BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

SIERRA CLUB, PRAIRIE RIVERS NETWORK, and NATIONAL ASSOCIATION FOR THE ADVANCEMENT OF COLORED PEOPLE,	)	
Complainants,	)	PCB 18-11 (Citizen Enforcement – Water)
v.	)	
CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES d/b/a CITY WATER, LIGHT AND POWER,	)	
Respondent.	)	

NOTICE OF FILING

To: Don Brown, Clerk
Illinois Pollution Control Board
60 E. Van Buren St., Ste. 630
Chicago, Illinois 60605

Please take notice that today I have electronically filed with the Office of the Clerk of the Illinois Pollution Control Board **THE CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES d/b/a CITY WATER, LIGHT AND POWER'S MOTION IN LIMINE,** which is attached and copies of which are herewith served upon you.

Respectfully submitted,

THE CITY OF SPRINGFIELD,
a municipal corporation

Dated: April 7, 2026

By: *Deborah J. Williams*

One of its Attorneys

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THE CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES d/b/a CITY WATER, LIGHT AND POWER'S MOTION IN LIMINE

1. NOW COMES Respondent, the City of Springfield, Office of Public Utilities (the "City") d/b/a City Water, Light and Power ("CWLP"), by and through its counsel and pursuant to 35 Ill. Adm. Code 101.502, and submits this Motion in Limine to the Hearing Officer for the above-captioned proceeding. CWLP respectfully requests that the Hearing Officer issue an Order barring evidence (1) of alleged exceedances of groundwater standards for parameters other than boron, sulfate and TDS and (2) of alleged exceedance of groundwater standards at monitoring wells not identified in the Complaint or Board Order on liability at the May 5, 2026 hearing from expert witness Mark Hutson. In support thereof, CWLP states as follows:

2. On September 27, 2017, Complainants Sierra Club, Prairie Rivers Network ("Prairie Rivers") and the National Association for the Advancement of Colored People ("NAACP") filed a single-count Complaint with the Illinois Pollution Control Board ("Board") alleging that groundwater contamination has and continues to cause violations of Sections 12(a)

and 12(d) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/12(a) and(d), and Sections 620.115, 620.301(a), and 620.405 of the Board's regulations. 35 Ill. Adm. Code 620.115, 620.301(a), 620.405.

3. Complainants filed a Motion for Partial Summary Judgment on the issue of liability on January 29, 2020. CWLP filed its own Motion for Summary Judgment on the issue of remedy on the same date. Responses to the cross-motions were filed on February 13, 2020, and February 27, 2020, respectively. Complainants also filed a motion for permission to file a Reply to the CWLP's Response. All motions were denied. *See* PCB 2018-11, Interim Opinion and Order of the Board at 31–32 (June 17, 2021).

4. In its June 17, 2021 Order denying the cross motions for partial summary judgment, the Board, *on its own Motion,* bifurcated the liability and remedy phases in this matter, stating as follows:

> "The Board directs that the hearing officer and the parties proceed expeditiously to hearing on all violations alleged in the amended complaint. ***All evidence related to the alleged violations may be admitted under 35 Ill. Adm. Code 101.626. If, after hearing, the Board finds that CWLP violated the Act or Board regulations as alleged by Citizen Groups, the Board will order a separate hearing on remedies, including civil penalties.*** See 35 Ill. Adm. Code 103.212(d) ("The Board in its discretion may hold a hearing on the violation and a separate hearing on the remedy.")." Slip Op. at 31-32 June 17, 2021 (emphasis added).

5. On June 24, 2022, Complainants filed their "Renewed" Motion for Summary Judgment regarding the remaining issues of material fact and questions of law prior to the Board's final decision on the issue of liability. In response, on July 25, 2022, CWLP did not dispute the absence of remaining issues of material fact or questions of law on the issue of liability, but did make the single argument that any alleged exceedances of the Part 620 groundwater protection standards after April 21, 2021, were improper because 35 Ill. Adm. Code Part 845 ("Part 845") became effective on that date, making CWLP no longer subject to the Part 620 Class I groundwater

protection standards for constituents regulated by Part 845. CWLP asserted that this reflected the Illinois Environmental Protection Agency's intent in proposing Part 845 groundwater protections standards that differed from those in Part 620. Complainants did not respond to or object to this characterization. *Nevertheless*, on September 7, 2023, the Board found that "[w]hile the administrative record in Docket R20-19 cited by CWLP may show IEPA's intention for Part 620 standards to not apply during the active life of a CCR impoundment, the Board did not codify the Agency's intent as an exemption in Part 845." September 7, 2023 Board Order at 8. Therefore, "the plain language of the Part 845 rules does not establish an exemption from Part 620 standards," and CWLP remained liable for violations of the Part 620 standards even after Part 845 effective date. *Id.*

6. In granting summary judgment on liability, the Board specified the limitations of its ruling as follows:

> "Having resolved the contested allegations in the renewed motion for partial summary judgment, the Board does not make a finding on the following allegations from the complaint and the amended complaint that the Citizen Groups are not seeking a finding on:
>
> 1. whether CWLP surface impoundments caused exceedances of groundwater quality standards at monitoring well AW-3;
>
> 2. whether exceedances of groundwater quality standards for arsenic, chromium, iron, lead, and manganese detected at downgradient monitoring wells AP-1, AP1R, AP-2, AP-2R, AP-3, and AW-3 at concentrations less than corresponding background levels were caused by CWLP surface impoundments; and
>
> 3. whether isolated manganese and arsenic concentrations detected reflect contaminant releases from CWLP surface impoundments. Mot. at 2.
>
> Therefore, the Board makes no findings on those specific issues, and instead relies on the findings of the June 2021 Order." *Id*. at 9.

Finally, the Board issued a clear and unambiguous statement of its liability finding in this matter:

> "The Board grants the Citizen Groups motion for summary judgment. The Board finds that there are no issues of genuine fact that CWLP violated Sections 12(a) of the Act and Sections 620.115, 620.301(a) and 620.405 of the Board's groundwater rules ***for the discharge of boron, sulfate, and TDS at wells AP-1R, AP-2, AP-2R, and AP-3***." *Id*. at 9. (emphasis added).

7. Following the Board's 2023 opinion in this matter which declined to accept the parties' undisputed interpretation of the intent of the regulations, stakeholders utilized the open docket in R22-18 to clarify the interaction between Part 845 and Part 620. No stakeholders commented negatively on the clarification proposal and ultimately the Board adopted language in Section 620.240(h) classifying groundwater subject to Part 845 as Class IV groundwater. *See generally,* In the Matter of: Proposed Amendments to Groundwater Quality (35 Ill. Adm. Code 620), R22-018; *see also* 35 Ill. Adm. Code 620.240(h), Amended at 49 Ill. Reg. 488, effective March 28, 2025.

8. On June 23, 2025, CWLP filed a motion with the Board pursuant to 35 Ill. Adm. Code 101.508 respectfully requesting that the Board enter an Order Preliminary to Hearing clarifying the scope of available remedies by finding the following: (1) CWLP's violations of Sections 12(a) and 12(d) of the Act based on exceedances of Part 620's Class I groundwater protection standards for boron, sulfate, and total dissolved solids ceased, at the very latest, on March 28, 2025, due to the Board's recent amendment to Part 620; (2) Given that exceedances of boron, sulfate, and total dissolved solids have ceased as of March 28, 2025, the remedies available to Complainants are narrowed to declaratory relief and penalties, as Complainants allege only wholly past violations, which are now moot and for which injunctive relief is not available; and (3) Based on such a finding, the Board

and/or its Hearing Officer will prohibit admission of any evidence related to exceedances of boron, sulfate, and total dissolved solids, or any other parameter for which there is a standard in Part 845, occurring after March 28, 2025, in addition to any evidence supporting a request for a cease-and-desist order or other injunctive relief—CWLP respectfully requests that only evidence related to the Complainants' requested declaratory relief and penalties be permitted at the remedy hearing.

9. On November 5, 2025, the Hearing Officer issued an order denying Respondent's Motion to the Board Preliminary to Hearing. On November 19, 2025, Respondent filed a Motion for Interlocutory Appeal from Hearing Officer Order, which was denied by the Board on January 22, 2026. In the denial Order the Board provided the following guidance to the parties:

> "However, CWLP is asking to exclude evidence which may or may not be probative in deciding the scope of remedy. The Board finds the hearing officer correctly denied the motion and affirms that denial. CWLP may renew its objections to specific lines of inquiry or specific evidence at hearing; however, the Board will not simply deny admission of evidence in this manner. The hearing officer, in the course of the hearing, is better able to make those determinations." January 22, 2026 Board Order Slip. Op. at 3.

The Hearing Officer Should Not Allow Testimony Regarding Alleged Exceedances of Parameters <u>Other Than</u> Boron, Sulfate and TDS in this Remedy Phase Hearing

10. Section 101.626 of the Board's rules provides that:

> "the hearing officer will admit evidence that is admissible under the rules of evidence as applied in the civil courts of Illinois, except as otherwise provided in this Part or 35 Ill. Adm. Code 105.
>
> a. Evidence. The hearing officer may admit evidence that is material, relevant, and would be relied upon by prudent persons in the conduct of serious affairs, unless the evidence is privileged."

35 Ill. Adm. Code 101.626.

11. For evidence to be admitted at the remedy hearing in this matter it must be "material" and "relevant." Evidence is material when it is offered to prove a theory at issue or is probative. *Migliore v. County of Winnebago* (1974) 24 Ill. App. 3d 799, 803, 321 N.E.2d 476, 480. Illinois courts have consistently defined "material" facts as those that might influence the outcome of the case. For instance, a material fact is one that could affect the result of the case when viewed in light of the substantive law governing the claim or defense. *Robinson v. City of Chicago*, 2025 IL App (1st) 232174 (2025); *Thia v. Triumvera 600 Naples Court Condo. Ass'n,* 2020 IL App (1st) 192408 (2020). Evidence or facts that do not pertain to a matter at issue under the substantive law are considered "immaterial" and should be excluded from consideration. 1 Illinois Evidence Courtroom Manual § 401.5 (2026).

12. Illinois law defines relevant evidence as evidence having "any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence." Ill. R. Evid. 401. This standard is codified in Illinois Rule of Evidence 401 and has been consistently applied in Illinois case law. See *People v. Safranek*, 2025 IL App (4th) 240967 (2025); *People v. Gordon*, 2017 IL App (3d) 140770 (2017); *Swift v. Schleiche*r, 2017 IL App (2d) 170218 (2017). "Relevancy is established where a fact offered tends to prove a fact in controversy or renders a matter in issue more or less probable." *People v. Monroe,* 66 Ill. 2d 317, 321; quoting *Marut v. Costello,* 34 Ill. 2d 125, 128. Relevant evidence means that the evidence tends to make a fact more or less probable than without the evidence or the fact is of consequence in determining the action. Fed. R. Evid. 401; *Jacobs v. Yellow Cab Affiliation, Inc*., 2017 IL App (1st) 151107, P34; *DiCosola v. Bowman*, 342 Ill. App. 3d 530, 535, 794 N.E.2d 875, 879, 276 Ill. Dec. 625 (2003); *Modelski v. Navistar Int'l Transp. Corp*., 302 Ill. App. 3d 879, 886. Irrelevant evidence is not admissible. Fed. R. Evid.

401. If the proposed evidence will not assist in resolving the question of fact, the evidence should be excluded. *Jacobs v. Yellow Cab Affiliation, Inc*., 2017 IL App (1st) 151107, P34; *First Midwest Trust Co. v. Rogers*, 296 Ill. App. 3d 416, 430, 701 N.E.2d 1107, 1116, 233 Ill. Dec. 833 (1998). Irrelevant evidence is evidence which does not possess a tendency to make existence of fact to be proved more probable or less probable. Fed. R. Evid. 401; *United States v. Quinto*, 582 F.2d 224, 42 A.F.T.R.2d (RIA) 5601, 1978-2 U.S. Tax Cas. (CCH) ¶ 9633, 78-2 U.S. Tax Cas. (CCH) ¶ 9633, 3 Fed. R. Evid. Serv. (CBC) 1097, 1978 U.S. App. LEXIS 9717 (2d Cir. 1978).

13. Complainants' expert witness Mark Hutson presents opinion evidence in his expert report of alleged exceedances of groundwater standards for parameters other than boron, sulfate and TDS. Testimony from the Complainants' purporting to present and rely on alleged exceedances of groundwater standards for parameters that were not addressed in the Board's liability finding and were specifically identified as parameters for which the Board was making no finding cannot be deemed relevant or material to the determination of the appropriate remedy to address the liability finding. The Board clearly ordered that the liability in this matter was for the discharge of boron, sulfate and TDS. The Board specifically and intentionally did not make a finding of liability for other parameters including arsenic, chromium, iron, lead, and manganese. Evidence related to alleged exceedances of arsenic, cobalt or other parameters not included in the liability order in this matter would not be relevant or material to this liability hearing.

14. An expert's opinion is no different than any other evidence in that it is subject to relevancy requirement of Rule 401. Fed. R. Evid. 401; *Bickerstaff v. Vassar College*, 196 F.3d 435, 81 Fair Empl. Prac. Cas. (BNA) 624, 53 Fed. R. Evid. Serv. (CBC) 462, 1999 U.S. App. LEXIS 29726 (2d Cir. 1999) Expert testimony, like all other evidence, must be relevant to be admissible. *People v. Owens*, 372 Ill. App. 3d 616, 622; *Maffett v. Bliss*, 329 Ill. App. 3d 562,

574, 771 N.E.2d 445, 455-56, 264 Ill. Dec. 741 (2002). Evidence should be excluded if the proposed evidence would not assist the court in resolving the questions of fact. *People v. Owens,* 372 Ill. App. 3d 616, 622. Additionally, opinion testimony, like all other evidence, must also be relevant to be admissible. *Maffett v. Bliss,* 329 Ill. App. 3d 562, 574, 771 N.E.2d 445, 455-56, 264 Ill. Dec. 741 (2002). Where Mr. Hutson's testimony relies on alleged exceedances of groundwater quality standards that Respondent was not found liable for, such testimony cannot be relevant to the Board's remedy determination in this matter.

15. Under Illinois Rule of Evidence 402, only relevant evidence is admissible, and irrelevant evidence is inadmissible . *People v. Bliefnick*, 2024 IL App (4th) 230707 (2024). (testimony as to victims state of mind were not relevant to Defendant's guilt). However, even relevant evidence may be excluded under Illinois Rule of Evidence 403 if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, misleading the jury, undue delay, waste of time, or needless presentation of cumulative evidence. *People v. Safranek*, 2025 IL App (4th) 240967 (2025), *People v. Gordon*, 2017 IL App (3d) 140770 (2017); *Swift v. Schleicher*, 2017 IL App (2d) 170218 (2017) (in medical malpractice case, Doctor's personal practice was not relevant to his opinion testimony where it did not contradict his opinion); *Martin v. City of Chicago*, 2024 IL App (1st) 220747-U, P23; *Smith v. Lubin*, 2013 IL App (1st) 111430-U, P27. Evidence is required to be excluded when "its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." Ill. R. Evid. 403 (eff. Jan 1, 2011); *Jacobs v. Yellow Cab Affiliation*, Inc., 2017 IL App (1st) 151107, P34; *Demos v. Ferris-Shell Oil Co.*, 317 Ill. App. 3d 41, 53, 740 N.E.2d 9, 18, 251 Ill. Dec. 179 (2000). Even if the Hearing Officer were to conclude that

evidence regarding parameters not included in the liability finding were somehow relevant to the appropriate penalty to remedy the violations found by the Board, that relevance is outweighed by its unfair prejudice, confusion of the issues and causing undue delay and waste of time. For Complainants to raise the issue at this late date of the case that Respondents have caused exceedances not included in the Board's Order creates unfair prejudice for CWLP. In addition to its prejudicial nature, such testimony would require CWLP cross-examine Complainants' witness and present testimony in its case rebutting evidence of these allegations which will cause a waste of time and resources for a matter that has already been pending for over eight years. In bifurcating the issues of liability and remedy the Board did not intend to double its work. It intended to streamline the issues so that this remedy hearing will only have to address the remedy for the specific violations found in the liability phase. The parties worked cooperatively to narrow the issues at the liability phase to obviate the need for a hearing. To relitigate these already resolved issues is prejudicial, can cause confusion of the issues and a waste of time and resources.

16. When the Board rejected CWLP's argument that no liability can be found for exceedances of groundwater standards after the adoption of Part 845, the Board pointed out in its liability opinion that "Section 42(h)(1) of the Act specifically allows the Board to consider the duration and gravity of violations in determining the proper remedy for a violation." September 7, 2023, Slip Op. at 9. While it will be a legal question for the post-hearing briefs to address the impact of the 2025 adoption of the Part 620 exemption of Part 845 sources for the boron, sulfate and TDS discharges; nevertheless, it would be prejudicial to CWLP and a waste of time for the Hearing Officer to allow evidence related to this factor for parameters that were not found to have been caused by the ash ponds such as arsenic or manganese. Complainants can point to no Section

42(h) or 33(c) factors that would make this evidence relevant and any argument for their relevance is more than outweighed by its prejudicial impact, confusion of the issues and waste of time and resources.

The Hearing Officer Should Not Allow Evidence of Alleged Exceedances of Groundwater Standards at Monitoring Wells Other than AP-1, AP-2 and AP-3

17. As explained above, in resolving the liability issues in this matter the Board found as follows:

> "The Board grants the Citizen Groups motion for summary judgment. The Board finds that there are no issues of genuine fact that CWLP violated Sections 12(a) of the Act and Sections 620.115, 620.301(a) and 620.405 of the Board's groundwater rules ***for the discharge of boron, sulfate, and TDS at wells AP-1R, AP-2, AP-2R, and AP-3***." Id. at 9. (emphasis added).

And more specifically:

> "Having resolved the contested allegations in the renewed motion for partial summary judgment, the Board does not make a finding on the following allegations from the complaint and the amended complaint that the Citizen Groups are not seeking a finding on:
>
> 1. **whether CWLP surface impoundments caused exceedances of groundwater quality standards at monitoring well AW-3**;
>
> 2. whether exceedances of groundwater quality standards for arsenic, chromium, iron, lead, and manganese detected at downgradient monitoring wells ***AP-1, AP1R, AP-2, AP-2R, AP-3, and AW-3*** at concentrations less than corresponding background levels were caused by CWLP surface impoundments; and
>
> 3. whether isolated manganese and arsenic concentrations detected reflect contaminant releases from CWLP surface impoundments. Mot. at 2.
>
> Therefore, the Board makes no findings on those specific issues, and instead relies on the findings of the June 2021 Order." (emphasis added) *Id*. at 9.

18. The Board found clearly and unambiguously that wells AP-1, AP-2 and AP-3 (and their replacements) have been impacted by CWLP's ash ponds. The Board specifically did not find that CWLP's ash ponds caused any violations at monitoring well AW-3 or any other groundwater monitoring well. For the reasons explained above, allegations of exceedances of groundwater standards at any wells other than AP-1, AP-2 and AP-3 (and their 'replacements' identified with an 'R") have not been found to be caused by the ash ponds and such evidence is not relevant or material for the remedy of the violations found by the Board. Even if the Hearing Officer were to find such information to be relevant, it would be prejudicial to CWLP, would cause a confusion of the issues and would require a relitigating of the liability issues at the remedy phase as CWLP would be required to put on rebuttal evidence on these issues.

Relief Requested

For the reasons stated herein and to avoid prejudice to both parties, Respondent, City of Springfield, Office of Public Utilities d/b/a City Water, Light and Power respectfully requests that the Hearing Officer issue an order (1) excluding evidence of alleged exceedances of groundwater standards for parameters other than boron, sulfate and TDS and (2) excluding evidence of alleged exceedance of groundwater standards at monitoring wells not identified in the Complaint or Board Order on liability. This relief will not prejudice the presentation of Complainants' testimony from expert Witness Mark A. Hutson, P.G. as it will only require the redaction of one his ten "significant findings" in his original Expert Report and portions of pages 15-17 of that report (Attachment A); portions of pages 6-7 in his Rebuttal Report (Attachment B) and merely four words on page 2 of his Supplemental Expert Report (Attachment C).

Respectfully submitted,

THE CITY OF SPRINGFIELD,
a municipal corporation

Dated: April 7, 2026 By: *Deborah J. Williams*

One of its Attorneys

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ATTACHMENT A

GEO-HYDRO, INC.
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January 5, 2025

Ms. Faith Bugel
Attorney
1004 Mohawk Rd.
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Subject: Review of Closure Permit Application and Other Pertinent Materials
City, Water, Light and Power Coal Combustion Residual Impoundments
Springfield, IL

Introduction

This report was prepared following a request from Sierra Club to review available information and provide my expert opinions on options for closing the City, Water, Light and Power (CWLP) coal combustion residuals (CCR) impoundments located at the Dallman Station (Dallman) in Springfield, Illinois. CCR storage and disposal facilities associated with Dallman are located on the floodplain of Sugar Creek immediately downstream of Lake Springfield and Spalding Dam.

I recommend that waste be excavated from the site and be either beneficially reused or disposed in a secure facility. The proposed cap-in-place remedy for the Lakeside and Dallman Ash Ponds does not meet the Illinois performance standard for CCR closures[1] which requires the facility to take measures, such as engineering controls that will control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste as well as post-closure releases to groundwater from the sides and bottom of the unit. Closing the impoundments by capping them in place fails to meet performance standard for because waste located at or below the potentiometric surface would continue to be in regular contact with groundwater. Capping waste in place would also leave the units susceptible to damage or releases during flood events. For these reasons I cannot recommend simply leaving the waste in place beneath a cap.

Because the CWLP CCR units are located immediately adjacent to Sugar Creek and waste is in regular contact with groundwater, there are few options that will be effective at containing the CCR waste and eliminating potential release of contaminants into the environment. Other remedial options may reduce contaminant concentrations to some extent for as long as one or more systems are operated and maintained. The overarching problem with this site would however remain. The CWLP impoundments were constructed in a location that is very poorly suited for waste disposal facilities. The CWLP ash is currently contained in:

[1] 35 Ill. Admin. Code Section 845.750(a)(1)

- impoundments that have been poorly designed and constructed,
- impoundments known to be releasing ash-related contaminants to groundwater in concentrations well above Illinois Class I Groundwater Quality Standards,
- impoundments with bottoms located at or below the water table, and
- impoundments located on the Sugar Creek 100-year floodplain.

Throughout this report, I cite to certain documents and evidence upon which I base my observations, opinions and conclusions. That does not mean, however, that the cited materials are the only sources of supporting evidence. For example, I often draw upon information in technical papers and textbooks as well as my decades of experience working on environmental contamination from waste disposal facilities, including numerous coal ash disposal facilities, to focus my review and inform my opinions.

A central tenet of responsible waste management is that it be prevention-based. The United States Environmental Protection Agency (EPA) articulated this tenet in its 1993 guidance for owners and operators of solid waste disposal facilities stating: "Ground water is … used extensively for agricultural, industrial, and recreational purposes. Landfills can contribute to the contamination of this valuable resource if they are not designed to prevent waste releases into ground water … Cleaning up contaminated ground water is a long and costly process and in some cases may not be totally successful."[2] Simply said, preventing groundwater contamination uses far fewer resources that cleaning up contamination that has already reached groundwater.

Unlike other forms of solid waste such as municipal solid waste (MSW), inorganic coal combustion residuals (CCR) and the metals contained in inorganic CCR do not biodegrade. Coal ash that is left in unlined ash basins will be capable of leaching toxic metals into Illinois groundwater and/or surface water at any time in the present, the near, or distant future for as long as soluble metals in the ash come into contact with water. This is true for unlined facilities[3] where waste is in contact with groundwater, whether or not a cap is placed on the top of the disposal area.

Therefore, effective closure of coal ash storage sites requires that the coal ash waste be securely and permanently isolated from water: including precipitation, surface water, and groundwater. Concerns over the adequacy of proposed coal ash impoundment closures typically center on the proposals ability to isolate the waste from water. Failure to isolate coal ash waste from water will result in leaching of contaminants, i.e. formation of leachate. "Leachate" "includes liquid, including any suspended or dissolved constituents in the liquid, that has percolated through or drained from waste or other materials placed in a landfill, or that passes through the containment

[2] EPA (1993), Criteria for Solid Waste Disposal Facilities, A Guide for Owners/Operators, EPA/530-SW-91-089, March 1993, p. 3, available at https://www.epa.gov/sites/production/files/2016-03/documents/landbig.pdf

[3] Facilities constructed with no low-permeability bottom liner that adequately restricts subsurface water flow.

structure (e.g., bottom, dikes, berms) of a surface impoundment."[4] If released to groundwater or surface water, leachate from coal ash impoundments impairs and degrades water quality. Due to the lack of a bottom liner, unlined coal ash impoundments "allow the leachate to potentially migrate to nearby groundwater, drinking water wells, or surface waters."[5]

Background

CWLP has notified IEPA of intent to initiate closure of the Lakeside and Dallman CCR impoundments under the requirements of 35 Illinois Administrative Code Section 845.750, Closure with a Final Cover System.[6] This letter documents the results of my review to date and identifies several significant findings that the Illinois Pollution Control Board should take into consideration when making its remedy decision to this matter. I reserve the right to amend, supplement or clarify my opinions based on the review of additional data and evidence, including any evidence contained in any additional disclosures by CWLP concerning closure of the Lakeside and Dallman ash ponds.

Summary of Significant Findings

The following are the major findings that resulted from my review to date:

- The cap-in-place closure proposed by CWLP would leave unlined ash ponds in place on the floodplain of Sugar Creek and over the original Sugar Creek channel where the disposed waste will remain in contact with groundwater.
- The proposed cap-in-place remedy for the Lakeside and Dallman Ash Ponds does not meet the Illinois performance standard for CCR closures[7] which requires the facility to take measures, such as engineering controls that will control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste as well as post-closure releases to groundwater from the sides and bottom of the unit.
- Coal ash contained within the impoundments is saturated by, and degrading the quality of groundwater within, beneath, and downgradient of the impoundments. This impairment and degradation of groundwater quality will continue post-closure unless ash and ash-constituents are effectively segregated from the groundwater flow system.
- [redacted]

[4] EPA (2015), Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, 80 Fed. Reg. (November 3, 2015) (40 C.F.R. Part 423), at pp. 67,838 and 67,847, available at https://www.govinfo.gov/content/pkg/FR-2015-11-03/pdf/2015-25663.pdf

[5] EPA (2015), at p. 67,847

[6] Andrews Engineering (2022), Final Closure Plan for Coal Combustion Residuals Surface Impoundments, contained in Attach. 13 to CWLP Closure Construction Permit Application (Feb. 2022)

[7] 35 Illinois Administrative Code Section 845.750(a)(1)

[redacted]

- The bottom of the ash impoundment is and would remain unlined under the proposed closure plan. The lack of a bottom liner and high groundwater elevation beneath the impoundments will result in some CCR being permanently submerged, and additional CCR being periodically re-wetted during flood events or periods of unusually high groundwater elevation.
- CCR contaminants will be released to the groundwater as long as soluble CCR constituents are allowed to be in continuous or intermittent contact with groundwater. Given the close proximity to the CWLP CCR impoundments, released contaminants must be expected to enter the surface water and accumulate in sediments within Sugar Creek.
- Even under a now routine flood event such as the 100-year flood[8], the Federal Emergency Management Administration (FEMA) predicts water will flow over the top Spalding Dam drop down the perimeter berm around the Lakeside Ash Pond into Sugar Creek. Catastrophic release of some portion of the CCR waste stored in the impoundment will become increasingly likely over time as storm events increase in intensity and become more common.
- As utilities have reluctantly realized that capping waste in contact with groundwater does not meet applicable performance standards, CCR closures are now being planned using alternative methods. CWLP must recognize that its proposed closure plan does not meet the performance standard and select a closure technique that is actually protective of the environment.
- Coal ash is known to be buried outside of the berms surrounding the Lakeside Ash Pond. Construction of a cap over the Lakeside Ash Pond would do nothing to eliminate contamination from wastes located outside of the berm. The appropriate closure method for the CWLP Coal Ash Ponds must address all of the disposed ash. The proposed Cap-in-Place closure does not achieve this goal.
- I recommend that waste be excavated from the site and be either beneficially reused or disposed in a secure facility. Closing the impoundments by capping them in place would reduce the amount of waste in contact with groundwater by reducing infiltration from above, but waste located at or below the potentiometric surface will continue to contaminate groundwater. Capping waste in place would also leave the units susceptible to damage or releases during flood events.

Qualifications

I express the opinions in this letter based on my formal education in geology and over 44 years of experience on a wide range of environmental characterization and remediation sites. My

[8] A 100-year flood is a flood event with a 1% annual chance of occurrence.

education includes Bachelor of Science and Masters of Science degrees in geology from Northern Illinois University and the University of Illinois at Chicago, respectively. My entire professional career has been focused on regulatory, site characterization, and remediation issues related to waste handling and disposal practices and facilities for regulatory agencies and in private practice. I have worked on contaminated sites in over 35 states and the Caribbean. My site characterization and remediation experience includes activities at sites located in a full range of geologic conditions, including soil and groundwater contamination in both consolidated and unconsolidated geologic media, and a wide range of contaminants. I have served in various technical and managerial roles in conducting all aspects of site characterization and remediation including definition of the nature and extent of contamination (including developing and implementing monitoring plans to accurately characterize groundwater contamination), directing human health and ecological risk assessments, conducting feasibility studies for selection of appropriate remedies to meet remediation goals, and implementing remedial strategies. Much of my consulting activity over the last 18 years has been related to groundwater contamination and permitting issues at coal ash storage and disposal sites in numerous states. I am a registered Professional Geologist (PG) in Georgia, Kansas, Illinois, Indiana, and Wisconsin, and am a Past President of the Colorado Ground Water Association. My current resume is provided in the Appendix to this report.

Discussion

Impoundment Location and Construction

Over several decades CWLP has constructed CCR disposal facilities on alluvial sediments in the floodplain of Sugar Creek, immediately downstream of Spalding Dam. The original meandering channel of Sugar Creek was abandoned and relocated westward to its current location to facilitate construction. The original Creek channel was reportedly abandoned by filling the abandoned channel with a wide variety of soils, ranging from silty clays to organic clays to silty sands.

CCR was first placed on the Lakeside Ash Pond property in the middle 1930's. It was not until some later time prior to 1958 that berms to contain disposed ash were constructed and the 44-acre Lakeside Ash Pond was placed into service.[9] The Lakeside Ash Pond is bounded by Spaulding Dam to the south and by earthen berms on the east, north, and west. The Lakeside Pond was expanded vertically in 1988 by building berms on top and inside of the existing embankments. The 1988 vertical expansion also included construction of internal berms over disposed ash to create lime softening ponds on the southern section of the Lakeside Ash Pond. Available drawings indicate that the top of existing embankments around the Lakeside Ash Pond

[9] Andrews Engineering (2016), History of Construction Report for Coal Combustion Residuals Surface Impoundments, October, 2016, p.3, contained in Attach. 14 to CWLP Initial Operating Permit Application (Oct. 2021)

are at an elevation of approximately 565-feet (msl).[10] The bottom elevation of the Lakeside Ash Pond is often not specified, but is identified on a Closure Plan drawing to be at an elevation of approximately 537 feet above mean sea level (msl).[11]

The 34.5 acre Dallman Ash Pond was put into operation in 1976. The Dallman Ash Pond is bounded by the Clarification Pond on the South, the FGDS landfill on the east, and by Sugar Creek on the north and west. The Dallman Ash Pond is contained by embankments constructed of natural soils. Available drawings indicate that the existing perimeter embankments around the Dallman Ash Pond are at an elevation of approximately 554-feet (msl).[12] In locations where the perimeter dikes crossed the former creek bed, the native materials were reportedly excavated to at least 4-feet below the existing channel banks and bottom, and backfilled with compacted cohesive soils.[13] Material from the center of the ash pond was excavated and utilized in the construction of the embankments, lowering the elevation of the base of the ash fill.[14] The bottom elevation of the Dallman Ash Pond has been routinely identified to be at an elevation of approximately 527-feet msl.[15]

Recent responses to comments from the Illinois Environmental Protection Agency (IEPA) on the Operating and Construction Application show that CWLP directed that borings be advanced at four locations each in both the Lakeside and Dallman Ash ponds for the apparent purpose of collecting porewater analyses.[16] In addition to sampling porewater, borings through the waste disposal units provide actual measurements of the bottom of fill elevation at these eight locations. The elevation of the base of CCR fill placed in the CWLP impoundments is a critical piece of information needed to evaluate the effectiveness on the proposed in-place closure. Two of the four borings through the Lakeside Ash Pond showed that the bottom of the disposed ash is at elevations of 530.0 to 530.5-feet msl rather than the 537-foot pond bottom previously reported by CWLP. Borings through the Dallman Ash Pond showed the bottom of ash at elevations as low as 523 feet msl, rather than the previously reported 527-foot pond bottom. Since only four borings in each impoundment were advanced it remains unclear if other, other lower elevation areas also exist in either impoundment. The fact that CCR waste is now known to have been placed deeper than had previously been identified has severe implications for site closure evaluations and modeling, and for the ability of the eventual remedy to protect environmental quality.

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[10] Andrews Engineering (2022), Closure Plans, City Water, Light, And Power, Springfield, Sangamon County, Illinois, Sheet 7, contained in Attachment 8 to the Closure Construction Permit Application, February 2022

[11] Andrews Engineering (2022), Closure Plans, City Water, Light, And Power, Springfield, Sangamon County, Illinois, Sheet 7, contained in Attachment 8 to the Closure Construction Permit Application, February 2022

[12] Andrews Engineering (2022), Closure Plans, City Water, Light, And Power, Springfield, Sangamon County, Illinois, Sheet 7, contained in Attachment 8 to the Closure Construction Permit Application, February 2022

[13] Andrews Engineering (2021a), Initial Operating Permit Application, October, 2021, p.5

[14] Andrews Engineering (2021a), p.7

[15] Andrews Engineering (2022), Closure Plans, City Water, Light, And Power, Springfield, Sangamon County, Illinois, Sheet 7 contained in Attachment 8 to the Closure Construction Permit Application, February 2022

[16] CWLP (2024), Coal Combustion Residuals Surface Impoundment Operating and Construction Permit Application Review Letter, September 9, 2024, Response to Item 1.7.15

Site Geology

The CWLP ash ponds are located in the alluvial valley of Sugar Creek. In fact, both the Lakeside and Dallman Ash Ponds were constructed within the floodplain and over the previous location of the meandering channel of Sugar Creek.[17] The creek channel was relocated to the west of the Lakeside and Dallman Ash Ponds to allow construction of waste storage facilities. [18]

Various alluvial units and placed fill materials overlie the Pennsylvanian Shale bedrock. Characterization of alluvial sediments is an extremely difficult task due to the very irregular thickness, discontinuous extent, and propensity for abrupt lithology changes that are all characteristics of alluvial sediments. As is typical of alluvial sediments, the unconsolidated sediments that overlie bedrock include various combinations of sands, gravels, silts and clays in generally fining upward sequences of highly variable thickness. The placed fill and naturally occurring sediments have been described in various characterization reports and grouped into the general units described below. However, boring logs through these units show widely varying sediment compositions and unit thicknesses rather than laterally continuous sediment layers. Highly variable sediment composition and layer thickness are common characteristics of alluvial sediments.

Creek Fill Material

Fill materials were used during site development to increase the elevation of low areas, specifically including the former channel of Sugar Creek. Borings completed into the Channel Fill materials show that fill consists of variable cohesive and granular soils classified as silty clays, clayey-silt, silt, or sand.[19] The field horizontal hydraulic conductivity of the fill materials is highly variable, ranging from 6.1×10^{-2} cm/sec in granular fill to 7.1×10^{-5} cm/sec in cohesive fill. The presence of creek fill has a profound effect on site hydrogeology and transport of contaminants from the impoundments. The flow of groundwater between the various geologic units is facilitated where granular fill materials extend down from the existing grade to the bedrock surface, interconnecting the Channel Fill with the Upper Sand Unit and the Basal Sand Unit.[20] This interconnection of the sand units creates a direct conduit for transfer of water and CCR contaminants between impounded CCR waste and the uppermost aquifer (Basal Sand) at the CWLP site. Recharge of overlying CCR and sediments by groundwater flowing upward from the Basal Sand Unit will maintain saturation of waste placed below the elevation of the potentiometric surface and facilitate migration of soluble metals.

[17] CWLP (1976), Sugar Creek Relocation Application, p.11, Bates 19.6

[18] CWLP (1976), p. 11, Bates 19.6

[19] Andrews Engineering (2021b), Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures, October 2021, p. 7, contained in Attach. 11 to CWLP Initial Operating Permit Application (Oct. 2021)

[20] Andrews Engineering (2021b), Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures, October 2021, p. 7, contained in Attach. 11 to CWLP Initial Operating Permit Application (Oct. 2021)

Upper Cohesive Deposit

The uppermost naturally occurring sediment unit generally encountered at the site is the Upper Cohesive Deposit but this unit is missing in areas underlain by the abandoned creek. In these areas both the Upper Cohesive Deposit and underlying Shallow Sand Unit are absent. [21] The remaining thickness of this unit in other areas of the impoundments may be significantly reduced in many locations as material from this unit was excavated and used in berm construction.

Where present this unit consists of silt, silty clays and clayey silts. The thickness of the Upper Cohesive Deposit was reported to vary from 2.5 to 16 feet. Laboratory tests of samples from this unit indicate that hydraulic conductivity is relatively low with laboratory tests of vertical conductivity values ranging between 5.2×10^{-7} cm/sec and 1.6×10^{-5} cm/sec.[22] However, the Upper Cohesive Deposit is an alluvial deposit and it is expected that horizontal hydraulic conductivity will be greater than the vertical conductivity.[23] Horizontal hydraulic conductivity should be expected to be at least one and likely more orders of magnitude higher than the laboratory test results indicate. The difference between vertical and horizontal hydraulic conductivities means that groundwater will flow more freely in the lateral direction Upper Cohesive Deposit than vertically through the Upper Cohesive Deposit. This observation conflicts with the assumption made during development of the Site Conceptual Model indicating that groundwater flows only vertically through sediment layers above the Basal Sand.[24]

Shallow Sand Unit

The Shallow Sand Unit often underlies the Upper Cohesive Deposit. This unit was not encountered at all locations across the site, but where encountered it was found to underlie the Upper Cohesive Deposit. Where present, this unit consists of silty to clayey fine sand that varies in thickness from one to three feet. Slug tests conducted on two piezometers completed in this unit show high horizontal hydraulic conductivities of 3.6×10^{-3} cm/sec and 2.9×10^{-2} cm/sec.[25] As is the case with the Upper Cohesive Deposit, the high horizontal conductivity of the Shallow Sand Unit conflicts with the with assumptions made in the Site Conceptual Model indicating that groundwater flows only vertically through sediment layers above the Basal Sand.[26]

Lower Cohesive Deposit

The Lower Cohesive Deposit ranges in thickness from 0 to 22 feet and is missing in some locations above the abandoned creek bed where it has likely been removed by erosion.[27] The acknowledgement in CWLP documents that the Lower Cohesive Deposit and overlying natural sediments are missing above some sections of the abandoned creek bed is a critical piece of

[21] Andrews Engineering (2021b), p. 6
[22] Andrews Engineering (2021b), p. 6
[23] Andrews Engineering (2021b), p. 6
[24] Andrews Engineering (2021c), Closure Alternatives Assessment – Contaminant Transport Model, Figure 4, contained in Attachment 2 of the Closure Construction Permit Application
[25] Andrews Engineering (2021b), p. 6
[26] Andrews Engineering (2021c), Figure 4
[27] Andrews Engineering (2021b), p. 6

information. This information must be recognized in order to understand not only how CCR contaminants have migrated from the impoundment during operation, but also why capping the impoundments in place is very unlikely to control the release of CCR contaminants.

Where present, the Lower Cohesive Deposit consists of clays, silty clays, and clayey silts that range in thickness from 0 to 22 feet. The average thickness is reported to be approximately 15 feet. The vertical hydraulic conductivity of the Lower Cohesive Deposit has been reported to range from 1.3 x 10^{-8} cm/sec to 1.8 x 10^{-6} cm/sec. The horizontal hydraulic conductivity ranges from 4.6 x 10^{-5} cm/sec to 7.6 x 10^{-5} cm/sec.[28] These results show that the horizontal hydraulic conductivity through the Lower Cohesive Deposit is two to three orders of magnitude higher than vertical conductivity and conflict with assumptions of only vertical flow through unconsolidated sediments made in the Site Conceptual Model. [29]

Basal Sand Unit

The Basal Sand Unit is composed of silty to clayey fine sands to sand with some gravel. It generally overlies the bedrock surface and underlies the Lower Cohesive Deposit. This unit is not present everywhere, but its thickness generally varies from 0 to 12.3 feet with a top elevation of from 491 to 513 feet above msl.[30] The Basal Sand Unit is the most conductive of any material encountered on site with an average field hydraulic conductivity of 1.73 x 10^{-2} cm/sec.[31] CWLP has identified the Basal Sand Unit as the Uppermost Aquifer on the site. This is the unit that is targeted by the groundwater monitoring system.

Bedrock

The uppermost bedrock that underlies the CWLP site is Pennsylvanian Shale. Bedrock is reportedly encountered at approximately 500 feet msl along the downgradient edge of the Dallman Ash Pond. The bedrock surface is known to slope from the east and west toward the center of the landfill area. The measured elevation varies from a low of 492 feet above msl near the center of the Landfill, to a high of approximately 554 feet above msl on a bedrock outcrop located near the southeast corner of Landfill Cell 1.[32] Two tests of the hydraulic conductivity of the upper portions of the shale returned values of 1.8 x 10^{-7} cm/sec and 1.3 x 10^{-5} cm/sec.[33] Vertical flow through the bedrock unit is not expected to be significant unless currently unidentified fracture zones were identified.

The above summary descriptions[34] of the geologic materials known to be on site clearly show that, as expected, the alluvial sediments that underlie the CWLP impoundments are highly

[28] Andrews Engineering (2021b), Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures, October 2021, p. 6, contained in Attach. 11 to CWLP Initial Operating Permit Application (Oct. 2021)
[29] Andrews Engineering (2021c), Figure 4
[30] Andrews Engineering (2021b), p. 7
[31] Andrews Engineering (2017), Groundwater Monitoring Program, p. 6, Bates 10.15
[32] Andrews Engineering (2021b), p. 8
[33] Andrews Engineering (2021b), p. 8
[34] Descriptions are based on information contained in referenced CWLP documents.

variable in terms of composition, hydraulic conductivity and both lateral and vertical extent. Both the Upper and Lower Cohesive Deposits are acknowledged to be thin in some areas and missing altogether in locations above the abandoned creek channel. Areas where these units are thin or missing function as conduits allowing groundwater to move into and out of the impoundments. The lack of continuously present cohesive units explains why contaminants have been shown to be migrating away from the impoundments and why closing the impoundments in place with waste in contact with groundwater will not be protective of the environment.

Site Hydrogeology

Potentiometric surface maps depicting the groundwater potential in the basal sand unit beneath the CWLP Ash ponds were included in an updated 2021 Hydrogeologic Report[35] and are provided as Attachment A. The potentiometric maps do not reflect the elevation of standing water held within the unlined ash ponds. Rather, the potentiometric maps reflect groundwater elevations measured in monitoring wells completed in the Basal Sand Unit and located around the perimeter of the ponds.

The highest groundwater potential on the site is consistently measured on the highland area off the southeast corner of the south side of the Lakeside Ash Pond near Lake Springfield. The potentiometric surface maps show that hydraulic head drops at regular intervals as groundwater flows from the southeast corner of the Lakeside Ash Pond toward areas of lower groundwater head to the north and west toward Sugar Creek.[36] The maps also show that groundwater reaches the upgradient (southeast) corner of the Dallman Pond with a measured head of approximately 535-feet above msl. Groundwater heads along the north and west (downgradient) sides of the pond are typically indicated to be between 525 and 530-feet above msl.

Under current conditions mounding of groundwater within the basal sand unit beneath the Dallman Pond is indicated by the local northward shift of the 535-foot contour line beneath the Dallman Ash Pond.[37] Identification of mounded groundwater beneath the pond confirms that there is a hydraulic connection between the impoundment and underlying sand units. Leakage of impoundment leachate into the underlying Basal Sand Unit is currently driving groundwater flow from the Dallman Ash Pond toward the north, east, and west. Flow toward the north and west is moving water from the ash pond toward discharge areas along Sugar Creek. Eastward flow from the Dallman Ash Pond moves groundwater toward the FGDS Landfill where it contributes to the shallow saturated conditions on that site before flowing northward toward the creek.

[35] Andrews Engineering (2021b), Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures, October 2021, Appendix C, contained in Attach. 11 to CWLP Initial Operating Permit Application (Oct. 2021)

[36] Andrews Engineering (2021b), Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures, October 2021, Appendix C, contained in Attach. 11 to CWLP Initial Operating Permit Application (Oct. 2021)

[37] See potentiometric surface maps in Attachment A to this report.

Once waste in the Dallman Ash Pond is dewatered, mounding of groundwater would be expected to slowly dissipate and head within the basal sand will return to the regular contour orientation observed upgradient of the pond, with head steadily decreasing from approximately 535-feet above msl on the southeast corner of the impoundment to 525 to 530-feet above msl along Sugar Creek.

Documents prepared at the direction of CWLP and posted in compliance with applicable CCR rules have historically identified the elevations of the bottom of the Lakeside and Dallman ponds to be at approximately 537 and 527 feet above msl, respectively.[38] But borings installed at the direction of CWLP to facilitate collection of porewater samples, and discussed above, indicate that at least some portion of the unlined Lakeside Ash Pond bottom is actually located at an elevation of 530 feet.[39]

Potentiometric surface maps provided in Attachment A show the groundwater elevation in the Basal Sand Unit beneath the Lakeside Ash Pond decreases from a high of 565 feet above msl beneath the southeast corner of the pond to approximately 540 feet above msl along the northern berm. Comparing the lowest elevation of the base of the Lakeside pond (530 feet) to the elevation of the potentiometric surface beneath the impoundment shows that 10 to 35-feet of the waste in the Lakeside Ash Pond is saturated by groundwater flowing through the waste. Capping the Lakeside Ash Pond wastes in place will not stop groundwater from flowing laterally through 10 to 35-feet of waste as it migrates toward discharge areas along Sugar Creek.

Similarly, we now know that at least some portion of the Dallman Ash Pond bottom is actually located at an elevation of 523 feet above msl.[40] The potentiometric surface maps (Attachment A) show the groundwater elevation in the Basal Sand Unit beneath the Dallman Ash Pond is will range in elevation from 525 and 535 feet above msl. Comparing the lowest elevation of the base of the Dallman Ash Pond (523 feet) to the potentiometric surface elevation shows that between 2 and 12-feet of waste in the Dallman Ash Pond is expected to remain saturated even if a cap is installed. Since neither of the ponds have been dewatered to date, the current elevation of the zone of saturation and thickness of saturated waste within ponds is very likely much greater than estimated here.

Vertical flow of groundwater between the Basal Sand Unit and the Lakeside and Dallman Ash Pond wastes has largely gone unaddressed in reports and submittals to regulators for many years. However, vertical flow was addressed in the hydrogeologic investigation conducted for the Flue Gas Desulfurization Sludge Landfill which is located immediately adjacent to both the Lakeside and Dallman CCR impoundments.[41] The hydrogeologic report compared hydraulic heads

[38] Andrews Engineering (2022), Closure Plans, City Water, Light, And Power, Springfield, Sangamon County, Illinois, Sheet 7, contained in Attachment 8 to the Closure Construction Permit Application, February 2022

[39] CWLP (2024), Coal Combustion Residuals Surface Impoundment Operating and Construction Permit Application Review Letter, September 9, 2024, Response to Item 1.7.15

[40] CWLP (2024), Coal Combustion Residuals Surface Impoundment Operating and Construction Permit Application Review Letter, September 9, 2024, Response to Item 1.7.15

[41] Patrick Engineering (1995), 1995 FGDS Hydrogeological Report Volume 4 or 5, Hydrogeologic Investigation, Addendum #2 to Attachment 28, CWLP - 007359

measured in shallow soils to heads measured in the Basal Sand Unit.[42] CWLP's own consultants concluded that:

> "… water level elevations in the basal sand generally appear to be one to two feet higher than the shallow water level elevations. This is consistent with the original interpretation of groundwater conditions that water within the near surface geologic layers is being recharged by the groundwater within the Basal Sand Unit."[43]

The absence of low conductivity materials above the Basal Sand Unit over some portions of the abandoned creek channel facilitates saturation of wastes located below the potentiometric surface. Placement of waste below the potentiometric surface in both CWLP ash ponds indicates that that the proposed cap-in place closure cannot be expected to eliminate the flow of groundwater through disposed waste, nor the downgradient migration of CCR-related contaminants. The Lakeside and Dallman Ash Ponds must not be allowed to close in place in the absence of additional actions to eliminate interaction between groundwater and waste.

Capping the CWLP impoundments in place will restrict infiltration from above, but will do nothing to eliminate inflow of groundwater through the side and bottom of either the Lakeside or Dallman Ash Ponds. As was described above, natural low conductivity materials have been replaced with fill beneath portions of the impoundments, especially over sections of abandoned creek channel segments.[44] The groundwater head within the basal sand must be expected to maintain saturation of 10 to 35 feet of waste in the Lakeside impoundment, and 2 to 12 feet of waste in the Dallman impoundment, even after the observed groundwater mounding has dissipated.

The proposed closure of the CWLP Dallman CCR impoundments leaving waste in contact with groundwater fails to meet either the federal or Illinois performance standards for CCR facility closures specified in 40 C.F.R. 257.102(d)(2)(i), and Illinois Title 35, Section 845.750, respectively. The United States Environmental Protection Agency (EPA) has repeatedly notified the owners of CCR facilities that proposed closure plans that cap CCR in place while leaving waste in contact with groundwater are insufficient. EPA has clearly stated that the performance standard requires the facility to take measures,

> "such as engineering controls that will "control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste" as well as "post-closure releases to the groundwater" from the sides and bottom of the unit."[45]

Further, EPA has recently denied approval of the Alabama Department of Environmental Management (ADEM) CCR program due to recurring failures of ADEM to require each CCR

[42] Patrick Engineering (1995), Addendum #2 to Attachment 28, Hydrogeologic Investigation, CWLP - 007359
[43] Patrick Engineering (1995), Addendum #2 to Attachment 28, Hydrogeologic Investigation, CWLP - 007359
[44] Stabilize (2010), City Water , Light, and Power – 35 IAC 620 Ash Pond Assessment, p. 8, CWLP - 001702
[45] For example see: EPA (2022), Letter from USEPA to Duke Energy, January 11, 2022, p. 3

unit in the State to achieve compliance with this minimum standard.[46] Approving closure of the CWLP impoundments by capping the waste in place without meeting the minimum performance standard could open Illinois EPA to similar action.

Illinois CCR regulations include a performance standard that is nearly identical to the federal standard.[47] The Illinois standard states:

> "The owner or operator of a CCR surface impoundment must ensure that, at a minimum, the CCR surface impoundment is closed in a manner that will:
>
> 1) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;"[48]

Capping the CWLP CCR in place with waste in regular contact with groundwater in no way meets either the federal or Illinois performance standards for CCR closures.

Flow and Transport Modeling

There are many disconnects between real world hydrogeologic conditions and the assumptions made in the overly simplistic and flawed contaminant transport modeling that was performed to support selection of the CWLP proposed in place closure.[49] For example:

- The model assumptions state that all geologic units are homogenous and isotropic[50] with respect to all lithologic and hydrogeologic parameters. The descriptions of the various geologic materials contained in CWLP submittals clearly show that this assumption is not met because the composition and hydraulic properties of individual units vary widely.
- The model assumptions state that all layers are laterally extensive and the thickness of each layer is uniform. Actual site conditions do not conform to these assumptions. Investigations done to date have all shown that thickness and composition of each of the alluvial sediment layers vary widely, including areas where cohesive deposits are completely missing from above the abandoned creek channel.
- The model assumes that the liquid head within the closed impoundments will be controlled by the rates of infiltration through the proposed cap and vertical (downward) seepage rates through the pond bottom calculated by the HELP model. These

[46] EPA (2024), Alabama: Denial of State Coal Combustion Residuals Permit Program, 89 Fed. Reg. (June 7, 2024) (40 C.F.R. Part 257), p. 48774, available at https://www.govinfo.gov/content/pkg/FR-2024-06-07/pdf/2024-11692.pdf

[47] https://www.ilga.gov/commission/jcar/admincode/035/035008450G07500R.html

[48] 35 Ill. Administrative Code, Section 845.750(a)(1)

[49] Andrews Engineering (2021), Closure Alternatives Assessment- Contaminant Transport Model, October 2021, p. 10, contained in Attachment 11 of the Closure Construction Permit Application

[50] Isotropic means that the properties of the materials do not change between locations, something that is known to be incorrect.

calculations assume that there is no recharge of impounded wastes from the sides and/or from below, something that is known to be false as discussed above. Groundwater is clearly in contact with impounded wastes and recharge from the underlying Basal Sand Unit will continue to maintain saturation of several feet of the disposed waste.

- The conceptual model for the modeling[51] assumes that groundwater flows only downward through the alluvial sediments that overlie the Basal Sand Unit even though the horizontal hydraulic conductivity of the overlying sedimentary units is typically one to three orders of magnitude higher in the horizontal direction and hydraulic head within the Basal Sand drives recharge of the overlying sediments from below.
- The modeling[52] predicts that once capped, leachate head within the Dallman Ash Pond will drop to within 0.12-feet above the pond bottom to an elevation of 527.12 feet. This modeled result indicates that the elevation of leachate within the impoundment is predicted to drop below the assumed elevation of surrounding groundwater (528 feet) and far below the real world potentiometric head (530 to 535-feet msl) in the basal sand unit (Attachment A), neither of which are correct. Capping the waste in place in the CWLP ash ponds without further engineering intervention (e.g. engineered barriers to prevent groundwater flow into the waste from the sides and bottom) will not reduce the leachate head within the impoundments to below the elevation of the underlying and surrounding groundwater.

Groundwater Quality Monitoring

The Annual Groundwater Monitoring and Corrective Action Report,[53] dated January 31, 2024, shows that impacts to groundwater quality downgradient of the ash ponds continue. The groundwater monitoring system at the Lakeside and Dallman Ash Ponds has been expanded over time to consist of two upgradient monitoring wells (AP-4 and AP-5) and six downgradient monitoring wells (AP-1, AP-2, AP-3, AP-6, AP-7, and RW-3). Upgradient wells are supposed to be purposefully placed in areas where there is no evidence of impacts from the facility where they provide information about naturally occurring concentrations of chemical parameters. Downgradient monitoring wells are placed hydraulically downgradient of the waste unit, between the ash ponds and Sugar Creek, in order to detect changes in water chemistry. Each of the compliance wells in the Lakeside and Dallman groundwater monitoring system was constructed with screened intervals set to monitor the quality of water flowing immediately above the bedrock in the Basal Sand (Uppermost Aquifer).

[51] Andrews Engineering (2021), Closure Alternatives Assessment- Contaminant Transport Model, October 2021, Fig. 4 contained in Attachment 11 of the Closure Construction Permit Application

[52] Andrews Engineering (2021), Closure Alternatives Assessment- Contaminant Transport Model, October 2021, Fig. 4 contained in Attachment 11 of the Closure Construction Permit Application

[53] Andrews Engineering (2024), Annual Groundwater Monitoring and Corrective Action Report, January 31, 2024

A regular systematic groundwater monitoring program was initiated in February 2012 and continues to the present.[54] Water from all of the tested wells is sampled and analyzed for a wide range of ash-related parameters including antimony, arsenic, barium, boron, beryllium, cadmium, calcium, chloride, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, pH, selenium, sulfate, thallium, total dissolved solids (TDS), and radium 226 & 228. Analytical results are compared to statistically derived background concentrations and relevant water quality standards to determine if groundwater quality has been significantly impacted by site operations.

Detection monitoring conducted during 2023 continued to show Statistically Significant Increases (SSIs) in the concentration of parameters at wells shown below.

Parameters and Wells with SSI's in 2023 Detection Monitoring	
Boron	AP-1, AP-2, AP-3, [redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
Sulfate	AP-1, AP-3
Total Dissolved Solids	AP-1, AP-2, AP-3

[redacted]

[redacted]
[redacted]

[redacted]

Wells	Parameter	Units	7/7/23	10/26/23	2/22/24	4/25/24	5/13/24	6/12/24	7/26/24	8/12/24	Distribution	Proposed Background Value
[redacted]												
[redacted]												

[54] CWLP Ash Pond Groundwater Laboratory Reports 2010 to present. Bates 6.6
[55] CWLP (2024), Coal Combustion Residuals Surface Impoundment Operating and Construction Permit, Application Review Letter, Supplemental Response, dated October 30, 2024

[56] CWLP (2024). Coal Combustion Residuals Surface Impoundment Operating and Construction Permit, Application Review Letter, Supplemental Response, dated October 30, 2024

[57] Andrews Engineering (2021b). Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures, October 2021, p. 12

[58] Andrews Engineering (2021b), p. 12

Proposed Closure Plan

CWLP continues to pursue closure of the Lakeside and Dallman Ash Ponds by capping the material in place. The most recent description of proposed construction[61] indicates that installation of the final cover system will include:

- Dewatering of the CCR as necessary to promote final grading of the CCR to establish a final slope to promote precipitation runoff of the final cover.
- Placement of a 40 mil low density polyethylene (LDPE) cover
- Placement of a geomembrane to promote lateral drainage on top of the LDPE
- Placement of a three-foot soil protective layer, or as otherwise approved
- Establishment of final vegetation on the protective layer
- Stormwater management structures

CWLP is currently proposing to perform no actions to control or remove groundwater contaminants that are known to be migrating from the ash ponds. They propose to dewater the CCR "as necessary" to establish a surficial crust capable of supporting the machinery needed to grade and construct the cap.[62] The Closure plan indicates that no corrective action for groundwater is needed since the overly simplistic and flawed groundwater contaminant transport model discussed above predicts that water quality standards will be achieved by capping the waste,[63] and that contamination has been retained on CWLP property, conveniently ignoring the probability of cross media transfer of contaminants from groundwater to surface water. Based on groundwater monitoring reports submitted by CWLP, ash-related contaminants have been

[59] Hanson Engineers (1987), Engineering Report, Proposed Embankment Modifications, CWLP Ash Disposal Area, p. 17, contained in Attachment 2 of the Closure Construction Permit Application
[60] 35 Illinois Administrative Code 845.740(a)
[61] Andrews Engineering (2022), Closure Construction Permit Application, February 2022
[62] Andrews Engineering (2022), Closure Construction Permit Application, February 2022, p. 10
[63] Andrews Engineering (2022), Closure Construction Permit Application, February 2022, p. 12

present in the groundwater that flows from the CWLP impoundments and into Sugar Creek for many years.

EPA has repeatedly stated that the performance standard requires the facility to take measures, such as engineering controls that will control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste as well as post-closure releases to groundwater from the sides and bottom of the unit.[64] Similarly, the Illinois CCR regulations require that a facility "Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters."[65] The proposed closure of the CWLP Dallman CCR impoundments leaving waste in contact with groundwater fails to meet these performance standards.

The Post-Closure Care Plan for the capped ash ponds[66] indicates that the owner will maintain the closed impoundments for a minimum of 30 years. Unfortunately, the location of the Lakeside and Dallman Ash Ponds immediately downstream of Spalding Dam and on the floodplain of Sugar Creek continue the need for cap maintenance far into the future and creating a long-term risk of catastrophic release of wastes.

Flood Damage Potential

In responses IEPA comments on the Operating and Construction Permit[67] CWLP repeatedly claimed that because the Dallman Ash Pond Berms and accumulated ash is now higher than predicted water elevation north of the site during the 100-year flood there should somehow be no concern about flood induced damage or release of waste. The berms around the Dallman impoundment are not however the locations in most jeopardy during severe flooding.

FEMA flood mapping (Attachment D) indicates that the elevation of the 100-year flood in Lake Springfield is 562 feet above msl. The FEMA map also shows that floodwaters are expected to overtop Spalding Dam and drop to an elevation of 547 feet above msl immediately below the dam. Water from Lake Springfield is shown to cross the dam and flow onto the Lakeside Ash Pond and the overlying Lime Ponds. Flood water flowing across the surface of the Lakeside Pond is correctly called inundation by floodwaters. Water that flows across the Lakeside Pond will rapidly drop down the side of the embankments to creek level. The force of floodwater flowing down the exterior embankment will create significant erosive potential.

We can also assume that the proposed cap is in place prior to the next major storm event. In that case, floodwater that crosses the dam would likely enter the planned drainage ditch that closure drawings show would be located along the south and west edges of the cap. The combined flow

[64] For example see: EPA (2022), Letter from USEPA to Duke Energy, January 11, 2022, p. 3

[65] 35 Illinois Administrative Code Section 845.750(a)(1)

[66] Andrews Engineering (2022), Post-Closure Care Plan for Coal Combustion Residuals Surface Impoundments, February 2022

[67] CWLP (2024), Coal Combustion Residuals Surface Impoundment Operating and Construction Permit Application Review Letter, September 9, 2024

of normal run-off from the cap and water flowing across the dam from Lake Springfield has the potential to cause significant erosion of the western berm of the Lakeside Ash Pond.

It is well established that storm-related flooding currently considered to have a 1% chance of occurrence in any particular year is becoming more frequent and of course, there are flood events that are more intense than 100-year events. The potential for significant impacts to CCR containment structures during significant flood events must be recognized when considering the proposed cap-in-place Closure. The proposed closure would essentially transform a temporary waste storage impoundment into a permanent waste disposal cell on the floodplain of Sugar Creek. Floodplains are unsuitable locations for waste disposal facilities, either closed or open.

Closure Alternatives

Many sites located across the country initially proposed to close their impoundments by capping the waste in place, even though waste would remain in contact with groundwater. As utilities have reluctantly realized that capping waste in contact with groundwater does not meet the EPA performance standard, CCR closures are now being planned using alternative methods. Some the alternative closure methods now being planned for use where waste is in contact with groundwater include:

Leachate Collection and Treatment

Installation and operation of leachate collection systems such as sumps or wells inside the impoundments could lower the leachate head within the impoundment and reduce the flux of contaminants out of the impoundments. Collection of leachate from within an ash impoundment has been proposed for implementation at the Gallagher Generating Station in Indiana.[68] At Gallagher a combination of capping the waste, construction of low conductivity cut-off walls, and pumping and treatment of leachate that enters the impoundment from below to maintain an inward gradient is being pursued.[69]

Leachate collection and treatment is not recommended for implementation at the CWLP Ash Ponds. Collecting leachate within the impoundments would only be useful if waste disposal units were allowed to be closed in place on the floodplain with waste in continual contact with groundwater (which is not recommended). Collection of leachate from the CWLP impoundments would have to continue indefinitely since the waste would remain in contact with groundwater. Active operation and maintenance of the leachate collection and water treatment systems would be necessary for as long as leachate continues to be generated. This option also does nothing to reduce the risk of catastrophic release of ash during flood events.

[68] ATC (2020), Response to Request for Additional Information & Addendum No. 5, Proposed Ash Pond Closure and Post-Closure Plans, June 3, 2020.

[69] Duke Energy (2024), Closure Plan, Gallagher Generating Station, Primary Pond, North Ash Pond, Primary Pond Ash Fill, April 22,2024

Collection and Treatment of Contaminated Groundwater

Installation and operation of groundwater collection wells or trenches installed through high permeability materials below or outside of the impoundments could potentially be used to capture contaminated groundwater. Applicability of this option would need to be carefully evaluated to determine its feasibility given the proximity of Sugar Creek, as well as to determine the number of wells, spacing of trenches, and/or pumping rates necessary to capture contaminants released from the leaking impoundments.

In practice, it has often been difficult to intercept or contain all of the contaminants in a plume using wells or trenches installed in alluvial sediments. The highly variable composition, orientation, and discontinuous nature of alluvial sediments can hinder the ability of wells and trenches to capture enough of the contaminated groundwater to halt plume migration. For example, at the Colstrip generating station in Montana efforts to control the spread of CCR-related contamination utilizing both capture wells and interceptor trenches have been utilized for over 20 years in an effort to stop the spread of multiple contaminant plumes. [70] [71] The location of facilities on alluvial bedrock and sediments with highly variable composition and thickness, has limited the effectiveness of these measures.[72] The inherent natural variability of alluvial sediments is acknowledged by a limitation in the Colstrip Assessment of Corrective Actions that states:

> "…results of assessments made based on hydrogeological and hydrogeochemical conditions consistent with those of the complex depositional environment and suite of inorganic constituents found at the Colstrip SES are subject to and limited by the high degree of natural variability."[73]

Installation and operation of groundwater collection wells or trenches installed below or outside of the CWLP impoundments is not recommended for the CWLP Ash Ponds. Collecting leachate within the impoundments may be useful when units are closed in place, but closing the CWLP units in place is not recommended since they are located on the Sugar Creek floodplain and waste is in contact with groundwater. There is very little distance between the edge of the impoundments and Sugar Creek in some locations[74] on the site. Wells or trenches placed between the impoundments and Sugar Creek could unintentionally capture significant amounts of water from Sugar Creek rather than impacted groundwater flowing from the leaking

[70] Limitations of using groundwater collection and treatment systems to control migration of contaminants through alluvial materials are illustrated by experiences at the Colstrip Generating Station in Montana

[71] Geo-Hydro, Inc. (2014), Litigation Support, Montana Environmental Information Center et.al. v. Montana Department of Environmental Quality, et. al,. 16th Jud. Dist. No. DV 12-42, p. 8, available at https://apiproxy.utc.wa.gov/cases/GetDocument?docID=49&year=2015&docketNumber=151500

[72] Geo-Hydro, Inc. (2014), Litigation Support, Montana Environmental Information Center et.al. v. Montana Department of Environmental Quality, et. al,. 16th Jud. Dist. No. DV 12-42, p. 11, available at https://apiproxy.utc.wa.gov/cases/GetDocument?docID=49&year=2015&docketNumber=151500

[73] Hydrometrics (2019), Assessment of Corrective Measures, Colstrip 3&4 EP CCR Units, April 2019

[74] Figure 1 and observations made during a site visit conducted on March 1, 2019 indicate that the distance from the outside of the impoundment berms to Sugar Creek are on the order of a few tens of feet in the vicinity of the clarification pond and the northwest corner of the Dallman Pond.

impoundments. Active operation and maintenance of the leachate collection and water treatment systems would be necessary for as long as leachate continues to be generated and migrating from the impoundments, a time period that may continue for many decades following the last placement of waste. Groundwater collection and treatment alone is not a final closure remedy and does not reduce the risk of damage or catastrophic release of ash. For all of these reasons, I do not recommend collection and treatment of groundwater for the closure remedy at the CWLP Ash Ponds.

Physical Barriers

Construction of physical barriers such as low permeability walls around the perimeter of the impoundments could restrict lateral flow of groundwater. As is the case for groundwater collection wells and trenches, construction of an effective low permeability barrier in alluvial sediments can be problematic. The effectiveness of these remedies is often dependent on construction quality, the ability to obtain a positive seal between the barrier and underlying low permeability unit, and the ability of underlying low permeability unit to prevent flow beneath the barrier. Low permeability barriers are being planned to cut-off lateral migration from the Primary pond at the Gallagher Generating Station in Indiana in an effort to both minimize inward flow toward leachate collection wells and to control the spread of contaminants. [75]

Installation of low permeability barriers is only part of a potential final closure remedy because it must be combined with other remedies meant to eliminate or control the formation of leachate within the impoundments. Installation of physical barriers is not recommended for the CWLP Ash Ponds since the waste would remain on the floodplain and remain at risk of release of ash during a major flood event.

Retrofit Impoundments

In an evaluation of compliance with CCR Rule surface impoundment location restrictions[76] prepared for CWLP, Andrews Engineering concluded that;

> "unlined ponds are placed directly above and within 5 feet of the high water table for the uppermost aquifer. Either it must be demonstrated that there will not be intermittent, recurring or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer, or cessation of disposal and closure must begin."[77]

It goes on to state that "Hydraulic separation can be shown by retrofitting the ponds. A composite liner consisting of a two-foot (minimum) low hydraulic conductivity ($< 1.0 \times 10^{-7}$ cm/sec) clayey material overlain by a minimum 30 mil geomembrane (or equivalent) will be adequate to demonstrate hydraulic separation."[78]

[75] Duke Energy (2024), Closure Plan, Gallagher Generating Station, Primary Pond, North Ash Pond, Primary Pond Ash Fill, April 22,2024

[76] Andrews Engineering (2018), p. 3

[77] Andrews Engineering (2018), p. 3

[78] Andrews Engineering, 2018, p. 3

Retrofitting the impoundments at the CWLP site to the specifications identified by Andrews would require that the waste that is currently located in the impoundments be removed so that a new composite liner system could be constructed. Low hydraulic conductivity clay soils would then be trucked to the impoundment, spread and compacted. Following placement of the low conductivity base material a synthetic liner system would be installed. Once completed, the retrofitted impoundments could again be utilized for waste disposal, if desired. The newly retrofitted impoundments would however remain potentially susceptible to damage or catastrophic release of wastes during flood events.

Retrofitting the impoundments is not recommended for implementation. While retrofitting the impoundments may have made operational and economic sense in the past, I know of no current need for waste storage capacity as coal ash is no longer being disposed in the impoundments. CWLP would incur the costs of removing existing wastes in preparation for retrofitting the impoundments with a liner system. Once the waste is removed from the current leaking impoundments, disposal should be at an appropriately located and constructed disposal facility.

In-Situ Stabilization

Chemically treating disposed wastes in-situ within the Lakeside and Dallman Ash ponds could be considered. In-situ stabilization (ISS) (a.k.a. encapsulation) is done by drilling closely spaced boreholes through the waste and mixing/injecting reagents (typically Portland cement and/or others) that site-specific testing shows is capable reducing hydraulic conductivity and/or leachability of the treated waste and/or soil.

This method is currently planned for implementation in discrete locations in the North Ash Basin at the Gibson Generating Station in Indiana.[79] The intent at Gibson is to perform ISS on soils and CCR in discrete locations on the impoundment bottom to increase strength and reduce the permeability of soil and CCR materials on the bottom of the impoundment that are or have the potential to be in contact with groundwater.

Although I have seen no indication that this alternative has been seriously considered, I recommend that ISS on disposed materials in the Lakeside and Dallman ponds be evaluated for its potential to reduce the hydraulic conductivity and leachability of disposed CCR. Laboratory and bench-scale testing with various treatment reagents would be needed to establish the feasibility of this option. In addition in reducing contaminant release, the increased strength of treated materials could also have the benefit of reducing potential for catastrophic releases during a major flood event.

Cap in Place

After years of detecting groundwater contamination in downgradient compliance monitoring wells[80] CWLP has proposed closing the Ash Ponds by capping the materials in place as the only

[79] Atlas Technical Consultants (2023), Closure Plan Revision, North Ash Basin System, Gibson Generating Station, March 7, 2023

[80] Andrews Engineering (2024), Annual Groundwater Monitoring and Corrective Action Report, January 2024, p.4

proposed remedy. Closure in place is proposed even though groundwater would continue to interact with the waste beneath the cap. This remedial option is only effective in locations where there is separation between the bottom of the waste and the groundwater, which is not the case at CWLP. Inflow of water through the bottom and sides of the Lakeside and Dallman ash impoundments will maintain leachate within the disposed CCR up to the elevation of the potentiometric surface measured in the Basal Sand.

Capping the CWLP Ash Ponds in place is an inappropriate remedy that I recommend be rejected for the CWLP Ash Pond closures for a variety of reasons, including:

- The CWLP impoundments are described as being "unlined ponds are placed directly above and within 5 feet of the high water table for the uppermost aquifer."[81]
- New information developed by CWLP in the past year shows that the bottoms of the impoundments are actually deeper than has previously been reported. The elevations of the bottom of the Lakeside and Dallman ponds are now known to be as deep as 530 and 524 feet, respectively.[82]
- The potentiometric surface elevation in the Basal Sand Unit beneath the Lakeside Ash Pond decreases from a high of 565 feet above msl beneath the southeast corner of the pond to approximately 540 feet above msl along the northern berm.[83] The potentiometric surface elevation beneath the Dallman Ash Pond is generally between 530 and 535 feet above msl.[84]
- Comparing the groundwater head within the basal sand to the new pond bottom data shows that we could expect 10 to 35 feet of saturated waste in the Lakeside impoundment, and 2 to 12 feet of saturated waste in the Dallman impoundment, even after the observed groundwater mounding has dissipated.
- Waste placed below the potentiometric surface will be continually saturated with groundwater even though the cap may function as planned.
- Contaminants mobilized from saturated CCR will continue to move downgradient from the impoundments toward discharge areas along and/or beneath Sugar Creek.

[81] Andrews Engineering, 2018, Evaluation of CCR Location Restrictions, contained in Attachment 6 to the CWLP Initial Operating Permit Application (Oct. 2021)

[82] CWLP (2024), Coal Combustion Residuals Surface Impoundment Operating and Construction Permit Application Review Letter, September 9, 2024, Response to Item 1.7.15

[83] Andrews Engineering (2021b), Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures, October 2021, Appendix C, contained in Attach. 11 to CWLP Initial Operating Permit Application (Oct. 2021)

[84] Andrews Engineering (2021b), Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures, October 2021, Appendix C, contained in Attach. 11 to CWLP Initial Operating Permit Application (Oct. 2021)

- The proposed cap-in-place remedy for the Lakeside and Dallman Ash Ponds does not meet the Illinois performance standard for CCR closures[85] which requires the facility to take measures, such as engineering controls that will control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste as well as post-closure releases to groundwater from the sides and bottom of the unit.
- Capping waste in place would also leave the units susceptible to damage or releases during flood events.

Excavation and Beneficial Reuse

Excavation and beneficial reuse of the waste stored in the Dallman impoundment is a final closure option that should be carefully evaluated when the site is closed. Beneficial reuse of some of the coal combustion wastes that are currently being produced and disposed in the CWLP impoundments has occurred in the past and continues to occur. In fact, William Antonacci indicated in his deposition that most of the ash contained in the Dallman Ash Pond was taken for beneficial use in rebuilding a highway interchange as recently as 2008 or 2009.[86] It is currently unclear if an appropriate use for all of the waste stored in the CWLP impoundments could readily be found, however it is clear that beneficial reuse opportunities are occasionally available. Excavation and disposal in an appropriately located and constructed disposal facility could be pursued to supplement beneficial reuse opportunities.

Benefits of excavation and beneficial reuse include: eliminate the source of groundwater and surface water contaminants, eliminate the risk of a catastrophic release to the environment in the event of flooding, elimination of at least 30 years of site monitoring and maintenance costs, and elimination potential liabilities of disposing of waste in another disposal facility. Excavation and beneficial reuse could be periodically supplemented with excavation and disposal when reuse opportunities are not available. For all of these reasons excavation and beneficial reuse of the CCR in the CWLP impoundments should be considered the most appropriate closure method.

Excavation and Disposal

Excavation and disposal of CCR in a properly lined, permitted landfill that meets all regulatory requirements and doesn't create further environmental liability is recommended as an appropriate and effective closure alternative. Disposal of excavated ash in a new or existing landfill capable of minimizing contact between ash and water, and containing ash contaminants would: eliminate the source of groundwater and surface water contaminants, eliminate the risk of a catastrophic release to the environment in the event of flooding, and eliminate at least 30 years of site monitoring and maintenance costs.

Utilities across the country have chosen to implement excavation and removal of waste as a technically effective and economically reasonable closure method. This method is most often used in locations, such as at the CWLP Ash Ponds, where there is inadequate separation between

[85] 35 Ill. Admin. Code Section 845.750(a)(1)
[86] See page 47 of transcript of William Antonacci deposition dated January 16, 2016.

the bottom of the impoundments and groundwater, or where disposal areas are located near surface water bodies. Identification of 100 different units where excavation and removal of waste was selected as the appropriate closure method is provided in Table 1.

I recommend that excavation and disposal of the CWLP waste in an appropriately located and constructed disposal facility be implemented as an alternative, or as a supplement, to excavation and beneficial reuse. In the event that beneficial ruse opportunities are not continuously available, excavation and disposal could occur between beneficial reuse opportunities. Excavation and disposal or excavation and beneficial reuse are the only closure options that remove ash from the Sugar Creek floodplain and remove the sources of known sources of groundwater contaminants from the environment.

Summary

Closing the impoundments by capping them in place would likely reduce infiltration into the waste from above, but waste located at or below the potentiometric surface will continue to release contaminants. Closed-in-place impoundments would also be susceptible to damage or release of wastes during flood events. For all of the reasons discussed in this report I recommend that capping the waste in place on the Sugar Creek floodplain be rejected as a final closure remedy

Other remedial options may reduce contaminant concentrations to some extent for as long as one or more systems are operated and maintained. The overarching problem with this site would however remain. The CWLP impoundments were constructed in a location that is very poorly suited to waste disposal facilities. Because they are located immediately adjacent to Sugar Creek and in regular contact with groundwater, there are few that will be effective at containing the CCR waste and controlling the release of contaminants into the environment. The CWLP ash is currently contained in:

- impoundments that have been inadequately designed and constructed,
- impoundments known to be releasing ash-related contaminants to groundwater in concentrations well above Illinois Class I Groundwater Quality Standards,
- impoundments with bottoms located at or below the water table, and
- impoundments located on the Sugar Creek 100-year floodplain.

For these reasons I see no responsible choices other than to recommend that the wastes either be excavated and beneficially reused or disposed in a properly located and constructed disposal facility.

Concluding Remarks

This report sets forth my opinions and the information upon which I relied in forming those opinions. I recommend that the Illinois pollution Control Board require that the groundwater monitoring system at the CWLP ash ponds be updated to address the inappropriate inclusion of

an impact downgradient well in the monitoring system and direct that closure of the impoundments be done in a manner that will meet the EPA Performance Standard for CCR site closures. I reserve the right to supplement this report and/or my opinions as new or additional information is brought to light in the future.

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ATTACHMENT B

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August 1, 2025

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Subject: Reply to Hunsberger Rebuttal Report Comments and Deposition Statements
City, Water, Light and Power Coal Combustion Residual Impoundments
Springfield, IL

Introduction

This report was prepared to (1) respond to comments[1] made by Mr. Brad Hunsberger of Andrews Engineering (Andrews) pertaining to statements I made during my March 5, 2025 deposition; and (2) highlight problems with statements made by Mr. Hunsberger during his June 20, 2025 deposition. After considering Mr. Hunsberger's rebuttal comments and deposition I continue to recommend that waste be excavated from the site and be either beneficially reused or disposed in a secure facility. My qualifications for making these observations and recommendations were discussed in my initial report.[2]

CWLP has notified IEPA of their intent to initiate closure of the Lakeside and Dallman CCR impoundments under the requirements of 35 Illinois Administrative Code Section 845.750, Closure with a Final Cover System,[3] yet the overarching problem with this site remains that the CWLP impoundments were constructed in a location that is very poorly suited for a permanent waste disposal facility. The proposed cap-in-place remedy for the Lakeside and Dallman Ash Ponds does not meet the Illinois performance standard for CCR closures,[4] which requires the facility to take measures, such as engineering controls that will control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste as well as post-closure releases to groundwater from the sides and bottom of the unit. Closing the impoundments by capping them in place fails to meet the performance standard because waste located at or below the potentiometric surface would continue to be in regular contact with groundwater. Infiltration of groundwater into the waste will enable continued the release of

[1] Andrews Engineering (2025), Response to Sierra Club Witness – Discovery Report and Deposition – Mark Hutson, Dated May 2025

[2] Geo-hydro, Inc. (2025), Review of Closure Permit Application and Other Pertinent Materials, City, Water, Light and Power Coal Combustion Residual Impoundments, Springfield, IL, January 5, 2025

[3] Andrews Engineering (2022), Final Closure Plan for Coal Combustion Residuals Surface Impoundments, contained in Attach. 13 to CWLP Closure Construction Permit Application, Feb 2022

[4] 35 Ill. Admin. Code Section 845.750(a)(1)

soluble contaminants into the groundwater. In addition, the units were constructed on the Sugar Creek floodplain and are potentially subject to damage during future flood events.

There are few options that will be permanently effective at containing the CCR waste and eliminating potential release of contaminants into the environment. For example, some alternative closure options might solidify the waste or otherwise reduce released contaminant concentrations to some extent for as long as one or more systems are implemented, operated and/or maintained. However, there is still no indication that CWLP (or their consultants) have seriously evaluated closure options other than cap-in-place.

Responses to Hunsberger Rebuttal Report Comments

Comment 1:

> *In this comment Mr. Hunsberger points out that the listing of publications that I have prepared does not list CCR-related documents.*

As is indicated in the summary of my qualifications provided in my initial report,[5] the majority of my work over the past 18 years of my career has been related to storage and disposal of coal ash at facilities across the country. I will also point out that the vast majority of this work has been performed under contracts in support of potential or pending legal actions that contain clear confidentiality requirements.

Comment 2:

> *In this comment Mr. Hunsberger indicates that because I do not consider myself a modeler that I cannot have an understanding of how groundwater modeling is performed.*

I note that Mr. Hunsberger did not question my actual comments on the modeling, but rather questioned how I could understand what has been done since I do not consider myself a modeler. I have managed groundwater modeling personnel and projects with groundwater modeling components since 1994. I have taken multiple continuing education classes in groundwater modeling at the Colorado School of Mines. On the Midwest Generation Site I was involved in planning the three-dimensional numeric groundwater flow (MODFLOW) and contaminant transport (MT3DMS) modeling, I provided peer review of the modelling process, and personally prepared the entire text of the Groundwater Impact Assessment document.

Comment 3:

> *Mr. Hunsberger objects to inclusion of a table in my report that presents a summary of CCR units that are proposed to be closed by removal or those where actual removal is reported to have occurred.*

[5] Geo-hydro, Inc. (2025), Review of Closure Permit Application and Other Pertinent Materials, City, Water, Light and Power Coal Combustion Residual Impoundments, Springfield, IL, January 5, 2025

The table was provided for the purpose of illuminating the fact that closure by removal can be technically feasible, economically reasonable, and is in fact being used at many locations. It was unnecessary to include sites where other closure options were selected to illustrate this point. My report clearly stated that I did not compile the information personally as it was compiled by Earthjustice.

Comment 4:

In this comment Mr. Hunsberger questions whether I know what a secure facility is.

During my deposition I indicated that a secure facility for disposing the CWLP waste should not be located on the floodplain below a dam and subject to potential damage or releases during a major flood event.[6] The CWLP waste should be disposed in a facility located outside of the floodplain where berms will not be eroded by floodwaters. The importance of placing wastes outside of flood-prone areas is illustrated by the damaging floods that have occurred at various locations across the country, including a 300-year flood event that I witnessed in Colorado[7] and three major flood events in Illinois that have occurred since 1993. The Illinois Association for Floodplain and Stormwater Management description of the 1996 flood in northern Illinois indicates that three dams in the region experienced complete failure and numerous other dams were overtopped, experiencing varying degrees of damage.[8]

An example of impacts that flooding has had on coal ash facilities located on the floodplain is the 2018 release of coal ash at the Duke Energy L.V. Sutton power plant in North Carolina. Flooding in the Cape Fear River caused the release of an estimated 2,000 cubic yards of waste from a coal ash impoundment.[9]

My testimony also indicated that a disposal facility should have a competent liner.[10] More specifically, a liner that meets Illinois and/or federal regulatory requirements should be utilized. I note that the Liner Status Report for the CWLP CCR units indicates that

> "While the vertical hydraulic conductivity is generally low, soils were not compacted beneath the impoundments except for sections where the dikes of the Dallman Ash Pond were built atop the existing creek bed. No composite liner or alternative composite liner as specified in 40 CFR Part 257.70 (b) or 40 CFR Part 257.70 9 (c)(1), was used to line the bottom of either ash pond." [11]

Not mentioned, but critical when considering permanent disposal of CCR, is maintaining long term separation between the waste and groundwater. Although the modeling conducted at the

[6] Hutson Deposition, March 5, 2025, page 23, lines 20-22

[7] https://www.weather.gov/safety/flood-states-co

[8] https://prepare.illinoisfloods.org/learn/climate-rainfall/historic-floods

[9] https://www.washingtonpost.com/energy-environment/2018/09/21/dam-breach-reported-former-nc-coal-plant-raising-fears-that-toxic-coal-ash-may-pollute-cape-fear-river/

[10] Hutson Deposition, March 5, 2025, page 23, lines 20-22

[11] Andrews Engineering (2016), Liner Status Report for Coal Combustion Residuals Surface Impoundments, October 2016, p. 2

site makes no effort to identify the expected post closure groundwater elevation or gradient across the impoundments, Andrews provided their estimated post-closure groundwater elevation on a drawing that was included in the groundwater modeling report.[12] Andrews estimated the post-closure groundwater elevation beneath the conceptualized Dallman impoundment to be approximately 528 feet. During his deposition, Mr. Hunsberger again verified that Andrews estimated that the post-closure groundwater elevation on all four sides of the Dallman impoundment is expected to generally be at 528 feet.[13] The actual post-closure groundwater elevation will likely be higher to the southeast where higher head groundwater is known to be flowing onto the site. However, along the downgradient perimeter of the Dallman impoundment the Andrews estimate of post-closure groundwater elevation at 528 feet appears reasonable.

Until recently the actual elevation of the bottom of the CWLP impoundments had not been reliably known. However, CWLP responses[14] to Illinois Environmental Protection Agency (IEPA) comments on the Operating and Construction Permit Application provided new details on the actual elevation of the pond bottoms. A total of eight borings (four through Dallman and four through Lakeside) were advanced through the waste contained in the impoundments to determine the bottom elevation and facilitate collection of porewater samples. The four borings advanced through the Dallman impoundment showed the pond bottom at elevations of 526.0, 523.0, 526.2, and 529.5 feet. Three of the four borings through the Dallman impoundment showed the pond bottom and disposed waste to be 2 to 5 feet below Andrews' estimated post-closure groundwater elevation, even after closure. This means that the bottom 2 to 5 feet of waste will be saturated with by groundwater that will flow through the waste.

In my opinion, the existing unlined impoundments, located on the floodplain of Sugar Creek, with waste reasonably expected to be submerged in groundwater even after closure in place, does not qualify as a secure facility.

Comment 5:

> *Mr. Hunsberger makes a long comment about my inclusion and consideration of the Federal Emergency Management Agency (FEMA) flood map of the CWLP site.*

I use the FEMA map of the 100-year floodplain to illustrate that there certainly is the potential for flooding associated erosion and damage at the CWLP CCR impoundments. The referenced FEMA flood map is the same map that IEPA relied on in their comments on the Initial Operating Permit Application for this site.[15] Mr. Hunsberger seems fixated on the 100-year flood event and whether the existing berms would be overtopped by floodwater, as if there were no potential for

[12] Andrews Engineering (2021), Closure Alternatives Assessment – Contaminant Transport Model, Figure 4, October 2021
[13] Hunsberger Deposition, June 26, 2025, page 17, line 1
[14] City Water, Light, and Power, 2024, Coal Combustion Residuals Surface Impoundment Operating and Construction Permit Application Review Letter, Response to Item 1.7.15, September 9, 2024
[15] City Water, Light, and Power, 2024, Coal Combustion Residuals Surface Impoundment Operating and Construction Permit Application Review Letter, Items 1.1.2, 1.7.15, 1.7.16, 2.3.6, 2.3.7, 2.5.1, September 9, 2024

damage unless the top of the berms were submerged. Water released from Lake Springfield during a flood event will cause high flow velocities immediately adjacent to the Lakeside Impoundment. I observed damage to a monitoring well from a typical high water event (not a major flood) during my site visit.

The discussion of flood damage in my report[16] indicates that the berms around the Dallman Impoundment are not the locations of highest concern during severe flooding events. In my opinion, the area of highest concern during a major storm event would be along the south and west sides of the Lakeside Impoundment. During a major flood event, the combined flow of runoff from the cap and water overtopping the adjacent dam could flow down the planned drainage ditch and down the berm with significant erosive potential.

Mr. Hunsberger indicates that the Annual Consolidated Report submitted in January 2025 showed that there was sufficient capacity within the impoundment area to retain and control precipitation received during a 1,000 year storm. This is referring to current capacity, before the waste is graded and capped. There would be no capacity in the Dallman or Lakeside impoundments to retain precipitation following cap installation.

Mr. Hunsberger questions my observations of flooding caused by a 300-year storm. I was describing the raging flood waters that resulted from a 300-year storm, while Mr. Hunsberger seems to think that because the difference in inches of rainfall between the 100 and 300-year storms in Springfield is only 2.15 inches, the resulting difference in flooding intensity is minimal. The rainfall in a 100 or 300-year storm may be only 30% different, but the difference in floodwater velocity and erosive potential can be significant.

Mr. Hunsberger fails to consider that there are many factors other than the total amount of rainfall that affect flooding. For example, the water content of soils in the drainage, the duration of the rain event, how much of the drainage area is impacted by the storm, and the geometry of the drainage all impact the intensity of flooding that results from a storm. In the case of the Sugar Creek, the discharge from Lake Springfield is funneled through a dam spillway and narrow stream channel adjacent to the Lakeside impoundment berm that results in high velocity flow. Potential for a storm similar to the 1996 event that flooded large portions of northern Illinois[17] must be acknowledged when considering whether the floodplain of Sugar Creek is an appropriate location for a permanent coal ash disposal facility.

Finally, it is clear that storms that used to be considered 100-year events are increasingly common and, of course, storms larger than the 100-year storm event must also be considered.

[16] Geo-hydro, Inc. (2025), Review of Closure Permit Application and Other Pertinent Materials, City, Water, Light and Power Coal Combustion Residual Impoundments, Springfield, IL, January 5, 2025, pages 18 -19

[17] https://prepare.illinoisfloods.org/learn/climate-rainfall/historic-floods

Comment 6:

> *Mr. Hunsberger makes a long comment about groundwater quality suggesting that I somehow cherry pick the results to support my interpretations.*

Mr. Hunsberger suggests that the indicator parameters arsenic, boron, sulfate, and TDS will be found at elevated concentration at all leaking CCR sites. In my experience this is not the case. I have worked with monitoring data from many sites and observed different parameters detected in highly variable concentrations. Monitoring at some sites show high arsenic, boron, sulfate and TDS, while at other sites one or more of these parameters may not be elevated. Examples of factors that influence the variability of chemical composition of CCR leachate include the source coal that was burned, the time period over which CCR has been in the unit, and the solid/liquid contact time. In some cases different sections of a single impoundment have been shown to contain different concentrations of various contaminants because of variation of the coal source or changes to plant processes that occurred over time.

[redacted][19]

Mr. Hunsberger indicates that use of AP-4 as a background well is appropriate because both State and Federal rules allow the use of wells that are not hydraulically upgradient. While it is correct that these rules make provisions for use of wells not located physically upgradient of the unit when appropriate, to be used wells must:

> "Accurately represent the quality of background groundwater that has not been affected by leakage for a CCR surface impoundment."[20]

Mr. Hunsberger indicates that EPA's and IEPA's review of the data from AP-4 and approval of its use proves that it is appropriate. I would be disappointed if the regulators who approved this use are fully aware of the following problems with its use. [redacted]

[18] Andrews Engineering (2025), Annual Groundwater Monitoring and Corrective Action Report, Year Ending December 31, 2024, January 2025, Table 1

[19] CWLP (2024), Coal Combustion Residuals Surface Impoundment Operating and Construction Permit, Application Review Letter, Supplemental Response, dated October 30, 2024

[20] Section 845.630(a)(1)

[21] Mr. Hunsberger verified that well AP-4 is located directly downgradient of the Lakeside impoundment during his June 26, 2025 deposition at page 72, line 22 through page 74, line 4

- [redacted]

[redacted] This rationale simply assumes that the soils between the fly ash and the well screen are of sufficiently low hydraulic conductivity to preclude vertical flow. It also ignores the fact that the location, orientation, and thickness of fly ash located outside of the Lakeside impoundment berms have never been characterized. Mr. Hunsberger simply assumes that the ash located outside of the berms is all located above the well screen with no supporting characterization of the depth or extent of ash buried outside of the Lakeside berms.

Further, Mr. Hunsberger claims that boron is the most likely indicator constituent for CCR because of differences in chemistry between wells located north and west of the impoundment. He indicates that since wells containing arsenic generally do not contain elevated boron, the arsenic must be from upgradient sources or natural variation. [redacted] Invoking natural variation to explain away arsenic contamination in a well that is located downgradient of an impoundment that contains porewater with high arsenic and that penetrates 10-feet of ash located outside of the impoundment is both inappropriate and misleading.

Comment 8:

> *Mr. Hunsberger takes issue with my opinion that capping waste in place is not an appropriate closure technique when groundwater is flowing through the waste.*

I was asked whether I agreed with the concept that closure by removal and closure in place can be equally protective depending on the specifics of the facility.[25] I said it is highly dependent on the specifics of the facility and the hydrogeologic setting. When pressed, I said that closure in place is not appropriate when groundwater is flowing through the waste. In his comment, Mr. Hunsberger argues that groundwater is not flowing through the waste; he is describing current

[22] CWLP (2024), Coal Combustion Residuals Surface Impoundment Operating and Construction Permit, Application Review Letter, Supplemental Response, dated October 30, 2024

[23] Andrews Engineering (2021), Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures, October 2021, Appendix A

[24] Hunsberger Deposition, June 26, 2025, page 69, line 21 through page 70, line 7

[25] Hutson Deposition, March 5, 2025, page 80, line 5

impoundment conditions, not the future closed impoundment. My response correctly indicates that it is inappropriate to close a CCR impoundment in place when, like at CWLP, groundwater would be flowing through waste. One need only compare Andrews' estimated post-closure groundwater elevation to the newly determined bottom of waste elevations in the impoundments to see that groundwater would be left to flow through waste if the facility is simply capped in place.

Comment 9:

> *Mr. Hunsberger indicates that once the CCR impoundments are dewatered that groundwater heads will be at or below the bottom of the ponds and that artesian heads measured on the site just east of the Dallman impoundment are caused by leakage from the impoundments.*

As I have previously stated, one need only compare Andrews' estimated post-closure groundwater elevation to the newly determined bottom of waste elevations to see that groundwater would be left to flow through waste if the facility is simply capped in place.

The artesian[26] conditions measured on the property likely reflect the high head conditions measured on the southeast corner of the site being transmitted through the basal sand layer. Mr. Hunsberger argues that the artesian heads that have been measured on the adjacent portions of the property are the result of excessive leakage from the facility and that leakage has charged the lower sediments. This could be possible, but if correct it would provide a clear indication that the sediments that form the bottom and sides of the CWLP impoundments provide minimal containment of water and soluble ash contaminants and that porewater inside the impoundments is in direct communication with the basal sand layer. Lack of containment of water and soluble contaminants is inappropriate for a permanent waste disposal facility.

Comment 10:

> *Mr. Hunsberger indicates that under Illinois Administrative Code Part 807 clay liners were designed to leak and my recollection of the policy is erroneous.*

Minimizing the ability of leachate (contaminants) to flow from a unit was what is reflected in the regulations and was what was discussed during my time at IEPA. The ability of some clay-rich subsurface soils to remove some contaminants from migrating porewater or groundwater was generally considered as secondary to maintaining a low hydraulic conductivity liner.

Mr. Hunsberger did not provide documentation or references indicating that the Illinois rules were designed to allow clay lined facilities to leak. However, in order to follow-up with Mr. Hunsberger's line of thought that liners were designed to leak under Part 807, I reviewed Part 807 and found that this section does not contain the words liner or attenuation. There are no

[26] Groundwater is considered "artesian" when the head measured in lower hydrogeologic units is higher than heads measured in shallower units. Artesian head can drive upward vertical groundwater flow.

requirements for a minimum cation-exchange capacity or coefficient of attenuation. Permeability and ion-exchange data are only identified as data that must be submitted unless waived by the agency.[27] Part 811.306 does contain requirements for liners beneath new landfills including a requirement of a maximum hydraulic conductivity of 1x10-7 cm/sec. If there ever was consideration of specifying a minimum cation-exchange capacity or coefficient of attenuation for waste unit liners, these considerations were not carried through to the final rules.

The composition of the contaminants migrating through liner materials is also of critical importance. For instance, Mr. Hunsberger erroneously indicates that boron should be detected in elevated concentrations from all leaking CCR disposal sites.[28] In practice, boron is considered a conservative parameter, meaning that it is generally transported with little to no removal by interaction with soils.

Comment 11:

> *In this comment Mr. Hunsberger seems to be concerned because I used the word lenses to describe the discontinuous nature of the alluvial sediments that underlie the site*.

Fluvial sediments like the sediments that underlie the CWLP impoundments typically consist of sediment layers that vary widely in both composition and thickness. Layers that are thin, change composition, or are completely missing between locations are appropriately described as lenses rather than continuous layers.

In his comment Mr. Hunsberger indicates that:

> "the upper cohesive deposit or lower cohesive deposit **are largely present** [*emphasis added]* beneath and adjacent to the impoundments", and
>
> "For the **vast majority** *[emphasis added]* of the site, the Sugar Creek bed rested on the top of the lower cohesive soil."

It is known that the fine grained sediments are missing in locations above the former creek bed and that the composition and thickness of the basal sand layer varies between locations. These are sedimentary lenses, not continuous layers of homogenous materials that extend all across the site.

Comment 12:

> *Mr. Hunsberger comments that I erroneously indicated that upgradient monitoring well AP-5 measures head in the basal sand unit.*

Given the highly variable nature of the fluvial sediments that underlie the site, the composition and thickness of the basal sand can vary widely between locations. AP-5 monitors head and

[27] Illinois Part 807, Section 807.316. a. 6
[28] See Hunsberger Comment No. 6

water quality in hydrologically equivalent sediments that overlie the shale bedrock, just like the other monitoring wells that are described as monitoring the basal sand.

I will also note the following paragraph from the Groundwater Monitoring Program[29] document.

> *"Monitoring well AP-5 is located in an upgradient position, southeast of the CCR surface impoundments and in a topographically slightly higher position. The well screen elevation is approximately 554.44 to 563.78 feet MSL.* ***The screened section of AP-5 is also located at the top of the Pennsylvanian shale and screened across the basal sand at this location.****[emphasis added] This well monitors the upgradient groundwater quality of the uppermost aquifer at this location."*

Mr. Hunsberger's comment ignores the facts that AP-5 monitors groundwater quality in the equivalent sediments overlying bedrock and that Groundwater Monitoring Program documents indicate that the well is screened across the basal sand unit.

Comment 13:

> *In this comment Mr. Hunsberger indicates that the spillway discharges due north, not in the direction of the impoundments. He also seems to believe that during flood conditions water discharged from the spillway will immediately lose velocity after being discharged into Sugar Creek.*

One of the things that I noticed during my site visit was that the dam spillway does indeed discharge to the northwest, but a bedrock outcrop located just below spillway will divert flow to the northeast, toward the berms along the western side of the Lakeside impoundment. Under flood conditions, the velocity of water flowing along the berms will indeed be lower than the velocity of water falling through the spillway, but the water velocity can still be sufficient to cause damage. During the same site visit I witnessed a steel well casing at the base of the berm that had been bent over during flooding. Protective metal well casings are not bent by debris in gently flowing water.

Rebuttal Comments on Hunsberger Deposition

Hunsberger Deposition Comment 1, p. 17, line 24:

In this portion of his deposition Mr. Hunsberger admits that there is always a component of horizontal flow, but the overall groundwater movement is downward. If the cap-in-place remedy were constructed at the CWLP sites, there would be a decrease in infiltration, lowered heads within the impoundment, and an associated reduction in the vertical flux of groundwater from the facility. Under these conditions horizontal groundwater flow into and out of the waste will become increasingly important to contaminant transport. The groundwater modeling conducted

[29] CWLP, Coal Combustion Residuals Surface Impoundments, Groundwater Monitoring Program, p.8, CWLP - 008652

to date fails to investigate horizontal flow into and out of the disposed waste if a cap were installed.

Hunsberger Deposition Comment 2, p. 42, line 23:

In this portion of his deposition Mr. Hunsberger describes the source of contamination being cut-off once the leachate head within the impoundment is reduced. This argument ignores the fact that Andrews has estimated that the groundwater elevation around and beneath the conceptualized Dallman impoundment would be approximately 528 feet after closure.[30] The actual post-closure groundwater elevation will likely be higher to the southeast where higher head groundwater is known to be flowing onto the site. However, along the downgradient perimeter of the Dallman impoundment the Andrews estimate of post-closure groundwater elevation at 528 feet appears reasonable.

Three of the four borings through the Dallman impoundment showed the pond bottom and disposed waste to be 2 to 5 feet below Andrews' estimated post-closure groundwater elevation, even after closure.[31] This means that the bottom 2 to 5 feet of waste will be saturated with by groundwater that will flow through the waste. This condition is hardly an indication that the CCR contaminant source is effectively cut off.

Capping of the waste is proposed as a method to prevent precipitation from infiltrating into the ash. Infiltration of precipitation is, however, only one way that water can enter the ash. Wherever the bottom of the ponds is located below the elevation of the water table, groundwater will continue to flow through the ash and generate leachate. The industry has been aware for two decades that leachate that is generated in this manner will flow laterally out of the impoundment and can have an adverse impact on water quality downgradient of the ash. Research conducted by the Electric Power Research Institute (EPRI) identified this problem in a paper (Attachment A) published in 2001.[32] In fact, EPRI stated that contaminant concentrations actually increased downgradient of an impoundment that had been dewatered and capped in place. The observed increase in contaminant concentration appears related to multiple factors including infiltration of clean precipitation being reduced by the cap, thus reducing dilution of leachate, as well as an increase in waste/groundwater contact time of caused by significantly reducing the hydraulic gradient. Mr. Hunsberger seems to not recognize the potential impact that leaving saturated CCR in contact with groundwater can have on water quality.

Hunsberger Deposition Comment 3, p. 50, line 6:

Mr. Hunsberger theorizes that in the event that CWLP chooses to completely dewater the waste contained in the impoundments, the waste would compact sufficiently to preclude subsequent interaction with groundwater. Dewatering the waste in place will reduce the porosity to some

[30] Hunsberger Deposition, June 26, 2025, page 43, line 8

[31] Also see response to Hunsberger comment #4, above.

[32] EPRI (2001), Evaluation and Modeling of Cap Alternatives at Three Unlined Coal Ash Impoundments, provided in Attachment A and available at https://www.epri.com/research/products/1005165

extent, but has never been shown to reduce the hydraulic conductivity enough to preclude re-wetting and interaction of groundwater with the waste. If this were actually the case there would be no need for processes such as in-situ chemical stabilization of ash that are being utilized at many locations including at the Duke Energy Gibson Station in Indiana where in-situ stabilization is being utilized to facilitate closure of the North Ash Pond. [33] At this site in-situ stabilization will be used to stabilize materials in the deepest portions of the impoundment where the closure plan includes leaving waste in potential contact with groundwater.

Hunsberger Deposition Comment 4, p. 54, line 15:

In relation to the groundwater elevation around and beneath the impoundments following closure Mr. Hunsberger acknowledged that, "we're not really going to know, you know, until the entire thing is capped and—and done." This appears to be an admission that the groundwater modelling conducted in support of the CWLP closure plan does not investigate if/how capping the waste would change the elevation of groundwater outside of the impoundments. CWLP is requesting authorization to close the impoundments in place without really knowing if the plan will work or if it will instead exacerbate the existing problem.

Hunsberger Deposition Comment 5, p. 82, line 10:

Mr. Hunsberger indicates that post-closure groundwater elevation beneath the impoundments will return to original conditions. He indicates that because there was no indication of water problems during construction of the Dallman impoundment that the original groundwater elevations will return.

Unfortunately, this scenario is extremely unlikely to occur. Examination of the 1976 topographic map[34] of the site shows that the original channel of Sugar creek meandered across the Dallman Impoundment to the east side where it turned south, flowing to the southeast corner of the Dallman impoundment. At the southeast corner of the Dallman Impoundment the original stream channel turned back to the north and meandered across the property that lies adjacent to Dallman.

Construction of the Dallman impoundment included re-routing the Sugar Creek channel to the west and north around the planned CCR impoundment. The previously existing channel was backfilled with various materials. The drawing indicates that over excavation and recompaction of fill materials was only conducted where a dike was to be constructed over the existing channel.

The original stream channel migrating across the location of both the Dallman impoundment and the adjacent property represents a linear groundwater discharge system that removed water from beneath the properties. Once the channel was moved, groundwater flowing from high head areas

[33] Duke Energy (2023), Closure Plan, Amendment One, Gibson Station, North Ash Pond, North Settling Basin, March 7, 2023, p. 2

[34] Andrews Engineering (2021), Closure Alternatives Assessment – Contaminant Transport Model, Figure 4, October 2021

on the southeast and east sides of the site was no longer removed by discharging into the original channel. Rather, water that had previously discharged to the original creek channel remained in the subsurface until reaching the new channel on the opposite side of the site. The elevation of groundwater beneath the Dallman impoundment would have readjusted upward to a higher elevation since the local discharge area had been moved to the opposite side of the impoundment. Simply assuming that the hydrogeologic flow system will return to its previous condition without considering the relocation of the local groundwater discharge areas is incorrect. The previously existing groundwater flow system beneath the impoundments no longer exists because the groundwater drain which previously depressed water elevation beneath the impoundments has been relocated to the opposite side of the site.

Concluding Remarks

I recommend that the Illinois Pollution Control Board require that CWLP update the groundwater monitoring system at their ash ponds to address the inappropriate inclusion of an impacted downgradient well in the monitoring system and direct that closure of the impoundments be done in a manner that will meet the EPA Performance Standard for CCR site closures. I continue to see no responsible choice other than to recommend that the wastes either be excavated and beneficially reused or disposed in a properly located and constructed disposal facility. I reserve the right to supplement this report and/or my opinions as new or additional information is brought to light in the future.

Mark A. Hutson, P.G.
Illinois Licensed Professional Geologist No. 196.001465

Attachment A

Evaluation and Modeling of Cap Alternatives at Three Unlined Coal Ash Impoundments

EPRI (2001)

ATTACHMENT C

GEO-HYDRO, INC.
Consulting in Geology and Hydrogeology

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February 10, 2026

Ms. Faith Bugel
Attorney
1004 Mohawk Rd.
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Subject: Comments on September 2025 Updated Closure Plan
City, Water, Light and Power (CWLP) Coal Combustion Residual Impoundments
Springfield, IL

Introduction

I have reviewed a series of updated documents, including significant revisions to the Closure Plan that were prepared in September 2025. The purpose of this review was to identify changes and possible deficiencies in CWLPs current plan for closure of the Lakeside and Dallman Coal Ash Impoundments. Documents reviewed included:

- Hanson (2025a), Dallman and Lakeside Ash Ponds, Assessment of Corrective Measures, dated September 23, 2025.
- Hanson (2025b), Dallman and Lakeside Ash Ponds, Interim Measures Report, dated September 23, 2025.
- Hanson (2025c), Dallman and Lakeside Ash Ponds, Closure Plan, dated September 23, 2025.
- Andrews Engineering (2025a), CCR Surface Impoundments – Nature and Extent Report, dated September 22, 2025.
- Andrews Engineering (2025b), CCR Surface Impoundments and FGDS Unit 2 Landfill, Flow Path Report, dated September 22, 2025.

Closure of the impoundments by simply capping them in place, which was the previous plan, would fail to meet the performance standard because waste located at or below the potentiometric surface would have continued to be in regular contact with groundwater. Infiltration of groundwater through the waste would have enabled the release of soluble contaminants. I also noted that the units were constructed on the Sugar Creek floodplain and potentially subject to damage during future flood events. This concern was most pronounced for the Lakeside Impoundment.

My review of the September 2025 updates showed that the proposal for closure of the Lakeside and Dallman Impoundments has been improved, albeit with several deficiencies that still need to be addressed.

Removal of Waste from the Lakeside Impoundment

Waste would be excavated from the Lakeside Impoundment and placed over the existing waste in the Dallman Impoundment. A wetland with a drainage channel to deliver water to Sugar Creek would be established on the footprint of the previous Lakeside Impoundment.

Benefits of the proposed relocation of wastes from the Lakeside Impoundment include:

- Removing Lakeside ash reduces the volume of waste in contact with groundwater and removes the source of contaminants detected in wells downgradient of the pond, [redacted]
- Lakeside Impoundment was, in my opinion, the area of highest concern for flood damage. Removal of CCR from the Lakeside ash impoundment significantly reduces the possibility of damage and potential releases during a major flood event.
- Removal of the Lakeside Impoundment and creation of a wetland on that property is likely to reduce hydraulic head beneath the entire property by creating a groundwater discharge area near the southeast corner of the property where high head groundwater enters the site. Discharge of groundwater into the newly established wetland may reduce the groundwater head further downgradient, including below Dallman, although no modeling has been reported that might estimate the actual impact of this action on groundwater heads beneath the remaining units.

Identified deficiencies of the revised plans relative to closure of the Lakeside Impoundment include:

- Liquids produced from dewatering Lakeside and Dallman ash will be discharged through the settling pond system. An NPDES modification for dewatering discharges is supposedly being reviewed, but no details were found in the reviewed documents. Lack of information about the NPDES modification is a deficiency of the reviewed documentation. The details of the frequency of sampling, the parameters to be analyzed, and concentration limits associated with discharging contaminated porewater to Sugar Creek are needed. Without this information, we cannot evaluate the potential for impacts to water quality in Sugar Creek.
- There is no indication in the revised documents about how groundwater monitoring program around the Lakeside and Dallman Impoundments would be altered. A new background data set may be required in order to recalculate values that represent background without the influence of leakage from the Lakeside Ash Pond. Lack of

information about a revised groundwater monitoring program following closure of the Lakeside and Dallman Impoundments is a deficiency of the available information.

Consolidating and Covering Wastes at the Dallman Impoundment

In 2020 testimony to the Illinois Pollution Control Board I warned that addition of CCR during closure of unlined impoundments in contact with groundwater is simply adding contaminant mass to the source of groundwater contamination.[1] Previous comments on CWLP closure plans have pointed out[2] that capping ash impoundments in place with waste left in contact with groundwater would not meet the performance standard for CCR closures[3] which requires the facility to take measures, such as engineering controls that will control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste as well as post-closure releases to groundwater from the sides and bottom of the unit. Any engineering controls or systems utilized to meet the performance standard must be permanent rather than temporary fixes designed to get the site through the required 30-year post closure care period.

The United States Environmental Protection Agency (USEPA) has clearly indicated that adding CCR to unlined impoundments that are required to close by the federal CCR rule is not permitted.[4] The revised closure documents do not identify why adding Lakeside waste to the Dallman Impoundment should be considered permissible.

Andrews Engineering has indicated that the bottom of Dallman Impoundment is at an elevation of approximately 530 feet and estimated the post-closure groundwater elevation beneath the closed Dallman Impoundment to be approximately 528 feet.[5] Four borings subsequently advanced through the Dallman Impoundment showed the pond bottom at elevations of 526.0, 523.0, 526.2, and 529.5 feet.[6] The bottom of the Dallman Impoundment was found to be up to 7 feet lower than the elevation than had been previously reported. Comparison of the pond bottom elevations to Andrews' estimated post-closure groundwater elevation showed that waste would be 2 to 5 feet below the estimated post-closure groundwater elevations in three of the four boring

[1]Geo-Hydro, Inc, (2020), Pre-Filed Testimony of Mark Hutson, Illinois Pollution Control Board, Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed New Ill. Adm. Code 845, R 20-19, August 27, 2020, p. 21

[2]Geo-Hydro, Inc. (2025), Reply to Hunsberger Rebuttal Report Comments and Deposition Statements, August 1, 2025

[3] 35 Ill. Admin. Code Section 845.750(a)(1)

[4]USEPA, Proposed Decision: Proposed Denial of Alternative Closure Deadline for Ottumwa Generating Station at 35-36 (Jan. 25, 2022) (attached as Ex. B to Environmental Groups' Comments on Environmental Groups' Proposed Rules, R2020-19(A) (June 3, 2022)); USEPA, Letter on Duke Energy Gallagher at 3-4 (Jan 11, 2022) (attached as Ex. F to Environmental Groups' Comments on Environmental Groups' Proposed Rules, R2020-19(A) (June 3, 2022))

[5] Andrews Engineering (2021), Closure Alternatives Assessment – Contaminant Transport Model, Figure 4, October 2021

[6] City Water, Light, and Power, 2024, Coal Combustion Residuals Surface Impoundment Operating and Construction Permit Application Review Letter, Response to Item 1.7.15, September 9, 2024

locations. Since only four borings were advanced through the Dallman waste it is very possible that waste placed further into groundwater is present at other locations.

The updated closure documents now indicate that Lakeside ash will be excavated and consolidated on the Dallman Impoundment. A system of dewatering wells that would be used to initially dewater the entire waste column would then remain in place to be used in the event that water is found to be in contact with the waste in the future. A geotextile final cover system is proposed rather than a natural clay or composite final cover system. Water collected during both waste dewatering and subsequent to cap installation would be discharged through the settling pond system.

The potential benefits and identified deficiencies of the revised closure plan must be carefully documented and evaluated. Potential benefits of the revised plan for closing the Dallman Impoundment include:

- The groundwater head beneath Dallman will likely be somewhat lower if high head groundwater entering the site from the southeast discharges to the new wetland. However, the post-closure changes to groundwater head beneath the Dallman Impoundment remain undetermined.
- Installation and operation of a system of dewatering wells is proposed to fully dewater the CCR contained in the Dallman Impoundment.
- The dewatering wells are to remain in place after closure to be used as needed to keep the ash column unsaturated.
- The proposed geosynthetic cap will likely be effective for a period of several decades following completion of the post closure monitoring period.

Currently identified deficiencies of the proposed closure plan for closing the Dallman Impoundment include:

- A detailed discussion of how the proposed closure plan would permanently meet the performance standard for CCR closures that is contained in Illinois CCR rules[7] must be provided.
- The proposal to add Lakeside CCR to the Dallman Impoundment runs afoul of USEPA's position that the practice of placing CCR in unlined impoundments that are required to close by the federal CCR rule is not permitted.
- All four of the borings advanced through the Dallman Impoundment showed that the bottom of the impoundment was actually lower than the previously reported 530 feet. Three of four borings showed the bottom of impoundment is located below the projected post-closure groundwater elevation of 528 feet. Four boring are inadequate to

[7] 35 Ill. Admin. Code Section 845.750(a)(1)

characterize the depth of waste beneath the Dallman Impoundment. A systematic boring program is needed to determine the actual elevation of the impoundment bottom.

- The proposed geotextile cover system has a design half life of 100+ years. Constructing the cap from geosynthetic materials with a design life of 100+ years is essentially putting a temporary fix over a permanent problem. At some point in the future, likely well after the required 30 years of post-closure monitoring has lapsed, the effectiveness of the cap system will decline. Regular monitoring of water elevation within and below the Dallman Impoundment is necessary for as long as the waste remains in place if future failure of the cap system is to be detected. Water elevation data is needed in order to determine if/when the ash is in contact with groundwater, either from upward flow from below or because the geosynthetic cap is deteriorating and loosing effectiveness.
- The updated Closure Plan indicates that the dewatering wells will remain in place for potential use in removing water from the base of the impoundment. The proposed Closure Plan lacks specificity about how the proposed dewatering well system will be controlled and monitored. Regular monitoring of groundwater/leachate elevation within and beneath the Dallman Impoundment is needed to document that the waste at the bottom of the impoundment remains dry under both high and low water conditions. There is no indication that porewater elevations in the waste will be monitored, no description of the porewater/groundwater elevation that would trigger pumping from the wells, and no description of whether the pumps will be manually controlled or will be automatically activated.
- The lack of an identified plan and commitment to operate the dewatering system past the required 30-years of care is another deficiency of the proposed closure plan. The dewatering wells are an integral component of the closure system now being proposed. A commitment to permanently maintain and operate the dewatering wells is needed if the proposed closure is to be anything more than a temporary fix to a permanent problem.
- Maintaining the dewatering well system in operating condition is likely to require a system of regular testing and maintenance due to the harsh chemical conditions in CCR porewater. The closure plan should identify how and when the wells will be tested and how pumps will be maintained. Constructing a pumping system is the first step, but identification of details about how the system will be maintained and operated is needed.
- Porewater collected in the dewatering wells is to be discharged to Sugar Creek under a revision to the site NPDES permit. The details of the frequency of sampling, the parameters to be analyzed, and concentration limits associated with discharging contaminated porewater to Sugar Creek are nowhere identified.

Concluding Remarks

The September 2025 revisions to the proposed Closure Plans for the Lakeside and Dallman Ash Impoundments show areas of improvement over CWLP's previous Closure Plans. Information and commitments that fill the deficiencies identified above are needed in order to evaluate the protectiveness of these plans.

Please let me know if you have questions or comments.

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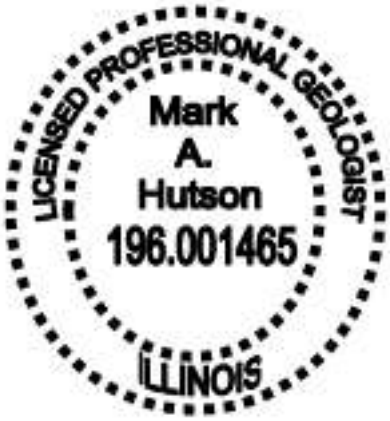

CERTIFICATE OF SERVICE

The undersigned, Deborah J. Williams, an attorney, certifies that I have served electronically upon the Clerk and by email upon the individuals named in the attached Service List, a true and correct copy of the **NOTICE OF FILING** and **THE CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES d/b/a CITY WATER, LIGHT AND POWER'S MOTION IN LIMINE**, from the email address deborah.williams@cwlp.com of this 64 page document before 5:00 p.m. Central Time on April 7, 2026 to the email address provided on the attached Service List.

Deborah J. Williams

SERVICE LIST PCB 18-11

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