), 44 F.R. 33663, 33666, 93 Stat. 1373, 1376, set out in the Appendix to Title 5, Government Organization and Employees. Office of Federal Inspector for the Alaska Natural Gas Transportation System abolished and functions and authority vested in Inspector transferred to Secretary of Energy by section 3012(b) of Pub. L. 102–486, set out as an Abolition of Office of Federal Inspector note under section 719e of Title 15, Commerce and Trade. Functions and authority vested in Secretary of Energy subsequently transferred to Federal Coordinator for Alaska Natural Gas Transportation Projects by section 720d(f) of Title 15.

§ 6904. Governmental cooperation

(a) Interstate cooperation

The provisions of this chapter to be carried out by States may be carried out by interstate agencies and provisions applicable to States may apply to interstate regions where such agencies and regions have been established by the respective States and approved by the Administrator. In any such case, action required to be taken by the Governor of a State, respecting regional designation shall be required to be taken by the Governor of each of the respective States with respect to so much of the interstate region as is within the jurisdiction of that State.

(b) Consent of Congress to compacts

The consent of the Congress is hereby given to two or more States to negotiate and enter into agreements or compacts, not in conflict with any law or treaty of the United States, for—

(1) cooperative effort and mutual assistance for the management of solid waste or hazardous waste (or both) and the enforcement of their respective laws relating thereto, and

(2) the establishment of such agencies, joint or otherwise, as they may deem desirable for making effective such agreements or compacts.

No such agreement or compact shall be binding or obligatory upon any State a party thereto unless it is agreed upon by all parties to the agreement and until it has been approved by the Administrator and the Congress.

(Pub. L. 89–272, title II, § 1005, as added Pub. L. 94–580, § 2, Oct. 21, 1976, 90 Stat. 2801.)

Executive Documents

TRANSFER OF FUNCTIONS

For transfer of certain enforcement functions of Administrator or other official of Environmental Protec-

§ 6944. Criteria for sanitary landfills; sanitary landfills required for all disposal

(a) Criteria for sanitary landfills

Not later than one year after October 21, 1976, after consultation with the States, and after notice and public hearings, the Administrator shall promulgate regulations containing criteria for determining which facilities shall be classified as sanitary landfills and which shall be classified as open dumps within the meaning of this chapter. At a minimum, such criteria shall provide that a facility may be classified as a sanitary landfill and not an open dump only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid waste at such facility. Such regulations may provide for the classification of the types of sanitary landfills.

(b) Disposal required to be in sanitary landfills, etc.

For purposes of complying with section 6943(2)[1] of this title each State plan shall prohibit the establishment of open dumps and contain a requirement that disposal of all solid waste within the State shall be in compliance with such section 6943(2)[1] of this title.

(c) Effective date

The prohibition contained in subsection (b) shall take effect on the date six months after the date of promulgation of regulations under subsection (a).

(Pub. L. 89–272, title II, § 4004, as added Pub. L. 94–580, § 2, Oct. 21, 1976, 90 Stat. 2815; amended Pub. L. 98–616, title III, § 302(b), Nov. 8, 1984, 98 Stat. 3268.)

Editorial Notes

REFERENCES IN TEXT

Section 6943(2) of this title, referred to in subsec. (b), was redesignated section 6943(a)(2) of this title by Pub. L. 96–463, § 5(b), Oct. 15, 1980, 94 Stat. 2056, and Pub. L. 96–482, § 32(d)(2), Oct. 21, 1980, 94 Stat. 2353.

AMENDMENTS

1984—Subsec. (c). Pub. L. 98–616 struck out ''or on the date of approval of the State plan, whichever is later'' at end.

Executive Documents

TRANSFER OF FUNCTIONS

For transfer of certain enforcement functions of Administrator or other official of Environmental Protection Agency under this chapter to Federal Inspector, Office of Federal Inspector for the Alaska Natural Gas Transportation System, and subsequent transfer to Secretary of Energy, then to Federal Coordinator for Alaska Natural Gas Transportation Projects, see note set out under section 6903 of this title.

§ 6945. Upgrading of open dumps

(a) Closing or upgrading of existing open dumps

Upon promulgation of criteria under section 6907(a)(3) of this title, any solid waste management practice or disposal of solid waste or hazardous waste which constitutes the open dumping of solid waste or hazardous waste is prohibited, except in the case of any practice or disposal of solid waste under a timetable or schedule for compliance established under this section. The prohibition contained in the preceding sentence shall be enforceable under section 6972 of this title against persons engaged in the act of open dumping. For purposes of complying with section 6943(a)(2) and 6943(a)(3) of this title, each State plan shall contain a requirement that all existing disposal facilities or sites for solid waste in such State which are open dumps listed in the inventory under subsection (b) shall comply with such measures as may be promulgated by the Administrator to eliminate health hazards and minimize potential health hazards. Each such plan shall establish, for any entity which demonstrates that it has considered other public or private alternatives for solid waste management to comply with the prohibition on open dumping and is unable to utilize such alternatives to so comply, a timetable or schedule for compliance for such practice or disposal of solid waste which specifies a schedule of remedial measures, including an enforceable sequence of actions or operations, leading to compliance with the prohibition on open dumping of solid waste within a reasonable time (not to exceed 5 years from the date of publication of criteria under section 6907(a)(3) of this title).

(b) Inventory

To assist the States in complying with section 6943(a)(3) of this title, not later than one year after promulgation of regulations under section 6944 of this title, the Administrator, with the cooperation of the Bureau of the Census shall publish an inventory of all disposal facilities or sites in the United States which are open dumps within the meaning of this chapter.

(c) Control of hazardous disposal

(1)(A) Not later than 36 months after November 8, 1984, each State shall adopt and implement a permit program or other system of prior approval and conditions to assure that each solid waste management facility within such State which may receive hazardous household waste or hazardous waste due to the provision of section 6921(d) of this title for small quantity generators (otherwise not subject to the requirement for a permit under section 6925 of this title) will comply with the applicable criteria promulgated under section 6944(a) and 6907(a)(3) of this title.

(B) Not later than eighteen months after the promulgation of revised criteria under subsection[1] 6944(a) of this title (as required by section 6949a(c) of this title), each State shall adopt and implement a permit program or other system or[2] prior approval and conditions, to assure that each solid waste management facility within such State which may receive hazardous household waste or hazardous waste due to the provision of section 6921(d) of this title for small quantity generators (otherwise not subject to the requirement for a permit under section 6925

[1] See References in Text note below.

[1] So in original. Probably should be ''section''.

[2] So in original. Probably should be ''of''.

§ 6944. Criteria for sanitary landfills; sanitary landfills required for all disposal

(a) Criteria for sanitary landfills

Not later than one year after October 21, 1976, after consultation with the States, and after notice and public hearings, the Administrator shall promulgate regulations containing criteria for determining which facilities shall be classified as sanitary landfills and which shall be classified as open dumps within the meaning of this chapter. At a minimum, such criteria shall provide that a facility may be classified as a sanitary landfill and not an open dump only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid waste at such facility. Such regulations may provide for the classification of the types of sanitary landfills.

(b) Disposal required to be in sanitary landfills, etc.

For purposes of complying with section 6943(2)[1] of this title each State plan shall prohibit the establishment of open dumps and contain a requirement that disposal of all solid waste within the State shall be in compliance with such section 6943(2)[1] of this title.

(c) Effective date

The prohibition contained in subsection (b) shall take effect on the date six months after the date of promulgation of regulations under subsection (a).

(Pub. L. 89–272, title II, § 4004, as added Pub. L. 94–580, § 2, Oct. 21, 1976, 90 Stat. 2815; amended Pub. L. 98–616, title III, § 302(b), Nov. 8, 1984, 98 Stat. 3268.)

Editorial Notes

REFERENCES IN TEXT

Section 6943(2) of this title, referred to in subsec. (b), was redesignated section 6943(a)(2) of this title by Pub. L. 96–463, § 5(b), Oct. 15, 1980, 94 Stat. 2056, and Pub. L. 96–482, § 32(d)(2), Oct. 21, 1980, 94 Stat. 2353.

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§ 6945. Upgrading of open dumps

(a) Closing or upgrading of existing open dumps

Upon promulgation of criteria under section 6907(a)(3) of this title, any solid waste management practice or disposal of solid waste or hazardous waste which constitutes the open dumping of solid waste or hazardous waste is prohibited, except in the case of any practice or disposal of solid waste under a timetable or schedule for compliance established under this section. The prohibition contained in the preceding sentence shall be enforceable under section 6972 of this title against persons engaged in the act of open dumping. For purposes of complying with section 6943(a)(2) and 6943(a)(3) of this title, each State plan shall contain a requirement that all existing disposal facilities or sites for solid waste in such State which are open dumps listed in the inventory under subsection (b) shall comply with such measures as may be promulgated by the Administrator to eliminate health hazards and minimize potential health hazards. Each such plan shall establish, for any entity which demonstrates that it has considered other public or private alternatives for solid waste management to comply with the prohibition on open dumping and is unable to utilize such alternatives to so comply, a timetable or schedule for compliance for such practice or disposal of solid waste which specifies a schedule of remedial measures, including an enforceable sequence of actions or operations, leading to compliance with the prohibition on open dumping of solid waste within a reasonable time (not to exceed 5 years from the date of publication of criteria under section 6907(a)(3) of this title).

(b) Inventory

To assist the States in complying with section 6943(a)(3) of this title, not later than one year after promulgation of regulations under section 6944 of this title, the Administrator, with the cooperation of the Bureau of the Census shall publish an inventory of all disposal facilities or sites in the United States which are open dumps within the meaning of this chapter.

(c) Control of hazardous disposal

(1)(A) Not later than 36 months after November 8, 1984, each State shall adopt and implement a permit program or other system of prior approval and conditions to assure that each solid waste management facility within such State which may receive hazardous household waste or hazardous waste due to the provision of section 6921(d) of this title for small quantity generators (otherwise not subject to the requirement for a permit under section 6925 of this title) will comply with the applicable criteria promulgated under section 6944(a) and 6907(a)(3) of this title.

(B) Not later than eighteen months after the promulgation of revised criteria under subsection[1] 6944(a) of this title (as required by section 6949a(c) of this title), each State shall adopt and implement a permit program or other system or[2] prior approval and conditions, to assure that each solid waste management facility within such State which may receive hazardous household waste or hazardous waste due to the provision of section 6921(d) of this title for small quantity generators (otherwise not subject to the requirement for a permit under section 6925

[1] See References in Text note below.

[1] So in original. Probably should be ''section''.

[2] So in original. Probably should be ''of''.

of this title) will comply with the criteria revised under section 6944(a) of this title.

(C) The Administrator shall determine whether each State has developed an adequate program under this paragraph. The Administrator may make such a determination in conjunction with approval, disapproval or partial approval of a State plan under section 6947 of this title.

(2)(A) In any State that the Administrator determines has not adopted an adequate program for such facilities under paragraph (1)(B) by the date provided in such paragraph, the Administrator may use the authorities available under sections 6927 and 6928 of this title to enforce the prohibition contained in subsection (a) of this section with respect to such facilities.

(B) For purposes of this paragraph, the term ''requirement of this subchapter'' in section 6928 of this title shall be deemed to include criteria promulgated by the Administrator under sections 6907(a)(3) and 6944(a) of this title, and the term ''hazardous wastes'' in section 6927 of this title shall be deemed to include solid waste at facilities that may handle hazardous household wastes or hazardous wastes from small quantity generators.

(d) State programs for control of coal combustion residuals

(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).

(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.

(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.

(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).

(2) Nonparticipating states

(A) Definition of nonparticipating State

In this paragraph, the term ''nonparticipating State'' means a State—

(i) for which the Administrator has not approved a State permit program or other system of prior approval and conditions under paragraph (1)(B);

(ii) the Governor of which has not submitted to the Administrator for approval evidence to operate a State permit program or other system of prior approval and conditions under paragraph (1)(A);

(iii) the Governor of which provides notice to the Administrator that, not fewer than 90 days after the date on which the Governor provides the notice to the Administrator, the State will relinquish an approval under paragraph (1)(B) to operate a permit program or other system of prior approval and conditions; or

(iv) for which the Administrator has withdrawn approval for a permit program or other system of prior approval and conditions under paragraph (1)(E).

(B) Implementation of permit program

In the case of a nonparticipating State and subject to the availability of appropriations specifically provided in an appropriations Act to carry out a program in a nonparticipating State, the Administrator shall implement a permit program to require each coal combustion residuals unit located in the nonparticipating State to achieve compliance with applicable criteria established by the Administrator 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).

(3) Applicability of criteria

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), shall apply to each coal combustion residuals unit in a State unless—

(A) a permit under a State permit program or other system of prior approval and conditions approved by the Administrator under paragraph (1)(B) is in effect for the coal combustion residuals unit; or

(B) a permit issued by the Administrator in a State in which the Administrator is implementing a permit program under paragraph (2)(B) is in effect for the coal combustion residuals unit.

(4) Prohibition on open dumping

(A) In general

The Administrator may use the authority provided by sections 6927 and 6928 of this title to enforce the prohibition on open dumping under subsection (a) with respect to a coal combustion residuals unit—

(i) in a nonparticipating State (as defined in paragraph (2)); and

(ii) located in a State that is approved to operate a permit program or other system of prior approval and conditions under paragraph (1)(B), in accordance with subparagraph (B) of this paragraph.

(B) Federal enforcement in an approved State

(i) In general

In the case of a coal combustion residuals unit located in a State that is approved to operate a permit program or other system of prior approval and conditions under paragraph (1)(B), the Administrator may commence an administrative or judicial enforcement action under section 6928 of this title if—

(I) the State requests that the Administrator provide assistance in the performance of an enforcement action; or

(II) after consideration of any other administrative or judicial enforcement action involving the coal combustion residuals unit, the Administrator determines that an enforcement action is likely to be necessary to ensure that the coal combustion residuals unit is operating in accordance with the criteria established under the permit program or other system of prior approval and conditions.

(ii) Notification

In the case of an enforcement action by the Administrator under clause (i)(II), before issuing an order or commencing a civil action, the Administrator shall notify the State in which the coal combustion residuals unit is located.

(iii) Annual report to Congress

(I) In general

Subject to subclause (II), not later than December 31, 2017, and December 31 of each year thereafter, the Administrator shall submit to the Committee on Environment and Public Works of the Senate and the Committee on Energy and Commerce of the House of Representatives a report that describes any enforcement action commenced under clause (i), including a description of the basis for the enforcement action.

(II) Applicability

Subclause (I) shall not apply for any calendar year during which the Administrator does not commence an enforcement action under clause (i).

(5) Indian country

The Administrator shall establish and carry out a permit program, in accordance with this subsection, for coal combustion residuals units in Indian country (as defined in section 1151 of title 18) to require each coal combustion residuals unit located in Indian country to achieve compliance with the applicable criteria established by the Administrator 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).

(6) Treatment of coal combustion residuals units

A coal combustion residuals unit shall be considered to be a sanitary landfill for purposes of this chapter, including subsection (a), only if the coal combustion residuals unit is operating in accordance with—

(A) the requirements of a permit issued by—

(i) the State in accordance with a program or system approved under paragraph (1)(B); or

(ii) the Administrator pursuant to paragraph (2)(B) or paragraph (5); or

(B) 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).

(7) Effect of subsection

Nothing in this subsection affects any authority, regulatory determination, other law, or legal obligation in effect on the day before December 16, 2016.

(Pub. L. 89–272, title II, §4005, as added Pub. L. 94–580, §2, Oct. 21, 1976, 90 Stat. 2815; amended Pub. L. 96–482, §19(a), (b), Oct. 21, 1980, 94 Stat. 2345; Pub. L. 98–616, title III, §302(c), title IV, §403(c), title V, §502(c), Nov. 8, 1984, 98 Stat. 3268, 3272, 3276; Pub. L. 114–322, title II, §2301, Dec. 16, 2016, 130 Stat. 1736.)

Editorial Notes

CODIFICATION

Another section 19(b) of Pub. L. 96–482 amended section 6946 of this title.

AMENDMENTS

2016—Subsec. (d). Pub. L. 114–322 added subsec. (d).

1984—Subsec. (a). Pub. L. 98–616, §403(c), inserted after first sentence "The prohibition contained in the preceding sentence shall be enforceable under section 6972 of this title against persons engaged in the act of open dumping."

Pub. L. 98–616, §502(c), inserted a closing parenthesis before the period at end.

Subsec. (c). Pub. L. 98–616, §302(c), added subsec. (c).

1980—Subsec. (a). Pub. L. 96–482, §19(a), (b)(1), struck out subsec. (a) which defined "open dump", which is covered in section 6903(14) of this title, redesignated subsec. (c) as (a) and substituted "Upon promulgation of criteria under section 6907(a)(3) of this title, any" for "Any", "section 6943(a)(2) and 6943(a)(3) of this title" for "section 6943(2) of this title", and "criteria under section 6907(a)(3) of this title" for "the inventory under subsection (b)".

Amendment by section 19(b)(1) of Pub. L. 96–482, directing that following reference to "4003(2)", which had been editorially translated as section 6943(2) of this title, the phrase "and 4003(3)" be inserted, was executed by translating "4003(2) and 4003(3)" as section 6943(a)(2) and 6943(a)(3) of this title, in view of the designation of the existing provisions of section 6943 of this title as subsec. (a) of section 6943 of this title by section 5(b) of Pub. L. 96–463 and also by section 32(d)(2) of Pub. L. 96–482.

Subsec. (b). Pub. L. 96–482, §19(b)(2), inserted introductory phrase "To assist the States in complying with section 6943(a)(3) of this title". Amendment referring to section "4003(3)" was executed by translating "4003(3)" as section 6943(a)(3) of this title, in view of the designation of the existing provisions of section 6943 of this title as subsec. (a) of section 6943 of this title by section 5(b) of Pub. L. 96–463 and also by section 32(d)(2) of Pub. L. 96–482.

Subsec. (c). Pub. L. 96–482, §19(a), redesignated subsec. (c) as (a).

Executive Documents

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§6946. Procedure for development and implementation of State plan

(a) Identification of regions

Within one hundred and eighty days after publication of guidelines under section 6942(a) of this title (relating to identification of regions), the Governor of each State, after consultation with local elected officials, shall promulgate regulations based on such guidelines identifying the boundaries of each area within the State which, as a result of urban concentrations, geographic conditions, markets, and other factors, is appropriate for carrying out regional solid waste management. Such regulations may be modified from time to time (identifying additional or different regions) pursuant to such guidelines.

(b) Identification of State and local agencies and responsibilities

(1) Within one hundred and eighty days after the Governor promulgates regulations under subsection (a), for purposes of facilitating the development and implementation of a State plan which will meet the minimum requirements of section 6943 of this title, the State, together with appropriate elected officials of gen-

RISK ASSESSMENT OF COAL COMBUSTION RESIDUALS:

LEGACY IMPOUNDMENTS AND CCR MANAGEMENT UNITS

April 2024

Final

Prepared By:

United States Environmental Protection Agency
Office of Land and Emergency Management
Office of Resource Conservation and Recovery

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Acronyms and Abbreviations

ACAA	American Coal Ash Association
ACI	Active Carbon Injection
ARAR	Applicable or Relevant and Appropriate Requirements
ASTM	American Association of Techniques and Methods
BEIR	Biological Effects of Ionizing Radiation
CCR	Coal Combustion Residuals
CCRMU	Coal Combustion Residual Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COALQUAL	Coal Quality Database
CTE	Central Tendency Exposure
Eco-SSL	Ecological Soil Screening Level
EIA	Energy Information Association
EPA	Environmental Protection Agency
EPACMTP	EPA Composite Model for Leachate Migration with Transformation Products
ESP	Electrostatic Precipitator
FGD	Flue Gas Desulfurization
GWPS	Groundwater Protection Standards
HELP	Hydrologic Evaluation of Landfill Performance
HQs	Hazard Quotients
HSWA	Hazardous and Solid Waste Amendments of 1984
LANL	Los Alamos National Laboratory
LEAF	Leaching Evaluation Assessment Framework
LOI	Loss on Ignition
Mgal	Millions of Gallons
MODFLOW-USGT	Modular Three-Dimension Finite-Difference Ground-Water Flow Model - Unstructured Grid Transport
NAICS	North American Industry Classification System
NOAA	National Oceanic and Atmospheric Administration

NRC	National Research Council
OLEM	Office of Land and Emergency Management
OPP	Office of Pesticide Programs
ORNL	Oak Ridge National Laboratory
PRG	Primary Remediation Goal
RCRA	Resource Conservation and Recovery Act
RESRAD	RESidual RADiation
RME	Reasonable Maximum Exposure
RSL	Regional Screening Level
TENORM	Technologically Enhanced Naturally Occurring Radioactive Material
USCHEM	United States geoCHEMical Database
U.S.	United States
USGS	United States Geologic Survey
USWAG	Utility Solid Waste Activities Group
WIIN	Water Infrastructure Improvements for the Nation

1 Introduction

The United States (U.S.) Environmental Protection Agency (EPA or the Agency) has taken many steps toward characterizing the risks that may result from disposal of coal combustion residuals (CCR) and developing regulations necessary to protect human health and the environment. This characterization of risk is conducted in support of the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by both the Hazardous and Solid Waste Amendments (HSWA) of 1984 and Water Infrastructure Improvements for the Nation (WIIN) Act of 2016. A full timeline and summary of regulatory actions related to CCR disposal can be found on the Agency website.[1]

This revised risk assessment presented in this document builds on and supplements the two most recently completed analyses in that timeline, the Final Human and Ecological Risk Assessment of Coal Combustion Residuals (U.S. EPA, 2014a) and the Draft Risk Assessment of Coal Combustion Residuals: Legacy Impoundments and CCR Management Units (U.S. EPA, 2023). Specifically, EPA has revised the Draft 2023 Risk Assessment to incorporate additional information and to address the comments received from the public. This document does not aim to directly summarize or respond to the specific comments received. That is provided in a separate response to comment document available in the docket for the final rule.

1.1 Regulatory Background

In 2015, EPA finalized national regulations for management of CCR generated at coal-fired electric utilities.[2] This rule established minimum national standards under Subtitle D of RCRA for the design, operation, and closure of landfills and surface impoundments that accept CCR after the effective date of the rule on October 19, 2015. These requirements were designed to address the potential risks EPA identified through environmental modeling documented in "Human and Ecological Risk Assessment of Coal Combustion Residuals" ("2014 Risk Assessment") (U.S. EPA, 2014a) and through a review of relevant damage cases.

The 2015 Rule was challenged by multiple parties, including a coalition of environmental advocacy groups. Among the issues raised by these petitioners was their contention that the scope of the rule violated the RCRA statute. Specifically, they argued exclusion of inactive surface impoundments at inactive facilities from the regulation ("legacy impoundments") could result in unmonitored leaks to groundwater and catastrophic structural failures, which violated a baseline requirement of RCRA that promulgated criteria for solid waste disposal pose "no reasonable probability of adverse effects on health or the environment." 42 U.S.C. 6944(a). On August 21, 2018, the U.S. Court of Appeals for the D.C. Circuit issued its opinion in the case of *Utility Solid Waste Activities*

1) Available online at: https://www.epa.gov/coalash/coal-ash-rule

2) 80 FR 21302, April 17, 2015.

Group v. EPA, 901 F.3d 414 (per curiam) (hereafter "*USWAG* decision"). This decision upheld the 2015 CCR Rule on most counts but agreed with the environmental petitioners on the issue of legacy impoundments, holding EPA acted "arbitrarily and capriciously and contrary to RCRA." As a result, the Court vacated the exemption for legacy impoundments and remanded the issue back to EPA.

In 2023, EPA proposed to revise the CCR Rule in response to the *USWAG* decision and to address additional issues that have arisen since that decision as a result of mandated facility reporting.[3] The Agency first proposed a set of requirements for management of CCR in legacy impoundments that would apply to the inactive facilities where these impoundments are located ("legacy facilities"), which include the same requirements as active units with the exception of certain design requirements and location restrictions. These requirements build off the existing risk record and respond to the *USWAG* decision. The Agency also proposed a separate set of requirements for management practices that result in placement of CCR on the land outside regulated disposal units, referred to as CCR management units ("CCRMU"), which would apply to both active facilities and legacy facilities. This would extend a subset of the requirements for CCR units to CCRMU, including groundwater monitoring, corrective action, closure, post-closure care, and reporting and recordkeeping. These requirements respond to 42 alternate source demonstrations or assessment of corrective measure documents that attribute identified groundwater contamination to these units.

1.2 Purpose and Scope of the Risk Assessment

The 2014 Risk Assessment previously addressed the potential risks from disposal of CCR in landfills and surface impoundments operating onsite at electric utilities (U.S. EPA, 2014a). This assessment utilized site-specific data, where available, supplemented by more regional and national data sets, to best reflect the variability of disposal practices, environmental conditions, and receptor behavior across the country. This assessment considered a range of exposure pathways that were modeled in a stepwise fashion, culminating in national-scale, probabilistic modeling. Based on the results of this probabilistic analysis, the Agency identified potential risks to groundwater from long-term leakage that warranted regulatory action.

The purpose of the current risk assessment is to evaluate the potential for risk from placement of CCR in legacy impoundments and CCRMU, which both fell outside the scope of the 2014 Risk Assessment. Because the 2014 Risk Assessment previously identified a subset of contaminants most likely to drive risk from leakage to groundwater, the current assessment of groundwater focuses on that list of contaminants. EPA started from the same methodology and data sources detailed in the 2014 Risk Assessment for selecting appropriate data and characterizing facility environmental

3) 88 FR 31982, May 18, 2023.

setting, CCR waste properties, contaminant leaching behavior and transport, and exposure. EPA found the same methodology and data sources were sufficient to support conclusions about the risks from the landfills and surface impoundments covered in this rulemaking. EPA adjusted the methodology as necessary to better reflect an updated conceptual model for smaller CCRMU placed for purposes other than disposal and to incorporate more recent data. Finally, EPA considered the potential for additional, non-groundwater exposures specific to these smaller CCRMU.

The regulatory scope of the current rulemaking is limited to management of CCRs generated by coal-fired electric utilities and independent power producers covered by the North American Industry Classification System (NAICS) Code 22111.[4] The scope of this risk assessment is limited to the disposal or other placement of CCR on the land at active and inactive electric utilities.

1.3 Overview of Assessment Methodology

The current risk assessment is divided into eight main sections and three appendices. The main sections summarize the different data sources relied upon, analyses performed, model results, and final conclusions. The appendices provide a more detailed discussion of the data and model results underlying the analyses summarized in the main text. The remainder of this subsection provides further information about the contents of each section and appendices.

- **Section 2, Problem Formulation:** describes the conceptual models used to identify relevant exposure pathways and summarizes new data sources used to characterize these pathways.
- **Section 3, Disposal Unit Groundwater Risk:** describes the review of available data conducted to characterize how risks from historical and inactive landfills and surface impoundments compare with those previously reported in 2014.
- **Section 4, CCRMU Fill Groundwater Risk:** describes modeling approach used to 1) estimate the magnitude of leakage from smaller CCRMU to groundwater, 2) model contaminant fate and transport through underlying soil and aquifer, and 3) calculate the magnitude of resulting exposure and corresponding risk.
- **Section 5, CCRMU Fill Soil Risk:** describes the modeling approach used to 1) estimate the rate at which gamma radiation and radon gas are released from smaller CCRMU placed within the soil, 2) model contaminant fate and transport through the overlying soil, and 3) calculate the magnitude of resulting exposure and corresponding risk.
- **Section 6, Uncertainty and Sensitivity Analyses:** describes the results of various analyses conducted to identify new sources of uncertainty and sensitive parameters that exert the greatest influence on modeled risks. To the extent possible, these sources are quantitatively

4) See: https://www.naics.com/naics-code-description/?code=22111

and qualitatively characterized to identify the potential for higher or lower risks than those previously modeled.

- **Section 7, Summary and Conclusions:** synthesizes available information from all sections of the risk assessment to reach final conclusions about the risks that may result from different CCR management practices.
- **Section 8, References:** provides citations for all documents referenced throughout the text.

2 Problem Formulation

The primary purpose of this section is to describe the conceptual models developed for legacy impoundments and different types of CCRMU, which form the basis for this risk assessment. This section also provides a summary of major data sources that have been updated since the 2014 Risk Assessment was finalized. These data on facility conditions and environmental setting are applied to the conceptual models to characterize the potential risks associated with placement of CCR on the land.

2.1 Overview of Coal Combustion and Residuals

CCR is a broad term that refers to a range of byproducts generated directly by coal combustion or as a result of applying certain pollution control devices to emissions from coal-fired combustion units. CCR may be generated wet or dry, but this can change after generation. Some CCR are dewatered after generation, while others are later mixed with water to facilitate transport. When multiple types of CCR are generated at the same facility, mixing and co-disposal may occur.

- **Fly ash** is the fraction of combusted coal that becomes suspended in plant flue gases. It is a very fine, powdery material composed primarily of silica. Fly ash is removed from the plant exhaust gases primarily by electrostatic precipitators (ESPs) or baghouses that contain fabric filters. In facilities that use activated carbon injection (ACI) before fly ash collection, the fly ash waste stream will also contain the carbon, along with other mercury control wastes. However, where ACI occurs after fly ash collection, a separate waste stream may result.

- **Bottom ash** consists of ash particles that are too large to become entrained in the flue gas during combustion. It is coarse, with grain sizes that range from fine sand to fine gravel, and quite angular, with a porous surface structure. Bottom ash is collected from the furnace after it collides with and agglomerates to furnace walls or falls through open grates to an ash hopper beneath the furnace.

- **Boiler slag** is molten bottom ash that has been quenched with water. When the molten ash comes in contact with the water, it crystallizes, fractures and forms pellets that are hard with a smooth, glassy appearance. Boiler slag is collected from the base of either slag tap or cyclone type furnaces.

- **Flue Gas Desulfurization (FGD) materials** are produced through a process used to reduce sulfur dioxide (SO_2) emissions from the exhaust gas system of a coal-fired boiler. The physical nature of these materials varies from a wet sludge to a dry powdered material, depending on the pollution control technology, and the composition consists of sulfites, sulfates, or a mixture thereof.

Figure 2-1 provides the layout of a generic coal-fired plant. This simplified layout is intended to demonstrate some major pollution control technologies, waste streams, and points of generation associated with coal combustion. It is intended to be illustrative and so does not capture all possible technologies or plant layouts.

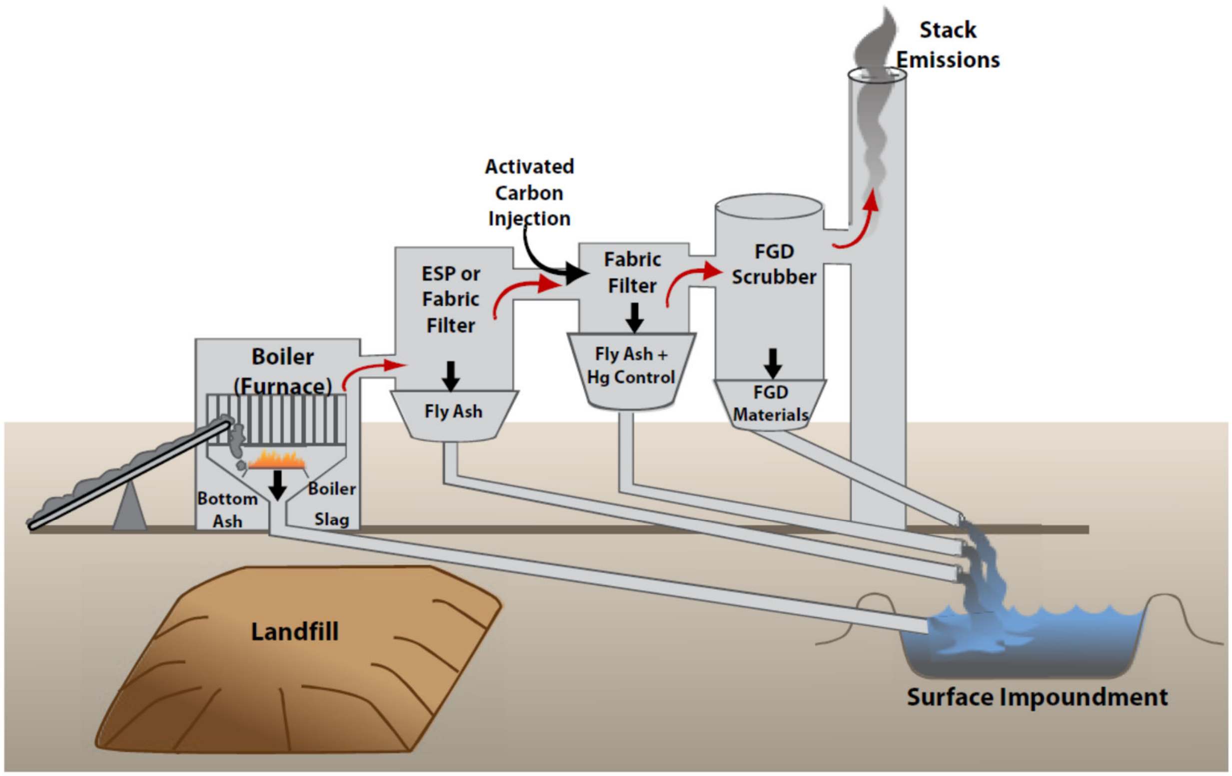

Figure 2-1. Generalized coal-fired power plant layout.

Since promulgation of the 2015 CCR Rule, the rates at which different CCR types are generated and the prevalence of various management practices may have shifted. However, the general descriptions provided here are still valid. For example, while there has been an increasing trend toward dry handling of CCR and landfill disposal, impoundments still operate across the country.

2.2 Conceptual Models

Once placed on the land, the chemical constituents present in CCR may leach or otherwise be released into the surrounding environment. To evaluate the potential for risk associated with such releases in the absence of regulatory action, EPA developed conceptual models with the intent to broadly depict the relevant characteristics of different management practices considered in the proposed rule. Thus, these definitions and conceptual models do not reflect any specific facility or unit. Nor are they intended to mirror distinctions made in the regulatory text. Instead, they form the basis for identification of complete exposure pathways and subsequent data collection efforts for use in this risk assessment.

2.2.1 Historical and Inactive Landfills

Historical landfills are defined for purposes of this document as landfills that ceased receipt of CCR prior to the effective date of the 2015 Rule and have installed some form of cover system over the remaining ash with the intent to close the unit. The steps taken toward closure may or may not be consistent with the requirements of 40 CFR § 257.102(d). Inactive landfills are defined for purposes of this document as landfills that ceased receipt of CCR prior to the effective date of the 2015 Rule and have taken no formal steps toward closure. These units may remain open to the air or have some limited soil cover for purposes such as dust control.

EPA believes the national-scale risks from historical and inactive landfills are best characterized using the same conceptual model as the 2014 Risk Assessment (U.S. EPA, 2014a). EPA modeled only one stage of the landfill lifecycle at the time because the groundwater model required a static unit configuration. The primary difference among landfill lifecycle stages is the presence of a cover system over the CCR following closure, which can reduce infiltration to some degree. Yet a cover constructed exclusively with natural soil is still expected to be relatively permeable and allow for infiltration. Given the prevalence of unlined units, EPA previously modeled all active landfills as closed under the assumption this stage of the landfill lifecycle contributes the most to long-term risk as a result of the longer time period that releases can occur. This conceptual model accurately identified potential risks from active landfills and is expected be equally applicable to historical and inactive landfills.

EPA previously established the following conceptual model for closed landfills. During closure, waste is left in place and a cover is installed with a permeability equivalent to that of the underlying liner or native soil. Landfills may contain one or more of the different CCR types, as well as other wastes such as coal refuse. For purposes of modeling, landfills are assumed to be constructed with a square footprint and located anywhere from entirely above grade to entirely below the ground surface. **Figure 2-2** depicts a conceptual model for one potential configuration of a closed landfill.

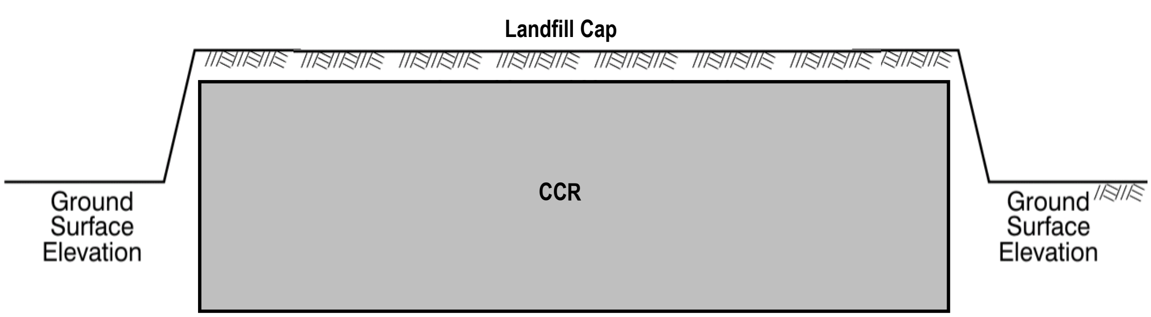

Figure 2-2. Cross-section view of closed landfill constructed above grade.

The 2014 Risk Assessment evaluated the potential risks to offsite receptors up to a mile away that result from disposal of CCR in landfills located at active facilities (U.S. EPA, 2014a). It considered multiple exposure pathways as part of a national-scale, probabilistic analysis, which included human ingestion of impacted groundwater and fish caught from impacted streams, as well as ecological exposure to impacted surface water and sediment. On a national scale, the evaluation found potential for risk to human health from impacted groundwater to occur within the range the EPA Office of Land and Emergency Management (OLEM) typically considers to warrant regulation.[5] In particular, unlined landfills that account for a majority of regulated units were found to result in cancer risks up to 2×10^{-5} for arsenic. Based on these results, groundwater exposure is considered the principal risk driver for regulated landfills. Given the similar design and siting of historical and inactive units, the same exposure pathway will be the focus of further analysis for these units. **Figure 2-3** depicts the different exposure pathways considered for impoundments.

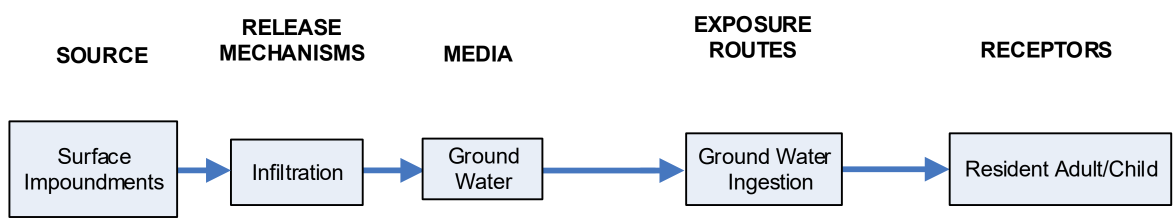

Figure 2-3. Surface impoundment conceptual exposure model.

2.2.2 Historical and Legacy Impoundments

Historical surface impoundments are defined for purposes of this document as impoundments that ceased receipt of CCR prior to the effective date of the 2015 Rule and have moved to drain the unit and install some form of cover system over the remaining ash with the intent to close the unit. The steps taken toward closure may or may not be consistent with the requirements of 40 CFR § 257.102(d). Legacy (i.e., inactive) impoundments are defined for purposes of this document as impoundments located at inactive electric utilities that ceased receipt of CCR prior to the effective date of the 2015 Rule, but still contain both CCR and free liquids. These liquids may take the form of wastewater ponded above the ash, excess porewater that can freely drain, or groundwater that saturates the ash. These units might be open to the air or have some form of soil accumulation on top of the ash for purposes such as dust control.

EPA believes the national-scale risks from historical and legacy impoundments are best characterized with the same conceptual model as the 2014 Risk Assessment (U.S. EPA, 2014a). EPA modeled only one stage of the impoundment lifecycle at that time because the groundwater model required a static unit configuration. The most significant difference among impoundment lifecycle stages is the presence of water ponded above the ash during unit operation. The hydraulic head from this water forces leachate into subsurface soils at a higher rate than would occur from gravity alone. EPA chose to model all surface impoundments during the active stage of their lifecycle under the assumption the sustained presence of this hydraulic head would result in the highest releases (U.S. EPA, 2014a). Although the current configuration of the historical and legacy

5) See, 80 FR 21449

impoundments may vary, both sets of units held ponded water during the active stage of their lifecycle. In the case of legacy impoundments, that ponded water may still be present. Regardless of whether the ponded water is still present, the impoundment would have gone through the same lifecycle which included a stage of ponded water. Thus, EPA believes the long-term risks from both historical and legacy impoundments are best characterized using the same conceptual model developed for active impoundments.

EPA previously established the following conceptual model for active surface impoundments. During operation, surface impoundment wastewater may be lost to a combination of infiltration to subsurface soils, evaporation to the atmosphere, and direct discharge to adjacent impoundments or nearby water bodies. CCR may accumulate until the surface impoundment's capacity is reached or the ash may be periodically dredged for disposition elsewhere. Impoundments may contain one or more of the different CCR types, as well as other wastes like coal refuse. To reflect that a majority of impoundments are dredged during operation, the conceptual model assumes that dredging losses are balanced out by continued loading from the facility, resulting in a constant ash thickness and water depth over the active life of the unit. For the purposes of modeling, surface impoundments are assumed to be constructed with a square footprint and located anywhere from entirely above grade to entirely below ground surface. **Figure 2-4** depicts a conceptual model for one potential configuration of an active impoundment.

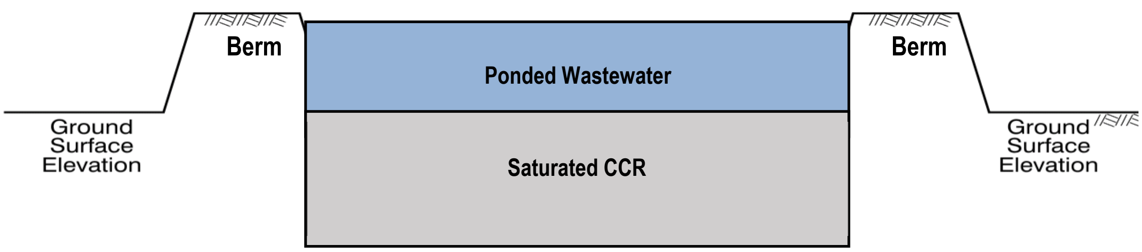

Figure 2-4. Cross-section view of active surface impoundment constructed above grade.

The 2014 Risk Assessment evaluated the potential risks to offsite receptors up to a mile away that result from disposal of CCR in surface impoundments located at active facilities (U.S. EPA, 2014a). It considered multiple exposure pathways as part of a national-scale, probabilistic analysis, which include human ingestion of impacted groundwater and fish caught from impacted streams, as well as ecological exposure to impacted surface water and sediment. On a national scale, the evaluation found potential for risk to human health from impacted groundwater to occur within the range that OLEM typically considers to warrant regulation.[6] In particular, unlined impoundments that account for a majority of regulated units were found to result in cancer risks up to 3×10^{-4} for arsenic and noncancer hazard quotients (HQs) up to 8, 3, 4, and 2 for arsenic, lithium, molybdenum, and thallium, respectively. Based on these results, groundwater exposure is considered the principal

6) See, 80 FR 21449

risk driver for regulated impoundments. Given the similar design and siting of legacy and historical units, the same exposure pathway will be the focus of further analysis for these units. **Figure 2-5** depicts the different exposure pathways considered for impoundments.

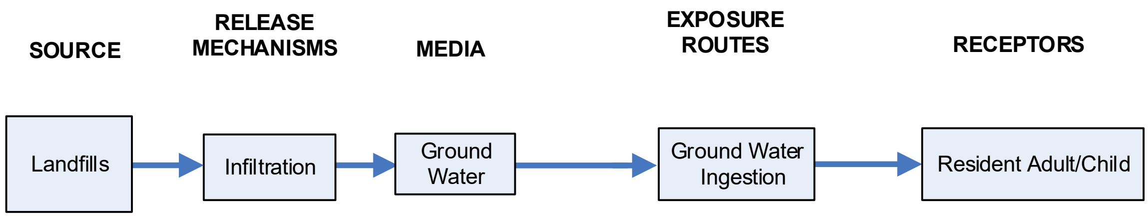

Figure 2-5. Landfill conceptual exposure model.

2.2.3 CCRMU Fills

The CCR Rule defines a CCRMU as any area of land on which non-containerized accumulations of CCR are received, placed, or otherwise managed, and is not otherwise regulated as a landfill or surface impoundment under the 2015 Rule. These units would include historical impoundments and landfills, inactive landfills, and other areas where CCR has been managed directly on the land. The intent of this broad definition is to capture management practices that fall outside the scope of the 2015 CCR Rule, but still have demonstrated potential to contaminate groundwater. As a result, CCRMU consist of a broad array of units unified by a single set of regulatory requirements.

As previously discussed, historical and inactive units have direct counterparts in the landfills and impoundments subject to the 2015 CCR Rule and so are best understood through the conceptual models for those regulated units. Therefore, a separate conceptual model was developed for the subset of CCRMU placed on the land outside of a new or existing landfill or impoundment and intended for a purpose other than disposal. It is anticipated the vast majority of such placement is associated with subsurface fills or similar uses. For clarity, this subset is hereafter referred to as "CCRMU fill(s)." This definition does not include placement in roadways, which are outside the scope of the rule, or piles and other placement on the land that have previously been established as forms of disposal. Nor does it include other diffuse placements, such as spreading for snow and ice control, for which there is little data available to characterize the manner or frequency of these placements across different sites.

CCRMU fill involves placement of dry CCR on or within the soil. In this way, the conceptual model for these fills also mirrors that of a landfill. During construction, a specified amount of CCR is placed in the fill. CCRMU fills are generally anticipated to be constructed with a fly ash, bottom ash, or boiler slag. FGD solids tend to be far more soluble than other CCR types and so are generally not anticipated to be suitable as fill. The timeframe for construction of a CCRMU fill is anticipated to be far shorter than for landfills and so is more likely to reflect ash from the single coal source. At the end of construction, waste is left in place and some form of cover is assumed to be initially placed over the ash. This cover may be native soil, concrete, or another material based on project specifications. However, in the absence of routine inspection and maintenance, it cannot be assumed that any engineered cover will remain intact. Thus, the conceptual model considers a fill that has been disturbed and original cover disrupted. For the purposes of modeling, CCRMU fills are assumed to be constructed with a square footprint and located anywhere from entirely above grade to entirely below the ground surface. **Figure 2-6** depicts the conceptual model for one potential configuration of a CCRMU fill.

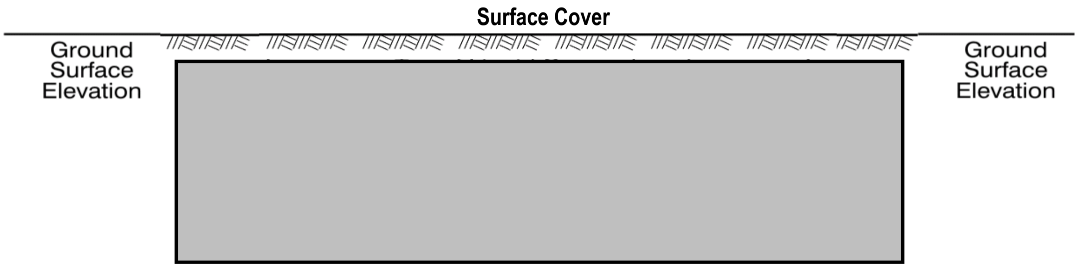

Figure 2-6. Cross-sectional view of generic CCRMU fill below grade.

CCRMU fills are located at the same facilities as historical and inactive disposal units. However, the exposure pathways for CCRMU fills can diverge from landfills and surface impoundments because facilities have not historically regarded such placements as a form of disposal. There is no indication facilities have reliably tracked or maintained these placements over time, as is required for disposal units. As a result, it is anticipated that, in the absence of further regulation, these fills will remain in place when ownership of the property changes.

EPA is concerned the potential risks from CCRMU fills have not been adequately characterized for all the stages of the fill lifecycle. The presence of engineering controls, such as an impervious structure constructed on top of the fill, might limit exposures while the facility is active. Yet, in the absence of land use restrictions, there is no guarantee these engineering controls will remain in place after the property transfers ownership. Disturbance of a fill may bring ash closer to the surface and create new pathways through which receptors may be exposed. For these reasons, EPA identified future land use as the point at which CCRMU fills are most likely to pose risk.

The Risk Assessment Guidance for Superfund and subsequent Agency policy directives instruct EPA to "assume future residential land use if it seems possible based on the evaluation of available information" (U.S. EPA, 1989; 2010). None of these facilities are expected to operate as electric utilities forever. Indeed, review of the U.S. Energy Information Administration (EIA) Form EIA-860 identified at least 85 utilities that burned coal and have closed since 2015 (U.S. EIA, 2022). EPA estimates that these facilities have an average of 1,000 to 40,000 individuals living within a one- to five-mile radius. 90th percentile population counts are closer to 2,300 to 94,000 individuals living within a one- to five-mile radius.[7] Many of these facilities are also located along water bodies. While neither factor guarantees future residential use, both serve to make the land more attractive to such development opportunities. Indeed, EPA is aware of 22 examples in which former electric utilities have been proposed for residential development, 19 of which are known to have burned coal.[8] Therefore, EPA finds that consideration of future residential land use is relevant and appropriate when identifying potential exposure pathways.

Some state or local regulations may place restrictions on future land uses. However, the existence, scope, and enforcement of such restrictions can be inconsistent across the country. This is further complicated by the fact that waste disposal is not the primary activity at these facilities and there can be considerable tracts of land beyond permitted disposal units that could be considered for redevelopment if the presence of CCR is not known. As such, this baseline risk assessment aims to provide "…an analysis of potential adverse health effects (current or future) caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (i.e., under an assumption of no action)" (U.S. EPA, 1989). This approach provides a consistent frame of reference for EPA to understand the risk potential of such placements and to ensure any standards established under RCRA provide protection on a national basis.

EPA identified three potentially complete exposure pathways for future receptors that warrant further investigation. These pathways are not intended to represent a comprehensive list of all possible pathways. Instead, the focus is on those anticipated to result in the greatest risks and so to be the primary basis for regulatory action. First, chemical constituents present in CCRMU fill can be released by dissolution into precipitation and other water that comes in contact with the CCR. Dissolved constituents can infiltrate down to the underlying water table and migrate through the aquifer to downgradient wells where residents are exposed through ingestion of drinking water. Even in cases where groundwater is not anticipated to be the main source of drinking water, this type of exposure represents the maximum beneficial use of groundwater resources that the Agency seeks to protect wherever practicable. Second, radioisotopes present in CCRMU fill can decay and release radiation in the form of either gamma rays or radon gas. Gamma rays can pass through soil and other materials to reach the ground surface where residents are exposed directly to ionizing radiation. Radon gas may migrate through the soil and accumulate in nearby buildings, where residents are exposed through inhalation of indoor air. Finally, CCR may become intermingled with surface soils, where residents and wildlife are exposed through incidental ingestion of soil and dust present outdoors and tracked into the home. **Figure 2-7** depicts the different exposure pathways considered for CCRMU fills.

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7) Data for total population collected according to the similar procedures as outlined in Appendix B of the 2014 Risk Assessment.

8) See: Memorandum to the Docket: Compilation of News Articles on Future Land Uses for Electric Utilities

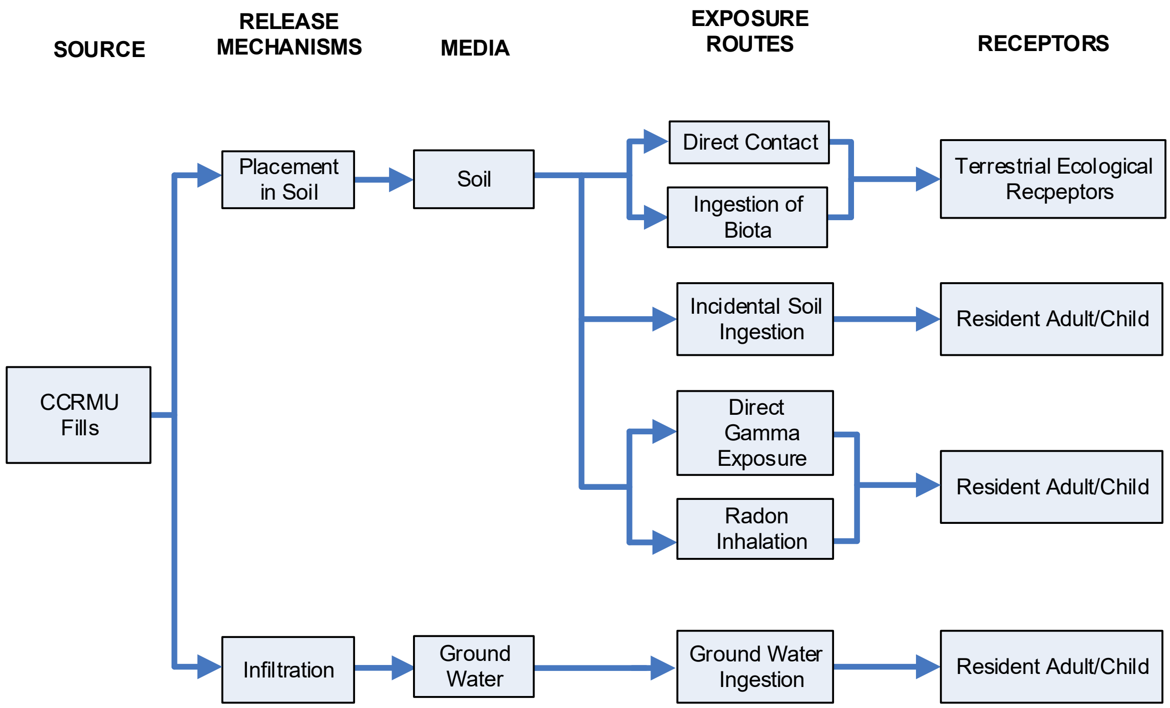


Figure 2-7. CCRMU fill conceptual exposure model.

2.3 Data Sources

The current assessment builds on the 2014 Risk Assessment and incorporates many of the same data sources previously applied to characterize facility environmental setting, waste composition and release potential, fate and transport through groundwater, and contaminant toxicity (U.S. EPA, 2014a). Many of these data sources and the associated approach to selecting these data for individual groundwater model runs are unchanged from the 2014 Risk Assessment and were previously discussed in detail as part of that previous assessment. These data sources were made available for public comment and external peer review and were found to represent the best available data. Therefore, EPA focuses subsequent discussion in this document on updated data sources that are relied upon in the current assessment. The following text details the major data sources relied upon in the current assessment that differ from or expand upon previous modeling.

2.3.1 Facility Data

The 2014 Risk Assessment relied on two EPA surveys conducted in 2009 and 2010 to identify the location of facilities with onsite disposal units ("EPA Surveys"). These surveys include data on 952 surface impoundments and 431 landfills located across 383 facilities. EPA ultimately determined that 218 of the surface impoundments and 122 of the landfills fell outside the scope of the final CCR Rule for one of the following reasons and so were not incorporated in the final risk model:

- The facility was no longer a coal-fired electric utility according to the 2012 EIA database;

- The landfill or surface impoundment was found to be inactive or retired; or
- The impoundment was not designed to accumulate CCR (e.g., cooling water ponds).

Since 2014, EPA has identified 3 additional facilities subject to the 2015 Rule that were not modeled in the 2014 Risk Assessment. These facilities were identified as a result of rule reporting requirements. Therefore, these regulated facilities were considered as part of current assessment. A list of all regulated facilities included in the model is provided in **Appendix A**.

In 2020, EPA published an Advance Notice of Proposed Rulemaking requesting information on legacy impoundments. Review of the comments received resulted in initial identification of 156 such impoundments not regulated under the 2015 CCR Rule. EPA conducted desktop research to supplement its understanding of each such unit and excluded impoundments found to not contain liquids after 2015 and those closed by removal between 2015 and 2022. The resulting universe relied upon in the Proposed Rule represented 127 legacy impoundments. In 2023, EPA received additional comments on the universe of facilities through both the Proposed Rule and subsequent Notice of Data Availability. These comments provided information on both newly identified units and previously identified units that no that no longer existed or otherwise did not meet the definition of a legacy impoundment. Following supplemental site research and verification, EPA identified a final list of 195 legacy impoundments and 204 CCRMU not regulated under the 2015 CCR Rule.[9] The current assessment used the information made available for these units to identify corresponding facility locations and associated environmental conditions. A list of 92 additional active and inactive facilities identified for this risk assessment is provided in **Appendix A**.

2.3.2 Meteorological Data

The 2014 Risk Assessment relied on the Hydrologic Evaluation of Landfill Performance (HELP) Model Version 3.0 to characterize meteorological conditions in the vicinity of modeled landfills and impoundments (U.S. EPA, 1994). HELP v3.0 provides data on precipitation, temperature, and solar radiation from a 30-year period between 1961 and 1990 at up to 183 meteorological stations at cities across the United States. Each disposal unit was assigned to the closest meteorological station to identify relevant data for environmental modeling.

Since the 2015 Rule was finalized, EPA released HELP Version 4.0 (U.S. EPA, 2020). This model update incorporates a meteorological dataset developed by the EPA Office of Pesticide Programs (OPP) with National Oceanic and Atmospheric Administration (NOAA) data. The OPP dataset is a grid of over 13,000 points distributed evenly across the country on a 0.25 × 0.25 degree grid (latitude/longitude) across the conterminous United States. Meteorological data are available for a 30-year period between 1985 and 2014 at each point on this grid. The current version of the HELP

9) Of the 204 CCRMU identified, a total of 9 were located at facilities that actively produced power as of 10/19/25, but had ceased on-site disposal of CCR before that date.

model is available for download on the EPA website.[10] Further information on how the OPP dataset was developed is described in Frye et al. (2016).

HELP v4.0 provides more recent data at a finer spatial resolution. Thus, the current risk assessment relied on the updated model to assign meteorological data to individual facilities. Once assigned, meteorological data drawn from HELP was applied to modeling of groundwater fate and transport in the same way as in the 2014 Risk Assessment. A list of the grid location assigned to each facility is provided in **Appendix A**.

2.3.3 Bulk Concentration Data

The 2014 Risk Assessment relied on a constituent dataset consisting of all the bulk concentration data for CCR that EPA had identified since 1998. These data were drawn from various public comments, state submissions, Agency studies, and peer-reviewed journal articles. Because these sources all had different goals in collecting the data, the amount of data available for each CCR type and chemical constituent varies. In particular, there is limited data for radionuclides present in CCR. Therefore, EPA has continued to review other data sources in order to expand upon the existing dataset.

EPA identified the U.S. Geological Survey (USGS) coal quality (COALQUAL) database as a new source of data that could be used to characterize radionuclide in the resulting CCR. COALQUAL contains information on nearly 7,500 samples of coal and associated rocks collected between 1973 and 1989. It was initially published in 1994 as part of the U.S. geoCHEMical (USCHEM) database. The current Version 3.0 was released as a standalone database in 2015 (USGS, 2015). COALQUAL contains data on up to 136 parameters for each sample, which include coal source, elemental composition, and ash yield. EPA used this information to estimate the bulk activity of different radionuclides in coal ash remaining after combustion. The full COALQUAL database is provided in **Appendix B**.

COALQUAL is believed to provide a valuable source of data for several reasons. First, the database includes a large number of geographically diverse samples collected from across 36 states. From these data, EPA incorporated as many as 6,100 samples across 25 states in the current analysis. This provides information on the variability of coal quality from across the country. Second, the samples represent a composite of entire coal beds weighted by the thickness of each discrete interval of minable coal (or "bench"). This is believed to provide information on the broader composition of coal that may be mined over time. Finally, USGS has undertaken extensive data verification and validation efforts to ensure consistency and reliability of the database.

10) Available online at: https://www.epa.gov/land-research/hydrologic-evaluation-landfill-performance-help-model

2.3.4 Leachate Concentration Data

The 2014 Risk Assessment relied on a constituent dataset consisting of all the CCR leachate data EPA had identified since 1998. These data were drawn from state submissions, public comments, Agency studies, and peer-reviewed journal articles. These data include porewater samples and leaching test data collected with SW-846 Methods, including extraction procedure toxicity test (Method 1310), toxicity characteristic leaching procedure (Method 1311), synthetic precipitation leaching procedure (Method 1312), and the leaching evaluation assessment framework (LEAF) methods (Methods 1313-1316). Following a review of the available data, EPA determined it was most appropriate to use porewater data to model leakage from surface impoundments and LEAF data to model leakage from landfills in the 2014 Risk Assessment.

EPA has since identified LEACHXS Lite as a source of new leachate data. LEACHXS Lite is a free data management and visualization tool that was developed by Vanderbilt University and others in partnership with EPA.[11] The LEACHXS Lite database contains all the LEAF data relied upon in the 2014 Risk Assessment, as well as LEAF data from other sources and for other materials. Review of the database identified one additional sample of fly ash leachate (Sample FA39), so EPA incorporated this sample into the larger constituent dataset. The additional leachate data is provided in **Appendix B**.

11) Available online at: https://www.vanderbilt.edu/leaching/leach-xs-lite/

3 Disposal Unit Groundwater Risk

As previously discussed, all landfills and surface impoundments progress through similar lifecycle stages during and after operation. The fact that some historical and inactive units may no longer contain ponded wastewater or may have installed a soil cover places these units in a different stage of their lifecycles. However, as noted during development of conceptual models, that alone does not necessarily differentiate the long-term risks from those of previously modeled active units. The potential for risk, and thus the need for groundwater monitoring and other requirements, must be considered over the full lifecycle of the unit. The risks associated with legacy impoundments and CCRMU disposal units can be understood in relation to those previously modeled in the 2014 Risk Assessment. EPA reviewed these previous model results and other available data about these historical and inactive units to understand any differences between these units that might affect modeled risks. The purpose of this section is to summarize the results of this review.

3.1 Previously Excluded Units

The 2014 Risk Assessment relied on data from the EPA Surveys. These surveys include data on 431 landfills and 952 impoundments located across 383 facilities. Of these units, EPA ultimately determined that 122 landfills and 218 surface impoundments fell outside the scope of the 2015 CCR Rule for one of the following reasons, and so even though EPA modeled the risks associated with these units, the results were not incorporated in the final risk results:

- The facility was no longer a coal-fired electric utility according to the 2012 EIA database;
- The landfill or surface impoundment was found to be inactive or retired; or
- The impoundment was not designed to accumulate CCR (e.g., cooling water ponds).

After removing impoundments not designed to contain CCR, there remained 122 landfills and 163 surface impoundments that represent either historical or inactive disposal units. As noted, EPA previously modeled the risks associated with these units prior to excluding them from the final risk results. Therefore, these model results provide the most direct comparison of risks between regulated and previously excluded units. EPA reviewed these results to understand how the risks associated these specific units compare with the active units previously reported in the 2014 Risk Assessment.

Table 3-1 presents the 90th percentile risks modeled for offsite human receptors who are exposed to groundwater. This value was selected in line with Agency policy to represent highly exposed individuals, defined as those with risks somewhere between the 90th and 99.9th percentile of the exposed population (U.S. EPA, 2004a). EPA selected the lower end of this range for use in the 2014 Risk Assessment because it provides the greatest confidence in the occurrence of any identified risks. Both cancer and noncancer risks are presented for the most sensitive age cohort modeled.

For drinking water ingestion, highest cancer risks were for adults (Ages > 21 years), while highest noncancer risks were for infants (Age < 1 year). Differences in most sensitive cohort are a result of the longer duration that adults are exposed that drives cancer risk and greater water consumption per pound of body weight for children that drives non-cancer risk (U.S. EPA, 2011). However, differences between the modeled adult and most sensitive child receptor are typically less than a factor of two. All values are rounded to the nearest whole number. Values that exceed the selected risk criteria (i.e., cancer risk > 1×10^{-5} or HQ > 1) are shown in **bold**. In instances where a value was found above the associated benchmark prior to rounding (e.g., HQ = 1.4), it was retained as an exceedance.

Table 3-1. 90th Percentile Nationwide Risks for Human Health from Excluded Units

Constituent	Surface Impoundments	Landfills
Carcinogenic Effects		
Arsenic III	**8×10^{-5}**	7×10^{-6}
Arsenic V	4×10^{-6}	3×10^{-7}
Noncarcinogenic Effects		
Arsenic III	**2**	0.2
Arsenic V	0.1	< 0.01
Molybdenum	**1**	< 0.01
Lithium	**2**	--*
Thallium	0.5	0.2

* Method 1313 data were not available to model this constituent for landfills.

For impoundments, the 90th percentile risks associated with ingestion of ground water are above cancer criteria for arsenic III (risk = 8×10^{-5}) and noncancer criteria for arsenic III (HQ = 2), lithium (HQ = 2), and molybdenum (HQ = 1). For landfills, the 90th percentile risks are below the cancer criteria for arsenic III, but still within OLEM risk range (risk = 7×10^{-6}). The risks associated with this set of excluded units vary somewhat from those previously reported, with slightly higher risks for landfills and slightly lower risks for impoundments. Yet there is general agreement on the overall magnitude of risk.

Of units reported in the 2014 Risk Assessment, approximately 42% of landfills and 65% of surface impoundments were modeled as having no engineered liner system based on facility self-reporting. For these unlined regulated impoundments, the 90th percentile risks are above cancer criteria for arsenic III (risk = 3×10^{-4}) and noncancer criteria for arsenic III (HQ = 8), lithium (HQ = 3), molybdenum (HQ = 4), and thallium (HQ = 2). For unlined regulated landfills, the 90th percentile risks are above cancer criteria for arsenic III (risk = 2×10^{-5}). Of the previously excluded units summarized above, approximately 71% of landfills and 57% of surface impoundments were modeled as having had no engineered liner system. For these unlined excluded impoundments, the 90th percentile risks are above cancer criteria for arsenic III (risk = 2×10^{-4}) and noncancer criteria for arsenic III (HQ = 5), lithium (HQ = 3), molybdenum (HQ = 2), and thallium (HQ = 1). For unlined excluded landfills, the 90th percentile risks are just above cancer criteria for arsenic III (risk = 1×10^{-5}). Thus, EPA finds that a primary difference between the national risks modeled for regulated and excluded units is the prevalence of liners. Since finalization of 2015 CCR Rule, facility reporting has revealed a greater percentage of regulated units are unlined than previously modeled. EPA is not aware of any evidence that even older units have been lined at higher rates, particularly those constructed prior to the promulgation of minimum standards for disposal in RCRA subtitle D landfills in 1991. Thus, EPA concludes that the national risks for regulated and previously excluded units both fall closer to those modeled for unlined units.

3.2 Facility Locations

Facility location is a useful proxy for the environmental conditions to which a unit may be exposed. Nearby facilities are likely to be subject to a similar range of weather and hydrogeologic conditions. Therefore, EPA reviewed the locations of facilities that were modeled in 2014 and that have since been identified to understand any differences in the geographic distribution of these facilities. **Figure 3-1** provides a map of the locations of different facility identified as having onsite disposal. The 2014 Risk Assessment modeled disposal units at 383 facilities across the conterminous United States, as well as two additional facilities in Alaska and Puerto Rico not depicted here.

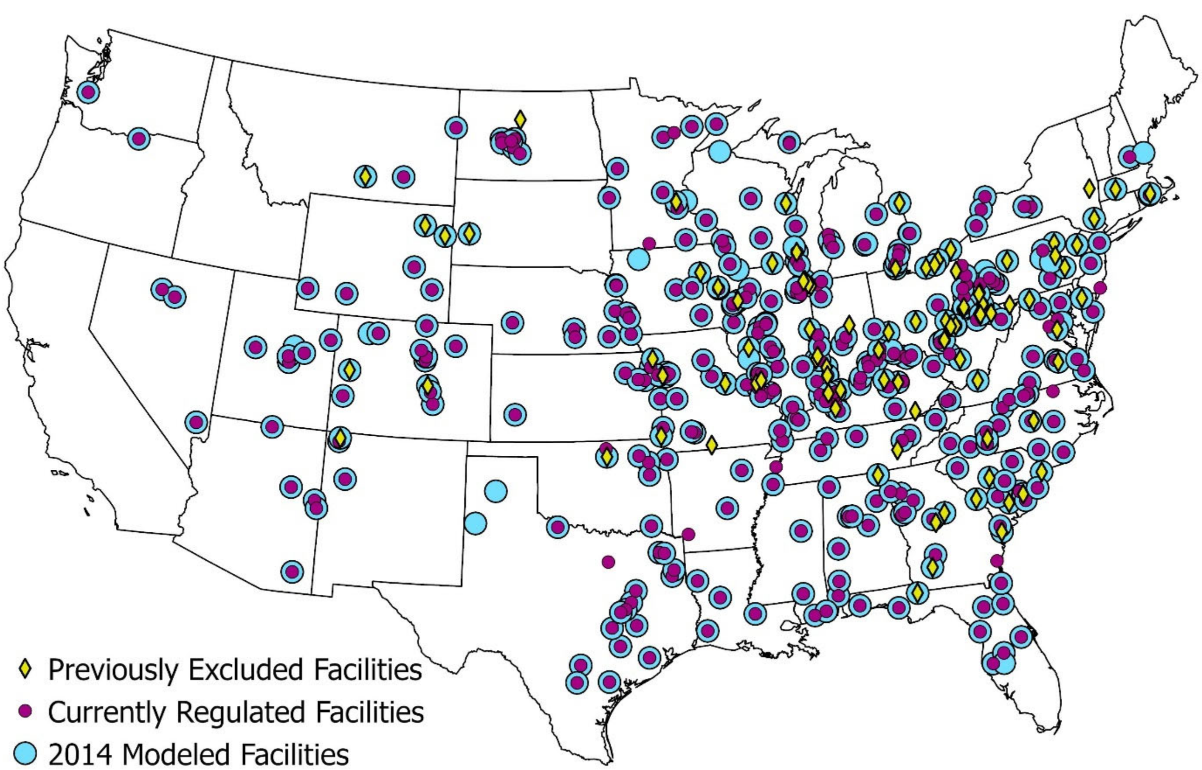


Figure 3-1. Identified facilities within the conterminous United States.

Of the 92 active and inactive facilities that were excluded from the original 2015 CCR Rule, a total of 76 had at least one unit that was previously modeled as part of the 2014 Risk Assessment. Thus, a vast majority of these facilities are already included in the model results summarized earlier in this section. The weather and hydrogeologic conditions modeled at these facilities are expected to be applicable to any onsite units that were not previously modeled. In some cases, these units will be located nearby or directly adjacent to those that were modeled. Additionally, EPA drew environmental data from over a mile around each modeled unit to best capture the prevalence of different conditions that could affect subsurface fate and transport at a site. As a result, it is unlikely that consideration of unit locations somewhere else on the same facility property would identify a dramatically different set of environmental conditions that would substantially alter probabilistic model results. The remaining 16 facilities that were excluded from the original 2015 CCR Rule are located an average distance of 26 miles from one or more facilities that were previously modeled. Thus, there is no indication the environmental conditions at these few facilities are not adequately captured by modeling of the surrounding facilities.

3.3 Unit Size

Public commenters have raised the potential for historical and inactive disposal units to be smaller in size than currently regulated units. These commenters contend that a smaller unit size would generate a lower volume of leakage and would not sustain plumes of the same magnitude as larger regulated units. EPA first reviewed available data from the EPA Surveys to understand the extent to which unit size may differ. **Figure 3-2** provides a comparison of the unit area modeled for both currently regulated and previously excluded units landfills (LFs) and surface impoundments (SIs).

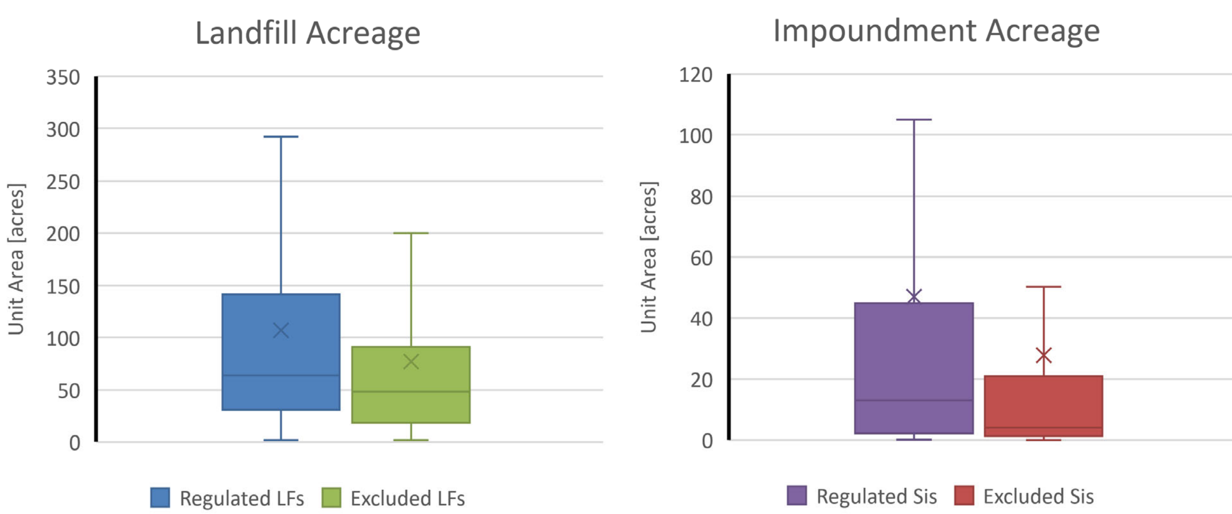


Figure 3-2. Comparison of regulated and excluded unit sizes.

This comparison indicates previously excluded units tend to be somewhat smaller than currently regulated units. The size of regulated units is a factor of anywhere between 1.3 to 3 times larger across the range of calculated summary statistics. The median size of regulated units is 64 acres for landfills and 13 acres for impoundments. The median size of excluded units is 48 acres for landfills and 4 acres for impoundments. Despite these differences, there remains a great deal of overlap in the range of sizes modeled for both sets of units. Thus, there is no indication that previous modeling did not capture the existence or prevalence of smaller disposal units.

As described above, similar risks were identified for all regulated and previously excluded units. Thus, there is no indication that differences in the size of these units had an appreciable effect on national risks. EPA is not aware of evidence that any remaining units not captured in the EPA Surveys are substantially or consistently smaller than those modeled or that any differences in size that may exist are substantial enough to shift nationwide risk estimates. Therefore, EPA concludes that, based on available data, the 2014 Risk Assessment adequately captures the effects of unit size on risk.

Finally, EPA notes that individual unit size is not necessarily a reliable metric to draw conclusions about the overall risk from CCR disposal at electric utilities. The 2014 Risk Assessment modeled the risks from each landfill and impoundment separately because it was difficult to confirm the relative locations and orientations of different units with data from the EPA Surveys. However, the Agency is aware of many cases in which multiple units, both landfills and impoundments, are located immediately adjacent to one another. As such, even the smallest units can meaningfully contribute to broader groundwater contamination, both onsite and offsite. It is likely that the 2014 Risk Assessment underestimated site risk to some degree by not evaluating leakage over the full contributing area of these adjacent disposal units.

3.4 Conclusions

EPA previously modeled a number of historical and inactive disposal units. These model results were ultimately excluded from the 2014 Risk Assessment because these specific units were judged to not be subject to the 2015 CCR Rule. These model results provide direct, quantitative evidence of the relative risk between the currently regulated and previously excluded disposal units. This comparison found no evidence the risks from regulated units are meaningfully different from those of legacy impoundments or CCRMU disposal units. EPA further reviewed available information about the location and size of these excluded units to determine whether there exists any potential for conditions beyond those modeled to result in a substantially different risk profile. This review found that previous modeling efforts already capture a majority of the newly identified active and inactive facility locations, as well as potential unit sizes. There is no indication the risks associated with any remaining, unmodeled units are not already reflected in the previous national model.

Thus, EPA concludes the results of the 2014 Risk Assessment are equally applicable to legacy impoundments and CCRMU disposal units.

The 2014 Risk Assessment modeled contaminant transport based on a national distribution of the closest residences anticipated to rely on groundwater as a source of drinking water up to a mile away from CCR units. These locations were defined using a combination of Census reports, satellite imagery, and other geographic data. This modeling approach assumed that, while the proximity of receptors around each unit may shift over time, the overall distribution of receptors across the country would remain the same. The risks identified based on these receptors provided a sufficient basis for national regulations. However, the fact the Agency did not need to consider risks to closer receptors to justify the rule does not mean these risks do not exist or warrant action. A broad goal of RCRA regulations is to protect groundwater. Thus, placements of CCR that does not allow for unrestricted future land use may warrant regulation now to ensure such placements are tracked and properly managed, so the site does not later become a Superfund site after responsible parties have dissolved. For these reasons, EPA conducted separate modeling of smaller CCRMU fills to understand the potential risks associated with these placements. The design and results of this modeling is documented in **Section 4 (CCRMU Fill Groundwater Risk)**.

4 CCRMU Fill Groundwater Risk

EPA conducted further modeling of the exposures that may result if contaminated groundwater is used as a source of drinking water by future residents. The goal of this modeling is to characterize the risks associated with smaller quantities of CCR and understand whether a lower limit exists below which even smaller placement pose no concerns. The section of the document describes the overarching framework for this modeling effort, as well as the specific models and inputs used to predict the fate and transport of constituents through subsurface soils and ground water.

4.1 Modeling Framework

The placement scenario considered for the current evaluation is CCRMU fills located onsite at both active and inactive facilities subject to this regulatory action. In the absence of any requirements to identify and track these smaller placements, it is assumed that the site will be redeveloped in the future for residential use. As part of redevelopment, it is assumed any current engineering controls have been disturbed (e.g., clay cap breached, overlying building demolished). It is assumed there will be some type of soil or other cover placed over the CCR so that it is not exposed to the open air. This is because CCR is not expected to support a robust vegetative cover and because exposed ash may require active measures for dust control. EPA used a combination of two models to characterize the potential impacts to groundwater quality and resulting risks to these residential receptors.

The first model is the EPA Composite Model for Leachate Migration with Transformation Products v2.22 (hereafter "EPACMTP") (U.S. EPA, 1996a, 1997a, 2003a,b,c). EPACMTP consists of two coupled modules: a one-dimensional module that simulates infiltration and dissolved constituent transport through unsaturated soils in the vadose zone and a three-dimensional module that simulates transport through groundwater. As described by the 2014 Risk Assessment, EPACMTP has undergone multiple rounds of internal and external review, including several by the EPA Science Advisory Board (Kool et al., 1994; U.S. EPA, 1996b, 1999a, 2004b). EPA used this model to calculate groundwater concentrations that result from waste disposal at specified locations and times. The outputs from EPACMTP were used to inform the second model.

The other model is Modular Three-Dimensional Finite-Difference Ground-Water Flow Model - Unstructured Grid Transport (hereafter "MODFLOW-USGT") Version 1.10 (USGS, 2013a; Panday, 2022). MODFLOW-USGT is a three-dimensional model capable of simulating groundwater flow and contaminant transport. This model allows for more direct consideration of transport in three dimensions by dividing the aquifer into a grid and assigning different values to each cell in that grid. This version of MODFLOW-USGT was chosen because it is a publicly available model; allows consideration of transport through unsaturated soils, which provides a more direct comparison for

EPACMTP; and has undergone extensive review and validation (e.g., U.S. EPA, 1997b, 2009a, 2015; Panday, 2022).

4.2 EPACMTP Setup

Model inputs for EPAMCTP were drawn from a range of site-based, regional, and national datasets based on a combination of government sources and peer-reviewed journal articles. Many of these sources are the same as previously used in the 2014 Risk Assessment (U.S. EPA, 2014a). These data sources were made available for public comment and external peer review and were found to represent the best available data. Therefore, subsequent discussion focuses on where the Agency incorporates new data sources or applies the same data sources in different ways. For example, when site-based data were not available for individual CCRMU fills, EPA drew data from more regional datasets.

4.2.1 CCRMU Fill Size

EPA has identified little available information on the total size of CCRMU fills present onsite at facilities. EPA believe it is unlikely that a consistent or reliable set of records could be identified for the purposes of characterizing CCRMU fill size. The available record indicates the location of such fills has not been closely tracked by facilities and the short timeframe for construction makes it unlikely these units would all be readily identified through aerial photography or similar means. Instead, EPA identified 74,800 tons as an upper limit of for the current assessment. This amount represents the smallest landfill size identified based on the EPA Surveys (Kastner, 2015). Despite potential for larger fills, a 74,800 ton upper bound is believed to provide a clear distinction between previously modelled landfills and CCRMU fills, and thus allow for a better understanding of potential risks associated with smaller placements of CCR not reflected in the 2014 Risk Assessment. Therefore, EPA modeled CCRMU fills based on a flat distribution ranging anywhere from 1 to 74,800 tons.

4.2.2 CCRMU Fill Dimensions

EPA has identified little available information on the relative dimensions of CCRMU fills present onsite at facilities. For purposes of modeling, EPA calculated possible dimensions of CCRMU fills by conceptualizing the fill as a conical pile. EPA then calculated the area of the most efficient piles possible based on the modeled tonnage and waste-specific range of values for density and angle of repose (i.e., friction angle of the ash) identified in the literature for fly and bottom ashes. Densities were sampled from across a range 910 kg/m^3 (Pandian, 2004) to 1,750 kg/m^3 (Kim et al., 2005). Angle of repose was sampled from across a range of 21 to 51 degrees (Muhanthan et al., 2004). EPA assumed the CCR is spread equally over the pile area to achieve a uniform thickness to establish a maximum thickness. EPA constrained the minimum thickness for all model runs to be one foot, intended to represent limited placement for grading or to promote drainage. The thickness for a model run was allowed to vary anywhere between these established minimum and maximum values for that configuration. The area of the fill was then calculated based on the selected tonnage and thickness

4.2.3 Depth Below Grade

It is assumed CCRMU fills can be constructed anywhere from entirely below the ground surface (e.g., structural fill) to entirely above grade (e.g., embankment). However, even if the entire unit is constructed above grade, it is assumed for purposes of modeling that the fill will have a minimum of two feet of soil cover. It is also assumed the top of a fill will not begin more than 10 ft below the ground surface because of the compounding cost of thicker covers. The exact thickness of the soil above the CCR is not a sensitive parameter in the model and will not affect long-term infiltration. Instead, the selected maximum is intended to prevent the fills from being modeled at unrealistic depths and potentially intersecting with a deeper water table (e.g., a 10 ft thick fill located 100 ft below ground surface).

CCRMU Fills were not allowed to be placed in direct contact with the groundwater table in the modelling. This is due in part to the constraints inherent in EPACMTP resulting from assumptions made to allow efficient derivation of flow and transport equations. First, the model assumes that flow in the unsaturated zone is one-dimensional and directed down toward the water table. Second, the model assumes that flow in the unsaturated zone is driven only by leakage from a contaminant source and can be represented by a constant rate. Contact between the fill and water table may violate these assumptions as one-dimensional and steady vertical flow cannot be guaranteed, particularly in cases of groundwater mounding. Furthermore, contact between the waste and water may shift redox conditions in ways that alter leaching behavior, which cannot be accounted for with available leaching test methods. Therefore, if the random sampling of model inputs resulted in a scenario where the fill was in contact with groundwater, the inputs were discarded and resampled.

4.2.4 Leachate Concentration

Leachate pH is a primary factor used to define relevant leachate concentrations. The 2014 Risk Assessment relied on a pH distribution generated from 580 samples collected from 42 landfills to approximate overall waste properties within landfills (U.S. EPA, 2014a). However, landfill disposal can include disposal of CCR types not relevant to CCRMU fills (e.g., FGD wastes) and mixing with non-CCR wastes (e.g., coal refuse). Therefore, for the current assessment, EPA instead relied on available LEAF Method 1313 leachate data to identify the range of natural pH for fly ash (i.e., the final pH when the ash is exposed only to water) (U.S. EPA, 2009b). EPA then applied an error bar of 0.5 pH units to either end of the reported natural pH to better capture potential variability and ensure a more continuous distribution. **Figure 4-1** depicts the resulting distribution of leachate pH, expressed both as a cumulative frequency and as a number of samples captured in discrete pH bins.

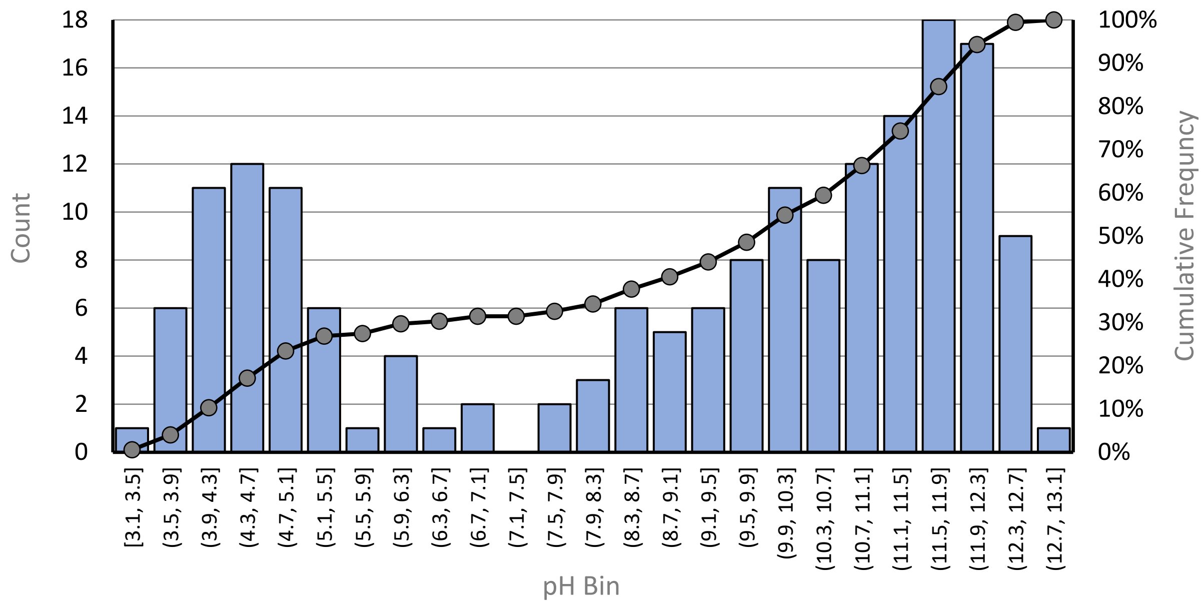


Figure 4-1. Modeled Leachate pH Distribution.

The current assessment relies on available data for fly ash measured with LEAF Method 1313 to characterize leachate concentrations from CCRMU fills. Data on mixed CCR were not used because of the potential inclusion of FGD scrubber sludge that is not considered relevant for this type of placement because of its high solubility. Method 1313 does not provide data at the exact same pH for every sample. Therefore, EPA first interpolated between measured leachate concentrations to obtain values at consistent 0.25 pH increments. EPA then sorted the interpolated values into bins of 0.5 pH increments shown in the **Figure 4-1**. Thus, each of these bins had two values for each ash sample. To identify the relevant leachate concentration for each model run, the pH distribution was probabilistically sampled and the associated pH bin was selected. Next, a sample ID from the bin was randomly selected. This ensured the model was not biased toward individual samples that had been analyzed under different conditions (i.e., ACI turned on and off). Finally, one of the leachate concentrations associated with the sample ID in that bin was randomly selected for use in the model.

4.2.5 Environmental Setting

As previously discussed, there is little information available on the exact locations of CCRMU fills onsite at facilities. These fills are placed for reasons other than disposal and so are not necessarily subject to the same siting considerations as landfills and impoundments (e.g., proximity to point of generation or surface water). As such, EPA assumed CCRMU fills could be located anywhere in the facility boundary. EPA generally drew a 1.2-mile (2.0-kilometer) radius around the centroid of each facility. In the rare case that the identified location of disposal units associated with a given facility were more than five miles apart and located in different hydrogeologic environments, EPA drew environmental data from around each unit to better reflect this variability. Environmental data was extracted from within that area for use in EPACMTP as previously described in Appendix B of the 2014 Risk Assessment.

In the absence of periodic inspections and a well-maintained cap, it cannot be guaranteed that the any ash placed in the ground will remain undisturbed as a result of human or animal activity, natural settling or freeze-thaw cycles, flooding and other extreme weather-related events, or other unforeseen factors. Given the properties of the ash can be subject to change, it was not possible to develop a distribution of conductivities. Instead, EPA modeled conductivity based on the dominant megatexture of surrounding soils as described in Appendix B of the 2014 Risk Assessment. As such, the model assumes the ash has been subjected to a similar degree of compaction as the surrounding soils.

4.2.6 EPACMTP Sampling Location

EPACMTP requires users to specify a fixed point some distance downgradient of the contaminant source where the model will calculate resulting groundwater concentrations. This point may be conceptualized as a well location where water is drawn from the ground. The current assessment considers two types of wells. The first type is a downgradient compliance well similar to those required at landfills by the 2015 CCR Rule. This well is located at a fixed location as close to the waste boundary as feasible. In this case, a distance of 3 ft (1m) from the centerline of the waste boundary was chosen because a plume will be thinnest directly adjacent to the fill. Therefore, the well was placed a short distance away from the waste boundary to provide a chance for the plume to mix somewhat with groundwater and ensure the model did not miss evidence of contamination by inadvertently oversampling beneath the region of groundwater contamination. The second type is a monitoring well similar to those used to delineate contaminant plumes as part of corrective action. These wells were placed at a fixed locations of 500 and 1,000 ft away from the centerline of the waste boundary. **Figure 4-2** shows a schematic of the well locations relative to a CCRMU fill. Because these fills may be located anywhere at a facility and because the intent of this modeling is to understand the full potential for contamination to spread, the current assessment did not separately consider the effects of interception of groundwater by surface water. Instead, this pathway is further discussed in **Section 6 (Uncertainty and Sensitivity Analyses)**.

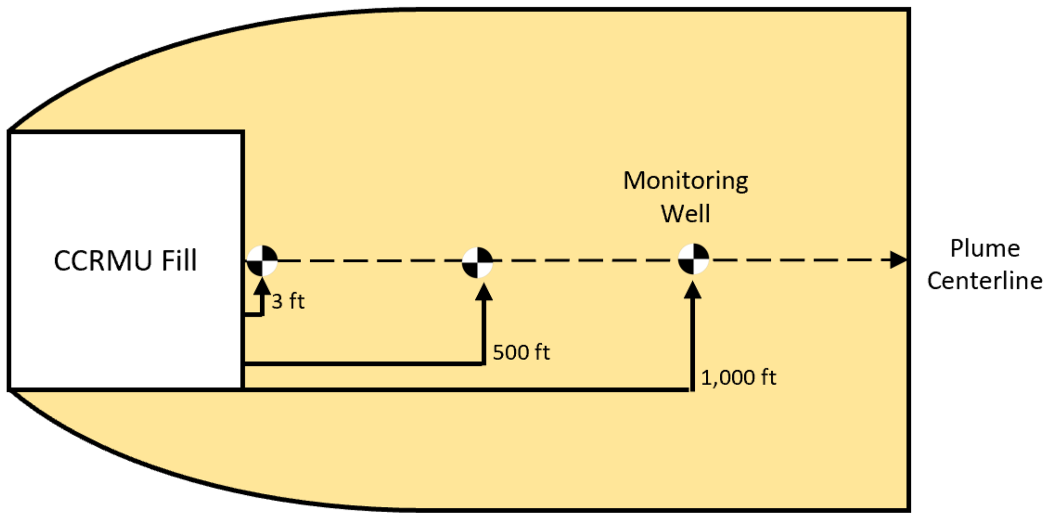


Figure 4-2. Aerial view of conceptual model for well locations.

For each model run and each well, a sample depth was randomly assigned within the top five feet of the surficial aquifer. The purpose of this interval is two-fold. First, it best reflects groundwater concentrations that would be measured by the low-flow sampling used in remedial investigations. Therefore, this interval is considered most appropriate to understand potential for exceedance of groundwater protection standard (GWPS). Second, it ensures a consistent frame of reference among the different wells. EPA has found that default of sampling in the top 30 ft of the aquifer can result in oversampling below the plume where it is thinnest, resulting in the appearance of lower concentrations at the wells closest to the unit.

4.2.7 Risk Benchmarks

For every model iteration, the groundwater concentration at each time step was identified. EPA ran the groundwater model until either the observed concentration at the well reached a maximum (i.e., peak) and then fell below a model-specified minimum concentration (1×10^{-16} mg/L), or the model had been run for a time period of 10,000 years. EPA selected these model horizons to ensure the peak and duration of any impacts to groundwater can be reliably identified across model runs despite the wide range of environmental conditions that may be encountered across the country (U.S. EPA, 2003d). Then the single year of highest concentration across all modeled time steps was identified. In cases where the ground water concentration was found to still be increasing after 10,000 years, EPACMTP stopped modeling and used the ground water concentration at that final year as the peak concentration. This does not mean it typically took that long for contamination be identified or that most model simulations continue for the full 10,000 years. Furthermore, the time to first exceedance of selected risk criteria is typically considerably less than the time to the greatest exceedance.

A time-weighted concentration was calculated by averaging the concentrations modeled for each time step over the specified exposure duration, centered around the year of highest concentration. The resulting concentrations were aggregated into probability distribution for that well location. Summary statistics were calculated from this distribution and compared against relevant risk benchmarks.

For the compliance well, the year of highest concentration was used to compare against GWPS. If the modeled concentrations at this location exceed promulgated GWPS, that indicates the CCRMU fills have potential to result in the same concentrations that would trigger corrective action in regulated landfills. This is relevant not only for the potential for CCRMU fills to directly impact groundwater quality, but also the potential for unmonitored releases to migrate from the CCRMU fills and interfere with groundwater monitoring at nearby regulated units.

For each of the monitoring wells, risk was calculated for a single reasonable maximum exposure (RME) residential receptor, relying on the Agency's approach to assessment of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites (U.S. EPA, 2014b). EPA chose this approach to ensure the full risk potential of individual sites is properly characterized, even if such high-end exposures ultimately occur at only a small percentage of sites nationwide. Because the future locations of these receptors are unknown and may occur relatively infrequently, the risk to this sensitive population may not be adequately captured by a nationwide assessment of receptor behavior. Including these considerations reflects the fact EPA is directed not only to issue nationwide rules, but also to issue site-specific permits.

For carcinogens, risk was calculated from modeled concentrations averaged over the 26 years bracketing the year of highest concentration, which represents the total time an individual lives at a residence and is exposed. For non-carcinogens, risk was calculated from the year of highest concentration. The reason for the separate approaches is differences in how cancer and non-cancer risks are evaluated. Cancer risk is calculated based on a slope factor and represents the increase in risk from all exposure spread out over the course of a lifetime. Therefore, cancer risk considers the cumulative exposure over time. Non-cancer risk is calculated based on a reference dose and represents the degree to which exposures exceed a threshold above which adverse health effects are anticipated to occur. Therefore, non-cancer risk usually considers the potential for exposures to exceed this threshold. If the modeled risks at the monitoring wells exceed either of these risk benchmarks, that indicates groundwater contamination has the potential to spread substantial distances at levels that may trigger further investigation or remedial action, such as source control, at a future cleanup site.

4.3 MODFLOW-USGT Setup

EPACMTP is designed to model groundwater concentrations at a single compliance location. Thus, it can be difficult to get a broader sense of full magnitude and extent of an individual plume over time from those results alone. MODFLOW-USGT was selected for use in this evaluation because it is a fully three-dimensional model that can simulate the shape and volume of a contaminant plume over time when run under transient conditions (as opposed to steady-state). MODFLOW models were constructed using model parameters and numerical grid dimensions selected to be consistent with EPACMTP runs. However, MODFLOW-USGT is not designed to be run in the same iterative and probabilistic manner as EPACMTP. Running MODFLOW for the over 150,000 EPACMTP runs would quickly become time and resource prohibitive. Instead, EPA used MODFLOW-USGT for a more targeted analysis intended to represent the 90th percentile groundwater concentrations identified across all EPACMTP model runs.

EPA first identified the 90th percentile groundwater concentration at the 1,000 ft monitoring well of EPACMTP model runs. EPA then pulled all model runs within ± 0.5% of that concentration for further review. The approximately 1,600 model runs pulled represent those with potential for substantial transport away from the CCRMU fill. From these runs, EPA then selected 24 at random and confirmed that the median inputs across these runs roughly matched those of the full 1,600 model runs scenarios.

4.3.1 Model Inputs

Inputs for MODFLOW were drawn directly from selected EPACMTP runs without modification. This was done to ensure that the conditions captured by MODFLOW-USGT mirror those from EPACMTP. **Table 4-1** lists the input parameters drawn from EPACMTP and their equivalent in MODFLOW-USGT. Some inputs used by EPACMTP do not have direct equivalents in MODFLOW-USGT because that model calculates them from other data. A list of the 24 EPACMTP model runs for each constituent and the associated model inputs are provided in **Appendix C**.

Table 4-1. Comparison of EPACMTP and Corresponding MODFLOW-USGT Model Inputs

EPACMTP Input Name	MODFLOW-USGT Input Name	Parameter Description	Units	MODFLOW-USGT Package
AREA	Modeled, not specified	Area of fill	m^2	N/A
XW	Modeled, not specified	Length of fill in direction of groundwater flow	M	N/A
RECHRG	RECH	Infiltration rate outside fill footprint. Modeled same as inside.	m/yr	RCH
SINFIL	RECH	Infiltration rate inside fill footprint. Modeled same as outside.	m/yr	RCH
TSOURC	PERLEN	Duration of leaching	Yr	DISU
DEPTH	Modeled, not specified	Depth or thickness of fill	M	N/A
DGBS	Modeled, not specified	Depth of fill bottom below ground surface	M	N/A
CZERO	CONC	Constant leachate concentration over time	mg/L	RCH
POR	PRSITY	Effective porosity of saturated soils	-	BCT
BULKD	BULKD	Bulk density of saturated soils	g/cm^3	BCT
ZB	Modeled, not specified	Thickness of saturated zone	M	N/A

Table 4-1. Comparison of EPACMTP and Corresponding MODFLOW-USGT Model Inputs

EPACMTP Input Name	MODFLOW-USGT Input Name	Parameter Description	Units	MODFLOW-USGT Package
XKX	HK and VKA	Hydraulic conductivity of saturated zone (aquifer)	m/yr	LPF
GRADNT	Modeled, not specified	Regional hydraulic gradient in the aquifer	-	N/A
AL	DL	Longitudinal dispersivity in the aquifer	M	LPF
AT	DT	Transverse dispersivity in the aquifer	M	LPF
AV	DTYZ and DTXZ	Transverse and vertical dispersivity in the aquifer	M	LPF
SATK	KSAT	Saturated hydraulic conductivity of unsaturated soils	cm/hr	LPF
ALPHA	ALPHA	Moisture retention parameter (Van Genuchten) Alpha	cm^{-1}	LPF
BETA	BETA	Moisture retention parameter (Van Genuchten) Beta	-	LPF
WCR	SR	Residual water content	-	LPF
WCS	PRSITY	Saturated water content (effective porosity)	-	LPF
DSOIL	Modeled, not specified	Depth from ground surface to water table	M	N/A
DISPR	DL	Longitudinal dispersivity in unsaturated zone	M	LPF
RHOB	BULKD	Bulk density of unsaturated soil	g/cm^3	LPF
UFCOF	ADSORB	Kd of unsaturated zone	cm^3/g	LPF
SFCOF	ADSORB	Kd of saturated zone	cm^3/g	LPF

4.3.2 Model Design

MODFLOW-USGT is divided into a series of components called "packages." Each package performs a specific task, which can be added to or omitted from the model structure to represent the scenario of interest. For example, one package may define properties of individual soil layers, while another may introduce a point of groundwater withdrawal (e.g., pumping activities). **Table 4-2** describes the specific packages used in the current modeling effort.

Table 4-2. MODFLOW-USGT Packages Used

Model Package	Acronym	Reason for Use
BASIC	BAS	The package handles a number of administrative tasks for the model as a whole. It opens files and determines options that will be active. It declares and allocates memory for variables that can then be used by other packages to define parameters.
Block Centered Transport	BCT	This package simulates the transport of contaminant mass. It specifies dispersion and adsorption parameters and material properties (i.e., porosity, water content and bulk density)
Output Control	OC	This package was used to instruct the model when and how to save outputs.
Sparse Matrix Solver	SMS	This package was used to solve groundwater flow and transport equations. It incorporates nonlinear methods for conditions where conductance is a

Table 4-2. MODFLOW-USGT Packages Used

Model Package	Acronym	Reason for Use
		function of hydraulic head and linear solution schemes to solve for matrix equations
Recharge	RCH	This package was used to simulate the rate and location of infiltration into the soil and fill.
Transient Constant Head	CHD	This package was used to specify the water level in boundary cells and hydraulic gradient across cells.
Layer-Property Flow (LPF)	LPF	This package was used to simulate flow in the saturated zone. It specified layer types, grid dimensions, and material properties (i.e. hydraulic conductivity and storage).
Unstructured Discretization	DISU	This package is used to organize and interrelate the location of different cells within the grid and to define initial time steps for the numerical solution.
Adaptive Time Stepping	ATS	This package allows the model to determine the appropriate length of time (time step) between each set of calculations to ensure efficient computation. If the model fails to converge on a solution to transport equations for a given time step, it will attempt to correct the problem by reducing the time step and solving again. It can also increase a time step length if a time step is quickly solved.
Prescribed Concentration Boundary	PCB	This package is used to specify a constant set of boundary conditions upgradient and downgradient of the unit.

MODFLOW-USGT allows for greater consideration of complex hydrogeology in modeled scenarios than EPACMTP. However, there is no reasonable means for EPA to assemble the level of detailed, site-specific data necessary to incorporate additional complexities on a national scale. Indeed, EPA has raised concerns through Part A and B reviews that facilities have not adequately characterized site hydrogeology even in the immediate vicinity of the regulated units. Therefore, some additional assumptions are required to enforce consistency in the modeling approach. Below is a list of the major assumptions to ensure consistency in the overall modeling approach. Additional parameter values are identified below:

- EPACMTP is unable to model waste in contact with the water table. Thus, EPA established the top two grid layers of MODFLOW-USGT to represent the total unsaturated thickness of CCR and soil above the aquifer using the DISU package. The thickness of the first layer equals that portion of fill that extends below ground surface and the second layer represents the distance between the bottom of the fill and the water table.

- EPACMTP assumes the unsaturated soil and aquifer are both homogenous and isotropic. To mirror these conditions in MODFLOW-USGT, EPA specified identical aquifer properties (e.g., hydraulic conductivity, porosity) in the X- and Y- directions. EPA then set the vertical anisotropy ratio (Kx/Kz) in the Z-direction equal to 1.

- EPACMTP assumes there is a constant aquifer thickness across the modeled area. It derives flow boundary conditions along the edge of the modeled area based on specified hydraulic gradient, hydraulic conductivity, and recharge rate. MODFLOW-USGT allows the saturated thickness of an unconfined aquifer to vary. To prevent a scenario where the aquifer is discontinuous, fixed water table depths are applied to the upgradient and downgradient ends of the model based on the specified saturated thickness and flow gradient for that model run.
- EPACMTP simulates steady groundwater flow in which groundwater head elevations do not change over time. Transient transport simulations are required to model plume volume and average risk over time. Transient flow simulations are utilized in MODFLOW-USGT in addition to transient transport to estimate water volumes more accurately over time and therefore an additional input parameter is required, the specific yield (S_Y), to account for gravity drainage from unconfined aquifer media. Fixed boundary conditions applied to flow simulations result in nearly steady state flow fields that render long-term results insensitive to the initial value of S_Y. Therefore, a default value of 0.13 for S_Y was selected with the intent to reflect silt and clay soils (Morris and Johnson, 1967).
- MODFLOW-USGT requires a set of boundary conditions for concentration. EPA specified a zero-concentration boundary upgradient of the fill to ensure no contributions from background. A zero-concentration boundary was also set at the base of the aquifer to prevent contaminant mass from flowing through that confining layer. At the bottom of the fill, EPA specified a constant concentration boundary condition equal to the leachate concentration to serve as the contaminant source. That boundary condition was maintained throughout the leaching duration simulated by EPACMTP, after which the boundary value was set to zero. Finally, EPA set a boundary condition at the downgradient edge of the model domain equal to the concentration in the final cell, which allowed any contaminant mass to continue to flow beyond the downgradient distance that was explicitly modeled.

4.3.3 MODFLOW-USGT Sampling Location

EPACMTP models the unsaturated and saturated zones as distinct components, each defined by a single set of parameters. MODFLOW-USGT does not explicitly define separate unsaturated and saturated zones. Instead, it relies on boundary and initial conditions to determine which parts of the model domain are saturated at any given time. MODFLOW-USGT allows the domain to be subdivided into cells that can each accept different parameter values. For purposes of this risk assessment, the model grid consists of 286 grid columns in the direction of groundwater flow, 181 grid rows perpendicular to groundwater flow, and 12 layers. This results in a total of 621,192 cells across the entire model domain. The specific number of layers and cells were defined through sensitivity analyses that identified the lowest number of cells at which the calculated plume volume and concentration had stabilized for all model runs (i.e., adding more cells did not refine the model outputs). **Figure 4-3** provides an example of how site hydrogeology is translated into a grid structure.

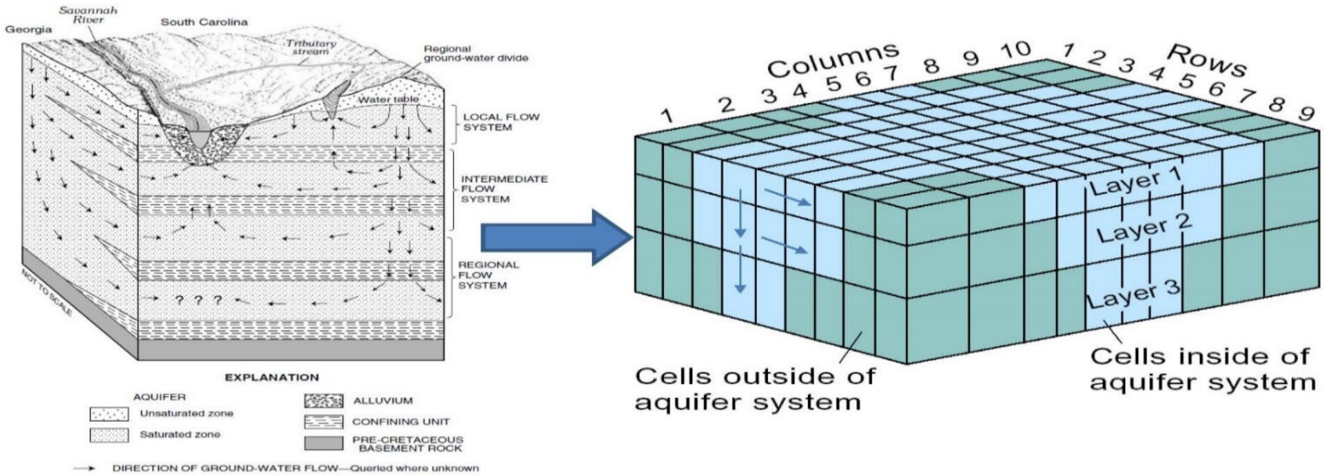


Figure 4-3. Conceptual model of three-dimensional groundwater flow.
(Adapted from USGS, 1996, 1997)

The model domain was set at 1,515 m (4,970 ft) in length, with the upgradient edge of the fill located 476 m (1,562 ft) away from the upgradient boundary. The model domain length of 1,515 m was selected to be greater than the model domain lengths estimated by EPACMTP for both sets of 24 model runs. EPACMTP estimates the model domain length based on consideration of the size of contaminant source, distance of receptor wells, and longitudinal dispersivity (U.S. EPA, 2003b). The model domain was set at 411 m (1,348 ft) in width, and rectangles, with a length that varies from 1 m at the smallest to 10 m at the largest. This layout was selected for several reasons: to allow finer resolution of calculations in the vicinity of the fill and along the plume flow path, to accommodate a range of fill sizes within the zone of higher resolution, and to reduce computational burden in areas furthest away from the plume. **Table 4-3** lists the sizes assigned to each cell within a layer. All layers in a run were assigned identical cell layouts. **Figure 4-3** shows an annotated screenshot of MODFLOW-USGT that depicts how different cell sizes are distributed within a modeled layer.

Table 4-3. Cell Layout in a MODFLOW-USGT Layer

Cell Length	Column Number	Row Number	Cell Aspect Ratio
10 m	1 to 39, 195 to 286	1 to 10, 171 to 181	1.5
6.5 m	40 to 41, 193 to 194,	11 to 12, 170 to 171	1.4
4.5 m	42 to 43, 191 to 192	13 to 14, 168 to 169	1.5
3 m	44 to 45, 189 to 190	15 to 16, 166 to 167	1.5
2 m	46 to 47, 187 to 188	17 to 18, 164 to 165	1.3
1.5 m	48 to 49, 185 to 186	19 to 20, 162 to 163	1.5
1 m	50 to 184	21 to 161	1.0

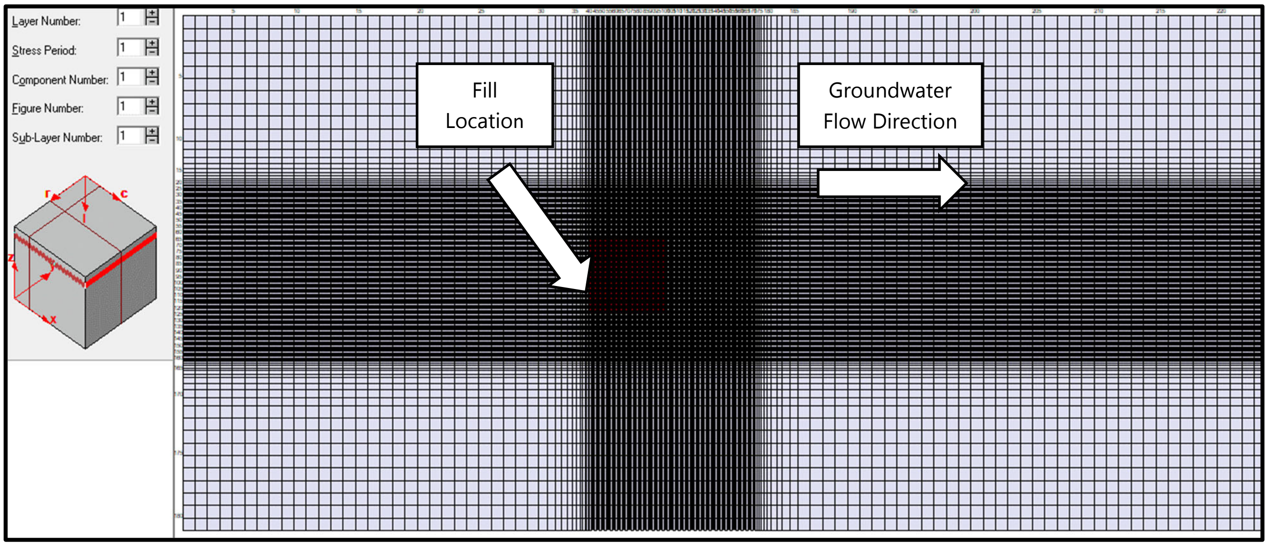


Figure 4-4. Depiction of grid layout for individual layer visualized within MODFLOW-USGT.

The top two layers represent 1) the depth of fill below ground surface and 2) the unsaturated soil between the fill and aquifer. These two layers were assigned properties corresponding to the unsaturated zone. The remaining 10 layers were assigned properties corresponding to the saturated aquifer. The aim of assigning thicknesses to these 10 layers was intended to maintain a thicknesses aspect ratio of less than 2.0 across all layers to ensure numerical convergence of the model. The purpose to the subdivision of layers is instead to refine the estimate of modeled plume volume. Details of grid dimensions for all scenarios are presented in **Appendix C**. All cells within the unsaturated and saturated layers are assigned corresponding parameter values from the EPACMTP runs. Contaminant concentrations are calculated as an average at the center node of each cell. Because a contaminant plume is typically curved, use of cells that are too large can result in underestimation of concentrations closer to the boundary.

For each model run, both the volume of groundwater above a specified concentration benchmark and average magnitude of exceedance of that benchmark over that volume were recorded at each time step. Benchmarks were separately established based on GWPS and the RME risk scenario described for EPACMTP with a cancer risk of 1×10^{-5} or HQ of 1. Use of these benchmarks provides a consistent frame of reference to identify the volume of affected groundwater over time. MODFLOW first determined which cells across the model domain were partially or fully below the water based on whether the calculated porewater pressure that was positive over some or all of the cell, indicating saturation of the soil. Next, the model identified which of saturated cells had an average groundwater concentration above relevant benchmarks. Finally, the model summed the volume of affected groundwater across these cells and calculated the average magnitude of exceedance over that total volume. These outputs across different points in time were used to understand the magnitude and extent of the resulting plume, as well as the potential for sustained exposure for future receptors.

4.4 Model Results

Groundwater concentrations modeled with EPACMTP at the waste boundary were compared to respective GWPS to understand the potential for fills to impact groundwater quality to an extent that would trigger corrective action at regulated landfills. The 90th and 50th percentile exceedance of GWPS for each constituent modeled with EPACMTP at the waste boundary are presented in **Table 4-4**. Values represent the ratio of modeled concentrations and corresponding GWPS. All values are rounded to the nearest whole number. Values that exceed the respective GWPS are shown in **bold**.

Table 4-4. Modeled Exceedance of GWPS at Waste Boundary.

Constituent	GWPS (µg/L)	90th Percentile	50th Percentile
Arsenic III	10	**26**	0.2
Arsenic V	10	**19**	0.2
Molybdenum	100	**156**	**2**
Thallium	2	**19**	0.8

The 90th percentile groundwater concentrations exceeded GWPS by factors of 26 for arsenic III, 19 for arsenic V, 156 for molybdenum, and 19 for thallium. The 50th percentile concentrations exceeded GWPS by a factor of 2 for molybdenum. Based on these results, EPA finds that CCRMU fills can meaningfully contribute to groundwater contamination across a facility.

Groundwater concentrations modeled with EPACMTP at 500 and 1,000 feet away from the waste boundary were used calculate risks to individual RME receptors exposed to these concentrations. Exceedance of risk benchmarks at 90th and 50th percentile concentrations are presented in **Table 4-5** for each distance from the waste boundary. Both cancer and noncancer risks are presented for the associated RME receptors based on Agency policy. For drinking water ingestion, cancer risks are calculated for an individual who is exposed for 6 years as a child and 20 years as an adult, while noncancer risks were for a child. Differences in most sensitive age cohort are a result of the longer duration that adults are exposed that drives cancer risk and greater water consumption per pound of body weight for children that drives non-cancer risk (U.S. EPA, 2011). All values are rounded to the nearest whole number. Values that exceed the selected risk criteria (i.e., cancer risk > 1×10^{-5} or HQ > 1) are shown in **bold**. In instances where a values were above the benchmark prior to rounding (e.g., HQ = 1.4), it was retained as an exceedance.

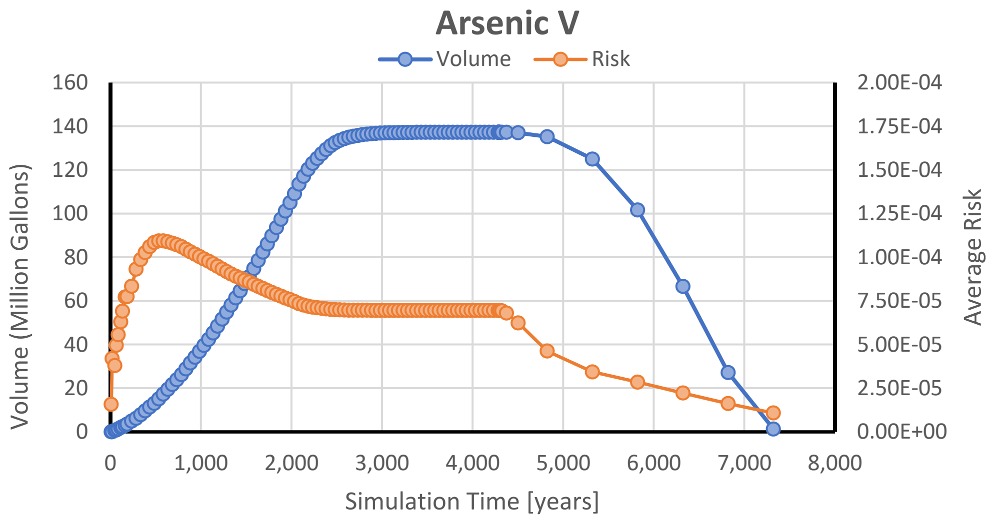
Table 4-5. Modeled Risk at Different Distances from CCRMU Fill

Constituent	Risk for 90th Percentile Groundwater Concentration		Risk for 50th Percentile Groundwater Concentration	
	500 ft	1,000 ft	500 ft	1,000 ft
Carcinogenic Effects				
Arsenic III	**6×10^{-4}**	**3×10^{-4}**	7×10^{-6}	3×10^{-6}
Arsenic V	**5×10^{-4}**	**2×10^{-4}**	4×10^{-6}	1×10^{-6}
Noncarcinogenic Effects				
Arsenic III	0.7	0.4	0.01	< 0.01
Arsenic V	0.5	0.3	< 0.01	< 0.01
Molybdenum	**26**	**15**	0.3	0.1
Thallium	**33**	**18**	**1**	0.7

Risks decline further away from the fill as the plume has greater opportunity to mix within the aquifer and disperse. However, at 90th percentile concentrations all constituents still exceed at least one benchmark (cancer or noncancer) at 1,000 ft from the fill. At this distance, EPA identified cancer risks from arsenic (risk = 3×10^{-4} for trivalent and 2×10^{-4} for pentavalent) and noncancer risks from molybdenum (HQ = 15) and thallium (HQ = 18). At 50th percentile concentrations, the only identified exceedance of benchmarks was for thallium (HQ = 1). This indicates potential for the leakage from CCRMU fills to spread at environmentally significant concentrations.

Because EPACMTP runs represent concentrations at a fixed location, they do not provide broader information about the magnitude and extent of the plume. As a result, EPA does not rely primarily on these results to draw direct conclusions about overall risk. Instead, the Agency retained a subset of 24 model runs for both arsenic V and molybdenum drawn from around the 90th percentile concentrations at 1,000 ft. Altogether, these runs reflect a range of conditions that collectively resulted in high-end groundwater concentrations 1,000 feet from the fill. These corresponding placements of CCR range from around 3,500 to 70,000 tons placed over areas between 0.15 to 2.0 acres.

EPA calculated the median of modeled risks and volumes across these runs to define values representative of these high-end runs over time. For arsenic V, the model identified a peak risk of 1×10^{-4} averaged over 32 million gallons (Mgal) of groundwater and a peak volume of 147 Mgal with an average risk of 7×10^{-5}. The same leakage of arsenic V would result in a peak GWPS exceedance of 3 averaged over a plume volume of 1.2 Mgal and a peak plume volume of 8 Mgal with an average exceedance of 2. It takes around 2,300 years from the time of first exceedance for the plume to fully dissipate. For molybdenum, the peak exceedance of both risk benchmark and GWPS was 10 averaged over a plume volume of 27 Mgal and a peak plume volume of 80 Mgal with an average exceedance of 4. It takes around 100 years from the time of first exceedance for the plume to fully dissipate. Results for each of the individual 24 model runs and the associated model inputs are presented in **Appendix C**. **Figure 4-5** presents a time series plot based on EPACMTP model run #94,263 for arsenic V and #33,662 for molybdenum. These runs were determined to fall closest to the overall median risk and volume results summarized above.



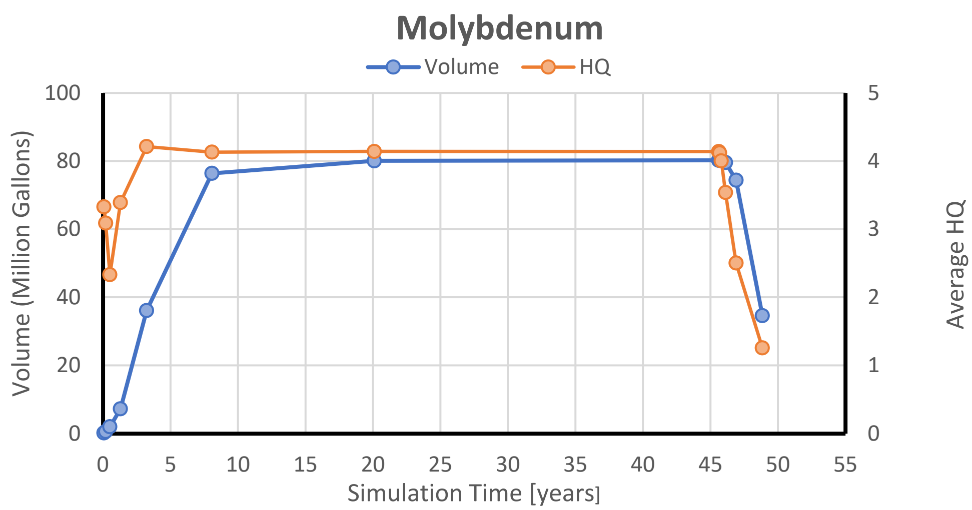


Figure 4-5. MODFLOW-USGT examples for arsenic V and molybdenum.

The average risk changes over time as the volume grows due to mixing with the aquifer and lateral dispersion. In both cases, the average risk across the plume eventually achieves a steady state until the leachable mass in the fill is depleted and the plume begins to shrink. However, not all model runs achieve a similar steady state conditions before the source is depleted. Plumes of these size and durations could readily sustain exposures for typical residential receptors anticipated to use around 80 gallons of water a day for all indoor household needs, resulting in less than 0.8 Mgal of use over the up to 26 years of exposure (USGS, 2018).

4.5 Conclusions

EPA modeled the potential magnitude and extent of groundwater contamination resulting from CCRMU fills with EPACMTP and MODFLOW-USGT. This modeling effort incorporated many of the same data sources previously used to characterize leakage from CCR in the 2014 Risk Assessment, applied to the conceptual model for smaller fills. EPACMTP model runs identified potential for these smaller fills to result in groundwater contamination under high-end and more moderate scenarios. In particular, high-end scenarios demonstrated potential for substantial plume spread. Therefore, MODFLOW-USGT was used to further model the full extent the plumes for a subset of high-end scenarios identified with EPACMTP. Based on these results, leakage of arsenic from smaller fills can still result in contamination that can extend over millions of gallons of groundwater and persist for a century or more. For all these reasons, EPA finds the potential for risk to future residential receptors to be within the range OLEM typically considers for regulation.

5 CCRMU Fill Soil Risk

CCR is recognized as a type of technologically enhanced naturally occurring radioactive material (TENORM).[12] "Technologically enhanced" in this context means naturally occurring radioactive material has been concentrated or altered, such as through combustion, in a way that increases the potential for exposure. Therefore, EPA conducted further modeling of the exposures to radiation that may result from living in a home built on or around a CCRMU fill. The goal of this modeling is to characterize the risks associated with placement of smaller quantities of CCR. The section of the document describes the overarching framework for this modeling effort, as well as the specific models and inputs used to predict risks from radiation.

5.1 Model Framework

The placement scenario considered for the current evaluation is CCRMU fills located onsite at both active and inactive facilities subject to this rulemaking. In the absence of requirements to identify and track these smaller placements, it is assumed that a site could be redeveloped in the future for residential use. It is also assumed there will initially be some type of soil layer placed over the CCR to support a lawn or similar vegetative cover.

This evaluation considered the potential for exposure to gamma radiation and radon gas from placement beneath the soil. Because the CCR is buried, EPA did not consider potential for direct exposure to the CCR or indirect exposure through uptake of contaminants by crops and livestock. Further, EPA did not separately consider leaching to groundwater due to a lack of data on leaching potential of these constituents from CCR. However, contributions from these additional pathways to overall exposures is expected to be lower than the modeled pathways.

EPA selected the Preliminary Remediation Goal (PRG) Calculator for the current evaluation.[13] The current version of the model calculates risk with cancer slope factors from Federal Guidance Report 13 (U.S. EPA, 1999b) with International Commission on Radiological Protection 107 decay data (ICRP, 2008), as outlined in the report "Calculation of Slope Factors and Dose Coefficients" (ORNL, 2014). The calculator was selected because it is a publicly available model that addresses relevant exposure scenarios, allows user specification of key parameters, and has undergone extensive review and validation both internally and externally (e.g., U.S. EPA, 2015; 2017; 2021; 2022). Further documentation of these reviews is available on the calculator webpage.

12) See: https://www.epa.gov/radiation/tenorm-coal-combustion-residuals

13) See: https://epa-prgs.ornl.gov/radionuclides/

5.2 Model Setup

For some parameters, the available data would not support development of continuous probability distributions. This precludes the type of fully probabilistic modeling conducted for groundwater exposures. Instead, model inputs for the PRG Calculator for direct gamma exposure were identified based on a review of model default values, EPA guidance, and the wider scientific literature. These inputs were used to conduct a more deterministic analysis intended to represent an RME exposure scenario. All values not discussed below were left as model defaults.

5.2.1 Bulk Activity

Activity is a measurement of the rate at which radioisotope mass within a sample disintegrates (or decays), expressed in units of picocuries per gram (pCi/g). One pCi is equal to 2.22 disintegrations per minute. Each disintegration releases ionizing radiation in the form of alpha particles, beta particles, or gamma waves that have the potential to damage genetic material and increase an individual's lifetime cancer risk. Activity determines the amount of each radioisotope present in that can release radiation into the surrounding environment.

EPA relied on the COALQUAL database to identify activity in coal ash. However, this data source reports chemical concentrations on a whole coal basis. Therefore, additional steps were required to estimate the activity of the resulting ash. COALQUAL reports two parameters in the datasheet that represent the amount of ash remaining after a coal sample has been burned. The parameter "STDAsh" in the "CQ_Prox_Ult" datasheet represents the percent ash yield as determined by the American Society for Testing and Materials (ASTM) Method D-3174 following combustion at 750 degrees Celsius (ºC), while the parameter "GSAsh Dry" in the "CQ_Trace" datasheet represents the percent ash yield determined by the USGS laboratories following combustion at 525 ºC. For some constituents in COALQUAL, USGS first measured concentrations in ash from combustion at 525 ºC and then back-calculated concentrations in the whole coal. One goal of combustion at a lower temperature was to limit loss of more volatile constituent mass from the ash and provide a more representative concentration in whole coal. As a result of the lower combustion temperature, the resulting ash yield for "GSAsh Dry" tends to be somewhat higher than "STDAsh." EPA selected "GSAsh Dry" to calculate concentrations in the resulting ash both because it was the basis for many USGS measurements and the higher residual ash yield reflects the reality that combustion of coal is not always complete.

After calculating ash concentrations, EPA filtered out any non-standard coal types listed under "Estimated Rank" in the "QC_Descript" sheet. For example, EPA removed samples listed as: "bone," "shale," "clay," "pyrite zone," "coal," and "carbonaceous to coaly shale." These samples might represent roof, floor, partings, or other non-coal samples.[14] This filtering removed only 89 samples

14) Roof, floor, and partings are non-coal rocks found above, below, and interbedded within minable coal deposits.

and so is not anticipated to have a substantial impact on concentrations. After filtering, remaining samples consisted of lignite, bituminous, sub-bituminous, semi-anthracite, and anthracite.

Not all coal deposits in the United States are mined in equal volumes. Therefore, EPA sampled the COALQUAL database in rough proportion to production statistics by county and coal rank. To represent changes in production over time, EPA drew data from a mixture of sources to represent each decade between the first and last years with reported data, 1983 and 2022. EPA pulled data from the EIA Coal Data Browser for the years 2022, 2013, and 2003 (U.S. EIA, 2024). The browser does not report a county for these years and so reported mine codes were used to assign locations for each mine based on data from U.S. Mine Safety and Health Administration (U.S. MSHA, 2024). EPA pulled data from the EIA-7A, Annual Survey of Coal Production and Preparation for the years 1993 and 1983 (U.S. EIA, 1993a; 1983). These surveys do not include information on coal rank for these years. Data from the 1993 Annual Coal Production Report were used to identify coal rank for each mine by matching production reported for individual mines with the coal rank production reported for the county (U.S. EIA, 1993b). A production report was not identified for 1983. Instead, EPA assigned coal rank to each mine based on data identified from other reported years. In the rare case that coal rank produced by a mine changed over time, the oldest value identified from across the reports was assigned.

EPA calculated the production for each combination of state, county, and coal rank across all years as a percentage of total production across all years. Both anthracite and lignite represent a small portion of coal mined and database samples, so these coals were grouped together with and sampled alongside bituminous coals. The calculated percentages are provided as part of **Appendix C**. EPA randomly sampled COALQUAL in proportion to these percentages. If fewer than three data points were available for a combination of county and rank, then samples were drawn from across the state to avoid biasing sampling toward a small number of data points. This process was repeated 150,000 times to provide coverage of all the samples in the database. This sampling resulted in a distribution of uranium and thorium bulk content. The calculated concentrations represent a "whole ash" concentration consisting of fly ash mixed with bottom ash or boiler slag.

All uranium and thorium mass is inherently radioactive and will eventually decay. However, this mass may consist of multiple different isotopes that decay at different rates and with different decay products. The primary radioisotopes of interest for the current assessment are uranium-238 (U-238) and thorium-232 (Th-232). These isotopes are both the most naturally abundant (99.27% and 99.98% of uranium and thorium, respectively) and serve as the starting point for their respective decay chains. EPA calculated the bulk activity of U-238 and Th-232 from the bulk content of uranium and thorium using the following **Equation 5-1**, adapted from U.S. EPA (2014d):

$$(5\text{-}1)\qquad A_B = \frac{(C_B)(NA)}{(2.8 \times 10^{-12})(M_A)(T_{1/2})}$$

Where:

A_B	=	Isotope Bulk Activity [pCi/g]
C_B	=	Element Bulk Content [mg/kg]
NA	=	Isotope Natural Abundance [%]
M_A	=	Isotope Atomic Mass [amu]
$T_{1/2}$	=	Isotope Half-Life [years]
2.8×10^{-12}	=	Unit Conversion Constant

Each measurement of uranium and thorium bulk content were converted to corresponding U-238 and Th-232 bulk activity prior to calculating summary statistics for the whole ash. Because these calculations rely on innate properties of the isotopes (e.g., half-life), it is unlikely these calculations introduced much additional uncertainty into the dataset. **Table 5-1** presents summary statistics used to characterize bulk activity of U-238 and Th-232.

Table 5-1. Calculated Bulk Activity (pCi/g)

Constituent	50th Percentile	90th Percentile
Uranium-238	3.6	7.8
Thorium-232	2.2	4.1

U-238 and Th-232 will both naturally decay through their respective chains of isotopes before reaching a stable end product. Each of these decays will release radiation into the surrounding environment. Of the isotopes in these decay chains, radium and its short-lived decay products are expected to contribute most to cancer risk. Thus, it is critical to understand the activity of these isotopes. COALQUAL does not report bulk content of radium in coal. The mass concentration of this element is typically very low, often on the order of picograms per kilogram, and so is typically reported only on the basis of bulk activity. Previous studies have found that U-238 and Th-232 are in approximate secular equilibrium with the respective radium isotopes, radium-226 (Ra-226) and radium-228 (Ra-228) (Beck and Miller, 1980; LANL, 1982; Lauer et al., 2015). Secular equilibrium is the state in which the mass of a radioisotope remains constant because its production rate (e.g., due to decay of a parent isotope) is equal to its decay rate. Under secular equilibrium, the activity of all isotopes in the decay chain is identical. Therefore, EPA used data on the activity of U-238 and Th-232 to also represent the activity of Ra-226 and Ra-228.

A major benefit of the COALQUAL dataset is that it provides consistent reporting of each element across samples. This can allow identification of trends in relative constituent concentrations, which can be an important consideration for cumulative risk because a sample with the highest activity of one isotope may not have the highest of another. Therefore, EPA calculated summary statistics for combined radium activity (Ra-226+228) across samples. **Table 5-2** presents summary statistics used to characterize combined activity of Ra-226+228.

Table 5-2. Combined Radium Bulk Activity (pCi/g)

Constituent	50th Percentile	90th Percentile
Radium 226 + 228	6.4	11.8

5.2.2 Radon Emanation Coefficient

The radon emanation coefficient (or "emanation power") is the fraction of generated radon able to escape from the ash and migrate into empty pore spaces between the ash particles. This parameter determines the fraction of radon that is available to migrate through the subsurface and enter overlying buildings. It is generally accepted that recoil is the dominant means by which radon gas is able to escape from solid particles. Recoil occurs because an alpha particle is ejected from the atom when radium decays to radon.[15] The force of ejection causes the newly formed radon atom to recoil in the opposite direction, which can result in release of radon from CCR if it occurs close enough to the surface of the ash particle. The distance radon can push through solid materials by recoil is small, typically on the order of a few micrometers. As a result, the radon emanation coefficient is influenced by waste properties, such as the size and shape of individual particles.

Sakoda et al. (2011) reported emanation coefficients from 46 samples of fly ash across six studies to derive an average emanation coefficient for Rn-222 of 3%. Other available data on CCR generated within the United States generally confirms the magnitude of that average. Beck et al. (1980) summarized data of fly ash and bottom ash samples from three power plants and reported average coefficients for both of less than 1%. Beck and Miller (1980) summarized data of 11 samples of fly ash and 10 samples of bottom ash or slag and reported an average emanation coefficient less than 2% and a maximum of 5%. The American Coal Ash Association, working with Laurence Berkley Laboratory, reported data on 20 samples of fly ash, with an average and maximum emanation of 1.2 and 3.5%, respectively (ACAA, 1981). The Los Alamos National Laboratory reported data on nine samples of both fly ash and bottom ash. The fly ash had average and maximum coefficients of 0.7 and 2.8%, while bottom ash had average and maximum coefficients of 0.2 and 0.4% (LANL, 1981). Based on these data, EPA assigned a moderate emanation coefficient to 1% for both Rn-220 and Rn-222. EPA applied factors of five to effectively bound the range of reported values and obtain low and high values of 0.2 and 5%, respectively.

The 50th and 90th percentile activities of Ra-226 in CCR of 4.0 and 7.5 pCi/g are higher than the corresponding values in background soil of 1.1 and 1.6 pCi/g, based on nation-wide data from Oak Ridge National Laboratory (ORNL, 1979). However, the range of radon emanation coefficients

15) An alpha particle is a positively charged subatomic particle that consists of two protons and two neutrons tightly bound together.

identified for CCR is substantially lower than for soils. The moderate values for CCR of 1% is over an order of magnitude lower than average values reported for soil around 20% (Sakoda et al., 2011). As a result, despite higher radium activities, radon emanation from CCR is generally expected to be lower than from background soil. Even with both the CCR radium activity and emanation coefficient set to higher values, radon emanation from CCR would fall within the range expected for soils. Thus, based on the available data, the radon risks from CCR are not distinguishable from background soil and highly unlikely to result in the radon accumulation within the range EPA recommends for remediation. Therefore, EPA did not retain radon for further consideration in this risk assessment and does not further discuss model parameters unique to this exposure pathway.

5.2.3 Cover Soil Depth

Cover soil depth is the thickness of uncontaminated soil separating CCRMU fill from the ground surface and the building foundation. A thicker cover will result in lower exposure because the soil serves as a shield that will absorb some of the gamma radiation and slow radon migration to allow for greater decay before either reaches the ground surface. It is generally assumed that placement of CCR will not extend up to the ground surface. However, EPA did not identify any data sources that could be used to define representative values for a cover that may be placed over fills. Instead, EPA considered multiple depths to define internal and external gamma shielding factors ranging from a maximum of 60 cm (2 feet), corresponding to the cover requirements for landfill closure, and down to 20 cm (0.65 feet) in increments of 20 cm.

5.2.4 Fill Size

The unit size is the land surface area over which the CCRMU fill extends. EPA set the unit size at 2,000 m^2 (0.5 acres), which is the closest available option in the PRG Calculator to the median unit size modeled for groundwater pathways of around 2,900 m^2 (0.72 acres) and so most representative of potential exposures. While larger amounts of CCR could be placed over smaller or larger areas, model results were not found to be particularly sensitive to areas within the range considered in this assessment.

5.2.5 Time Spent Indoors/Outdoors

The time spent indoors and outdoors is the fraction of a day a resident spends inside and outside around the home. This parameter determines the level of exposure to gamma radiation and radon. When inside, there is less exposure to gamma radiation because concrete and other building materials serve as shields that absorb some of the radiation before it can reach the resident. These parameters are expressed as a percent of a given 24-hour day. EPA selected the values for time spent indoors and outdoors as the PRG Calculator defaults of 68% and 7% of the day respectively. These values correspond to the 50th percentile values from Table 16-16 “indoors in a residence (all rooms)” and Table 16-20 “at home in the yard or other areas outside the house” in the 2011

Exposure Factors Handbook (US EPA, 2011). The remaining time not accounted for between these two fractions is assumed to be spent away from home and so not exposed.

5.2.6 Exposure Duration

Exposure duration is the number of years a receptor is expected to live at a single residence before moving away. It determines the total amount of time a receptor is near the waste and potentially exposed. EPA selected the value for exposure duration as the PRG Calculator default of 26 years. This value corresponds to the 90th percentile value from Table 16-108 in the 2011 Exposure Factors Handbook (U.S. EPA, 2011).

5.2.7 Risk Benchmarks

EPA calculated health-based benchmarks for direct gamma exposure to Th-232 and U-238 decay chains with the PRG Calculator. Contributions to exposure from incidental ingestion, inhalation, and consumption of produce were not included. Separate sets of values were calculated with the inputs identified throughout this section for each cover thickness. The benchmarks for a thickness of 20, 40, and 60 cm that correspond to a risk of 1×10^{-5} are 0.856, 4.02, and 16.7 pCi/g for the Th-232 decay chain and 1.34, 7.54, and 39.0 pCi/g U-238.

5.3 Results

For each cover thickness, EPA used the identified benchmarks to calculate the risk associated with each individual sample in the overall distribution of ash activity sampled from COALQUAL. The intent of this approach is to more accurately reflect the relative contributions from both decay chains. EPA then calculated the risks associated with the 90th and 50th activities from across the overall distribution. **Table 5-3** presents the results of this analysis. All values are rounded to the nearest whole number. Values that exceed the selected risk criteria (i.e., cancer risk > 1×10^{-5}) are shown in **bold**. In instances where a values were above the benchmark prior to rounding (e.g., risk = 1.4×10^{-5}), it was retained as an exceedance.

Table 5-3. Modeled Risk with Different Cover Thickness.

Cover Thickness	90th Percentile Activity	50th Percentile Activity
60 cm	4×10^{-6}	2×10^{-6}
40 cm	**2×10^{-5}**	**1×10^{-5}**
20 cm	**1×10^{-4}**	**6×10^{-5}**

High-end risks resulting from exposure to gamma radiation range from 4×10^{-6} at a cover thickness of 60 cm to 1×10^{-4} at a cover thickness of 20 cm. Risks associated with more moderate activity were approximately a factor of two lower, ranging from 2×10^{-6} at a cover thickness of 60 cm to 6×10^{-5} at a cover thickness of 20 cm.

5.4 Conclusions

CCR is a type of TENORM that contains radioisotopes at levels greater than typically observed in background soil. Available data indicate the potential for radon emanation and associated risk from CCR is not distinguishable from that of background soils. Therefore, this exposure route was not retained for further consideration. The remaining risks from gamma radiation for future residential receptors were modeled with the EPA PRG Calculator under the assumption that some level of cover separates the CCR and the receptor. Modeled high-end risks ranged from 4×10^{-6} at a cover thickness of 60cm to 1×10^{-4} at a cover thickness of 20 cm.

The parameter with the greatest influence on risk is the amount of cover soil separating the CCR and the receptor. This is because the soil serves as a shield and limits exposure to gamma radiation. However, this indicates the potential for even greater risks if CCR is located closer to the ground surface. While it is considered unlikely a future resident would live on top of an entirely uncovered CCRMU fill, there is real potential for the CCR to become mixed in with the surface soil if the fill is disturbed. Modeling such exposures would require additional assumptions about the degree of disturbance and mixing, which would introduce additional uncertainty into the calculated risks. Therefore, this scenario is discussed further in **Section 6 (Uncertainty and Sensitivity Analyses)**.

6 Uncertainty and Sensitivity Analyses

EPA reviewed the models used, as well as the data and assumptions input into the models, to better understand the potential sources of uncertainty inherent in the quantitative analyses. The Agency qualitatively and, to the extent possible, quantitatively analyzed these sources to understand the potential effects each may have on modeled risks. EPA also conducted further sensitivity analyses to understand how the modeled risks vary in response to changes in sensitive parameters and to evaluate the potential for risks through exposure pathways that could not be fully modeled on a national scale. The purpose of this section is to document the results of these additional analyses.

6.1 Uncertainty Analyses

Uncertainty exists to some degree in any quantitative evaluation, and can bias the calculated results higher or lower than actual values. It is important to understand both the direction and magnitude of uncertainties present in a risk assessment. The direction of uncertainty is the tendency for that uncertainty to push a predicted value higher or lower than the actual value, while the magnitude of uncertainty is the extent to which that uncertainty may push a predicted value away from the true value. Characterizing these uncertainties helps to ensure that the overall conclusions of the evaluation would not change with the consideration of additional information. There are three primary causes of uncertainty:

- Variability is the extent to which the characteristics of an environmental system are heterogeneous, and is reflected in the parameter distributions used as inputs for the models. Although variability can be better captured by collecting additional data, it cannot be eliminated and must be treated explicitly in the assessment.
- Data uncertainty is a description of the imperfection in knowledge of the true value of a particular parameter. Uncertainty is generally reducible through additional research and information-gathering.
- Model error occurs because models and their mathematical expressions are simplifications of reality that are used to approximate real-world conditions, processes, and their relationships. These assumptions are sometimes necessary to solve complex mathematical equations or to fill gaps in available knowledge. However, the simplification of complex systems may misrepresent real-world conditions to an unknown degree.

Uncertainties identified in the evaluation were managed to the extent practicable to minimize the potential effects on model results. Variability was addressed by compiling available data into probabilistic distributions for each parameter. Uncertainty about the exact range or distribution of a parameter was addressed through use of estimated point values or distributions to appropriately bound the true range, while ensuring protection of human health and the environment.

As previously documented in **Section 4.1** and **Section 5.1**, the publicly available models used in the current evaluation have undergone extensive review and validation. Together, these reviews verified that the mathematical formulation of the models is scientifically sound, the code executes properly, and the results can provide a reasonable representation of real-world conditions. Due to the extent of past review, EPA has a high degree of confidence in the design and functionality of these models. While some sources of uncertainty based on the model design are known to remain, such as the inability to fully quantify the effects of disposal below the water table, EPA aimed to constrain the scope of the evaluation to minimize the effects of such uncertainties on quantitative model results. Thus, EPA limited the discussion here to uncertainties associated with key inputs selected for use in the models. In particular, many inputs used to characterize groundwater fate and transport were drawn from the same sources as the 2014 Risk Assessment (U.S. EPA, 2014a). Uncertainties associated with these sources were previously discussed in the 2014 Assessment and these sources were found to represent the best available data available on a national scale. As a result, the focus of this uncertainty analysis is new sources of data incorporated in this evaluation.

6.1.1 Constituents Retained for Groundwater Modeling

The 2014 Risk Assessment identified potential for groundwater risk to receptors that live up to a mile away from landfills and surface impoundments (U.S. EPA, 2014a). For the current assessment, the Agency retained only those constituents found to pose risk from unlined impoundments. These constituents are those that have the demonstrated potential to spread furthest at environmentally significant concentrations and so are most likely to pose concern closer to smaller CCRMU fills. The 2014 Risk Assessment did identify other contaminants of concern, but these were all associated with specific CCR or management scenarios not considered relevant to CCRMU fills (i.e., FGD waste, codisposal with coal refuse). While there may be potential for these other constituents to result in more localized impacts to groundwater, consideration of these additional constituents was not necessary to establish the potential for risk from CCRMU fills. Therefore this uncertainty is unlikely to affect the final conclusions of the risk assessment.

6.1.2 Lithium

Lithium was previously identified as a risk driver for unlined surface impoundments in the 2014 Risk Assessment (U.S. EPA, 2014a), but was not retained for modeling in the current assessment because of the limited number of LEAF samples and associated a lack of information on leachable content. The inability to fully model this constituent may result in an underestimation of risk to groundwater. Lithium is a highly mobile constituent previously identified as posing similar risks as molybdenum based on impoundment porewater data. Available LEAF data indicate that lithium and molybdenum can both leach at similarly high concentrations when managed dry in landfills. Thus, it is anticipated that modeled lithium risks for CCRMU fills would be comparable to those identified for molybdenum. The exact magnitude of this uncertainty is not known.

6.1.3 Leachate pH

EPA modeled leaching from CCRMU fills with distribution of leachate pH based on measurements of the natural pH (or "own pH") of individual ash samples analyzed with LEAF methods. Sampling of this pH distribution resulted in a median pH of around 10 across all model runs. This aligns with the median pH modeled in the 2014 Risk Assessment, which relied on measurements of pH from landfill leachate (U.S. EPA, 2014a). However, the broader distribution of pH values has a greater prevalence of acidic conditions than previously modeled in 2014 Risk Assessment. It is reasonable that the pH conditions in landfills and CCRMU fills can differ. Landfills can contain a mixture of different CCR types and other related waste streams, resulting in a different overall pH from that of individual CCR. Smaller CCRMU fills are more likely to consist of a single ash type. Thus, EPA determined it is most appropriate to consider the pH of individual ash samples, rather than broader landfill conditions. To better understand the impact of pH on modeled risks, EPA parsed the 90th modeled groundwater concentrations at 1,000 feet from the waste boundary into bins representing acidic (pH < 7) and basic (pH > 7) conditions. **Table 6-1** presents the results of this comparison. Values that exceed the selected risk criteria (i.e., cancer risk > $1{\times}10^{-5}$ or HQ > 1) are shown in **bold**.

Table 6-1. Modeled Risk for Different Leachate pH

Constituent	Acidic	Basic
Carcinogenic Effects		
Arsenic III	**$1{\times}10^{-4}$**	**$3{\times}10^{-4}$**
Arsenic V	**$1{\times}10^{-4}$**	**$3{\times}10^{-4}$**
Noncarcinogenic Effects		
Arsenic III	0.2	0.5
Arsenic V	0.1	0.3
Molybdenum	0.4	**20**
Thallium	**47**	**5.2**

This comparison shows that consideration of acidic leachate pH as low as 3.1 actually resulted in lower risks for most constituents. This is because the pH distribution does not include highly acidic conditions that are known to mobilize arsenic and other constituents. Only thallium had higher risks at an acidic pH. Thus, to the extent that basic pH conditions are more prevalent in the field, there is potential for the model to underestimate thallium risk to some degree. Yet thallium was still found to spread at concentrations of concern up to 1,000 ft away from the waste boundary under more basic conditions. Therefore, the magnitude of this uncertainty is considered to be small.

6.1.4 Chemical Speciation

The speciation of arsenic can alter the mobility of this constituent in the environment. Arsenic occurs most frequently in either a trivalent (arsenic III) or pentavalent (arsenic V) oxidation state, with arsenic III as the more mobile form. The speciation of arsenic can change during transport through the subsurface soil and groundwater based on the prevailing geochemistry. There is not sufficient data available on a national scale to model changes in oxidation state during transport, particularly where the pH and redox conditions of a leachate plume may further alter groundwater chemistry. To account for this uncertainty, EPACMTP was run twice for both valence states of arsenic. The results from the two model runs bracket the full range of possible risks. Actual risks for arsenic on a national scale are anticipated to fall somewhere within this range. However, EPA notes that the current assessment identified potential for risk to groundwater from the less mobile arsenic V species. Therefore, this uncertainty is unlikely to affect the final conclusions of the risk assessment.

6.1.5 Landfill Cover

It is possible some historical landfills have been closed in a manner more consistent with the existing CCR regulations than modeled. However, this is unlikely to change the overall conclusions of the risk assessment. This is because, regardless of the cover that is ultimately installed, higher leakage can occur throughout the active life of the unit when the landfill face is open and able to intercept more precipitation. This conclusion is reinforced by the fact that facility monitoring reports document that around 20% of currently active landfills have already triggered corrective action. Additionally, EPA has seen no evidence to suggest closure of older historical and inactive units has been consistently more protective than previously modeled. The Agency's previous review of state programs prior to 2015 found that oversight of these wastes and the overall protectiveness of particular programs varied widely and raised concerns about adequacy. For these reasons, EPA believes the approach to modeling national risks in the 2014 Risk Assessment is equally applicable to historical landfills.

EPA also believes the 2014 Risk Assessment accurately represents the risk potential that remains for units that were closed consistent with the 2015 CCR Rule. If the cover system is not adequately maintained after closure, degradation over time from human or animal activity, natural settling, freeze-thaw cycles, flooding and other extreme weather events, and other factors can result in greater leakage from the unit than designed. In some cases, groundwater monitoring may provide the only clear evidence the cap is not performing as designed. Thus, the 2014 Risk Assessment accurately describes the risks that can result if these units are not adequately maintained and monitored in line with current regulatory requirements.

6.1.6 Fill Conditions

EPACMTP requires a fixed source term to model leakage and so cannot track changes to a unit over time. There is little information available on the current condition of these fills. However, in the absence of routine maintenance, it cannot be assumed any fill will remain undisturbed due to some combination of natural processes (e.g., erosion, freeze-thaw cycling, differential settling) or anthropogenic activity (e.g., construction, excavation). Therefore, to understand the risk potential of these units in the absence of required maintenance, EPA assumed all CCRMU fills could become disturbed at some point. There is no information available that could be used to estimate the extent to which these fills may be disturbed. Therefore, EPA modeled the hydraulic conductivity of a disturbed fill as equivalent to that of the surrounding soil megatexture under the presumption that the ash would achieve a similar degree of natural compaction. This approach is considered to be reasonable, as there is substantial overlap in the range of reported conductivities for both fly and bottom ash (e.g., EPRI, 1993; Ramme and Tharanyil, 2013) and natural soils. This approach may overestimate the potential for long-term infiltration to some degree. For example, EPA is aware that some fly ash has the potential to self-cement when exposed to water, which would result in a lower conductivity. Yet, it is unclear how common it is for this type of ash to be placed in fills when it is a valuable commodity for use in concrete. Further, there is little information about the long-term performance of unamended ash left in the soil, particularly if that ash does not meet specifications for use in concrete. For these reasons, EPA believe the current modeling approach makes the best use of available information while remaining protective of human health.

6.1.7 Offsite Receptors

There is little information available about the specific locations of CCRMU fills. As a result, it is not possible to develop a probabilistic distribution of distances to the nearest offsite resident or model the potential for risk to these receptors. However, groundwater modeling with MODFLOW identified the potential for high-end plumes to extend approximately 3,000 feet (0.56 mile) from the waste boundary. EPA previously estimated that around 70% of the nearest residents identified in the 2014 Risk Assessment live within half a mile of a landfill (U.S. EPA, 2014a). Thus, to the extent that CCRMU fills tend to be located similar distances from the property boundary as disposal units, there is real potential for contamination to migrate offsite and for nearby receptors to be exposed. Further, there is potential for leakage from a fill to intersect with and exacerbate releases from any nearby disposal units or other fills, resulting in even greater risk from disposal units to offsite receptors than previously modeled. The inability to model exposure of offsite residential receptors to leakage from CCRMU fills will result in an underestimation of risk to some degree. However, the magnitude of this uncertainty is unknown.

6.1.8 Risks to Surface Water

The fact some contaminant plumes might discharge to surface water at a given site does not mean there is no potential for harm or no need for further action to account for impacts to nearby surface water bodies. Surface water bodies are large and highly interconnected systems that receive discharge from a diverse array of sources. EPA notes that the 2014 Risk Assessment modeled risks from each landfill and impoundment in isolation. However, facilities can have multiple disposal units located in close proximity, which may result in greater cumulative impacts to surface water than reported in the 2014 Assessment. There is also an unknown potential for multiple CCRMU fills to be located across the facility and further contribute to facility-wide discharge. Finally, there can be any number of other industrial sources located along the banks of the water body, each with their own associated discharges. If all facilities along the water body were allowed to freely discharge to surface water solely because no individual unit posed risk, the cumulative impacts to surface water could be severe. The 2015 CCR Rule addressed this potential risk by specifying corrective action must "remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible." 40 C.F.R. 257.97(b)(3). Thus, dilution of a groundwater plume into surface water could not be considered a presumptive remedy. This requirement is consistent with guidance for OLEM programs, which specify the need to prevent groundwater contamination above GWPS from contaminating other aquifers or environmental media (U.S. EPA, 2009c).

EPA reviewed model results for previously excluded impoundments to understand the potential for discharge of concentrations greater than GWPS to nearby surface water bodies. The Agency first combined and rearranged Equations J-1 and J-2 from the 2014 Risk Assessment, substituting parameters to obtain an equation solvable with only data reported in the EPACMTP Input/Output Database (**Appendix C**). The resulting **Equation 6-1** was then applied to back-calculate the average groundwater concentration for each constituent at the point of discharge to surface water.

$$(6\text{-}1) \qquad \bar{C}(X = X_{SW}, t) = \frac{(\text{SWFlux})}{(BaseF)(Plume\_Width)\left(10^6 \frac{m^2}{km^2}\right)}$$

Where:

C	=	Groundwater concentration at $X = X_{SW}$ (g/m^3 or mg/L);
X	=	Specified distance downgradient of unit edge (m);
X_{SW}	=	Distance of stream from the downgradient unit edge (m);
t	=	Time of peak discharge (yr);
SWFlux	=	Averaged constituent mass loading to surface water (g/yr);
BaseF	=	Baseflow per unit length of stream (km^2/yr); and
Plume_Width	=	Width of impacted groundwater discharging to stream (m).

Equation 6-1 was applied to each model run for previously excluded surface impoundments. This was done for constituents previously found to pose groundwater risk from unlined impoundments. Calculated concentrations were then compared against relevant GWPS to calculate a percentage of model runs where average discharge exceed standards. **Table 6-2** lists the percentage of model runs for each contaminant that the average groundwater concentration over the area of discharge exceeded GWPS. Similar calculations were not done for lithium because benchmarks for ecological exposure to surface water or sediment and uptake by fish were not identified for lithium in 2014. Because a corresponding risk could not be calculated, SWFlux was not modeled at the time.

Table 6-2. Impoundment Exceedance of GWPS at Surface Water Boundary

Constituent	All Exceedance (%)	Unlined Exceedance (%)
Arsenic (III)	19.8	31.1
Arsenic (V)	5.5	8.9
Molybdenum	35.9	55.1
Thallium	1.3	2.1

Based on these results, a substantial fraction of these impoundments have the potential to discharge concentrations above GWPS to surface water. However, EPA notes these percentages are based on an average concentration over the entire area of discharge. If a discharge is broad and has wide regions of lower concentrations around the periphery, it can mask evidence of high concentrations closer to the center of the plume. As a result, it is expected the percentage of units that can result in discharges that exceed GWPS is somewhat higher than reported above.

6.1.9 Alternate Contaminant Sources

As part of the current risk assessment, EPA considered whether there might be a quantity of CCR small enough to pose no reasonable risk of adverse impacts to groundwater. Such an analysis might be feasible for individual placements of CCR. However, management of CCR onsite at electric utilities is considered unique from management offsite in part because there is far greater potential for placement of CCR at multiple discrete locations, both across the facility and in close proximity. The presence of unidentified accumulations of CCR are a particular concern for groundwater monitoring around currently regulated disposal units. There is presently limited data available on the size and extent of placement across these facilities and the available record indicates that documentation of past placement has not always been maintained. As such, EPA does not believe it is possible to compile a reliable record of such placements in the absence of further facility inspection and reporting.

The regulatory framework of the 2015 CCR Rule does not capture contamination arising from CCRMU (disposal units or fills). Therefore, at present, both previous and ongoing leakage from such placements can affect groundwater quality at wells installed around monitored CCR units without running afoul of the rule. The statistical methods used to identify statistically significant increases and statistically significant levels are formulated based on the assumption there is a common background that would be found both upgradient and downgradient of a CCR unit, provided that unit has not leaked. However, this assumption would not be valid if background wells have been affected by leakage from disposal of CCR further upgradient, which can leak all the same constituents as currently regulated units. If concentrations in background wells increase due to leakage from disposal further upgradient, then the resulting characterization of background would not provide an accurate baseline for comparison against compliance wells. Any leakage from the regulated CCR unit would then need to progress even further and faster than from the upgradient disposal to be distinguished from the skewed background. At a minimum, this could delay identification of a release.

Leakage from CCR disposed further upgradient does not have to constitute a release by itself to confound groundwater monitoring at nearby CCR units. Elevated levels of the common ions and other constituents listed on Appendix III could still delay or prevent a monitored CCR unit from entering into assessment monitoring. Further, leakage from smaller sources can still contribute to overall risk by supplementing leakage from regulated CCR units, resulting in a larger downgradient plume than would have otherwise occurred.

EPA previously identified potential for risk to human health and the environment from operating landfills and surface impoundments. If identification of a release from these currently regulated CCR units is delayed or prevented by leakage from upgradient disposal, then previously identified risks from these CCR units to nearby receptors would remain. The longer that contamination is allowed to spread, the greater potential that full remediation will not be feasible as a result of complex site geology or other factors. Therefore, just because a particular CCRMU might not be expected to trigger corrective action in isolation does not mean there is no potential for concern. The Agency is unable to reliably identify a minimum quantity of CCR at which interference with groundwater monitoring is unlikely. This would depend on a number of factors such as the quantity of ash, the number and proximity of these placements, and the relative timeframe over which each has leaked. This represents a major source of uncertainty in the current assessment.

6.1.10 Bulk Activity

COALQUAL includes data on coal samples as-mined. These samples will all undergo processing and combustion prior to disposal as coal ash, both of which may alter the overall composition of the sample. Therefore, EPA considered the potential for these processes to result in either an over or underestimation of bulk contaminant concentrations in the resulting ash.

COALQUAL reports the weighted average of concentrations across multiple benches to provide an estimate of coal quality across the full bed and incorporate any vertical variation in coal quality. These full-bed averages provide estimates of overall coal quality, but there is potential that some portions of the bed may not ultimately be mined or delivered due to lower quality coal or other economic factors. Such selective mining practices might avoid some of the more pyrite- or clay-rich portions of the coal bed associated with higher concentrations of some contaminants. EPA anticipates that sampling of the COALQUAL database weighted toward states and counties with the highest production rates will blunt effects of this uncertainty to some degree. These represent the most productive regions of the country with large reservoirs of salable coal, making it less likely that poor quality deposits will represent a majority of the sampled bed. There is also no evidence such mining practices consistently prevent mining of coal with higher contaminant concentrations. Specifically, empirical measurements of CCR bulk content demonstrate the potential for concentrations of a similar magnitude as estimated by COALQUAL. As a result, the magnitude of this uncertainty is believed to be small.

Coal naturally contains impurities, such as pyrite and quartz, which can contribute to undesirable residuals (i.e., ash) and air pollutants (e.g., sulfur dioxide) during combustion. Coal cleaning is the process by which impurities are removed to the extent practicable from coal prior to combustion. Coal cleaning is a longstanding practice because it can increase the heating value and improve fuel consistency. Today it is employed just as often to reduce emissions of sulfur dioxide and other air pollutants (U.S. EPA, 1977). Although a wide array of cleaning methods have been proposed, the most common approach is still washing (NRC, 2007). Washing is accomplished by first crushing the coal to expose impurities that are not chemically bound within the coal. Afterward, the coal is placed in water, where the impurities separate from the coal based on differences in specific gravity. A secondary benefit of washing is it can greatly reduce concentrations of certain trace elements closely associated with the impurities, particularly sulfur minerals. However, washing also reduces the overall amount of CCR generated by combustion. For example, one study found of eastern coals found an average 70% reduction in the residual ash remaining after cleaning (EPRI, 1998). Thus, reduction in constituent mass from cleaning will be counterbalanced to some degree by concentration back into a smaller amount of ash. EPA identified one study that compared concentrations of raw and clean coal on an ash basis (USGS, 2021). **Table 6-3** presents a comparison of reported thorium and uranium concentrations from coal beds before and after cleaning. Based on this comparison, typical ash from cleaned coal tends to have similar or higher concentrations of these elements. Thus, this uncertainty is considered unlikely to result in an underestimation of risk.

Table 6-3. Bulk Content of Raw and Clean Coals on Ash Basis (mg/kg).

Sample Number	Field Sample ID	Coal Bed	Sample Type	Thorium	Uranium	Median Thorium	Median Uranium
45	BR Dan 1-2	Danville #7	Raw Coal	16.8	6.1	16.8	6.1
46	BR Dan 4	Danville #7	Clean coal	17.8	22.9	17.8	22.9
26	IL 23-ER 1D	De Koven	Raw coal	7.8	5.4	7.8	5.4
27	IL 24-ER 2D	De Koven	Clean coal	15.5	12.0	15.5	12.0
14	IL 11-SM 1H	Herrin #6	Raw coal	13.0	10.4		
21	IL 18-BH 2H	Herrin #6	Raw coal	17.9	8.4		
35	IL 32-MM 1H	Herrin #6	Raw coal	13.8	7.2	13.0	7.2
39	IL 36-WH 1H	Herrin #6	Raw coal	11.6	4.9		
1	IL-1	Herrin #6	Raw Coal	5.6	5.2		

Table 6-3. Bulk Content of Raw and Clean Coals on Ash Basis (mg/kg).

Sample Number	Field Sample ID	Coal Bed	Sample Type	Thorium	Uranium	Median Thorium	Median Uranium
8	IL-8	Herrin #6	Final product	1.8	7.6	16.0	23.1
15	IL 12-SM 2H	Herrin #6	Clean coal	17.2	22.1		
20	IL 17-BH 1H	Herrin #6	Clean coal	11.8	4.7		
33	IL 30-PM 2H	Herrin #6	Clean coal	15.9	24.0		
36	IL 33-MM 2H	Herrin #6	Clean coal	16.1	17.2		
40	IL 37-WH 2H	Herrin #6	Clean coal	18.3	78.1		
42	IL 39-LG 2H	Herrin #6	Clean coal	13.2	24.6		
24	IL 21-CP 1M	Murphysboro	Raw coal	24.5	15.5	24.5	15.5
25	IL 22-CP 2M	Murphysboro	Clean coal	25.0	14.3	25.0	14.3
17	IL 14-V 1S	Springfield #5	Raw coal	10.4	7.7	13.2	8.2
22	IL 19-BH 1S	Springfield #5	Raw coal	15.9	8.7		
18	IL-15-V 2S	Springfield #5	Clean coal	11.7	14.5	15.4	11.8
23	IL 20-BH 2S	Springfield #5	Clean coal	19.0	9.1		

Coal combustion occurs at extremely high temperatures that can exceed 1,000 °C (1,832 °F). These temperatures are higher than the boiling points of many trace constituents. As a result, certain constituents can vaporize from the coal during combustion and escape from the boiler along with the flue gas. However, flue gas will not remain at such a high temperature. For example, at a plant equipped with an FGD unit, the flue gas will generally exit at temperature between 55 to 70°C (130 to 160°F) (NETL, 2016). That is below the boiling point of most elements and so it is expected the majority of constituent mass will condense out onto ash particulates and be captured in pollution control devices, such as baghouses. Therefore, EPA assumes the effects of volatilization on whole ash concentrations are negligible for the constituents considered in this evaluation. However, this may not be the case for highly volatile constituents, such as boron, mercury, and selenium.

Coal combustion is often not a 100% efficient process, resulting in some amount of unburnt carbon mass, commonly referred to as loss on ignition (LOI), remaining in the residual ash. EPA could not explicitly incorporate LOI in calculations because that data is not available in COALQUAL. The presence of unburnt carbon would increase the overall mass of ash generated and may result in lower concentrations than calculated. Available estimates indicate that LOI for most ashes falls within a narrow range and is often less than 10% on a mass basis (Heidrich et al., 2013). That amount of unburnt carbon, while potentially significant from a chemical perspective, is expected to amount to a rounding error for calculation of mass concentrations. Additionally, EPA relied on the reported "GSash" to represent ash yield for the calculation of ash bulk content in part because it reflects combustion at a lower temperature and results in greater yield than "STDash." This approach is expected to indirectly reflect the additional mass of ash resulting from LOI to some extent. As a result, the magnitude of this uncertainty is believed to be small.

To further understand the potential, EPA compared the bulk activity of both thorium and uranium calculated from COALQUAL with measurements of fly ash identified from government and industry reports, as well as peer-reviewed journal articles (**Appendix B**). Summary statistics were calculated after averaging samples from each study determined to represent the same facility burning the same coal source. **Table 6-4** summarizes this comparison of calculated and measured bulk content. Upper bound values represent a maximum reported value unless otherwise indicated.

Table 6-4. Comparison of CCR Bulk Activity Data.

Constituent	Data Source	Sample Count	50th Percentile (pCi/g)	90th Percentile (pCi/g)	Upper Bound (pCi/g)
Uranium-238 / Radium-226	COALQUAL[1]	6,104	3.6	7.8	21
	Appendix B Uranium-238	199	3.4	6.8	37
	Appendix B Radium-226	160	4.2	8.1	28
Thorium-232 / Radium-228	COALQUAL[1]	5,836	2.2	4.1	7.3
	Appendix B Thorium-232	108	2.4	5.4	24
	Appendix B Radium-228	61	2.1	3.1	3.8

NR – Not Reported

1) Upper bound is 99th percentile to exclude outlier values for purposes of comparison.

This comparison indicates there is generally good agreement between the values calculated from COALQUAL and empirical measurements reported in the broader literature. Values calculated from COALQUAL fall in the narrow range between those reported in the literature for the parent isotopes and radium progeny. This provides confidence the activities calculated from COALQUAL are reasonable. Use of these data would not result in substantially different conclusions about potential for exposure compared to other available data. EPA did not identify a strong regional influence on the variability of the calculated activities. The average activities of the COALQUAL samples used in this analysis from eastern and western production states without any further weighting are 2.7 vs 2.7 pCi/g for Th-232 and 4.7 vs 5.2 pCi/g for U-238. Thus, there is no indication that further refinement of the sampling methodology would yield substantially different results.

Based on these results, EPA sampled COALQUAL for other constituents evaluated in the current assessment using the methodology described in **Section 5 (CCRMU Fill Soil Risk).** EPA compared the calculated values with empirical measurements of fly ash from the 2014 Risk Assessment (U.S. EPA, 2014a) and other literature sources to understand how calculated values compared for other relevant constituents. Values were not calculated for thallium because the high number of nondetects in COALQUAL database for this constituent. Insufficient empirical data was identified to conduct a comparison for lithium. **Table 6-5** summarizes the results of this comparison. Upper bound values represent a maximum reported value unless otherwise indicated.

Table 6-5. Comparison of CCR Bulk Concentration Data.

Constituent	Data Source	Count	50th Percentile (mg/kg)	90th Percentile (mg/kg)	Upper Bound (mg/kg)
Arsenic	COALQUAL[1]	6,102 Samples	35	251	1,197
	U.S. EPA (2014a)	36 Facilities	60	211	980
	EPRI (2008)	NR	50	NR	NR
Molybdenum	COALQUAL[1]	5,820 Samples	15	50	150
	U.S. EPA (2014a)	16 Facilities	14	62	260
	EPRI (2011)	81 Samples	16	NR	236

NR – Not Reported
1) Upper bound is 99th percentile to exclude outlier values for purposes of comparison.

These values also show general agreement across the distribution of concentrations for arsenic and molybdenum. This provides some confidence the concentrations calculated from COALQUAL are reasonable. Use of these data would not result in substantially different conclusions about the magnitude of potential exposures compared to other data sources. EPA did identify strong regional influence on the variability of calculated concentrations for arsenic. The average concentration of COALQUAL samples used in this analysis from eastern and western production states without any further weighting are 47 vs 310 mg/kg. As a result, there may be potential for calculated values to shift somewhat in response to further refinement of the sampling methodology. As a result, EPA does not further rely on COALQUAL at this time to draw conclusions about these constituents at this time.

6.1.11 Coal Combustion Residual Type

The bulk activity calculated with the COALQUAL database represents the whole ash generated by combustion, which is a mixture of fly ash and bottom ash or boiler slag. It is not possible to further break out the contributions from each type of CCR. In a typical boiler, the ratio of generated ash types falls somewhere around 80% fly ash to 20% bottom ash (U.S. EPA, 1981). This ratio has remained relatively consistent. Recent statistics on national generation rates show that fly ash accounts for 74% of the annual mass of these three ash types (ACAA, 2022). Thus, the whole ash can be understood as predominantly fly ash.

There are potential differences in the composition of fly ash and other CCR types that may result from differences in the volatility of individual constituents. As previously noted, more volatile constituents have a greater tendency to escape from the boiler and settle out onto fly ash. This may result in higher concentrations in fly ash compared to bottom ash and boiler slag. Generally, there are far less data available on constituent concentrations present in and released from bottom ash and boiler slag. This may be due in part to the smaller quantities of ash generated. The most recent

American Coal Ash Association (ACAA) report indicates that coal combustion across the United States results in 74% fly ash, 23% bottom ash, and 3% boiler slag (ACAA, 2022). Thus, from a waste management perspective, fly ash has historically been a dominant concern.

In 2014, EPA did not have sufficient data on bottom ash or boiler slag to separately model these CCR types. This was not considered a major source of uncertainty because of the prevalence of co-management of different CCR types in landfills and impoundments. Since then, the Agency has not identified any substantial new sources of data to further inform groundwater modeling for these CCR types. As a result, EPA was again unable to separately model these CCR types as part of the current evaluation. However, it is assumed that there is similar potential for co-management in CCRMU fills.

Despite the lack of waste characterization data for bottom ash and boiler slag, the monitoring data that the 2015 CCR Rule required facilities to report provides ample evidence that these two CCR types have similar potential to contaminate groundwater based on facility monitoring reports as of October 2023. A total of 26 of 81 units identified as dedicated to bottom ash have initiated corrective action (32%). A total of 5 of 13 units identified as dedicated to slag have initiated corrective action (38%). These rates of are comparable those for units that manage other or mixed ash types (41%). Thus, it appears that any differences in the composition of bottom ash and boiler slag are not substantial enough to prevent groundwater releases. As a result, the magnitude of the uncertainty as it related to groundwater exposure is considered low.

As part of the Agency's regular review of the available literature, EPA did identify a number of sources that characterized the bulk activity of bottom ash. Altogether, these sources are considered sufficient to characterize the anticipated bulk activity of this CCR type. **Table 6-6** provides a comparison of summary statistics for Ra-226 activity in fly and bottom ash. Summary statistics were calculated after averaging samples from each study that were collected from a single source. The underlying raw data are made available in **Appendix B.** Little data was identified for Ra-228 in bottom ash and so a similar comparison could not be conducted.

Table 6-6. Comparison of Fly and Bottom Ash Bulk Activity.

Constituent	Ash Type	Sample Count	50th Percentile (pCi/g)	90th Percentile (pCi/g)
Radium-226	Fly Ash	160	4.2	8.1
	Bottom Ash	42	4.4	8.8

Based on these data, there is no indication the Ra-226 activity of bottom ash will differ substantially from that of fly ash. Additionally, it has been previously reported that both thorium and uranium are expected to be similarly distributed between bottom ash and fly ash (Clarke and Sloss, 1992). Therefore, EPA concludes the use of COALQUAL data to also represent the bulk activity of bottom ash is appropriate. EPA is not aware of any reason the overall composition of boiler slag would differ dramatically from that of bottom ash. As a result, the magnitude of the uncertainty as it relates to radiation exposure is considered low.

6.1.12 Radiation Model

The Agency considered both the RESRAD Onsite model and the EPA PRG Calculator for use in the current risk assessment to evaluate the risks from exposure to radiation. RESRAD was initially considered because it provides greater ability to directly adjust the model parameters that control radon fate and transport through subsurface soils. However, because it was found that emanation of radon from CCR is indistinguishable from background soils, the PRG Calculator was selected for ease of use and programmatic consistency. As previously documented in **Section 5.1**, the PRG Calculator has undergone extensive review and validation. To better understand the potential for this selection to affect modeled risk, EPA compared the results of the two models for a single scenario. The Agency considered an exposure scenario of direct exposure to gamma radiation and incidental ingestion of soil for a resident living on top of an uncovered fill containing 4.0 pCi/g Th-232 and 7.8 pCi/g U-238 in equilibrium with their respective decay chains. Under this scenario, both RESRAD and the PRG Calculator return a risk of 9×10^{-4}. Given the agreement between these results, EPA concludes the uncertainty associated with model selection is likely to be minimal.

6.1.13 Additional Soil Exposure Pathways

The current assessment of soil exposure focused on incidental ingestion of soil and direct exposure to gamma radiation because these are the two most direct exposure routes. There can be potential for additional exposure through other routes if CCRMU fills are disturbed. Not all of these other pathways are likely to be major contributors to overall risk. For example, based on default PRG Calculator inputs, the risk from inhalation of ash particles that become suspended in the air is three orders of magnitude less than from external exposure to gamma radiation. Therefore, consideration of this pathways is not expected to impact overall risk estimates. Other pathways have potential to result in greater risk but depend on a number of additional factors that introduce further variability and potential uncertainty into exposure estimates on a national scale. For example, based on default PRG Calculator inputs, the risk from consumption of a range of produce grown on impacted soil may be up to an order of magnitude greater than external exposure to gamma radiation. However, actual risk at a site will depend on a number of factors, such as the types of crops grown, the consumption rate for each crop, and how much of the diet is sourced from the garden. There is little data available for many of these factors to support modeling on a national scale and it is also unlikely this exposure scenario would occur at every site. The lack of quantitative evaluation for these additional pathways may result in some underestimation of risk. The magnitude of this uncertainty is unknown. However, risks associated with the more direct exposure pathways were already found to be substantial enough to warrant action. Therefore, this uncertainty is unlikely to alter the overall conclusions of the current assessment.

6.1.14 Background

EPA generally only considers contributions from disposed wastes to risk when conducting national risk assessments under RCRA. Background concentrations may contribute to risk when present and may sometimes be higher than the concentrations modeled in the risk assessment. Although constituent concentrations in undisturbed environmental media can be highly variable, they are often relatively low in concentration. As a result, consideration of these concentrations would generally have no impact on the overall conclusions of a national-scale risk assessment. Instead, consideration of background concentrations is more appropriate on a site-specific basis when risk managers are determining the need for and scope of corrective action. EPA recognizes that a focus on background is more common for discussion of radioactivity, particularly when providing context for the associated risks to the broader public. The 50th and 90th percentiles of Ra-226+228 in background surface soil are estimated to be 2.1 and 3.0 pCi/g (ORNL, 1979). EPA has found that activities of nearly half of fly and bottom ashes are likely to be greater than the standard of 5 pCi/g Ra-226+228 above background soil, which has been adopted as an applicable or relevant and appropriate requirement (ARAR) for some cleanups under Superfund and some state programs (U.S. EPA, 1998). Additionally, EPA has found that high-end Ra-226+228 activity in CCR has the potential to be around an order of magnitude higher than background soil. Thus, there is clear potential for mixing of CCR with soil to further increase any existing risk from background. Mixing of small quantities of CCR with soil may not result in total soil activity above the ARAR. For high-end CCR activity, this may require a roughly equal mixture of soil and ash. However, that does not mean that lower accumulations pose no concern. EPA has shown that unrestricted exposure to the high-end activity found in CCR can result in a cancer risk approaching 1×10^{-3}. Therefore, smaller accumulations in surface soil can still result in risks within the range EPA considers for regulation. As such, EPA has identified an ARAR of 5 pCi/g as equally applicable to subsurface contamination that may be disturbed at some point in the future and concluded that "it would not generally be appropriate to allow backfilling with material with concentration higher than 5 pCi/g." Therefore, further consideration of background is unlikely to alter the conclusions of the current assessment.

6.2 Sensitivity Analyses

Sensitivity analyses identify the parameters that exert the greatest influence on modeled risks. These analyses provide further insight as to whether specific waste management scenarios can result in risks substantially different than those modeled nationally. EPA relied on the findings of these analyses to draw additional conclusions about the potential risks associated with CCR management and to refine the scope of its proposed regulatory action.

6.2.1 Central Tendency Exposure for Groundwater

Consistent with EPA's long-standing practice under RCRA (as well as other agency programs), an RME individual provides the principal basis for evaluating potential human health risks. As such, the focus of groundwater modeling with MODFLOW was the risk to this RME receptor. However, EPA also considers moderate, central tendency (CTE) exposures to provide broader understanding of the overall distribution of risk. Such information can provide useful information that can guide decision-making, such as prioritization of resources for cleanups across different sites. Therefore, EPA conducted an additional sensitivity analysis to evaluate the risks for a CTE individual from the high-end concentrations previously discussed in **Section 4.4**.

EPA updated the concentrations benchmarks used with MODFLOW to reflect a CTE scenario based on the most recent available data on median receptor characteristics and behavior from the 2011 Exposure Factors Handbook (U.S. EPA, 2011) for tap water ingestion rate (Table 3-33) and residence time (Table 16-88). This resulted in values for an adult receptor of 1 L/day for tap water ingestion and 9 years for residence time. EPA compared the CTE benchmark to the average concentration of arsenic V over the full volume of the plume at different points in time. This comparison identified a peak risk of 2×10^{-5} averaged over a volume of 32 Mgal and a risk of 9×10^{-6} averaged over a peak volume of 147 Mgal. A comparison of the RME and CTE risks for arsenic V associated with concentrations averaged over the volume of high-end plumes is presented in **Table 6-7**. Values that exceed a cancer risk of 1×10^{-5} are shown in **bold**. This indicates the high-end concentrations resulting from these units can also pose risk within the range EPA typically considers for regulation for a substantial portion of an exposed population.

Table 6-7. Comparison of RME and CTE Risk for High-End Groundwater Concentrations

Constituent	Groundwater Volume (Mgal)	RME Risk	CTE Risk
Arsenic V	32	$\mathbf{1\times10^{-4}}$	$\mathbf{2\times10^{-5}}$
	147	$\mathbf{7\times10^{-5}}$	9×10^{-6}

6.2.2 De Minimis Placements

In Section 4 (CCRMU Fill Groundwater Risk), EPA modeled groundwater concentrations at the boundary of smaller CCRMU fills to understand the potential for exceedance of GPWS that would trigger corrective action at landfills. On the whole, this analysis identified the potential for both moderate and high-end groundwater concentrations of molybdenum to exceed GWPS. Given that these results reflect the full range of evaluated fill sizes, EPA conducted further sensitivity analysis to better understand whether there is an amount below which there is no reasonable probability of adverse impacts to groundwater quality. To better understand the relationship of tonnage and modeled risk, EPA first organized all the individual model runs from the smallest to largest tonnage and binned the runs in increments of 2,000 runs (i.e., 1-2000, 2001-4000, etc.). This approach aims to identify broader trends across model runs while minimizing the range of tonnages summarized in each data point. A running 90th percentile was calculated for both the tonnage and risk for each group of samples. **Figure 6-1** presents the results of this review for molybdenum, which was found to exceed GWPS by the largest margin out of the modeled constituents, along with the best-fit trendline and associated 95th percentile confidence interval.

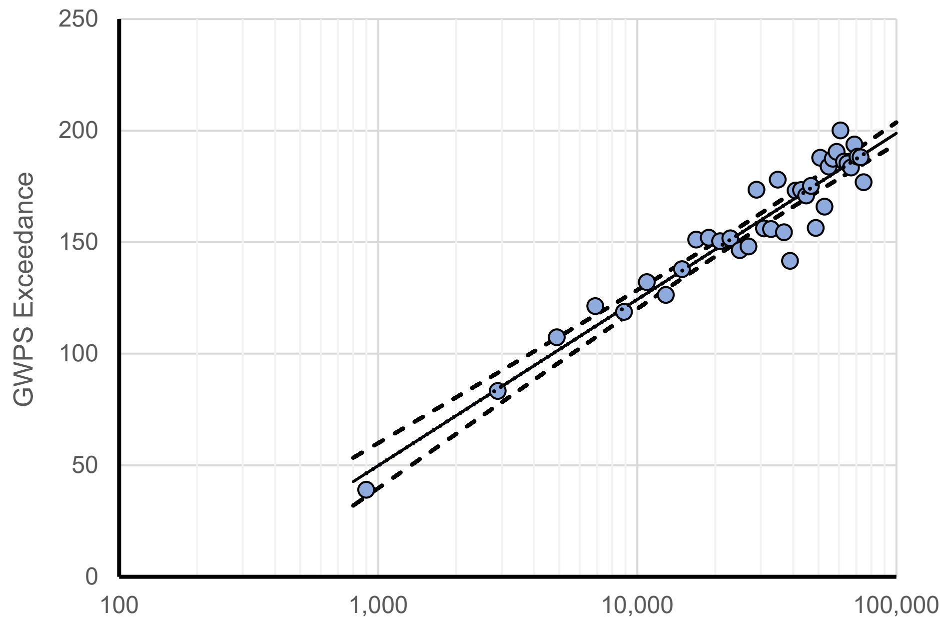


Figure 6-1. Magnitude of molybdenum GWPS exceedance as function of tonnage.

This graph shows there is a trend of decreasing groundwater concentrations along with decreasing tonnage. However, there remains potential for exceedance of GWPS at the waste boundary below 1,000 tons. EPA did not attempt to summarize results for tonnages lower than that because of the small number of runs conducted below that amount, which amount to about 1% of all model runs. As can be seen in the figure, there is already a fair amount of variability among the runs as plotted. Parsing the smaller number of runs below 1,000 tons could lead to erroneous conclusions because the smaller number of runs would allow the variability of individual runs to exert even greater influence on calculated summary statistics, leading to less reliable values. Nor did EPA extrapolate from plotted data to identify a lower mass limit below which no exceedances are expected. The graph provides strong evidence of a general magnitude of exceedances and existence of broader trends, but there remains uncertainty about the exact shape of the curve. For example, each data point on the curve summarizes results for a range of tonnages, with the very first ranging from 1 to 921 tons. With more model runs, that range could be further shrunk to provide a more precise estimate around a specific tonnage. Such refinement would be expected to shift the overall curve; however, the associated magnitude and direction of this shift is not known. Nor is it known how many additional model runs would be needed to support identification of a lower limit. Thus, EPA does not draw any final conclusions about the potential for adverse impacts from placements less than around 1,000 tons.

6.2.3 Additional Exposure Pathways

In **Section 5 (CCRMU Fill Soil Risk)**, EPA evaluated the risks associated with CCRMU fills assuming a scenario where the fills remained covered by some amount of soil. However, there is no guarantee that any form of cover currently in place will be maintained into the future in the absence of land use restrictions or requirements for routine maintenance. Mixing of CCR with surface soil will result in increased exposures not only to radiation, but also to other chemical constituents present. There is substantial uncertainty about the degree of mixing that will occur at a national scale. Thus, EPA designed this sensitivity analysis to consider how risks would change as the quantity of ash mixed with surface soil increases.

To calculate cancer risk, EPA drew health-based benchmarks for ingestion and direct gamma exposure from both Regional Screening Level (RSL) Calculator for arsenic[16] and PRG Calculator for Th-232 and U-238 decay chains. The arsenic benchmark is based on default exposure for adult incidental ingestion. The Th-232 and U-238 benchmarks for are based on the same exposure scenario defined in **Section 5** with the exception of no soil cover. The benchmarks corresponding to 1×10^{-5} risk for residential exposures were 6.77 mg/kg arsenic, 0.113 pCi/g Th-232, and 0.145 pCi/g U-238. EPA first applied these benchmarks to calculate the risk associated with undiluted exposure to CCR. For arsenic, EPA used summary statistics for fly ash from the 2014 Risk Assessment summarized in **Table 6-5** to identify the 90th and 50th concentrations. For radionuclides, EPA calculated a combined Th-232 and U-238 risk for each individual sample from the COALQUAL database and then calculated an overall 90th and 50th percentile risk based on same national sampling of the database as described in **Section 5**. Finally, EPA scaled these risks based on different degrees of mixing with the surface soil. **Figure 6-2** depicts the risk from CCR as it becomes an increasing fraction of the overall surface soil.

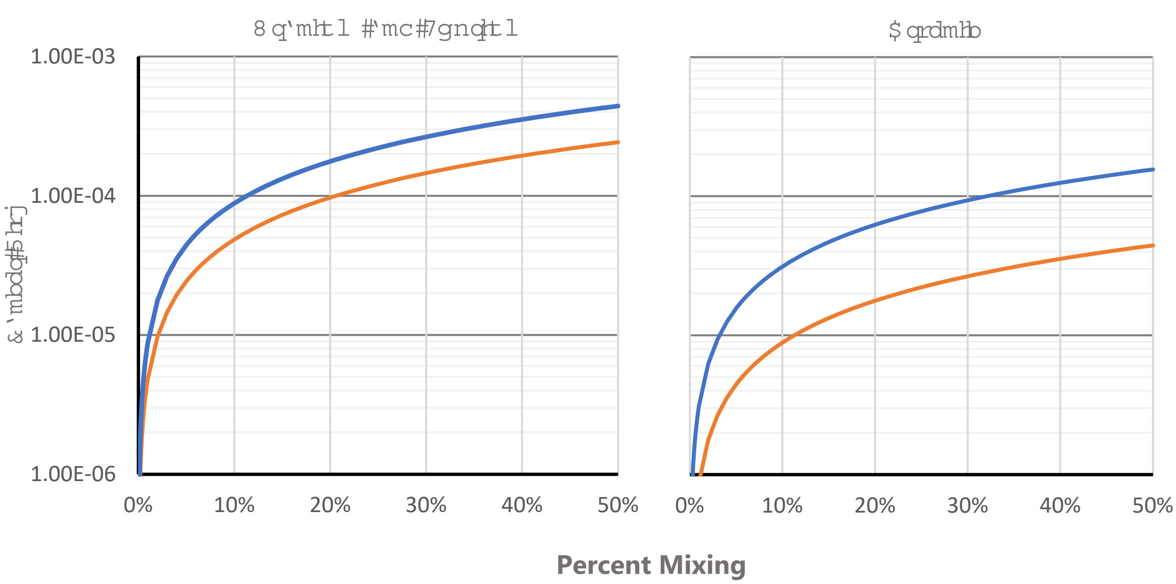


Figure 6-2. Human health risk from various degrees of ash mixing.

16) See: https://www.epa.gov/risk/regional-screening-levels-rsls

For radionuclides, cancer risks above 1×10^{-4} are possible for residential receptors with mixing of more than 11% for 90th percentile activity and 21% for 50th percentile activity. For arsenic, cancer risks above 1×10^{-4} are possible with mixing of more than 33% for 90th percentile concentration, but would not occur at any degree of mixing for 50th percentile concentration. Agency policy is to evaluate the risks from radionuclide exposures the same as for chemical contaminants (U.S. EPA, 2014c). Therefore, the cancer risks from concurrent exposure to radionuclides and arsenic are treated as additive. EPA did not calculate a cumulative risk here because the different data sources used to characterize arsenic and radionuclides levels do not allow for a one-to-one comparison. However, given the differences observed in the graphs, consideration of cumulative risk is expected to reduce the mixing required to exceed a risk of 1×10^{-4} by a few percentage points at most. Thus, cancer risks are driven generally by exposure to radionuclides and particularly by isotopes of radium and their immediate decay products.

Natural background soils can also contain radium at levels that pose risk. However, the activity of CCR has been found to be substantially higher. For example, the 90th percentile radium activity in background surface soil is estimated to be 3.0 pCi/g, with roughly equal contributions from the Ra-226 and Ra-228 (ORNL, 1979). After subtracting this background from the estimated 90th percentile activities in CCR of 7.8 pCi/g Ra-226 and 4.0 pCi/g Ra-228, it would require closer to 15% mixing to result in an incremental increase in cancer risk of 1×10^{-4}. This confirms that further consideration of background would not alter the overall conclusions of this analysis. It is not acceptable for waste disposal to substantially add to potential risk solely because background risks may already be elevated.

EPA separately considered a CTE scenario for radiation based on the most recent available data on median receptor characteristics and behavior from the 2011 Exposure Factors Handbook (U.S. EPA, 2011) for soil and dust ingestion (Table 5-1) and residence time (Table 16-88). This resulted in values for an adult receptor of 50 mg/day for soil and dust ingestion and 9 years for residence time. The benchmarks associated with this scenario are 0.333 pCi/g Th-232 and 0.445 pCi/g U-238, approximately a factor of three higher for each compared to the RME scenario. Changes in these values are driven primarily by differences in residence time. This would result in a risk of 1×10^{-4} occuring at mixing closer to 33% for 90th percentile activity. Thus, similar risks could be possible for a substantial fraction of the population at even lower mixtures.

6.2.4 Additional Ecological Exposures

In the previous sensitivity analysis, EPA evaluated the risks to human health associated with CCR mixed with surface soil. However, commenters raised scenarios in which other sensitive receptors may be present. Specifically, some commenters stated that facilities may become nature preserves. Therefore, EPA conducted an analysis of soil mixing for ecological exposures in the same manner as previously discussed for human exposure to arsenic. This analysis considered all constituents with available ecological soil screening levels (Eco-SSLs) (U.S. EPA, 2005a). These benchmarks represent concentrations of contaminants in soil that are protective of ecological receptors derived separately for four groups of ecological receptors that commonly come into contact with soil or ingest biota that live in or on soil (i.e., plants, soil invertebrates, birds, and mammals). EPA selected the benchmark for the most sensitive receptor among these groups for use in this analysis. The Agency drew concentration data for fly ash from the 2014 Risk Assessment for comparison (U.S. EPA, 2014a). **Table 6-8** summarizes the risk from fly ash at 90th and 50th percentile concentrations as it becomes an increasing fraction of the overall surface soil. Constituents that exceed associated benchmarks with less than 10% mixing are highlighted in **bold**.

Table 6-8. Ecological Risk from Various Degrees of Ash Mixing.

Constituent	Eco-SSL (mg/kg)	Benchmark Source	50th Percentile		90th Percentile	
			Concentration (mg/kg)	Mixing (%)	Concentration (mg/kg)	Mixing (%)
Antimony[1]	0.27	U.S. EPA (2005b)	5.0	**5%**	39	**1%**
Arsenic	18	U.S. EPA (2005c)	60	30%	211	**9%**
Barium	330	U.S. EPA (2005d)	472	70%	6,067	**5%**
Beryllium	21	U.S. EPA (2005e)	10	> 100%	24	88%
Cadmium	0.36	U.S. EPA (2005f)	1.1	33%	8.1	**4%**
Chromium	26	U.S. EPA (2008)	82	32%	181	14%
Cobalt	13	U.S. EPA (2005g)	52	25%	99	13%
Copper	28	U.S. EPA (2007a)	82	34%	331	**8%**
Lead	11	U.S. EPA (2005h)	53	21%	140	**8%**
Manganese	220	U.S. EPA (2007b)	180	> 100%	369	60%
Nickel	38	U.S. EPA (2007c)	93	41%	263	14%
Selenium	0.52	U.S. EPA (2007d)	5.7	**9%**	22	**2%**
Silver	4.2	U.S. EPA (2006)	1.3	> 100%	4.0	> 100%
Vanadium	7.8	U.S. EPA (2005i)	312	**3%**	521	**1%**
Zinc	46	U.S. EPA (2007e)	144	32%	600	**8%**

1) One extreme outlier of 1,370 mg/kg was identified as more than an order of magnitude higher than any other reported value and excluded from calculations.

This analysis indicates potential for risk to sensitive ecological receptors from antimony, selenium, and vanadium with mixing of less than 10% for 90th and 50th percentile concentrations. Additional constituents with potential for risk with mixing of less than 10% for just the 90th percentile include arsenic, barium, cadmium, copper, lead, and zinc. As a result, these constituents are considered the most likely to drive further evaluation of ecological risk at sites where CCR has been disposed.

Eco-SSLs are screening benchmarks intended to protect sensitive ecological receptors. Unlike for human receptors, where Census and other population statistics can be used to locate receptors with some accuracy, site-specific surveys are often needed to confirm the presence of and risk to specific ecological receptors. As a result, it is not possible to assign a likelihood of risk to the accumulations identified above. Nevertheless, identification of benchmark exceedances at such low mixing rates indicate the potential for risk and need for further evaluation, even where future land use is not residential.

Eco-SSLs do have the potential to be set lower than background soil concentrations. As such, EPA considered how background concentrations could affect the overall rate of accumulation in soil. This comparison found concentrations in fly ash can be substantially higher than background. For example, the 90th percentile vanadium concentration in background soil is estimated to be 107 mg/kg (USGS, 2013b). After subtracting this background from the estimated 90th percentile fly ash concentration of 521 mg/kg, it would require closer to 2% mixing to exceed the Eco-SSL. Similar results are obtained for antimony with a high-end background of 1.1 mg/kg and selenium with a high-end background of 0.6 mg/kg. Thus, further consideration of background is not expected to alter the overall conclusions of this analysis.

6.2.5 Post-Closure Exposures

The main model and sensitivity analyses identified potential risks resulting from gamma radiation and radon gas if CCRMU fills are disturbed. To ensure that current disposal standards are sufficient to mitigate the identified risks, EPA conducted a further analysis of closed disposal units. A major consideration is the fact that land use controls imposed on these units will prevent construction of habitable structures on top of the cover system. This will greatly limit the types of exposures and amount of time any individual will spend on top of the unit in a given day. In the absence of residential receptors, a RME scenario under a future land use might be an individual who uses the open area for recreation.

EPA has not established recommended exposure factors for this type of receptor, as actual behavior can vary widely across different sites. Instead, EPA considered a worst-case scenario equivalent to an outdoor worker who spends 8 hours a day, 225 days a year, over the course of 25 years in the open air standing on top of a soil cover with a maintained thickness of 0.6 m (2 ft). The benchmarks corresponding to 1×10^{-5} risk are 28.1 pCi/g Th-232, and 65.5 pCi/g U-238. EPA calculated the combined Th-232 and U-238 risk for each individual sample from the COALQUAL database and then overall the 90th risk based on same sampling of the database as described in **Section 5**. Under this worst-case scenario, the PRG Calculator identified a cancer risk attributed to gamma radiation of around 3×10^{-6}.

The scenario is expected to overestimate risk for multiple reasons. For example, it is highly unlikely any receptor would be present on top of a closed unit all day for over two decades. Additionally, many units will not contain ash with high-end activities. Based on these various considerations, it is likely that the risks associated with release of gamma radiation from disposal units closed in a manner consistent with the requirements of the 2015 CCR Rule will fall outside the OLEM risk range.

6.3 Conclusions

EPA identified and reviewed major sources of uncertainty that have been identified since the 2014 Risk Assessment to understand the potential effects on modeled risks. The uncertainties associated with newer data sources are expected to have minimal effect on the conclusions of this assessment. Uncertainties associated with scenarios that could not be quantitatively modeled have the potential to result in underestimation of risk in some circumstances. To the extent practicable, EPA aimed to minimize the influence of such uncertainties by focusing on the most direct exposure pathways and applying best available data.

EPA also conducted several sensitivity analyses to understand the potential for substantially higher risk than was modeled on a national scale. One analysis identified potential for risk to future residents and ecological receptors from exposure to soil if CCRMU fills are disturbed and mixed with surface soil. Another affirmed that current regulatory requirements for closure of disposal units are adequate to protect human health and the environment from anticipated exposures to radiation.

The results of all these analyses reinforce the conclusions from previous modeling that disposal in historical and inactive landfills and surface impoundments, as well as placement in CCRMU fills, have the potential to result in risk to future receptors that warrant regulatory action.

7 Summary and Conclusions

The purpose of this document is to characterize the potential for risk on a national basis resulting from management of CCR in legacy impoundments and CCRMU. To accomplish this task, EPA drew on previous modeling to supplement available record for legacy impoundments and CCRMU disposal units. EPA also conducted further mathematical modeling to estimate the magnitude of environmental releases from smaller CCRMU fills, contaminant fate and transport through the environment, and the potential risk of adverse effects to human health and the environment. EPA then conducted additional sensitivity and uncertainty analyses to identify any potential for higher risks than those identified in through the main analysis. The following discussion summarizes the various analyses conducted and results obtained for different exposure pathways, provide further context for these results, and present the final Agency conclusions.

7.1 Problem Formation

EPA first developed conceptual models to illustrate a generalized layout of legacy impoundments and CCRMU, the different pathways through which constituents may be released from CCR and migrate through the environment, and the risks to human health and the environment that could result. The conceptual models for landfills and impoundments were the same as used in the 2014 Risk Assessment/ EPA determined that a second model was warranted for CCRMU because some smaller placements have not historically been regarded as disposal by facilities and so have not been reliably tracked or maintained over time. These smaller placements may be disturbed after land use changes, which can result in additional release pathways. Therefore, EPA prepared a second conceptual model for smaller units (i.e., CCRMU fills). These conceptual models provide the basis for subsequent modeling efforts.

When CCR are placed on the ground for any purpose, they may leach metals and other inorganic contaminants to groundwater. Once mixed with groundwater, contamination may migrate downgradient to private wells where it is ingested by receptors who rely on groundwater as their primary source of drinking water. But a receptor does not need to be presently exposed for there to be a reasonable probability of adverse effects on health or the environment. EPA evaluated this exposure pathway in the 2014 Risk Assessment and identified a set of constituents most likely to pose risk to offsite receptors living up to a mile away. The 2024 assessment builds on those model results and identifies arsenic, lithium, molybdenum, and thallium as constituents that warranted further evaluation. These are the constituents found in the 2014 Risk Assessment to pose the greatest risk for unlined surface impoundments and have the greatest demonstrated potential to spread and pose risk on a national scale. These 2014 model results therefore also provide a reasonable screen to identify the most likely risk drivers for receptors living even closer to these types of units.

When CCR is placed in fills and left unmonitored, the ash can be disturbed in the future when land use changes. In the absence of records of the presence of CCR, and in the absence of inspection and maintenance, any engineering controls currently present that might serve to limit exposure cannot reasonably be assumed to remain in place in perpetuity. For this reason, EPA considered the potential for additional exposure pathways that could occur under a future residential land use scenario. The 2014 Risk Assessment did not evaluate risks from direct placement of CCR in the soil. However, EPA previously identified radium as a constituent of concern in the 2015 CCR Rule and included two radioisotopes on the Appendix IV list for groundwater monitoring, radium-226 and radium-228. These radioisotopes are part of larger, naturally occurring decay chains that begin with uranium-238 and thorium-232, respectively. Even if some form of cover remains over the ash, future receptors who live on or around a fill may be exposed to radiation through direct exposure to gamma radiation or inhalation of radon gas. Therefore, EPA considered potential for exposure to the full decay chains of these radium isotopes as the primary risk driver for this pathway.

7.2 Disposal Unit Groundwater Risk

All disposal units pass through the same lifecycle stages, ranging from initial construction to final closure. As a result, there is potential for historical and inactive disposal units to result in the same types of environmental releases as currently regulated units over the course of their lifecycle. The fact some historical and inactive units may have since drained ponded wastewater or installed some form of cover system does nothing to remediate any prior releases. EPA conducted a review of the available data on these historical and inactive units to understand whether the associated risks would be expected to differ from those previously modeled for regulated units.

The 2014 Risk Assessment modeled risks for a total of 122 landfills and 163 impoundments that were ultimately excluded from the final summary of national risks because it was determined that these units fell outside the scope of the 2015 CCR Rule. These units were excluded because they were anticipated to cease receipt of waste prior to the effective date of the rule. Therefore, model results for these previously excluded units directly address the historical and inactive units subject to the current rulemaking. EPA reviewed model results for these previously excluded units to better understand whether the associated risks were any different from those of currently regulated units. For highly exposed individuals, landfills were estimated to pose cancer risks as high as 7×10-6 from arsenic III, while surface impoundments were estimated to pose cancer risks as high as 8×10-5 from arsenic III and noncancer HQs as high as 2 for arsenic III, 2 for lithium, and 1 for molybdenum.

Differences between these risks and those for currently regulated units are attributed primarily to differences in the prevalence of engineered liners modeled for the two sets of units. The previously excluded units were modeled as having no engineered liner at 71% of landfills and 57% of impoundments, compared to 42% of landfills and 65% of impoundments for currently regulated units. For unlined units, the arsenic III risk from previously excluded units was 1×10-5 for landfills and 2×10-4 for surface impoundments, while corresponding risk from regulated units were 2×10-5 for landfills and 3×10-4 for surface impoundments. Since all of this modeling was completed in 2014, it has been discovered through facility reporting that a greater percentage of regulated units has no engineered liner than EPA previously modeled. For example, in the 2014 Risk Assessment, EPA estimated that 65% of impoundments had no engineered liner based on the EPA Surveys. It has since become clear that even fewer impoundments are actually lined. EPA's review of available liner demonstration documents posted on facilities' CCR websites indicates closer to 83% of have no engineered liner. EPA has seen no evidence that would indicate older historical and inactive units would be lined at any greater frequency. Thus, EPA concludes that the national risks for regulated and previously excluded units will fall closer to those modeled for unlined units.

EPA reviewed available data on facility location to understand whether environmental conditions (e.g., precipitation, soil type) at inactive and active facilities could be substantially different than previously modeled. Such conditions can affect the rate of leakage from a unit and subsequent transport of that leachate through the subsurface. This review found that around 8280% of the active and inactive facilities that were not subject to the 2015 CCR Rule had already been modeled as part of the 2014 Risk Assessment and so are already reflected in the risk results for those previously excluded units. The remaining 1820% of facilities are located an average distance of 25 26 miles from the nearest modeled facility. Therefore, EPA concludes that the 2014 Risk Assessment adequately captures the effects of facility location on national risk.

Commenters stated that the smaller size of historical and inactive disposal units would result in lower volumes of leakage and could not sustain plumes of the same magnitude as from larger regulated units. EPA reviewed data from the EPA Surveys to determine whether the sizes of previously excluded units are substantially different than EPA modeled for currently regulated units. This comparison indicates that excluded units do tend to be somewhat smaller. The average size modeled for excluded units was 77 acres for landfills and 28 acres for impoundments. The average size modeled for regulated units was 107 acres for landfills and 47 acres for impoundments. Despite these differences, there remains a great deal of overlap in the range of sizes for both sets of units. Further, as described above, similar risks were identified for both sets of units. Thus, there is no indication that size differences of this magnitude have any notable effect on national risk. Nor is there any information available about the units not captured in the EPA Surveys that would indicate these remaining units are significantly smaller. Therefore, EPA concludes that the 2014 Risk Assessment adequately captures the effects of unit size on national risk.

7.3 CCRMU Fill Groundwater Risk

EPA conducted national-scale modeling of CCRMU fills to understand the potential groundwater risks that could result from these smaller placements of CCR. The exposure route evaluated for was human ingestion of groundwater used as a source of drinking water. The evaluation incorporated many of the same data sources used in the 2014 Risk Assessment to characterize the variability of site conditions. Two models were used to evaluate contaminant fate and transport, EPACMTP and MODFLOW-USG. EPACMTP was run first at specified distances along the centerline of the plume to understand the potential for releases to occur and spread further downgradient. MODFLOW-USG was then run for a subset of the conditions to understand the broader magnitude and extent of these plumes.

Groundwater concentrations modeled with EPACMTP at the waste boundary were first compared to respective GWPS to understand the potential for fills to impact groundwater quality to an extent that would trigger corrective action at regulated landfills. The 90th percentile concentrations exceeded GWPS by factors of 26 for arsenic III, 19 for arsenic V, 156 for molybdenum, and 19 for thallium. The 50th percentile concentrations exceeded GWPS by a factor of two for molybdenum. Based on these results, EPA finds that CCRMU fills can meaningfully contribute to groundwater contamination across a facility.

Groundwater concentrations modeled with EPACMTP at 500 and 1,000 feet away from the waste boundary were used calculate risks to individual RME receptors exposed to these concentrations. The 90th percentile concentration of each modeled constituent exceeded at least one risk benchmark at 1,000 feet. This indicates potential for leakage from fills to spread at environmentally significant concentrations. However, because these model runs represent concentrations at a fixed location, they do not provide broader information about the magnitude and extent of the plume. As a result, EPA does not rely primarily on these results to draw direct conclusions about overall risk. Instead, the Agency retained a subset of these model runs for both arsenic V and molybdenum from around the 90th percentile concentrations modeled at 1,000 ft. EPA selected pentavalent arsenic because it is the less mobile species and so provides a reasonable bounding on the high-end concentrations that can result for this contaminant. These runs were retained for further modeling with MODFLOW-USG to characterize the full magnitude and extent of each plume over time.

The MODFLOW-USG runs were designed with the same inputs as corresponding EPAMCTP runs. Altogether, these model runs reflect a range of conditions that collectively resulted in high-end groundwater concentrations 1,000 feet from the fill. These corresponding placements of CCR range from around 3,500 to 70,000 tons placed over areas between 0.15 to 2.0 acres. EPA calculated the midpoint across these runs to define values representative of the 90th percentile model runs. For arsenic V, the model identified a peak risk of 1×10-4 averaged over 32 million gallons (Mgal) of groundwater and a peak volume of 147 Mgal with an average risk of 7×10-5. The same leakage of arsenic V would result in a peak GWPS exceedance of three averaged over a plume volume of 1.2 Mgal and a peak plume volume of 8 Mgal with an average exceedance of 2 times GWPS. It would take around 2,300 years from the time of first exceedance for the plume to fully dissipate. For molybdenum, the peak exceedance of both risk benchmark and GWPS was 10 averaged over a plume volume of 27 Mgal and a peak plume volume of 80 Mgal with an average exceedance of 4 times GWPS. It would take around 100 years from the time of first exceedance for the plume to fully dissipate. Plumes of these size and duration could readily sustain exposures for a typical residential receptors that are anticipated to use around 80 gallons of water a day for all indoor household needs, resulting in less than 0.8 Mgal of use over 26 years of exposure.

7.4 CCRMU Fill Soil Risk

EPA modeled of CCRMU fills to understand the potential risks that could result from CCR present in the soil. Exposure routes initially considered for evaluation were human inhalation of radon gas and direct exposure to gamma radiation emitted from the CCR. However, based on a preliminary review of available data, EPA determined that radon emanation from CCR (i.e., fraction of radon able to escape into the surrounding air) is generally lower than from most soils. Despite the higher overall activity of CCR, the resulting radon emanation from the ash is not distinguishable from that of most surface soils. Therefore, EPA did not retain exposure to radon for further consideration.

Modeling of exposure to gamma radiation was conducted with the EPA PRG calculator. EPA evaluated the potential for direct exposure to gamma radiation from CCR under a soil cover ranging in thickness from 60 to 20 cm (2 to 0.66 feet). EPA compared the combined activity of the uranium-238 and thorium-232 decay chains in the CCR to the health benchmarks for each cover thickness to calculate the risks that could result from receptors living on or near the fill. Both 90th and 50th percentile activities have potential to result in cancer risks at or above 1×10-5 with a cover of 40 cm. The 90th percentile activity resulted in a cancer risk of 1×10-4 with a cover of 20 cm. This indicated the potential for even higher risk if the cover were to be disturbed and the CCR brought to the ground surface. However, evaluation of this scenario would require additional assumptions about the degree of mixing, which could be a major source of uncertainty on a national scale. Therefore, EPA retained this scenario for further consideration as part of a separate sensitivity analysis.

7.5 Uncertainty and Sensitivity Analyses

EPA reviewed the models used, as well as the data and assumptions input into the models, to better understand the potential sources of uncertainty inherent in the model results. The Agency qualitatively and, to the extent possible, quantitatively analyzed these sources to understand the potential effects each may have on modeled risks. EPA also conducted further sensitivity analyses to understand how the modeled national risks vary in response to changes in sensitive parameters and to evaluate the potential for risks through exposure pathways that could not be fully modeled on a national scale.

The major source of uncertainty identified for the groundwater model is the potential for greater risk from multiple units located in close proximity. The EPA Surveys did not provide information on the relative location or orientation of different landfills and impoundments at any given facility and so the 2014 Risk Assessment modeled risks from each unit individually. However, the Agency is now aware of many instances where multiple units are located directly adjacent to one another, resulting in a larger total area over which leakage can occur. This could result in greater cumulative risk to offsite receptors than predicted based on contributions from each individual unit. Furthermore, there is potential for legacy impoundments and CCRMU (disposal units and fill) to confound groundwater monitoring programs when located upgradient of a regulated unit. Ongoing leakage from these unregulated units has the potential to skew the characterization of background groundwater quality. Under these circumstances, any leakage from a regulated unit would need to progress even further and faster to be distinguishable from that skewed background. This could delay or entirely prevent a regulated unit from entering into corrective action, resulting in risk to downgradient receptors.

EPA conducted a sensitivity analysis to determine whether there is a unit size below which adverse impacts to groundwater quality are unlikely and monitoring is not warranted. This analysis found exceedances of GWPS are possible for placements below 1,000 tons. Thus, such placements can meaningfully contribute to groundwater contamination at these facilities. It was not possible to identify a limit much lower than this tonnage because of the few model runs conducted at smaller amounts. Extrapolation beyond available model runs could introduce a great deal of uncertainty into any specific limit identified. The extent to which any identified limit could shift higher or lower in response to further modeling around these lowest tonnages is not known. Therefore, the Agency could not identify a lower limit based on the current modeling.

EPA conducted further sensitivity analyses to better characterize the risks to human health that may result from mixing of CCR with the soil. There is little data available to predict the likelihood of different degrees of mixing that could occur across the country. Instead, EPA considered the incremental contributions from CCR through increased mixing with soil to identify the point at which accumulation would raise concern. This analysis focused on radionuclides previously identified as potential risk drivers for soil, but also considered contributions from arsenic that may further contribute to cancer risk. The exposure pathways considered were incidental ingestion of the CCR and soil mixture and direct exposure to gamma radiation. For radionuclides, cancer risks above 1×10-4 are possible for residential receptors at mixing of more than 11% for 90th percentile activity and 21% for 50th percentile activity. For arsenic, cancer risks above 1×10-4 are possible at mixing of more than 33% for 90th percentile concentration, but would not occur at any degree of mixing for 50th percentile concentration. Both radionuclides and arsenic also occur naturally in soil; however, levels in CCR can be markedly higher than typical background levels. In particular, EPA has identified the potential for CCR to have a combined radium activity nearly 10 pCi/g above typical background soils. This is greater than the ARAR that has been applied at some cleanups for surface and subsurface soils under Superfund and State programs. As such, consideration of the incremental increase above background does not alter the overall results of this analysis. Therefore, EPA concludes that accumulation of CCR within the soil column can result in risks within the range that EPA considers or regulation.

EPA separately considered the potential for risk to ecological receptors that may result from mixing of CCR with the soil based on comments received that a future use for these facilities could be as a nature preserve. EPA calculated the incremental contributions from CCR as described above and compared the resulting concentrations to available ecological benchmarks. This analysis focused on constituents for which ecological soil screening levels are available. This comparison indicates that antimony, selenium, and vanadium are most likely to drive risk and require further evaluation at both high-end and median ash concentrations. In some cases, ecological benchmarks are lower than typical background soil levels. However, consideration of the incremental increase above background does not alter overall results. Therefore, the potential for risk from accumulation of CCR within the soil column remains even if future residential land use is not anticipated.

7.6 Final Conclusions

Based on the analyses summarized in the current risk assessment, EPA concludes that there is a reasonable probability of adverse effects on health and the environment due to leakage from legacy CCR surface impoundments and CCRMU. EPA's assessment estimates that the risks that leakage from these units would adversely impact groundwater quality and pose risk to future receptors fall within the range EPA typically considers warrants regulation under section 4004(a) (i.e., cancer risks greater than 1×10^{-5} and non-cancer risks exceeding an HQ of 1). Older historical and inactive disposal units can pose risks to offsite receptors substantially the same as previously reported for currently regulated units. Smaller CCRMU fills can pose risk to onsite receptors and materially contribute to broader groundwater contamination across the facility. Depending on the location of these fills, they can also pose risk to offsite receptors. The risks identified for CCRMU fills are also believed to provide a bounding estimate on the risks posed by disposal units, as leakage from these larger units would generally be expected to result in more extensive releases than modeled for fills. Risks to human health from groundwater are anticipated to be driven by ingestion of arsenic, lithium, molybdenum, and/or thallium. Health effects associated with arsenic ingestion are an increase in the risk of cancer in the skin, liver, bladder, and lungs, as well as nausea, vomiting, abnormal heart rhythm, and damage to blood vessels. Health effects associated with ingestion of lithium are neurological and psychiatric effects, decreased thyroid function, renal effects, cardiovascular effects, skin eruptions, and gastrointestinal effects Health effects associated with molybdenum ingestion are higher levels of uric acid in the blood, gout-like symptoms, and anemia. Health effects associated with thallium ingestion are hair loss, ocular effects, and behavioral changes.

EPA also concludes the unmonitored accumulation of CCR in surface and subsurface soils has the potential to result in risk to future human and ecological receptors in the range OLEM typically considers for regulation. Potential human health risks are driven by incidental ingestion of ash mixed with the soil and direct exposure to gamma radiation from radium and its associated decay chains. Health effects attributed to radium exposure include increased risk of several types of cancer, particularly lung and bone cancer. Potential ecological risks are driven by exposure to antimony for mammals, selenium for plants and mammals, and vanadium for birds from ash mixed with the soil. Health effects attributed to these exposures are decreased reproduction, growth, or survival. EPA did not seek to identify a comprehensive list of other contaminants that might also contribute to risk as part of the current assessment; however, any further risk would be equally addressed by controls put in place to mitigate the identified soil risks.

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Appendix A: Facility List

EPA has identified a number of facilities that are expected to be subject to the current rulemaking, but that were not previously modeled as part of the 2014 Risk Assessment. These include active facilities subject that are currently regulated and additional active or inactive facilities that were exempt from the 2015 CCR Rule. EPA incorporated all these additional facilities along with those previously modeled in current groundwater modeling for CCRMU fills. **Attachment A-1** provides a list of newly identified units and assigned facility locations. **Attachment A-2** provides a list of all facility locations modeled for CCRMU fills, the regulatory status of those facilities, whether they were modeled in 2014, and a summary of the environmental parameters assigned to that facility for purposes of fate and transport modeling.

Appendix B: New Characterization Data

Since finalization of the 2014 Risk Assessment, EPA has identified additional sources of data that were used in this risk assessment to supplement and corroborate the Agency's characterization of CCR composition and behavior. The COALQUAL database includes data on the composition of coal samples from across the country and was used to estimate CCR bulk composition and activity. **Attachment B-1** provides the 2015 COALQUAL database, as well as a the summary of frequency at which EPA sampled the different combinations of state, county, and coal rank from the database based on EIA coal production data. The LEACHXS Lite database includes a repository of LEAF leachate data on a range of materials. Recent review of this database identified additional CCR data that was used together with previously collected leachate data. **Attachment B-2** provides new leachate data drawn from LEACHXS Lite. The bulk activity dataset represents data compiled by the Agency from the broader literature. This dataset was used to corroborate the bulk activity calculated from COALQUAL. **Attachment B-3** provides the bulk activity data identified through a review of the literature.

Appendix C: Model Outputs

This risk assessment modeled the fate and transport of metallic and other inorganic constituents identified as constituents of concern for CCRs. As part of this effort, EPA applied multiple models to characterize the magnitude and extent of adverse impacts to different environmental media. EPACMTP is groundwater model designed to calculate concentrations at a specified distance away from the source. **Attachment C-1** provides Access databases that contain the EPACMTP inputs and associated outputs for landfills and impoundments previously modeled, but not incorporated in the results reported in the 2014 Risk Assessment. **Attachment C-2** provides Access databases that contain the EPACMTP inputs and corresponding outputs for CCRMU fills at three distances away from the waste boundary. MODFLOW-USGT is a groundwater model that can be used to calculate concentrations in three dimensions. **Attachment C-3** summarizes the MODFLOW-USGT model inputs and outputs for each model run conducted. **Attachment C-4** provides full output files for the two individual model runs discussed in the main text.