UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

ELECTRONIC MAIL
CONFIRMATION OF RECEIPT EMAIL REQUESTED

Susan B. Comensky
Vice President, Environmental Affairs
Alabama Power Company
600 18th Street N.
Birmingham, Alabama 35203
scomensk@southernco.com

Re: Notice of Potential Violations and Opportunity to Confer
Alabama Power Company, Plant Barry - Bucks, Alabama

Dear Susan Comensky:

This Notice of Potential Violations (NOPV) and Opportunity to Confer concerns the compliance of Alabama Power Company's Plant Barry in Bucks, Alabama with the requirements for the management of coal combustion residuals (CCR) found at 40 Code of Federal Regulations (C.F.R.) Part 257, Subpart D (the CCR Rule). The U.S. Environmental Protection Agency reviewed the documents listed in Enclosure 1. These documents include documents posted on Alabama Power Company's publicly accessible CCR compliance website, Alabama Power Company's 2020 permit application to the Alabama Department of Environmental Management (ADEM), and Alabama Power Company's July 1, 2021, CCR Facility Permit (Permit Number 49-35). Based on this review, the EPA has determined that Alabama Power Company has potentially violated and is potentially in violation of the CCR Rule.

These potential violations are outlined below and discussed more fully in Enclosure 2.

Potential Violations

1. Alabama Power Company has potentially failed to meet the criteria for conducting the closure of the Plant Barry Ash Pond as required by 40 C.F.R. § 257.102.

2. Alabama Power Company has potentially failed to establish an adequate Groundwater Monitoring System for the Plant Barry Ash Pond as required by 40 C.F.R. § 257.91.

3. The Emergency Action Plan provided by Alabama Power Company has potentially failed to meet the requirements of 40 C.F.R. § 257.73.

The EPA's priority is to ensure that Alabama Power Company is operating in compliance with the CCR Rule. The EPA is interested in discussing the potential violations identified above and developing an agreed-upon compliance schedule to address these areas of potential noncompliance.

With this letter, the EPA is extending to you an opportunity to confer and advise the Agency of any further information the EPA should consider with respect to the potential violations. If Alabama Power Company is interested in discussing these issues and a potential path to resolution, Alabama Power Company should contact Robert Nakamoto **within fourteen (14) days** following receipt of this letter to schedule a meeting. Robert Nakamoto can be reached at (404) 562-9341 or by email at nakamoto.robert@epa.gov. Alabama Power Company may elect to be represented by legal counsel during any discussions or meetings and should be prepared to present relevant information and documentation pertaining to the potential violations identified herein and described more fully in Enclosure 2. In furtherance of these discussions, please provide a detailed written response to the potential violations identified in Enclosure 2 **within thirty (30) days** following receipt of this NOPV. This response should describe any actions that Alabama Power Company has taken and/or intends to take related to the potential violations. Your response should be emailed to Robert Nakamoto at nakamoto.robert@epa.gov.

In addition to the potential violations identified above, the EPA would also like to discuss the following areas of concern the EPA has identified related to Alabama Power Company's compliance with the CCR Rule.

Areas of Concern

1) Alabama Power Company's lack of detail and/or supporting information in certain reports for the Ash Pond, including, but not limited to, the following:

    a. Reports of Annual Inspections, 2016 – 2021 - the reports consist of a one-page checklist with, in many cases, one-word responses.

    b. History of Construction, undated - while the report included design drawings for two of the historical dike modifications, the report should also have included design or as-built drawings for the original 1965 construction and a 1972 dike modification.

    c. Periodic Structural Stability Assessment, Plant Barry Ash Pond, dated October 15, 2021 – the two-page report only included general statements and lacked specific details, drawings, historical construction documents, or current photos documenting the status of the unit with respect to items required by 40 C.F.R. § 257.73(d).

    d. Amended Closure Plan for Ash Pond, Revision 1, dated April 2020 (Amended Closure Plan) – the plan that was posted on the Alabama Power Company CCR website included the narrative section but did not include the referenced attachments.

2) The general lack of specificity regarding timeframes provided in the Amended Closure Plan, including but not limited to, the inclusion of vague and non-specific statements, and the large gap in time between the completion of construction of the internal drainage system (estimated July 2022) and the end of final cap construction activities (estimated August 2030). It is difficult for the EPA to determine that the closure will be completed in the shortest amount of time,

consistent with recognized and generally accepted good engineering practices, pursuant to 40 C.F.R. § 257.102(d)(1)(v).

3) The Ash Pond unit boundary, as shown on various figures and drawings posted on Alabama Power's CCR website, excludes a state-permitted solid waste landfill that is sited in a location that is immediately adjacent to the north of the Ash Pond. However, aerial photographs from 1960, 1974 and 1992 appear to indicate that the two areas were either partially or fully connected. The Agency requests more information, including, but not necessarily limited to, design or as-built drawings that provide detail on the construction of the Ash Pond berm system from the time of original construction of the Ash Pond through to the period of time that the berm system was last upgraded.

Any submittal that Alabama Power Company prepares to comply with the CCR Rule must be maintained, placed in the operating record, and placed on the Alabama Power Company CCR website in accordance with the recordkeeping, notification, and publicly accessible CCR website requirements pursuant to 40 C.F.R. §§ 257.105, 257.106, and 257.107. Please note that original versions of documents must remain on the Alabama Power Company CCR website for a minimum of five years, in accordance with 40 C.F.R. § 257.107(c). In addition, any information provided by Alabama Power Company may be used by the EPA in any civil or criminal proceedings related to this or other matters. Any false, fictitious, or fraudulent material omissions, statements or representations may subject Alabama Power Company to criminal penalties under Section 3008(d)(3) of RCRA, 42 U.S.C. § 6928(d)(3).

If Alabama Power Company has any technical questions, please direct those to Robert Nakamoto. Please direct any legal questions to Joan Redleaf Durbin at (404) 562-9544 or by email at redleaf-durbin.joan@epa.gov. Thank you for your prompt attention to this important matter.

Sincerely,

KIMBERLY BINGHAM Digitally signed by KIMBERLY BINGHAM Date: 2023.01.31 15:58:34 -05'00'

Kimberly L. Bingham
Chief
Chemical Safety and Land Enforcement Branch

Enclosures:
1. Documents Reviewed
2. Potential Violations

cc: Sharon Trippany, Environmental Affairs Specialist, Alabama Power Company, Plant Barry (sctrippa@southernco.com)
Lance R. LeFleur, Director, ADEM (llefleur@adem.alabama.gov)
Russell A. Kelly, Chief, Permits and Services Division, ADEM (rak@adem.alabama.gov)
Steve Cobb, Chief, Land Division, ADEM (sac@adem.alabama.gov)

ENCLOSURE 1

Documents Reviewed
Plant Barry Ash Pond

1) History of Construction for Existing CCR Surface Impoundment, Plant Barry Ash Pond, 40 C.F.R. § 257.73(c)(1)(i)-(xii), at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/History%20of%20Construction%20-%20Ash%20Pond.pdf

2) Revised Closure Permit Application for the Plant Barry Ash Pond, dated April 30, 2020, at: http://adem.alabama.gov/newsEvents/notices/feb21/pdfs/2apcbarry-application.pdf

3) Coal Combustion Residual Facility Permit, dated July 1, 2021, Permit Number 49-35, posted on ADEM's eFile database at: https://adem.alabama.gov/compInfo/efile.cnt

4) Location Restriction Demonstration, (40 C.F.R. §257.64 and ADEM Admin. Code r. 335-13-15-.03(5)), Plant Barry Ash Pond, Alabama Power Company, dated October 17, 2018, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/location-restriction-demonstration/Location%20Restriction%20Demonstration%20-%20Barry%20Ash%20Pond.pdf

5) Updated Structural Stability Assessment, Plant Barry Ash Pond, dated February 8, 2018, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/Updated%20Structural%20Stability%20Assessment%20-%20Ash%20Pond.pdf

6) Initial Safety Factor Assessment, Plant Barry Ash Pond, dated October 17, 2016, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/Initial%20Safety%20Factor%20Assessment%20-%20Ash%20Pond.pdf

7) Periodic Safety Factory Assessment, Plant Barry Ash Pond, dated October 15, 2021, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/PERIODIC%20SAFETY%20FACTOR%20ASSESSMENT%20-%20BARRY%20AP.pdf

8) Emergency Action Plan, Plant Barry Ash Pond, dated April 17, 2017, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/Emergency%20Action%20Plan%20-%20Ash%20Pond.pdf

9) CCR Surface Impoundment Emergency Action Plan, Plant Barry Ash Pond, Revision 1, dated April 15, 2020, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/Emergency%20Action%20Plan%20REV1%20-%20Ash%20Pond.pdf

10) Initial Structural Stability Assessment, Plant Barry Ash Pond, dated October 17, 2016, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/Initial%20Structural%20Stability%20Assessment%20-%20Ash%20Pond.pdf

11) Updated Structural Stability Assessment, Plant Barry Ash Pond, dated February 8, 2018, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/Updated%20Structural%20Stability%20Assessment%20-%20Ash%20Pond.pdf

12) Periodic Structural Stability Assessment, Plant Barry Ash Pond, dated October 15, 2021, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/PERIODIC%20STRUCTURAL%20STABILITY%20ASSESSMENT%20-%20BARRY%20AP.pdf

13) Initial Hazard Potential Assessment, Plant Barry Ash Pond, dated October 17, 2016, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/Initial%20Hazard%20Potential%20Assessment%20-%20Ash%20Pond.pdf

14) Periodic Hazard Potential Assessment, Plant Barry Ash Pond, dated October 15, 2021, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/design-criteria/PERIODIC%20HAZARD%20POTENTIAL%20ASSESSMENT%20-%20BARRY%20AP.pdf

15) Reports of Annual Inspections, 2016 – 2021, under "Operating Criteria," at: https://www.alabamapower.com/company/about-us/how-we-operate/ccr-rule-and-compliance.html

16) 2022 Semi-Annual Groundwater Monitoring and Corrective Action Report, dated July 31, 2022, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/groundwater-monitoring-and-corrective-action/20220731_SemiAnGWRep_BAR_AP_FINAL.pdf

17) Dam Safety Assessment of CCW Impoundments, James M. Barry Electric Generating Plant, Final Report, dated December 8, 2010, at: https://archive.epa.gov/epawaste/nonhaz/industrial/special/fossil/web/pdf/apc_barry_cbi_final.pdf

18) Groundwater Remedy Selection Report, dated October 2021, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/groundwater-monitoring-and-corrective-action/Groundwater%20Remedy%20Selection%20Report%20-%20Plant%20Barry.pdf

19) Assessment of Corrective Measures Plant Barry Ash Pond Report, dated July 19, 2019, at:

https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/groundwater-monitoring-and-corrective-action/Assessment%20of%20Corrective%20Measures%20Plant%20Barry%20Ash%20Pond.pdf

20) Amended Closure Plan for Ash Pond, Revision 1, dated April 2020, at: https://www.alabamapower.com/content/dam/alabama-power/pdfs-docs/company/how-we-operate/ccr/plant-barry/ash-pond/closure-and-post-closure/Barry%20Ash%20Pond%20Amended%20Closure%20Plan%20Rev%201%20April%202020.pdf

21) Historical Aerial Imagery for Mobile (Bucks County), at http://alabamamaps.ua.edu/aerials/Counties/Mobile/Mobile.html

ENCLOSURE 2

Potential Violations
Alabama Power Company-Plant Barry Ash Pond (Ash Pond)

1) Alabama Power Company has potentially failed to meet the criteria for conducting closure of the Plant Barry Ash Pond as required by 40 C.F.R. § 257.102.

Specifically, Alabama Power Company has potentially failed to prepare a closure plan that adequately addresses the closure performance standards in 40 C.F.R. § 257.102(d), in potential violation of 40 C.F.R. § 257.102(b).

40 C.F.R. § 257.102(b)(1)
Content of the plan. *The owner or operator of a CCR unit must prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally accepted good engineering practices. The written closure plan must include, at a minimum, the information specified in paragraphs (b)(1)(i) through (vi) of this section.*

(i) A narrative description of how the CCR unit will be closed in accordance with this section.
(ii) If closure of the CCR unit will be accomplished through removal of CCR from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section.
(iii) If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with [40 C.F.R. § 257.102(d)] of this section, and the methods and procedures to be used to install the final cover. The closure plan must also discuss how the final cover system will achieve the performance standards specified in [40 C.F.R. § 257.102(d)] of this section.

40 C.F.R. § 257.102(d)(1)
Closure performance standard when leaving CCR in place – *(1) The owner or operator of a CCR unit must ensure that, at a minimum, the CCR unit is closed in a manner that will:*

(i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;
(ii) Preclude the probability of future impoundment of water, sediment, or slurry;
(iii) Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period;
(iv) Minimize the need for further maintenance of the CCR unit; and
(v) Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.

40 C.F.R. § 257.102(d)(2)
Drainage and stabilization of CCR surface impoundments. *The owner or operator of a CCR surface impoundment or any lateral expansion of a CCR surface impoundment must meet the requirements of paragraphs (d)(2)(i) and (ii) of this section prior to installing the final cover system required under paragraph (d)(3).*

(i) Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.

(ii) *Remaining wastes must be stabilized sufficient to support the final cover system*.

Alabama Power Company is required to have a written closure plan that identifies, among other things, how the performance standards in 40 C.F.R. § 257.102(d) will be met. *See* 40 C.F.R. § 257.102(b)(1). Alabama Power's written Amended Closure Plan for Ash Pond, Revision 1, dated April 2020 (Amended Closure Plan), appears to not adequately discuss how the performance standards will be met, which raises serious concerns about whether Alabama Power's closure will ultimately meet the performance standards as discussed in detail below.

Overview of Closure Plan Potential Violations

The Amended Closure Plan appears to not describe any adequate engineering measures that will be taken to "control, minimize, or eliminate, to maximum extent feasible" either post-closure infiltration of liquids into the waste or post-closure releases of CCR or leachate to the groundwater, especially given the groundwater infiltrating into the impoundment from the sides and bottom. 40 C.F.R. § 257.102(d)(1)(i). The only measures described are those taken to facilitate CCR consolidation and cap construction. In addition, the Amended Closure Plan narrative appears to not adequately describe how Alabama Power Company will "preclude the probability of future impoundment of water, sediment, or slurry." 40 C.F.R. § 257.102(d)(1)(ii). Further, given the concerns identified below as to the floodplain in which the Ash Pond sits, and the conditions beneath the Ash Pond, including the presence of debris, the Amended Closure Plan appears to not adequately include measures that will provide for major slope stability during the closure and post-closure period. 40 C.F.R. § 257.102(d)(1)(iii). Moreover, the Amended Closure Plan appears to not adequately address how the closure activities will minimize the need for additional maintenance of the Ash Pond. 40 C.F.R. § 257.102(d)(1)(iv). Finally, the Amended Closure Plan appears to not address the groundwater infiltrating into the impoundment from the sides and bottom, nor describe how, despite those continuous flows into the unit, Alabama Power Company will eliminate free liquids and sufficiently stabilize the remaining ash as required by 40 C.F.R. § 257.102(d)(2). As a result of the Amended Closure Plan appearing to not adequately specify how the closure will achieve the performance standards in 40 C.F.R. § 257.102(d), Alabama Power Company has potentially violated 40 C.F.R. § 257.102(b)(1).

Discussion

40 C.F.R. § 257.102(b)(1) / 40 C.F.R. § 257.102(d)(1)(i)

The unlined Ash Pond is closing with CCR remaining in contact with groundwater as demonstrated by the Amended Closure Plan and other additional data posted on the Alabama Power Plant Barry CCR website. Based on groundwater elevation data from 2016 to present, as presented in the 2022 Semi-Annual Groundwater Monitoring and Corrective Action Report, dated July 31, 2022, the EPA estimates that approximately 41% of the ash is currently in contact with groundwater (23% after consolidation). Further, according to a site drawing included in the Revised Closure Permit Application for the Plant Barry Ash Pond, dated April 30, 2020 (Permit Application), entitled "Bottom of CCR – Top of Underlying Clay Layer," dated December 2018, the area that comprises the consolidated closure footprint for the Ash Pond will have varying bottom elevations with some elevations that are below Mean Sea Level (MSL) down to a maximum depth of 2.5 feet below MSL. The Amended Closure Plan describes various free liquid and interstitial dewatering activities such as pumping, pressure relief wells, rim ditches, and the installation of an internal drainage corridor within the soil containment berm.

Further, the Amended Closure Plan includes a statement that "[s]tudies are ongoing to evaluate the effectiveness of including a network of collection corridors transecting the pond." The Amended Closure Plan also states that a cover system, including an impermeable geomembrane, will be installed over the consolidated CCR unit.

However, the EPA did not find an analysis in the Amended Closure Plan of how, if at all, the groundwater levels would be affected by any of the dewatering activities and engineering controls. In addition, while the Amended Closure Plan states that the cover system will address infiltration through the cover system (i.e., from the top), it does not contain information about any engineering controls that would "control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids" from any other source (including groundwater), such as from the sides and bottom of the CCR unit. Significant volumes of saturated CCR will persist post closure as groundwater will continue to flow into and out of the unlined Ash Pond in perpetuity from the sides and bottom of the unit. In essence, this means the Ash Pond will continue releasing CCR contaminants indefinitely. Given that reasonably available engineering measures exist that can prevent, or at least control, the flow of groundwater into the Ash Pond (and consequently the releases out of the Ash Pond), the EPA cannot reasonably conclude that the Amended Closure Plan adequately describes how the closure work will meet the requirement to "control, minimize or eliminate, to the maximum extent feasible" post-closure infiltration into the unit or post-closure releases of CCR or leachate to the groundwater. Therefore, Alabama Power Company has potentially violated 40 C.F.R. § 257.102(b)(1).

40 C.F.R. § 257.102(b)(1) / 40 C.F.R. § 257.102(d)(1)(ii)
The Amended Closure Plan appears to have failed to adequately describe how the closure of the unit will preclude the probability of future impoundment of water, sediment, or slurry in the closed CCR unit, especially given that large amounts of saturated CCR will remain in groundwater. Therefore, Alabama Power Company has potentially violated 40 C.F.R. § 257.102(b)(1).

40 C.F.R. § 257.102(b)(1) / 40 C.F.R. § 257.102(d)(1)(iii)
40 C.F.R. § 257.102(d)(1)(iii) requires that closure of the CCR unit include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period. Alabama Power Company's Ash Pond was originally constructed in a wetlands area, in a 100-year flood zone, and is situated above a clay layer of varying thicknesses along with other depositional layers of various types of silty or clayey sands mixed with organic debris. Each of these conditions has the potential to adversely impact the ability of the Ash Pond to be closed in a manner that provides for slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period. However, there appears to be no information provided in the Amended Closure Plan that adequately addresses these conditions.

For example, the 2021 Periodic Safety Factor Assessment for the Ash Pond, posted on the Alabama Power CCR website, contains a note that "[t]he embankments are constructed of clays and clayey sands that are not susceptible to liquefaction." However, Attachment B of the 2021 Periodic Safety Factor Assessment, entitled "Cross Section Geometry," indicates the presence of "Slightly Densified Bottom Ash (Bottom Ash/Soil Fill)" and "Silty sand dike fill" within a portion of the perimeter dike. Further, the boring logs included as Attachment D of the 2021 Periodic Safety Factor Assessment, entitled "Main Dike Borings and Dilatometers," indicate the presence of loose sandy silt or clayey sand fill materials and organic debris in the borings. For example, boring BA-13 indicates "[r]oot at contact 21.0 [feet]" and "[sand] with wood fragments to 34 [feet]." Each of the remaining three boring logs included in the 2021 Periodic Safety Factor Assessment also indicate the presence of organic debris in the borings. In

addition, borings BA-13, BA-14, BA-17, and BA-18 indicate the presence of "scattered soft zones," "quartz sand," or "soft silty clay" underlying the fill materials. While the aforementioned cross-section and boring logs were included as attachments to the 2021 Periodic Safety Factor Assessment, the Amended Closure Plan appears to not adequately address the presence of either CCR within a portion of the perimeter dike, the presence of sand in the dike fill, or soft zones and organic debris in the foundation materials located below the perimeter dike. Further, the presence of soft zones or saturated sands could give rise to conditions that may make areas susceptible to instability, sloughing, settling and/or liquefaction, especially under load conditions or significant flooding and coastal storm events. Absent any further data or analysis, the potential for instability, sloughing, settling, and/or liquefaction appears to have not been adequately evaluated.

In addition, boring log and groundwater monitoring well construction data from groundwater wells situated along the perimeter of the Ash Pond, which were included in the Permit Application, include references to the presence of a thin clay layer that contains organic debris situated at or just below the elevation corresponding with the bottom of the Ash Pond. Recorded observations include notes, such as: "abundant organics/wood fragments/peat," "abundant woody material," "significant amounts of woody material, fibrous to log size," "trace organics/wood fragments," "increase in organic content/wood fragments/peat," "organics/wood fragments/peat," "large wood fragments and branches present," "organic material present such as roots," "roots and other organics throughout," and "high organic content, roots, wood."

Further, the following excerpt from the Organic Material Management Plan Revision A, dated October 2018, which was included in the Permit Application, additionally supports a conclusion that the consolidated footprint of CCR will be residing on a foundation of material that is partially comprised of vegetative debris:

> The Ash Pond has been active for several decades and will be closed by consolidating the CCR into a smaller footprint and then installing a final cover system over the CCR. Over the operating life of the Ash Pond, vegetation has become established on the exposed and partially submerged areas of CCR within the pond. The vegetation includes both woody (e.g., trees, branches, wood chips, and root balls) and non-woody (e.g., grasses and cattails) organic materials. These materials are currently in physical contact with CCR because of their root systems, may contact CCR during the removal process, and/or are submerged in the pond or were submerged in the past. Additionally, existing CCR and natural soils beneath the CCR contain organic materials associated with vegetation that existed within the pond footprint prior to disposal.

Absent any other evaluation and subsequent data, the presence of sand and unconsolidated organic debris, both below the earthen berms surrounding the Ash Pond, and below the proposed consolidated footprint of CCR, can lead to slope instability, resulting in possible sloughing or movement of the final cover system.

Finally, the Location Restriction Demonstration for Unstable Areas, which was posted on the Alabama Power Company CCR website and certified on October 17, 2018, contains the following statement: "The upper clay layer has likely experienced some consolidation throughout the years of operation of the CCR unit, but as the rate of consolidation is directly related to the steady rate of load application from the CCR placed in the unit, it has not created an unstable condition." While the Location Restriction Demonstration references the likelihood of settlement during active operations, the Amended Closure Plan does not include an assessment of how consolidation of CCR during the closure

process may impact the overall stability of the unit foundation. Therefore, Alabama Power Company has potentially violated 40 C.F.R. § 257.102(b)(1).

40 C.F.R. § 257.102(b)(1) / 40 C.F.R. 257.102(d)(1)(iv)
The Amended Closure Plan appears to not include sufficient information to evaluate whether or how long certain maintenance activities, such as pumping of interstitial water from the internal drainage corridors would be needed after closure. As a result, the EPA cannot determine that the Amended Closure Plan adequately sets out how the closure will ensure that the need for further maintenance of the Ash Pond is minimized. Therefore, Alabama Power Company has potentially violated 40 C.F.R. § 257.102(b)(1).

40 C.F.R. § 257.102(b)(1) / 40 C.F.R. § 257.102(d)(2)
As noted above, the unlined Ash Pond is closing with an EPA-estimated 23% of the CCR ash remaining in contact with groundwater after consolidation. As also noted above, the presence of significant volumes of saturated CCR will persist during closure and post closure as groundwater will continue to flow into and out of the unit in perpetuity from the sides and bottom of the unit. The Amended Closure Plan does not address this ongoing flow of groundwater into the Ash Pond and does not describe how free liquids (groundwater or any other liquids within the Ash Pond) will be eliminated or how the remaining ash will be sufficiently stabilized to support the final cover system. Therefore, Alabama Power Company has potentially violated 40 C.F.R. § 257.102(b)(1).

Conclusion

For all the foregoing reasons, Alabama Power Company has potentially violated 40 C.F.R. § 257.102(b).

2) Alabama Power Company has potentially failed to establish an adequate Groundwater Monitoring System for the Plant Barry Ash Pond as required by 40 C.F.R. § 257.91.

40 C.F.R. § 257.91(a)
Performance standard. *The owner or operator of a CCR unit must install a groundwater monitoring system that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that:*
(1) Accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the CCR management area where:
(i) Hydrogeologic conditions do not allow the owner or operator of the CCR unit to determine what wells are hydraulically upgradient; or
(ii) Sampling at other wells will provide an indication of background groundwater quality that is as representative or more representative than that provided by the upgradient wells; and
(2) Accurately represent the quality of groundwater passing the waste boundary of the CCR unit. The downgradient monitoring system must be installed at the waste boundary that ensures detection of groundwater contamination in the uppermost aquifer. All potential contaminant pathways must be monitored.

Overview of Groundwater Monitoring System Potential Violations

Alabama Power Company has not included geologic Units 1 and 2 as part of the uppermost aquifer in its August 21, 2020, Revised Groundwater Monitoring Plan (GWMP). In addition, Alabama Power

Company has not evaluated whether geologic Units 4 and 5 are either hydraulically connected to, or are part of, the uppermost aquifer. Further, Alabama Power Company has not installed upgradient monitoring wells in geologic Units 1 and 2. As a result of Alabama Power Company failing to include geologic Units 1, 2, 4, and 5 as part of or connected to the uppermost aquifer, Alabama Power Company has potentially violated 40 C.F.R. § 257.91(a).

Discussion

40 C.F.R. § 257.91(a)(2)

The regulations define the "uppermost aquifer" as "the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary." See definitions at 40 C.F.R. § 257.53. In addition, 40 C.F.R. § 257.91(b)(2) provides that the number, spacing, and depths of monitoring systems shall be determined based upon site-specific technical information that must include thorough characterization of, among other things: aquifer thickness and saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer, including, but not limited to, thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.

Alabama Power Company's GWMP included, in the Permit Application, states that "the uppermost aquifer beneath the Site corresponds to [geologic] Unit 3 sands which are part of the Watercourse Aquifer system." However, while the GWMP provides that 2018 pumping tests indicated that geologic Unit 1 is an aquitard and that geologic Unit 3 is largely confined from the CCR unit by the low permeability clays of geologic Units 1 and 2, the GWMP also acknowledged that vertical seepage from the CCR unit through clays can occur due to head differences between the Ash Pond and geologic Unit 3. Furthermore, based on information in the GWMP, both geologic Units 1 and 2 could serve as potential contamination migration pathways as they are closest to the CCR, groundwater elevations are within and above these geologic units, groundwater contamination exists directly beneath these geologic units, both geologic units contain permeable heterogeneities such as organic debris and lenses of silty or clayey sands, and geologic Unit 2 specifically contains more permeable interbedded clayey sands.

Absent any other information, geologic Units 1 and 2 should be considered part of the uppermost aquifer system. Currently, there is only one monitoring well installed in geologic Unit 1 or the upper portion of geologic Unit 2 (MW-1) situated along the entire downgradient boundary of the Ash Pond, which creates significant data gaps between the Ash Pond and two adjacent surface water features (the Mobile River and Sister's Creek) that surround the Ash Pond on three sides. Therefore, groundwater contamination exists in the middle of the uppermost aquifer, but the upper portion of the uppermost aquifer is not being monitored due to the absence of monitoring wells in geologic Units 1 and 2.

In addition, according to the GWMP, arsenic contamination exists in groundwater directly on top of geologic Unit 4 between BY-AP-MW-11 and BY-AP-MW-13/13V along the downgradient edge of the Ash Pond. While BY-AP-MW-12VM (between MW-11 and BY-AP-MW-13/13v) was advanced into geologic Units 4 and 5, it was abandoned prior to well installation. It appears that BY-AP-MW-14V was partially advanced into geologic Unit 4, but its well screen was installed in geologic Unit 3. Therefore, geologic and hydrogeologic data characterizing geologic Units 4 and 5 is limited. While geologic Unit 4 is generally characterized as a clay with low vertical and hydraulic conductivity, alluvial "clay" often contains lenses or interbedded more permeable sediments. Furthermore, geologic Unit 4's thickness above a more permeable geologic Unit 5 is mostly estimated (as little as 5-10 feet in some places) along

the entire downgradient edge of the CCR unit. Therefore, absent any additional hydrogeological data excluding geologic Units 4 and 5, the lower portion of the uppermost aquifer does not appear to be adequately monitored, either because geologic Units 4 and 5 are part of or are hydraulically connected to the uppermost aquifer.
As a result of Alabama Power Company failing to include geologic Units 1 and 2 and failing to evaluate whether to include Units 4 and 5 as part of or connected to the uppermost aquifer in the GWMP, Alabama Power Company has potentially violated 40 C.F.R. § 257.91(a)(2).

40 C.F.R. § 257.91(a)(1)
In addition, regarding the requirement to accurately represent the quality of background groundwater, according to Alabama Power's 2022 Semi-Annual Groundwater Monitoring and Corrective Action Report, dated July 31, 2022, monitoring wells BY-AP-MW-2 through BY-AP-MW-4 had historically served as upgradient monitoring wells. However, monitoring wells BY-GSA-MW-1 through BY-GSAMW-4 now serve as upgradient locations for the Ash Pond. Each of the groundwater monitoring wells that are currently serving as upgradient monitoring wells are screened in geologic Unit 3. As discussed above, absent any other information, geologic Units 1 and 2 should be considered part of the uppermost aquifer system. Therefore, there are data gaps in the upgradient monitoring system. Because of these data gaps, Alabama Power Company has potentially violated 40 C.F.R. § 257.91(a)(1).

Conclusion

For all the foregoing reasons, Alabama Power Company potentially violated the performance standard in 40 C.F.R. § 257.91(a).

Corrective Action Concerns

The potential violations identified above with respect to Alabama Power Company's closure and GWMP, including its groundwater monitoring well network, highlight some of the EPA's concerns that any ongoing evaluation of certain major components of a corrective action remedy, such as ongoing research on the viability of Monitored Natural Attenuation (MNA), would not be adequately supported due to the data gaps referenced above.

In addition, as discussed in Section 4 of the Assessment of Corrective Measures Plant Barry Ash Pond Report, dated July 19, 2019, one of the elements of the proposed corrective measures remedy is combined closure/source control by "dewatering the Ash Pond, consolidating the CCR material, and capping it with a low-permeability cover system to prevent infiltration." The Groundwater Remedy Selection Report, dated October 2021, also discusses various source control measures such as CCR consolidation and capping. However, due to the nature of EPA's concerns with closure as discussed above, further discussions about corrective action are warranted.

3) The Emergency Action Plan provided by Alabama Power Company has potentially failed to meet the requirements of 40 C.F.R. § 257.73.

40 C.F.R. § 257.73(a)
(3) ***Emergency Action Plan (EAP) -***
(i) ***Development of the plan.*** *No later than April 17, 2017, the owner or operator of a CCR unit determined to be either a high hazard potential CCR surface impoundment or a significant hazard*

potential CCR surface impoundment under paragraph (a)(2) of this section must prepare and maintain a written EAP. At a minimum, the EAP must:

(A) Define the events or circumstances involving the CCR unit that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner.

Overview of Emergency Action Plan Potential Violation

Alabama Power Company did not include certain probable major storm or river flooding events in its Emergency Action Plan (EAP). In addition, Alabama Power Company did not adequately describe the procedures that will be followed to detect a safety emergency, especially in circumstances where there is a state or federal storm or hurricane watch/warning declaration. As a result of these deficiencies in Alabama Power Company's EAP, Alabama Power Company has potentially violated 40 C.F.R. § 257.73(a)(3).

Discussion

Pursuant to 40 C.F.R. § 257.73(a)(3), the owner or operator of a CCR unit determined to be a significant hazard potential CCR surface impoundment must prepare and maintain a written EAP that meets the requirements of 40 C.F.R. § 257.73(a)(3)(i). Alabama Power Company's EAP does not include river floods or coastal storms as events that represent safety emergencies. Alabama Power Company assigned the Plant Barry Ash Pond a Significant Hazard Potential classification under 40 C.F.R. § 257.73, and therefore must prepare and maintain an EAP. The latest revision to the EAP, Revision 1, dated April 15, 2022 (Revised EAP), provided details of several types of events and circumstances involving the Ash Pond that would represent a safety emergency; however, the Revised EAP failed to include certain types of probable events having the potential to occur given the location of the unit which is situated in an area that is surrounded by a 100-year floodplain and in an area prone to major coastal storm events such as hurricanes.

For example, while the limits of potential flooding in the event of failure of the Ash Pond dam/dike were modeled, the inputs to the model were based only on a "sunny day breach," which simulates a release using normal river levels as one of the inputs to the model. A "fair weather" or "sunny day" dam failure, in which the reservoir is at normal full pool elevation and normal stream flow is prevailing, is generally considered to have the greatest potential for loss of human life due to the element of surprise. Failure of a dam during flood flow conditions, however, will result in downstream inundation at higher elevations and will include additional affected populations. A sensitivity analysis (i.e., varying the breach parameters such as breach width and time to failure for the various flood inflow conditions), which allows the reviewer to identify the effect of various failure scenarios to select the most appropriate failure mode for developing the EAP, was not conducted.

The Revised EAP additionally states that "[t]hese flood extents are provided for planning purposes only; actual flooding can vary due to actual conditions present at the time of failure." Further, the definition for "Inundation Map" located on page ii of the Revised EAP includes the following statement: "The models are considered conservative but larger floods could potentially occur." However, a High Flow emergency level, which indicates that flooding is occurring on the adjacent river system was not considered. The High Flow emergency level is used to convey to outside agencies that downstream areas may be affected by the release. Although the amount of flooding may be beyond the control of the

owner/operator, information on the timing and amount of release from the unit may be helpful to authorities in making decisions regarding warnings and evacuations.

In addition, a major coastal storm event was not listed as one of the situations on the untitled table that was provided on page 5 of the Revised EAP. Further, the guidelines for the various listed responses all start at the detection of a failure scenario, as opposed to certain pre-failure scenarios for specific types of events that can be forecasted, such as a state or federally declared hurricane or major flood watch or warning. Finally, the Revised EAP fails to describe the procedures that will be followed to detect a safety emergency in a timely manner in situations when a state or federally declared hurricane or major flood watch or warning is declared as these activities would likely occur prior to landfall when the effects from flooding would be detected.

Conclusion

For all the foregoing reasons, Alabama Power Company potentially violated 40 C.F.R. § 257.73(a)(3).