

PROPOSED DETERMINATION

Proposed Conditional Approval of Alternative Closure Deadline for

A.B. Brown Generating Station

EXECUTIVE SUMMARY:

Southern Indiana Gas and Electric Company, Inc. (SIGECO) owns and operates a coal-fired power plant, the A.B. Brown Generating Station (A.B. Brown) in Mount Vernon, Indiana. At A.B. Brown, SIGECO maintains a 164-acre unlined waste pond (Ash Pond) that contains 5.9 million cubic yards (CY) of coal combustion residuals (CCR). Every day the Ash Pond receives 6.96 million gallons of additional sluiced CCR and 1.86 million gallons of non-CCR waste. The Ash Pond sits approximately 2,000 feet from the Ohio River. Groundwater is regularly in direct contact with the base of the unlined pond and the CCR it contains. The Ash Pond's downgradient groundwater monitoring wells indicate the pond is leaking CCR constituents into the aquifer.

Under the Environmental Protection Agency (EPA) regulations for CCR landfills and surface impoundments at 40 C.F.R. § 257.101(a), unlined CCR surface impoundments such as the Ash Pond were required to cease receipt of all CCR and non-CCR wastestreams by April 11, 2021. This deadline was established after the United States Court of Appeals for the District of Columbia Circuit (D.C. Cir.) found that EPA erred when it established a rule that allows unlined CCR surface impoundments to continue to operate until they leak despite the Agency's conclusions that "unlined impoundments have a 36.2 to 57% chance of leakage at a harmfully contaminating level" and that such leaks, when they occur, pose substantial risks to humans and the environment. *See Utility Solid Waste Activities Group (USWAG) v. EPA*, 901 F.3d 414, 427-428 (D.C. Cir. 2018) (finding that "[i]t is inadequate under RCRA for the EPA to conclude that a major category of impoundments that the agency's own data show are prone to leak pose 'no

reasonable probability of adverse effects on human health or the environment,’ 42 U.S.C. §6944(a), simply because they do not already leak.”). Despite the risks posed by unlined CCR surface impoundments, EPA’s regulations provide an opportunity for such impoundments to continue to operate beyond April 11, 2021, if the owner or operator submits a demonstration showing that the facility meets the criteria for 40 C.F.R. § 257.103(f)(1).

On November 25, 2020, SIGECO submitted to EPA a demonstration (referred to as the “Demonstration” in this document) for the A.B. Brown facility seeking an extension pursuant to 40 C.F.R § 257.103(f)(1) to allow the Ash Pond to continue to receive CCR and non-CCR wastestreams until the requested alternative deadline of October 15, 2023. After EPA determined the demonstration request was complete on January 11, 2021, the requirement to close the Ash Pond was tolled pending a final decision by EPA. 40 C.F.R. § 257.103(f)(3)(ii).

EPA is proposing to find that SIGECO is not in compliance with all of the requirements of subpart D of part 257, including the groundwater monitoring and corrective action requirements. In addition, EPA is proposing to find that SIGECO failed to evaluate individual wastestreams as part of their demonstration. For these reasons, EPA is proposing to conditionally approve the request for an extension because the Agency has determined that conditions can be developed to address the identified noncompliance before the date of the requested extension. EPA is proposing to conditionally approve the request for an extension for the Ash Pond until October 15, 2023. EPA is also accepting comments on whether the Agency should deny the request for an extension based on the proposed findings of noncompliance.

DATES: *Comments.* Comments must be received on or before November 18, 2022.

ADDRESSES AND PUBLIC PARTICIPATION: The EPA has established a docket for this notice under Docket ID No. EPA-HQ-OLEM-2022-0335. EPA established a docket for the

August 28, 2020, CCR Part A Rule under Docket ID No. EPA-HQ-OLEM-2019-0172.¹ All documents in the docket are listed in the <https://www.regulations.gov> index. Publicly available docket materials are available either electronically at <https://www.regulations.gov> or in hard copy at the EPA Docket Center. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the EPA Docket Center is (202) 566-1742. You may send comments, identified by Docket ID. No. EPA-HQ-OLEM-2022-0335, by any of the following methods:

- Federal e-Rulemaking Portal: <https://www.regulations.gov> (our preferred method). Follow the online instructions for submitting comments.
- Mail: U.S. Environmental Protection Agency, EPA Docket Center, Office of Land and Emergency Management, Docket ID No. EPA-HQ-OLEM-2022-0333, Mail Code 28221T, 1200 Pennsylvania Avenue NW, Washington, DC 20460.
- Hand Delivery or Courier (by scheduled appointment only): EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue NW, Washington, DC 20004. The Docket Center's hours of operations are 8:30 a.m. – 4:30 p.m., Monday – Friday (except Federal Holidays).

INSTRUCTIONS: All submissions received must include the Docket ID number (EPA-HQ-OLEM-2022-0335) for this action. Comments received may be posted without change to <https://www.regulations.gov>, including any personal information provided. Once submitted, comments cannot be edited or removed from the docket. The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be

¹ See Section II.A of this document for more information on the CCR Part A Rule.

Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (i.e., on the web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit <https://www.epa.gov/dockets/commenting-epa-dockets>.

Due to public health concerns related to COVID-19, the EPA Docket Center and Reading Room are open to the public by appointment only. Our Docket Center staff also continues to provide remote customer service via email, phone, and webform. Hand deliveries or couriers will be received by scheduled appointment only. For further information and updates on EPA Docket Center services, please visit us online at <https://www.epa.gov/dockets>.

The EPA continues to carefully and continuously monitor information from the Centers for Disease Control and Prevention, local area health departments, and our Federal partners so that EPA can respond rapidly as conditions change regarding COVID-19.

FOR FURTHER INFORMATION CONTACT: For information concerning this proposed decision, contact:

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- For more information on coal ash regulations, please visit <https://www.epa.gov/coalash>.

SUPPLEMENTARY INFORMATION:

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List of Acronyms

ACM – Assessment of corrective measures

ASD – Alternative source demonstration

CBI – Confidential business information

CCR – Coal combustion residuals

C.F.R. – Code of Federal Regulations

CY – Cubic yards

EPA – Environmental Protection Agency or the Agency

FGD – Flue gas desulfurization

GWMCA – Groundwater monitoring and corrective action

GWPS – Groundwater protection standards

MGD – Million gallons per day

MISO – Midcontinent Independent System Operator, Inc.

MNA – Monitored natural attenuation

POTW – Publicly owned treatment works

RTO – Regional transmission organization

SIGECO – Southern Indiana Gas and Electric Company, Inc.

SSI – Statistically significant increase

SSL – Statistically significant level

SSRP – South Side Runoff Pond

I. General Information

A. The Decision the Agency is Proposing.

The EPA is proposing to conditionally approve the extension request submitted by SIGECO for an unlined CCR surface impoundment, the Ash Pond, located at A.B. Brown in Mount Vernon, Indiana. SIGECO submitted the Demonstration to EPA for approval seeking an extension pursuant to 40 C.F.R § 257.103(f)(1) to allow the surface impoundment to continue to receive CCR and non-CCR wastestreams after April 11, 2021.

After review of the Demonstration and additional information provided by SIGECO, EPA proposes to find that the Demonstration fails to show that SIGECO is in compliance with the CCR regulations. Notwithstanding this proposed finding, EPA is proposing to conditionally approve the request for an extension, instead of proposing to deny the extension, based on proposed conditions that address the identified compliance issues and that can be implemented at A.B. Brown before the date of the requested extension. Thus, EPA is proposing to conditionally approve the request if, prior to final action, SIGECO agrees to satisfy the conditions specified in Section IV.A of this proposed decision. If the conditions are met, EPA's conditional approval would allow SIGECO to continue placing CCR and non-CCR wastestreams in the Ash Pond through October 15, 2023. EPA is proposing that failure to meet any of the conditions subsequent to issuance of the final conditional approval would automatically convert the conditional approval into a denial. In such a case, the facility's deadline to cease placing any waste into the Ash Pond would revert to 135 days from the date of EPA's final decision, which is the deadline that would have been established had EPA denied the extension request. See Section IV.B of this document for further discussion of the basis for that deadline and of the process for a potential extension to address reliability issues.

Additionally, EPA solicits comment on whether to deny the extension on the grounds that the Demonstration fails to meet the requirements of 40 C.F.R. § 257.103(f)(1)(iv) in case, after reviewing public comment, EPA determines a conditional approval to be inappropriate.

B. The Agency's Authority for this Proposed Decision.

This proposal is being issued pursuant to the authority in 40 C.F.R. § 257.103(f).

II. Background

A. Summary of the Part A Final Rule

In April 2015, EPA issued its first set of regulations establishing requirements for CCR surface impoundments and landfills. “Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities,” 80 FR 21302 (April 17, 2015). In 2020, EPA issued revisions to that rule. “Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; A Holistic Approach to Closure Part A: Deadline to Initiate Closure rule,” 85 FR 53516 (Aug. 28, 2020) (the “Part A Rule”). The Part A Rule established April 11, 2021, as the date that electric utilities must cease placing waste into all unlined CCR surface impoundments. The Part A Rule also revised the alternative closure provisions of the CCR regulations (40 C.F.R. § 257.103) by allowing owners or operators to request an extension to continue to receive CCR and/or non-CCR wastestreams in unlined CCR surface impoundments after April 11, 2021, provided that certain criteria are met. EPA established two site-specific alternatives to initiate closure of unlined CCR surface impoundments (40 C.F.R. § 257.103(f)), commonly known as extensions of the date to cease receipt of waste.

The first alternative is for a facility that must continue to use an unlined CCR surface impoundment after April 11, 2021, because no alternative capacity is available either on-site or off-site, and it was technically infeasible to develop alternative capacity by that date. 40 C.F.R. § 257.103(f)(1) (titled *Development of Alternative Capacity is Technically Infeasible*). The second alternative is for coal-fired boiler(s) that are going to permanently shut down by a date certain after April 11, 2021, but there is no alternative capacity either on- or off-site that is available to accept the CCR and non-CCR wastestreams between April 11, 2021, and the permanent closure

date of the coal-fired boiler. 40 C.F.R. § 257.103(f)(2) (titled *Permanent Cessation of Coal-Fired Boiler(s) by a Date Certain*).

In this case, SIGECO is requesting an extension under the first Part A alternative. Under this alternative, an owner or operator may submit a demonstration seeking EPA approval to continue using its unlined CCR surface impoundment for the specific amount of time needed to develop alternative disposal capacity for its CCR and/or non-CCR wastestreams. EPA may grant an extension of the deadline to cease receipt of waste if the facility demonstrates that the requirements of 40 C.F.R. § 257.103(f)(1) are met. Specifically, the regulation requires the facility to demonstrate that: 1) no alternative disposal capacity is currently available on- or off-site of the facility; 2) the CCR and/or non-CCR waste stream must continue to be managed in that CCR surface impoundment because it was technically infeasible to complete the measures necessary to obtain alternative disposal capacity either on- or off-site at the facility by April 11, 2021; and 3) the facility is in compliance with all the requirements of 40 C.F.R. part 257, subpart D. 40 C.F.R. § 257.103(f)(1)(i)-(iii).

Under the first requirement, the owner or operator must demonstrate that there is no alternative disposal capacity available on- or off-site. 40 C.F.R. § 257.103(f)(1)(i). As part of this, facilities must evaluate all potentially available disposal options to determine whether any are technically feasible. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1). The owner or operator must also evaluate the site-specific conditions that affected the options considered. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(i). Additionally, the regulations prohibit the owner or operator from relying on an increase of cost or inconvenience of existing capacity as a basis for meeting this criterion. 40 C.F.R. § 257.103(f)(1)(i).

The Demonstration must substantiate the absence of alternative capacity for each wastestream that the facility is requesting to continue placing in the CCR surface impoundment beyond April 11, 2021. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1). As soon as alternative capacity is available for any of the wastestreams, the owner or operator must use that capacity to dispose of those wastestreams instead of using the unlined CCR surface impoundment. 40 C.F.R. § 257.103(f)(1)(v). This means that if there is a technically feasible option to reroute any of the wastestreams away from the unlined surface impoundment, the owner or operator must implement the alternative. 40 C.F.R. § 257.103(f)(1)(ii), (v). In the CCR Part A Rule preamble, EPA acknowledged that some of these wastestreams are very large and will be challenging to relocate, especially for those that are sluiced. However, the smaller volume wastestreams have the potential to be rerouted to temporary storage tanks. In such cases, the owner or operator must evaluate this option, and, if it is determined to be technically feasible, must implement it. 85 Fed. Reg. 53,541.

EPA also stated in the Part A Rule that it is important for the facility to include an analysis of the adverse impacts to the operation of the power plant if the CCR surface impoundment cannot be used after April 11, 2021. EPA stated that this is an important factor in determining whether the disposal capacity of the CCR surface impoundment in question is truly needed by the facility. EPA required that a facility provide analysis of the adverse impacts that would occur to plant operations if the CCR surface impoundment in question were no longer available. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(ii).

In addition, to support the alternative deadline requested in the demonstration, the facility must submit a workplan that contains a detailed explanation and justification for the amount of time requested. 40 C.F.R. § 257.103(f)(1)(iv)(A). The written workplan narrative must describe

each option that was considered for the new alternative capacity selected, the time frame under which each potential capacity could be implemented, and why the facility selected the option that it did. Id. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1). The discussion must include an in-depth analysis of the site and any site-specific conditions that led to the decision to implement the selected alternative capacity. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(i).

The workplan must contain a visual timeline and narrative discussion to justify the time requested. 40 C.F.R. § 257.103(f)(1)(iv)(A)(3). The visual timeline must clearly indicate how each phase and the steps within that phase interact with or are dependent on each other and the other phases. Additionally, any possible overlap of the steps and phases that can be completed concurrently must be included. This visual timeline must show the total time needed to obtain the alternative capacity and how long each phase and step is expected to take. The detailed narrative of the schedule must discuss all the necessary phases and steps in the workplan, in addition to the overall time frame that will be required to obtain capacity and cease receipt of waste. The discussion must include: 1) why the length of time for each phase and step is needed and a discussion of the tasks that occur during the specific step; 2) why each phase and step must happen in the order it is occurring; 3) the tasks that occur during each of the steps within the phase; and 4) anticipated worker schedules. 40 C.F.R. § 257.103(f)(1)(iv)(A)(3). This overall discussion of the schedule assists EPA in understanding whether the time requested is warranted. Finally, facilities must include a narrative on the progress made towards the development of alternative capacity as of the time the demonstration was compiled. 40 C.F.R. § 257.103(f)(1)(iv)(A)(4). This section of the Demonstration is intended to show the progress and efforts the facility has undertaken to work towards ceasing placement of waste in the unlined

CCR surface impoundment and to determine whether the submitted schedule for obtaining alternative capacity was adequately justified at the time of submission.

The Part A Rule also requires that a facility be in compliance with all the requirements in 40 C.F.R. part 257 subpart D in order to be approved for an extension. 40 C.F.R. § 257.103(f)(1)(iii). Various compliance documentation must be submitted with the demonstration for the entire facility, not just for the CCR surface impoundment in question. 40 C.F.R. § 257.103(f)(1)(iv)(B). Additionally, the information presented in the narrative of the Demonstration and information posted on the facility's CCR website relating to the closure or retrofit of the impoundment and the development of the new alternative disposal capacities are considered by EPA to allow for an adequate analysis of the facility's compliance with the CCR regulations.

The first group of compliance documents required to be included in the Demonstration relate to documentation of the facility's compliance with the requirements governing the design, construction, and installation of the groundwater monitoring systems, as well as sampling and analysis of data obtained from those systems. The rule specifically requires copies of the following documents: 1) map(s) of groundwater monitoring well locations (these maps should identify the CCR units as well); 2) well construction diagrams and drilling logs for all groundwater monitoring wells; 3) maps that characterize the direction of groundwater flow accounting for seasonal variation; 4) constituent concentrations, summarized in table form, at each groundwater monitoring well monitored during each sampling event; and 5) descriptions of site hydrogeology including stratigraphic cross-sections. 40 C.F.R. § 257.103(f)(1)(iv)(B)(2)-(4).

The second group of documents required under the regulations are those necessary to demonstrate compliance with the corrective action regulations, if applicable. To comply with this

requirement, a facility that triggered corrective action must at the least submit the following documentation: the corrective measures assessment required at 40 C.F.R. § 257.96; progress reports on remedy selection and design; and the report of final remedy selection required at 40 C.F.R. § 257.97(a). 40 C.F.R. § 257.103(f)(1)(iv)(B)(5) and (6).

Finally, the regulations require facilities to submit the most recent structural stability assessment required at 40 C.F.R. § 257.73(d), and the most recent safety factor assessment required at 40 C.F.R. § 257.73(e) and §§ 257.103(f)(1)(iv)(B) (7) and (8).

B. Description of A.B. Brown Generating Station and Summary of Request for Extension

On November 25, 2020, SIGECO submitted a Demonstration pursuant to 40 C.F.R. § 257.103(f)(1) requesting additional time to develop alternative capacity to manage CCR and non-CCR wastestreams at the A.B. Brown Generating Station near Mount Vernon, Indiana. SIGECO is the owner and operator of the A.B. Brown Generating Station. EPA reviewed the A.B. Brown Demonstration to determine whether it included the information, analyses, and documentation required under 40 C.F.R. § 257.103(f)(1). On January 11, 2022, EPA notified SIGECO that its demonstration was deemed complete, and, pursuant to 40 C.F.R. § 257.103(f)(3)(ii), that completeness determination tolls the April 11, 2021, cease receipt of waste date for the unlined surface impoundment the Demonstration covers until EPA issues a final decision on this proposed action.²

As previously discussed, SIGECO requested an extension under the first alternative, which requires creating alternative capacity for the CCR and non-CCR wastestreams routed to the Ash Pond. SIGECO plans to obtain alternative capacity by expanding the South Side Runoff Pond (SSRP) for all non-CCR wastestreams and one CCR wastestream (i.e., the flue gas

² See A.B. Brown Completeness Letter in the docket.

desulfurization wastewater). SIGECO plans to retire coal-fired Units 1 and 2 by October 15, 2023, which will cease the creation of all the CCR wastestreams (i.e., dry bottom ash transport water, the fly ash transport water, and flue gas desulfurization wastewater). SIGECO is constructing new gas-fired boilers to replace the generating capacity that will be lost from closure of the coal-fired units, and that work is scheduled to be completed in late 2024.

To assist the readers' review, EPA provides additional details on the A.B. Brown Generating Station below, including information on its CCR surface impoundments and landfills, and information on other non-CCR impoundments. This summary is based on information provided in the Demonstration.

1. Coal-Fired Boilers and Generating Capacity

SIGECO operates two coal-fired generating units, Units 1 and 2, with a combined generation capacity of 490 net megawatts. SIGECO is planning to retire the two units on October 15, 2023, and it plans to construct natural gas-fired boilers to replace the coal units.

2. CCR Units

SIGECO currently operates three CCR units at A.B. Brown that are subject to federal CCR regulations. Two units are CCR surface impoundments named the Ash Pond (also referred to as the "Surface Impoundment" in the Demonstration) and the Brown Sedimentation Pond. The third unit is a CCR landfill named the Brown Landfill (also referred to as the "FGD Landfill" in the Demonstration).³

(a) Ash Pond.

The Ash Pond is an unlined CCR surface impoundment and subject to closure pursuant to 40 C.F.R. § 257.101(a)(1). This provision provides that SIGECO must cease placing CCR and

³ Demonstration, Figure 4, PDF pg. 19

non-CCR wastestreams into the unit and either retrofit the unit or initiate closure as soon as technically feasible, but not later than April 11, 2021.

In 1978, the Ash Pond was constructed by building an earthen dam across an existing valley. In 2003, a second dam, known as the upper dam, was constructed east of the original dam to increase storage capacity. In 2016, the upper dam was decommissioned, and a 10-foot breach was cut into the upper embankment thus making one CCR unit referred to as the Ash Pond. The Ash Pond receives the following CCR wastestreams: bottom ash transport water, fly ash transport water, and treated flue gas desulfurization (FGD) wastewater. The following non-CCR wastestreams flow into the Ash Pond: stormwater runoff, landfill runoff and leachate, runoff from the SSRP, plant wastewater, and treated sanitary wastewater. These CCR and non-CCR wastestreams total 8.8 million gallons per day (MGD) and there is an estimated 5.9 million CY of CCR materials in the Ash Pond. The Demonstration states that the approximate surface area of the Ash Pond is 164 acres. As of November 25, 2020 (the date SIGECO submitted the Demonstration to EPA), the Demonstration states that the Ash Pond is compliant with the wetlands, fault area, seismic impact zone, and unstable area location restrictions specified in 40 C.F.R §§ 257.61 through 257.64. However, the Ash Pond does not meet the uppermost aquifer separation criteria found in 40 C.F.R. § 257.60. SIGECO has decided to close the Ash Pond by removal and to rely on beneficial use of the majority of the CCR in a cement kiln.

SIGECO outlines the closure plan for the Ash Pond as it relates to the extension request. As discussed in Section II.A., EPA established two site-specific alternatives to initiate closure of CCR surface impoundments. The first is a demonstration that development of alternative capacity is technically infeasible by the April 11, 2021, the required CCR impoundment closure date (40 C.F.R. § 257.103(f)(1)). The second is permanent cessation of the coal-fired boiler(s) by

a date certain (40 C.F.R. § 257.103(f)(2)). Despite the fact that it plans to shut down its coal-fired boilers, SIGECO is seeking approval of an extension under the first extension mechanism (40 C.F.R. § 257.103(f)(1)) because the coal-fired boilers are being replaced by natural gas-fired units, which makes A.B. Brown eligible for an extension under 40 C.F.R. § 257.103(f)(1). As stated above, SIGECO plans to close the Ash Pond by removal and to rely on beneficial use of a majority of the CCR in cement. For CCR that do not meet the cement kiln specifications, SIGECO plans to dispose of them in the Brown Landfill. SIGECO explains that due to contractual obligations and production constraints by the cement kiln user, it is estimated to take 13 years to complete the closure of the Ash Pond. SIGECO plans to construct a pipe conveyor to transport the CCR material from a receiving hopper to a barge loading facility on the Ohio River. SIGECO has chosen the 40 C.F.R. § 257.103(f)(1) option as § 257.103(f)(2) requires closure to be completed by October 17, 2028, for units greater than 40 acres. According to SIGECO, the closure completion date of October 17, 2028, is not technically feasible based on the selected closure method of the Ash Pond. Therefore, SIGECO has opted for 40 C.F.R. § 257.103(f)(1), but it does not explain how this provision allows for closure after October 17, 2028. Section III.E.1 further discusses the closure timeline of the Ash Pond.

According to the Demonstration, it is infeasible to obtain alternative capacity for the CCR and non-CCR wastestreams managed by the Ash Pond by April 11, 2021. SIGECO's selected alternative capacity is a new lined CCR surface impoundment for the treated FGD wastewater and all the non-CCR wastestreams that are currently disposed in the Ash Pond. It is estimated that construction of the new lined CCR surface impoundment will be completed by July 1, 2023. The two remaining CCR wastestreams (i.e., dry bottom ash transport water and the fly ash transport water) will continue to be disposed in the Ash Pond until October 15, 2023, when the

coal-fired units will shut down permanently and the CCR wastestreams will no longer be produced.

(b) Brown Sedimentation Pond

The Brown Sedimentation Pond is a lined CCR surface impoundment with a 1.01 million gallons capacity and a surface area of 1.3 acres. Leachate and runoff from the Brown Landfill are disposed in the Brown Sedimentation Pond. According to the facility website, the Brown Sedimentation Pond is in compliance with all the location restrictions specified in 40 C.F.R §§ 257.60 through 257.64.

(c) Brown Landfill

The Demonstration does not discuss the characteristics of the CCR landfill named the Brown Landfill. The following was extracted from the landfill closure plan posted on the facility's CCR website.^{4,5} The Brown Landfill is 128 acres and accepts dewatered FGD sludge. The permitted waste volume of the landfill is 9,320,966 CY.

3. *Non-CCR Units*

The Demonstration does not identify non-CCR units at A.B. Brown. The Capital Pond and SSRP are mentioned in the Demonstration as they were considered when evaluating alternative capacities. However, SIGECO does not discuss the characteristics of the ponds or if they are CCR or non-CCR impoundments. The Demonstration discusses that the Capital Pond receives supernatant from the Brown Sedimentation Pond and has a capacity of 6.96 million gallons.

⁴ <https://midwest.centerpointenergy.com/reporting/ccr>

⁵ October 2016 A.B. Brown Generation Station Type III Residual Waste Landfill Closure Plan

4. *CCR and Non-CCR Wastestreams*

The Demonstration identifies three CCR wastestreams at A.B. Brown that flow into the Ash Pond. The Ash Pond currently receives and manages bottom ash transport water, fly ash transport water, scrubber, and truck bay wash waters from the FGD system. These CCR wastestreams result in an average of approximately 6.96 MGD that flow into the Ash Pond.

The Ash Pond also receives non-CCR wastestreams, which include Capital Pond discharge, treated sanitary wastewater, SSRP discharge, plant floor drains, coal pile runoff, and stormwater. These non-CCR wastestreams result in an average of approximately 1.86 MGD that flow into the Ash Pond. Almost all flows are recycled back to the plant with a portion being treated by the Wastewater Mercury Treatment System. Once the wastewater is treated, it is conveyed to a smaller lined settling pond and discharged through a National Pollutant Discharge Elimination System-permitted Outfall 001.⁶

III. EPA Analysis of Demonstration

EPA is proposing to conditionally approve the extension request for the Ash Pond at A.B. Brown because, although SIGECO has not demonstrated that the facility is in compliance with all the requirements of 40 C.F.R. part 257 subpart D, EPA has determined that conditions can be developed to bring the facility into compliance with the CCR rule requirements before the requested extension date.

To provide readers with a summary of EPA's analysis of the Demonstration set out below, EPA first discusses SIGECO's evaluation of on- and off-site capacity and the proposed finding that SIGECO failed to consider individual wastestreams in some of their analyses. 40 C.F.R. 257.101(a)(1); 257.103(f)(1)(iv)(A)(1); and 257.103(f)(1)(v). Next, EPA analyzes the

⁶ Demonstration, Table 1, PDF pg. 16 and Figure 3, PDF pg. 17

impacts on the facility if the Ash Pond cannot be used through the proposed extension date. EPA then discusses SIGECO's evaluation of the site-specific analysis for the alternative capacity selected. EPA's analysis of the Demonstration workplan finishes with an evaluation of SIGECO's justification for the time requested. Finally, this section concludes with EPA's analysis of SIGECO's compliance with the other requirements of the Subpart D regulations.

EPA is proposing to determine that SIGECO has not justified its stated closure time frame of 13 years for the Ash Pond, has not demonstrated compliance with the groundwater monitoring requirements, and has not demonstrated compliance with the applicable corrective action provisions.

A. Evaluation of SIGECO's Claim of No Alternative Disposal Capacity On- or Off-Site

As discussed above in Section II.A., to obtain an extension of the cease receipt of waste deadline, the owner or operator must demonstrate that there is no alternative disposal capacity available on- or off-site. 40 C.F.R. § 257.103(f)(1)(iv)(A). In this case, the Demonstration provides an analysis of the potential alternative disposal options both on- and off-site as required by the Part A Rule. However, as discussed below, EPA is proposing to find that SIGECO failed to consider individual wastestreams.

1. On-Site Capacity Alternatives

In Section 5.1 of the Demonstration, SIGECO evaluated existing on-site capacity and concluded that there is no additional capacity available on-site for all of the wastestreams currently managed in the Ash Pond. EPA is proposing to determine that SIGECO failed to consider individual wastestreams in the analysis for on-site capacities, thereby making it difficult for EPA to determine that there were no on-site capacity alternatives.

In Section 5.1.1 of the Demonstration, SIGECO evaluated on-site options for alternative capacity, which included repurposing existing lined facilities, construction of a new pond, construction of a temporary wastewater treatment facility, conversion to dry handling, and constructing temporary storage. For each of these alternatives, SIGECO outlines the major activities, estimates the timeline, and discusses whether it is feasible at the site. SIGECO determined that there are no technically feasible options for obtaining alternative capacity for all CCR and non-CCR flows. However, SIGECO did identify one alternative capacity option that can handle one CCR flow, FGD wastewater, and all non-CCR flows, which are stormwater runoff, landfill runoff and leachate, and SSRP wastewater. As described in Alternative 3 of Section 5.1.1, SIGECO intends to obtain alternative disposal capacity to the Ash Pond by constructing a new lined CCR surface impoundment and routing the FGD wastewater and all non-CCR flows to the new impoundment. SIGECO determined that there are no technically feasible options for obtaining alternative capacity for the two remaining CCR wastestreams, the bottom ash transport water and fly ash transport water, which will continue to be disposed of in the Ash Pond until the coal-fired boilers are retired by October 15, 2023. EPA is also proposing to determine that SIGECO failed to consider individual wastestreams in the analysis for on-site capacities, as discussed in Section III.A.3 below.

2. *Off-Site Capacity Alternatives*

In Section 5.1.2. of the Demonstration, SIGECO concluded that off-site alternative capacity was not a technically feasible option for the CCR and non-CCR wastestreams currently routed to the Ash Pond. As discussed below, EPA is proposing to determine that SIGECO failed to consider individual wastestreams in the analysis for off-site capacities.

3. *Proposed Finding that SIGECO Failed to Evaluate Individual Wastestreams*

EPA's understanding of the Demonstration is that SIGECO evaluated some of the on-site and all of the off-site disposal capacity options for all the wastestreams together rather than evaluating the potential for routing each individual wastestream. As stated in the Part A final rule preamble, "[T]he final rule requires owners and operators to cease using the CCR surface impoundment as soon as feasible, to document the lack of both on and off-site capacity for each individual wastestream, and expressly requires that as capacity for an individual wastestream becomes available, owners or operators are required to use that capacity..." 85 FR 53541. *See also* 40 C.F.R. 257.101(a)(1); 257.103(f)(1)(iv)(A)(1); and 257.103(f)(1)(v). The Demonstration fails to explain why individual wastestreams were not considered, and therefore, EPA is proposing to find that the analysis provided is inadequate because SIGECO failed to evaluate individual wastestreams as required by the Part A final rule.

In Alternative 1 of Section 5.1.1 of the Demonstration, SIGECO evaluated two existing lined impoundments at A.B. Brown Generating Station, the Brown Sedimentation Pond and the Capital Pond, to see if these ponds have the capacity to handle CCR and non-CCR wastestreams currently routed to the Ash Pond. According to a bathymetry survey of the lower Ash Pond, a capacity of 48 million gallons of storage would be needed. The Brown Sedimentation Pond has a total capacity of 1.01 million gallons and the Capital Pond has a capacity of 6.96 million gallons. SIGECO concluded that the combined capacity of the Sedimentation Pond and Capital Pond are less than 17% of the capacity needed (i.e., approximately 8 million gallons). To accommodate the additional 40 million gallons of capacity, SIGECO stated that an extensive expansion of these ponds would be required. Upon further review, SIGECO concluded there are also space constraints for such expansions and as a result, this option was determined to be infeasible.

SIGECO does not provide any additional information on the Sedimentation Pond and the Capital Pond beyond their respective capacities. SIGECO does not discuss whether these ponds have the available capacity to accept individual wastestreams as required by the regulations. Instead, SIGECO evaluated the availability of alternative capacity by only considering all wastestreams together.

In Alternative 6 of Section 5.1.1 of the Demonstration, SIGECO evaluated the feasibility of using temporary storage tanks as an alternative capacity for the wastestreams. According to SIGECO, approximately 48 million gallons would be required to replace the capacity of the Ash Pond. Secondary containment would be required to address spills, and solids that settle in the tank must be periodically removed and dewatered. SIGECO states this would require 2,400 frac tanks or 19 modular tanks. The modular tanks would require an area of 30 acres. SIGECO reports that there is no such space near the Ash Pond and that the tanks would need to be located further away, which would require further design and construction to transfer the wastestreams. SIGECO also states that tanks are considered high risk as the geomembrane liners of the secondary containment system would likely be damaged when settled solids are removed. SIGECO concludes that due to the environmental risks and space constraints the temporary tanks are not feasible. However, SIGECO failed to evaluate individual wastestreams. If SIGECO were to evaluate this alternative capacity by individual wastestream, 48 million gallons of capacity would not be necessary. SIGECO's Demonstration does not discuss using fewer tanks for individual wastestreams.

In Section 5.1.2 of the Demonstration, SIGECO evaluated off-site capacities for all wastestreams. One option evaluated is transporting all the wastestreams to publicly owned treatment works (POTW). SIGECO outlines the requirement of POTW's to meet discharge

limits, which would require on-site pretreatment of the wastestreams. To meet the pretreatment requirements, SIGECO would have to construct an on-site wastewater treatment facility, which SIGECO estimates would take 42 months or until June 2024. SIGECO considers this option to be not technically feasible because the estimated time would go beyond the retirement date of the coal-fired units and, therefore, the CCR wastestreams would no longer be generated by the time of completion. SIGECO also estimated that 1,764 truckloads per day for all wastestreams would be required to transport all CCR and non-CCR wastestreams to a POTW.⁷ SIGECO stated that the daily truck traffic would strain traffic in the area and introduce significant logistical challenges at A.B. Brown. Therefore, SIGECO determined that transporting the wastestreams via truck is not technically feasible. In addition, SIGECO evaluated pumping the wastestreams to the nearest POTW, which is 6.9 miles away from A.B. Brown. SIGECO stated that given the length of the pipeline, volume of flows, and regulatory and design obstacles, this option is not technically feasible because it was estimated to take 60 months, or well beyond the retirement date of the coal-fired units. Based on these determinations, SIGECO concluded that off-site disposal of the wastestreams currently routed to the Ash Pond is not technically feasible; however, as noted above, SIGECO did not consider individual wastestreams and so it did not discuss if these off-site POTWs could accept any individual CCR or non-CCR wastestream as required by the regulations. In fact, SIGECO did not even claim to have evaluated the wastestreams individually, much less provide documentation substantiating a claim that every individual wastestream must continue to be managed in the Ash Pond.

⁷ Demonstration, Table 6, PDF pg. 34

EPA is proposing to find that the analysis demonstrating no available on- or off-site alternative disposal capacity for the Ash Pond CCR and non-CCR wastestreams is inadequate because SIGECO failed to evaluate individual wastestreams.

B. Evaluation of SIGECO's Analysis of Adverse Impacts to Plant Operations

The Part A Rule next requires that a facility provide analysis of the adverse impacts that would occur to plant operations if the CCR surface impoundment in question were no longer available. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(ii). SIGECO provided a justification in their Demonstration as required, and, for the reasons discussed below, EPA is proposing to find that there would be adverse impacts to the power plant if the Ash Pond could not be used after April 11, 2021.

In Section 5.1.4 of the Demonstration, SIGECO asserted that if the Ash Pond were required to cease receipt of waste before the retirement of Units 1 and 2 then it would have to cease producing power. SIGECO claims that Units 1 and 2 are an essential part of the generation capacity within the region. SIGECO also shares the results of the 2020 Midcontinent Independent System Operator, Inc. (MISO) survey, which projects a slight capacity surplus in 2021 and shortfall in 2025 for the region. This survey also shows that a shortfall can be experienced as early as 2022.

EPA understands that requiring SIGECO to immediately cease placement of waste is not feasible without impacts to the A.B. Brown Generating Station. Additionally, EPA understands that if A.B. Brown were to idle or shut down, that will not completely stop all the wastestream flows to the Ash Pond, as non-CCR flows from around the plant would continue until July 2023 when the alternative capacity will be ready. EPA proposes to find that if A.B. Brown were unable to continue using the Ash Pond, and if no other on- or off-site alternative capacity is

available, there would be adverse impacts on the ability to run the associated boilers such that a longer planned temporary outage would likely be required.

C. Evaluation of SIGECO's Site-Specific Analysis for Alternative Capacity Selected

As discussed above in Section II.A., the regulations require SIGECO to demonstrate that the time it is requesting is the fastest technically feasible time frame to develop their selected alternative capacity option, and that the development of any of the available alternatives to manage the wastestreams was not feasible prior to April 11, 2021. To support these findings, the facility must submit a detailed justification for the amount of time requested that includes: 1) a description of each option that was considered; 2) the time frame under which each potential capacity could be implemented, and 3) why the facility selected the option that it did, along with an in-depth analysis of the site and any site-specific conditions that led to the decision to implement the selected alternative capacity. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(i). These factors assist EPA in understanding whether the time requested is warranted.

The EPA has evaluated SIGECO's analysis and is proposing to conclude that the time requested is the fastest technically feasible time frame to develop their selected alternative capacity option. In the Demonstration, SIGECO stated it requires the use of the Ash Pond after April 11, 2021, due to the wastestreams that it handles.

In Section 5.1.3 of the Demonstration, SIGECO explains that none of the options can address all CCR and non-CCR flows prior to retirement of Units 1 and 2, thus, SIGECO opted to expand the SSRP for all non-CCR wastestreams and the FGD wastewater. This will eliminate FGD wastewater and non-CCR flows to the Ash Pond by July 1, 2023. The fly ash and bottom ash waste flows will continue to flow to the Ash Pond until the stated retirement of the coal-fired boilers by October 15, 2023, as SIGECO explains that there are no technically feasible

alternative capacities to address these flows prior to retirement. EPA is proposing to determine that this conclusion is supported by the information provided in the Demonstration.

D. Evaluation of SIGECO's Justification for Time Requested to Retrofit the South Side Runoff Pond

As discussed above in Section II.A., facilities must demonstrate that the amount of time requested in the demonstration is the fastest technically feasible time to develop the selected alternative disposal capacity by including a visual timeline and narrative discussion to support the time requested. 40 C.F.R. § 257.103(f)(1)(iv)(A)(1)(iii) and § 257.103(f)(1)(iv)(A)(3). EPA is proposing to conclude that SIGECO has justified the time needed to develop alternative disposal capacity to expand the SSRP for all non-CCR wastestreams and one CCR wastestream.

In Section 5.2 of the Demonstration, SIGECO outlines the retrofitting of the existing SSRP. SIGECO plans to expand the SSRP to the north and west to maximize storage capacity. The retrofit will add 4.2 acres and 8 million gallons of storage capacity to the existing SSRP.⁸ SIGECO will clean close the existing pond, construct the additional capacity, and then install a composite liner system compliant with 40 C.F.R. § 257.70 along the bottom of the retrofitted pond. SIGECO also stated that, due to a lack of groundwater elevation data in the area, they will have to investigate the location of the uppermost aquifer. SIGECO anticipates they will possibly have to raise the base pond elevation to meet the aquifer location restriction in 40 C.F.R. § 257.60(a). Another part of the retrofit will be to relocate the existing wastewater treatment system such that it is adjacent to the newly retrofitted pond. The new pond will manage the FGD wastewater, landfill runoff leachate, stormwater, and coal pile runoff wastestreams. EPA has evaluated the time requested and has identified no steps that can be completed more quickly or

⁸ Demonstration, Figure 6, PDF pg. 24

that are otherwise unreasonably long. Given the chosen methods for obtaining alternative capacity for the wastestreams, the requested deadline of October 15, 2023, appears to be the fastest technically feasible for the Ash Pond to cease receipt of all CCR and non-CCR wastestreams, with FGD wastewater and all the non-CCR wastestreams ceasing being placed in the Ash Pond by July 1, 2023.

E. Evaluation of SIGECO's Compliance Documentation

The Part A Rule requires that a facility must be in compliance with all the requirements in 40 C.F.R. part 257 subpart D in order to be approved for an extension of the cease receipt of waste deadline. 40 C.F.R. § 257.103(f)(1)(iii). EPA is proposing to determine that SIGECO has not adequately demonstrated compliance with the closure time frame, groundwater monitoring, and corrective action requirements in the regulations.

1. Proposed Finding that SIGECO's Closure of the Ash Pond will Fail to Meet the Closure Deadline

The regulations state that closure of a surface impoundment must be completed within five years of commencing closure activities. 40 C.F.R. § 257.102 (f)(1)(ii). The closure time frame may be extended if it can be demonstrated that it is technically infeasible to complete closure due to factors beyond the facility's control such as unusual amounts of precipitation, length of time to dewater, terrain surrounding the unit, and time required to obtain necessary permits. 40 C.F.R. § 257.102 (f)(2)(i)(A)-(D). SIGECO states the Ash Pond will complete closure in 12 years due to the beneficial reuse of the excavated CCR in a cement kiln. SIGECO states that the closure completion date in the regulations is technically infeasible due to the

current contractual obligations and production limitations by the end user of the CCR; therefore, closure is estimated to take 12 years to complete.⁹

SIGECO does not explain how a contractual obligation is a factor beyond SIGECO's control as outlined in 40 C.F.R. § 257.102 (f)(2)(i)(A)-(D), nor does the Agency believe that a contractual obligation constitutes a technical infeasibility that justifies a later closure deadline under the regulations. Technically infeasible means not possible to do in a way that would likely be successful. 40 C.F.R § 257.53. SIGECO has not explained why, for example, it cannot construct alternative storage for the excavated CCR and thereby reduce the closure timeline without requiring a change to the amount of time necessary to beneficially use all the CCR in cement production.

EPA is proposing to determine that SIGECO has not justified an extension of the maximum closure date for the Ash Pond. 40 C.F.R. § 257.102 (f)(1)(ii). EPA is not in this action approving or denying the closure plan for the Ash Pond, but based on information available to EPA, it does not appear that SIGECO will be able to justify an extension of the closure date under the regulations. 40 C.F.R. § 257.102 (f)(2)(i)(A)-(D). To address this issue and obtain conditional approval, EPA is proposing that SIGECO amend the Ash Pond's closure plan to meet all the closure requirements in 40 C.F.R. § 257.102, including the closure completion timing requirement in 40 C.F.R. § 257.102 (f)(1)(ii).

2. *Groundwater Monitoring Compliance*

As stated in Section II.A. above, the regulations require development of a groundwater monitoring network that will characterize the background levels of constituents in the uppermost aquifer upgradient of a CCR unit, so that those levels can be compared with the constituent

⁹ See Executive Summary in the Demonstration, PDF pg. 9.

levels downgradient of the CCR unit after the groundwater has flowed beneath it. See 2015 CCR rule preamble at 80 FR 21302, 21399-400. The objective of a groundwater monitoring system is to characterize groundwater to determine whether it has been contaminated by the CCR unit being monitored. Prompt contaminant detection is important in order for corrective measures to be developed to stop migration of contaminants as soon as possible.

To ensure detection of a release, the regulations establish a general performance standard that all groundwater monitoring systems must meet: all groundwater monitoring systems must consist of a sufficient number of appropriately located wells that will yield groundwater samples in the uppermost aquifer that represent the quality of the background groundwater and the quality of groundwater passing the downgradient waste boundary, monitoring all potential contaminant pathways. 40 C.F.R. § 257.91(a)(1), (2). Because hydrogeologic conditions vary so widely from one site to another, the regulations do not prescribe the exact number, location, and depth of monitoring wells needed to achieve the general performance standard. Rather the regulation requires installation of a minimum of one upgradient and three downgradient wells, as well as any additional monitoring wells necessary to achieve the general performance standard of accurately representing the quality of the background groundwater and the groundwater passing the waste boundary, monitoring all potential contaminant pathways. 40 C.F.R. § 257.91(c)(1), (2). The number, spacing, and depths of the monitoring wells must be determined based on a thorough characterization of the site, including a number of specifically identified factors relating to the hydrogeology of the site (e.g., aquifer thickness, groundwater flow rates and direction). 40 C.F.R. § 257.91(b). Groundwater elevation measurements must be obtained around the unit(s) at sampling events over time to characterize groundwater flow direction at those times and identify seasonal and temporal fluctuations. Further, any facility that determines that the

regulatory minimum number of wells is adequate to meet the performance standard must document the factual basis supporting that determination. 40 C.F.R. § 257.91(f). In essence, the regulation establishes a presumption that the minimum of one upgradient and three downgradient wells is not sufficient, and it requires the facility to rebut the presumption in order to install only this minimum. 80 FR 21399.

In addition, the placement of the monitoring wells is critical to proper characterization of the groundwater, but even a sufficient number of properly placed wells will not provide adequate characterization if the sampling and analysis of data are not properly conducted.

The regulations require facilities to submit several groundwater monitoring compliance documents as part of their demonstration so that EPA can thoroughly evaluate the groundwater monitoring network and the site hydrogeology for every CCR unit at the facility. 40 C.F.R. § 257.103(f)(1)(iv)(B)(2), (3) and (4). EPA evaluated the documentation SIGECO provided in the Demonstration and reviewed the January 2018 through 2022 Annual Groundwater Monitoring and Corrective Action (GWMCA) Reports. The Demonstration provides information for three groundwater monitoring systems for the Ash Pond, Brown Landfill, and Brown Sedimentation Pond. EPA is proposing to determine that the Ash Pond and Brown Landfill groundwater monitoring systems are inadequate for multiple reasons set forth below, and, therefore, do not adequately demonstrate compliance with the regulations.

First, EPA believes there are deficiencies in the characterization of groundwater flow. 40 C.F.R. § 257.91(b)(1). Second, EPA identified unmonitored portions of downgradient boundaries at both the Ash Pond and Brown Landfill. 40 C.F.R. § 257.91(c). Third, EPA found issues with the reported quantitation limits in certain groundwater data. 40 C.F.R. § 257.93(g)(5). Fourth, the Annual GWMCA Reports did not include all required information. 40 C.F.R. § 257.90(e)(3).

Fifth, the Alternative Source Demonstration (ASD) for the Brown Landfill does not appear to meet the requirements of 40 C.F.R. § 257.95(g)(3). Finally, it appears that SIGECO used intra-well comparisons in their statistical analysis of data for arsenic, cobalt, and lithium at the Brown Landfill without providing sufficient justification or appropriate background data. 40 C.F.R. § 257.91(a)(1), 40 C.F.R. § 257.93(f)(6).

(a) Proposed Finding That Characterization of Groundwater Flow Is Inadequate

CCR groundwater monitoring networks are required to be designed based on site-specific, technical information that must include thorough characterization of groundwater flow direction, including seasonal fluctuations. 40 § C.F.R. 257.91(b)(1). Characterizing the direction of groundwater flow is vital as it shows where groundwater below the CCR units flows from and flows to, thus allowing the facility to identify an upgradient to downgradient flow direction (where one exists). This characterization is generally accomplished by measuring the elevation at which groundwater is encountered below the surface at multiple locations in the area to be characterized. Because groundwater flows from higher elevations to lower elevations, this information is used to determine the direction of groundwater flow and to support decisions about where to place monitoring wells to accurately characterize groundwater quality upgradient and downgradient of a CCR unit. 40 C.F.R. § 257.91(a)(1), (2). EPA is proposing to determine that there are an insufficient number of groundwater elevation data points surrounding the Ash Pond and the Brown Landfill to support conclusions about groundwater flow direction, and therefore, the proper placement of monitoring wells. Because of this, EPA is proposing to conclude that SIGECO has not adequately demonstrated the groundwater monitoring well systems meet the performance standards in 40 C.F.R. § 257.91(a) and (b).

In the Demonstration and Annual GWMCA Reports, SIGECO states groundwater flow in the vicinity of the Ash Pond is predominantly to the west and northwest¹⁰ and that groundwater does not flow south towards the Ohio River.¹¹ A helpful tool to visualize groundwater flow direction is a potentiometric surface map, which depicts monitored groundwater elevations. In a potentiometric map, locations with the same groundwater elevation are connected by a contour line, and arrows are drawn from contours at higher elevations toward the contours with lower elevations to indicate groundwater flow direction across the site. The Demonstration includes two potentiometric surface maps reflecting groundwater elevation data obtained in November 2016 and June 2017.¹² However, there are an insufficient number of groundwater elevation data points to support characterization of groundwater flow direction (i.e., to explain why the contours are shaped as depicted and, therefore, why the arrows point where they do) at the north, east, and south sides of the Ash Pond. For example, there are no groundwater elevation data points between monitoring wells CCR-AP-7R and CCR-AP-1R; CCR-AP-1R and CCR-AP-4R; or CCR-AP-4R and CCR-AP-3R to support the contour lines shown in these areas in potentiometric surface maps. The 455-foot contour line is depicted as a line on or near which CCR-AP-7R and CCR-AP-1R are located, with more than 3,000 feet of contour between them which has no groundwater elevation data points along that length to support the conclusion that groundwater is found at 455 feet.

Confusingly, this same 455-foot contour line is depicted on CCR-AP-7R, at which the groundwater elevation measurement was 452.74 feet, but it is depicted only close to CCR-LF-3, at which the groundwater elevation measurement was 454.92 feet, much closer to 455 feet.

¹⁰ Demonstration, Appendix J, PDF pg. 224-225

¹¹ Demonstration, Appendix K, PDF pg. 238

¹² Demonstration, Appendix H, PDF pg. 180-181

It is not clear how SIGECO determined how to place the 435-foot contour line to the south of CCR-AP-3R and CCR-AP-4R when there are no groundwater elevation measurements south of these wells. This means it is unclear how it was concluded that groundwater flows to the west in this area. In addition, it is not clear how SIGECO determined how to place the 435-foot contour line to the east of CCR-AP-4R when there is no groundwater elevation data to the east of that well. A sufficient number of groundwater elevation data points depicted on a potentiometric map are needed to show groundwater flow direction and display downgradient boundaries of the Ash Pond.

During the investigation of the nature and extent of the molybdenum and lithium plumes from the Ash Pond, a French drain system that captures shallow groundwater along the western unit boundary near wells CCR-AP-2R, CCR-AP-5R, and CCR-AP-6 was discovered.^{13,14} In the January 2022 Ash Pond Annual GWMCA Report, SIGECO discusses a French drain system that manages shallow groundwater between the Ash Pond and generating station.¹⁵ The system is located along the northwest side of the lower ash pool, and runs northeast to southwest.¹⁶ Groundwater enters the French drain through two 4-inch perforated pipes placed in a bed of gravel. The captured groundwater discharges into the SSRP, which discharges back into the Ash Pond. The potentiometric surface map depicts groundwater flow at the southwest border of the lower ash pool from an elevation of 440 feet at the border toward an elevation of 370 feet in a southwestern direction. This contradicts SIGECO's claim that groundwater flows north and northwest and is evidence of a portion of unmonitored downgradient boundary between monitoring wells CCR-AP-5R and CCR-AP-3R.

¹³ March 2020 Ash Pond Semi-Annual Selection of Remedy Progress Report

¹⁴ January 2022 Ash Pond Annual GWMCA Report, Appendix A, Section 2.2

¹⁵ January 2022 Ash Pond Annual GWMCA Report, Appendix A, Section 2.2

¹⁶ January 2022 Ash Pond Annual GWMCA Report, Appendix A, Figure 1

Additionally, the Ash Pond January 2018 through 2021 Annual GWMCA Reports do not contain information about groundwater flow direction or groundwater elevation measurements taken at each sampling event. These data are required to be obtained by 40 C.F.R § 257.93(c), and they are required to be reported by 40 C.F.R § 257.90(e)(3). The characterization of groundwater flow is also needed to support the monitoring system design to ensure that all potential contaminant pathways are monitored for releases from the Ash Pond. 40 C.F.R § 257.91(a)(2).

There are also insufficient groundwater elevation data to characterize groundwater flow direction in the vicinity of the Brown Landfill. The same potentiometric surface maps used for the Ash Pond are used for the Brown Landfill. SIGECO states that groundwater in the eastern portion of the Brown Landfill flows to the north and northeast and groundwater in the western portion flows to the north and northwest.¹⁷ There are insufficient groundwater elevation data depicted along the west side of the landfill to support these conclusions. For example, there are no groundwater elevation measurements along the western border of the landfill or within approximately 1,000 feet of that border, nor are there any elevation measurements to the west of the unit. This means that any contour lines or flow direction arrows drawn in this area are not based on site-specific data. Likewise, there are an insufficient number of groundwater elevation measurements east of the landfill to support the drawing of contour lines, and subsequently flow direction arrows, to reliably depict groundwater flow direction in this area. For example, between CCR-LF-3 and CCR-LF-4 there are no groundwater elevation measurements to support the spacing and placement of the 445-foot and 435-foot contour lines. Three contour lines are shown to the northeast of CCR-LF-3, depicting a drop in groundwater elevation of more than 30

¹⁷ Demonstration, Appendix J, PDF pg. 223

feet. At their intersection with the eastern boundary of the landfill, the contours are drawn perpendicular to the border, meaning groundwater would flow to the north along the eastern boundary and neither toward nor away from the landfill. However, no elevation measurements are provided to support the placement of these contours in this area. In order to determine if the eastern boundary is a downgradient boundary, flow direction in this area must be characterized using site data. Groundwater flowing to the northeast may not be characterized by CCR-LF-4 thus showing an unmonitored potential contaminant pathway. Groundwater flow in the vicinity of CCR-LF-4 is not well defined. The groundwater elevation at well CCR-LF-4 is approximately 430 feet, which indicates that groundwater may flow west towards the 425-foot contour line; this would mean that this well is upgradient.¹⁸ However, groundwater may be flowing north towards the other 425-foot contour line, which would mean that this well is downgradient. It should be noted that the 425-foot contour line to the north is not supported by groundwater elevation data and thus may not be accurate.

EPA is proposing to determine that SIGECO failed to characterize groundwater flow conditions based upon site-specific technical information as required by 40 C.F.R. § 257.91(b)(1). Consequently, EPA is proposing to determine that SIGECO has not demonstrated that the groundwater monitoring system accurately represents the quality of groundwater passing the downgradient boundary in the uppermost aquifer and that all potential contaminant pathways are monitored. 40 C.F.R. § 257.91(a)(2). To address this issue and obtain conditional approval, EPA is proposing that SIGECO characterize groundwater flow direction around the Ash Pond and Brown Landfill, supported by sufficient elevation data points. EPA anticipates that upon characterization of groundwater flow, further potential contaminant pathways will be identified

¹⁸ January 2020 Brown Landfill Annual GWMCA Report, Appendix A, Figure 2

and, therefore, additional downgradient groundwater wells will be needed to monitor such pathways. Final decisions regarding placement of monitoring wells must be based on adequate characterization of groundwater flow direction and rate across the unit and in the area immediately surrounding the unit.

(b) Proposed Finding That Spacing and Placement of Monitoring Wells Is Not Sufficient to Monitor All Potential Contaminant Pathways from the CCR Unit

EPA is proposing to find that not all potential contaminant pathways are monitored at the Ash Pond and Brown Landfill. 40 C.F.R. § 257.91(a)(2) requires installation of a groundwater monitoring system that accurately represents the quality of groundwater passing the waste boundary of each unit and monitors all potential contaminant pathways. The downgradient monitoring wells must be installed at the waste boundary and ensure detection of groundwater contamination in the uppermost aquifer. The regulations also require the installation of a sufficient number of wells to meet the performance standard in 40 C.F.R. § 257.91(a), based on the site-specific information specified by 40 C.F.R. § 257.91(b). 40 C.F.R. § 257.91(c)(1). The regulations specify that the groundwater monitoring system must contain a minimum of one upgradient and three downgradient monitoring wells, as well as all additional monitoring wells needed to meet the performance standard. *Id.* EPA is proposing to conclude that SIGECO has not adequately demonstrated the number of wells and spacing was determined consistent with the criteria in 40 C.F.R. §§ 257.91(b)(1) and (b)(2).

As discussed in Section III.E.2.a, it does not appear, based on the Demonstration, that the groundwater flow is adequately characterized near the Ash Pond and Brown Landfill or that all groundwater flow pathways are monitored. For these two CCR units, the number and spacing of wells is not supported by site-specific data.

In some cases, at the Ash Pond and Brown Landfill, the distance between downgradient groundwater monitoring wells is over 1,000 feet. For example, on the west border of the landfill between groundwater monitoring wells CCR-LF-1 and CCR-LF-6, there are approximately 2,000 feet of downgradient unit boundary with no groundwater monitoring wells. This issue is applicable to the Ash Pond as well. For example, as discussed in Section III.E.2.a, the discovery of a French drain system revealed that groundwater flows to the west in the vicinity of the southwest portion of the lower ash pool of the Ash Pond. There are approximately 1,000 feet of unmonitored unit boundary between groundwater monitoring wells CCR-AP-5R and CCR-AP-3R in this area, despite the fact that a preferential pathway for groundwater flow has been identified in the French drain system. These unmonitored portions of the downgradient waste boundary leave direct pathways of potential contaminant migration unmonitored.

EPA is proposing to determine that there are unmonitored potential contaminant pathways along portions of the downgradient boundary at both the Ash Pond and Brown Landfill. To address this issue and obtain conditional approval, SIGECO must develop plans for revised groundwater monitoring systems at all downgradient boundaries of the Ash Pond and Brown Landfill, with appropriate spacing so that all potential contaminant pathways are monitored. The number of wells and spacing must be determined based on the criteria in 40 C.F.R. §§ 257.91(b)(1) and (b)(2), which include groundwater flow rate and direction and taking into account seasonal or temporal fluctuations. Final decisions regarding placement of monitoring wells must be based on adequate characterization of groundwater flow direction and rate across the unit and in the area immediately surrounding the unit.

(c) Proposed Finding That SIGECO Failed to Use the Lowest Quantitation Limits

The regulations at 40 C.F.R. § 257.93(g)(5) require that practical quantitation limits must be set at the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy available to the facility. EPA is proposing to find that SIGECO's quantitation limits were not the lowest concentration level that can be reliably achieved. There is a range of different reporting limits that may be used by laboratories to document whether and at what concentration a constituent is present. Two reporting limits relevant to the review of this application are practical quantitation limits and method detection limits. Practical quantitation limits are the lowest concentration that can be measured with a specified degree of certainty, while method detection limits are the lowest concentration that can be reliably distinguished from zero by the analytical method. Measurements between the quantitation and detection limits confirm the presence of a constituent, with reported concentrations considered to be estimated, but still valid, values.¹⁹ Both limits are calculated using a standard deviation derived from repeated measurements of quality assurance samples. Thus, any steps taken to achieve a lower quantitation limit will also result in a lower detection limit. Elevated quantitation limits and corresponding detection limits are prohibited, in part, because they can artificially elevate background characterization or mask detections of constituents. In all cases, the quantitation limit used in compliance reports must be below the regulatory limit (i.e., the groundwater protection standard) or compliance with the standard cannot be assessed.

SIGECO's Demonstration does not include monitoring data with quantitation limits that comply with 40 C.F.R. § 257.93(g)(5) on multiple occasions in the January 2020 through 2021

¹⁹ The Risk Assessment Guidance for Superfund generally recommends that these estimated values be considered of sufficient quality to use as the reported concentration in quantitative risk analyses. *See* Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual Part A, December 1989.

Annual GWMCA Reports for the Ash Pond and Brown Landfill. For example, in the January 2020 Annual GWMCA Reports, antimony results in downgradient wells CCR-AP-3, CCR-AP-5, CCR-AP-6, CCR-AP-7R, CCR-AP-9, CCR-LF-2, CCR-LF-4, and CCR-LF-5 were reported as below a reporting limit of 20 µg/L. This limit is higher than the groundwater protection standard (GWPS) of 6 µg/L for antimony, which means the results cannot be known to be either above or below the GWPS. This is also seen in results from the same wells for thallium, for which results were reported as below a limit of 10 µg/L, five times the GWPS of 2 µg/L. Another example can be found in the January 2021 Annual GWMCA Reports; cadmium in downgradient wells CCR-AP-2R, CCR-AP-3, CCR-AP-5, CCR-AP-9, and CCR-LF-2 was reported as below a quantitation limit of 10 µg/L, higher than the GWPS of 5 µg/L. For all of these examples, neither the Annual GWMCA Reports nor the Demonstration provide an explanation for why the reporting limit is higher than the GWPS.

EPA's experience with reviewing analytical data for metals in groundwater is that much lower quantitation limits, well below the GWPS, are typically achievable. However, there is a lack of documentation about the analytical methods used or any description of efforts taken to further reduce the laboratory reporting limits, as well as failure to include analytical laboratory reports of the sample analyses in the Annual GWMCA Reports, which would have information about any data quality issues. Therefore, EPA is unable to determine the cause of the high limits or verify that these limits are the lowest that can be reliably achieved for these samples.

EPA is proposing to determine that some of the groundwater quality data from the groundwater monitoring systems at all three units does not meet the requirements of 40 C.F.R. § 257.93(g)(5). To address this issue and obtain conditional approval, EPA is proposing that future groundwater samples must use the lowest quantitation limits that can be reliably achieved,

supported by quality assurance documentation in the Annual GWMCA Reports that adequately explains the reasons for instances where expected quantitation limits could not be met, discusses how those values may be utilized in data analyses, and provides corrective actions planned to avoid recurrence of those instances.

(d) Proposed Finding That GWMCA Reports Are Incomplete and Lack Clarity of Visual Representation of Data

EPA is proposing to determine that the Annual GWMCA Reports do not include all information required to be obtained under 40 C.F.R. §§ 257.90 through 98. 40 C.F.R. § 257.90(e)(3). The lack of this information undermines EPA's ability to adequately evaluate the Demonstration. The Annual GWMCA Report is required to provide the most recently obtained groundwater monitoring and corrective action information so that the Agency or other parties are able to determine compliance with the CCR requirements. The groundwater monitoring provisions in 40 C.F.R. §§ 257.90 through 257.95 include numerous requirements (e.g., standards for lowest achievable quantitation limits, requirements to analyze unfiltered groundwater samples for total recoverable metals, and performance standards for various statistical methods). It is SIGECO's responsibility to provide this information to demonstrate its compliance with the regulations, and the failure to provide this information in the Annual GWMCA Reports prevents EPA, states, or other stakeholders from evaluating their compliance.

The Annual GWMCA Reports for the three CCR units do not contain all the laboratory analytical reports or information about statistical analyses (e.g., analysis and results, statistical method applied, confidence levels, normality test results). Not only do the GWMCA Reports fail to include all the required data, but EPA found that some reports also fail to discuss the monitoring results in the narrative as required by 40 C.F.R. § 257.90(e)(6)(iii). The January 2018

Annual GWMCA Reports for all three units identify statistically significant increases (SSIs) but there is no mention of the constituent(s) for which the SSIs were detected, the dates they were detected, or the identity of the wells at which they were detected.

Additionally, visual representation of data has been prepared in a way that makes it difficult to review and assess for compliance. As previously mentioned, the most recently obtained groundwater elevation data are not provided in Annual GWMCA Reports. For example, the January 2019 Annual GWMCA Reports for all three units include the same potentiometric surface map using data from June 2017 despite the requirements to obtain groundwater elevation data during each sampling event thereafter, including in 2018.²⁰ Site maps that depict groundwater flow information or locations of monitoring wells do not also show the boundaries of the CCR unit.^{21,22} Future submittals should include visual representation of data that includes all related information needed to understand and review the data being presented.

EPA is proposing to determine that A.B. Brown's Annual GWMCA Reports are incomplete. 40 C.F.R. § 257.90(e)(3). To address this issue and obtain conditional approval, SIGECO must amend past Annual GWMCA Reports for all three units to contain all monitoring data required to be submitted under 40 C.F.R. §§ 257.90 through 257.98, including groundwater elevation measurements, statistical analyses (i.e., data used in the analyses, normality assessment, results, confidence levels, and any limitations of the analysis), field data logs for groundwater sampling, and laboratory analysis reports for all monitoring data. Additionally, SIGECO should ensure that past Annual GWMCA Reports contain potentiometric surface maps with the groundwater elevation data obtained during that year.

²⁰ January 2019 Annual GWMCA Reports for each unit, Appendix A, Figure 3

²¹ January 2019 Annual GWMCA Reports for each unit, Appendix A, Figure 2

²² January 2018 Annual GWMCA Reports for each unit, Figure 1

(e) Proposed Finding That the Alternative Source Demonstration (ASD) for the Brown Landfill Is Insufficient

EPA is proposing to find that the ASD for the Brown Landfill is not sufficiently supported by site-specific facts and analytical data. If a facility determines that there was an SSI over background levels for one or more of the constituents in Appendix III to 40 C.F.R. part 257 at a monitoring well at the downgradient waste boundary, there is an opportunity to complete an ASD showing that a source other than the unit was the cause of the SSI. 40 C.F.R. § 257.94(e)(2). If a successful ASD for an SSI is not completed within 90 days, an assessment monitoring program must be initiated. Similarly, if a statistically significant level (SSL) over a GWPS is detected, there is an opportunity to complete an ASD. 40 C.F.R. § 257.95(g)(3)(ii). A successful ASD will demonstrate that a source other than the CCR unit is responsible for the SSI or SSL. In order to rebut the site-specific monitoring data and analysis that resulted in an SSI or SSL, an ASD requires conclusions that are supported by site-specific facts and analytical data. Merely speculative or theoretical bases for the conclusions are insufficient.

In the January 2019 Brown Landfill Annual GWMCA Report, SIGECO reported detection of SSIs for Appendix III parameters and that an ASD was unsuccessful, thus assessment monitoring was initiated. In the January 2020 Brown Landfill Annual GWMCA Report, SIGECO reported detection of SSLs for cobalt, arsenic, and lithium. An ASD was completed that claimed that a potential source of the arsenic and lithium SSLs was a coal seam; an alternative source for cobalt was not identified, however, SIGECO stated that it believes the Brown Landfill is not the source of the SSLs.²³

²³ January 2020 Brown Landfill Annual GWMCA Report, Appendix A

The following are presented as lines of evidence in the ASD. SIGECO stated that during the installation of groundwater monitoring well CCR-LF-4, a 2-inch coal seam was encountered.²⁴ The material was tested for total and leachable arsenic and lithium. Results show that leached concentrations are higher than the maximum detected concentrations of arsenic and lithium in the groundwater samples at CCR-LF-4.²⁵ SIGECO also tested the FGD sludge, which is disposed in the landfill, to assess its leached concentrations of arsenic, cobalt, and lithium. The results indicate the FGD sludge leachable concentrations of arsenic, cobalt, and lithium are lower than the GWPS.²⁶ SIGECO states that these results indicate that the coal seam is the alternative source of arsenic and lithium SSLs and that the FGD sludge is not the source of arsenic, cobalt, and lithium.

EPA has identified multiple concerns about the lines of evidence presented. First, the well construction diagram of CCR-LF-4 does not identify the coal seam.²⁷

Second, if a coal seam is present and it has the potential to affect the groundwater quality as SIGECO claims, then the well is not properly placed and constructed to accurately characterize the groundwater quality passing the downgradient waste boundary of the Brown Landfill. 40 C.F.R §§ 257.91(a)(2), (e). This well also may not be cased in a manner that protects the integrity of the borehole. 40 C.F.R § 257.91(e). In the subsequent Annual GWMCA Reports for 2021 and 2022, SIGECO continued to utilize this well to characterize groundwater quality, despite arguments in the ASD that it could not do so because of the coal seam. The well continued to detect arsenic and lithium concentrations above the GWPS.^{28,29}

²⁴ January 2020 Brown Landfill Annual GWMCA Report, Appendix A, PDF pg. 17

²⁵ January 2020 Brown Landfill Annual GWMCA Report, Appendix A, PDF pg. 18

²⁶ January 2020 Brown Landfill Annual GWMCA Report, Appendix A, PDF pg. 18

²⁷ Demonstration, PDF pg. 875-877

²⁸ January 2021 Brown Landfill Annual GWMCA Report, PDF pg. 7-8

²⁹ January 2022 Brown Landfill Annual GWMCA Report, PDF pg. 7-8

Third, the results indicate that the coal seam samples were prepared or analyzed beyond the specified holding time and arsenic was found in the blank sample.³⁰ Arsenic should not be present in the blank sample, as a blank sample should be uncontaminated water. The purpose of using blank samples is to test for potential contamination of field samples in the analytical process, and this result is an indication of inaccurate arsenic analytical results. Despite these issues, SIGECO states that the analytical results are reliable as they represent minimum values and bias the results low.³¹ However, contamination of a sample during analysis would result in an elevated result, and the “minimum” would be artificially high. SIGECO offers no explanation for the presence of arsenic in the results for the blank sample. EPA believes this issue alone raises serious questions about the validity of the results.

Fourth, EPA believes that the approach of comparing a sample of water leached from a collected sample of CCR under laboratory conditions is not representative of groundwater in the environment that has come into contact with CCR. SIGECO states that the leached concentrations of arsenic and lithium in the coal seam were higher than the concentrations found in the groundwater, thus, supporting that the coal seam is the source. However, the laboratory conditions in which the leaching occurred and in which the sample was analyzed do not resemble field conditions of the groundwater. The laboratory testing method 6010B³² requires the solid (i.e., coal seam sample) to be digested in acid ranging from pH 2 to 3.³³ In comparison, pH in well CCR-LF-4 ranges from 6.53 to 7.2.³⁴ It would be expected that acidic pH conditions used in method 6010B would result in higher concentrations of arsenic and lithium than concentrations

³⁰ January 2020 Brown Landfill GWMCA Report, PDF pg. 81-93

³¹ January 2020 Brown Landfill GWMCA Report, Appendix A, PDF pg. 17

³² January 2020 Brown Landfill Annual GWMCA Report, Analytical Report PDF pg. 81-93

³³ EPA Method 6010B

³⁴ January 2018 through January 2022 Brown Landfill Annual GWMCA Reports

in more neutral (pH 7) groundwater conditions.³⁵ Therefore, the results are insufficient to conclude the coal seam is the source of arsenic and lithium SSLs in CCR-LF-4, because it is insufficient to rebut the monitoring data that indicate the CCR unit is the source of the SSLs. The same is true for the cobalt SSLs in CCR-LF-2. SIGECO states that a lab test demonstrated the leached concentration of cobalt from the FGD sludge disposed of in the landfill is lower than the GWPS and that this fact supports its conclusion that the landfill is not the source of cobalt SSLs. However, no alternative source of cobalt is identified in the ASD. An alternative source must be identified, and a hydraulic connection between that source and the monitoring well where the SSL was detected must be demonstrated for an ASD to be sufficient.

Fifth, the location from which the FGD sludge sample was taken is not disclosed in the ASD. It is not clear if the sample was taken from an area of the landfill with recently deposited FGD or from a closed landfill cell that has already potentially leached arsenic, cobalt, and lithium over the decades the landfill has been in operation. Therefore, EPA believes this line of evidence is inconclusive.

EPA is proposing to determine that the ASD is insufficient and does not meet the requirements of 40 C.F.R. § 257.95(g)(3)(ii). To address this issue and obtain conditional approval, EPA is proposing that the Brown Landfill initiate an assessment of corrective measures pursuant to 40 C.F.R. § 257.96(a). If during the characterization of the nature and extent of the release the plume is found to be from a source other than the Brown Landfill, then the Remedy Selection Report could document this and an adequate demonstration could support a decision not to select a remedy.

³⁵ <https://www.epa.gov/caddis-vol2/ph>

(f) Proposed Findings of Improper Intrawell Comparisons at the Brown Landfill

EPA is proposing to find that SIGECO has not provided sufficient information to support its use of intrawell comparisons at the Brown Landfill. In the January 2021 Brown Landfill Annual GWMCA report, SIGECO states that it changed its data analysis approach to utilize intrawell comparisons for cobalt, arsenic, and lithium as a result of findings in the ASD.

Intrawell comparisons are not simply a statistical method; in the CCR regulations, they are an approach to background characterization. Intrawell data comparisons use samples taken at different times from the same well to characterize both background groundwater quality and downgradient compliance groundwater quality. This means downgradient compliance wells would also serve as background wells. Alternatively, interwell data comparisons use samples taken from different wells—upgradient or sidegradient wells characterize background groundwater quality and downgradient wells characterize downgradient groundwater quality.

The CCR regulations do not mention interwell or intrawell comparisons specifically; instead, they establish requirements for characterizing background. Background groundwater quality is to be established in an upgradient well, unless a groundwater flow gradient does not exist, or it can be shown that groundwater samples from a well that is not upgradient of the CCR unit would characterize background groundwater quality as accurately or more accurately than samples from an upgradient well. 40 C.F.R. § 257.91(a). This indicates a strong preference for interwell comparison, which would necessarily be used when background is established in any well other than a downgradient compliance well (i.e., an upgradient or side gradient well).

However, the CCR regulations allow background to be established in a well that is not upgradient of the unit (i.e., in a downgradient compliance well) if the criteria in 40 C.F.R. § 257.91(a)(1)(i) and (ii) are met. It must be demonstrated that the data from the non-upgradient

well can characterize background groundwater quality as accurately or more accurately than data from an upgradient well. It also must be demonstrated the data were gathered when the well was known to be uncontaminated by the CCR unit.³⁶ This generally means that background data used in intrawell comparisons must be obtained prior to placement of CCR in the unit.

Even if the conclusions of the ASD were correct, they primarily depend upon contamination from the downgradient compliance well itself due to the coal seam; this would not support the use of intrawell data comparisons. SIGECO has not provided sufficient information for EPA to determine whether the requirements in 40 C.F.R. § 257.91(a)(1) have been met. SIGECO does not indicate when background samples were obtained from the compliance wells for use in intrawell comparisons. There is no explanation on how it was determined that they are as or more representative of background groundwater quality than upgradient samples, or how they are known to be uncontaminated by the Brown Landfill.³⁷ 40 C.F.R. § 257.91(a)(1), 40 C.F.R. § 257.93(f)(6).

EPA is proposing to determine intrawell data comparisons are inappropriate in this case. To address this issue and obtain conditional approval, EPA is proposing that SIGECO amend past statistical analyses to utilize interwell comparisons and use appropriate comparisons in the future. These revised analyses must be included in the revisions to the Brown Landfill Annual GWMCA Reports required by the conditions.

3. Corrective Action Compliance for the Ash Pond

When groundwater assessment monitoring shows SSLs of any constituent above a GWPS, and an alternative source is not identified within 90 days, a facility must undertake

³⁶ See 40 C.F.R. § 257.91(a)(1) and “March 2009 Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance” (“Unified Guidance”). pg. 17-22

³⁷ Unified Guidance, pg. 17-22 and 18-2

several corrective action steps, including conducting an Assessment of Corrective Measures (ACM) and selecting a remedy to address the release. 40 C.F.R. § 257.96 through §257.98. An ACM is an assessment of measures to “prevent further releases, remediate any releases, and restore affected areas to original conditions.” 40 C.F.R. § 257.96. An ACM must include an analysis of the effectiveness of potential corrective measures at meeting all requirements and objectives of the remedy required by 40 C.F.R. § 257.97, and that analysis must address at least the criteria listed in 40 C.F.R. § 257.96(c)(1) through (c)(3). 40 C.F.R. § 257.96(c). During the 2019 assessment monitoring events at the Ash Pond³⁸ at wells CCR-AP-3R and CCR-AP-2R, lithium and molybdenum were detected at SSLs above the GWPSs of 40 µg/L and 100 µg/L established for those constituents at the Ash Pond, respectively. SIGECO is therefore subject to corrective action requirements at the Ash Pond.

EPA has reviewed the ACM and Addendum to the ACM included as Appendix K to the Demonstration. Based on that review, EPA is proposing to determine that SIGECO has failed to comply with several corrective action requirements. It appears SIGECO has failed to characterize the nature and extent of the release and site-specific conditions that may affect the remedy selected as required by 40 C.F.R. § 257.95(g)(1). Further, EPA is proposing to determine that SIGECO failed to provide sufficient site-specific data to support an adequate assessment of the alternatives in 40 C.F.R. § 257.96(c). Finally, at the writing of this proposal, SIGECO has yet to select a remedy. EPA is proposing to determine that SIGECO has failed to select a remedy “as soon as feasible.” 40 C.F.R. § 257.97(a).

To address this issue and obtain conditional approval, EPA is proposing that SIGECO amend the ACM to meet the requirements of 40 C.F.R. §§ 257.96 through 257.98. To meet the

³⁸ January 2020 Ash Pond Annual GWMCA Report

condition, the revised ACM must include: 1) characterization of the release, 2) site conditions that may affect the expected performance of each remedial technology assessed, 3) relative quantitative or qualitative assessment of the performance of each remedial technology according to each criterion listed in 40 C.F.R. § 257.96(c), and 4) all assessments in the ACM must be supported by site data, information about how the remedial technology works, and how it will meet the remedy requirements listed in 40 C.F.R. § 257.97(b).

(a) Proposed Finding of Insufficient Characterization of the Release and Site Conditions

EPA is proposing to find that SIGECO failed to characterize the nature and extent of the release from the Ash Pond. Under 40 C.F.R. § 257.95(g)(1), SIGECO is required to characterize the nature and extent of the release and any relevant site conditions that may ultimately affect the remedy selected. The characterization must be sufficient to support a complete and accurate assessment of the corrective measures, pursuant to 40 C.F.R. §§ 257.96 and 257.97, to prevent further releases from the CCR unit, remediate any releases, and restore affected areas to original conditions. The requirement to characterize the release includes gathering data to quantify the levels at which constituents are present, quantifying the estimated mass of the release, and installing at least one well at the facility boundary in the direction of contaminant migration. 40 C.F.R. §§ 257.95(g)(1)(i)-(iv). All this work must be completed within 180 days of detecting an SSL of a constituent in Appendix IV to 40 C.F.R. part 257, unless a 60-day extension is warranted. 40 C.F.R. § 257.96(a). Based on the information contained in the ACM, SIGECO does not appear to have fully complied with any of these requirements.

In Section 2.4 of the ACM, SIGECO discusses the nature and extent of the release. In November 2018, SIGECO installed five additional groundwater monitoring wells downgradient of the Ash Pond to gather additional data about where contamination had migrated beyond the

downgradient waste unit boundary. Table 1A of the ACM includes analytical groundwater monitoring results from these new wells, which show no exceedances of GWPSs of either molybdenum or lithium. SIGECO finishes this discussion by stating the release is limited to the shallow aquifer and that the plume has been vertically and horizontally delineated. However, as discussed previously, concerns regarding inadequate characterization of groundwater flow direction and the unmonitored downgradient boundary cause EPA to question the sufficiency of the investigation. Also, concerns about the clarity of presentation of visual data is relevant to the ACM, which does not depict groundwater flow direction on the single map that is provided to show the extent of molybdenum contamination.³⁹ The following are examples of the overall lack of information and discussion in the ACM, which result in our finding that the ACM does not meet the requirements of 40 C.F.R. § 257.95(g)(1).

First, the ACM lacks discussion of the molybdenum solute transport model that was apparently used, and its relation to the nature and extent of the plume. In Section 4.2 of the ACM, SIGECO indicates that groundwater flow and solute transport was modeled for the site, and that the model was then used to compare the remedies in respect to time to achieve GWPS. However, the model results for the groundwater flow are not discussed. Nor is the time to achieve the GWPS discussed for each of the alternatives. In Section 5.2.1.5 of the ACM, SIGECO states the time to achieve GWPS for all alternatives is “long,” but no specific time frame is given. It is unclear why model results were not discussed in the ACM, as they relate to the nature and extent of the molybdenum plume. Lithium was not modeled as molybdenum was claimed to be a more conservative constituent that would require the longest time to attenuate.

³⁹ November 2020 Ash Pond Addendum to ACM, Figure 6, PDF pg. 22

Because of this and the absence of any other data, the nature and extent of the lithium release was not characterized.

Second, the estimated mass of the releases of both lithium and molybdenum are missing from the characterization as required by 40 C.F.R. § 257.95(g)(1)(ii).

Last, SIGECO failed to identify any viable attenuation mechanisms for either lithium or molybdenum in the ACM and no additional geochemical data or data on which chemical oxidation states or in which environmental media molybdenum and lithium are present within the aquifer matrix are included in the ACM.

To adequately characterize the nature and extent of the release, site-specific data are critical and, therefore, such information must be included in the ACM. Sufficient site-specific data must be collected to support an adequate assessment of the alternatives according to the criteria in 40 C.F.R. § 257.96(c). EPA is proposing to determine that SIGECO fails to comply with the requirement in 40 C.F.R. § 257.95(g)(1) to characterize the release and site conditions sufficiently “to support a complete and accurate assessment of the corrective measures that may affect the remedy ultimately selected.” 40 C.F.R. § 257.95(g)(1). To address this issue and obtain conditional approval, EPA is proposing that SIGECO adequately characterize the release of each Appendix IV constituent with an SSL, including a plume map estimating the lateral and vertical extent of the release of the constituent and the calculated mass of the release.

(b) Proposed Finding of Improper Application of Assessment Criteria

EPA is proposing to find that SIGECO improperly applied the assessment criteria to the considered alternatives and fails to support conclusions with an overall lack of discussion and site-specific data. The ACM assesses the ability of alternatives to meet the requirements in 40 C.F.R. § 257.97(b) according to criteria in 40 C.F.R. § 257.97(c), rather than 40 C.F.R. §

257.96(c). In the ACM, SIGECO considers three alternatives: 1) monitored natural attenuation (MNA), 2) hydraulic containment with no treatment and MNA, and 3) hydraulic containment with treatment and MNA. All alternatives include closure by removal of the Ash Pond. The alternatives are compared to each other based on evaluation criteria listed in Section 5.1. Furthermore, Section 4.1 indicates that criteria in 40 C.F.R. §§ 257.96(c)(1) through (c)(3) were considered during the evaluation. High-level discussions of the assessment criteria are presented throughout Section 5.2 and are summarized in Table 2. However, the ACM lacks discussion of how each of the alternatives meet the requirements of 40 C.F.R. §§ 257.96(c)(1) through (c)(3); nor is it clear how well each alternative performs with respect to these criteria. Below EPA outlines an example in the ACM where each of these criteria are not discussed.

The ACM lacks discussion of the alternatives' performance with respect to the requirements of 40 C.F.R. § 257.96(c)(1). Reliability (one of the required factors in 40 C.F.R. § 257.96(c)(1)) is partially assessed throughout Section 5.2. For example, in Section 5.2.1.7, MNA is rated most favorable when assessing long-term reliability. However, the ACM does not demonstrate the existence of any attenuation mechanisms that may be occurring at the site, so there is no discussion of the permanence or irreversibility of MNA for these constituents at this site. There is no basis to assess MNA favorably in long-term reliability without demonstrating the occurrence or irreversibility of any mechanisms that would attenuate lithium or molybdenum at the site. The requirement is to assess the reliability inherent to the technology itself and to consider site-specific circumstances that affect that reliability. 40 C.F.R. § 257.96(c)(1). Any identified, credible reliability issues should be based on site-specific circumstances that are either conducive to facilitate proper design and implementation to improve reliability, or that present particular challenges that would hamper reliability. No such site-specific circumstances are

discussed. This lack of explanation does not comply with 40 C.F.R. § 257.96(c), which specifies that the assessment of control measures “must include an *analysis* of the effectiveness of potential corrective measures” (emphasis added) according to the listed criteria. Mere unsupported conclusions cannot meet this standard. Thus, this information is necessary to show that MNA meets the requirements of 40 C.F.R. § 257.97(b).

In another example, the ACM lacks discussion of the time required to begin and complete the remedy. 40 C.F.R. § 257.96(c)(2). In Section 5.2.1.5, SIGECO states that Alternatives 2 and 3 would achieve the GWPS in the shortest amount of time compared to Alternative 1; this conflicts with the results of the groundwater flow and solute transport model found in the ACM Addendum. SIGECO states that the model was constructed to evaluate and compare the alternatives in support of the ACM. Figure 8 of the Addendum includes model results showing MNA (Alternative 1) would achieve GWPS for molybdenum after approximately 200 years versus 230 years for pumping (Alternative 2 and 3). The Addendum does not discuss the parameters and assumptions of each scenario (i.e., alternative) and how they were incorporated in the model analysis. In addition, SIGECO does not report the exact amount of time for these alternatives besides the mention of 13 years for “active treatment” of Alternative 3 in Section 4.3.3. It is not clear why active treatment would only continue for 13 years if the estimated time to achieve GWPS would be 230 years. Thus, SIGECO never clearly states the time required to begin and complete these alternatives as required by 40 C.F.R. § 257.96(c)(2), or explain the basis for its conclusions about the performance of each alternative.

EPA is proposing to determine that SIGECO fails to comply with the requirement in 40 C.F.R. § 257.96(c). The ACM fails to discuss criteria 40 C.F.R. §§ 257.96(c)(1) through (3) and give site-specific data as support. Conclusions without a supporting assessment or data do not

constitute “an analysis of the effectiveness of potential corrective measures.” Further, inaccurate assessments in an ACM can ultimately result in selection of a remedy that will not meet the requirements of 40 C.F.R. § 257.97(b).

(c) Proposed Finding of Improper Assessment of Risk and Exposure to Human Health and the Environment

EPA is proposing to find that SIGECO improperly assessed risk in the ACM. In Section 3 of the ACM, SIGECO discusses the risk evaluation to identify the potential for human or ecological exposure to constituents released into the environment. This section relates to criteria in 40 C.F.R. § 257.97(c)(1)(i),(ii), “The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on consideration of...Magnitude of reduction of existing risks; Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy...” The risk evaluation appears to be based upon the assumption that because no receptors have been identified, there is no risk from continued releases of inorganic metals to the aquifer or possibly the Ohio River, so all alternatives are equivalent. For discussion about groundwater flow to the Ohio River, see Section III.E.2.a. As discussed previously, the release and the extent of contaminated groundwater have not been characterized. Also, lithium and molybdenum will persist in the environment because they will not degrade, and they are known to present risks to human health and the environment above the GWPSs. Alternatives that are likely to mitigate long-term risks (e.g., those that remove the contamination from the environment) can be distinguished from those that are not (e.g., those that immobilize constituent in a way that is not permanent and leave it in the aquifer) and are assessed accordingly. The requirement to assess their relative performance under this criterion is not met with an

unsubstantiated claim that no receptors are or will be impacted by the release. Additionally, the current presence or absence of nearby receptors does not serve to distinguish the performance of any technology, since this assumption would be equally applied to all of them. The presence or absence of current, immediate receptors is not a valid criterion for remedy selection. However, groundwater contaminants discharged to the Ohio River would be considered cross-media impacts, and that criterion is required to be considered in accordance with 40 C.F.R. § 257.96(c)(1).

(d) Proposed Issues Found with Assessment of Monitored Natural Attenuation (MNA)

Very little information is provided in the ACM to support positive assessment of MNA. MNA refers to reliance on natural attenuation processes to achieve corrective action objectives within a time frame that is reasonable compared to that offered by other, more active methods. The “natural attenuation processes” at work in such a remediation approach generally include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater.⁴⁰

EPA is proposing to determine that MNA in the ACM fails to meet the requirements of 40 C.F.R. § 257.97. SIGECO fails to determine the existence, and demonstrate the irreversibility, of MNA mechanisms necessary to evaluate the performance, reliability, ease of implementation, and the time required to begin and complete the remedy. 40 C.F.R. §§ 257.96 (c)(1) and (c)(2). This information would ultimately be necessary to show that MNA meets the requirements of 40 C.F.R. § 257.97(b). The ACM also provides no evidence of the MNA mechanism occurring at this site for lithium and molybdenum. The ACM contains no data or discussion to support the

⁴⁰ “Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites,” April 1999, PDF pg. 12

occurrence of immobilization of lithium or molybdenum at A.B. Brown, and so its favorable assessment under the balancing criterion found in Sections 5.2.1, 5.2.2, and 5.2.3 of the ACM are unsupported.

(i) MNA Guidance in Other EPA Cleanup Programs

EPA has extensive experience with MNA in environmental cleanup programs. Based on that experience, EPA considers the scientific principles of chemical and physical behavior of constituents in such guidance to be relevant to corrective action at CCR units. EPA believes that the 2015 “Use of Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites” (“2015 MNA Guidance”) contains relevant information because the regulated constituents are inorganic contaminants and the focus of the CCR corrective action program is on groundwater cleanup. While scientific aspects of the 2015 MNA Guidance (e.g., the behavior of inorganic contaminants in the environment or the ways in which specific MNA mechanisms work) are relevant, EPA acknowledges that policy aspects of the 2015 MNA Guidance may not be relevant. As an example, using a step-by-step tiered analysis approach to screen sites for MNA for the purposes of cost-effectiveness⁴¹ would be inappropriate⁴² for CCR corrective action given the prohibition against consideration of costs and the deadline in 40 C.F.R. § 257.96(a) to complete the ACM.

Mass reduction through degradation generally is not a viable process for most inorganic contaminants in groundwater, except for radioactive decay. Constituents in Appendix IV to 40 C.F.R. part 257 are atoms, and atoms do not break down or degrade through any naturally occurring process unless they are radioactive. Thus, while MNA can reduce the concentration or

⁴¹ “Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites,” April 1999, PDF pg. 13-14

⁴² USWAG decision, Section IV.B.4

mobility of inorganic contaminants in groundwater if immobilization occurs through adsorption or absorption to subsurface soils, it does not remove the contaminants from the environment. MNA, therefore, would not perform well with respect to the requirement in 40 C.F.R. § 257.97(b)(4), which requires that remedies “remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible.”

Inorganic contaminants persist in the subsurface because, except for radioactive decay, they are not degraded by other natural attenuation processes.⁴³ Often, however, inorganic contaminants may exist in forms that have low mobility, toxicity, or bioavailability such that they pose a relatively low level of risk. Therefore, natural attenuation of inorganic contaminants is most applicable to sites where immobilization is demonstrated to be in effect and the process/mechanism is irreversible.⁴⁴ Immobilization that is not permanent would require ongoing monitoring in accordance with 40 C.F.R. § 257.98(a)(1) as long as immobilized constituents remain in the aquifer matrix.

Dilution and dispersion reduce concentrations through dispersal of contaminant mass rather than destruction or immobilization of contaminant mass.⁴⁵ Consequently, these mechanisms do not meet the requirement at 40 C.F.R. § 257.97(b)(4) to remove from the environment as much of the contaminated material as is feasible, and they may not meet the requirement at 40 C.F.R. § 257.97(b)(1) to be protective of human health and the environment.

⁴³ This is in contrast to organic compounds, comprised of multiple elements, which may react or degrade to their constituent elements or form other, less harmful compounds.

⁴⁴ “Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites,” April 1999, PDF pg. 18

⁴⁵ “Use of Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites,” August 2015, PDF pg. 24

Note that this is also consistent with EPA’s long-standing policy that dilution and dispersion are generally not appropriate as primary MNA mechanisms.⁴⁶

In order to conduct the assessment required by 40 C.F.R. § 257.96(c), evaluation of MNA as a corrective measure requires analysis of site-specific data and characteristics that control and sustain naturally occurring attenuation. “It is necessary to know what specific mechanism (e.g., what type of sorption or reduction and oxidation reaction) is responsible for the attenuation of inorganics so that the stability of the mechanism can be evaluated. [...] Changes in a contaminant’s concentration, pH, oxidation and reduction potential, and chemical speciation may reduce a contaminant’s stability at a site and release it into the environment.”⁴⁷ Determining the existence, and demonstrating the irreversibility, of MNA mechanisms is necessary to evaluate the performance, reliability, ease of implementation, and time required to begin and complete the remedy. 40 C.F.R. §§ 257.96 (c)(1) and (c)(2). This information would ultimately be necessary to show that MNA meets the requirements of 40 C.F.R. § 257.97(b).

(ii) Lack of Data to Support Conclusions about Monitored Natural Attenuation

The ACM fails to discuss any attenuation processes, or provide site-specific evidence that any are occurring, for lithium and molybdenum at the site. SIGECO references the 2015 MNA Guidance in the ACM, stating MNA is a viable remedial technology that is applicable to inorganic compounds in groundwater. Despite the absence of such data, SIGECO has assessed MNA more favorably than the two other remedial technologies. These conclusions are unsupported by data, and appear to result from inconsistent application of the criteria or inaccurate statements. These portions of the assessment do not seem to accurately reflect the

⁴⁶ “Use of Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites,” August 2015, PDF pg. 24

⁴⁷ “Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites,” April 1999, PDF pg. 17

control measure's "effectiveness in meeting all of the requirements and objectives" in 40 C.F.R. § 257.97(b) based on information in the ACM. Conclusions without supporting data do not constitute an analysis of effectiveness. Inaccurate assessments in an ACM can ultimately result in selection of a remedy that will not meet the requirements of 40 C.F.R. § 257.97(b).

As stated above, SIGECO assesses MNA favorably for most of the criteria in 40 C.F.R. § 257.97(c). For example, in Section 5.2.1.1. of the ACM, SIGECO evaluates the magnitude of the reduction of existing risks. For this criterion, SIGECO favors MNA because the source is completely removed from the environment. It is not clear if source removal is referring to the fact that the Ash Pond will be closing by removal or due to migration of all the released contamination off-site through dilution and dispersion. If SIGECO is referring to MNA completely removing the source, this is true for all alternatives and, therefore, they should all be assessed the same. As previously discussed, while MNA can reduce the concentration or mobility of inorganic contaminants in groundwater, it does not remove the contaminants from the environment. Through dilution and dispersion, contamination migrates off-site to downgradient receptors, so risks are not reduced, but rather they are transferred to other locations. Therefore, SIGECO's favorable assessment of MNA with respect to this criterion is improper. EPA has found that SIGECO's favorability of MNA is a common theme throughout the ACM. The ACM has skewed the assessment of MNA more favorably than is allowed by the regulation and the conclusions are not supported by site-specific data. To assess MNA, attenuation mechanisms (i.e., immobilization or dilution and dispersion) must be identified in order to assess performance at meeting the requirements of 40 C.F.R. § 257.97(b). Different mechanisms would be assessed differently according to criteria in 40 C.F.R. § 257.96(c).

IV. EPA's Proposed Action

A. Proposed Conditional Approval of the Extension Request

On January 11, 2022, EPA proposed to conditionally approve the request submitted for Spurlock Power Station to extend the cease receipt of waste date for an unlined CCR surface impoundment. See “Conditional Approval of an Alternative Closure Deadline for H.L. Spurlock Power Station, Maysville, Kentucky” (Spurlock proposal) (Docket ID No. EPA-OLEM-HQ-2021-0595). EPA explained in that proposed action that the Agency was clarifying and revising its original interpretation of the regulations at 40 C.F.R. § 257.103(f)(3) to allow the Agency to issue conditional approvals in certain limited circumstances. EPA proposed to limit conditional approvals to situations where the actions necessary to address the noncompliance are straightforward and the facility will be able to take the necessary actions well before the extended deadline that it requested. EPA further described the situations where a conditional approval might be appropriate as those that involve relatively straightforward technical issues where the remedies for the noncompliance are easily identified and quickly implemented. In such cases, EPA noted that conditions can be readily developed to bring the facilities into compliance and allow EPA to evaluate whether the conditions are met based on appropriate documentation.

EPA then identified specific examples of situations in which the Agency anticipated that the characteristics necessary to support a conditional approval might (and might not) be present.⁴⁸ Specifically, EPA stated in the Spurlock proposal that the Agency did not anticipate issuing conditional approvals in cases where “the noncompliance involves more complicated technical issues where the specific actions necessary to come into compliance cannot be easily identified and/or cannot be remedied quickly.”⁴⁹ EPA further stated that the necessary conditions

⁴⁸ See Spurlock Proposal pgs. 9-13.

⁴⁹ See Spurlock Proposal at pg. 13.

to bring a facility into compliance are likely to be more complicated and time-consuming where a facility is not in compliance with corrective action requirements or where a facility is out of compliance with several regulatory requirements. *Id.* EPA concluded by stating that “[i]n situations in which there is affirmative evidence of harm at the site, such as where a facility has delayed corrective action, EPA cannot grant additional time for the impoundment to operate without some evidence that these risks are mitigated,” and that the Agency would evaluate each demonstration on a case-by-case basis to determine whether a conditional approval is warranted based on the facts surrounding each facility. *Id.* EPA is incorporating the justification for granting conditional approvals set forth in the proposed Spurlock decision. Based on a case-specific review, EPA is proposing to find that A.B. Brown meets the criteria discussed in Spurlock for a conditional approval even though its situation has some characteristics that EPA warned in Spurlock might make it difficult to meet the criteria for a conditional approval (e.g. corrective action issues).

For A.B. Brown, EPA conducted a thorough review of its Demonstration and additional information from SIGECO. Based on that review, EPA developed conditions that are straightforward, and EPA believes that compliance with the proposed conditions can be evaluated based on the documentation EPA proposes to require. In addition, the conditions EPA developed will require compliance in a short enough time period after the final decision that a conditional approval would not authorize a sustained period of continued operation of a deficient CCR surface impoundment without evidence that the risks are being adequately mitigated. EPA recognizes that there appears to have been a delay in implementing required corrective actions at A.B. Brown, but EPA believes that A.B. Brown’s compliance with the conditions set forth below

will mitigate the harm caused by the delay in corrective action by significantly speeding up the implementation of adequate corrective action measures.

For all these reasons, EPA is proposing to conditionally approve an extension of the cease receipt of waste date for A.B. Brown to use the Ash Pond until October 15, 2023, provided that the following conditions are met:

1. No later than 30 days after the date of EPA's final decision,⁵⁰ SIGECO shall post on its public CCR website a statement committing to meet all of the conditions to qualify for the conditional approval.
2. No later than 30 days after the date of EPA's final decision, SIGECO shall certify that the coal-fired boilers will be retired not later than October 15, 2023.
3. No later than 30 days after the date of EPA's final decision, SIGECO shall certify that the expanded SSRP will meet the placement above the uppermost aquifer location restriction. 40 C.F.R. § 257.60.
4. No later than 90 days after the date of EPA's final decision, SIGECO shall amend the Ash Pond's closure plan to meet the closure time frame outlined in 40 C.F.R. § 257.102 (f)(1)(ii). SIGECO shall also post the amended closure plan on the facility website.
5. No later than 30 days after the date of EPA's final decision, SIGECO shall amend and submit to EPA for approval all Annual GWMCA Reports to include all the data obtained under 40 C.F.R. §§ 257.90 through 257.98 as required by 40 C.F.R. § 257.90(e)(3). This condition will not be met until EPA approves the revised plans. This includes, but is not limited to:
 - a. Groundwater quality data, including laboratory analysis reports and statistical analyses;

⁵⁰ The date of EPA's final decision means the date that the decision is signed, not the effective date of the decision.

- b. Groundwater elevation measurements and calculations of groundwater flow rate and direction;
 - c. For the applicable Brown Landfill GWMCA Reports, amend past statistical analyses to utilize interwell comparisons instead of intrawell comparisons in the revised GWMCA Reports;
 - d. Any other environmental data obtained under 40 C.F.R. §§ 257.90 through 257.98, such as environmental samples to characterize site conditions to assess corrective measures, including sampling records and laboratory analytical reports.
6. No later than 60 days after the date of EPA's final decision, SIGECO shall submit to EPA for approval revised plans for the groundwater monitoring systems for the Ash Pond and Brown Landfill that meet the performance standard required by 40 C.F.R. § 257.91. This condition will not be met until EPA approves the revised plans. The plans must ensure the systems address the following items:
- a. Characterization of groundwater flow direction around the CCR units, taking into account seasonal or temporal fluctuations and any effects of extraction wells, supported by a sufficient number of groundwater elevation measurements, appropriately located and spaced, to support a determination that the proposed groundwater monitoring systems meet the criteria in 40 C.F.R. §§ 257.91(a) and (b);
 - b. Identification of wells at the downgradient waste boundary of the CCR units, with rationale explaining why these wells are sufficient in number and spacing to monitor all potential contaminant pathways, consistent with the performance standard in 40 C.F.R. § 257.91(a)(2) and based on criteria in 40 C.F.R. § 257.91(b); and

- c. P.E. certifications that include all information the P.E. relied upon in making the certification, and which clearly document how the P.E. determined the revised groundwater monitoring systems meet the performance standards in 40 C.F.R. § 257.91.
7. No later than 60 days after the date of EPA's approval of the revised plan for a groundwater monitoring system at a CCR unit, SIGECO shall complete installation of any new wells at that unit.
8. No later than 60 days after the date of EPA's final decision, SIGECO shall submit to EPA for approval revised sampling and analysis plans for the Ash Pond and the Brown Landfill that meet the standards in 40 C.F.R. § 257.93. The sampling and analysis plan for each CCR unit must describe sampling and analytical procedures, including field sampling and calibration procedures and statistical approaches to be used to collect and analyze groundwater samples and report the results. This condition will not be met until EPA approves the revised plans. The plans must address the following items:
- a. All information required by 40 C.F.R. § 257.93(a);
 - b. Specific procedures to be followed to comply with requirements in 40 C.F.R. § 257.93(b) through (e), (g) and (h);
 - c. Information about specific statistical procedures to be used (e.g., statistical method selected(s), performance criteria applied) that documents how these procedures comply with 40 C.F.R. §§ 257.93(f) and (g);
 - d. Anticipated quantitation limits based on consultation with the certified laboratory to be used to conduct analyses, in accordance with 40 C.F.R. § 257.93(g)(5), and designation of maximum acceptable quantitation limits which, if exceeded, would require resampling;
 - e. An accelerated sampling schedule to address the following:

- i. obtain a minimum of eight independent baseline groundwater samples from each new well in accordance with 40 C.F.R. § 257.94(b) as soon as feasible;
 - f. continue assessment monitoring at the CCR units, in accordance with 40 C.F.R. § 257.95; and
 - g. A P.E. certification that the statistical method(s) selected are appropriate for evaluating groundwater monitoring data at the CCR units, in accordance with 40 C.F.R. § 257.93(f)(6), and includes a narrative description of how the statistical method(s) selected meet those requirements.
- 9. No later than 60 days after the date of EPA's approval of the sampling and analysis plan for a CCR unit, or no later than 30 days after installation of any new wells at that unit, whichever is later, SIGECO must begin groundwater sampling described in the approved plan.
- 10. No later than 60 days after EPA's approval of the sampling and analysis plan for each CCR unit, SIGECO must conduct statistical analyses that meet the performance standards in 40 C.F.R. § 257.93(g) on all monitoring data obtained from the revised groundwater monitoring system.
 - a. Groundwater Protection Standards must be established for constituents in Appendix IV to 40 C.F.R. 257 Subpart D;
 - b. Using interwell comparisons, these data must be evaluated for SSLs above the groundwater standard for each constituent in Appendix IV to 40 C.F.R. 257 Subpart D;
 - c. All data must be included in the statistical analysis unless there is evidence that a sampling, analytical or data recording or transcription error has occurred, or it is an elevated statistical outlier detected in an upgradient background well; and

- d. After statistical analyses are completed, they must be included in an Annual GWMCA Report for the year in which the analyses were required.
11. No later than 180 days after the date of EPA's final decision or no later than 240 days after a final decision if additional Appendix IV constituents are identified in the corrected statistical analyses, SIGECO shall submit to EPA for approval an ACM for the Brown Landfill to assess alternatives to address all constituents with a detected SSL. This condition will not be met until EPA approves the amended ACM.
 12. No later than 60 days after the date of EPA's final decision, SIGECO shall decommission groundwater well CCR-LF-4 and install one or more replacement well(s) that meets 40 C.F.R. § 257.91(a)(2).
 13. No later than 90 days after the date of EPA's final decision, SIGECO shall submit a revised ACM for the Ash Pond. This condition will not be met until EPA approves the revised ACM and it is posted on the facility website. The ACM must address the following:
 - a. Characterization of the release of each Appendix IV constituent with an SSL, including a plume map estimating the lateral and vertical extent of the release of the constituent and the calculated mass of the release;
 - b. Characterization of site conditions that may affect the expected performance of each remedial technology assessed. This includes, but is not limited to, chemical and physical properties of site media (soil, groundwater, etc.) in the area of the release (e.g., pH, oxidation reduction potential, iron, chemicals necessary to facilitate any chemical reactions or other mechanisms upon which the remedial technologies rely);
 - c. Provide relative, quantitative assessment of the performance of each remedial technology according to each criterion listed in 40 C.F.R. § 257.96(c). A range of technologies,

including groundwater containment and treatment approaches, must be assessed in the ACM. MNA that relies on mechanisms that site data indicate are potentially occurring and that immobilize CCR constituents in groundwater may be included in the assessment.

MNA that relies on dilution and dispersion may not be included in the assessment; and

- d. All assessments in the ACM must be supported by information about how the remedial technology works and will meet the remedy requirements listed in 40 C.F.R. § 257.97(b).

14. If groundwater monitoring or statistical analyses conducted after EPA's final decision identify SSLs of additional Appendix IV constituents at the Ash Pond, SIGECO must, within 90 days of completing an analysis that identifies an SSL, submit to EPA either an ASD providing substantive evidence that the SSL came from a source other than the Ash Pond or initiate a revised ACM to assess alternatives to address all constituents with a detected SSL. This condition will not be met until EPA approves the ASD or revised ACM.

1. Proposed Procedures

EPA does not intend that the addition of these conditions establish independently enforceable requirements. Rather, existing statutory and regulatory requirements remain enforceable in accordance with their terms. These added conditions must be met in order for SIGECO to obtain, and maintain, approval for an alternative deadline pursuant to 40 C.F.R. § 257.103(f)(1). This means that failure to meet the conditions would result in revocation of the conditional approval, but that failure would not itself be grounds for enforcement action. Instead, SIGECO may be subject to enforcement of any underlying noncompliance upon which the conditions were premised and SIGECO would be subject to enforcement for noncompliance if it continued to use the surface impoundment past the new deadline to cease receipt of waste, as

well as for any other noncompliance either identified in the final decision or detected apart from this process.

EPA is further proposing that, if SIGECO fails to meet any of the conditions in the final decision, the conditional authorization will be automatically revoked and will convert to a denial. In such an event, EPA is proposing that SIGECO's deadline would revert to 135 days from the date of EPA's final decision, which is the deadline that would have been established had EPA originally denied the extension request. See Section IV.B.2 of this document for further discussion of the basis for that deadline. In addition, if EPA notifies SIGECO that EPA has determined that a submission required under any of the conditions listed above does not meet the relevant performance standards, EPA is proposing that the conditional approval would automatically convert to a denial as of the date of the notification to SIGECO. In such case, the new deadline to cease receipt of waste would be 135 days from the date of the notification.

EPA is proposing that SIGECO post a notice on its public CCR website within 5 days of meeting each condition. EPA is not proposing to provide an opportunity for notice and comment or to otherwise establish any process to further adjudicate issues relating to SIGECO's compliance with the conditions. EPA may approve a submitted plan with or without comments or may deny the plan outright. In either case EPA does not intend to provide any opportunity for further consultation. EPA will notify SIGECO if the Agency determines that a condition has not been met, even if the Agency has not yet determined the form or timing of the notification. One option that EPA is considering would be to send a letter to SIGECO and post a notice on the Agency's website. EPA requests comment on whether these procedures would be appropriate, and on whether there are alternative mechanisms that would be more appropriate.

Although EPA is proposing a conditional approval, EPA is also taking comment on whether it should deny the extension request on the grounds that the request fails to demonstrate that the facility meets the requirements of 40 C.F.R. § 257.103(f)(1)(iv) based on the proposed findings of noncompliance identified in Section III above. EPA is doing so in case EPA determines that the regulations should not be interpreted to allow conditional approvals or EPA determines that circumstances make a conditional approval inappropriate in this case. Such circumstances might include: substantial disagreement about the conditions that would be necessary to come into compliance, SIGECO's indication that it is not interested in a conditional approval, or the actions necessary to come into compliance would take longer than the amount of time that would be granted to continue operation of the unit. If EPA determines that a conditional approval is not appropriate under the circumstances, EPA will issue a denial as its final decision.

B. Deadline to Cease Receipt of Waste

1. Conditional Approval

EPA is proposing that SIGECO's deadline to cease receipt of waste will be October 15, 2023, for the Ash Pond, provided that SIGECO meets all of the conditions set forth above. If SIGECO fails to meet all of the specified conditions, or ceases to comply with any of the conditions, then its conditional approval will convert to a denial. EPA is proposing that in such an event SIGECO's deadline to cease receipt of waste would be determined consistent with Section IV.A.1 above.

2. Denial

This section proposes the new deadline to cease receipt of waste in the event that EPA's final decision denies SIGECO's request for an extension or that EPA issues a conditional approval that converts to a denial.

EPA is proposing that SIGECO must cease receipt of waste within 135 days of the date of the Agency's final decision (i.e., the date on which the decision is signed). EPA is further proposing that, under certain circumstances described below, EPA could authorize additional time for SIGECO to continue to use the impoundment to the extent necessary to address demonstrated grid reliability issues, if any, provided that SIGECO submits a planned outage request to MISO within 15 days of the date of EPA's final decision and SIGECO provides the MISO determination disapproving the planned outage and the formal reliability assessment upon which it is based to EPA within 10 days of receiving them.⁵¹

The regulations state that, when EPA denies an application for an extension, the final decision will include the facility's deadline to cease receipt of waste, but the regulations do not provide direction on what the new deadline should be. 40 C.F.R. § 257.103(f)(3). EPA is proposing to set a new deadline for SIGECO to cease receipt of waste that would be 135 days from the date of the final decision denying the request in SIGECO's Demonstration. This would provide SIGECO with the same amount of time that would have been available to the facility had EPA issued a denial immediately upon receipt of the Demonstration (i.e., from November 25, 2020, when EPA received the submission, to April 11, 2021, the regulatory deadline to cease receipt of waste). This amount of time thus puts the facility in the same place it would have been had EPA immediately acted on the Demonstration and therefore adequately accounts for any equitable reliance interest SIGECO may have had after submitting its Demonstration. Moreover, as discussed further below, this date should provide SIGECO with adequate time to coordinate

⁵¹ EPA is proposing the same process for evaluating electric reliability impacts as set forth in the proposed Part A decisions issued on January 11, 2022. EPA received comments on the process for determining electric reliability impacts. EPA continues to evaluate those comments and will respond to them when EPA issues a final decision on one or more of the January 11, 2022, proposed determinations. This proposed action is not a response to those comments and no final decision has been made to date.

with and obtain any necessary approvals from MISO for any outage of the coal-fired boiler that may be necessary. This proposed deadline for SIGECO to cease receipt of waste is the same as the proposed effective date of EPA's final decision if EPA denies the request (see Section VI below).

Given that this proposed deadline (135 days from the date of EPA's final decision) is sooner than the deadline requested by SIGECO, EPA understands that it is likely that the coal-fired boilers associated with the CCR units will temporarily need to stop producing waste (and therefore power) until either construction of the alternative disposal capacities is completed and commercially operational or some other arrangements are made to manage its CCR and/or non-CCR wastestreams. See discussion of adverse effects above in Section III.B. In SIGECO's Demonstration they note that A.B. Brown is essential to the generation capacity within the fleet and region and if the requested deadline were not granted, it could experience a shortfall as early as 2022. SIGECO provided no information or evidence to support the statement.

This facility operates as part of the MISO system, which is a regional transmission organization (RTO) that is part of the Eastern Interconnection grid. Comments submitted by MISO on the first batch of Part A decisions proposed on January 25, 2022, indicate that whether a particular outage will actually have an adverse, localized impact on electric reliability or otherwise adversely affect the reliability of the grid must be determined based on the fact-specific circumstances associated with each proposed outage.

EPA does not currently have independent evidence showing that the temporary outage of the coal-fired boiler at A.B. Brown would trigger local reliability violations or would otherwise adversely affect resource adequacy requirements.⁵² In addition, especially with the advance

⁵² A local reliability violation might occur, for example, if transmission line constraints limit the amount of power that can get to an area from plants outside that area.

notice, there are a wide array of tools available to utilities, system operators, and state and federal regulators to address situations where the outage of a generating unit might otherwise affect local electric reliability conditions. For example, MISO noted that the impact of any specific planned outage could potentially be managed by strategically scheduling, staggering, or structuring the outage (full outage versus partial, for example) to evaluate reliability concerns. They further noted that such determinations will need to be based on the fact-specific circumstances of the outage in question, including consideration of other planned outages anticipated on the system and transmission related issues.

EPA is sensitive to the importance of maintaining enough electricity generating capacity to meet the region's energy needs, including meeting specific, localized issues. EPA understands that it is possible that in some instances temporarily taking any large generating units (including coal-fired units) offline could have an adverse, localized impact on electric reliability (e.g., voltage support, local resource adequacy). If a generating asset were needed for local reliability requirements, the grid operator (e.g., MISO) might not approve a request for a planned outage. In such instances, the owners/operators of the generating unit could find themselves in the position of either operating in noncompliance with RCRA or halting operations and thereby potentially causing adverse reliability conditions.

EPA is obligated to ensure compliance with RCRA to protect human health and the environment. Where there is a conflict between timely compliance and electric reliability, EPA intends to carefully exercise its authorities to ensure compliance with RCRA while taking into account any genuine, demonstrated risks to grid reliability identified through the process

established by MISO that governs owner/operator requests for planned outages and/or deactivation.⁵³

Accordingly, EPA is proposing to rely on established processes and authorities used by MISO to determine whether a planned outage necessary to meet the new deadline would cause a demonstrated grid reliability issue. MISO is responsible for coordinating and approving requests for planned outages of generation and transmission facilities, as necessary, for the reliable operation of the MISO RTO.⁵⁴ In MISO, power plants are normally required to submit a request at least 26 weeks in advance of a planned outage to allow MISO to evaluate whether the resource is needed to maintain grid reliability, among other scheduling considerations. MISO will grant the request unless it determines that the planned outage would adversely affect reliability. MISO has indicated it will be able to provide an initial assessment of reliability within 135 days.

If MISO approves a planned outage request, the outage may proceed and there would be no reason to expect that the outage would affect reliability. However, if MISO disapproves a planned outage, the procedure is for the MISO member to submit a new planned outage request for MISO to evaluate (with potential proposals to mitigate previously indicated reliability violations with the prior request). This process is repeated until the generating facility submits an acceptable request. The MISO member may also request MISO's assistance in scheduling a planned outage. MISO may rely on different bases in determining whether to deny a request for a planned outage. For example, a denial may be issued because of timing considerations taking into account previously approved planned outage requests, in which case the EPA would expect the plant owner to work with MISO to plan an outage schedule that can be approved by MISO

⁵³ See MISO Tariff available at www.misoenergy.org/legal/tariff.

⁵⁴ See, MISO Outage Operations Business Practices Manual, BPM-008-r19, Effective Date: September 21, 2021, page 14, available for download at <https://www.misoenergy.org/legal/business-practice-manuals/>.

and also satisfies the plant owner's RCRA obligations, without regard to any cost implications (e.g., in meeting any contractual obligations with third parties) that may result for the plant owner under a revised proposed outage schedule.

Alternatively, however, in some cases, MISO might deny a request should it determine that the planned outage could not occur without triggering operational reliability violations. In such cases, the system operator might determine that the generating unit would need to remain in operation until remedies are implemented. As set forth above, SIGECO has presented no evidence that such is the case with this facility.

For A.B. Brown, EPA is proposing to rely on MISO's procedures for reviewing planned maintenance outage and similar requests. Accordingly, EPA is proposing that, if MISO approves SIGECO's request, EPA would not grant any further extension of the deadline to cease receipt of waste (i.e., the deadline would be 135 days from the date of EPA's final decision). If, however, MISO disapproves SIGECO's planned outage request based on a technical demonstration of operational reliability issues, EPA is proposing that, based on its review of that disapproval and its bases, EPA could grant a further extension (i.e., beyond 135 days from the date of EPA's final decision). EPA is further proposing that such a request could only be granted if it were supported by the results of the formal reliability assessment(s) conducted by MISO that established that the temporary outage of the boiler during the period needed to complete construction of alternative disposal capacity would have an adverse impact on reliability. In such a case EPA is proposing that, without additional notice and comment, it could authorize continued use of the impoundments for either the amount of time provided in an alternative schedule proposed by MISO, or the amount of time EPA determines is needed to complete construction of alternative disposal capacity based on its review of the Demonstration, whichever is shorter. EPA is further

proposing that a disapproval from MISO without a finding of technical infeasibility for demonstrated reliability concerns would not support EPA's approval of an extension of the date to cease receipt of waste because any concern about outage schedules and their implications for plant economics could be resolved without an extension of RCRA compliance deadlines (e.g., through provision of replacement power and/or capacity; rearranging plant maintenance schedules; reconfiguration of equipment).

To obtain an extension, EPA is proposing that SIGECO must submit a request for an outage or suspension to MISO within 15 days of the date of EPA's final decision. To avoid the need for serial requests and submissions to MISO, EPA is proposing to require SIGECO to contact MISO and request assistance in scheduling the planned outage so that SIGECO and MISO can determine the shortest period of time during an overall planned outage or suspension period in which the generating unit must be online to avoid a reliability violation. EPA expects that SIGECO and MISO would plan the outage(s) and return-to-service periods – and any other needed accommodations – in ways that minimize the period of actual plant operations.

Finally, to obtain an extension from EPA, SIGECO must submit a copy of the request to MISO and the MISO determination (including the formal reliability assessment) to EPA within 10 days of receiving the response from MISO. EPA will review the request and, without further notice and comment, issue a decision.

One hundred and thirty-five days should normally provide adequate time for MISO to provide an initial determination whether a planned outage of a generating unit will cause a reliability issue. According to the MISO Tariff, section 38.2.5 (at PDF page 628), the normal process for obtaining approval for a planned outage occurs within 26 weeks.⁵⁵ EPA also believes

⁵⁵ MISO Tariff, Effective On: November 19, 2013, available for download at <https://www.misoenergy.org/legal/tariff/>.

135 days will provide sufficient time to accommodate multiple requests, if necessary, to determine whether a reliability issue exists. However, EPA solicits comment on whether 135 days from the date of the final decision provides sufficient time to accommodate the normal process of obtaining approval for a planned outage.

V. Conclusion

EPA is proposing to conditionally approve the extension request in the Demonstration submitted by SIGECO. If EPA's final action is a denial, SIGECO must cease receiving waste within 135 days of EPA's final decision. If EPA determines that circumstances warrant a conditional approval, as described above, and SIGECO provides appropriate commitments in response to this proposal that it is interested in accepting a conditional approval, EPA is proposing to condition this approval on SIGECO timely taking those actions specified in Section IV.A of this proposed decision. If finalized, a conditional approval would allow SIGECO to continue placing CCR wastestreams into the Ash Pond until October 15, 2023. If at any time SIGECO fails to comply (or ceases compliance with) any of the conditions, the proposed conditional approval would terminate and revert to a denial. In such a case the deadline to cease receipt of waste would be as discussed in Section IV.B.2 above.

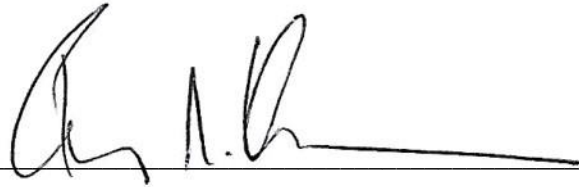
VI. Effective Date for Denial

EPA is proposing to establish an effective date for the final decision on SIGECO's Demonstration of 135 days after the date of the final decision (i.e., the date that the final decision is signed). EPA is proposing to align the effective date with the new deadline that EPA is proposing to establish for SIGECO to cease receipt of waste. EPA is doing so for all of the

reasons discussed as the basis for proposing to establish the new cease receipt of waste discussed in Section IV of this document.

10/05/2022

Date



Barry N. Breen

Acting Assistant Administrator