ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 257

[EPA–HQ–OLEM–2019–0173; FRL–10015–88–OLEM]

RIN 2050–AH11

Hazardous and Solid Waste Management System: Disposal of CCR; A Holistic Approach to Closure Part B: Alternate Demonstration for Unlined 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 U.S. Court of Appeals for the D.C. Circuit issued its opinion in the case of *Utility Solid Waste Activities Group* v. *EPA,* 901 F.3d 414 (per curiam) (*USWAG*). This rule finalizes regulations proposed on March 3, 2020, including procedures to allow facilities to request approval to operate an existing CCR surface impoundment with an alternate liner, among other things. Provisions from the proposed rule that are not addressed in this rule will be addressed in a subsequent action.

DATES: This final rule is effective on December 14, 2020.

ADDRESSES: EPA has established a docket for this action under Docket ID. No. EPA–HQ–OLEM–2019–0173. All documents in the docket are listed on the *regulations* dot *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 *regulations* dot *gov.*

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SUPPLEMENTARY INFORMATION:

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I. General Information

A. Does this action apply to me?

This rule applies to all CCR generated by electric utilities and independent power producers that fall within the North American Industry Classification System (NAICS) code 221112 and may affect the following entities: electric utility facilities and independent power producers that fall under the NAICS code 221112. This discussion 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 § 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 revising certain provisions of the CCR regulations at 40 CFR part 257 in response to the decision issued by the D.C. Circuit on August 21, 2018, in *Utility Solid Waste Activities Group* v. *EPA* 901 F.3d 414 (D.C. Cir.). Specifically, the Agency is finalizing a revision to the 2015 CCR Rule that provides procedures for facilities to request approval to use an alternate liner for CCR surface impoundments.

EPA is finalizing a two-step process for submittal of the necessary documentation for the alternate liner demonstration. The first step consists of an initial application intended to show whether a unit meets certain minimum requirements before embarking on a comprehensive alternate liner demonstration. These minimum requirements are designed to ensure that it is likely that the facility will ultimately be able to make the more extensive demonstration to support continued operation, and that the CCR surface impoundment can operate safely over the short term while the facility collects the data and conducts the analyses necessary to support the demonstration. The first step requires the facility to demonstrate that it is in full compliance with the applicable requirements in 40 CFR part 257 subpart D; that it possesses site characteristics that make it likely that it could qualify for a demonstration; and that there are no constituents listed in part 257 Appendix III that have been detected at a statistically significant increase (SSI) above background. The second step consists of a final demonstration intended to show whether there is a reasonable probability that releases from the impoundment throughout its active life may result in groundwater concentrations of constituents listed in part 257 Appendix IV at a statistically significant level (SSL) in the future. The purpose of this two-step approach is to ensure that units allowed to embark on a comprehensive and time-consuming demonstration meet the minimum requirements to ensure protectiveness throughout the process.

Provisions from the proposed rule that are not addressed in this rule will be addressed in a subsequent rulemaking action. The remaining provisions from the proposed rule are to allow the use of CCR during closure of a CCR unit, to establish an additional closure option for CCR units being closed by removal of CCR, and to establish requirements for annual closure progress reports.

EPA intends that the provisions of this rule be severable. In the event that any individual provision or part of this 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.

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

These regulations are established under the authority of sections 1008(a), 2002(a), 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), 6944, and 6945(a) and (d).

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

This action is expected to result in an estimated annualized net cost savings of approximately $4.0 million per year to $8.0 million per year when discounting at 7% and approximately $2.2 million per year to $4.5 million per year when discounting at 3%. Further information on the economic effects of this action can be found in Unit VII of this preamble.

II. Background

A. The ''2015 CCR Rule''

On April 17, 2015, EPA finalized national minimum criteria for the disposal of CCR as a solid waste under Subtitle D of RCRA. 80 FR 21302. The Agency refers to the April 17, 2015 rule as the ''2015 CCR Rule'' in this preamble. CCR are generated from the combustion of coal by electric utilities and independent power producers for the generation of electricity. CCR include fly ash, bottom ash, boiler slag, and flue gas desulfurization materials and are commonly referred to as coal ash. The CCR regulations are codified in subpart D of part 257 of title 40 of the CFR.

The 2015 CCR Rule regulated existing and new CCR landfills and existing and new CCR surface impoundments, as well as all lateral expansions of these CCR units. The federal national minimum criteria consist of location restrictions (siting limitations), design and operating criteria, groundwater monitoring and corrective action requirements, and closure and post-closure care requirements. In addition, the 2015 CCR Rule put in place recordkeeping, notification, and internet posting provisions that require owners and operators of CCR units to maintain a publicly accessible internet site of rule compliance information. The 2015 CCR Rule does not regulate CCR that are beneficially used. It established a definition of ''beneficial use of CCR'' to distinguish between beneficial use and disposal.

Of particular relevance to this action, the 2015 CCR Rule required that any existing unlined CCR surface impoundment that cause groundwater concentrations to exceed a groundwater protection standard (GWPS) must stop receiving waste (CCR and/or non-CCR wastestreams) within six months of making an exceedance determination. This would also trigger the requirement to initiate either unit retrofit or closure activities.[1] See § 257.101(a)(1) at 80 FR 21490 (April 17, 2015). In the 2015 CCR Rule, the term ''unlined'' CCR surface impoundment included any unit not constructed with one of the following types of liners: (1) A composite liner; (2) an alternative composite liner; or (3) a liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} centimeters per second. Lined CCR surface impoundments (as defined in the CCR regulations) that impact groundwater above the specified GWPS are not required to close and could continue to operate while corrective action is performed, and the source of the groundwater contamination is addressed.

The 2015 CCR Rule was challenged by several parties, including a coalition of regulated entities and a coalition of environmental organizations (''Environmental Petitioners''). See *USWAG* v *EPA,* 901 F.3d 414 (DC Cir. 2018). The Environmental Petitioners raised two challenges [2] that are relevant to this final rule. First, they challenged the provision that allowed existing, unlined CCR surface impoundments to continue to operate until they cause groundwater contamination. See § 257.101(a)(1) at 80 FR 21490 (April 17, 2015). 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.'' See 42 U.S.C. 6944(a). The Environmental Petitioners also challenged the provisions that allowed impoundments lined with two feet of clay (*i.e.,* compacted soil) to continue operating even when they leak, requiring only that they remediate the resulting contamination. The petitioners pointed to record evidence that ''clay-lined'' units are likely to leak and contended that EPA's approach ''authorizes an endless cycle of spills and clean-ups'' in violation of RCRA.

B. The 2018 USWAG Decision

The D.C. Circuit issued its decision on *USWAG* v. *EPA* on August 21, 2018. The Court upheld most of the 2015 CCR Rule but ruled for the Environmental Petitioners on the two claims discussed in Unit II.A of this preamble. The Court held that EPA acted ''arbitrarily and capriciously and contrary to RCRA'' in failing to require the closure of unlined surface impoundments and in classifying so-called ''clay-lined'' impoundments as lined, based on the record supporting the rule. 901 F.3d at 431–432. The Court ordered that ''the Final Rule be vacated and remanded with respect to the provisions that permit unlined impoundments to continue receiving coal ash unless they leak, § 257.101(a), [and] classify 'clay-lined' impoundments as lined, see 40 CFR 257.71(a)(1)(i).'' *Id.* The Court issued the mandate for this decision on October 15, 2018. This decision is referred to as the ''*USWAG* decision'' in this action.

C. The March 2020 Proposed Rule

In the March 3, 2020 rule, 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 co-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. In this final rule, the Agency is taking final action on the proposed procedures for facilities to request approval to use an alternate liner for CCR surface impoundments. Provisions from the proposed rule that are not addressed in this rule will be addressed in a subsequent action.

D. Public Participation on the Proposed Rule

The Agency received over 42,000 comments on the proposed rule, with over 170 unique comments. The majority of commenters focused on the alternate liner demonstration (ALD) provisions, as well as use of CCR in closure. Commenters included individual electric utilities and independent power producers, national trade associations, state agencies, public

[1] Certain units may be eligible for the alternative closure procedures specified in § 257.103 which would change the date by which the unit must stop receiving waste.

[2] Environmental Petitioners also challenged the provisions exempting inactive surface impoundments at inactive power plants from regulation. The Court ruled for the Petitioners on these claims, vacating these provisions and remanding to EPA. However, in contrast to the other provisions addressed in this rule, additional rulemaking is necessary to effectuate the Court's order, as the Court's vacatur alone did not subject these units to regulation. This aspect of the decision will be addressed in a subsequent proposal.

interest and environmental groups, 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. EPA's responses to comments on the proposed rule are addressed either in this preamble or in the response to comment document available in the docket to this final rule.

EPA conducted two virtual public hearings on April 7, 2020, and April 9, 2020 using an internet-based software platform. The platform allowed 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. On April 7, 2020, there were 38 speakers and a total of 142 registered attendees. On April 9, 2020, there were 30 speakers and a total of 82 registered attendees. Testimony at the public hearing focused generally on the proposed amendments of allowing the use of alternate liner demonstrations and use of CCR in closure. Several speakers commented on the alternate liner demonstration or the use of CCR in closure to allow CCR to be disposed in unlined surface impoundments indefinitely and contaminating groundwater, and the overall risks, especially health risks, related to CCR. Many speakers advocated for strengthening of the regulations rather than finalizing ''rollbacks.'' Many commenters were concerned that people were unable to attend the public hearing because of the COVID–19 pandemic, and that EPA did not extend the public comment period. Transcripts for both virtual public hearings are included in the docket for this action.

III. Addition of § 257.71(d) To Allow for Alternate Liner Demonstrations

The 2015 CCR Rule required that all existing unlined CCR surface impoundments that caused groundwater concentrations to exceed associated GWPS must stop receiving waste and either retrofit or close. In the 2015 CCR Rule, the term ''unlined'' CCR surface impoundment included any unit not constructed with one of the following types of liners: (1) Composite liner; (2) alternative composite liner; or (3) liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/s.[3] See § 257.71(a). Lined CCR surface impoundments (as defined in the CCR regulations) that impact groundwater above the specified GWPS were not required to close and could continue operations while corrective action was performed and the source of the groundwater contamination was addressed.

On August 21, 2018, the U.S. Court of Appeals for the D.C. Circuit found in the *USWAG* decision that the rulemaking record did not support the conclusion that the 2015 CCR Rule would adequately address the adverse effects posed by clay-lined CCR surface impoundments. Therefore, the court vacated the provisions that treated clay-lined surface impoundments differently than unlined impoundments. *USWAG,* 901 F.3d at 449. The result of the court's decision is that such units are now required to either retrofit or close. In response to this ruling, EPA received reports from industry groups and individual companies claiming that the performance of some surface impoundments that would now be required to retrofit or close is equivalent or even superior to the liners required by the 2015 CCR Rule.[4] These impoundments rely on engineered liner components (*e.g.,* manufactured geomembrane, mechanically compacted soil) that deviate from the requirements of the rule and/or on natural low-conductivity soil beneath the unit. EPA agrees that it is possible for individual impoundments that are not lined with a composite liner or an alternative composite liner (as those terms are defined in the CCR regulations) to still be protective of human health and the environment. This is possible if the effective hydraulic conductivity of the engineered liner and/or naturally occurring soil is so low that, even if leachate migrates from the unit, the volume of leachate that can be released to the underlying aquifer over the active life of the impoundment is so small that these releases will not result in adverse effects at any point in the future. Therefore, EPA proposed procedures in the March 2020 rule at § 257.71(d) to allow facilities to submit to EPA an alternate liner demonstration that would provide a sufficient record to support the continued operation of an unlined surface impoundment that can be shown to pose no reasonable probability of adverse effects to human health or the environment.

The current self-implementing regulations limit the ability of owners and operators to make a site-specific demonstration that the design of a particular CCR surface impoundment is equivalent to the composite liner system in §§ 257.71(c); consequently, a regulatory revision would be necessary. However, the Agency's current record does not support conclusions on whether any individual impoundment has a low enough effective hydraulic conductivity to be protective, were the unit allowed to continue operations. This would require site-specific data, such as liner performance and surrounding hydrogeologic characterization information. The data relied upon in the 2014 Risk Assessment were organized into distributions compiled at various geographic scales (*e.g.,* local, regional, national). The resolution of these data were sufficient for identifying the potential for risk at a national scale. However, the same data cannot be used to draw conclusions about any individual impoundment. While reports submitted to EPA by industry since the finalization of the 2015 CCR Rule have provided valuable information about the characteristics of impoundments anticipated to perform equivalent to the liner system required by the 2015 CCR Rule, these reports generally did not include the type or specificity of data needed to support conclusions about individual impoundments.

Therefore, owners and operators who believe an unlined surface impoundment meets the RCRA § 4004(a) standard and should be allowed to continue operation as designed must provide EPA or a Participating State Director with the site-specific data and analysis necessary to demonstrate this fact. Based on the available groundwater monitoring and location restriction data posted on facilities' publicly accessible CCR internet sites, EPA believes that it is likely that only a small fraction of non-composite lined surface impoundments currently in operation will be able to apply successfully for this demonstration.

A. Factual Basis

The factual record supporting the 2015 CCR Rule included a national-scale assessment of the risks associated with disposal of CCR in surface impoundments constructed with various liner types.[5] As part of the 2014 Risk Assessment, EPA modeled peak groundwater concentrations that might occur in off-site wells up to a mile away for a duration of up to 10,000 years. This modeling effort identified potential risks from both unlined and clay-lined surface impoundments: The risk that

[3] The liner terms ''compacted soil'' and ''clay-lined'' are used interchangeably in this preamble discussion.

[4] These reports are available in the docket to this rulemaking.

[5] U.S. EPA. 2014. ''Human and Ecological Risk Assessment of Coal Combustion Residuals.'' Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. December.

groundwater would be contaminated at levels exceeding GWPS and the risk arising from the exposure of human and environmental receptors to contaminated water. It is now known that a greater fraction of operating units are unlined than previously understood. This may shift the national-scale risks reported for all impoundments closer to the risks for just unlined units because a greater fraction of all impoundments would now be modeled as unlined, but it would not substantially alter the high-end risks already modeled for unlined impoundments. Thus, the change in liner designation would not impact the overall conclusions about risk drawn from the 2014 Risk Assessment. Based on this modeling, EPA estimated that releases from up to 36.2% of unlined impoundments and 9.1% of clay-lined surface impoundments could ultimately contaminate off-site wells.[6] EPA is aware that monitoring data indicates that a higher percentage than this have exceeded GWPS. However, monitoring wells are located at the waste boundary, which invariably have higher concentrations than would be found up to a mile away from the unit, and includes additional contributions from background groundwater. In addition, a number of these impoundments are located near water bodies, which intercept some or all of the release before it can reach private wells on the opposite side. Therefore, EPA does not believe that the field data that has become available since finalization of the risk assessment conflicts with previous modeling results.

As explained in the proposed rule, EPA considers it to be theoretically possible for some unlined and clay-lined units to achieve the same level of performance as the composite liners required by the 2015 CCR Rule. In order for this to be the case, the effective hydraulic conductivity of the engineered liner and/or naturally occurring soil would need to be so low that, even if leachate migrates from the unit, the volume of leachate that can be transmitted to the underlying aquifer over time is small enough that it will not adversely affect groundwater quality. For a unit to achieve this, it would need to perform materially better than the clay-lined units evaluated in the 2014 Risk Assessment. Those clay-lined surface impoundments were modeled with a fixed hydraulic conductivity of 1×10^{-7} cm/s and thickness of 3 feet, similar to the minimum design standard for clay-lined units outlined in the 2015 CCR Rule. For this fixed set of parameters, EPA identified risks slightly above the relevant risk criteria only for lithium, one of the most mobile CCR constituents.[7] Based on these model results, an effective hydraulic conductivity of 1×10^{-8} cm/s would be sufficient to reduce identified risks to below levels of concern on a national-scale. However, conditions present at individual facilities, such as the thickness of the low-conductivity soil or the presence of a geomembrane liner, might support somewhat higher soil conductivities on a case-by-case basis. Regardless, a conductivity of 1×10^{-7} cm/s for the lowermost soil component of the liner, whether in isolation or beneath a geomembrane component, remains the absolute floor for any unit to even be considered for an alternate liner demonstration.

EPA established the minimum liner requirements for CCR surface impoundments in the 2015 rule based on the original municipal solid waste landfill regulations at 40 CFR part 258. These requirements were based on the Agency's experience with various liner materials and reflect a uniform design that EPA expects to be reliably protective if manufactured and constructed properly. However, EPA acknowledged in the original 1991 rule (56 FR 51059, October 9, 1991) that alternative designs may be able to achieve the same performance. Thus, EPA also acknowledges that the fact that an individual unit does not meet the liner requirements of the 2015 CCR Rule does not in and of itself indicate that a unit will pose risk. Facilities that commented on the proposed rule reported units that were considered unlined based on the 2015 CCR Rule definition for several reasons. Based on the available information from these comments and the Part 258 regulatory record, EPA identified three primary reasons that an alternately lined unit could still be protective.

One type of impoundment that was classified as unlined, but which might still be demonstrated to be protective, is a unit where the soil was not mechanically compacted to the specified depth. It is well-established in the literature that clay-rich soils can achieve hydraulic conductivities lower than 1×10^{-8} cm/s; however, this often requires some degree of compaction to break down any larger clumps of soil and minimize the volume of void spaces between soil particles that allow water to flow. Reports provided by some facilities purport that the necessary compaction of these soils had been accomplished onsite through natural processes. One example of the natural processes envisioned by commenters is glacial compaction, whereby stress from the weight and flow of the glacier compressed the naturally occurring soil. This process has been found to result in regions of soil with conductivities lower than 1×10^{-8} cm/s.[8] Soils from around the perimeter of such units, which have historically been exposed to similar environmental conditions as the soil beneath the unit and so are expected to have similar characteristics, can be collected to confirm that necessary hydraulic conductivity is present and consistent across the site. Therefore, EPA believes the potential exists for facilities to successfully demonstrate that naturally compacted soil can be protective.

Another type of unlined impoundment that may still be demonstrated to be protective is one where the layer of compacted soil was not thick enough to meet the current part 257 requirement. Based on EPA's experience with these liner materials, two feet of soil is the minimum thickness needed to reliably obtain adequate compaction and meet requirements for hydraulic conductivity. This thickness is considered necessary to minimize the number of cracks or imperfections through the entire liner thickness that could allow leachate migration. Based on EPA's experience, a two-foot minimum thickness is believed to be sufficient to reliably inhibit hydraulic short-circuiting of the entire layer. While it is possible to achieve low conductivities with a reduced thickness, there is a far greater risk of lateral and vertical imperfections that may arise during construction. Therefore, EPA believes that successful demonstration is possible here only if the facility can provide data showing the liner achieves an adequately low hydraulic conductivity in-situ.

The final type of unlined impoundment that may still be demonstrated to be protective is one where the geomembrane liner used was not thick enough to meet the current part 257 requirement. The upper component of a composite-lined unit must consist of a minimum of a 30-mil

[6] U.S. EPA. 2014. ''Regulatory Impact Analysis: EPA's 2015 RCRA Final Rule Regulating Coal Combustion Residual (CCR) Landfills and Surface Impoundments at Coal-Fired Electric Utility Power Plants.'' Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. December.

[7] Lithium had a non-cancer hazard quotient of 2.

[8] United States Department of the Interior. 1998. ''National Water-Quality Assessment of the Lake Erie-Lake St. Clair Basin, Michigan, Indiana, Ohio, Pennsylvania, and New York Environmental and Hydrogeologic Setting.'' Water-Resources; Investigations Report 97–4256. Prepared by the United States Geological Survey. Columbus, OH.

geomembrane liner, or 60-mil if the liner is constructed with high density polyethylene. Based on EPA's experience with these liner materials, these are the minimum thicknesses necessary to ensure adequate liner performance, including being able to withstand the stress of construction and to ensure that adequate seams can be made. Commenters argued that, due to improvements in welding technology and quality control procedures since these standards were first promulgated, concerns regarding welding thinner HDPE geomembranes have greatly diminished. If the facility is able to document the integrity of the liner design, then the performance of these liners will be primarily a function of construction quality. Commenters acknowledged that thinner liners are theoretically more susceptible to defects during installation, but also argued that no such trends have been identified in the literature. The 2014 Risk Assessment found that a well-constructed geomembrane liner can remain protective, even with a higher proportion of imperfections. Therefore, EPA believes the potential exists for facilities to successfully demonstrate that alternate geomembrane liners can be protective, provided that the soil directly beneath the geomembrane has sufficiently low conductivity.

To support the conclusion that the long-term performance of an alternately lined CCR surface impoundment can meet the RCRA § 4004 protectiveness standard, EPA would need several categories of information. EPA proposed two categories of information that must be provided for the demonstration step, which the Agency is finalizing as part of this rulemaking. The first category is a characterization of the site-specific hydrogeology surrounding the surface impoundment. The purpose of these data is to define the variability of the soil around the surface impoundment to determine whether preferential flow pathways exist that effectively negate the low conductivity of the alternate liner. The second category of data is a characterization of the potential for infiltration through any engineered liner and/or naturally occurring soil that control the release and transport of leachate. These data will provide for a reasonable estimate of the rate at which contaminants may be released and transported to groundwater over time. Based on comments received, EPA is also finalizing a third category of information. This additional category is documentation of material properties and unit construction quality. The purpose of these data is to document that the impoundment can be expected to achieve the low conductivity specified in the unit designs. This category is included in the application step to confirm upfront that conditions simulated in a laboratory setting as part of the demonstration step are a reasonable reflection of field conditions.

Thus, EPA concludes that there is potential for some existing unlined and clay-lined CCR surface impoundments to continue operating without presenting unacceptable risk. However, the Agency's current risk assessment does not support conclusions on whether any individual surface impoundment has a low enough effective hydraulic conductivity that operation of the unit will continue to be protective in the future. This would require the site-specific data discussed above, including, for example, data on the ability of the engineered liner and/or naturally occurring soil to limit the release and transport of leachate away from the unit. Therefore, EPA proposed procedures at § 257.71(d) to allow facilities to submit such information to EPA to demonstrate that the engineered liner and/or naturally occurring soil will remain protective, and consequently the continued operation of an individual unlined surface impoundments will present no reasonable probability of adverse effects to human health or the environment.

Specifically, EPA proposed a two-step process. In the first step, a facility would be required to submit an initial application to demonstrate that they meet certain minimum requirements before embarking on a comprehensive alternate liner demonstration. These minimum requirements are designed to ensure that it is likely a facility will ultimately be able to make the more extensive demonstration to support continued operation, and that the CCR surface impoundment can operate safely over the near term while the facility collects the data and conducts the analyses necessary to support the demonstration. In the second step, the facility would be required to submit the data and analyses necessary to support a determination that the CCR surface impoundment can sustain its current performance and operate safely for the remainder of its active life.

Most industry groups and individual facilities voiced support for the option to make this type of demonstration, stating that the definition of a lined CCR surface impoundment in the 2015 CCR Rule is inflexible and would result in the unnecessary closure of some unlined CCR surface impoundments that, as designed, are as protective as lined CCR surface impoundments. Many environmental groups and private citizens were critical of the proposal and commented that it was unsupportable and would lead to greater risks to human health and the environment. Some of the same commenters noted that, while the types of information required may be useful to differentiate non-compliant and underperforming units, there were concerns that the amount of information required would be difficult or impossible to collect and review.

1. Existing Record

Environmental groups stated the existing risk record does not support the conclusion that alternate liners can be protective, citing the potential risks identified for clay-lined units in the 2014 Risk Assessment. Some of these commenters further argued that the reports submitted by facilities to date are inadequate and similarly do not support the continued operation of the units documented therein. These commenters provided critiques of the individual units and concluded that the information provided in the associated reports is not sufficient to demonstrate whether on-site groundwater monitoring wells are adequate in number or construction to accurately reflect upgradient and downgradient conditions at the site. Further, commenters concluded that some facilities have inappropriately handled monitoring data to erroneously show that the CCR surface impoundment has not contaminated groundwater. Commenters also critiqued a report prepared by the Electric Power Research Institute (EPRI), which they claim shows that clay liners cannot be equivalent to composite liners in protecting health and the environment.

As stated in the proposal and above, EPA agrees that neither the 2014 Risk Assessment nor the industry reports support conclusions about any individual unlined surface impoundment. In order to draw conclusions about the protectiveness of any individual CCR surface impoundment, EPA needs site-specific information on the performance of the engineered liner and/or the naturally occurring soil. This is why EPA proposed a process for facilities to submit documentation that would support the continued operation of an unlined surface impoundment. At an absolute minimum, the performance of these CCR units would need to surpass that of the clay liners previously modeled, making them distinct from the far broader universe of clay-lined and unlined CCR surface impoundments considered in the *USWAG* decision.

Although the reports submitted to EPA by individual facilities since finalization of the 2015 CCR Rule provide an indication on which impoundments are most likely to seek an ALD, EPA stated in the proposal that these reports did not include the type or specificity of data necessary to support conclusions about these individual surface impoundments. As a result, EPA did not rely on the conclusions of these reports to support any provisions of this final rule. As discussed in more detail below in Unit III.B, part of the purpose of the initial application step is to determine whether the types of deficiencies raised by commenters are present at a particular site, and if so, to ensure that these facilities do not progress to the longer ALD process.

The report submitted by EPRI considered more broadly whether alternative liners can achieve GWPS near the CCR waste boundary. The modeling approach in many ways mirrored that used by EPA in the 2014 Risk Assessment. Although EPRI initially made some assumptions that would tend to overestimate risk, such as ignoring the effects of constituent sorption onto the soil, these assumptions were later explored in select sensitivity analyses. Ultimately, EPRI found that even thick clay liners with a hydraulic conductivity of 1×10^{-7} cm/s could result in exceedances of GWPS under high-end conditions, while thinner clay liners with a conductivity at and above 1×10^{-8} cm/s did not. These results generally comport with the conclusions drawn from the 2014 Risk Assessment and suggest that there are plausible scenarios in which alternative liners can be protective. Critiques of the EPRI report by commenters focused heavily on the fact that the modeled clay liners did not perform equivalently to composite liners, meaning that the alternative liner could result in releases greater than a composite liner. However, after consideration of the comments received, the Agency believes this type of ''equivalence'' is not the appropriate standard to apply in an alternate liner demonstration. It would be difficult for an owner or operator to demonstrate that a clay liner of any thickness would prevent migration just as effectively as a composite liner, which includes a flexible membrane liner that, by design, is impermeable. Such a standard would unnecessarily limit the ability of owners and operators to utilize otherwise protective designs. Therefore, EPA believes the appropriate standard for an alternate liner demonstration is that there is no reasonable probability that releases throughout the active life of the CCR surface impoundment will result in adverse effects to human health or the environment. This is the standard relied upon in the 2015 CCR Rule to determine that composite-lined units were protective. This standard is achieved in an ALD by documenting that the peak groundwater concentration that may result from releases over the active life of the impoundment will not exceed GWPS at the waste boundary.

Therefore EPA is making revisions at § 257.71(d) to specify the owner or operator of a CCR surface impoundment constructed without a composite liner or alternative composite liner, as defined in § 257.70(b) or (c), may submit an Alternate Liner Demonstration to the Administrator or the Participating State Director to demonstrate that the design of the current liner system or the naturally occurring media will remain protective of human health and the environment.

2. Potential Risks to Surface Water

Several environmental groups expressed concern that the focus on protection of groundwater would exclude protection of ecological receptors in nearby surface water. In particular, commenters highlighted the potential for some constituents to be toxic for aquatic wildlife at lower levels than for human ingestion of groundwater. These commenters also stated that the *USWAG* decision faulted EPA for not directly addressing potential risks to ecological receptors identified in the 2014 Risk Assessment. Another commenter pointed to the damage cases relied upon in the 2015 CCR Rule that identified additional risks to surface water.

The 2014 Risk Assessment identified the potential for surface water risks from unlined units as a whole, but the existing risk record does not support similar concerns about units that would be able to obtain an ALD. Releases from the base of an impoundment will migrate down to groundwater prior to discharge into downgradient surface water. The risk assessment explicitly modeled this pathway and found that all surface water risks from clay-lined units fall below levels of concern by an order of magnitude or more. If the effective hydraulic conductivity of an alternate liner is sufficient to mitigate the groundwater risks previously identified in the risk assessment, then it will only further reduce downgradient releases to surface water through groundwater discharge. Thus, by demonstrating that an alternately lined impoundment can reliably perform better than the clay-lined units considered in the 2014 Risk Assessment, this confirms that these impoundments will pose no reasonable probability of adverse effects to surface water. Although damage cases considered in the 2015 CCR Rule identified some surface water impacts beyond those reported in the risk assessment, these were frequently associated with scenarios not explicitly modeled in the risk assessment, such as direct discharge of either CCR and/or associated wastewater to surface water or disposal of CCR in high-risk areas (*e.g.,* within the groundwater table). These scenarios have already been addressed under RCRA through requirements for structural integrity and location restrictions, respectively. In addition, EPA is finalizing a requirement as part of this rule that facilities must remain in detection monitoring throughout both the application and demonstration steps. Ensuring that there is no SSI of Appendix III constituents throughout the demonstration will also ensure that Appendix IV constituents will not migrate beyond the waste boundary and pose risk to nearby ecological receptors while the owner or operator prepares the necessary documentation to demonstrate both that the facility complies with all relevant requirements of the 2015 CCR Rule and that the long-term performance of the impoundment will be protective.

3. Continued Operation of CCR Surface Impoundments During Demonstration

Industry groups agreed with EPA's basis for the proposed rule and stated that the D.C. Circuit had not precluded EPA from supplementing the existing risk record to support future decisions about individual unlined CCR surface impoundments. However, several environmental groups argued that the rule was in violation of the *USWAG* decision and contrary to RCRA. These commenters claimed that the D.C. Circuit decision required the closure of all unlined and clay-lined CCR surface impoundments and so any rule that would allow additional time for operation while the CCR surface impoundments complete a demonstration process would violate the decision. Others contended that allowing any additional time for operation would violate RCRA § 4004(a) because it might provide deficient units additional time to contaminate groundwater before addressing the source.

EPA disagrees with the suggestion that this rule is inconsistent with the *USWAG* decision. The D.C. Circuit held that the rulemaking record supporting

the 2015 CCR Rule did not support allowing clay-lined units to continue to operate indefinitely. 901 F.3d at 431–432. The court did not find that the statute per se prohibited such units, but that EPA had failed to provide enough evidence to demonstrate that the statutory standard had been met. *Id.* Consequently, EPA is not precluded from subsequently developing the evidence necessary to support the continued operation of some or all of these units. As discussed in greater detail in subsequent Units of this preamble, the record associated with the specific subset of impoundments that will be eligible under this rule is very different than the record associated with all units regulated under the 2015 CCR rule. For example, in the 2015 CCR rule the majority of units had been operating for years without groundwater monitoring or other regulatory requirements. The record for that rule documented that the majority of these units had likely been contaminating groundwater for years; EPA estimated that the contamination at these units had spread well beyond the waste boundary. And because there was no groundwater monitoring at these facilities, EPA was unable to distinguish between units that did pose a risk and those that did not. By contrast, only units that remain in detection monitoring throughout the application and demonstration process can be approved for an ALD. As discussed later in this preamble, EPA has also addressed the specific faults that the court found in EPA's prior record.

EPA further disagrees with the suggestion that this rule fails to meet the standard in RCRA § 4004(a). EPA purposefully divided the ALD process into two steps to weed out the facilities that fail to meet the RCRA § 4004(a) standard. The initial application ensures that a facility is in compliance with applicable requirements in 40 CFR part 257 subpart D, that the design of the monitoring network is sufficient to identify releases, that the CCR surface impoundment is in detection monitoring, and that the unit has the soil characteristics or engineering quality that would make it possible to meet the ultimate performance standard before a facility is granted any additional time to complete the more comprehensive alternate liner demonstration. The combination of these factors ensures that the only CCR surface impoundments allowed to progress to the demonstration step are those that EPA expects to remain protective during the year-long process to complete the demonstration.

Because the initial application phase will be completed by April 11, 2021 (the deadline for unlined surface impoundments to cease receipt of waste pursuant to § 257.101(a)(1)), this process will grant additional time to operate only to CCR surface impoundments that continue to show that they can operate safely during the time it will take for the process to be completed. As discussed in more detail below, the initial application will be due no later than November 30, 2020, and EPA will make a decision on whether the facility qualifies to submit a demonstration no later than April 11, 2021. Consequently, all facilities that submit an application must still be prepared to cease receipt of waste and to begin closure in the event that the application is ultimately rejected.

Finally, CCR surface impoundments that are able to progress to the demonstration step will have shown that the design of the groundwater monitoring network is sufficient to identify releases from the unit and that there is currently no evidence that releases have occurred or are likely to occur while they are completing the demonstration.

CCR surface impoundments are continuously full of water. The resulting hydraulic head on the liner can be considerably greater than found in landfills, which results in a greater and sustained potential for infiltration into the subsurface. The expectation is that releases from the unit to the subsurface would be limited primarily by the low hydraulic conductivity of the engineered liner and/or naturally occurring soil. Many of the surface impoundments at facilities that commented on the proposed rule have been in operation for over a decade and some for almost 70 years. If GWPS have not been exceeded throughout years of operation, this indicates that some combination of low conductivity soil, the thickness of the soil column above the aquifer, or a geomembrane liner component is effectively limiting or entirely preventing the release and transport of leachate. And for units such as these, with an adequate monitoring network, the fact that they have not triggered assessment monitoring means there is no evidence of any release to groundwater. In addition, these units will continue routine groundwater monitoring while preparing the demonstration to ensure that they continue to perform as anticipated over the year-long demonstration step. CCR units that trigger either assessment monitoring or corrective action at any point during the process would be rendered ineligible to proceed. Thus, any impoundment able to submit a successful ALD would not have had any discernable impact to groundwater quality.

Moreover, it is highly unlikely that a unit with no prior indication of impacts to groundwater will contaminate groundwater above the GWPS within the relatively short timeframe permitted to complete the demonstration. Groundwater transport is a gradual process as the leachate migrates to and mixes with the groundwater. It is not realistic to expect a sudden exceedance of the GWPS after years of no detections from groundwater monitoring. Rather, one would expect to first see the more mobile constituents in Appendix III, such as total dissolved solids, before detecting any of the constituents of concern in Appendix IV. If a unit is leaking but has failed to identify the exceedance due to a deficiency with either the design or implementation of the groundwater monitoring program, that will be identified during the application review. Thus, there is no evidence that these units will present a risk of contaminating groundwater above GWPS or a risk to downgradient human or ecological receptors. Nonetheless, these units will continue routine groundwater monitoring while preparing the demonstration to ensure that the units continue to perform as anticipated.

4. Potential for Future Harm

Some environmental groups contended that it does not matter whether an unlined unit can be shown to have no current groundwater contamination because the existing risk record shows that it can happen in the future. These commenters pointed specifically to the Agency's previous finding that a certain portion of unlined and clay-lined units are anticipated to eventually contaminate groundwater. Commenters further stated that allowing these units to continue operation is contrary to the *USWAG* decision because the risk record does not show whether any future release could be promptly detected and, once detected, promptly remedied before it can result in harm to human health or the environment. Commenters also pointed out that the risk is further compounded by the potential size of the plume from unlined units.

EPA disagrees with the proposition that allowing CCR surface impoundments that meet the requirements for an ALD to continue operation is in violation of the *USWAG* decision. The D.C. Circuit found that it was contrary to RCRA § 4004(a) to allow unlined and clay-lined units to continue

operating because the rulemaking record failed to address a number of the risks associated with these units. For example, the record did not demonstrate that a leak from these units could be reliably contained and addressed before it resulted in harm to human health and the environment. 901 F.3d at 432. The D.C. Circuit specifically pointed to several factors that EPA had failed to address that might prolong the time required to address leaks, including the rate and extent of contaminant release, the well sampling schedule, and the time allowed to implement source control. Id at 42,432. However, the conditions established as part of this rule ensure that these issues will be sufficiently addressed for the subset of CCR surface impoundments able to obtain and operate under an ALD.

First, units with an ALD that enter into assessment monitoring are required to conduct additional analyses to identify the presence and magnitude of any trends of increasing groundwater concentrations in downgradient wells. If these analyses show the potential exists for releases from the impoundment to result in an exceedance of GWPS within the timeframe needed to reliably close the unit, the facility must retrofit or close. This provision is intended to prevent adverse effects to groundwater and, if necessary, to expedite remedial efforts. Use of trend analysis is appropriate to monitor for evidence of increasing groundwater concentrations because the release and transport of inorganic elements through the subsurface is a gradual and steady process. The presence of low conductivity soil beneath a unit would only further limit the speed at which contamination can spread. For example, based on the range of anticipated hydraulic gradients and other relevant soil properties, groundwater moving through soil with a hydraulic conductivity of 1×10^{-7} cm/s would be expected to progress less than a foot a year.[9] In this context, there is little concern that the time between semi-annual monitoring events would substantially delay identification of potential contamination.[10]

Even if corrective action were triggered before closure could be completed, this in no way prevents the concurrent implementation of corrective measures beyond the waste boundary to contain the plume and prevent downgradient exposures. EPA has previously documented how pump and treat can be systematically applied to control plume migration, even when the contaminant source has not yet been addressed.[11] Furthermore, facilities that are able to submit a successful demonstration will be among the most well-characterized units in the country, which would further limit the timeframe needed to contain the plume and the potential for unforeseen setbacks that could result in an inadequate understanding of local hydrogeology.

Ultimately, EPA believes that a judgement on whether a plume can be addressed promptly should be based on the potential for immediate and future harm. This is consistent with the established criteria in § 257.97(d) that require the development of a reasonable schedule to implement remedial actions to be based on a number of factors, such as the immediacy of risk to nearby receptors and the risk of contaminant spread to other environmental media. Altogether, these factors will help ensure that any contamination identified at the waste boundary can be addressed before it results in risk to downgradient receptors, regardless of the original extent of the release.

EPA is also confident that contamination at these sites can be successfully remediated. The inorganic constituents on Appendix IV are not novel. Issues of impracticability at corrective action sites are often associated with the ability to access contaminants in the subsurface. The primary causes have been the hydrophobic behavior of organic compounds, which is not relevant in this context, and the presence of complex site hydrogeology.[12] The CCR location restrictions at § 257.64 prohibit disposal in karst and other unstable areas that might confound remedial efforts. Other highly complex geology, such as fractured bedrock, is notoriously resistant to modeling and unlikely to allow for a successful demonstration. Although corrective action at the remaining sites may be technically complex, it remains feasible. Therefore, there is little concern that corrective action, if required, would not eventually achieve established cleanup goals. For all these reasons, the Agency is not making any amendments to the proposal as a result of these comments.

B. Application

In the March 2020 proposed rule, EPA proposed to establish a two-step process: Requiring an initial application followed by the submission of the alternate liner demonstration. The application step is designed to ensure that a surface impoundment meets minimum requirements before embarking on a comprehensive alternate liner demonstration.

The Agency proposed that in order to apply for an ALD, an owner operator must first submit a letter to EPA declaring their intention to submit a demonstration under the provision. EPA also proposed that along with the letter, a facility must provide documentation showing (1) that a facility is in compliance with all applicable requirements in 40 CFR part 257 subpart D, including all location restrictions, and (2) that there has not been an exceedance of any Appendix IV constituents. EPA further proposed that, as part of this demonstration, a facility must submit documentation to show that the existing network of monitoring wells is sufficient to identify any releases based on direction of flow, well location, screening depth, and other relevant factors. EPA proposed that this could include well construction logs and a sufficient number of diagrams to depict depth to groundwater, the potentiometric surface, and the anticipated directions of groundwater flow across the site. Finally, EPA proposed to require the facility to show there is no indication from groundwater monitoring data that the unit has or will adversely affect groundwater, in part by providing documentation of the most recent statistical tests conducted and the rationale for the methods used in these comparisons. Upon submission of the application, a copy of the written demonstration and all associated documentation must be simultaneously posted to the facility's publicly accessible CCR internet site.

No commenter raised concern about EPA's proposal to require the submission of a letter or the specific requirements applicable to the letter or the two categories of accompanying information required to be submitted. However, some commenters broadly requested that EPA provide greater clarity on the types of information that must be submitted for the application to be considered complete, while other commenters asked for greater clarity on

[9] The maximum hydraulic gradient considered in the 2014 Risk Assessment was 1.0 ft/ft.

[10] Additionally, it is notable that the semi-annual timing between sampling events is designed to ensure a degree of statistical independence in assembled monitoring data. Too-frequent sampling at a given background well can result in highly autocorrelated, non-independent data that can reduce the accuracy of statistical tests.

[11] U.S. EPA. 2008. ''A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems.'' EPA 600/R–08/003. Prepared by the Office of Research and Development. Cincinnati, OH. January.

[12] U.S. EPA. 2012. ''Summary of Technical Impracticability Waivers at National Priorities List Sites.'' OSWER Directive 9230.2–24. Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. August.

the specific elements necessary to satisfy the requirements of the rule.

EPA is finalizing much of § 257.71(d)(1) as proposed—retaining the requirement to submit a letter and accompanying information to demonstrate that certain minimum criteria have been met. The final rule also retains the requirements to submit documentation showing that a facility is in compliance with all applicable requirements in 40 CFR part 257 subpart D, including all location restrictions. However, the final rule includes a modified provision requiring facilities to demonstrate that there has not been a statistically significant increase over background levels of any Appendix III constituents throughout the application and demonstration process. EPA has also made several modifications in response to comments requesting greater clarity. Other changes were made to conform the procedures in this rulemaking with the procedures recently adopted in § 257.103. These topics are discussed in further detail in the next Units of this preamble.

1. Application Letter

EPA proposed that the owner or operator must first submit a letter to EPA declaring their intention to submit an alternate liner demonstration. EPA received no comments that raised questions or concerns about the substantive information to be included in the letter. Consequently, the final rule adopts these requirements without substantial revision. The final rule requires the owner or operator of the CCR surface impoundment to submit a letter to EPA or the Participating State Director. This letter will announce the owner or operator's intention to submit an alternate liner demonstration. The application must include the location of the facility and identify the specific CCR surface impoundment for which the demonstration will be made. The application letter must also include the information in § 257.71(d)(1)(i)(A) through (D), as specified in the regulatory text, and further described below.

2. Compliance With the CCR Regulations and Required Documentation

Along with the letter, EPA proposed at § 257.71(d)(1)(i)(A) that the owner or operator must submit information to EPA documenting that the facility is in compliance with the applicable requirements in 40 CFR part 257, subpart D.

EPA continues to believe that requiring facilities to document compliance with the subpart D of part 257 requirements is an important part of the demonstration. Compliance with the rule provides critical support for the determination that these units will not present the types of risks identified in the damage cases considered in the 2015 CCR Rule. For example, some of the damage cases resulted from disposal in high-risk areas (e.g., within the groundwater table). These issues will be addressed through documenting that the surface impoundments meet the requirements of the 2015 CCR Rule (*e.g.,* location restrictions). Similarly, documenting compliance with the groundwater monitoring requirements shows that the design of the groundwater monitoring network is sufficient to identify groundwater contamination in the uppermost aquifer. This, together with the fact that the unit remains in detection monitoring, demonstrates that there is currently no evidence the risks modeled in the 2014 Risk Assessment are present or will result from continued operation of the impoundment in the near term.

Overall, compliance with part 257, subpart D generally provides some guarantee that the risks at the facility are properly managed and adequately mitigated. Consequently, this determination provides critical support for a decision to allow continued operation of the alternately lined surface impoundment. This means that EPA must be able to affirmatively conclude that the facility meets this criterion prior to authorizing any continued operation of the surface impoundment. It also means that EPA cannot grant facilities additional time to cure any noncompliance. However, EPA's determination will be prospective only; accordingly, for purposes of the ALD process, EPA is only interested in the state of a facility's current compliance rather than any instances of historic non-compliance.

In response to commenters who requested that EPA provide greater specificity about what constitutes a complete submission, EPA has amended the regulatory text to identify specific documents that the owner or operator of a CCR unit must provide to demonstrate its current compliance with the requirements of part 257, subpart D. Most of these documents are the same documents that EPA is requiring facilities to provide under the recent amendments to § 257.103. Further, these documents should already exist either because they would have had to be compiled when the unit was first constructed, or they were required to be developed under the existing regulations.

Consistent with the recent amendments to § 257.103 (85 FR 53516, August 28, 2020), EPA has decided that a certification of compliance and the requirement to remain in compliance with the regulations are also necessary in this final rule. The compliance certification is represented at § 257.71(d)(1)(i)(A) to require a certification signed by the owner or operator of the CCR unit saying it is in full compliance with part 257, subpart D, except for the requirement to document that the unit is constructed with either a composite liner or alternative composite liner under § 257.71(a)(1). This approach will prevent non-compliant unlined surface impoundments from operating for an extended period of time into the future. Requiring that only compliant surface impoundments can be approved for an ALD provides additional support for EPA's conclusion that this final rule meets the statutory standard.

3. Groundwater Monitoring Network Documentation

EPA proposed at § 257.71(d)(1)(i)(B) that the facility must show in the initial application that the existing network of monitoring wells is sufficient to identify any releases based on direction of flow, well location, screening depth and other relevant factors, including well construction logs and a sufficient number of diagrams to depict depth to groundwater, the potentiometric surface, and the anticipated direction(s) of groundwater flow across the site (multiple diagrams may be necessary if the direction of flow is affected by seasonal, tidal or other influences). EPA also proposed that these diagrams should include all the water table measurements reported from a standard datum, a map scale, and a legend of any important map symbols. EPA proposed that facilities that have improperly placed groundwater monitoring wells would not be eligible to apply or submit an alternate liner demonstration.

Many commenters requested greater specificity on the types of information required for this part of the application. Some questioned whether facilities will be required to gather additional groundwater and other site-specific data in support of the application, or whether facilities only needed to submit previously collected groundwater monitoring data and analyses conducted for their sites. One commenter asked whether the application required specific information, such as representative geologic cross sections, groundwater contour maps of the facility, or other hydrogeologic data. Another requested inclusion of a

requirement that facilities include the depth of water ponded in the impoundment to ensure that wells intended to reflect background conditions are not impacted by groundwater mounding. Some commenters pointed out that some of the elements required in the application are standard components of the annual groundwater monitoring and corrective action reports already required by § 257.90(e). Examples include groundwater flow maps and statistical test results. These commenters requested that the monitoring reports and other existing documentation be allowed to substitute for some or all of the application through citation, weblink, or other reference. Although some commenters acknowledged that the information requested would facilitate review of the application, others protested the additional burden of repackaging information.

The intent of this provision is to allow for a comprehensive review of the existing well network to determine whether it is sufficient to identify releases from the unit that have occurred or might occur in the future. EPA did not intend to require the collection of any further groundwater data or other site-specific data for the purposes of the application. Facilities have already designed and implemented their site groundwater monitoring programs, and EPA expects the facility would normally have generated the information specified in § 257.71(d)(1)(i)(B)(*1*) of this final rule, either as part of developing or implementing the groundwater monitoring program. However, facilities are encouraged to provide additional detailed interpretation of the data and analyses for consideration during the review.

EPA proposed that the application include documentation of relevant factors considered by the owner or operator when determining the appropriate number and placement of monitoring wells. As highlighted by some commenters, this should include characterization of the local hydrogeology, including the factors detailed in § 257.91(b), and the potential for groundwater mounding beneath the unit to affect characterization of background. However, the appropriate types of data and level of detail will depend largely on the complexity of the site. As a consequence, EPA is not requiring every facility to incorporate discussion of the depth of impounded water as part of the justification for well placement. Any potential for groundwater mounding should have been accounted for when the wells were first installed and so should be reflected in the documentation already required. If mounding is found to be present, then this information must be reflected in any maps of groundwater elevation and flow direction. However, it is considered highly unlikely that a facility with appropriately located wells and releases substantial enough to result in groundwater mounding would remain in detection monitoring and be eligible for an ALD.

Because this record already exists, the facility would only be required to provide all the data and analyses that were relied upon to comply with the relevant standards of the CCR regulations. However, documenting that the existing well network meets the standard in this rule will require a level of detail and discussion beyond what is required in a routine groundwater monitoring report. And, although such reports contain a subset of the required information, it is likely to be divided up among a number of different documents. This will complicate and extend the review process because the key data and figures will not be presented alongside the relevant discussion to provide proper context. Thus, applications that incorporate the required information solely through reference will be considered incomplete.

Because this information is already available, preparation of the application should not require much additional work beyond compiling information in a concise and coherent fashion. EPA discourages facilities from sending hundreds or thousands of pages of laboratory printouts and other raw data; instead, EPA expects the data to be presented in a tabular or other format that has gone through a quality control process to present the data in a concise format. The types of data and analyses considered by facilities beyond what is required to be presented as part of monitoring reports may appropriately vary on a case-by-case basis.

Therefore, EPA is finalizing the provisions at § 257.71(d)(1)(i)(B)(*1*) with amendments to specify the documents that the facility must provide to demonstrate how it has complied with each requirement in § 257.91. The regulatory text can provide an effective checklist for facilities to follow. In order to review a facility's current compliance with the requirements governing groundwater monitoring systems, the Agency will need the following updated list of information: (1) Map(s) of groundwater monitoring well locations (these maps should identify the CCR units as well) that depict the elevation of the potentiometric surface and the direction(s) of groundwater flow across the site; (2) well construction diagrams and drilling logs for all groundwater monitoring wells; (3) maps that characterize the direction of groundwater flow accounting for temporal variations; and (4) any other data and analysis the facility relied upon when determining the number and placement of wells around the unit compiled in a concise and readable format.

4. No Adverse Effects on Groundwater Documentation

EPA proposed at § 257.71(d)(1)(i)(C) that facilities must demonstrate that there is no indication from groundwater monitoring data that the unit has or will adversely affect groundwater (*i.e.,* no statistically significant levels (SSL) of Appendix IV constituents above relevant GWPS), including documentation of the most recent statistical tests conducted and the rationale for the methods used in these comparisons. Facilities that have conducted improper statistical analysis of groundwater monitoring results would not be eligible to apply or submit a demonstration.

The Agency received comments about the proposed language that a facility must demonstrate ''there is no indication from the groundwater monitoring data that the unit has or will adversely affect groundwater . . .'' Commenters expressed concern that this standard was more stringent than required by the subsequent demonstration step and may necessitate collection of an unspecified amount of additional data, such as sampling for Appendix IV constituents at units that had not progressed beyond detection monitoring, which they worried would not be possible to obtain prior to the application deadline.

As discussed previously, EPA did not intend for facilities to conduct additional rounds of sampling for the application beyond that required for ongoing compliance with the CCR regulations. The referenced preamble language was intended to convey that the monitoring data collected to date must show that there is currently no evidence that the unit has contaminated groundwater, as well as no evidence that it might do so in the future. The language in question was based on the assumption that units presently in assessment monitoring could submit an application. However, EPA has reconsidered that position in light of comments received. The final rule instead requires that all units must stay in detection monitoring to remain eligible for an ALD. The fact that a unit remains in detection monitoring

provides better evidence to demonstrate that the standard in the proposed rule has been met (*i.e.,* that the unit is not currently causing adverse effects), and that such effects are not expected to occur in the near term. EPA acknowledges, as demonstrated for composite-lined units in the 2014 Risk Assessment, that releases can occur from even the most well-designed units and that these impoundments can remain protective. However, greater assurance that the impoundment can continue to operate safely throughout the approval process is necessary at this stage, prior to the demonstration that the ultimate performance standard in this rule has been met.

To reflect these changes, EPA is adopting a provision at § 257.71(d)(1)(i)(B)(*2*) to specify that facilities must demonstrate that the unit remains in detection monitoring as a precondition for submitting an application. Consistent with the proposal, as part of demonstrating that the facility remains in detection monitoring, the owner operator must document the most recent statistical tests conducted and the rationale for the methods used in these comparisons.

Many industry and some state commenters requested greater specificity on the types of information required for this part of the application. One commenter requested clarification on the relationship between these requirements and those found in § 257.93 and § 257.94. Another commenter asked whether a qualified professional engineer's certifications that the groundwater monitoring program meets the requirements of the 2015 CCR Rule would provide sufficient documentation.

The intent of this provision is to allow for a comprehensive review of the facility's determination that a unit has not adversely affected groundwater. Certification from a qualified professional engineer alone would not provide the necessary documentation. EPA proposed that facilities include documentation of the most recent statistical test and rationale for the methods selected. Whether the results of the statistical tests are valid depends on all the data and analyses that underpin it. The documentation must demonstrate that the characterization of groundwater quality is sufficient; the management of collected monitoring data has been properly considered and addressed non-detect data, trends, and other relevant factors that may affect data quality; and that the statistical tests applied are appropriate. The specific standards that the application must address are detailed in § 257.93 through § 257.94.

Therefore, EPA is finalizing § 257.71(d)(1)(i)(B)(*2*) with amendments to specify that the facility must document how it has complied with each requirement in §§ 257.93 through 257.94. The regulatory text in these sections can provide an effective checklist for facilities to follow. To support that demonstration, the final rule requires facilities to provide the following: (1) Documentation of the most recent statistical test; and (2) the rationale for the methods used in these comparisons. As part of this rationale, the facility must provide all data and analyses relied upon to comply with each requirement.

5. Location Restrictions

EPA proposed at § 257.71(d)(1)(i)(D) that a unit must be in compliance with all relevant location restrictions at §§ 257.60 through 257.64 in order to be eligible for an ALD.

Many industry commenters requested greater specificity on the types of information required for this part of the application. Specifically, commenters inquired whether facilities were expected to submit the entire package of location restriction demonstrations, or if they can simply certify that the CCR surface impoundment meets all location restrictions. The documents that demonstrate a unit meets a location restriction should already exist because they are required under the existing regulations. Location restrictions were established to ensure that units are constructed in suitable geographic areas. Prohibited locations reflect areas where local conditions have the potential to compromise the integrity of the unit or where, if contamination were to occur, the damages could be particularly severe or difficult to remediate. EPA still believes this is critical to the record supporting continued operation of the unit. Consequently, facilities must submit the entire package of location restriction demonstrations.

Therefore, EPA maintains that documentation that the facility is in compliance with all location restrictions must be submitted to EPA or the Participating State Director as a requirement of the initial application and is finalizing § 257.71(d)(1)(i)(B)(*3*).

6. Structural Stability and Safety Factor Assessment Submission

In order to align with the recent amendments to § ''257.103 (85 FR 53516, August 28, 2020)(''Part A final rule''), this final rule specifies that a facility must submit the facility's most recent structural stability assessment required at § 257.73(d) and safety factor assessment required at § 257.73(e) at § 257.71(d)(1)(i)(B)(*4*) and (*5*). EPA's intention to review these items was discussed in the proposed rule as part of the discussion when discussing that a unit must be in full compliance with the 2015 CCR Rule. EPA received no comments raising concern about inclusion of this requirement. The inclusion of this requirement also responds to requests that EPA provide greater specificity on the documents that must be submitted as part of the application.

The Agency recognizes that the requirement to conduct periodic structural stability assessments and safety factor assessments is not applicable to all CCR surface impoundments. As specified in § 257.73(b), only those impoundments with a height of five feet or more and a storage volume of 20 acre-feet or more, or those impoundments with a height of 20 feet or more are subject to these assessment requirements. An owner or operator submitting an ALD application for a unit not meeting these thresholds must include an affirmative statement in the certification signed by the owner or operator under § 257.71(d)(1)(i)(A) indicating that the impoundment is not subject to the structural stability and safety factor assessment requirements under § 257.73(d) and (e). Similarly, EPA is aware that not all impoundment dikes were constructed with soils that are susceptible to liquefaction, and thus are not subject periodic safety factor assessments showing that the calculated liquefaction factor of safety equals or exceeds 1.20. See § 257.73(e)(1)(iv). For impoundments not constructed with soils subject to liquefaction and subject to the safety factor assessment requirements, the owner or operator must include an affirmative statement in the certification required under § 257.71(d)(1)(i)(A) stating that the unit is not subject to the liquefaction factor of safety because it has been determined that the dike(s) was not constructed with soils subject to liquefaction.

7. Documentation of Source Material and Construction Quality

EPA noted in the proposal that geomembrane liners are not as sensitive to the chemical composition of coal ash leachate as soil-based liners and so performance may depend more on the frequency and magnitude of imperfections that arise during installation. In these instances, laboratory infiltration tests on pristine samples are unlikely to provide representative data on field performance. EPA discussed

construction quality reports as a type of documentation that could support characterization of geomembrane liner performance in the field. However, EPA did not require the submission of any particular documents as part of the application.

Multiple commenters indicated that historical data on the construction of impoundments is important to understand whether a unit can perform as intended. Commenters identified several specific factors they believed should be part of the submission, such as the initial saturation, compactive effort, plasticity index, subgrade water content, and clay content of the liner. One commenter also warned that specifications on a manufacturer's product sheet alone may not provide adequate assurance of good performance in the field.

EPA agrees that considerations of construction quality are equally relevant to all types of liners. Indeed, the ability of any liner to achieve performance objectives is predicated on the quality of both the source materials and the construction of the surface impoundment. Therefore, EPA concludes that information on both must be incorporated in the application to provide evidence that the unit has the soil characteristics or engineering quality that would make it possible for the unit to meet the ultimate performance standard is expected to remain protective in the near term while the comprehensive demonstration is completed. The relevant types of information will depend on the design of the surface impoundment. Consequently, EPA is not specifying particular documents or data that must be submitted for every impoundment.

Source quality testing ensures that the materials used to construct the liner conform with project specifications and are able to meet the necessary standards. However, EPA has found negligible correlation between field hydraulic conductivity and many of the common soil characterization parameters identified by the commenter, such as plasticity index and clay content.[13] As a result, EPA previously concluded that it is difficult to determine whether a particular soil is suitable for use as a liner based solely on individual index properties and without relevant confirmatory testing. For engineered soils, this will involve establishing the relationship between water content, density, and hydraulic conductivity in a laboratory setting before construction begins to ensure the liner will be installed under optimum conditions. For naturally-occurring soils, this will involve testing that the pre-existing soil structure achieves a sufficiently and consistently low hydraulic conductivity. For geomembrane liners, this involves confirming that the material can withstand the stresses it will be exposed to and that the seams of the liner can be reliably welded to meet performance requirements. Altogether, this information provides evidence that these materials can meet relevant performance objectives during operation.

Construction quality testing ensures that surface impoundment construction has been performed in accordance with all relevant technical specifications before any waste is accepted. EPA stated in the proposal that collection of in-situ data from an operating surface impoundment will generally be impracticable because of the potential to disrupt the integrity of the liner, and some facilities agreed in their comments. However, laboratory testing cannot account for operational problems during construction that result in substandard conditions, such as desiccation, cracking, poor bonding, and inconsistent compaction of the liner. There are no standardized laboratory tests designed to simulate a liner that has been poorly designed or constructed. Therefore, without contemporaneous documentation that the surface impoundment liner was well constructed, it will be too difficult to confirm that any data subsequently collected for the demonstration reliably represents actual liner conditions. In particular, for soil liners that do not meet the thickness requirement of the rule, field testing is likely the only reliable way to ensure that construction has achieved a sufficiently low and consistent hydraulic conductivity. Considerable guidance exists on factors that must be addressed to ensure the quality of a liner, such as: the proper thickness, compaction, moisture content, and density of compacted soil; the in-situ hydraulic conductivity of compacted soil; protection of soil from desiccation and freezing; placement of the geomembrane liner without excessive waves, with a goal of ensuring intimate contact between the liner and the underlying soil; and protection of geomembranes from puncture by adjacent materials or equipment. Altogether, this information provides evidence that the liner is well constructed and can be reasonably simulated in a laboratory setting.

EPA is finalizing a new requirement at § 257.71(d)(1)(i)(C) that facilities are required to provide documentation of the design specifications for any engineered liner components (*e.g.,* manufactured geomembrane, mechanically compacted soil), as well as all data and analyses the facility relied on when determining that the materials are suitable for use and that the construction of the liner is of good quality and in line with proven and accepted engineering practices.

8. Additional Release Pathways

In the proposal, EPA stated that in some instances direct infiltration to groundwater may not be the sole mechanism by which unpermitted release of leachate from a surface impoundment occurs. It is possible that additional, site-specific release pathways may exist for some impoundments. For example, there may be lateral transport from the surface impoundment directly into the water body driven in part by the hydrostatic head within the surface impoundment. EPA listed proximity to a water body, construction above grade, lack of a geomembrane liner, and the presence of low conductivity soil beneath the unit as factors that could contribute to such releases. EPA stated that, if such conditions are present at a site, then the demonstration would need to address whether such releases may occur and the potential adverse effects on health or the environment associated with these pathways. The same types of data collected to evaluate releases to groundwater should also support evaluation of such pathways.

EPA received no adverse comments on this topic. One commenter affirmed that such pathways are possible and are a concern. No commenters identified other relevant subsurface release pathways beyond the one contemplated in the proposal.

Upon further consideration, EPA now believes that this type of release is already adequately addressed by the requirements of § 257.96(a). Because this issue involves compliance with an aspect of the 2015 CCR Rule, EPA believes it is most appropriately addressed as part of the application step. As clarified in the Phase One Rule, this provision requires a facility to commence corrective action ''immediately upon detection of a release from a CCR unit'' for any non-groundwater releases. 83 FR 11584 (March 15, 2018). Thus, the existence of subsurface releases directly to surface water would trigger immediate corrective action. Further, unlike groundwater, there is no standardized

[13] U.S. EPA. 2002. ''Assessment and Recommendations for Improving the Performance of Waste Containment Systems.'' EPA/600/R–02/099. Prepared by the Office of Research and Development. December.

method to monitor the progression or effects of this type of release to confirm that the unit remains protective. Therefore, if the design of a surface impoundment cannot be shown to reliably prevent such releases, it would be ineligible for an ALD.

Therefore, EPA is finalizing a requirement at § 257.71(d)(1)(i)(D) that facilities with surface impoundments located on properties adjacent to a water body must demonstrate that there is no reasonable probability that a complete and direct transport pathway (*i.e.,* not mediated by groundwater) could exist between the impoundment and any nearby water body. If the potential for such releases is identified, then the unit would not be eligible to submit a demonstration. If ongoing releases are identified, the owner or operator of the CCR unit must address these releases in accordance with § 257.96(a).

C. Alternate Liner Demonstration

EPA proposed that the ALD must present evidence to demonstrate, with a reasonable degree of certainty, that based on the construction of the unit and surrounding site conditions, operation of the surface impoundment will not result in groundwater concentrations above relevant GWPS at the waste boundary.

EPA proposed at § 257.71(d)(1)(ii) that the liner demonstrations must be certified by a professional engineer. Some commenters requested that the qualifications necessary to certify the ALD be broadened beyond professional engineers to include geologists and hydrogeologists. The commenter noted that licensed professional geologists or hydrogeologists are trained and experienced in investigation and analysis of groundwater and subsurface contaminant flow and chemistry. EPA previously considered this exact request and rationale as part of the 2015 CCR Rule. The Agency concluded there that, while some environmental professionals (*e.g.,* hydrologists, geologists) may be qualified to make certain certifications, EPA was not convinced that either hydrologists or geologists licensed by a state are held to the same standards as a professional engineer. 80 FR 21337 (April 17, 2015). One commenter requested that EPA use the term ''qualified professional engineer'' rather than ''professional engineer,'' as this is the term that was used in the 2015 CCR Rule. EPA agrees with this suggestion and will be finalizing the rule requiring that certification must be provided by a ''qualified professional engineer''.

The qualified professional engineer must certify that the demonstration package presents evidence to demonstrate that there is no reasonable probability that peak groundwater concentrations that may result from releases throughout the active life of the surface impoundment will exceed GWPS at the waste boundary based on the construction of the unit and surrounding site conditions.

EPA proposed two lines of evidence for which site-specific data must be collected and incorporated into the demonstration. These are the characterization of site hydrogeology and the potential for infiltration. EPA identified these lines of evidence because the hydraulic conductivity of the engineered liner and/or naturally occurring soil is expected to be the primary mechanism that will limit release and transport of contaminants from the unit. These data will be used to model the potential for the release of contaminants and their transport through the environment. For each line of evidence, as well as any other data and assumptions incorporated into the determination, EPA proposed that the facility must include documentation on how the data were collected and why these data and assumptions are believed to adequately reflect potential contaminant transport at and around that specific surface impoundment.

1. Line of Evidence #1—Characterization of Site Hydrogeology

The first line of evidence that EPA proposed at § 257.71(d)(1)(ii)(A) requires characterization of the variability of the site-specific soil and hydrogeology that surrounds the CCR surface impoundment. Some surface impoundments are located on soils that are expected to have extremely low hydraulic conductivity. However, there are concerns that heterogeneity within these soils may result in preferential flow pathways that effectively negate the low conductivity of the remaining soil. For example, many electric utilities are located in close proximity to bodies of water. The flow path of these water bodies is likely to have shifted over geologic time, which could result in complex depositional environments with interconnected lenses of sand. Therefore, the purpose of this first line of evidence is twofold: to define the broader connectivity of higher conductivity soils that might act as preferential flow pathways and to characterize the variability of the soil to guide collection of samples for the second line of evidence.

EPA proposed that characterization of site hydrogeology must include all of the following: (1) Measurements of the hydraulic conductivity in the uppermost aquifer from existing monitoring wells and discussion of the methods used to obtain these measurements; (2) Subsurface samples collected to characterize site hydrogeology must be located around the perimeter of the surface impoundment at a spatial resolution sufficient to ensure that any regions of substantially higher conductivity have been identified; (3) Conceptual site models with cross-sectional depictions of site stratigraphy that include the relative location of the surface impoundment (with depth of ponded water noted), monitoring wells (with screening depths noted), and all other subsurface samples used in the development of the models; (4) Narrative description of site geological history; and (5) All data used in the conceptual site model summarized into easily readable graphs or tables. EPA did not receive any comments relevant to § 257.71(d)(1)(ii)(A)(*4*). Therefore, EPA is finalizing this requirement as proposed with updated numbering to reflect changes in the other regulatory text paragraphs. Discussion of comments on other provisions are provided in the following Units.

a. Measurements from Existing Wells

EPA proposed at § 257.71(d)(1)(ii)(A)(*1*) that the demonstration must include measurements of the hydraulic conductivity in the uppermost aquifer measured from existing monitoring wells and discussion of the methods used to obtain these measurements.

One commenter stated that EPA should consider modifying or removing the requirement that uppermost aquifer hydraulic conductivity measurements must be measured from existing monitoring wells. They argued that there may be additional data points and locations that may be more representative than conductivity measurements taken from the existing well locations. The commenter requested that locations for these measurements be determined by the technical team preparing the demonstration and should not be limited to these prescriptive locations.

The waste boundary is the point of compliance for all GWPS. These standards apply to all units subject to the existing regulations, including those submitting an ALD. Thus, the hydrogeologic conditions in the vicinity of the wells used to determine compliance are highly relevant. However, § 257.71(d)(1)(ii)(A)(*1*) only establishes a minimum standard for the demonstration. Facilities can collect and incorporate additional data beyond this minimum in the demonstration, as

warranted to further delineate hydrogeologic conditions. Therefore, EPA made no amendment to the rule language in response to this comment.

b. Sampling at the Perimeter of a Surface Impoundment

EPA proposed to require that subsurface samples must be collected to characterize site hydrogeology and must be located around the perimeter of the surface impoundment at a spatial resolution sufficient to ensure that any regions of substantially higher conductivity have been identified. In the proposal, EPA acknowledged that some data may already be available from previous investigations, such as sampling or logging done during the installation of monitoring wells or other subsurface evaluations. However, the Agency considered it likely that additional data would be necessary to provide adequate coverage of the subsurface.

Environmental groups raised concerns that it would not be feasible for an owner or operator to collect enough site-specific data to allow for a determination that an existing alternate liner is protective. One commenter stated that site characterization at the necessary spatial resolution would require multiple rounds of sampling, might necessitate installation of additional monitoring wells, and would require far longer than allowed by this rule. Another went further and stated that no characterization of a site's hydrogeology and potential for infiltration will be able to prove that a nonconductive layer is continuous under the entire ash pond.

EPA agrees that it is critical to adequately characterize potential transport beneath the unit but disagrees that it is not possible to collect sufficient data to characterize subsurface transport. For the subset of impoundments that rely on natural soils to limit contaminant transport, it is improbable that any high-conductivity soils present on-site are limited entirely to within the footprint of a unit. The long-term movement of both water bodies and glaciers tend to leave deposits all along the migration path. This is supported by observations across a wide range of depositional environments that layers of sand and clay are typically found in a ''shingled'' or ''laterally offset'' fashion, rather than as a ''layer cake'' with one stacked neatly on top of the other.[14] Thus, collection of samples from around the perimeter is expected to provide reliable information about both the variability of conditions underneath the impoundment and the potential for transport away from the impoundment. Even if isolated lenses of sand or other high-conductivity material were located entirely beneath the impoundment, these disconnected deposits would not negate the low conductivity of the surrounding clay because of a lack of connectivity. Finally, the surficial geophysical methods referenced by one of the same commenters can provide information on soils some distance away from the point of measurement. Depending on the specific geometry of a unit and the methods used, the data collected around the perimeter of the unit can also provide substantial coverage of the soils beneath the unit. Based on these facts, EPA concludes that data collected from around the waste boundary can also provide reasonable estimates of the variability beneath the unit for the purposes of an alternate liner demonstration.

Although fieldwork may take some time, it will not begin from scratch. Facilities allowed to progress to the demonstration step will have already confirmed that there is adequate subsurface characterization available to appropriately site the existing groundwater wells. These data will inform subsequent sampling efforts. In the proposal, EPA contemplated the potential for this line of evidence to also identify the need for additional wells to address previously unidentified regions of high conductivity soil. However, the finalized application step requires documentation that the existing network is sufficient to ensure detection of contamination in the uppermost aquifer. Therefore, this line of evidence will not involve the time-consuming process of installing and sampling new monitoring wells. The standardized geophysical survey methods discussed both in the proposal and raised by commenters can be conducted within the required timeframe, even if more than one round of data collection is ultimately required.

Therefore, EPA is finalizing the requirement at § 257.71(d)(1)(ii)(A)(*2*) without change from the proposal. The final rule requires that measurements of the variability of subsurface soil characteristics must be collected from around the perimeter of the impoundment to identify any regions of substantially higher hydraulic conductivity.

c. Sampling Methods

In the proposal, EPA discussed that traditional geologic mapping, that relies primarily on the Unified Soil Classification System, has been found to underestimate the prevalence and interconnectedness of soil deposits that may act as preferential flow pathways. EPA cited to a practical guide on the use of environmental sequence stratigraphy and facies models to aid in characterization of subsurface heterogeneity.[15] EPA noted that there are a number of methods available that can provide useful data at the necessary spatial resolution, such as direct-push logging (*e.g.,* cone penetration test) and borehole geophysical logging. However, EPA did not propose the use any specific methods, nor did the Agency place explicit restrictions on the types of methods available.

Several industry commenters and one environmental group expressed concern that the proposal unnecessarily required invasive sampling methods to collect the necessary data on conditions below the ground surface. Multiple commenters identified specific methods, such as electrical-resistivity tests, as alternate methods that could provide relevant information. One commenter further pointed to the Interstate Technology and Regulatory Council website on advanced site characterization tools.[16]

EPA acknowledges that the language used in the proposal could be taken to imply that invasive sampling is the only type of method allowed for this line of evidence, but EPA did not intend to restrict the methods available for use in this way. EPA agrees that surficial (or non-invasive) sampling can provide useful information, though these methods often require correlation or a combination of qualitative and quantitative interpretation to properly interpret the data. These surface geophysical tools tend to be most powerful when used in combination with other methods.

Therefore, for clarity, EPA is finalizing an amended version of § 257.71(d)(1)(ii)(A)(*3*). The final rule specifies that characterization of subsurface variability must be conducted with recognized and generally accepted methods. Facilities must document how the combination of methods relied upon provides reliable

[14] U.S. EPA. 2017. ''Best Practices for Environmental Site Management: A Practical Guide for Applying Environmental Sequence Stratigraphy to Improve Conceptual Site Models.'' EPA/600/R–17/293. Prepared by the Office of Research and Development. Cincinnati, OH. September.

[15] U.S. EPA. 2017. ''Best Practices for Environmental Site Management: A Practical Guide for Applying Environmental Sequence Stratigraphy to Improve Conceptual Site Models.'' EPA/600/R–17/293. Prepared by the Office of Research and Development. Cincinnati, OH. September.

[16] *h t t p s // asct-1.itrcweb* dot *org/.*

information at a spatial resolution necessary to adequately characterize the variability of subsurface conditions that will control contaminant transport.

d. Sample Depth and Spacing

EPA discussed in the preamble of the proposed rule that samples should extend down to the top of the natural water table or at least 20 feet beneath the bottom of the nearest water body (to identify potential for upwelling), whichever is greater, to ensure that any potential preferential flow pathways have been identified. EPA also discussed that the initial soil samples collected around the perimeter of the unit should be spaced at a distance no greater than 200 feet apart in low-conductivity soils. This distance reflects recommendations by the U.S. Department of Transportation (U.S. DOT) for the characterization of unknown subsurface environments.[17] If there is indication from the site history, collected soil samples, or other sources that high-conductivity deposits may be present at widths narrower than 200 feet, then even finer sample spacing may be warranted. EPA stated that the demonstration must substantiate why the number and types of samples collected are sufficient to capture any heterogeneity of the subsurface and why the data used to estimate contaminant fate and transport through the subsurface are representative of the variability identified. If regions of higher conductivity are present around the site, the potential impacts of preferential flow on groundwater concentrations will need to be considered in the demonstration. Furthermore, if regions of preferential flow are identified in otherwise low-conductivity soils that are not adequately captured by the existing monitoring well network, then re-evaluation of the placement of monitoring wells around the waste boundary would be warranted to address these gaps.

Many commenters argued that the depth and spacing of samples discussed in the preamble was overly strict. No commenters raised issue with the rationale for the proposed sample depths. However, one commenter argued that characterization down to the groundwater table is unnecessarily burdensome for sites with deep groundwater. This commenter stated that if the first 100 feet of the soil overlying the aquifer is not sufficient to prevent contamination of groundwater, then the next 100 feet is unlikely to alter that fact. Several commenters raised questions about the rationale for the proposed sample spacing. One commenter pointed out that EPA has previously written that the number of borings necessary to characterize soils is dependent on the geological complexity, size, potential areal extent of a release, and the importance of defining small-scale discontinuities in formation materials.[18] Many others pointed out that the U.S. DOT guidance referenced in the preamble is not directly related to waste disposal and that the guidance also states that the spacing and depth of the borings should be based on an evaluation of available information.[19] Most of these commenters requested further justification for the criteria for sample spacing.

EPA generally agrees with commenters that the exact depth and spacing of samples should be informed by site conditions. The discussion provided in the proposal was intended to define an initial depth and spacing of samples that would ensure identification of subsurface variability at these sites, not to impose this exact sampling regime at every site. Instead, EPA intended for facilities to document why the number and types of samples collected are sufficient to capture the heterogeneity of the subsurface if sampling deviated from these specifications. Such documentation would not provide additional useful information if all sampling was pre-determined. EPA believes these baseline requirements are warranted because there will be no time for facilities to fill data gaps in the characterization of the site if a demonstration is found to be insufficient. These requirements also help clarify the level of documentation expected as part of the demonstration.

As discussed, the 200 feet spacing was based on a U.S. DOT publication that provides a review of recommended practices for installation of pavement from a geotechnical perspective based on guidelines from textbooks, several state agencies, and the Federal Highway Administration. Commenters are correct that a primary focus of the publication is the stiffness and strength of the soil; however, it also accounts for soil permeability and the presence of discontinuities, fractures, and fissures of subsurface formations, which are relevant to the demonstration. The minimum spacing was selected from this publication based on the professional judgement of Agency staff, who have considerable experience on this topic from work at cleanup sites across the country. For all these reasons, EPA continues to believe that selected minimum spacing is relevant and appropriate. Notably, no commenters indicated that an initial 200 feet spacing was too wide apart to effectively characterize soil, nor did any commenters identify another standard believed to be more directly applicable.

In response to these comments, EPA is finalizing § 257.71(d)(1)(ii)(A)(*4*) with amendments to make clear that facilities must document why the specific number, depth, and spacing of samples collected are sufficient to reflect the variability of subsurface soils if 1) samples are advanced to a depth less than the top of the groundwater table or 20 feet beneath the bottom of the nearest water body, whichever is greater, or 2) samples are spaced farther apart than 200 feet around the surface impoundment perimeter.

e. Conceptual Model

EPA proposed at § 257.71(d)(1)(ii)(A)(*3*) that as part of the first line of evidence, facilities must provide conceptual site models with cross-sectional depictions of site stratigraphy that include the relative location of the surface impoundment (with depth of ponded water noted), monitoring wells (with screening depths noted), and all other subsurface samples used in the development of the models.

One commenter stated that the conceptual models should also include ''all relevant hydraulic information, including depth to saturated zones, piezometric surface elevation, withdrawal points, recharge and discharge areas. Based on groundwater and contaminant flow model projections, the cross sections should extend a sufficient distance from the surface impoundment to incorporate the influence of such features on the site-vicinity hydrogeology.''

EPA agrees that the depiction of site hydrology on these diagrams is important. Although some data identified by the commenter are already required as part of other diagrams, inclusion here allows both an alternate view of these data (cross-sectional instead of aerial) and a more complete understanding of the relationship between site geology and subsurface transport. At the same time, requiring

[17] U.S. DOT. 2006. ''Geotechnical Aspects of Pavement: Reference Manual/Participant Workbook.'' FHWA NHI–05–037. Prepared by the Federal Highway Administration. Washington, DC. May.

[18] U.S. EPA. 1989. ''Interim Final RCRA Facility Investigation (RFI) Guidance Volume II Of IV: Soil, Ground Water And Subsurface Gas Releases.'' EPA 530/SW–89–031. OSWER Directive 9502.00–6D. Prepared by the Office of Solid Waste. Washington, DC. May.

[19] U.S. DOT. 2006. ''Geotechnical Aspects of Pavement.'' FHWA NHI–05–037. Prepared by the Federal Highway Administration. Washington, DC. May.

facilities to depict the full variability of groundwater depth and flow in these cross-sections could dramatically increase the total number of diagrams needed without providing much additional clarity. Instead, EPA believes it is more important for this set of diagrams to depict the range of hydrologic conditions encountered at the site.

Therefore, in response to these comments, EPA is finalizing § 257.71(d)(1)(ii)(A)(*5*) with an amendment that each cross-sectional diagram must also include demarcation of, at a minimum, (1) the upper and lower limits of the uppermost aquifer across the site, (2) the upper and lower limits of the depth to groundwater measured from facility wells if the uppermost aquifer is confined, and (3) both the location and geometry of any nearby points of groundwater discharge or recharge (*e.g.,* surface water bodies, wells) with potential to influence groundwater depth and flow measured around the unit.

2. Line of Evidence #2—Potential for Infiltration

The second line of evidence that EPA proposed at § 257.71(d)(1)(ii)(B) would require evaluation of the potential for infiltration through any liners and underlying soils that control the release and transport of leachate by either in-situ sampling, or by conducting an analysis of the soil-based liner and underlying soil of the unit through laboratory testing. EPA discussed in the preamble that the purpose of this line of evidence is to provide a reasonable estimate of the rate at which contaminants may be released and transported to groundwater over time. However, EPA also questioned whether collection of in-situ data would be feasible for facilities.

EPA received comments from multiple facilities agreeing that collection of data from beneath the surface impoundment could be unnecessarily onerous and may disturb the integrity of the surface impoundment. One environmental group stated that field measurements of hydraulic conductivity were preferable because laboratory measurements have the potential to differ from field measurements. This commenter stated that the hydraulic conductivity of geosynthetic clay liners can be impacted by a variety of factors in the field that may not be adequately addressed in the lab, citing to several studies purported to raise concerns both that laboratory tests were unreliable and that the leaching behavior of clays were too poorly understood to reliably measure in the lab.

EPA agrees with commenters who stated that in-situ analysis of liner performance while the unit operates would be impracticable. Installation of a leachate collection device, such as lysimeter, beneath the impoundment to measure releases in real time risks disruption of the liner. In addition, because the current state of the liner cannot be directly observed or measured during operation, it is not possible to determine whether such measurements reflect the long-term interactions between the liner and CCR leachate. Therefore, EPA is removing the provision that allowed for in-situ sampling of hydraulic conductivity.

EPA disagrees that the studies provided by the commenter raise wider concerns about either the general reliability and reproducibility of laboratory methods or the specific ability to accurately measure hydraulic conductivity in a laboratory setting. The Agency's review of the cited articles found that excerpts quoted by the commenter did not fully reflect the context or conclusions of the studies, that the conclusions the commenter had drawn from some studies were incorrect, and that many of the studies cited had limited or unclear applicability to CCR surface impoundments. Specifically:

- The first study quoted by the commenter evaluated the precision among labs for hydraulic conductivity measurements of fine-grained soils using Method C of ASTM D5084–10.[20] From this study the commenter drew the quote, ''many of the laboratories in the study did not follow the test method precisely.'' However, the authors of this study concluded that the variability of results between labs was not sensitive to these deviations from protocol. Further, the authors found that ''hydraulic conductivity can be measured within a factor of 2 for the 10^{-6} cm/s range, a factor of 1.5 for the 10^{-6} cm/s range, and a factor of 4 for the 10^{-9} cm/s range.'' These results do not support wider concerns about laboratory reproducibility raised by the commenter. First, the commenter fails to acknowledge that measurement uncertainty is an inherent part of any data collection effort and they provide no evidence that field measurements would yield appreciably lower variability. Second, the magnitude of variability identified in the study is minor compared to the multiple orders of magnitude over which soil conductivity can vary. Thus, this source of variability will become less important in lower conductivity soils. Finally, the commenter does not acknowledge that uncertainties can be managed within an evaluation to ensure that long-term contaminant release and transport are not underestimated. For example, under the requirements of this rule, facilities are required to measure the hydraulic conductivity of subsurface soils saturated with CCR leachate, which will simulate the highest conductivity possible for that soil.
- A second study referenced by the commenter compared concentrations in CCR leachate with two different EPA methods, the synthetic precipitation leaching procedure (SPLP; Method 1312) and Leaching Environmental Assessment Framework (LEAF, Method 1313).[21] From this study the commenter pointed to the statement that ''SPLP results were highly variable when compared to the LEAF data.'' The commenter indicated that this was evidence that laboratory tests were not reliable. EPA disagrees. The study authors discussed potential causes of observed differences between the two methods, which they attributed primarily to the different extraction acids used by the two methods, a conclusion supported by the findings of previous studies. This is reasonable because the two leaching tests are designed to represent somewhat different environmental scenarios. There is no indication that either method returned erroneous results for the specified conditions. EPA has subjected the LEAF methods to extensive inter-laboratory validation and has great confidence in the results of these methods.[22] The Agency has also emphasized that the data from leaching tests must be considered carefully to ensure that the test conditions provide relevant information about actual environmental conditions. Therefore, the commenter's assertion that these results raise concerns about the reliability of laboratory methods is incorrect.
- The commenter cited a number of studies as evidence that in-situ conditions exist that cannot be reliably

[20] Benson, C.H. and N. Yesiler, 2016. ''Variability of Saturated Hydraulic Conductivity Measurements Made Using a Flexible-Wall Permeametter,'' Geotechhnical Testing Journal. 39(3):476–491.

[21] da Silva, E.B., S. Li, L.M. de Oliveira, J. Gress, X. Dong, A.C. Wilkie, T. Townsend, and S.Q. Ma. 2018. ''Metal Leachability from Coal Combustion Residuals under Different pHs and Liquid/Solid Ratios.'' Journal of Hazardous Materials. 341:66-74.

[22] U.S. EPA. 2012. ''Interlaboratory Validation of the Leaching Environmental Assessment Framework (LEAF) Method 1313 and Method 1316.'' EPA 600/R–12/623. Prepared by tthe Office of Research and Development. September.

measured. However, many of these studies do not directly address clay liners or even waste disposal, focusing instead on issues such as climate change. Others evaluated liners exposed to extreme conditions, such as sustained operating temperatures above 100 °F and high ammonia concentrations. The commenter provides no indication beyond the ancillary citations how these issues are germane. Nevertheless, the commenter concluded that ''in-situ conditions are very complex and we do not yet have enough understanding of how these complexities affect CCR leachability to ensure that we make accurate models in the lab.'' Yet, this assertion does not comport with the available literature that shows reasonable agreement can be achieved between field and lab measurements when units are well constructed.[23]

EPA maintains that laboratory analysis is the preferred means to measure hydraulic conductivity of soil for the purposes of an ALD. Field analysis typically involves use of an infiltrometer or permeameter to measure the rate that water infiltrates into the uppermost layer of soil. These methods are generally not designed to account for the complexities associated with this type of demonstration. First, the soil to be tested may be located some distance below the ground surface, which will be difficult to isolate and reliably test in the field. Second, field tests are generally designed to use water, rather than a high-ionic strength leachate. As a result, these methods are not designed to collect the effluent needed to track system chemistry. Third, the potentially long test run times could make it difficult to control for environmental variables, such as evaporation. Therefore, to ensure reliable implementation of test methods and consistency between the various samples, EPA concludes that all samples for hydraulic conductivity should be measured in a controlled laboratory setting.

Therefore, EPA is finalizing the requirement at § 257.71(d)(1)(ii)(B) with an amendment that removes the option for in situ sampling. The final rule now specifies that facilities must send all samples of the soil-based liner components and/or naturally-occurring soil for analysis under controlled conditions in a certified laboratory. Samples must be analyzed using a recognized and generally accepted methodology. Facilities must document in the demonstration how the selected test method is designed to simulate field conditions (*e.g.,* hydraulic head, effective stress).

In the proposal, EPA stressed that it is critical that laboratory tests are designed to reflect site conditions to ensure the data generated reflect real-world and long-term operating conditions. EPA provided several examples of potentially relevant site conditions. EPA received a number of comments related to several of these and other site conditions. Discussion of the site conditions and the specific comments received is provided in the following Units of this preamble.

a. Number and Location of Samples

EPA did not provide specific discussion in the proposal about the required number, depth, or spacing of samples for analysis of hydraulic conductivity for the second line of evidence. Instead, EPA stated in the first line of evidence that samples must be located around the perimeter of the surface impoundment at a spatial resolution sufficient to ensure that any regions of substantially higher conductivity have been identified. EPA had intended for the variability of the hydrogeology identified in the first line of evidence to inform the number and location of samples analyzed for the second line of evidence.

Based on comments received, EPA believes that commenters generally assumed EPA had proposed that the location of samples for hydraulic conductivity must coincide with samples collected for the first line of evidence. As such, EPA considers all general comments requesting that the frequency of data collection be based on the variability of the site geology to be equally relevant here.

EPA did not envision that samples collected to characterize hydraulic conductivity would exactly match the number or location of those collected for the first line of evidence. For example, as discussed in Unit III.C.1.b of this preamble, this rule also allows for use of non-intrusive methods to support the first line of evidence. Because non-intrusive methods do not advance equipment into the soil, they do not allow for simultaneous collection of subsurface soil samples. The combination of methods used to characterize site hydrogeology may identify regions of subsurface variability some distance away from the point of measurement. Therefore, facilities should instead use the information available on subsurface variability from the first line of evidence to inform the number and location of samples for the second line of evidence.

Therefore, for clarity and consistency with the first line of evidence, EPA is finalizing a requirement at § 257.71(d)(1)(ii)(B)(*1*) that facilities are required to document where samples were collected around the surface impoundment and how the number, depth, and spacing of these samples (1) are supported by the data collected for the first line of evidence and (2) are sufficient to capture the variability of hydraulic conductivity for the soil-based liner components and/or naturally occurring soil.

b. Permeant Liquid

EPA discussed in the proposal that tests used to estimate hydraulic conductivity need to use a permeant liquid that reflects the composition of the infiltrating surface impoundment porewater. The method must account for the chemistry of CCR porewater that can have both extreme pH and high salinity. Extreme pH may dissolve key components of the soil structure, while high salinity may result in interlayer shrinkage of clays, both of which can result in higher hydraulic conductivity. Use of a non-representative liquid (*e.g.,* deionized water) as the permeant liquid or pre-hydrating the clay may actually decrease the conductivity of clay through swelling and result in a lower measured conductivity than would actually occur in the field.

EPA received no adverse comments on this topic. One commenter raised concern that exposure to CCR leachate can adversely affect the integrity of a liner, though this commenter made no reference to the preamble discussion. Instead, the commenter cited to multiple studies purported to show that CCR leachate can adversely affect geosynthetic clay liners and that pre-hydrating samples with deionized water may underestimate long-term conductivity.

As discussed in the proposal and above, EPA agrees that the effects of leachate chemistry on long-term soil conductivity are potentially significant. Therefore, EPA is finalizing a requirement at § 257.71(d)(1)(ii)(B) that the liquid used to pre-hydrate the clay and measure long-term hydraulic conductivity must reflect the pH and major ion composition of the impoundment porewater.

c. Thixotropic Effects

EPA raised concern in the proposal that preparation of samples intended to reflect compacted soil liners for testing may result in the soil becoming temporarily less permeable as a result of

[23] U.S. EPA. 2002. ''Assessment and Recommendations for Improving the Performance of Waste Containment Systems.'' EPA/600/R–02/099. Prepared by the Office of Research and Development. December.

thixotropic behavior. EPA previously raised the potential for the structure of thixotropic materials, such as certain clays, to become temporarily more dispersed when agitated, which might limit flow through interstitial pores and make it more difficult for water to infiltrate.[24] EPA was concerned that the material will gradually become more permeable as it is allowed to rest and return to its original state. Therefore, EPA stated in the proposal that compacted samples should be allowed to rest for sufficient periods prior to testing to reflect the long-term behavior of the soil in the field.

EPA received no comments that expressed support for this requirement. One commenter questioned whether thixotropy is a relevant consideration and if a ''rest period'' is actually needed to provide a realistic measurement of hydraulic conductivity. This commenter pointed to multiple studies that found minimization of void spaces in the soil macrostructure was a key control on hydraulic conductivity. Based on this literature, the commenter concluded that the microscale structure described with terms such as ''dispersed'' or ''flocculated'' is not a major concern.

The literature provided by the commenter indicates that effects from thixotropy are not a major concern in the measurement of hydraulic conductivity. EPA acknowledges that this topic is not raised in more recent literature discussed as part of this rulemaking. Similarly, none of the standardized tests for hydraulic conductivity reviewed by EPA specifies a need for an extended rest period. In addition, studies conducted more recently by EPA and others have obtained good agreement between measurements in the lab and field for many compacted, low-conductivity soils without a rest period. Finally, this requirement has the potential to add a considerable amount of time to an already time-intensive analysis. For all these reasons, EPA concludes that the available evidence does not support finalization of this provision.

d. Natural Soil Structure

EPA discussed in the proposal that preparation for samples intended to reflect the naturally-occurring soils beneath the surface impoundment for testing may result in the soil becoming permanently less permeable by disturbing the natural structure of the soil and eliminating voids and other features that may act as conduits for infiltration in the field. Failure to preserve the structural integrity of such samples could result in a lower measured conductivity than would actually occur in the field because it results in greater compaction or consolidation than exists in the field. EPA pointed out that standardized methods have been developed to obtain undisturbed soil samples.

EPA received no comments relevant to this topic. Therefore, EPA is finalizing a requirement at § 257.71(d)(1)(ii)(B)(*3*) that facilities must ensure that samples intended to represent the hydraulic conductivity of naturally-occurring soils (*i.e.,* not mechanically compacted) are handled in a manner that will ensure the macrostructure of the soil is not physically disturbed during collection, transport, or analysis (*e.g.,* initial saturation). Facilities must provide documentation of the measures taken to ensure the integrity of the samples relied upon.

e. Test Termination Criteria

EPA discussed that the termination point of a test must be established at a point that ensures the long-term behavior of the liner is accurately reflected. Some tests for hydraulic conductivity stop after the inflow and outflow rates equilibrate or after a specified volume of water has passed through the soil. However, these metrics may not be sufficient to identify the reactions that can occur between the soil and liquid (*e.g.,* exchange of adsorbed cations). Some metrics that more directly address the chemistry of the soil-leachate interactions include equilibration of electrical conductivity and pH. Failure to run the test on a timeframe relevant to the chemical reactions of interest may result in a lower measured conductivity than would actually occur in the field.

One facility stated that the proposed hydraulic conductivity testing is difficult, time-consuming, and not commonly conducted. The facility asserted that the information obtained from such tests would not significantly inform a determination of whether the impoundment is protective. Another commenter suggested two methods as most appropriate for use in the demonstration: ASTM D6766 (Standard Test Method for Evaluation of Hydraulic Properties of Geosynthetic Clay Liners Permeated with Potentially Incompatible Liquids) and ASTM D7100 (Standard Test Method for Hydraulic Conductivity Compatibility Testing of Soils with Aqueous Solutions). This commenter noted that both methods include termination criteria based on chemical equilibrium.

EPA acknowledges that it can take considerable time for hydraulic conductivity tests to meet termination criteria, and that criteria based on chemical equilibrium may require more time than those based on other metrics. However, the Agency disagrees that these tests provide no useful information. By allowing the chemistry of the system to reach equilibrium, it ensures that the long-term effects of leachate chemistry on the soil are adequately characterized. High ionic strength liquids have been shown to increase the long-term hydraulic conductivity of some soil materials by orders of magnitude compared to deionized water. The fact that these types of tests have been uncommon does not negate their importance.

EPA agrees that the two methods referenced by the second commenter are more appropriate for use in the demonstration than ASTM D5084, which EPA provided as an example in the preamble. However, the two methods referenced by the commenter identify somewhat different termination criteria based on solution chemistry. While one method identifies only equilibrium for electrical conductivity, the other further identifies pH, concentrations of unspecified solutes, and/or the dielectric constant. Electrical conductivity and pH provide a means to identify changes in the dominant solution chemistry. In addition, both can be tested for rapidly and easily. That is why EPA believes they serve as practical indicators for the hydraulic conductivity tests. While other criteria, such as specific solute concentrations, can provide further information on how the leachate interacts with the soil (*e.g.,* which ions are substituted on the soil surface), EPA has not seen evidence that these additional parameters will identify significant changes in the solution chemistry that electrical conductivity and pH would not.

Therefore, EPA is finalizing a requirement at § 257.71(d)(1)(ii)(B)(*4*) that any test for hydraulic conductivity relied upon must include, in addition to other relevant termination criteria specified by the method, criteria that equilibrium has been achieved within acceptable tolerance limits between the inflow and outflow for both electrical conductivity and pH.

3. Additional Lines of Evidence

EPA solicited comment on whether there are any additional lines of evidence that should be included as part of the demonstration. Various industry groups, individual facilities,

[24] U.S. EPA. 1986. ''Design, Construction, and Evaluation of Clay Liners For Waste Management Facilities.'' EPA/530–SW–86–007–F. Prepared for the Office of Solid Waste and Emergency Response. Washington, DC.

environmental groups, and states all proposed additional factors to be considered. These factors included whether a unit had individual liner components that met the standard of the CCR regulations, previous certification of performance from states or professional engineers, and the impact of closure on releases. These are discussed in more detail in the following Units of this preamble.

a. Presence of Geomembrane Liner

One commenter requested that EPA waive the demonstration requirement for units that have at least a 60-mil geomembrane liner, but do not meet the remaining requirements to be considered a lined unit. This and another commenter indicated that a successful initial application combined with decades of operation without any indication the unit has adversely affected groundwater should be sufficient evidence that the liner is protective.

EPA emphasizes that the intent of a demonstration is to characterize the potential for future groundwater exceedances. It can take years or even decades for leachate released from an impoundment to reach downgradient wells. Thus, the fact that a unit has not yet triggered corrective action does not mean it is not possible at some point in the future. This is why groundwater monitoring is required at all units. Furthermore, as part of the demonstration, facilities are required to test the hydraulic conductivity of the soil component of the composite liner to demonstrate its long-term performance when exposed to leachate. If the soil liner beneath a geomembrane liner is found to be ineffective, then imperfections in the geomembrane liner may lead to unimpeded flow of leachate into the subsurface. Based on this, EPA concludes that information on the subsurface soil component is a necessary line of evidence for all impoundments. Therefore, both an initial application and final demonstration must be submitted as part of an alternate liner demonstration for any impoundment.

b. Previous Certification

Multiple commenters requested that EPA give deference to a previous certification by a professional engineer or prior approval by a state regulatory authority when determining whether to approve a demonstration. Some commenters noted that their states require quality-assurance/quality-control (QA/QC) plans for liner construction and maintenance be included in the permit and that their surface impoundment liner was inspected and certified by a licensed professional engineer with appropriate expertise. One commenter asserted that this helps establish a presumption that a surface impoundment liner is adequately protective. However, none of the commenters elaborated on how the Agency should assign weight to such findings as part of the larger review.

EPA agrees that documentation about the quality of liner construction is necessary to prove that the surface impoundment has been well constructed and so has the potential to be protective. That is why information on construction quality must be provided upfront in the application step. However, the fact that a unit meets an unspecified design standard does not guarantee that particular standard will be protective in the long term. A purpose of the demonstration step is to document that the design of an alternate liner will remain protective in the long-term when exposed to CCR leachate. EPA cannot outright substitute a prior approval by either a qualified professional engineer (PE) or state agency for the comprehensive alternate liner demonstration required by this rule. State requirements can vary in both scope and specificity and EPA does not have a reliable record of what was considered as part of these reviews or how it aligns with the requirements of this rule. To the extent that previous findings by a PE or state authority details how a unit achieves the requirements of this rule, EPA will consider the rationale provided as part of the larger demonstration. However, this rationale does not substitute for providing any of the data or other underlying documentation required by this rule. Therefore, EPA made no changes to the rule in response to these comments.

c. Consideration of Unit Closure

One state recommended that the existence of plans to dewater the surface impoundment and install an impermeable cap be included as an additional line of evidence in the demonstration. The commenter noted such actions could alter the hydrogeologic model and/or reduce groundwater impacts. However, the commenter did not elaborate on how the Agency should weigh such information as part of the larger review.

The intent of the determination is to document the potential environmental impacts associated with continued operation of the unit. Although the installation of an impermeable cap would reduce infiltration, such actions would not be feasible during operation and are already required of all surface impoundments as part of closure. Therefore, it is not clear how this could be incorporated as a line of evidence. Therefore, EPA concludes that is not a relevant line of evidence and made no changes to the regulations in response to this comment.

4. Incorporation of Lines of Evidence Into Demonstration

EPA proposed that the data collected for the two lines of evidence, characterization of site hydrogeology and potential for infiltration, must be incorporated into the final demonstration. Each one provides different, site-specific data necessary to understand the potential for continued operation of the unit to adversely affect groundwater in the future. Consideration of future effects will necessitate some amount of fate and transport modeling. EPA acknowledged that the type of model used will depend on the complexity of the site. Regardless of the modeling approach used, all of the data incorporated into the calculations must be documented and justified.

EPA received some general comments related to the incorporation of the lines of evidence into the demonstration. One commenter stated that groundwater and contaminant flow models should be developed by drawing on the data used for the conceptual site models and run using various scenarios to ensure adequate consideration of a range of operating and site conditions. A second commenter stated that the magnitude of releases from surface impoundments is determined by a myriad of variables and reducing these systems to only one (*i.e.,* hydraulic conductivity) fails to capture this complexity, increasing the chance of mischaracterizing the probability of groundwater contamination.

EPA agrees with the first commenter that it is critical that facilities document how any data relied upon adequately reflect the range of variability in operational and environmental conditions at and around the surface impoundment to ensure that high-end risks are not underestimated. EPA disagrees with the second commenter that the required lines of evidence are not adequate to identify this variability and the potential for adverse effects to groundwater. Although the effective hydraulic conductivity of the engineered liner and/or naturally occurring soil is one of the most important parameters, this does not mean other parameters are not also important or accounted for in the demonstration. EPA previously identified a list of highly sensitive

model parameters in the 2014 Risk Assessment. Data for some of these parameters are already available through the existing groundwater monitoring program (*i.e.,* depth to groundwater, hydraulic gradient). Data for others will be collected for the two lines of evidence required by this rulemaking (*i.e.,* infiltration rate, hydraulic conductivity). EPA did not propose to require the remaining parameters to be collected on a site-specific basis (*i.e.,* leachate concentration, sorption coefficients) because a national-scale record of these parameters already exists for the constituents modeled in the 2014 Risk Assessment. To avoid the need for entirely new, site-specific risk assessments that evaluate impacts to both groundwater and surface water, facilities will need to consider the same high-end leachate concentrations that the clay-lined units were found unable to contain in order to demonstrate that the alternate liner performs materially better. Therefore, EPA is requiring that the owner or operator draw from the existing risk record to characterize leachate chemistry and behavior in the demonstration. Use of these data will help mitigate any uncertainties about the representativeness of the sampled ash or how conditions might change in the future. Altogether, this will ensure confidence that GWPS will not be exceeded.

EPA is finalizing a requirement at § 257.71(d)(1)(ii)(C) that facilities must incorporate the site-specific data collected for the two lines of evidence, characterization of site hydrogeology and potential for infiltration, into a mathematical model used to calculate the potential groundwater concentrations that may result in downgradient wells as a result of the impoundment. EPA is amending the proposed regulatory text to incorporate greater specificity based on the discussion in the preamble to the proposed rule. Accordingly, the final regulation specifies that facilities must also, where available, incorporate the national-scale data on constituent concentrations and behavior provided by the existing risk record. Where an existing record is not available, the owner or operator must justify how the data used are adequate to reflect high-end concentrations and behavior at the site. The regulation also specifies that application of the model must account for the full range of current and potential future conditions at and around the site to ensure that high-end groundwater concentrations have been effectively characterized. All of the data and assumptions incorporated into the model must be documented and justified.

a. Specific Models Used

EPA discussed in the proposal that the model used may vary based on the complexity of a particular site. More complex sites may merit the use of a probabilistic fate and transport model similar to that used in the 2014 Risk Assessment. If a site is less complex (*e.g.,* homogenous, low-conductivity soil), then more deterministic calculations may be sufficient to demonstrate that no adverse effects will occur. Regardless of the approach used, all of the data incorporated into the calculations must be documented and justified.

One commenter expressed concerns that the EPA Composite Model for Leachate Migration with Transformation Products (EPACMTP) is not able to fully represent the complexities of site conditions and so should not be allowed as the basis for decisions about future unit performance. EPACMTP was previously used by the Agency in the 2014 Risk Assessment and later by EPRI in a white paper submitted to EPA to show that some unlined surface impoundments can also be protective. This commenter raised two specific concerns about EPACMTP. First, that the model treats the subsurface environment as homogenous and so is not able to reflect variable hydraulic conductivity in any individual model run. Second, that the model cannot account for constituent mass sinks beyond the unit, such as discharge of groundwater to water bodies.

The Agency agrees that there can be instances where EPACMTP is not the model best suited to represent the complexities of a particular site. EPA discussed one such example in a memorandum included in the docket for the proposed rule.[25] Based on these considerations, EPA did not propose to require use of EPACMTP or any other specific model in a demonstration. However, this does not mean that use of EPACMTP is never appropriate. EPA was cognizant of the limitations of the model when preparing the 2014 Risk Assessment and took steps to ensure that risks were neither underestimated nor overestimated. To address heterogeneity in the subsurface, EPA conducted a probabilistic analysis that varied the hydraulic conductivity based on the range of soil types identified around a facility. To address losses to nearby water bodies, EPA applied a post-processing module to subtract out the intercepted mass. This shows that how a model is applied can be just as important as the model design. Appropriate use of a model will help reduce uncertainties to a degree that allows decisions to be made with the necessary level of confidence.

To ensure that a model is applied appropriately, it is critical to understand all the assumptions built into that model. All models include some degree of simplification compared to the real world so that calculations are both feasible and manageable. More simplistic models may provide less precise results, but that does not mean these results are inadequate. Whether a model is appropriate is more often determined by how it is applied to support decision-making. The goal of modeling in the demonstration step is to provide confidence that peak groundwater concentrations that may result from releases throughout the active life of the impoundment will not exceed GWPS at the waste boundary. In this context, simplifying assumptions that will tend to overestimate the magnitude of contaminant release and transport can actually provide greater confidence in the conclusions of the demonstration.

Therefore, based on the comments received, EPA is finalizing an additional requirement at § 257.71(d)(1)(ii)(C)(*1*) that the models relied upon must be well-established and validated, with background documentation that can be made available for public review. Proprietary models that operate in a black box will not be considered appropriate for use in a demonstration.

b. Use of Groundwater Protection Standards

EPA discussed in the proposal that as part of the demonstration, the owner or operator must demonstrate that the surface impoundment has not and will not result in groundwater concentrations above relevant GWPS at the waste boundary (health-based or background, whichever is higher). EPA stated that this is the standard used to trigger corrective action for lined surface impoundments and it is considered equally appropriate in this context.

Several commenters raised concerns about the use of GWPS as the basis to determine that an impoundment is protective. One commenter alleged that facilities were allowed to set their own GWPS. Another commenter stated that EPA had not provided justification why the standard used to determine that lined surface impoundments must initiate corrective action is equally

[25] U.S. EPA. 2020. ''Review of Analyses in EPRI White Paper: Model Evaluation of Relative Performance of Alternative Liners.'' Prepared by the Office of Land and Emergency Management. February.

appropriate to use in the approval of alternate liners.

EPA believes that use of GWPS is appropriate and protective. GWPS are set as either specific regulatory standards identified in the CCR regulations or background groundwater concentrations, whichever is higher. Facilities are not granted discretion to establish alternate values. These standards are deemed to be protective and used in a number of regulatory programs within the Agency. EPA also considers them to be sufficient to demonstrate if the long-term performance of an alternate lined CCR impoundment can be protective because these standards align with those previously used to determine that composite-lined units are protective.

The 2014 Risk Assessment evaluated the risks associated with releases from CCR surface impoundments. As discussed previously, the only risks identified for clay-lined units in this risk assessment were the result of human ingestion of lithium in groundwater up to a mile away from the waste boundary. Lithium is one of the most mobile CCR constituents. If the engineered liner and/or naturally occurring soil of the alternate liner has an effective hydraulic conductivity sufficient to eliminate the risks associated with high-end lithium concentrations previously considered in the 2014 Risk Assessment, then there is confidence that the alternate liner will also prevent risks to both groundwater or surface water from the remaining constituents. Requiring the impoundment to meet the health-based GWPS for lithium at the waste boundary, where concentrations are highest, will only further limit the potential magnitude of releases from the alternate liner.

Therefore, EPA is adopting a revised provision in the final rule that will better align the ALD requirements with the existing risk record and with the statutory standard in RCRA § 4004(a). EPA is finalizing an additional requirement at § 257.71(d)(1)(ii)(C)(2) that facilities must demonstrate that there is no reasonable probability that the peak groundwater concentrations that may result from releases that occur over the active life of the unit will exceed GWPS at the waste boundary.

c. Consideration of Background Groundwater Concentrations

EPA did not explicitly discuss consideration of existing background groundwater concentrations in the proposal but noted that it is a key factor when establishing GWPS at a particular site. It follows that background is also a factor when determining if these standards have been exceeded. Naturally occurring background concentrations are typically much lower than promulgated GWPS, but have been found to exceed these standards in some places. Even when contributions from the impoundment are small, the addition of these releases to high existing background concentration may still trigger corrective action. Because a characterization of background is available on a site-specific basis and an ALD is required to show that the peak groundwater concentration that may result from releases over the active life of the impoundment will not exceed GWPS, existing background concentrations are a relevant consideration for all constituents. Consideration of existing background concentrations will only further limit the potential magnitude of any releases from the alternate liner.

EPA is finalizing a new provision at § 257.71(d)(1)(ii)(C)(*3*) that documentation of the model outputs must include the peak groundwater concentrations modeled for all Appendix IV constituents attributed to the impoundment both in isolation and in addition to background. This will provide an understanding of both the increase in concentration attributed to releases from the surface impoundment and the overall likelihood for an exceedance of GWPS.

d. Risk From Other Constituents

Some commenters stated that units with ALDs should be forced to close after an SSI over background of any Appendix III constituent. Under this approach, any increase in concentrations distinguishable from background would trigger closure, regardless of the magnitude. Commenters expressed concern that reliance on Appendix IV constituents would not adequately protect against risks from the release of Appendix III constituents, such as boron and sulfate.

EPA disagrees with these commenters. As discussed previously, EPA distinguishes between the situation prior to the time EPA has determined that the unit meets the requirements of the ALD and after EPA has determined that the unit meets the requirements. In the former case EPA must assume that the unit does not have the low hydraulic conductivity necessary to ensure the GWPS will never be exceeded; as a consequence, EPA is requiring the unit to remain in detection monitoring throughout the application process. By contrast, the record is very different with respect to a unit that has been approved for an ALD. In this case the site characteristics can support the additional time needed to determine the appropriate actions to address all the potential risks at that particular site. In addition, the Appendix III list is not intended to identify risk. These constituents and water quality parameters are intended to indicate that the overall groundwater chemistry has shifted, which may be the result of a release from the unit. Some additional constituents that were evaluated in the risk assessment, such as boron and fluoride, were selected because the higher mobility in the subsurface makes them ideal early indicators. EPA did not identify any risks for these constituents from clay-lined units. Therefore, a unit with an ALD that has been found to perform better than the modeled clay-lined units will also pose no concern for these constituents. Sulfate was not modeled in the risk assessment because EPA did not identify any health benchmarks derived in a manner consistent with the OLEM hierarchy for human health toxicity values or relevant ecological benchmarks. Nor did EPA receive any comments on the risk assessment identifying relevant benchmarks that the Agency had omitted. The review of the literature conducted in support of the advisory level identified some potential for laxative effects from elevated sulfate levels, though these effects were not observed for longer-term exposures as individuals appeared to adapt over time. EPA concluded that available data did not permit a full dose-response assessment for sulfate in water and ultimately set an advisory level lower than associated with short-term effects reported by any individual study.[26] The World Health Organization subsequently reached a similar conclusion, stating that ''the existing data do not identify a level of sulfate in drinking-water that is likely to cause adverse human health effects.[27]'' Some organizations have chosen to compare this advisory level to monitoring well data reported by facilities to estimate risk.[28] Even if this were an appropriate use of this advisory level, the report shows that sulfate levels above the advisory level occur concurrently with exceedances of GWPS and do not

[26] U.S. EPA. 2003. ''Drinking Water Advisory: Consumer Acceptability Advice and Health Effects Analysis on Sulfate.'' EPA 822–R–03–007. Office of Water. February.

[27] World Health Organization. 2004. ''Sulfate in Drinking-Water: Background Document for the Development of WHO Guidelines for Drinking-Water Quality.'' WHO/SDE/WSH/03.04/114.

[28] Environmental Integrity Project. 2019. ''Coal's Poisonous Legacy: Groundwater Contaminated by Coal Ash Across the U.S.''

outpace the magnitude of these exceedances. This is expected because several Appendix IV constituents can be associated with sulfate in the ash. There is no indication that the hypothetical risks from sulfate raised by the commenter would not be addressed by the requirements of this rule. Therefore, EPA maintains use of Appendix IV constituents as the basis for the alternate liner demonstration. However, as discussed in Unit IV.D.5.b of this preamble, detection of an SSI of Appendix III constituents will trigger additional measures designed to ensure that levels of Appendix IV constituents are never detected at SSLs. As discussed in Unit IV.D.5.b of this preamble, detection of an SSI of Appendix III parameters will trigger additional measures designed to ensure that an SSL of Appendix IV constituents do not occur.

D. Procedures for Approval and Denial of Alternate Liner Demonstration

As mentioned previously, EPA proposed a two-step process first requiring the submittal of an application, and then, if the application is approved a demonstration. EPA also proposed regulations to govern the procedures for the review of and public comment on those documents. These elements of the proposal are discussed below.

1. Application Process

a. Deadline of Application Submission

EPA proposed at § 257.71(d)(2)(i) that the initial applications were due no later than thirty days after the effective date of the final rule. Industry commenters requested additional time to prepare and submit the application, as well as the ability to provide follow-up information beyond the deadline if EPA finds some aspect of the documentation to be inadequate. Commenters worried generally that a fixed deadline of 30 days would provide little time to prepare an application, and in particular that any time spent waiting for input from EPA would further limit the time remaining to make any necessary updates. Commenters stated that given the significance of this step, EPA must provide facilities with adequate time to assemble this critical preliminary information, which may require the assistance of third-party engineering firms. They further stated that facilities should not be rushed to prepare this information, which, if determined to be insufficient, will disqualify a facility from being able to seek an alternate liner demonstration and subject the unit to closure. EPA received comments requesting the ability to meet with EPA before submitting their application. Additionally, industry commenters were also concerned about the initial application deadline as it related to the proposed deadline of August 31, 2020 to cease receipt of waste, as well as the deadlines for submission of requests to obtain alternative compliance deadlines in 84 FR 65941 (December 2, 2019) (''Part A Proposed Rule'').

EPA agrees with commenters that the proposed thirty-day deadline and the proposed date to cease receipt of waste could have made implementation difficult. In response to the comments, EPA is extending the timeframe available for facilities to submit the initial application. EPA believes that submittal by November 30, 2020, is appropriate for facilities to prepare and submit the application. This is the same date by which facilities will be required to submit requests for extensions pursuant to § 257.103(f), and in the interest of simplifying the regulations it makes sense to coordinate the dates. This will provide sufficient time for facilities to become familiar with requirements of this rule and collect the information needed for the initial application. It is worth noting in this respect that EPA is not requiring the generation of new data or additional sampling to support the initial application. The additional time will also provide the Agency the ability to engage in a limited amount of discussion with a facility before the application submission deadline. Such discussions would need to occur before the deadline for final submission of the application. In regard to the deadline to cease receipt of waste, the Part A final rule established a deadline of April 11, 2021, for those units that are closing pursuant to § 257.101(a)(1) or § 257.101(b)(1)(i). This alleviates the concern that an owner or operator would not have sufficient time to submit an application before the deadline to cease receipt of waste.

EPA also received comments in support of allowing the Participating State Director (*i.e.* the State Director of a State with an approved CCR State Permit Program in accordance with RCRA section 4005(d)) to review and approve alternate liner demonstrations. The commenters said states often have resources and expertise to evaluate applications and the associated technical documents necessary in order to approve alternate liner demonstrations. The Agency agrees that a Participating State Director should have the ability to review and approve an ALD, and therefore finalized provisions in § 257.71(d) to allow that to occur.

Therefore, EPA is finalizing at § 257.71(d)(2)(i) that the owner or operator of the CCR surface impoundment must submit the application to EPA or the Participating State Director by November 30, 2020. This date is consistent with the date in the Part A final rule to submit an alternative closure demonstration.

b. Application Review

EPA proposed at § 257.71(d)(2)(ii) that EPA or the Participating State Director will evaluate the application and may request additional information as necessary to complete its review. If the application was complete it would toll the facility's deadline to cease receipt of waste for that surface impoundment until issuance of a final decision on the surface impoundment's eligibility. However, EPA proposed that incomplete submissions would not toll the deadline. EPA proposed that within sixty days of receiving the application, EPA or the Participating State Director would notify the owner or operator of its determination on the eligibility of their surface impoundment, and finally, that the facility must post the determination to its publicly accessible CCR internet site. EPA stated in the proposed rule that if the Agency or Participating State Director determines the application is lacking necessary information or specificity, the facility may have an opportunity to resubmit with the required information, provided it was submitted before the deadline for all initial applications (*i.e.,* 30 days after the effective date of the final rule). However, no resubmissions could be accepted after this deadline.

Many industry commenters requested clarification as to what information is required to constitute a complete application. Other commenters requested that EPA provide a separate certification process through PE certification, development of a checklist, or other means that could be used to confirm an application is ''complete'' before submittal. Commenters stated that a ''complete'' application consists of all the information necessary to trigger tolling of the facility's deadline to cease receipt of waste into that unit until a final decision on the unit's eligibility is issued. Commenters contrasted this with a ''sufficient'' application, which would allow a facility to proceed to the demonstration step. Because of the relatively short timeline provided to submit an application in the proposal, these commenters worried there would not be an opportunity to resubmit an

application found to be incomplete and the facility would not be allowed to toll the deadline. One commenter said that EPA should provide owners/operators with additional time beyond the original deadlines to make their resubmittals because an insufficient application submittal does not mean the liner itself is insufficient, which is the ultimate point for the alternate liner demonstrations.

EPA is adopting procedures that largely mirror those adopted for requests submitted pursuant to § 257.103(f). Upon receiving the application, EPA will evaluate the application to determine whether it is complete. EPA may request additional, clarifying information to complete its review and/or discuss the application with the facility. Consistent with the proposed rule, submissions that EPA determines to be incomplete will be rejected without further process, at which point any tolling of the facility's deadline will end. (EPA anticipates that the question of tolling for incomplete submissions should not generally arise, as the agency anticipates making these determinations before April 11, 2021). No commenter disagreed that this was appropriate. Incomplete submissions include both the situation in which the submission does not include all of the required material, and the situation in which EPA is unable to determine from the submission whether the facility or the unit meets the criteria for the application. EPA does not agree with the commenter that it would be appropriate to grant additional time to allow a facility to cure an incomplete application; the new deadline of November 30, 2020, provides more than a sufficient amount of time for the facility to submit a complete application. As discussed above, if an application was deemed incomplete, the owner or operator could attempt to cure the deficiencies and resubmit the application provided that it can do so before the November 30, 2020 deadline. If the application is deemed incomplete, the owner or operator may seek an alternative closure deadline pursuant to § 257.103(f)(1) or (f)(2). For more information on this please see Unit III.D.3.

EPA agrees that the timeframes are ambitious but continues to believe that they can be met. As discussed in more detail below, the Agency has limited the issues to be resolved during this process, and, as requested by commenters, has amended the proposed regulation to specify in detail the information needed for a submission to be considered complete. Consequently, EPA anticipates it will be able to make most decisions without further requests for information. Once the owner or operator submits the application to EPA for approval, the owner or operator must place a copy into the facility's operating record and on its publicly accessible CCR internet site. EPA will also post who has submitted an application on EPA's website.

One commenter expressed concern that utilities' alternate liner applications would not be posted publicly prior to a proposed approval, and the beginning of the thirty-day comment period on the alternate liner demonstration would likely be the first time the vast majority of the public would have the opportunity to review many of the highly complex, technical documents that would form the basis of EPA's decision. In response to the comment about not providing an opportunity for public comment on the application and to be consistent with the process established in the Part A final rule, EPA is finalizing a requirement at § 257.71(d)(2)(iii)(C) to provide for public comment on the application by granting a twenty day public comment period. After reviewing the submission, EPA will either post a determination that the submission is incomplete on EPA's website or a proposed decision to grant or to deny the request in the docket on *regulations* dot *gov* for public notice and comment. EPA will also post the application on its website. EPA will allow for a 20-day public comment period. EPA will evaluate the comments received and amend its final decision as warranted. EPA will post all decisions on its website, in the relevant docket and notify the facility. EPA will make best efforts to complete the application review within sixty days of receiving the complete application.

Some commenters raised the argument that because part 257 is self-implementing and because certain regulatory provisions might be viewed as ambiguous, there could be differences in opinion on what constitutes compliance. These commenters felt that differences in interpretation should be discussed during EPA's review process and corrected as warranted as part of a facility's completion of its demonstration.

EPA is establishing an expedited process to resolve requests for continued operation under § 257.71(d); in order to meet these time frames EPA has limited the issues to be resolved in this proceeding. One of the primary issues to be resolved will be whether the facility is in compliance with the regulations. Although EPA does not agree that the regulations are ambiguous, EPA may be able to engage in a limited amount of discussion with a facility before the submission deadline. In addition, as explained previously, documentation that a facility remains in compliance with the requirements of part 257 subpart D provides critical support for a decision to allow continued operation of the unlined surface impoundment. This means that EPA must be able to affirmatively conclude that the facility meets this criterion prior to authorizing any continued operation of the unlined surface impoundment. As a consequence, any opportunity to correct the demonstration is limited to the period before the deadline for submission.

Finally, note that any determinations made in evaluating the compliance aspects of submitted applications will be made solely for the purpose of determining whether to grant an initial application. In making these determinations the Agency generally expects to consider and rely on the information in a submission, information contained in submitted comments to a proposed decision, and any other information the Agency has at the time of the determination. These determinations may not be applicable or relevant in any other context. Should the facility's compliance status be considered outside of this context in the future, the Agency may reach a contrary conclusion based, for example, on new information or information that was not considered as part of this process.

EPA is revising the regulatory text (now found at § 257.71(d)(2)(iii)) for the application review to more clearly reflect the circumstances under which a facility's deadline to cease receipt of waste will be tolled. Consistent with the recently promulgated regulations in § 257.103, the regulations provide that the deadline to cease receipt of waste will be tolled by the submission of an application until EPA determines the application is incomplete or the application is denied. As previously discussed, because EPA anticipates making determinations on the initial application before the April 11, 2021 deadline, issues of tolling should not arise for incomplete or denied applications. If EPA approves an application, the deadline to cease receipt of waste will continue to be tolled until EPA determines the demonstration is incomplete or issues the final disposition on the merits of the demonstration. The language in this section will still state that within sixty days of receiving a complete application, EPA or the Participating State Director will notify the owner or operator of its determination on the

eligibility of their surface impoundment. This section will also require that the facility must also post EPA's determination to its publicly accessible CCR internet site. Finally, this section states that the application will be available for public comment on EPA's docket for 20 days. EPA will evaluate comments as part of the review. EPA or the Participating State Director will post the decision on the application on their website and will add it to the docket.

c. Application Denial

EPA proposed at § 257.71(d)(2)(vi) that if EPA or the Participating State Director determines that the unit is not eligible for an ALD, the owner or operator must cease receipt of waste and initiate closure within six months of the denial or by the deadline in § 257.101(a), whichever is later. If a facility needed to obtain alternative capacity, they could do so in accordance with the procedures in § 257.103.

Commenters requested clarification on how the timing of a denial would work with the deadlines applicable to units closing under § 257.101(a) and 257.101(b)(1)(i). EPA is revising its proposal to better account for coordination with the recently promulgated final deadlines and procedures associated with these surface impoundments. As previously discussed, EPA intends to issue a final decision within sixty days of submission of a complete application. Therefore, if the application was received on November 30, 2020, EPA would make best efforts to issue the denial by February 1, 2021 which is two months before the April 11, 2021 deadline by which these units are required to cease receipt of waste. Under the newly promulgated regulations the surface impoundment must either cease receipt of waste no later than April 11, 2021 or the owner or operator may apply for an alternative closure deadline in accordance with § 257.103(f)(1) or (f)(2). Under the procedures associated with § 257.103(f) facilities will have four months to submit an application. EPA is therefore granting facilities that need to submit an application to continue to operate the unit pursuant to § 257.103 four months from the date of denial to submit their application. All other facilities must cease receipt of waste—either by the April 11, 2021 deadline (assuming EPA has issued its decision prior to the deadline) or by the revised deadline which will be included in the denial. This revised deadline will account for the amount of time EPA has taken to issue its decision. EPA has no basis to universally authorize the surface impoundment to continue operating for an additional six months in these circumstances. Those units that can close by the deadline must do so (*e.g.* because they have alternative capacity on site) or the facility must be treated the same as any other facility seeking an extension pursuant to § 257.103(f). Further discussion of the relationship of the timing of an application denial and the alternative closure standards is found in Unit III.D.3 below.

Therefore, EPA is revising § 257.71(d)(2)(vi) to remove the provision requiring the facility to initiate closure ''within six months of the denial.''

d. Multi-Unit Liner Demonstration

The 2015 CCR Rule allowed monitoring networks for CCR units to be designed with consideration of multi-unit systems (*i.e.,* multiple surface impoundments at one site) that share groundwater monitoring systems and other technical features. EPA made no reference to multi-unit systems in the proposed rule. Multiple commenters requested clarification on how ALD requirements would apply to these multi-unit systems. Specifically, commenters inquired whether facilities with multiple units can submit a single application and demonstration that covers all the units, or if documentation for each individual unit must be submitted separately.

Given that decisions about the design and implementation of these groundwater monitoring programs and such sites were made based on consideration of multiple units, EPA considers it to be reasonable that the ALD documentation could also include multiple units to reduce redundancy and ensure that each individual unit is discussed in the full context of the larger system. Further, given that these units are located in close proximity, the data generated for one is likely to be equally applicable to multiple units in the demonstration. For example, grouping data from wells around adjacent units will provide a more comprehensive picture of groundwater depth and flow around the wider facility. Therefore, EPA is amending the rule to make clear that a single application and demonstration may be submitted for multi-unit systems.

2. Demonstration Process

a. Deadline of Demonstration Submission

EPA proposed at § 257.71(d)(2)(i) that the facility would have one year from the date the application was due (*i.e.,* 13 months from the effective date of the final rule) to submit their alternate liner demonstration if EPA approved their application. The proposal also stated that if the owner or operator cannot meet this deadline due to analytical limitations related to the measurement of hydraulic conductivity, the owner or operator must submit a request for an extension no later than 90 days prior to the deadline for submission of the demonstration, that includes a summary of the data collected to date that show the progress towards relevant test termination criteria for all samples responsible for the delay, along with an alternate timeline for completion that has been certified by the laboratory.

One commenter stated that one year would not provide the amount of time needed to perform the robust analyses needed to provide greater certainty that the unit would pose no reasonable probability of adverse effects to human health or the environment. The commenter also stated that some of that one year would be spent waiting for a determination from EPA that the unit is eligible for an ALD. The commenter stated that this gave the facility only 10 months to prepare the ALD if they waited until their application was approved, and that would not be sufficient if they needed to install additional groundwater monitoring wells, validate fate and transport models, develop three-dimensional visualization to support conceptual site models, or establish background water quality to evaluate the potential effects for seasonality in the groundwater quality observations.

EPA does not agree with the commenter. First, a facility should not wait for application approval to start their demonstration work. Second, EPA is not requiring a facility to install additional monitoring wells or further characterize background water quality to support the demonstration. Facilities were required to have installed an appropriate number of monitoring wells and to adequately characterize background water quality to evaluate the potential effects for seasonality years ago under part 257. EPA is not granting additional time as part of this process for facilities to come into compliance with existing requirements. Finally, while three-dimensional visualization may be useful for EPA's review, it is not a requirement. Therefore, the Agency is not revising the amount of time given to develop the demonstration package.

EPA is finalizing § 257.71(d)(2)(i) to require facilities to have one year from the date the application was due to submit their alternate liner demonstration. Therefore,

demonstrations are due no later than November 30, 2021. Once the owner or operator submits the demonstration to EPA for approval, the owner or operator must place a copy into the facility's operating record and on its publicly accessible CCR internet site.

As mentioned above, EPA also proposed to allow extensions on the demonstration submittal deadline in the limited circumstance that it is not feasible for the lab to fully analyze the field samples by the demonstration deadline. EPA proposed that the request must be submitted no later than 90 days prior to the demonstration deadline. The proposal further stated that EPA or a Participating State Director would evaluate the information provided in the request and determine whether the duration of the requested extension is acceptable. EPA did not receive any comments that indicated the type of delay considered in the preamble was unreasonable or entirely avoidable. Some facilities requested additional information on the maximum duration of an extension, what information the facility should provide as part of the request, and whether extensions could be provided for any other reasons.

(i) Extension Due to Analytical Limitations for Chemical Equilibrium

EPA discussed in the proposal that extensions would be allowed on the condition that analytical limitations prevent the necessary data from being collected by the demonstration deadline. EPA specifically pointed to the fact that tests for hydraulic conductivity may take upwards of 300 days to complete for extremely low conductivity soils. It is important that these tests be allowed to run to completion because long-term changes to soil structure, such as flocculation of clay particles, can substantially alter the conductivity of the soil.

One commenter raised concerns that hydraulic conductivity tests for low permeability soils may take longer than the timeframe allotted for the demonstration but made no reference to the deadline extension discussed in the preamble. Another commenter requested clarification on the duration of an extension and what information should be provided as part of the request.

As acknowledged in the proposal, EPA understands that the test methods for hydraulic conductivity may take a considerable amount of time. EPA continues to believe it is critical that these tests are allowed to run to completion to ensure that effects of leachate chemistry on the liner integrity are identified. Therefore, EPA will allow a one-time extension on the deadline for submittal of the demonstration for analytical limitations associated with completing the hydraulic conductivity test. The duration of the extension will be determined solely by the time projected by the lab to achieve termination criteria for chemical equilibrium. These metrics will progress along either a linear or asymptotic curve as the composition of the effluent approaches that of the influent. Thus, it is reasonable, based on these curves and the rate of flow for the lab to estimate how long it will take to approach and maintain conditions for test termination for the necessary duration. EPA expects facilities that receive this extension will use this additional time to prepare all other necessary documentation so that, once the data is available, it will be a relatively straightforward task to run the model and document the results. Once the owner or operator receives the data, they will have 45 days beyond the timeframe certified by the laboratory for the facility to submit the completed demonstration.

In response to comments, EPA is finalizing amendments to clarify that, as part of the extension request, facilities must provide (1) a brief timeline of fieldwork to confirm that samples were collected expeditiously, (2) a chain of custody documenting when samples were sent to the laboratory, (3) written certification from the lab identifying how long it is projected for the necessary termination criteria to be met, and (4) documentation of the progression towards all termination metrics to date.

(ii) Other Analytical Limitations

One commenter requested clarification on what other types of analytical limitations EPA would be considered eligible for extension. However, the commenter did not provide a specific example of another type of analytical limitation that might warrant a similar extension.

It is possible that chemical interactions between the soil and leachate may cause the measured hydraulic conductivity to shift abruptly and substantially due to resulting changes in the soil structure. This shift may be substantial enough that it will take longer for the hydraulic conductivity to stabilize than it will for the chemistry of the system to reach equilibrium. This scenario may occur regardless of whether an extension has been provided to allow system chemistry to reach equilibrium. Yet, unlike chemical equilibrium between the influent and effluent, there is no predefined endpoint for hydraulic conductivity. As a result, there are no reasonable means to predict how much longer it will take for this parameter to fully stabilize. However, it is expected that the bulk of any changes to soil structure and hydraulic conductivity will have occurred by the time that the chemistry of the system has achieved equilibrium. This is because the primary driver of these changes, the exchange of ions between the soil and the leachate, is mostly complete. For this reason, EPA believes that the magnitude of any changes to hydraulic conductivity recorded by the time chemical equilibrium has been established can provide a reasonable upper bound on any future changes. Thus, rather than provide an unspecifiable amount of additional time to allow the hydraulic conductivity to fully stabilize, EPA concludes it is preferable in this case that the owner or operator complete the demonstration within the existing deadline with the available data. Use of appropriate bounds of uncertainty based on the magnitude of changes to hydraulic conductivity measured to date can ensure that long-term contaminant transport is not underestimated.

Therefore, EPA is finalizing amendments to the proposal to clarify that, if the measured hydraulic conductivity has not stabilized to within acceptable tolerance limits by the time the termination criteria for solution chemistry are met, the owner or operator must submit a preliminary demonstration within the existing deadline (with or without the one-time extension for analytical limitations). In this preliminary demonstration, the owner or operator must justify how the bounds of uncertainty applied to the available measurements of hydraulic conductivity ensure that the final value is not underestimated. The preliminary demonstration will be subject to all of the same process, notification and posting requirements of a final demonstration. EPA will review the preliminary demonstration to determine if it is complete and will propose to deny or to tentatively approve the demonstration. Once the final laboratory results are available, the owner or operator must submit a final demonstration that incorporates the finalized hydraulic conductivity data to confirm that the model results in the preliminary demonstration are accurate. Until the time that EPA takes final action on this final demonstration, the surface impoundment must stay in detection monitoring to remain eligible for an ALD. If EPA tentatively approved the preliminary demonstration, EPA will then take action on the newly

submitted final demonstration using the same procedures that apply to the initial determination. The public will have an opportunity to comment only on the new information presented in the complete final demonstration or in EPA's proposed decision on the revised demonstration.

(iii) Extension Request Deadline

EPA proposed that facilities must submit a request for an extension no later than 90 days before the deadline for submission of the demonstration. One commenter requested additional time to submit the request, stating that unforeseen issues might arise late in the demonstration process that necessitate an extension. The commenter did not elaborate on the types of delays that may occur so late in the process. In order to complete the demonstration on time, EPA expects facilities to collect the necessary field data expeditiously and long before the extension request deadline. The facility should be aware of and be able to plan for any complications associated with sample collection. Once data have been collected from the field and analyzed, the remaining modeling and documentation can be completed in the office where the risk of unavoidable delay is minimal. Indeed, much of the necessary documentation can be compiled concurrently with sample collection and analysis. EPA is maintaining the submission deadline for extension requests that the owner or operator of the CCR surface impoundment must submit the extension request no later than September 1, 2021. The owner or operator must also post this extension request on their publicly accessible CCR internet site.

b. Demonstration Review

EPA proposed at § 257.71(d)(2)(iii) that EPA or the Participating State Director will evaluate the demonstration package and may request additional information as necessary to complete its review. Submission of a complete demonstration package will continue to toll the facility's deadline to cease receipt of waste into that unit until issuance of a final decision under § 257.71(d)(2)(v). Incomplete submissions will cease tolling the facility's deadline. EPA also proposed at § 257.71(d)(2)(iv) that EPA or the Participating State Director will propose a decision on the demonstration and post that decision on EPA or Participating State Director's website for a 30-day public comment period. Finally, EPA proposed at § 257.71(d)(2)(v) that after consideration of the comments, EPA or the Participating State Director will make a final decision within four months of receiving the complete alternate liner demonstration and that if no substantive comments were received the decision would become automatically effective 5 days from the close of the comment. The facility must also post EPA's determination on its ALD to its publicly accessible CCR internet site.

Commenters pointed out that there appeared to be an unintended gap in tolling. The proposed regulatory text indicated that the deadline to cease receipt of waste would not be tolled during the period between approval of the initial application and the time the alternate liner demonstration package was submitted. That was not the Agency's intent. EPA intended that the deadline would be tolled during the entire time between an approved application and the final determination on the ALD. Accordingly, the regulatory text has been amended to make this clear.

EPA also received comments that the 30-day public comment period was too short to allow for sufficient opportunity for members of the public to review and comment on such highly complex, technical documents. EPA acknowledges that the public comment period is short but disagrees that it is too short to be meaningful. EPA is requiring facilities to post all submissions on their publicly accessible CCR internet site at the same time they submit them to EPA. The public can start their review at the same time as EPA and begin to gather information and prepare their comments. For similar reasons, EPA also disagrees that a 30-day comment period violates either the Administrative Procedures Act (APA) or RCRA 7004(b). This process is not a rulemaking, but an informal adjudication. Such adjudications do not typically include an opportunity for public comment and therefore the provision of a 30-day comment period meets the mandate in RCRA § 7004(b) to promote public participation. Moreover, the APA imposes neither a requirement to provide an opportunity for public comment nor any minimum time for a comment period for such procedures. Finally, EPA notes that the same commenters requesting longer comment periods have also raised concern that the process grants facilities too much additional time to continue operating. EPA is also interested in not granting undue amounts of additional time for facilities to continue operating and is expediting all aspects of this process, including the comment period. After reviewing the submission, EPA will post a proposed decision to grant or to deny the demonstration in the docket on *regulations* dot *gov* for public notice and comment. EPA will also post the demonstration on its website.

One commenter stated that the regulations do not give the reviewing agency a deadline for approving or disapproving a submitted demonstration, so that such a demonstration can remain pending indefinitely. The Agency disagrees with that comment and is finalizing as proposed § 257.71(d)(2)(v) which states that EPA will evaluate the comments received and amend its decision as warranted within four months. EPA will post all final decisions on EPA's website and in the appropriate docket. The facility must post, along with a copy of its demonstration, the Agency's final decision on the facility's publicly accessible CCR internet site.

Finally, EPA is not finalizing the automatic five-day effective date for demonstrations with no substantive comments since this approach would be too difficult to implement.

c. Demonstration Denial

EPA proposed at § 257.71(d)(2)(vi) that if EPA or the Participating State Director determines that the unit's alternate liner does not meet the standard for approval, the owner or operator must cease receipt of waste and initiate closure within six months of the denial. If a facility needs to obtain alternative capacity, they may do so in accordance with the procedures in § 257.103.

Commenters were primarily concerned about the ability to pursue a capacity extension under § 257.103 if their ALD was denied.

If an ALD is denied and the facility lacks capacity, the owner or operator may apply for one of the site-specific alternative deadlines § 257.103(f)(1) or (f)(2) as described below. As discussed in that section the time frames for applying for those alternatives will be governed by § 257.103(f) rather than the six months contemplated by the proposal. By contrast, if the owner or operator chooses to not apply for § 257.103(f)(1) or (f)(2), for example, if they already have alternative capacity to manage their waste on site, then the surface impoundment must cease receipt of waste and initiate closure by the date specified in EPA's decision (which will be the date EPA determines that such actions are technically feasible).

3. Relationship to § 257.103(f)(1) and (f)(2) Alternative Closure Requirements

In the proposal, EPA stated that should a facility pursuing an ALD not have alternative capacity, the owner or operator must continue to actively pursue avenues of obtaining alternative capacity during the time they are pursuing the ALD. Commenters were concerned that this would put the owner or operator in the position of devoting resources to two parallel paths to seek an extension under both § 257.71(d) and under either § 257.103(f)(1) or (f)(2). The Agency understands that the facility will be required to expend resources on two parallel tracks, but continues to believe that owners or operators that are pursuing an ALD who lack alternative capacity in which to manage their wastes must actively work to attain that capacity during the ALD process. As discussed in more detail below, facilities will not be able to obtain more than the maximum time allowed under § 257.103(f); in order to meet these deadlines, facilities will need to be pursuing alternative capacity well before EPA would render a decision on their ALD. To do otherwise would create incentives for facilities to apply for an ALD as a means of obtaining additional time under § 257.103(f)(1) or (f)(2). Any owners or operators that are preparing to submit an ALD and whose facilities lack alternative capacity should therefore also be preparing to submit a demonstration of lack of capacity under either § 257.103(f)(1) or (f)(2) in the event their application is denied.

The current deadline for all facilities who lack capacity and wish to apply for the § 257.103(f)(1) or (f)(2) alternative closure requirements is November 30, 2020. That provides the owner or operator approximately 4 months from the signature date of the Part A final rule to submit the demonstration. Accordingly, if an application is rejected or an ALD is denied the owner or operator will be given four months to apply for either § 257.103(f)(1) or (f)(2). The facility's deadline to cease receipt of waste will be tolled during these four months to allow the owner or operator to develop the § 257.103(f)(1) or (f)(2) demonstration. Thereafter, consistent with the procedures adopted in § 257.103, the deadline to cease receipt of waste will continue to be tolled until the Agency determines whether the submission is incomplete or reaches a final decision. As stated earlier, the Part A final rule requires owners and operators to submit demonstrations under the alternative closure provisions of § 257.103(f)(1) or (f)(2) by November 30, 2020. To accommodate facilities whose application or alternative liner demonstration under § 257.71(d) is denied and who intend to submit a demonstration under the alternative closure provisions, the Agency is revising § 257.103(f)(3)(i)(A) and (C) to allow such demonstrations to be submitted after the deadline of November 30, 2020. Specifically, EPA is revising § 257.103(f)(3)(i)(A) and (C) by adding the clause ''Except as provided by § 257.71(d)(2)(iii)(E) and (viii),'' to each paragraph.

A facility may not be granted more time than the maximum that is provided in § 257.103(f)(1) or (f)(2), even if the owner or operator is applying for the alternate closure requirements after they are denied an ALD. Specifically, a unit that qualifies for alternate closure dates under § 257.103(f)(1) would still be required to cease receipt of waste no later than October 15, 2023. An eligible unlined surface impoundment granted a capacity extension must cease receiving CCR and/or non-CCR wastestreams no later than October 15, 2024. In order to continue to operate until October 15, 2024, the owner or operator must demonstrate that the unit meets the definition of an eligible unlined CCR surface impoundment. Units applying for an ALD that ultimately are granted alternate closure dates under § 257.103(f)(2) would need to cease operation of their coal fired boiler and complete closure of the surface impoundment no later than October 17, 2023 if they are 40 acres or smaller and by October 17, 2028 if they are larger than 40 acres.

4. Recertification

EPA discussed in the proposal that the approved demonstration will be effective for the remaining active life of the unit since the demonstration must show that the engineered liner and/or naturally occurring soil is sufficient to prevent adverse effects from the surface impoundment.

Several facilities and industry groups affirmed that a one-time demonstration is appropriate. Several other commenters argued that units should be required to periodically recertify the results of the ALD. One of these commenters cited to several studies to argue that onsite hydrogeologic conditions can shift suddenly and affect the performance of the liner. These commenters pointed to shifting land use and climate change as phenomena that could impact liner performance. The land uses envisioned by the commenter include increased agriculture or urban development. However, the commenters provided no direct explanation how these changes were expected to impact liner performance.

A study cited by this commenter noted that the climate change would primarily impact surface water, but that there could also be impacts to the quantity and quality of groundwater.[29] The most likely way in which this could impact liner performance would be a decrease in the depth to groundwater. However, the long-term trends considered by these and other studies are often projected out many decades into the future and are variable across the country. Portions of the country are projected to see a decrease in precipitation, while others are projected to see an increase through more intense storms, which may or may not translate to increased groundwater recharge. Similarly, the land uses cited would only further deplete groundwater through increased extraction for agriculture or increased runoff from more impervious surfaces. Regardless, the 2014 Risk Assessment found that variations in the water table height did not substantially shift high-end risks, particularly for the most mobile constituents. Therefore, there is no indication that shifts in the groundwater table would alter the conclusion whether continued operation of a surface impoundment in the near term is protective. In addition, depth to groundwater is a parameter that is routinely measured during all phases of groundwater monitoring and so it will be apparent without recertification if groundwater levels are rising. Changes to the background quality of groundwater that has no direct contact with the unit would have no effect on whether the unit remains protective. As a result, it is not apparent from the comments provided what would be further achieved by requiring facilities to periodically recertify the characterization of local hydrogeology. Therefore, EPA made no amendments to the requirements of the rule in response to this comment.

5. Loss of Authorization

EPA proposed at § 257.71(d)(2)(vii)(A) that authorization of an ALD could be rescinded at any time if the facility fails to maintain the performance standard or any other requirement of this rule. To identify the potential for a future exceedance of GWPS, the Agency proposed that facilities that trigger assessment monitoring would need to

[29] Green, T.R., M. Taniguchi, H. Kooi, J.J. Gurdak, D.M. Allen, K.M. Hiscock, H. Treidel, and A. Aureli. 2011. ''Beneath the Surface of Global Change: Impacts of Climate Change on Groundwater.'' Journal of Hydrology. 405:532–560.

conduct intra-well analyses on each downgradient well to identify any trends of increasing concentrations and this information would be included as part of subsequent groundwater monitoring reports. The proposal further stated that if there is evidence that the unit may exceed GWPS before source control measures were put in place (*e.g.,* dewatering, impermeable cap, clean closure), then the alternative liner authorization would be reconsidered.

EPA also proposed at § 257.71(d)(2)(vii)(B) that the onus would remain on the facility at all times to demonstrate that the unit meets the conditions for authorization of the ALD. The proposal further stated that EPA or the Participating State Director could, without further notice or process, deny or revoke the owner or operator's authorization if these conditions for qualification were no longer being met.

EPA received a number of comments on the proposed loss of authorization provisions. Some industry groups and facilities requested confirmation that an option is available to demonstrate whether increased groundwater concentrations are attributed to a source unrelated to the unit before authorization would be revoked. One facility claimed that it was inappropriate to rely on groundwater monitoring at all to determine compliance. Several environmental groups stated that use of GWPS to determine ongoing compliance is not protective, while several industry groups commented that use of trend analysis was not a reliable way to determine compliance.

a. Use of Groundwater Monitoring To Determine Ongoing Compliance

The proposed rule stated at § 257.71(d)(2)(vii)(A) that if at any time assessment monitoring pursuant to § 257.95 is triggered for the unit, the facility must conduct intra-well analyses on each well as part of subsequent groundwater monitoring reports to identify any trends of increasing concentrations. The proposal further explained that if trend analysis predicts there will be an exceedance of GWPS for any constituent, EPA or the Participating State Director would reconsider the authorization and may revoke it if source control measures could not be put in place while the unit continues to operate.

In response to that provision, one commenter stated it was inappropriate to rely on groundwater monitoring to determine whether a unit continued to meet the standards of the ALD because groundwater monitoring does not provide direct information about whether the conditions of the liner or site soils have changed. Instead, this commenter argued the rule should allow for an examination of changes to the liner itself, or changes in the site soils, hydrology or other site conditions evaluated in the demonstration.

EPA disagrees that groundwater monitoring is an inappropriate method by which to establish whether a unit remains in compliance with this rule. Groundwater monitoring provides direct evidence of the impoundment's impact on groundwater quality. Whether these impacts are a result of a material change to the liner is immaterial to the fact that those impacts have occurred. In addition, the commenter provided no indication of what types of examinations were envisioned, how these examinations would be triggered, how these examinations could be used to prove a unit remains protective, and how this all would proceed faster than groundwater monitoring. To address all of these issues, EPA proposed the use of trend analysis to identify the potential for harm before it would occur so that it can be addressed. Therefore, EPA maintains the requirement to base continued authorization of an ALD on the results of groundwater monitoring.

b. Trend Analysis

EPA proposed at § 257.71(d)(2)(vii)(A) that units with an approved ALD that have entered into assessment monitoring (*i.e.,* SSI of Appendix III) must conduct additional intra-well analysis to identify any increasing trends of Appendix IV constituents in groundwater. A positive trend can show that contaminant levels have gotten worse compared to earlier measurements from the same well. Understanding the nature of the trend, including the rate of increase per unit of time, allows estimation of how rapidly concentration levels are increasing. If the identified trendline is steep enough to result in an exceedance of GWPS within the timeframe required to complete closure of the unit, the facility would have to begin implementation of source control measures at that time.

The final rule adopts a provision that largely tracks the proposal. The final rule requires that if a unit with an approved ALD enters into assessment monitoring, the facility must, in addition to their regular groundwater monitoring, conduct additional intra-well analysis to identify any statistically significant trend of increasing concentrations of appendix IV constituents in groundwater. If the identified trendline is steep enough that it would result in an exceedance of a GWPS at any point during the active life of the unit, the facility must close the unit.[30] This final provision represents a change only for those units that have a geosynthetic liner; the proposal specified that units with only natural soil liners would be required to close at this point, as the agency was aware of no other effective option for source control. The Agency is expanding this requirement to units with geosynthetic liners in response to comments stating that the Agency lacked data to demonstrate that these liners can be effectively repaired.

Trend analysis will require collection of multiple samples to define whether and to what extent concentrations are changing over time. As discussed in the following Unit, EPA is requiring that the necessary samples be collected over the course of the following year; however, there is minimal risk that an impoundment able to obtain an ALD and that has no prior history of releases might trigger corrective action so soon after entering into assessment monitoring. As discussed previously, an SSI of Appendix III constituents is not an indication that adverse effects have occurred or will occur. An SSI only shows that there has been some increase in Appendix III constituents discernable from background, regardless of the magnitude. Multiple constituents on Appendix III were included on this list for their mobility in the environment and so provide the best early indicators that a release has occurred. As a result, at the time that an SSI is first identified, it is possible that there will not have been any associated increase in most Appendix IV constituents. This will be confirmed by the first sample collected within the initial 90-day window in accordance with the existing requirements in § 257.95(b). Any further increase in concentrations of Appendix IV constituents is expected to be gradual based on the documented low conductivity of the engineered liner and/or naturally occuring soil provided in the ALD. The fact that many of these alternately lined units will have operated for decades without ever leaving detection monitoring provides additional evidence that any releases

[30] The comparison of a projected concentration to groundwater standards is not a statistical test of significance because, without measurements of future groundwater concentrations, it is predicated on the assumption that the current trend will persist unchanged. Nevertheless, the fact that the impoundment has entered into assessment monitoring, there is a statistically significant trend of increasing concentration, and the current magnitude of that trend has the potential to result in a future exceedance of GWPS is considered sufficient evidence that a release has occurred and there is a reasonable probability that continued operation of the impoundment could adversely affect groundwater.

identified in the future are indeed slow moving or small in magnitude. It is possible for an impoundment to remain in assessment monitoring for the remainder of its operational life without ever exceeding GWPS. As demonstrated for composite-lined units in the 2014 Risk Assessment, releases can occur from even the most well-designed units and these units can remain protective for the duration of their active life.

EPA received a number of specific comments on the application of trend analysis. These comments and the revisions made to the proposed rule in response are discussed in the following Units of preamble.

(i) Identification of Trends

Commenters claimed that use of trend analysis is inconsistent and inferior to the statistical methods already required and do not meet the performance standards of § 257.93(g). Commenters stated that the proposal provided no guidance on how to identify trends and that the criteria used by EPA to determine that units were noncompliant would be subjective.

Trend analysis serves a distinct purpose from the other statistical methods. Methods detailed in § 257.93(f) for use in assessment monitoring are intended to identify whether groundwater concentrations have exceeded GWPS, while trend analysis, as used in this context, is intended to identify whether GWPS could be exceeded in the future. Trend analysis does not substitute for monitoring data and statistical evaluations already required by the rule. Trend tests are robust statistical methods and have previously been applied by the Agency both to provide evidence of plume migration and the need to expand the monitoring well network. EPA has previously developed guidance and tools to aid in applying trend analysis.[31] [32] Statistical identification of a positive trend involves testing the estimated slope coefficient from the regression trend line. Identification of a pattern of increase within the sampling record provides a reliable method to determine that concentrations have risen more than expected by chance alone. Once the trend is calculated, confidence limits around the trend line should be calculated to account for variability within the dataset. The upper 95th percentile confidence limit on the trend line must be used to ensure potential increases have not been underestimated. Use of the upper percentile is considered appropriate here because the goal is to prevent the impoundment entering into corrective action in the future. Waiting for the corresponding lower confidence limit to exceed GWPS to take action would provide greater certainty that an exceedance will occur by a certain time, but it would also make it far more likely that an exceedance could occur before then.

The final rule also includes a minimum sampling frequency to ensure that the number of samples collected is consistent with the data requirements in § 257.93(e). Four independent samples is generally considered the minimum number necessary to conduct meaningful statistical analysis on a trend. The first of these samples must be collected within 90 days of triggering assessment monitoring in accordance with § 257.95(b). The remaining three must be collected on a quarterly basis within a year of triggering assessment monitoring. After establishing this baseline from the initial sampling events, the subsequent monitoring frequency will be established in accordance with § 257.95(d). The trend analysis must be updated after each sampling event.

There will always be some degree of uncertainty associated with extrapolation of measured data into the future, with uncertainty increasing the further the trend is projected into the future. There is potential that reliance on trends can overestimate the potential of future exceedances. For example, it is possible that linearly increasing concentrations may eventually plateau at some level below GWPS. However, asymptotic conditions occur gradually and during that time concentrations continue to increase, albeit at a slower rate. Therefore, a decline in the slope of the trend does not itself ensure that GWPS will not eventually be exceeded. Additionally, there is no way to guarantee based on existing monitoring data that any plateau in current concentrations will be sustained in perpetuity. The timeframe required for trendline projection is commensurate with the uncertainty associated with closure, which is directly related to the size and complexity of the unit. Although full closure may take the full time projected, the initial steps of ceasing placement of new ash and dewatering the unit will have the greatest relative impact on releases by eliminating the primary mechanisms driving infiltration to the subsurface.

Therefore, EPA is adopting a provision at § 257.71(d)(2)(vii)(A) to ensure that the number of samples available will provide sufficient information to support decisions. Except as provided for in § 257.95(c), the owner or operator must collect a minimum of four independent samples from each well (background and downgradient) within one year of triggering assessment monitoring and analyze each sample for all Appendix IV constituents.[33] After the initial sampling period, monitoring may revert to the previously established frequency.

EPA is also finalizing a requirement at § 257.71(d)(2)(vii)(A)(*1*) to clarify that the owner or operator of the CCR unit must apply an appropriate statistical test to identify trends within the monitoring data. For normal distributions of data, linear regression will be used to identify the presence and magnitude of any trends. For non-normal distributions of data, the Mann-Kendall test will be used to identify the presence of a trend and the Theil-Sen trend line will be used to determine the associated magnitude. The test used shall comply, as appropriate, with the performance standards in § 257.93(g). If a trend is identified, the facility will use the upper 95th percentile confidence limit on the trend line to determine if GWPS could be exceeded in the future. The facility will project this trend line into the future for a duration set to the maximum number of years allowed for closure of the surface impoundment pursuant to § 257.102.

The owner or operator must submit to EPA a report of the results of each sampling event, as well as the initial trend analysis and they must include all data relied upon by the facility to support the analysis. The reports and the final trend analysis must be posted to the facility's publicly accessible CCR internet site and submitted to EPA within 14 days of completion. EPA will publish a proposed decision on the trend analysis on *regulations* dot *gov* for a 30-day comment period. After consideration of the comments, EPA will issue its decision. If the trend analysis shows the potential for a future exceedance of a groundwater protection standard the CCR surface impoundment must cease receipt of waste pursuant to the withdrawal notice. Furthermore, if at any time the unit exceeds any GWPS, the authorization will be withdrawn.

[31] U.S. EPA. 2009. ''Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance.'' EPA 530–R–09–007. Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. March.

[32] U.S. EPA. 2018. ''Groundwater Statistics Tool User's Guide.'' Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. September.

[33] U.S. EPA. 2018. ''Groundwater Statistics Tool User's Guide.'' Prepared by the Office of Solid Waste and Emergency Response. Washington, DC. September.

(ii) Alternative Source Demonstrations Under § 257.94(e)

Under an approved alternative liner demonstration, EPA proposed that if groundwater monitoring detects a statistically significant increase of any Appendix III constituent, the facility would need to complete an alternative source demonstration pursuant to § 257.94(e) or initiate assessment monitoring pursuant to § 257.95. 85 FR 12462 (March 3, 2020). In response to the proposal, commenters noted that the proposed regulatory text did not include a specific provision allowing for alternative source demonstrations to be made under § 257.94(e) prior to proceeding to assessment monitoring. These commenters requested the final rule include such regulatory text. These commenters further requested that the final rule allow facilities the opportunity to complete an alternative source demonstration when an Appendix IV constituent is detected at statistically significant levels above a GWPS pursuant to § 257.95(g) prior to initiating corrective action activities.

The current regulations provide facilities the opportunity under each phase of the groundwater monitoring program to demonstrate that a source other than the CCR unit caused the increase in groundwater concentrations for a constituent or that the increase resulted from an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. §§ 257.94(e) and 257.95(g). The final rule does not eliminate the opportunity for an owner or operator to make an alternative source demonstration for an Appendix III constituent pursuant to § 257.94(e), but the Agency has amended it slightly for units with an ALD. Similar to the provision at 257.95(g), the unit with an ALD may pursue an alternate source demonstration simultaneously while conducting the trend analysis. Given that it will take close to a year to complete a trend analysis, EPA considers that waiting an additional 90 days to commence the trend analysis is not warranted in this circumstance. As a consequence, the Agency agrees with commenters that the rule should include a specific provision allowing for alternative source demonstrations to be made under § 257.94(e). This regulatory text is codified in § 257.71(d)(2)(ix)(A)(*1*) in the final rule.

EPA disagrees with commenters that the rule should allow for alternative source demonstrations in the assessment monitoring program under § 257.95(g) when an Appendix IV constituent is detected at a statistically significant level. First, because the purpose of the requirement to close based on the trend analysis is to ensure that no Appendix IV constituent is detected at a statistically significant level, the provision at § 257.95(g) should never be triggered while the unit is operating under an alternative liner demonstration. Nor is it likely that an alternative source of contamination will be present that had not been discovered previously as a consequence of the detection of a statistically significant increase of one or more Appendix III constituents. Finally, while the Agency does agree that the risk of drawing incorrect conclusions about unit performance based on the presence of an error is equally applicable to the trend analysis conducted during assessment monitoring, EPA believes it is more appropriate for the facility to address such errors in the trends analysis sampling results report required under § 257.71(d)(2)(ix)(B). Therefore, the final rule does not allow owners and operators to make use of the alternative source demonstration provisions under § 257.95(g) while operating under the alternative liner demonstration provisions.

If an owner or operator pursuing an alternative liner demonstration makes a successful alternative source demonstration for an Appendix III constituent pursuant to § 257.94(e), the final rule requires the owner or operator to submit the alternative source demonstration to EPA for review and approval. The Agency is requiring review and approval of alternative source demonstrations because a successful demonstration under § 257.94(e) allows a CCR unit to continue with the detection monitoring program instead of progressing to an assessment monitoring program. EPA is finalizing this requirement at § 257.71(d)(2)(ix)(A)(*4*).

The owner or operator must post the alternative source demonstration to the facility's publicly accessible CCR internet site and submit it to EPA for review and approval within 14 days of completing the demonstration. EPA will publish a proposed decision on the alternative source demonstration on *regulations* dot *gov* for a 20-day comment period. After consideration of the comments, EPA will issue its decision. If the alternative source demonstration is approved by EPA, the owner operator may return to detection monitoring under § 257.94 and cease conducting the trend analysis. If the alternative source demonstration is denied by EPA, the owner or operator must either complete the trend analysis or cease receipt of waste and initiate closure of the unit, as well as initiating an assessment monitoring program as provided by § 257.94(e). See § 257.71(d)(2)(ix)(A)(*5*).

(iii) Source Control

In the proposed rule EPA explained that if there was evidence that the groundwater concentrations may exceed the groundwater protection standard for any Appendix IV constituent within the operational life of the CCR unit, EPA or the Participating State Director would reevaluate the authorization and may revoke it if source control measures could not be put in place while the unit continues to operate. 85 FR 12462, 12477 (March 3, 2019). EPA further explained that for units without a geomembrane liner the only source control that would be effective was the unit to cease receipt of waste and initiate closure.

Several commenters stated that the proposed rule contemplates repair of clay-lined impoundments as part of source control. These commenters further explained that the available record does not support the conclusion that a clay-lined surface impoundment can be repaired successfully. These commenters also raised the concern that proposal procedures were deficient in that facilities were not required to provide evidence of liner repairability in order to continue to operate. Commenters also stated that the proposed source control provisions would cause harmful delays in closure of unlined impoundments by providing additional time for a facility to continue operating while attempting to put source controls in place after detection of a groundwater protection standard exceedance. EPA received no comments that contradicted the agency's conclusion that closure is the only method of source control that would be effective for units with a natural soil-based liner.

After reviewing the record again, EPA agrees that the agency failed to identify any data to demonstrate that the source of a leak from an impoundment that receives an ALD can be identified and repaired. Therefore, the final rule treats units with a geomembrane the same as impoundments that rely on only a natural soil-based liner and requires them to close upon a determination that a GWPS will be exceeded during the active life of the unit.

IV. Corrections to §§ 257.102 and 257.103

A. Correction to the Alternative Final Cover System Requirements

EPA proposed to revise the alternative final cover system requirements under § 257.102(d)(3)(ii) to correct a typographical error (85 FR 12468, March 3, 2020). In the introductory text to § 257.102(d)(3)(ii), the regulations provide that 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 (f)(3)(ii)(A) through (D) . . .'' EPA explained in the proposal that the reference to paragraphs (f)(3)(ii)(A) through (D) is an incorrect cross-reference approval and that the correct cross-reference should be to the criteria in paragraphs (d)(3)(ii)(A) through (C). The Agency received no comments in response to this proposed change. In this action, EPA is finalizing the proposal to revise the introductory text of § 257.102(d)(3)(ii).

B. Revisions to the Alternative Closure Requirements

EPA recently promulgated amendments to the alternative closure requirements under § 257.103 that provide closure options in situations where an owner or operator is closing a CCR unit but has no alternative disposal capacity or is permanently closing the coal-fired boiler in the foreseeable future (85 FR 53516, August 28, 2020)(''Part A final rule''). Since publication of the Part A final rule, the Agency has identified a typographical error in the regulatory text. This error is being corrected in this final rule and are described below.

1. Correction to § 257.103(f)(1)(vi)

Section 257.103(f)(1)(vi) establishes maximum time frames that wastes may be managed in a CCR surface impoundment while operating pursuant to the alternative closure provisions under § 257.103(f)(1). The regulatory text under § 257.103(f)(1)(vi) provides that ''All CCR surface impoundments covered by this *section* must cease receiving waste by the deadlines specified . . .'' (emphasis added). As discussed in the Part A final rule, the maximum time frames provided for in § 257.103(f)(1)(vi) only apply to impoundments operating under § 257.103(f)(1); however, the use of the term ''section'' in this regulatory text could be interpreted incorrectly to apply also to other provisions under § 257.103, such as the alternative closure provisions under § 257.103(f)(2). Therefore, EPA is replacing the word ''section'' in the introductory text of § 257.103(f)(1)(vi) with ''paragraph (f)(1)'' to reflect the intent of the provision.

V. Rationale for 30-Day Effective Date

The effective date of this rule is 30 days after publication in the **Federal Register**. With some exceptions (see 5 U.S.C. 553(a),(d)), the Administrative Procedure Act (APA) provides that publication of a substantive rule shall be made not less than 30 days before its effective date and that this provision applies in the absence of a specific statutory provision establishing an effective date. See 5 U.S.C. 553(d) and 559. EPA has determined there is no specific provision of RCRA addressing the effective date of regulations that would apply here, and thus the APA's 30-day effective date applies.

EPA has previously interpreted section 4004(c) of RCRA to generally establish a six-month effective date for rules issued under subtitle D. See 80 FR 37988, 37990 (July 2, 2015). After further consideration, EPA interprets section 4004(c) to establish an effective date solely for the regulations that were required to be promulgated under subsection (a). Section 4004(c) is silent as to subsequent revisions to those regulations; EPA therefore believes section 4004(c) is ambiguous.

Section 4004(c) states that the prohibition in subsection (b) shall take effect six months after promulgation of regulations under subsection (a). Subsection (a), in turn provides that ''[n]ot later than one year after October 21, 1976 . . . [EPA] 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.'' As noted, section 4004(c) is silent as to revisions to those regulations.

In response to Congress's mandate in section 4004(a), EPA promulgated regulations on September 13, 1979. 44 FR 53438. EPA interprets section 4004(c) to establish an effective date applicable only to that action, and not to future regulations the Agency might issue under this section. In the absence of a specific statutory provision establishing an effective date for this rule, APA section 553(d) applies.

EPA considers that its interpretation is reasonable because there is no indication in RCRA or its legislative history that Congress intended for the agency to have less discretion under RCRA subtitle D than it would have under the APA to establish a suitable effective date for subsequent rules issued under section 4004(c). Consistent with EPA's interpretation of the express language of section 4004, EPA interprets statements in the legislative history, explaining that section 4004(c) provides that the effective date is to be 6 months after the date of promulgation of regulations, as referring to the initial set of regulations required by Congress to be promulgated not later than 1 year after October 21, 1976. These statements do not mandate a 6 month effective date for every regulatory action that EPA takes under this section. This rule contains specific, targeted revisions to the 2015 rule and the legislative history regarding section 4004 speaks only to these initial 1976 mandated regulations.

This reading allows the Agency to establish an effective date appropriate for the nature of the regulation promulgated, which is what EPA believes Congress intended. EPA further considers that the minimum 30-day effective date under the APA is reasonable in this circumstance where none of the provisions being finalized require an extended period of time for regulated entities to comply.

VI. Effect of This Final Rule on States With Approved CCR Programs

This final rule has impacts on states with an approved program. As of this final rule, EPA has granted approvals to the states of Oklahoma and Georgia.

Oklahoma and Georgia were each granted approval for § 257.71, and their regulations continue to operate without change in lieu of the federal program. In essence this means that the revisions promulgated in this rule making will not take effect in either of these states until such time as Oklahoma or Georgia revises the program to adopt them.

EPA has determined that this rule is not more stringent than the current regulations in 40 CFR Subpart D. As a consequence, neither state is required to adopt these provisions in order to maintain program approval. See, RCRA section 4005(d)(1)(D)(i)(II).

The process for approving Oklahoma or Georgia's 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.

VII. The Projected Economic Impacts 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. The RIA estimates that the net annualized impact of this proposed regulatory action over a 100-year period of analysis will be annual cost savings of approximately $ 4.0 million to $ 8.0 million when discounting at 7% and approximately $ 2.2 million to $ 4.5 million when discounting at 3%. This action is not considered an economically significant action under Executive Order 12866.

B. Affected Universe

The rule potentially affects coal fired electric utility plants (assigned to the utility sector North American Industry Classification System (NAICS) code 221112) that dispose of their waste onsite in surface impoundments. The universe consists of approximately 523 surface impoundments at 229 facilities.

C. Costs, Cost Savings, and Benefits of the Final Rule

The Alternative Liner Demonstration finalized in this rule results in paperwork costs associated with submitting an application for demonstration and, if approved, the required demonstration. Provision One also results in cost savings associated with delays in closure of units (*i.e.,* time value of money savings). Overall, the RIA estimates that the time value of money cost savings will be greater than the paperwork costs, making this a net cost savings rule of approximately $4.0 million to $8.0 million per year when discounting at 7% and approximately $2.2. million to $4.5 million per year when discounting at 3%.

The rule is not anticipated to result in impacts to benefits. A qualitative discussion of benefits is available in Chapter 3 of the RIA, which can be found in the docket for this rulemaking.

VIII. Executive Orders

Additional information about these statutes and Executive Orders can be found at *epa* dot *gov/laws- regulations/ laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This is a significant regulatory action that was submitted to the Office of Management and Budget (OMB) for review because it raises novel legal or policy issues. Any changes made in response to OMB recommendations have been documented in the docket. EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis is available in the docket and is summarized in Unit VII of this preamble.

B. Executive Order 13771: Reducing Regulation and Controlling Regulatory Costs

This action is considered an Executive Order 13771 deregulatory action. Details on the estimated cost savings of this final rule can be found in EPA's analysis of the potential costs and benefits associated with this action.

C. Paperwork Reduction Act (PRA)

The information collection activities in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the PRA. The Information Collection Request (ICR) document that the EPA prepared has been assigned EPA ICR number 2609.02. You can find a copy of the ICR in the docket for this rule, and it is briefly summarized here.

The information to be collected as a part of this rule includes demonstrations that must be made to EPA by owners and operators of units that seek to obtain an alternate liner demonstration under § 257.71(d). These demonstrations will show that the unit in question meets the necessary criteria to receive the extension.

Respondents/affected entities: Coal-fired electric utility plants that will be affected by the rule.

Respondent's obligation to respond: The recordkeeping, notification, and posting are mandatory as part of the minimum national criteria being promulgated under Sections 1008, 4004, and 4005(a) of RCRA.

Estimated number of respondents: 7.

Frequency of response: The frequency of response varies.

Total estimated burden: EPA estimates the total annual burden to respondents to be an increase in burden of approximately 2,179 hours from the currently approved burden. Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: $900,000 (per year), includes $0 annualized capital costs and $785,000 annualized operation & 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.

D. 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. In making this determination, the impact of concern is any significant adverse economic impact on small entities. An agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no net burden or otherwise has a positive economic effect on the small entities subject to the rule. This action is expected to result in net cost savings of approximately $4.0 million to $8.0 million per year when discounting at 7% and $2.2 million to $4.5 million per year when discounting at 3%. These cost savings will accrue to all regulated entities. We have therefore concluded that this action will relieve regulatory burden for all directly regulated small entities.

E. Unfunded Mandates Reform Act (UMRA)

This action does not contain any unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. This action imposes no enforceable duty on any state, local or tribal governments or the private sector.

F. 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.

G. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175. 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.

H. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the EPA does not believe the environmental health risks or safety risks addressed by

this action present a disproportionate risk to children. This action's health and risk assessments are contained in the document titled ''Human and Ecological Risk Assessment of Coal Combustion Residuals,'' which is available in the docket for the final rule as docket item EPA–HQ–RCRA–2009–0640–11993.

As ordered by E.O. 13045 Section 1–101(a), 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 and assessed environmental health risks and safety risks that may disproportionately affect children in the revised risk assessment. The results of the screening assessment found that risks fell below the criteria when wetting and run-on/runoff controls required by the rule are considered. Under the full probabilistic analysis, composite liners required by the rule for new waste management units showed the ability to reduce the 90th percentile child cancer and non-cancer risks for the groundwater to drinking water pathway to well below EPA's criteria. Additionally, the groundwater monitoring and corrective action required by the rule reduced risks from current waste management units. This action does not adversely affect these requirements and EPA believes that this rule will be protective of children's health.

I. 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. For the 2015 CCR rule, EPA analyzed the potential impact on electricity prices relative to the ''in excess of one percent'' threshold. Using the Integrated Planning Model (IPM), EPA concluded that the 2015 CCR Rule may increase the weighted average nationwide wholesale price of electricity between 0.18 percent and 0.19 percent in the years 2020 and 2030, respectively. As the final rule represents a cost savings rule relative to the 2015 CCR rule, this analysis concludes that any potential impact on wholesale electricity prices will be lower than the potential impact estimated of the 2015 CCR rule; therefore, this final rule is not expected to meet the criteria of a ''significant adverse effect'' on the electricity markets as defined by Executive Order 13211.

J. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

K. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). The documentation for this decision is contained in EPA's Regulatory Impact Analysis (RIA) for the CCR rule which is available in the docket for the 2015 CCR final rule as docket item EPA–HQ–RCRA–2009–0640–12034.

The EPA's risk assessment did not separately evaluate either minority or low-income populations. However, to evaluate the demographic characteristics of communities that may be affected by the CCR rule, the RIA compares the demographic characteristics of populations surrounding coal-fired electric utility plants with broader population data for two geographic areas: (1) One-mile radius from CCR management units (*i.e.,* landfills and impoundments) likely to be affected by groundwater releases from both landfills and impoundments; and (2) watershed catchment areas downstream of surface impoundments that receive surface water run-off and releases from CCR impoundments and are at risk of being contaminated from CCR impoundment discharges (*e.g.,* unintentional overflows, structural failures, and intentional periodic discharges).

For the population as a whole 24.8 percent belong to a minority group and 11.3 percent falls below the Federal Poverty Level. For the population living within one mile of plants with surface impoundments 16.1 percent belong to a minority group and 13.2 percent live below the Federal Poverty Level. These minority and low-income populations are not disproportionately high compared to the general population. The percentage of minority residents of the entire population living within the catchment areas downstream of surface impoundments is disproportionately high relative to the general population *i.e.,* 28.7 percent, versus 24.8 percent for the national population. Also, the percentage of the population within the catchment areas of surface impoundments that is below the Federal Poverty Level is disproportionately high compared with the general population, *i.e.,* 18.6 percent versus 11.3 percent nationally.

Comparing the population percentages of minority and low income residents within one mile of landfills to those percentages in the general population, EPA found that minority and low-income residents make up a smaller percentage of the populations near landfills than they do in the general population, *i.e.,* minorities comprised 16.6 percent of the population near landfills versus 24.8 percent nationwide and low-income residents comprised 8.6 percent of the population near landfills versus 11.3 percent nationwide. In summary, although populations within the catchment areas of plants with surface impoundments appear to have disproportionately high percentages of minority and low-income residents relative to the nationwide average, populations surrounding plants with landfills do not. Because landfills are less likely than impoundments to experience surface water run-off and releases, catchment areas were not considered for landfills.

The CCR rule is risk-reducing with reductions in risk occurring largely within the surface water catchment zones around, and groundwater beneath, coal-fired electric utility plants. Since the CCR rule is risk-reducing and this action does not add to risks, this action will not result in new disproportionate risks to minority or low-income populations.

L. Congressional Review Act (CRA)

This action is subject to the CRA, and EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 257

Environmental protection, Beneficial use, Coal combustion products, Coal combustion residuals, Coal combustion waste, Disposal, Hazardous waste, Landfill, Surface impoundment.

Andrew Wheeler,

Administrator.

For the reasons set out in the preamble, EPA amends 40 CFR part 257 as follows:

PART 257—CRITERIA FOR CLASSIFICATION OF SOLID WASTE DISPOSAL FACILITIES AND PRACTICES

■ 1. The authority citation for part 257 continues to read as follows:

Authority: 42 U.S.C. 6907(a)(3), 6912(a)(1), 6944, 6945(a) and (d); 33 U.S.C. 1345(d) and (e).

■ 2. Amend § 257.71 by adding paragraph (d) to read as follows:

§ 257.71 Liner design criteria for existing CCR surface impoundments.

* * * * *

(d) *Alternate Liner Demonstration.* An owner or operator of a CCR surface impoundment constructed without a composite liner or alternate composite liner, as defined in § 257.70(b) or (c), may submit an Alternate Liner Demonstration to the Administrator or the Participating State Director to demonstrate that based on the construction of the unit and surrounding site conditions, that there is no reasonable probability that continued operation of the surface impoundment will result in adverse effects to human health or the environment. The application and demonstration must be submitted to the Administrator or the Participating State Director no later than the relevant deadline in paragraph (d)(2) of this section. The Administrator or the Participating State Director will act on the submissions in accordance with the procedures in paragraph (d)(2) of this section.

(1) *Application and alternative liner demonstration submission requirements.* To obtain approval under this paragraph (d), the owner or operator of the CCR surface impoundment must submit all of the following:

(i) *Application.* The owner or operator of the CCR surface impoundment must submit a letter to the Administrator or the Participating State Director, announcing their intention to submit a demonstration under paragraph (d)(1)(ii) of this section. The application must include the location of the facility and identify the specific CCR surface impoundment for which the demonstration will be made. The letter must include all of the following:

(A) A certification signed by the owner or operator that the CCR unit is in full compliance with this subpart except for § 257.71(a)(1);

(B) Documentation supporting the certification required under paragraph (d)(1)(i)(A) of this section that includes all the following:

(*1*) Documentation that the groundwater monitoring network meets all the requirements of § 257.91. This must include documentation that the existing network of groundwater monitoring wells is sufficient to ensure detection of any groundwater contamination resulting from the impoundment, based on direction of flow, well location, screening depth and other relevant factors. At a minimum, the documentation must include all of the following:

(*i*) Map(s) of groundwater monitoring well locations in relation to the CCR unit(s) that depict the elevation of the potentiometric surface and the direction(s) of groundwater flow across the site;

(*ii*) Well construction diagrams and drilling logs for all groundwater monitoring wells;

(*iii*) Maps that characterize the direction of groundwater flow accounting for temporal variations; and

(*iv*) Any other data and analyses the owner or operator of the CCR surface impoundment relied upon when determining the design and location of the groundwater monitoring network.

(*2*) Documentation that the CCR surface impoundment remains in detection monitoring pursuant to § 257.94 as a precondition for submitting an application. This includes documentation that the groundwater monitoring program meets the requirements of §§ 257.93 and 257.94. Such documentation includes data of constituent concentrations, summarized in table format, at each groundwater monitoring well monitored during each sampling event, and documentation of the most recent statistical tests conducted, analyses of the tests, and the rationale for the methods used in these comparisons. As part of this rationale, the owner or operator of the CCR surface impoundment must provide all data and analyses relied upon to comply with each of the requirements of this part;

(*3*) Documentation that the unit meets all the location restrictions under §§ 257.60 through 257.64;

(*4*) The most recent structural stability assessment required at § 257.73(d); and

(*5*) The most recent safety factor assessment required at § 257.73(e).

(C) Documentation of the design specifications for any engineered liner components, as well as all data and analyses the owner or operator of the CCR surface impoundment relied on when determining that the materials are suitable for use and that the construction of the liner is of good quality and in-line with proven and accepted engineering practices.

(D) Facilities with CCR surface impoundments located on properties adjacent to a water body must demonstrate that there is no reasonable probability that a complete and direct transport pathway (*i.e.,* not mediated by groundwater) can exist between the impoundment and any nearby water body. If the potential for such a pathway is identified, then the unit would not be eligible to submit a demonstration. If ongoing releases are identified, the owner or operator of the CCR unit must address these releases in accordance with § 257.96(a); and

(E) Upon submission of the application and any supplemental materials submitted in support of the application to the Administrator or the Participating State Director, the owner or operator must place the complete application in the facility's operating record as required by § 257.105(f)(14).

(ii) *Alternate Liner Demonstration Package.* The completed alternate liner demonstration package must be certified by a qualified professional engineer. The package must present evidence to demonstrate that, based on the construction of the unit and surrounding site conditions, there is no reasonable probability that operation of the surface impoundment will result in concentrations of constituents listed in appendix IV to this part in the uppermost aquifer at levels above a groundwater protection standard. For each line of evidence, as well as any other data and assumptions incorporated into the demonstration, the owner or operator of the CCR surface impoundment must include documentation on how the data were collected and why these data and assumptions adequately reflect potential contaminant transport from that specific impoundment. The alternate liner demonstration at a minimum must contain all of the following lines of evidence:

(A) *Characterization of site hydrogeology.* A characterization of the variability of site-specific soil and hydrogeology surrounding the surface impoundment that will control the rate and direction of contaminant transport from the impoundment. The owner or operator must provide all of the following as part of this line of evidence:

(*1*) Measurements of the hydraulic conductivity in the uppermost aquifer from all monitoring wells associated with the impoundment(s) and discussion of the methods used to obtain these measurements;

(*2*) Measurements of the variability in subsurface soil characteristics collected from around the perimeter of the CCR surface impoundment to identify regions of substantially higher conductivity;

(*3*) Documentation that all sampling methods used are in line with recognized and generally accepted practices that can provide data at a spatial resolution necessary to adequately characterize the variability

of subsurface conditions that will control contaminant transport;

(*4*) Explanation of how the specific number and location of samples collected are sufficient to capture subsurface variability if:

(*i*) Samples are advanced to a depth less than the top of the groundwater table or 20 feet beneath the bottom of the nearest water body, whichever is greater, and/or

(*ii*) Samples are spaced further apart than 200 feet around the impoundment perimeter;

(*5*) A narrative description of site geological history; and

(*6*) Conceptual site models with cross-sectional depictions of the site environmental sequence stratigraphy that include, at a minimum:

(*i*) The relative location of the impoundment with depth of ponded water noted;

(*ii*) Monitoring wells with screening depth noted;

(*iii*) Depiction of the location of other samples used in the development of the model;

(*iv*) The upper and lower limits of the uppermost aquifer across the site;

(*v*) The upper and lower limits of the depth to groundwater measured from monitoring wells if the uppermost aquifer is confined; and

(*vi*) Both the location and geometry of any nearby points of groundwater discharge or recharge (*e.g.,* surface water bodies) with potential to influence groundwater depth and flow measured around the unit.

(B) *Potential for infiltration.* A characterization of the potential for infiltration through any soil-based liner components and/or naturally occurring soil that control release and transport of leachate. All samples collected in the field for measurement of saturated hydraulic conductivity must be sent to a certified laboratory for analysis under controlled conditions and analyzed using recognized and generally accepted methodology. Facilities must document how the selected method is designed to simulate on-site conditions. The owner or operator must also provide documentation of the following as part of this line of evidence:

(*1*) The location, number, depth, and spacing of samples relied upon is supported by the data collected in paragraph (d)(1)(ii)(A) of this section and is sufficient to capture the variability of saturated hydraulic conductivity for the soil-based liner components and/or naturally occurring soil;

(*2*) The liquid used to pre-hydrate the samples and measure long-term hydraulic conductivity reflects the pH and major ion composition of the CCR surface impoundment porewater;

(*3*) That samples intended to represent the hydraulic conductivity of naturally occurring soils (*i.e.,* not mechanically compacted) are handled in a manner that will ensure the macrostructure of the soil is not disturbed during collection, transport, or analysis; and

(*4*) Any test for hydraulic conductivity relied upon includes, in addition to other relevant termination criteria specified by the method, criteria that equilibrium has been achieved between the inflow and outflow, within acceptable tolerance limits, for both electrical conductivity and pH.

(C) *Mathematical model to estimate the potential for releases.* Owners or operators must incorporate the data collected for paragraphs (d)(1)(ii)(A) and (d)(1)(ii)(B) of this section into a mathematical model to calculate the potential groundwater concentrations that may result in downgradient wells as a result of the impoundment. Facilities must also, where available, incorporate the national-scale data on constituent concentrations and behavior provided by the existing risk record. Application of the model must account for the full range of site current and potential future conditions at and around the site to ensure that high-end groundwater concentrations have been effectively characterized. All of the data and assumptions incorporated into the model must be documented and justified.

(*1*) The models relied upon in this paragraph (d)(1)(ii)(C) must be well-established and validated, with documentation that can be made available for public review.

(*2*) The owner or operator must use the models to demonstrate that, for each constituent in appendix IV of this part, there is no reasonable probability that the peak groundwater concentration that may result from releases to groundwater from the CCR surface impoundment throughout its active life will exceed the groundwater protection standard at the waste boundary.

(*3*) The demonstration must include the peak groundwater concentrations modeled for all constituents in appendix IV of this part attributed both to the impoundment in isolation and in addition to background.

(D) Upon submission of the alternative liner demonstration to the Administrator or the Participating State Director, the owner or operator must place the complete demonstration in the facility's operating record as required by § 257.105(f)(15).

(2) *Procedures for adjudicating requests*—(i) *Deadline for application submission.* The owner or operator must submit the application under paragraph (d)(1)(i) of this section to EPA or the Participating State Director for approval no later than November 30, 2020.

(ii) *Deadline for demonstration submission.* If the application is approved the owner or operator must submit the demonstration required under paragraph (d)(1)(ii) of this section to EPA or the Participating State Director for approval no later than November 30, 2021.

(A) *Extension due to analytical limitations.* If the owner or operator cannot meet the demonstration deadline due to analytical limitations related to the measurement of hydraulic conductivity, the owner or operator must submit a request for an extension no later than September 1, 2021 that includes a summary of the data that have been analyzed to date for the samples responsible for the delay and an alternate timeline for completion that has been certified by the laboratory. The extension request must include all of the following:

(*1*) A timeline of fieldwork to confirm that samples were collected expeditiously;

(*2*) A chain of custody documenting when samples were sent to the laboratory;

(*3*) Written certification from the lab identifying how long it is projected for the tests to reach the relevant termination criteria related to solution chemistry, and

(*4*) Documentation of the progression towards all test termination metrics to date.

(B) *Length of extension.* If the extension is granted, the owner or operator will have 45 days beyond the timeframe certified by the laboratory to submit the completed demonstration.

(C) *Extension due to analytical limitations for chemical equilibrium.* If the measured hydraulic conductivity has not stabilized to within acceptable tolerance limits by the time the termination criteria for solution chemistry are met, the owner or operator must submit a preliminary demonstration no later than September 1, 2021 (with or without the one-time extension for analytical limitations).

(*1*) In this preliminary demonstration, the owner or operator must submit a justification of how the bounds of uncertainty applied to the available measurements of hydraulic conductivity ensure that the final value is not underestimated.

(*2*) EPA will review the preliminary demonstration to determine if it is

complete and, if so, will propose to deny or to tentatively approve the demonstration. The proposed determination will be posted in the docket on *regulations* dot *gov* and will be available for public comment for 30 days. After consideration of the comments, EPA will issue its decision on the application within four months of receiving a complete preliminary demonstration.

(*3*) Once the final laboratory results are available, the owner or operator must submit a final demonstration that updates only the finalized hydraulic conductivity data to confirm that the model results in the preliminary demonstration are accurate.

(*4*) Until the time that EPA approves this final demonstration, the surface impoundment must remain in detection monitoring or the demonstration will be denied.

(*5*) If EPA tentatively approved the preliminary demonstration, EPA will then take action on the newly submitted final demonstration using the procedures in paragraphs (d)(2)(iv) through (vi) of this section.

(*6*) The public will have 30 days to comment but may comment only on the new information presented in the complete final demonstration or in EPA's tentative decision on the newly submitted demonstration.

(D) Upon submission of a request for an extension to the deadline for the demonstration due to analytical limitations pursuant to paragraph (d)(2)(ii)(A) of this section, the owner or operator must place the alternative liner demonstration extension request in the facility's operating record as required by § 257.105(f)(16).

(E) Upon submission of a preliminary demonstration pursuant to paragraph (d)(2)(ii)(C) of this section, the owner or operator must place the preliminary demonstration in the facility's operating record as required by § 257.105(f)(17).

(iii) *Application review*—(A) EPA will evaluate the application and may request additional information not required as part of the application as necessary to complete its review. Submission of a complete application will toll the facility's deadline to cease receipt of waste until issuance of a final decision under paragraph (d)(2)(iii)(C) of this section. Incomplete submissions will not toll the facility's deadline and will be rejected without further process.

(B) If the application is determined to be incomplete, EPA will notify the facility. The owner or operator must place the notification of an incomplete application in the facility's operating record as required by § 257.105(f)(18).

(C) EPA will publish a proposed decision on complete applications in a docket on *regulations* dot *gov* for a 20-day comment period. After consideration of the comments, EPA will issue its decision on the application within sixty days of receiving a complete application.

(D) If the application is approved, the deadline to cease receipt of waste will be tolled until an alternate liner demonstration is determined to be incomplete or a final decision under paragraph (d)(2)(vi) of this section is issued.

(E) If the surface impoundment is determined by EPA to be ineligible to apply for an alternate liner demonstration, and the facility lacks alternative capacity to manage its CCR and/or non-CCR wastestreams, the owner or operator may apply for an alternative closure deadline in accordance with the procedures in § 257.103(f). The owner or operator will be given four months from the date of the ineligibility determination to apply for the alternative closure provisions in either § 257.103(f)(1) or (f)(2), during which time the facility's deadline to cease receipt of waste will be tolled.

(F) Upon receipt of a decision on the application pursuant to paragraph (d)(2)(iii)(C) of this section, the owner or operator must place the decision on the application in the facility's operating record as required by § 257.105(f)(19).

(iv) *Demonstration review.* EPA will evaluate the demonstration package and may request additional information not required as part of the demonstration as necessary to complete its review. Submission of a complete demonstration package will continue to toll the facility's deadline to cease receipt of waste into that CCR surface impoundment until issuance of a final decision under paragraph (d)(2)(vi) of this section. Upon a determination that a demonstration is incomplete the tolling of the facility's deadline will cease and the submission will be rejected without further process.

(v) *Proposed decision on demonstration.* EPA will publish a proposed decision on a complete demonstration package in a docket on *regulations* dot *gov* for a 30-day comment period.

(vi) *Final decision on demonstration.* After consideration of the comments, EPA will issue its decision on the alternate liner demonstration package within four months of receiving a complete demonstration package. Upon approval the facility may continue to operate the impoundment as long as the impoundment remains in detection monitoring. Upon detection of a statistically significant increase over background of a constituent listed on appendix III to this part, the facility must proceed in accordance with the requirements of paragraph (ix) of this section.

(vii) *Facility operating record requirements.* Upon receipt of the final decision on the alternate liner demonstration pursuant to paragraph (vi) of this section, the owner or operator must place the final decision in the facility's operating record as required by § 257.105(f)(20).

(viii) *Effect of Demonstration Denial.* If EPA determines that the CCR surface impoundment's alternate liner does not meet the standard for approval in this paragraph (d), the owner or operator must cease receipt of waste and initiate closure as determined in EPA's decision. If the owner or operator needs to obtain alternate capacity, they may do so in accordance with the procedures in § 257.103. The owner or operator will have four months from the date of EPA's decision to apply for an alternative closure deadline under either § 257.103(f)(1) or (f)(2), during which time the facility's deadline to cease receipt of waste will be tolled.

(ix) *Loss of authorization*–(A) The owner or operator of the CCR unit must comply with all of the following upon determining that there is a statistically significant increase over background levels for one or more constituents listed in appendix III to this part pursuant to § 257.94(e):

(*1*) In addition to the requirements specified in this paragraph (d), comply with the groundwater monitoring and corrective action procedures specified in §§ 257.90 through 257.98;

(*2*) Submit the notification required by § 257.94(e)(3) to EPA within 14 days of placing the notification in the facility's operating record as required by § 257.105(h)(5);

(*3*) Conduct intra-well analysis on each downgradient well to identify any trends of increasing concentrations as required by paragraph (d)(2)(ix)(B) of this section. The owner and operator must conduct the initial groundwater sampling and analysis for all constituents listed in appendix IV to this part according to the timeframes specified in § 257.95(b);

(*4*) The owner or operator may elect to pursue an alternative source demonstration pursuant to § 257.94(e)(2) that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality, provided that such alternative source

demonstration must be conducted simultaneously with the sampling and analysis required by paragraph (d)(2)(ix)(A)(*3*) of this section. If the owner or operator believes that a successful demonstration has been made, the demonstration must be submitted to EPA for review and approval. The owner or operator must place the demonstration in the facility's operating record within the deadlines specified in § 257.94(e)(2) and submit the demonstration to EPA within 14 days of placing the demonstration in the facility's operating record.

(*5*) The alternative source demonstration must be posted to the facility's publicly accessible CCR internet site and submitted to EPA within 14 days of completion. EPA will publish a proposed decision on the alternative source determination on *regulations* dot *gov* for a 20-day comment period. After consideration of the comments, EPA will issue its decision. If the alternative source demonstration is approved, the owner or operator may cease conducting the trend analysis and return to detection monitoring. If the alternative source demonstration is denied, the owner or operator must either complete the trend analysis or cease receipt of waste. Upon receipt of the final decision on the alternative source demonstration, the owner or operator must place the final decision in the facility's operating record as required by § 257.105(f)(22).

(B) *Trend analysis.* (*1*) Except as provided for in § 257.95(c), the owner or operator must collect a minimum of four independent samples from each well (background and downgradient) on a quarterly basis within the first year of triggering assessment monitoring and analyze each sample for all constituents listed in appendix IV to this part. Consistent with 257.95(b), the first samples must be collected within 90 days of triggering assessment monitoring. After the initial year of sampling, the owner or operator must then conduct sampling as prescribed in § 257.95(d)(1). After each sampling event, the owner or operator must update the trend analysis with the new sampling information.

(*2*) The owner or operator of the CCR surface impoundment must apply an appropriate statistical test to identify any trends of increasing concentrations within the monitoring data. For normally distributed datasets, linear regression will be used to identify trends and determine the associated magnitude. For non-normally distributed datasets, the Mann-Kendall test will be used to identify trends and the Theil-Sen trend line will be used to determine the associated magnitude. If a trend is identified, the owner or operator of the CCR surface impoundment will use the upper 95th percentile confidence limit on the trend line to estimate future concentrations. The owner or operator will project this trendline into the future for a duration set to the maximum number of years established in § 257.102 for closure of the surface impoundment.

(*3*) A report of the results of each sampling event, as well as the final trend analysis, must be posted to the facility's publicly accessible CCR internet site and submitted to EPA within 14 days of completion. The trend analysis submitted to EPA must include all data relied upon by the facility to support the analysis. EPA will publish a proposed decision on the trend analysis on *regulations* dot *gov* for a 30-day comment period. After consideration of the comments, EPA will issue its decision. If the trend analysis shows the potential for a future exceedance of a groundwater protection standard, before the closure deadlines established in § 257.102, the CCR surface impoundment must cease receipt of waste by the date provided in the notice.

(C) If the trend analysis demonstrates the presence of a statistically significant trend of increasing concentration for one or more constituents listed in appendix IV of this part with potential to result in an exceedance of any groundwater protection standard before closure is complete, or if at any time one or more constituents listed in appendix IV of this part are detected at a statistically significant level above a groundwater protection standard, the authorization will be withdrawn. The provisions at § 257.96(g)(3) do not apply to CCR surface impoundments operating under an alternate liner demonstration. Upon receipt of a decision that the alternate liner demonstration has been withdrawn, the owner or operator must place the decision in the facility's operating record as required by § 257.105(f)(24).

(D) The onus remains on the owner or operator of the CCR surface impoundment at all times to demonstrate that the CCR surface impoundment meets the conditions for authorization under this section. If at any point, any condition for qualification under this section has not been met, EPA or the Participating State Director can without further notice or process deny or revoke the owner or operator's authorization under paragraph (d)(2)(ix) of this section.

■ 3. Amend § 257.101 by revising paragraph (a)(3) to read as follows:

§ 257.101 Closure or retrofit of CCR units.

(a) * * *

(3) The timeframe specified in paragraph (a)(1) of this section does not apply if the owner or operator complies with the alternate liner demonstration provisions specified in § 257.71(d) or the alternative closure procedures specified in § 257.103.

* * * * *

■ 4. Amend § 257.102 by revising (d)(3)(ii) introductory text to read as follows:

§ 257.102 Criteria for conducting the closure or retrofit of CCR units.

* * * * *

(d) * * *

(3) * * *

(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.

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■ 5. Amend § 257.103 by revising paragraphs (f)(1)(vi) introductory text, (f)(3)(i)(A) and (f)(3)(i)(C) to read as follows:

§ 257.103 Alternative closure requirements.

* * * * *

(f) * * *

(1) * * *

(vi) *Maximum time frames.* All CCR surface impoundments covered by paragraph (f)(1) must cease receiving waste by the deadlines specified in paragraphs (f)(1)(vi)(A) and (B) of this section and close in accordance with the timeframes in § 257.102(e) and (f).

* * * * *

(3) * * *

(i) * * *

(A) Except as provided by § 257.71(d)(2)(iii)(E) and (viii), the owner or operator must submit the demonstration required under paragraph (f)(1)(iv) of this section, for an alternative deadline to cease receipt of waste pursuant to paragraph (f)(1) of this section, to the Administrator or the Participating State Director for approval no later than November 30, 2020.

* * * * *

(C) Except as provided by § 257.71(d)(2)(iii)(E) and (viii), the owner or operator must submit the demonstration required under

paragraph (f)(2)(v) of this section to the Administrator for approval no later than November 30, 2020.

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■ 6. Amend § 257.105 by adding paragraphs (f)(14) through (23) to read as follows:

§ 257.105 Recordkeeping requirements.

* * * * *

(f) * * *

(14) The application and any supplemental materials submitted in support of the application as required by § 257.71(d)(1)(i)(E).

(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).

(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).

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■ 7. Amend § 257.106 by adding paragraphs (f)(13) through (23).

§ 257.106 Notification requirements.

* * * * *

(f) * * *

(13) Provide notification of the availability of the application and any supplemental materials submitted in support of the application specified under § 257.105(f)(14).

(14) Provide notification of the availability of the alternative liner demonstration specified under § 257.105(f)(15).

(15) Provide notification of the availability of the alternative liner demonstration extension request specified under § 257.105(f)(16).

(16) Provide notification of the availability of the documentation prepared for the preliminary demonstration specified under § 257.105(f)(17).

(17) Provide notification of the availability of the notification of an incomplete application specified under § 257.105(f)(18).

(18) Provide notification of the availability of the decision on the application specified under § 257.105(f)(19).

(19) Provide notification of the availability of the final decision on the alternative liner demonstration specified under § 257.105(f)(20).

(20) Provide notification of the availability of the alternative source demonstration specified under § 257.105(f)(21).

(21) Provide notification of the availability of the final decision on the alternative source demonstration specified under § 257.105(f)(22).

(22) Provide notification of the final decision on the trend analysis specified under § 257.105(f)(23).

(23) Provide notification of the decision that the alternative source demonstration has been withdrawn specified under § 257.105(f)(24).

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■ 8. Amend § 257.107 by adding paragraphs (f)(13) through (23).

§ 257.107 Publicly accessible internet site requirements.

* * * * *

(f) * * *

(13) The application and any supplemental materials submitted in support of the application specified under § 257.105(f)(14).

(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).

(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).

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