Ex. 42

From:	Bourgikos, Spiros
To:	Becker, PJ
Cc:	Williams, Deborah J; Paul.Eisenbrandt@illinois.gov; james.m.jennings@illinois.gov; R5LECAB
Subject:	Notice of Violation
Date:	Monday, November 28, 2022 11:31:49 AM
Attachments:	CCR_Dallman_NOVCoverLetter_20221109 (1).pdf Dallman - NOV Att A - ALL -10-18-22 (002).docx Dallman - NOV Att A.1 - 1228070019_CWLP_InspectionReport_Rev0 20220912.pdf Dallman - NOV Att A.2 - CTI FinalReport SSA-SFA-Review-CWLP_20220916_REV 0.pdf

CAUTION: This email originated from outside the City of Springfield/CWLP. DO NOT reply, click links, or open attachments unless you recognize and/or trust the sender. Please contact ISD Technical Support @ Ext. 2834 with questions or concerns.

Dear Mr. Becker,

Attached, please find a Notice of Violation letter that EPA is issuing to City Water Light and Power (CWLP) for violations of the requirements of 40 CFR Part 257 Subpart D.
The alleged violations are based on EPA's review of information, including but not limited to, data posted by CWLP to its publicly accessible internet site titled
"CCR Rule Compliance Data and Information," the information submitted by CWLP on July 5, 2022, in response to EPA's May 2, 2022 Request for Information,
and information gathered during the April 27, 2022 inspection of the Facility conducted by CTI and Associates and EPA.

Please respond to this email to acknowledge receipt.

Thank you for your prompt attention to these concerns.
If you have any questions, please contact me at (312) 886-6862.

Spiros Bourgikos
Environmental Engineer
U.S. Environmental Protection Agency, Region 5
Enforcement and Compliance Assurance Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

VIA EMAIL
DELIVERY RECEIPT REQUESTED

Patrick Becker
Environmental Health and Safety Manager
Regulatory Affairs
City Water, Light, and Power
801 E. Monroe, 4th Floor
Springfield, Illinois 62701
pj.becker@cwlp.com

Re: **Notice of Violations**
City Water, Light, and Power - Dallman and Lakeside Ash Ponds
Facility ID: ILD000665968

Dear Mr. Becker:

The purpose of this letter is to inform City Water, Light, and Power (CWLP) that the United States Environmental Protection Agency, Region V (EPA) has determined that CWLP is in violation of the requirements of 40 C.F.R. Part 257, Subpart D.

CWLP, as the owner and operator of Coal Combustion Residual (CCR) landfill and surface impoundment units at its facility located at 3100 Stevenson Drive, Springfield, Illinois (Facility), is subject to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6907, et seq., and the regulations promulgated thereunder, 40 C.F.R. Part 257, Subpart D – Standards for the Disposal of CCR in Landfills and Surface Impoundments.

Based on the EPA's review of the information available to it, including but not limited to, information posted by CWLP to its publicly accessible internet site entitled *CCR Rule Compliance Data and Information,* ("federal CCR website"); information submitted by CWLP on July 5, 2022, in response to EPA's May 2, 2022 and August 2, 2022, Requests for Information, and information gathered during the April 27, 2022, inspection of the Facility conducted by EPA and CTI & Associates, EPA has determined that CWLP has failed to comply with and is in violation of the requirements of 40 C.F.R. Part 257, Subpart D, as specifically alleged in Attachment A for the Dallman and Lakeside Ash Ponds. Attachment A is not a comprehensive list of all potential Subpart D violations. EPA is reviewing information related to CWLP's landfill unit 2 and closure, post-closure, and corrective action requirements applicable to CWLP's surface impoundments. EPA will separately notify CWLP if there are any violations in these areas after it has completed its reviews.

According to Section 3008(a) of RCRA, EPA may issue an order assessing a civil penalty for any past or current violation, requiring compliance immediately or within a specified time period, or both. Although this letter is not such an order or a request for information under Section 3007 of RCRA, 42 U.S.C. § 6927, we request that you submit a response in writing to us no later than 45 days after receipt of this letter documenting the actions, if any, which you have taken or plan to take to establish compliance with the requirements listed in Attachment A. You should submit your response to Spiros Bourgikos, at bourgikos.spiros@epa.gov.

If you want to confer with us, you should contact Spiros Bourgikos, at bourgikos.spiros@epa.gov within 10 calendar days after you receive this letter. Please be advised that this conference is not a settlement negotiation covered by Federal Rule of Evidence 408 and we may use any information you submit in support of an administrative, civil, or criminal action.

You should direct questions about this letter to Spiros Bourgikos, at (312) 886-6862 or at bourgikos.spiros@epa.gov. Questions from legal counsel can be directed to Rich Clarizio, in EPA Region V's Office of Regional Counsel, at (312) 886-0559 or Clarizio.Richard@epa.gov.

Sincerely,

Michael D. Harris
Division Director
Enforcement and Compliance Assurance Division

Attachments

cc: Paul Eisenbrandt, IEPA, (paul.eisenbrandt@illinois.gov)
James Jennings, IEPA (james.m. jennings@liinois.gov)
Deborah Williams, CWLP (Deborah.williams@cwlp.com)

ATTACHMENT A
NOTICE OF VIOLATION
City Water, Power and Light
Lakeside and Dallman Ash Ponds

This document presents potential violations of the following regulations at the CWLP Lakeside and Dallman Ash Ponds.

Location Restrictions - 40 C.F.R. §§ 257.60 to 64.

Initial and Periodic Hazard Potential Classification Assessments - 40 CFR § 257.73(a)(2) & (a)(3).

Structural Stability Assessment - 40 CFR § 257.73(d)

Safety Factor Assessment - 40 CFR § 257.73(e)

Fugitive Dust Control Plan - 40 C.F.R. § 257.80 – Air Criteria

Inflow Design Flood Control - 40 CFR § 257.82

Inspection Requirements for CCR Surface Impoundments - 40 C.F.R. § 257.83

Groundwater Monitoring Systems - 40 CFR § 257.90 et seq.

Statistical Analysis and Background - 40 CFR 257.91(a)(1), 93(a), (b), (g)(5) and 94(b)

Federal CCR Website - 40 C.F.R. § 257.107

City Water, Light, and Power (CWLP) – Lakeside and Dallman Ash Ponds
Location Restrictions
Violations of 40 C.F.R. §§ 257.60 to 64

1. Since October 17, 2018, CWLP failed to demonstrate compliance with 40 C.F.R. §§ 257.60(b), 61(b), 62(b), 63(b), and 64(b). 40 C.F.R. §§ 257.60(a), 61(a), 62(a), 63(a), and 64(a) emplace certain restrictions on the location of existing and new CCR surface impoundments, including that they:

    a. Must not be located closer than 5 feet above the upper limit of the uppermost aquifer, 40 C.F.R. § 257.60(a),
    b. Must not be located in wetlands, 40 C.F.R. § 257.61(a),
    c. Must not be located within 60 meters (200 feet) of the outermost damage zone of a fault that has had displacement in Holocene times, 40 C.F.R. § 257.62(a),
    d. Must not be located within a seismic impact zone, 40 C.F.R. § 257.63(a); and
    e. Must not be located in an unstable area, 40 C.F.R. § 257.64(a).

    The owner or operator of the CCR unit must obtain a certification by a qualified professional engineer (QPE) demonstrating that it has met the above cited requirements of 40 C.F.R. §§ 257.60(a) to 64(a). See 40 C.F.R. §§ 257.60(b), 61(b), 62(b), 63(b), and 64(b).

    CWLP placed a three-page document on its CCR Rule Compliance Data and Information website (federal CCR website) entitled *City Water, Light and Power CCR Surface Impoundment Location Restrictions* (October 2018) (SILR). This document appears to be CWLP's sole attempt at showing compliance with the provisions of 40 C.F.R. §§ 257.60 to 64. The SILR appears to have been generated by Andrews Engineering but does not contain a signature or a certification by a professional engineer. As such, this document does not satisfy the certification requirements of 40 C.F.R. §§ 257.60(b) to 64(b).

2. Since October 17, 2018, CWLP failed to demonstrate compliance with 40 C.F.R. §§ 257.60(a) and (c)(1), which require the owner or operator of an existing CCR surface impoundment to either (1) demonstrate by October 17, 2018 that its unit is constructed with a base that is located no less than 1.52 meters (five feet) above the upper limit of the uppermost aquifer, or (2) demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table).

    The SILR states that the Lakeside and Dallman ash ponds do not meet the location restriction requirements of 40 C.F.R. § 257.60(a). It states that the bottom of the Lakeside ash pond is approximately 535 feet above mean sea level (MSL) and the bottom of the Dallman ash pond is approximately 533 MSL, with some variability. It states that

there are sand/sandy deposits that are water bearing within 5 feet of the bottom of the ash ponds and that there is direct hydraulic contact with the water table. It further states that the units would likely not be found to meet the location restrictions of 40 C.F.R.§ 257.60.

On July 5, 2022, CWLP submitted to EPA *Hydrogeologic Report, Groundwater Monitoring Program and Statistical Procedures*, October 2021 (2021 Hydrogeologic Report). It was included as Attachment 12 to CWLP's February 1, 2022, Closure Construction Permit Application (2022 Permit Application). The 2022 Permit Application states that the impoundments do not meet the restriction on the location of the units within five feet of the uppermost aquifer. See, 2022 Permit Application, p. 1. Pages eight and nine of the Hydrogeologic Report state that the uppermost aquifer is characterized as the basal sand overlaying the shale bedrock. The potentiometric surface of the basal sand varies from 565 feet MSL at upgradient locations, south of the Lakeside ash pond, to 525 feet MSL at downgradient locations near Sugar Creek, north of the Dallman ash pond. Therefore, the Dallman and Lakeside ash ponds do not meet the location restrictions of 40 C.F.R. § 257.60(a).

To date, CWLP has not demonstrated that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the Dallman and Lakeside ash ponds and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table). Therefore, the Lakeside and Dallman ash ponds do not meet the location restriction requirements and CWLP has failed to make an appropriate demonstration pursuant to 40 C.F.R. § 257.60(a).

40 C.F.R. § 257.60(c)(4) provides that an owner or operator of an existing CCR surface impoundment who fails to demonstrate compliance with the requirements of 40 C.F.R. § 257.60(a) by the date specified in 40 C.F.R. § 257.60(c)(1) is subject to the requirements of 40 C.F.R. § 257.101(b)(1).

3. Since October 17, 2018, CWLP has failed to demonstrate compliance with 40 C.F.R. § 257.61(a). 40 C.F.R. §257.61(a) provides that if a CCR unit is located in a wetland then by October 17, 2018, the owner or operator of the CCR unit must demonstrate that it meets the requirements of 40 C.F.R. § 257.61(a)(1)-(5).

   The CWLP federal website contains the SILR, which discusses the wetland location restrictions. It states the surface impoundments are listed on the U.S. Fish & Wildlife Service (USFWS) wetland inventory map and that clarification is needed from USFWS and the U.S. Army Corps of Engineers (USACE). On July 5, 2022, CWLP provided EPA with a copy of its *Wetland Assessment Report for Coal Combustion Residual Surface Impoundments* (2021 State WAR). The 2021 State WAR is not on the CWLP federal website. The 2021 State WAR identifies the surface impoundments as wetlands according to the USFWS National Wetland Inventory. It also identifies riverine wetlands associated with Sugar Creek near the surface impoundments. Sugar Creek previously flowed through the area occupied by the Dallman and Lakeside surface impoundments. The impoundments are connected to Sugar Creek through a clarification pond located on-

site, which discharges to Sugar Creek through a Clean Water Act National Pollution Discharge Elimination System (NPDES) discharge.

Neither the 2018 SILR nor the 2021 State WAR are sufficient to meet the requirements of 40 C.F.R. § 257.61(a)(1)-(5). Further, neither document contains a certification by a QPE that the surface impoundments are in compliance with 40 C.F.R. § 257.61. Consequently, since October 17, 2018, CWLP has not demonstrated compliance with the requirements of 40 C.F.R. § 257.61(a).

40 C.F.R. § 257.61(c)(4) provides that an owner or operator of an existing CCR surface impoundment who fails to demonstrate compliance with the requirements of 40 C.F.R. § 257.61(a) by the date specified in 40 C.F.R. § 257.61(c)(1) is subject to the requirements of 40 C.F.R. § 257.101(b)(1).

CWLP – Lakeside and Dallman Ash Ponds
Initial and Periodic Hazard Potential Classification Assessments
Violations of 40 CFR § 257.73(a)(2) & (a)(3)

The violations identified in this document are the result of reviewing the October 2016 and the October 2021 Hazard Potential Classification for Coal Combustion Residuals Surface Impoundments for the CWLP, Lakeside and Dallman Ash Ponds (Lakeside and Dallman units) and observations made during the April 27, 2022, on-site inspection. See, *Structural Stability Assessment Review – CWLP, Site Inspection Report,* CTI and Associates, Inc. (CTI), September 12, 2022, Inspection Report (Attachment A.1) and *Final Structural Stability Assessment Review – CWLP, Site Inspection Report,* CTI, September 12, 2022 (Attachment A.2). Unless otherwise indicated, the violations are the same for the 2016 and 2021 Hazard Potential Classification Reports because the reports are almost identical.

1. CWLP failed to comply with 40 C.F.R. § 257.73(a)(2), which requires the owner or operator of the CCR unit to document the hazard potential classification of each CCR unit as either a high, significant or low hazard potential, by incorrectly classifying the Lakeside and Dallman units as low hazard potential units. CWLP based its hazard classification of the two ponds on the classification assigned by the Illinois Department of Natural Resources (IDNR), "Class III", which corresponds to U.S. Corps of Engineers "Low Hazard Potential". In considering the hazard potential based on IDNRs Class III, classification, CWLP failed to consider the hazard potential according to the definitions of hazard potential specified under 40 C.F.R. § 257.73(a)(2).

   Based on the information provided, the Dallman and Lakeside units are incorrectly classified as low hazard. An impoundment should be classified as "significant hazard potential" if it has the potential for likely environmental damage should the potential for ash to flow into the adjacent lake or the adjacent stream or to flow beyond the property line. For both of these units, if a failure were to occur it would likely impact Sugar Creek which is less than 50 feet away from the impoundments. The classification of the units should, therefore, have been "significant hazard potential."

2. CWLP failed to comply with 40 C.F.R. § 257.73(a)(3)(i), which requires the owner or operator of a CCR unit determined to be either high or significant hazard potential CCR unit, to prepare and maintain a written Emergency Action Plan (EAP). The EAP must: (a) define the events and circumstances that present a safety emergency and describe the procedures that will be followed to detect a safety emergency in a timely fashion; (b) Define responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency; (c) provide contact information of emergency responders; (d) include a map which delineates the downstream area which will be affected in the event of a CCR unit failure; and (e) include provisions for annual face-to-face meeting between the owner or operator of a CCR unit and local emergency responders.

   Based on the information reviewed, CWLP by incorrectly classifying the hazard potential of the two CCR units as low instead of significant, failed to prepare and maintain an EAP.

CWLP – Lakeside and Dallman Ash Ponds
Structural Stability Assessment
Violations of 40 CFR § 257.73(d)

The violations identified in this document are the result of reviewing the October 2016 and the October 2021 Structural Stability Assessment Reports for Coal Combustion Residuals Surface Impoundments for the CWLP Ash Ponds (SSA Reports) for the Lakeside and Dallman units and observations made during the April 27, 2022, on-site inspection. See, *Structural Stability Assessment Review – CWLP, Site Inspection Report*, CTI and Associates, Inc. (CTI), September 12, 2022, Inspection Report (Attachment A.1). and *Final Structural Stability Assessment Review – CWLP, Site Inspection Report*, CTI, September 12, 2022 (Attachment A.2). Unless otherwise indicated the violations are the same for the 2016 and 2021 SSA Reports because the reports are almost identical.

1. CWLP failed to comply with 40 C.F.R. § 257.73(d)(1), which requires the owner or operator of the CCR unit to document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. As specifically presented in items 2 through 11 below, the SSA Reports are deficient because they either do not have adequate documentation supporting their conclusions or they failed to conduct evaluations consistent with generally accepted good engineer practices.

   At a minimum, good engineering practices would have required a discussion of the impact of the approximately 10-foot-high stockpiles observed during the April 27, 2022, inspection; the overgrown vegetation which was neither maintained properly nor allowed for proper inspection of the condition of the dikes; and the impact of seepage observed during the annual inspections from 2011 to 2021. Additionally, since there were no as-built or construction plans, good engineering practices would have included an independent method of verifying the structural stability of the units (e.g., borings), especially since portions of the units were located over soils associated with Sugar Creek. *See also*, SSA Review and CTI Inspection Report.

2. CWLP failed to demonstrate whether there is adequate foundation and abutment stability for the Lakeside and Dallman units as required by 40 C.F.R. § 257.73(d)(1)(i). The SSA Reports stated that the ash ponds were constructed in a creek bed with silty clays and granular fill characterized as poorly graded silty to clayey soils. The report cites to a 1994 study of the adjacent landfill–unit 2 to demonstrate that there is a stable foundation and abutment to the surface impoundments.

   Generally accepted good engineering practices require the assessment to examine the adequacy of the foundations of the surface impoundments based on available boring data and site-specific strength data derived from subsurface exploration of the surface impoundments, not the adjacent landfill. Additionally, for the Dallman unit, since its dikes crossed Sugar Creek, which is a historic channel that was modified, geotechnical

information should have been collected at key places where the dikes crossed the historic channel to confirm that stream sediments were removed.

3. CWLP failed to demonstrate whether there is adequate slope protection to prevent surface erosion, wave action, and adverse effects of sudden drawdown as required by 40 C.F.R. § 257.73(d)(1)(ii). 40 C.F.R. § 257.73(d)(1)(ii) requires documentation to support whether there is adequate slope protection to protect against erosion, wave action and drawdown. CWLP failed to include documentation discussing the adequacy of the protection of the inside slope of the embankment (i.e., vegetation or riprap) for wave protection at the Dallman unit.

4. CWLP failed to demonstrate whether the dikes are mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit, as required by 40 C.F.R. § 257.73(d)(1)(iii).

   Regarding the Lakeside unit, CWLP did not provide information in the SSA Reports to document whether the dikes were sufficiently compacted. There were no as-built or construction plans available for the original construction of the dikes. Additionally, although the SSA Report indicates that there were construction plans for the Lakeside dikes when they were subsequently modified as part of the dike raise, CWLP failed to provide that information.

   Regarding the Dallman unit, the SSA Report states that the construction plans called for a minimum compaction rate. However, the SSA Report stated that there were no construction plans or as-built documents related to the dike compaction. Borings were conducted as part of piezometer installation in 2010 but CWLP did not present the location of the borings on any legible map and therefore it is not possible to determine if those borings were drilled through the Dallman dikes and demonstrate whether the unit has dikes that meet the standard set forth.

   Good engineering practices require supporting documentation for the claimed compaction. Such documentation might include as-built documents and geotechnical analysis (borings) to verify the compaction of the dikes. CWLP should have provided the as-built information. Where such information is not available, CWLP should have used confirmatory borings to demonstrate that the material was adequately and consistently compacted.

5. CWLP failed to demonstrate whether vegetated slopes of dikes and surrounding areas do not exceed a height of six inches above the slope of the dike, except for slopes which have an alternate form or forms of slope protection, as required by 40 C.F.R. §§ 257.73(a)(4) and (d)(1)(iv). The SSA Reports did not include any information responsive to this requirement. It noted that there were no construction plans or as-built documents available. During the April 27, 2022, site inspection, it was observed that the site was heavily overgrown with vegetation on the inside and outside of the dikes exceeding 5 feet in height. Good engineering practice requires consideration of the condition of the vegetation on the dikes and a discussion of vegetative management for the site (i.e.,

mowing frequency). During the April 27, 2022, site inspection, CTI and EPA observed tall trees, brush, and grass. CWLP allowed these features to grow for multiple seasons. The vegetative cover prevented observation of the condition of the dikes and as a result the SSA Reports were based on conclusions that were not supported by good engineering practices.

Additionally, CWLP should have discussed the vegetation problems in the SSA Reports pursuant to 40 C.F.R. § 257.73(d)(2). CWLP should have identified and taken corrective measures. Historical documents provided by CWLP, as part of the CWLP Answers to Request for Information, indicate that overgrown vegetation is, and always has been, a continual problem for CWLP. Overgrown vegetation, including trees and brush, were identified in the dam inspection report dated June 2, 1987, provided in Attachment 5, with a recommendation to remove the vegetation and conduct regular mowing in the inspection report and in the provided June 1987 maintenance plan. Vegetation control was also identified as a "Priority 1 Recommendation" in the *Coal Ash Impoundment Site Assessment Final Report* (Kleinfelder 2011), where the inspector noted overgrown vegetation including trees. In addition to the failure to remedy overgrown vegetation which resulted in noncompliance with the CCR Rule, the overgrown vegetation makes daily, monthly, and annual inspections ineffective.

6. CWLP failed to demonstrate whether a single spillway or a combination of spillways are designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge event as required to comply with 40 C.F.R. § 257.73(d)(1)(v)(A). The SSA Reports state that the Lakeside and Dallman units do not have constructed or natural spillways. This is incorrect. A spillway is any structure used to provide controlled release of water and includes both open channel flow structures and pipe structures. The SSA Reports must be revised to discuss the two (2) different spillways in service at the Lakeside Ash Pond—the wooden stoplog spillway from the main pond and the culvert spillway from the lime decant water channel—and the culvert spillway at Dallman Ash Pond, along with how they have been designed to manage the sustained flows and or short-term infrequent flows such as stormwater discharges.

7. CWLP failed to demonstrate whether the combined capacity of all spillways were designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the event as required by 40 C.F.R. § 257.73(d)(1)(v)(B).

   a. Lakeside and Dallman Units

   The *Inflow Design Flood Control Report* (2016) shows that the adequacy of the outlet structures is due to the freeboard in the ponds being greater than the depth of the rainfall event. It also states that the design storm event should be the 100-year flood, since CWLP has classified these impoundments as a low hazard potential CCR Impoundment (Andrews Engineering 2016e and Andrews Engineering 2021e).

Based on the information provided, the Dallman and Lakeside units are incorrectly classified as low hazard. An impoundment should be classified as "significant hazard potential" if it has the potential for likely environmental damage should a failure occur due to the potential for ash to flow into the adjacent lake or the adjacent stream or to flow beyond the property line. For both of these units, if a failure were to occur it would likely impact Sugar Creek which is less than 50 feet away from the impoundments. The classification of the units should, therefore, have been "significant hazard potential." As such, appropriate revisions need to be made, including a revision to the design storm for the Inflow Design Flood Control Report to be a 1000-year flood.

b. Lakeside Unit

The SSA Reports state that the outlet structure was constructed from a 24-inch RCP pipe. Although CWLP provided some information on the construction of the pipe, it did not provide sufficient information on the structure's ability to manage the peak discharge. The impoundment appears to be largely dry, contains some material stockpiles, and some areas of the impoundment may be above the outlet structure elevation. Good engineering practices require consideration of these factors and consideration of the maximum process water flow during the design storm event.

Based on observations during the April 27, 2022 site inspection, it appears the process water flow from the Lime Sludge Ponds built over the southern portion of the Lakeside Unit may be hydraulically isolated from the rest of the ash pond. Effluent from the decanting of the lime sludge flows into a dedicated channel along the south and western portion of the Lakeside unit and through a dedicated spillway to the Clarification Pond. A separate hydraulic analysis for this ditch and outlet structure is appropriate.

The assessment should have discussed the hydraulic adequacy of the existing spillways to manage any process flows in addition to the design storm event. This analysis should be performed once an accurate hazard classification for the pond is established.

c. <u>Dallman Unit</u>

The SSA Report states that the Dallman unit outlet structure is constructed from a 24-inch HDPE. CWLP failed to provide information on the structure's ability to manage the peak discharge, as provided in this document.

Based on observations during the April 27, 2022, site inspection, it appears the outlet structure consists of two CMP pipes of approximately 18 to 24 inches in size. One of the two culverts has a 12-inch HDPE forcemain pipe through it from the historical practice of controlling the pond level through a pump system. The pump system is now inactive but the historic forcemain pipe remains in place,

obstructing one of the culverts. The freeboard of the pond from the culvert invert to the top of the dike visually appeared to be approximately 4 feet. CWLP failed to provide evidence that this freeboard is adequate.

Although the pond is largely diked above grade, there appear to be some small areas that may run into the pond from offsite including the top of the dikes, which appear to be pitched inward and allow potential drainage from the adjacent landfill. The analysis should also take into account the maximum process water flow during the design storm event.

During the April 27, 2022 site inspection, EPA observed that a significant portion of the Dallman unit contains stockpiled material that is piled above the elevation of the perimeter dikes. These stockpiles reduce the ability of the impoundment to manage storm events. The actual stage-storage curve based on current conditions should be utilized in analyzing the hydraulic capacity of the impoundments and outlet structures.

The SSA Report should be revised to discuss the hydraulic adequacy of the existing spillway to manage any process flows in addition to the design storm event required by the revised hazard classification for the impoundment. Stage storage based on present conditions and an accurate representation of the outlet structure should be utilized for the calculation accounting for the large material stockpiles.

8. CWLP failed to document whether the hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure, as required by 40 C.F.R. § 257.73(d)(1)(vi).

   The SSA Report identifies a pipe (Lakeside unit) and an outlet structure (Dallman unit) that are constructed through the berms. It states that these structures comply with the standard set out in 40 C.F.R. § 257.73(d)(1)(vi), but CWLP failed to provide any documentation supporting this assertion. Generally accepted good engineering practice require the assessment to include the basis for the condition of the hydraulic structures, such as visual observations of the exposed portions of the structures and in line observations, including with a camera, for those portions that are not exposed.

   During the April 27, 2022, site inspection, EPA observed that the Dallman unit outlet structure had significant erosion on the downstream side with the outlet pipes cantilevered. One of the two outlet pipes was obstructed by a historic forcemain that is no longer in service. The Lakeside unit structure appeared to show signs of deterioration on the wooden stop logs of the outlet structure.

   The assessment should include information on the visual observation from the upstream or downstream side and camera surveillance of the pipe through the impoundment. The

actual condition of the outlet structures, as observed during the April 27, 2022 site inspection, should be reflected in the assessment.

9. CWLP failed to document whether the downstream slopes would maintain their structural stability during low pool of an adjacent water body or sudden drawdown of that water body, as required by 40 C.F.R. § 257.73(d)(1)(vii).

   The assessment identifies Sugar Creek and the Clarification Pond as adjacent water bodies for both units. Lake Springfield is also adjacent to the Lakeside unit. The assessment indicates that the stability analyses performed in the Initial Safety Factor Assessment assumes that both Sugar Creek and the Clarification Pond were at minimal levels. CWLP failed to include a discussion of the potential for rapid drawdown for either of these water bodies and failed to include a discussion of the potential for a rapid drawdown of Lake Springfield. Generally accepted good engineering practice require that the assessment discuss these potentials. The assessment should be revised to discuss the potential for rapid drawdown in Sugar Creek, the Clarification Pond, and Lake Springfield. If there is potential for a rapid drawdown scenario for any of these water bodies, an analysis for a rapid drawdown condition should be provided.

10. CWLP failed to recommend corrective measure remedies, implement them as soon as feasible, and document them in the SSA Report for any structural stability deficiencies or releases identified in the SSA Reports, as required by 40 C.F.R. § 257.73(d)(2).

    For the Lakeside unit, the SSA Report noted that there is periodic seepage between the original dike and the raised dike. CWLP failed to include a discussion of the corrective measures taken or if the seepage was an indication of possible structural instability in the dam. For the Dallman unit, the Assessment indicated that there are periodic erosion ruts and gullies on the north and west outer berms which are being immediately filled with soil and monitored. During the April 27, 2022 site inspection, the northeast corner showed signs of erosion at an unstabilized road leading from the top of the dike to the toe of the dike. In addition, the site contained heavy vegetation significantly exceeding the requirements of the CCR Rule.

11. CWLP failed to comply with 40 C.F.R. § 257.73(d)(3), which requires a certification from a qualified professional engineer (QPE) stating that the initial assessment and each subsequent periodic assessment was conducted in accordance with the requirements of this section, including but not limited to, 40 C.F.R. § 257.73(d)(1). The QPE statement does not address whether the Ash Ponds were designed, constructed, operated, and maintained in accordance with good engineering practices. The QPE statement in the 2016 SSA Report states that it was in compliance with 40 C.F.R. § 257.81 (Run-on and run-off controls for CCR Landfills). In the 2020 SSA Report, the QPE certification stated that it was in compliance with 35 Illinois Administrative Code (I.A.C.) 845.450. Neither of these certifications are appropriate. Additionally, as indicated in items 2 through 10, above, the assessments were not done in accordance with the identified

requirements. The assessments need to be revised to address the identified deficiencies and to contain a proper QPE statement.

12. CWLP failed to comply with 40 C.F.R. §§ 257.73(f)(1) and (2), which require that the initial assessment not be completed earlier than April 17, 2013 nor later than October 17, 2016. The initial SSA Report, although signed by the QPE on October 14, 2016, relies on assessments that were completed prior to April 17, 2013. The initial SSA Report stated that it relied upon the following reports: May 2011 Coal Ash Impoundment Site Assessment Report (2011 SAR); the Historical Aerial Photographs (April 1995 – March 2014) (Photos); the July 1987 Engineering Report: Proposed Embankment Modification; CWLP Ash Disposal Area (1987 Pond Modification Report); and the August 1976 Construction Grading Plan for Dallman Ash Ponds (1976 Pond Grading Plan). Except for the aerial photographs, all of the reports cited were generated prior to April 17, 2013. The cited reports were not contemporaneous with the time period for completing the initial assessment—April 17, 2013 to October 17, 2016. As such, CWLP failed to take into consideration the impact of the load and destabilizing impact of the approximately 10-foot-high stockpiles; the presence of vegetation which blocks the ability to determine the condition of the dikes; and the seepage identified since 2011.

13. CWLP failed to comply with 40 C.F.R. §§ 257.73(d)(1) and (f)(3), which require that a periodic assessment is conducted once every five years. The assessment should include structural stability of the units and documents whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The October 2021 SSA Report duplicated the October 2016 SSA Report and therefore was not an updated assessment of the structural stability of the impoundments. As such, CWLP failed to conduct the required periodic assessment.

14. As a result of the above identified deficiencies, CWLP violated, and is in violations of, 40 C.F.R. § 257.73(d)(2). 40 C.F.R. § 257.73(d)(2) provides that the periodic assessment described in 40 C.F.R. § 257.73(d)(1) must identify any structural stability deficiencies associated with the CCR unit in addition to recommending corrective measures. If a deficiency or a release is identified during the periodic assessment, the owner or operator unit must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken.

    The periodic assessments that CWLP provided failed to identify the structural stability deficiencies noted above. Further, CWLP failed to remedy the deficiencies or prepare documentation detailing the corrective measures taken. Therefore, CWLP has violated, and is in violation of, 40 C.F.R. § 257.73(d)(2).

CWLP – Lakeside and Dallman Ash Ponds
Safety Factor Assessment
Violations of 40 CFR § 257.73(e)

The violations identified in this document are the result of reviewing CWLP's October 2016 *Initial Safety Factor Assessment for Coal Combustion Residuals* and the October 2021 *CWLP Updated Safety Factor Assessment* (collectively, "SFA Reports") for the Lakeside and Dallman units and observations made during the April 27, 2022, on-site inspection. See, *Structural Stability Assessment Review – CWLP, Site Inspection Report*, CTI and Associates, Inc. (CTI), September 12, 2022, Inspection Report (Attachment A.1) and *Final Structural Stability Assessment Review – CWLP, Site Inspection Report,* CTI, September 12, 2022 (Attachment A.2). The violations apply to both the 2016 and 2021 SFA Reports since they are almost identical.

40 C.F.R. § 257.73(e) requires the owner or operator to conduct an initial safety factor assessment by October 17, 2016, and to periodically update it every five years, no later than the anniversary date of the first assessment. The owner or operator must document whether the calculated factors of safety for each CCR unit achieves the minimum safety factors required by paragraphs (e)(1)(i) through (iv) of 40 C.F.R. § 257.73 for the critical cross section of the embankment. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading conditions. The owner or operator is required to calculate the safety factors under long-term, maximum storage pool loading condition; the maximum surcharge pool loading condition; seismic conditions and possible liquefaction of the dikes constructed of soils susceptible of liquefaction. The safety factor assessment is to be supported by appropriate engineering calculations. A qualified professional engineer must certify that it meets the requirements of 40 C.F.R. § 257.73(e).

1. CWLP failed to comply with 40 C.F.R. § 257.73(e)(1) because the SFA Report safety factor assessment was based on deficiencies, data gaps, and failed to consider major changes to the units after they were constructed. As discussed more fully in the SFA Review and items 2 through 5 below, the deficiencies or data gaps include, but are not limited to:
    - Problems with documentation of the selection and topography of the critical cross section,
    - Inadequate boring logs,
    - Incomplete consideration of weak materials or materials susceptible of liquefaction,
    - An incomplete consideration of the subsurface water levels upstream, within, and downstream of the units,
    - Reports that were relied upon but not included such as construction plans or as-built diagrams and
    - Failure to consider the load and destabilizing impact of the approximately 10-foot-high stockpiles in one of the units when modeling for the safety factor assessment.

    Furthermore, the designation of the critical cross section was not based on appropriate engineering considerations such as length and steepness of the slope of the dikes; an accurate representation of subsurface materials and groundwater conditions; nor the

liquefaction potential and the consequences of a failure or release of ash into the environment. The SFA calculations were influenced by these errors or omissions. Consequently, the SFA calculations were not supported by appropriate documentation nor were they representative of appropriate engineering considerations or calculations.

2. CWLP failed to comply with 40 C.F.R. § 257.73(e)(1) because the SFA Reports rely on incomplete subsurface stratigraphic information. The reliability of an SFA is dependent on an accurate understanding of the subsurface stratigraphy below the units. Typically, a geotechnical subsurface exploration is conducted to assess the subsurface stratigraphy to close any data gaps in the existing information. CWLP provided only a small number of historic borings for the impoundments with the latest exploration being from 2010. CWLP did not provide additional geotechnical data as part of itsit's response to the CCR Rule (i.e., after 2015). As indicated below, the information for each unit was further limited. These limitations influenced the accuracy of the SFA Reports and demonstrated that the SFA Reports were not supported by adequate documentation or based on appropriate engineering considerations.

a. Lakeside Unit

The stratigraphy included in the stability analysis is reported to be based on the B-1, B-2, and B-3 borings from 1987 (Andrews Engineering 2016b and Andrews Engineering 2021b). The layers used in the slope stability analyses are not labeled in the outputs for the analysis, so it is difficult to tell how the material properties were assigned and to correlate them with the borings. The geometry of the upstream raised dike does not match the detail provided in Figure 2 in the history of construction and no boring was conducted in the upstream dike raise to justify the thickness of the compacted cohesive dike layer for the embankment. Not all of the layers encountered were modeled, including the potentially loose sand layer encountered in boring B-2.

Additionally, the piezometric levels assumed in the analyses are not consistent with the observed wet seeps periodically seen during the inspections between the original and raised dikes. This indicates that the piezometric water level would be high enough to daylight as a seep at the interface between the two dikes. Therefore, the piezometric head used in the analyses may not be representative.

b. <u>Dallman Unit</u>

The stratigraphy included in the stability analysis is reported to be based on historical boring logs AP-1 through AP-4 (Andrews Engineering 2016b and Andrews Engineering 2021b) which were piezometers drilled in 2010. The layers used in the slope stability analyses are not labeled in the outputs for the analysis, so it is difficult to tell how the material properties were assigned and to correlate them with the borings. The plan

drawing for the historic borings is illegible, so it is not possible to review the subsurface conditions indicated by the borings relative to geotechnical cross sections. The piezometric heads assumed in the analyses seem to be conservative to the water level through most of the dike system being near the ground surface, but it is not possible to verify if the piezometric head found in the borings is consistent with these findings due to the illegibility of the plan drawing. It is also difficult to tell if any of the borings coincide with points where the dike crosses the historic Sugar Creek, which may potentially have soft sediment if it was not completely removed as indicated in the plan drawings (Andrews Engineering 2016d).

3. CWLP failed to comply with 40 C.F.R. § 257.73(e)(1) because the SFA Reports rely on incomplete or unsubstantiated information on the composition of the soil materials comprising the units. The reliability of an SFA is dependent on an accurate understanding of the composition of the materials that comprise the unit. CWLP did not choose strength and unit weight parameters for the analyses by use of data, but instead CWLP chose based on engineering judgment and a limited amount of Standard Penetration Test (SPT) data. CWLP did not conduct an actual strength test for any of the soil materials and did not perform or report a correlation of material type and SPT value to strength. CWLP did not perform a liquefaction analysis on the non-cohesive subgrade soils, including low blow-count silt, sand, and fly ash to determine if liquefied strengths may be warranted in some analysis cases. These limitations indicate that the SFA Reports were not supported by adequate documentation and were not based on appropriate engineering considerations.

a. <u>Lakeside Unit</u>

The reports reference "a previous geotechnical investigation and stability analysis." This appears to be included in Attachment 5 of CWLP's Answers to Request for Information. Attachment 5 was an Engineering Report for the Proposed Embankment Modifications performed by Hanson Engineers Incorporated in 1987. CWLP did not perform laboratory testing for soils encountered during this investigation. Instead, CWLP recorded SPT data and what appears to be pocket penetrometer data. CWLP did not model all of the layers encountered during the geotechnical investigation, including the potentially loose sand layer encountered in boring B-2. CWLP did not perform a liquefaction analysis on the non-cohesive subgrade soils including low blow-count silt, sand, and fly ash to determine if liquefied strengths may be warranted in some analysis cases.

There is no indication that any of the material input parameters were based on laboratory testing data. CWLP stated in the reports that "highly conservative geotechnical parameters based upon the previous geotechnical investigation" were utilized in the Safety Factor Assessments. Although the material parameters utilized for the materials in the model may be reasonable, they do not appear to be necessarily "highly conservative."

Recognized and generally accepted good engineering practice states that material parameters for subsurface materials in a geotechnical analysis should be based on site specific data obtained for those soils including strength and density correlations to SPT data, cone penetration test (CPT) data, and laboratory testing data from samples retrieved during a geotechnical investigation.

b. <u>Dallman Unit</u>

The reports reference a "recent site investigation" which "provide the stratigraphic and in-situ strengths of the earthen materials." It is unclear if the reference is talking about laboratory testing data on critical layers as the in-situ strengths or if this is a reference to SPT testing performed during the borings. If CWLP performed laboratory testing, this data should be provided. CWLP did not perform a liquefaction analysis on the non-cohesive subgrade soils including silt, sand, and fly ash to determine if liquefied strengths may be warranted in some analysis cases.

There is no indication that any of the material input parameters were based on laboratory testing data. CWLP stated in the reports that "conservative geotechnical parameters" were utilized in the Safety Factor Assessments. Although the material parameters utilized for the materials in the model may be reasonable, they do not appear to be necessarily "conservative" given the low blow count material encountered in the 2010 investigation.

4. CWLP failed to comply with 40 C.F.R. § 257.73(e)(1) because the SFA Reports presented safety factor results that did not consider liquefaction analyses or liquefaction screening analysis for non-cohesive subgrade soils. The failure to conduct this analysis indicates that the results were not based on appropriate engineering considerations or calculations.

5. CWLP failed to comply with 40 C.F.R. § 275.73(e)(2) because the 2021 SFA fails to have an appropriate certification by a QPE. Although the 2021 SFA appears to have been timely completed, it does not contain a proper certification. The QPE certified to compliance with 35 IAC 845.460 not 40 C.F.R. 257.73(e), as required.

CWLP – Lakeside and Dallman Ash Ponds
Fugitive Dust Control Plan
Violations of 40 C.F.R. § 257.80 – Air Criteria

The following violations have been identified based on a review of the 2015 *Fugitive Dust Control Plan* and each *Annual Fugitive Dust Control Report*, 2016 through 2021, that CWLP placed on its *CCR Rule Compliance Data and Information* federal CCR website.

1. CWLP failed to comply with 40 C.F.R. § 257.80(b)(1), which requires that the CCR fugitive dust control plan include both the dust control measures, along with an explanation of how the measures selected are applicable and appropriate for site conditions. The dust control plan includes control measures but no explanation of how the measures are applicable and appropriate.

2. CWLP failed to comply with 40 C.F.R. § 257.80(b)(2), which requires the CCR fugitive dust control plan include procedures to emplace CCR as conditioned CCR, meaning wetting CCR with water to a moisture content that will prevent wind dispersal but will not result in free liquid. The CCR fugitive dust control plan indicates that the gypsum and ash piles have an appropriate moisture content but does not include procedures for wetting CCR with water to a moisture content that will prevent wind dispersal.

3. CWLP failed to comply with 40 CFR 257.80(b)(3), which requires the CCR fugitive dust control plan include procedures to log citizen complaints received by the owner or operator involving CCR fugitive dust events at the facility. The fugitive dust control plan certified on May 28, 2015, notes that annual reports will include all citizen complaints but does not include any procedures to log complaints. A record of all citizen complaints is insufficient to comply with 40 C.F.R. § 257.80(b)(3), as such a record is a separate and distinct requirement. *See* 40 C.F.R. § 257.80(c).

4. CWLP failed to comply with 40 CFR 257.80(b)(4), which requires the CCR fugitive dust control plan include a description of the procedures the owner or operator will follow to periodically assess the effectiveness of the control plan. The fugitive dust control plan certified on May 28, 2015 does not include such procedures.

CWLP – Lakeside and Dallman Ash Ponds
Inflow Design Flood Control
Violations of 40 CFR § 257.82

The violations identified in this document are the result of reviewing the October 2016 Inflow Flood Control Plan for Coal Combustion Residuals Surface Impoundments for the CWLP Ash Ponds for the Lakeside and Dallman Ash Ponds (aka Lakeside and Dallman units) and observations made during the April 27, 2022, on-site inspection. See *Structural Stability Assessment Review – CWLP, Site Inspection Report,* CTI and Associates, Inc. (CTI), September 12, 2022, Inspection Report and *Final Structural Stability Assessment Review*, September 2022 (SSA Report),

1. CWLP failed to comply with 40 C.F.R. § 257.82(a)(1), which requires the owner or operator of the CCR unit to design an inflow flood control system that adequately manages the peak discharge into the CCR unit in accordance with the hazard potential of the CCR unit as specified in 40 C.F.R. § 257.82(a)(3)(i) through (iii). For high hazard potential the peak discharge is the probable maximum flood (3)(i); for significant hazard potential, the peak discharge is the 1,000-year flood (3)(ii); and for low hazard potential the peak discharge is the 100-year flood (3)(iii).

   As discussed under violations of 40 C.F.R. § 257.73(a)(2) & (a)(3) the Dallman and Lakeside units are incorrectly classified as low hazard. They should be classified as a significant hazard. By classifying the Lakeside and Dallman ash ponds as low hazard potential CCR units, CWLP in its initial inflow flood control considered the flow of a 100-year flood and not the flood of a 1,000-year storm.

2. CWLP failed to comply with 40 C.F.R. § 257.82(a)(2) which requires the inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from a 1,000-year flood.

   The initial plan for the Lakeside and Dallman ash ponds, showed that the adequacy of the outlet structures is due to the freeboard in the ponds being greater than the depth of 100-year rainfall event. CWLP should have considered the adequacy of the outlet structures to a 1,000-year flood.

3. CWLP failed to comply with 40 C.F.R. § 257.82(c)(1) which require the owner or operator of a CCR unit to document how the inflow flood control has been designed and constructed to meet the peak flow of 1,000-year flood. Each plan must also be supported by engineering calculations.

   The initial inflow flood control plan does not include any engineering calculations even for the incorrect peak flow of a100-year flood. For the Lakeside unit, the plan should be revised to discuss the hydraulic adequacy of the existing spillways to the design storm event required by the revised hazard classification for the impoundment. For the Dallman unit, the plan should be revised to discuss the hydraulic adequacy of the existing spillways

to manage any process flows into the Dallman ash pond, in addition to the design storm event required by the revised hazard classification for the impoundment.

4. CWLP failed to prepare a periodic inflow design flood control within five years of the initial inflow design flood control plan, as required by 40 C.F.R. § 257.82(c)(4).

   The initial and periodic inflow design flood control plans are required to be posted on the CWLP federal CCR website as specified by 40 C.F.R. § 257.107(g)(4). Based on the review of the documents that are posted in the CWLP federal CCR website as of August 31, 2022, the website does not include a periodic inflow design flood control plan.

CWLP – Lakeside and Dallman Ash Ponds
Inspection Requirements for CCR Surface Impoundments
Violations of 40 C.F.R. § 257.83

1. CWLP failed to comply with 40 C.F.R. § 257.83(b)(3)(i), which requires the owner or operator of an existing CCR unit to complete the initial inspection required by 40 C.F.R. § 257(b)(1) and (2) no later than January 19, 2016. 40 C.F.R. § 257.83(b)(4) provides that "the owner or operator has completed an inspection when the inspection report has been placed in the facility's operating record as required by" 40 C.F.R. § 257.105(g)(6).

   Based on CWLP's inspection reports that are posted on its CCR website, the initial inspection report of its surface impoundments was not certified by a qualified professional engineer until March 2, 2016. Therefore, the completed initial inspection report could not have been placed in the facility's operating record until March 2, 2016, and as such the initial inspection report could not have been completed until March 2, 2016. By failing to complete its initial inspection by January 19, 2016, CWLP is in violation of 40 C.F.R. § 257.83(b)(3)(i).

2. CWLP failed to comply with 40 C.F.R. § 257.83(b)(4)(i), which requires the owner or operator of the CCR unit to conduct an annual inspection within a year of the previous inspection report and provides that the deadline for completing subsequent inspection reports is based on the date of completing the previous year's report.

   In 2018, CWLP completed its inspection report on January 12, 2018. In 2019, CWLP completed the inspection reports for its surface impoundments on January 29, 2019. This is more than a year from its previous inspection report. In 2020, CWLP completed the inspection reports for its surface impoundments on January 30, 2020. This is more than a year from its previous inspection report. CWLP completed its inspection reports as follows:

   - For 2017, the inspection was conducted on 12/18/2016, Report certified on 1/13/2017.
   - For 2018, the inspection was conducted on 1/10/2018, Report certified on 1/12/2018.
   - For 2019, the inspection was conducted on 1/8/2019, Report certified on 1/29/2019.
   - For 2020, the inspection was conducted on 12/26/2019, Report certified on 1/30/2020.
   - For 2021, the inspection was conducted on 12/23/2020, Report certified on 1/28/21.

   Therefore, in 2019, 2020, and 2021, CWLP violated 40 C.F.R. § 257.83(b)(4)(i) by failing to complete its annual inspection within one year of its previous inspection.

CWLP – Lakeside and Dallman Ash Ponds
Groundwater Monitoring Systems
Violations of 40 CFR § 257.90 et seq.

1. From at least October 12, 2017, to June 7, 2018, CWLP failed to comply with 40 C.F.R. §§ 257.90(b)(1)(i), 257.91(a)(1), (a)(2), (c), (e) and (f) and 257.94(b). The owner or operator of a CCR unit is required to install a groundwater monitoring system that accurately represents the quality of groundwater that has not been affected by leakage from a CCR unit or passing the waste boundary of the CCR unit.

   a. CWLP failed to comply with 40 C.F.R. § 257.91(e)

   CWLP did not case monitoring well AW-3 in a manner that maintained the integrity of the monitoring well borehole, as required by 40 C.F.R. § 257.91(e).

   The owner or operator of the CCR unit must obtain a certification from a Qualified Professional Engineer (QPE) that the groundwater system meets this criterion by October 17, 2017. See 40 C.F.R. §§ 257.90(b)(1)(i) and 91(f).

   CWLP identified wells AP 1-5 and AW-3 as its monitoring wells for the purposes of compliance with 40 C.F.R. § 257.91 prior to 2018. See *Annual Groundwater Monitoring and Corrective Action Report (Annual Report) Year Ending December 31, 2017*, 2018 (2017 Annual Report). CWLP identified wells AP-4 and 5 as the background wells and monitoring wells AP 1-3 and AW-3 as downgradient wells. CWLP added two additional wells, AP-6 and AP-7, at the end of 2021 (2021 Annual Report) in response to the statistically significant increase (SSI) of arsenic that it detected.

   From the second quarter of 2015 until the first quarter of 2017, CWLP collected eight samples from the original groundwater monitoring system (GWMS). On October 12, 2017, CWLP secured a certified statement from a QPE indicating that these five wells met all the requirements of 40 C.F.R. § 257.91. See *Groundwater Monitoring System Certification*, October 2017 (2017 GWS Certification). During 2017, CWLP did not indicate any problems with the integrity of any of the monitoring wells in the GWMS. See 2017 Annual Report.

   Based on the first detection monitoring sampling event on November 9, 2017, CWLP indicated that there was an SSI of arsenic detected in monitoring well AW-3. Consequently, CWLP indicated that it would start assessment monitoring during the first quarter of 2018. See 2017 Annual Report.

   On June 7, 2018, CWLP secured a second certification from a QPE indicating that well AW-3 was replaced because it was not capable of providing representative samples of groundwater flowing underneath the unit and determining whether groundwater was affected by the CCR unit. See *Groundwater Monitoring System Certification*, October 2017, Revised April 2018 (2018 GWMS Certification). CWLP installed the replacement well for AW-3 in time for the May 4, 2018 sampling event. The QPE from 2018 stated

that the integrity of well AW-3 was suspect. CWLP did not provide information about the problems with AW-3. Since there were no identified changes in the monitoring well system from the second quarter of 2015, CWLP's 2018 GWMS Certification establishes that AW-3 did not meet the requirements of 40 CFR §§ 257.91(a)(2) and (e) at the time of the initial QPE certification on October 12, 2017. Consequently, from at least October 17, 2017, until AW-3 was replaced in April 2018, CWLP failed to comply with 40 C.F.R. §§ 257.90(b)(1)(i) and 91(f).

b. CWLP failed to comply with 40 C.F.R. §§ 257.90(b), 91(a), and 91(c)

Background monitoring well AP-5 and downgradient wells AP-6 and 7 were not capable of adequately characterizing background and downgradient groundwater quality, as required by 40 C.F.R. §§ 257.90(b)(1)(i), 91(a)(1) and (2). CWLP converted AP-6 and AP-7 from temporary well locations (GP-6 and GP-7) bored in July 2019, to permanent wells within its GWMS in 2020, see 2021 Annual Report. CWLP placed the wells downgradient of RW-3 because of the continued SSI of arsenic detected at RW-3 from the February 28, 2020, sampling event. CWLP added AP-6 and AP-7 to determine the nature, rate, and extent of this arsenic contamination.

According to boring logs provided in *Alternate Deadline to Initiate Closure* (dated November 24, 2020), AP-5 is not screened in the same basal sand unit and 1 to 2 feet of gray shale bedrock as AP-4 (the second background well) and the other listed downgradient wells, as of the 2017 GWMS. Both upgradient wells, AP-5 and AP-4, should be screened in the same hydrogeologic unit to provide accurate groundwater contaminant levels. Based on the recorded well construction log, AP-5 is only screened from 17.82 feet to 27.15 feet below ground surface (BGS), ending in gray silty sand. This does not match the consistency of other screened wells, which end in various combinations of light to dark gray clayey slit or dark gray shale. This determination is supported by the site hydrogeology and stratigraphy described in the *Alternate Deadline to Initiate Closure*. AP-5 should have been screened in the bottom 10 feet of the boring (36 to 46 feet BGS), which contains a mix of clayey silt, silty sands, silty clay and ending in 1 to 2 feet of the gray shale bedrock. As the two upgradient wells are not screened within the same geologic unit, data used from AP-5 does not accurately represent the quality of groundwater and cannot be used to accurately determine groundwater monitoring information such as groundwater protection standards.

Potentiometric maps provided in CWLP's *Alternate Deadline to Initiate Closure* demonstrate groundwater flow beneath the southwest corner of the Lime Softening Ponds, near AP-4, flowing in a northwest direction. This would indicate that groundwater encountered at AP-4 is coming from beneath the limits of waste from the original placement of the unlined Lakeside Ash Pond. The radial flow illustrated on the potentiometric surface maps provides evidence for groundwater mounding beneath Dallman Ash Pond and likely Lakeside Ash Pond as well. This information would indicate that AP-4 is potentially affected by CCR waste and could not be used as an upgradient well.

This is a pivotal problem affecting all comparisons and uses of the background data, the

calculation of the groundwater protection standard (GWPS), and the calculations of the statistical analysis to determine if an SSI in Appendix IV constituents is present. AP-4 and AP-5 do not meet the requirements of 40 CFR § 257.91. Therefore, CWLP has not been in compliance with the requirements of 40 C.F.R. §§ 257.90(b)(1)(i), 91(a)(1), and (2), and 91(c), since October 17, 2017.

More recently, AP-6 is incorrectly screened because it is not screened in the same hydrogeologic unit as RW-3. According to the boring logs, AP-6 (originally GP-6) is screened from 26 to 36 feet BGS. Approximately 9 feet of the well is screened in dark gray silty clay with some sand. Less than a foot of AP-6 is located in dark brownish gray clayey sand. The boring log ends at 37 feet BGS and does not reach the gray shale bedrock. This is contrary to the basal sand unit in which RW-3 is located, where the screen ends in the shale bedrock. As AP-6 is not screened the same geologic unit as the remaining GWMS, AP-6 does not accurately represent the groundwater in the area. Therefore, CWLP failed to comply with the requirements of 40 CFR § 257.91(a)(1) and 257.91(c)(2).

See also, Violations of 40 C.F.R. 40 C.F.R. 90, et seq., Statistical Analysis and Background.

2. Since October 12, 2017, CWLP failed to comply with 40 C.F.R. § 257.91(a)(2) and (b)(1) which requires the number, spacing and depths of the monitoring system wells to be determined based upon site-specific technical information that must include a thorough characterization of aquifer thickness, groundwater flow rate, and groundwater flow direction, including seasonal and temporal fluctuations in groundwater flow.

a. CWLP failed to comply with 40 C.F.R. § 257.91(b).

CWLP failed to conduct stream gauging and include information on the elevation of the water in the ash ponds and Lake Springfield during each monitoring event. Sugar Creek previously flowed under a large portion of the CCR units. CWLP altered Sugar Creek in such a manner that it now is immediately adjacent to the units and located to the north and east of the units. The ash ponds are unlined and adjacent to Lake Springfield. There is groundwater mounding underneath, at least, the Dallman Ash Pond, and likely Lakeside Ash Pond as well. Groundwater flow is typically either influenced by or influences nearby water bodies. In order to accurately determine the groundwater flow rate and direction, the monitoring system should have included consideration of these factors. Typically, stream gauging of an adjacent stream such as Sugar Creek and water level elevations of the ash ponds and Lake Springfield would yield site-specific technical information which would lead to accurately determining the number, spacing and depths of the groundwater monitoring system. CWLP did not do stream gauging on Sugar Creek to determine appropriate groundwater flow rate and direction. It did not provide information on the water level elevations of the ash ponds or Lake Springfield. CWLP appears to have only utilized potentiometric surface maps to determine groundwater levels and flow. The potentiometric surface maps fail to account for positive and negative water movement of the groundwater and flow rates. Consequently, CWLP failed to determine the adequate number, spacing and depth of monitoring wells based on site-specific technical

information.

b. CWLP failed to comply with 40 C.F.R. §§ 257.91(a)(2) and (b)(1).

CWLP failed to have an adequate number of monitoring wells to ensure detection of groundwater contamination in the uppermost aquifer. Based on the cross-sections and potentiometric surface maps developed by CWLP, there appears to be unique geological formations and a rift bisecting the Dallman Ash Pond groundwater flow towards the northern end of the impoundment. See cross-section A-A' of the *IEPA Initial Operating Permit Application*, October 2021. To further evaluate the impact and confirm the possible presence of a bedrock high, additional wells and borings should be located on the south of the pond and along the eastern boundary of the unit. The contour maps are currently supported by only two wells—RW-3 and AP-5—which are over 2000 feet apart, to interpolate groundwater levels along this eastern side. CWLP does not have any wells located between the Lakeside and Dallman units or on the eastern edge of the Dallman unit. Therefore, the current GWMS does not meet the requirements of 40 C.F.R. §§ 257.91(a)(2) and (b)(1).

3. From at least January 31, 2017 to January 31, 2020, CWLP failed to comply with 40 C.F.R. § 257.90(e)(6)(iii)(A) which requires the owner or operator to include in a section at the beginning of each annual groundwater monitoring and corrective action report, at a minimum, a summary of the constituents listed in Appendix III that were detected above a SSI over background and the names of the monitoring wells associated with such an increase. 40 C.F.R. § 257.90(e)(6)(iv) requires similar reporting if there was a statistically significant level of an Appendix IV constituent above the GWPS.

   In its 2017 Annual Report, CWLP did not identify that there were SSIs for the Appendix III constituents from the November 2017 sampling event. This information was confirmed in CWLP's 2018 Annual Report and February 2018 Notification of Statistically Significant Increase. In its 2018 to 2020 Annual Reports, CWLP indicated that there were SSIs for Appendix III constituents. However, in its 2018 Annual Report, CWLP did not report the constituents or the location of the monitoring wells. In its 2019 Annual Report, CWLP did not include in the summary an identification of the SSI and statistically significant levels (SSL) or the locations of where these issues occurred. In its 2020 Annual Report, CWLP reported the Appendix III constituents and the monitoring wells, but did not report the monitoring wells where Appendix IV measured concentrations were above the GWPS for arsenic.

4. From at least June 26, 2019, CWLP failed to comply with 40 C.F.R. § 257.96, which states that "[w]ithin 90 days of finding that any constituent listed in Appendix IV to this part has been detected at a statistically significant level exceeding the groundwater protection standard defined under § 257.95(h), or immediately upon detection of a release from a CCR unit, the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions." 40 C.F.R. § 257.96 also requires that "the owner or operator must discuss the results of the corrective measures assessment at least 30 days prior to the selection of

remedy, in a public meeting with interested and affected parties." The corrective measures assessment must include specific information, including but not limited to, an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives of the remedy as described under 40 C.F.R. § 257.97. See, 40 C.F.R. 257.96(c). On November 9, 2017, CWLP detected statistically significant increases of Appendix III constituents. CWLP posted on its federal CCR website the following:

a. Notice of a statistically significant increase above the Groundwater Protection Standard for arsenic. This document was not signed and had a date of July 2018.
b. A Notice that it was initiating an assessment of corrective measures. This document was unsigned and had a date of April 2019.
c. A Notice that it had completed a corrective measures assessment. This document was signed June 26, 2019. It stated that CWLP had not made a decision on whether to retrofit or close the surface impoundments. It did not provide any of the analysis required by 40 C.F.R. §§ 257.96 or 257.97.

CWLP has not completed the corrective measures assessment required by 40 C.F.R. §§ 257.96 or 257.97 and has not immediately taken all necessary measures to control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of contaminants into the environment.

5. From at least January 31, 2019, CWLP failed to comply with 40 CFR §§ 257.94(e)(2) because CWLP failed to include in its 2019 Annual Report the results of its 2018 alternate source demonstration (ASD) and the required QPE certification. An owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. If the owner or operator attempts to make an alternate source demonstration (ASD), then they must have a written demonstration with a QPE certification as to the accuracy of the information in the written demonstration. They must complete this demonstration within 90 days of detecting an SSI over background for one or more Appendix III constituents.

   CWLP detected significant increases of boron, calcium, chloride, pH, sulfate, and total dissolved solids (TDS) on November 9, 2017. If CWLP elected to do an ASD, then a written ASD with a QPE certification was required to be completed by February 7, 2018. CWLP indicated in its 2018 Annual Report (dated January 2019) that it attempted an ASD based on a belief that SSIs of arsenic were the result of naturally occurring minerals within the local geologic deposits or CCR material contained within the peripheral berm. However, CWLP did not commence work on this ASD until September or October of 2018 when it conducted on-site sampling. In the 2018 Annual Report (dated January 2019), CWLP indicated that it completed the ASD and determined that the arsenic was not the result of naturally occurring minerals or from the peripheral berm. However, CWLP did not include with that Annual Report the written demonstration of the results of the ASD or a QPE certification.

In July of 2019, CWLP detected arsenic concentrations in monitoring well RW-3 that it claimed were below the arsenic GWPS. CWLP discontinued its corrective measures assessment (CMA) without completing that assessment. CWLP continued with its groundwater monitoring program and at the next sampling event on February 28, 2020, it detected arsenic above the GWPS. In the 2020 Annual Report, CWLP stated further efforts to determine an ASD were taken during 2020 with the installation of dedicated low-flow pumps in November 2020 to reduce possible turbidity in the well samples. A second ASD attempt is not expressly permitted under the regulations. And, even if such an attempt was permitted, CWLP failed to complete its attempted second ASD by May 28, 2020—ninety days after it detected arsenic above the GWPS. First quarter sampling on January 21, 2021, indicated arsenic concentrations were again above GWPS.

6. From at least December 31, 2017, to May 4, 2018, CWLP failed to comply with 40 C.F.R. § 257.95(b), when it failed to timely sample and analyze groundwater for all Appendix IV constituents. According to 40 C.F.R. § 257.95(b), within 90 days of triggering the need for an assessment monitoring program and annually thereafter, CWLP was required to sample and analyze groundwater for all Appendix IV constituents. Additionally, CWLP was required to semi-annually monitor groundwater for all Appendix III constituents and those Appendix IV constituents that were detected.

   CWLP's November 9, 2017, sampling event detected SSIs of the following Appendix III constituents: boron, calcium, chloride, pH, sulfate, and total dissolved solids (TDS,) above background at downgradient wells AP 1-3 and AW-3. See 2017 Annual Report (dated January 2018). According to the 2017 Annual Report, the November 9, 2017 sampling event detected SSIs of Appendix III constituents. The date when CWLP completed the statistical analysis showing an SSI, is the trigger date for measuring when the assessment monitoring should have commenced. However, it is not possible to determine the earliest date of this triggering event since CWLP did not include the statistical analysis with the 2017 Annual Report. [1] Based on the information available and according to the 2017 Annual Report, CWLP was aware that there was an SSI by December 31, 2017. Consequently, CWLP should have collected and analyzed its first assessment monitoring samples on or about December 31, 2017. CWLP did not collect its first assessment monitoring samples until May 4, 2018. See 2018 Annual Report.

7. From at least February 8, 2018, to July 9, 2018, CWLP failed to comply with 40 C.F.R. § 257.95(d)(2) when it failed to establish a GWPS for arsenic. According to 40 CFR § 257.95(d)(2), CWLP was required to establish a GWPS for all Appendix IV constituents detected after receiving the results of the sampling required by 40 C.F.R. 257.95(b). Since the sampling was due by February 8, 2018, CWLP was required to establish the GWPS by that date. It did not conduct the sampling at that time and consequently was not able to establish a GWPS. Instead, on May 4 and July 9, 2018, CWLP sampled its monitoring

[1] Although CWLP replaced and recertified AW-3 to RW-3, the SSIs of Appendix III constituents from the November 9, 2017, sampling event were found at monitoring wells that were not impacted by the recertification

wells and found arsenic concentrations at well RW-3 above the background concentrations. See 2018 Annual Report. CWLP did not establish the GWPS for arsenic until after July 9, 2018. See *Notification of Statistically Significant Increase in Accordance with 40 C.F.R. § 257.95(g)*, July 2018 (2018 Notice SSI). Although 40 C.F.R. § 257.95(h) provides that the background concentration could be the GWPS, that is not the only possible concentration limit that may be used for arsenic. CWLP did not identify the specific GWPS for arsenic in the 2018 Notice SSI nor in the 2018, 2019, or 2020 Annual Reports.

8. Since at least February 28, 2020, CWLP failed to comply with 40 C.F.R. § 257.95(g) when it failed to provide notice of an SSL above the GWPS for arsenic at monitoring well RW-3 on February 28, 2020. By February 28, 2020, CWLP had installed AP-6 and 7, additional downgradient wells, as part of its monitoring well network. See 2020 Annual Report. CWLP sampled all the wells in its monitoring network on February 28, 2020, and August 5, 2020. On both dates CWLP detected concentrations of each of the Appendix III constituents, except flouride, above SSI concentrations. Furthermore, CWLP detected arsenic above the GWPS at 0.497 mg/L and 0.253 mg/L in monitoring well RW-3. See *2020 Annual Report*.

   Since certifying the completion of corrective measures in August 2019, see *CWLP CCR Completion of Corrective Measures*, August 2019, CWLP has not provided notice of an SSL, as required by 40 C.F.R. § 257.95(g), for the arsenic detected above the GWPS on February 28, 2020, and August 5, 2020. CWLP attempted to conduct an ASD but did not complete it within the required 90 days—May 28, 2020—as required by 40 C.F.R. § 257.95(g)(3)(i) and (4). Additionally, the ASD that CWLP attempted did not demonstrate that an alternate source was the cause of the arsenic it detected above GWPS. Therefore, pursuant to 40 C.F.R. §§ 257.95(g)(3)(i) and 95(g)(4), CWLP was required to initiate a CMA by August 28, 2020. CWLP did not do so and failed to complete a CMA for the most recent SSL detections by January 28, 2021.

   From 2012 until 2015, prior to beginning the detection monitoring required by the CCR rules, CWLP collected samples from RW-3 and other wells that are part of its CCR detection monitoring system. At least one sample per year from RW-3 was above both the maximum contaminant level (MCL) for arsenic and the background that CWLP established. Consequently, prior to establishing its CCR detection monitoring system CWLP knew that there were elevated arsenic concentrations. CWLP could have installed low flow pumps and resolved its turbidity issue when sampling any time before it started the CCR detection monitoring program in 2017 but did not.

9. From at least May 4, 2018, to February 28, 2020, CWLP failed to comply with 40 C.F.R. § 257.95(g)(1)(i) to (iv). According to 40 C.F.R. § 257.95(g)(1)(i) to (iv), if the owner or operator detects an SSL exceeding the GWPS of any Appendix IV constituent then it must characterize the nature and extent of the release and any relevant site conditions that may affect the remedy ultimately selected. Additional requirements under this provision include installing additional wells to define the plume and at least one additional monitoring well at the facility boundary in the direction of contaminant migration, collect data on the nature and estimate quantity of material released, and sample this well in accordance with 40

C.F.R. § 257.95(d)(1).

a. CWLP failure to install additional monitoring well(s).

On May 4, 2018, CWLP detected an SSL of arsenic above the GWPS. CWLP was required to install at least one additional monitoring well. On April 29, 2019, Andrews Engineering, Inc. (Andrews) certified that CWLP had not installed additional monitoring wells or collected additional sampling "due to poor weather conditions that made most of the site inaccessible." See *Assessment of Corrective Measures Extension*, May 2019. The additional monitoring wells were to be installed and sampled in May 2019. See *Assessment of Corrective Measures Extension in Accordance with 40 C.F.R. § 257.96(a)*, May 2019. CWLP's monitoring system throughout 2019 consisted of wells AP-1 to 5 with RW-3 as a replacement for AW-3. CWLP did not install additional wells in 2019, as required by 40 C.F.R. § 257.95(g)(1)(iii). See 2019 Annual Report. CWLP did not add the required additional monitoring well until February 28, 2020. See 2020 Annual Report.

b. Failure to characterize the nature and extent of the release

CWLP identified that it had undertaken actions to characterize the nature and extent of the RW-3 release in accordance with 40 C.F.R. §§ 257.95(g)(1)(i), (ii) and (iv). In its 2021 Annual Report, CWLP stated that it had added two additional monitoring wells—AP-6 and AP-7— to its groundwater monitoring network, downgradient of RW-3 in order to help capture the nature and extent of the RW-3 arsenic release. CWLP concluded that due to the lack of exceedances of the GWPS that the nature and extent of arsenic contamination had been characterized. According to the boring logs, AP-6 (originally GP-6) was not screened in the same hydrogeological unit as RW-3, thus preventing its ability to adequately determine if arsenic was flowing through or past the well. GP-6 is screened from 26 to 36 feet BGS. Less than one foot is potentially located in the basal sand unit that RW-3 is located in. Due to the improper screening of AP-6, CWLP has not clearly defined the contaminant plume and has not appropriately sampled, in accordance with 40 C.F.R. § 257.95(d)(1).

c. Failure to collect data on the nature and quantity of the arsenic released

Further, as a result of the above identified deficiencies, CWLP has not collected data on the quantity of arsenic released.

10. From at least November 4, 2018, CWLP failed to comply with 40 C.F.R. § 257.95(g)(3)(i), (ii) and (4) when it failed to timely initiate the corrective measures assessment by November 4, 2018, for the SSL of arsenic that it detected on May 4, 2018 in monitoring well RW-3. CWLP also failed to comply with 40 C.F.R. § 257.96(a) from at least April 4, 2019, to the date of this letter because it failed to complete the corrective measures assessment.

    According to 40 C.F.R. § 257.95(g)(3)(i), (ii) and (4), within 90 days of detecting an SSL exceeding the GWPS of any Appendix IV constituent, an owner or operator must, among

other things, initiate an assessment of corrective measure pursuant to 40 C.F.R. § 257.96. Pursuant to 40 C.F.R. § 257.95(g)(3)(ii), during this same 90-day period of time, the owner or operator may demonstrate that the SSL was the result of an alternate source or an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. According to 40 C.F.R. § 257.95(g)(iv), if the owner or operator is not successful in demonstrating the alternate source then it must initiate an assessment of the corrective measures. 40 C.F.R. § 257.96(a) requires the owner or operator to complete the corrective measures assessments within 90 days of the date it is required to initiate the assessment. A 60-day extension is allowed to complete the corrective measures assessment if the owner or operator demonstrates there is the need based on site-specific conditions.

On May 4 and July 19, 2018, CWLP detected arsenic at 0.0826 mg/L and 0.136 mg/L in monitoring well RW-3. These concentrations were above the background concentration of arsenic of 0.0724 mg/L and were consequently above the GWPS for arsenic.

As a result of the May 4, 2018, sampling event, CWLP was required to initiate a corrective measures assessment (CMA) by August 4, 2018. It had until January 4, 2019, to complete the CMA, if it demonstrated the need for a 60-day extension for site-specific reasons. If CWLP elected to demonstrate an alternate source then it had to complete the ASD by August 4, 2018. If it was unsuccessful in demonstrating an alternate source then CWLP had to initiate the CMA by November 4, 2018, and complete the CMA by April 4, 2019, if it demonstrated the need for a 60-day extension for site-specific reasons. CWLP did not make a successful ASD for the May 4, 2018, SSI of arsenic above the GWPS and, as of the date of this letter, has not completed the CMA that it started in April of 2019.

In July of 2018, Andrews on behalf of CWLP prepared a one-page notice that indicated that there was a SSI of arsenic above the GWPS at the new well RW-3. See *Notification of Statistically Significant Increase in Accordance with 40 C.F.R. § 257.95(g)*, July 2018. (2018 SSI Notice). The notice indicated that an investigation to evaluate the geochemical properties in the vicinity of RW-3 was currently on-going. No other information was provided and the notice was not signed.

Andrews reported that an ASD pursuant to 40 C.F.R. § 257.94(e)(2) and 257.95(g)(3)(ii) was conducted between September and October of 2018. See 2018 Annual Report. By December 31, 2018, CWLP reported that its ASD had been completed. See *2018 Annual Report*. This ASD consisted of additional soil and groundwater samples around RW-3 and replacement of a monitoring well near the toe of the landfill. This effort confirmed that the arsenic concentrations in RW-3 were not the result of naturally occuring minerals within the local deposits or CCR material contained in the peripheral berm of the landfill. See, 2018 Annual Report. Consequently, the ASD was unsuccessful in demonstrating that the May 4, 2018, SSI for arsenic was the result of error, which meant CWLP was required to initiate and complete a CMA.

In April of 2019, CWLP posted a notice that it had initiated the CMA. See *Initiation of Assessment of Corrective Measures in Accordance with 40 C.F.R. § 257.95(g)* (2019 CMA Initiation Notice). No further information was provided.

On June 26, 2019, Andrews, on-behalf of CWLP, certified that CWLP had completed the CMA. See *Completion of Corrective Measures in Accordance with 40 C.F.R. § 257.96(a), July 2019* (2019 CMA Completion Notice). The 2019 CMA Completion Notice contradicted the certification of completion of CMA because it stated that CWLP had begun to characterize the nature, rate, and extent of the release and was still evaluating whether it was going to retrofit or close the surface impoundments as the long-term corrective measure. Therefore, the 2019 CMA Completion Notice did not provide sufficient information to demonstrate that the CMA was completed.

CWLP discontinued its CMA sometime between August 1, 2019 and December 31, 2019, stating that it was not required because CWLP has detected arsenic concentrations at 0.025 mg/L in two sampling rounds. However, arsenic was below the GWPS only during the August 1, 2019, semiannual sampling event. See 2019 Annual Report. Arsenic concentrations were detected at 0.124, and therefore above the GWPS, in the February 13, 2019, sampling event. See, 2019 Annual Report.

In May 2019, CWLP extended five direct-push borings into the uppermost aquifer. Results of the borings were included in the 2019 Annual Report. In July 2019, CWLP bored and sampled an additional five new wells—3 new locations and 2 from the May boring. CWLP concluded that the presence of total arsenic in RW-3 was low and ceased its investigation into the ASD. Results from sampling on February 28, 2020 were above GWPS and CWLP stated further efforts to determine an ASD were taken during November 2020 with the installation of dedicated low-flow pumps to reduce possible turbidity in the samples. CWLP indicated that it would not complete its second alternate source demonstration until after it collected its 2021 samples. It indicated that the low-flow sampling devices would resolve the turbidity issues and result in arsenic concentrations below the GWPS. The 2021 sampling continued to demonstrate arsenic above the GWPS even with low-flow sampling. Sampling results for RW-3 in 2021 were 0.116 mg/L on January 27; 0.119 mg/L on May 27; and 0.105 mg/L on August 24. See Table 2 *IEPA Initial Operating Permit Application*, October 2021 and 2021 Annual Report.

11. Since at least July 26, 2019, CWLP has failed to comply with 40 C.F.R. § 257.97(a) and (b) because it failed to address how its selected remedies—closure and/or retrofitting—will attain the GWPS and remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible. CWLP failed to comply with 40 C.F.R. § 257.96(c) because it has failed to address:

    - The performance, reliability and ease of implementation and potential impact of its selected remedy (closure),
    - How its selected remedy will attain the GWPS and remove as much contaminated material as is feasible,
    - The time required to complete its selected remedy; and
    - The institutional requirements, such as state or local permits or other environmental or public health requirements that may substantially affect the implementation of these remedies.

Further, CWLP failed to comply with 40 C.F.R. § 257.97(a) because it has not prepared a final report describing the selected remedy and how it meets the standards specified in 40 C.F.R. § 257.97(b). CWLP has also failed to obtain a certification from a QPE that the selected remedies meet the requirements of 40 C.F.R. § 257.97. Finally, CWLP has failed to prepare a semiannual report describing the progress in selecting and designing the remedy.

According to 40 C.F.R. § 257.96(c), the CMA must address the performance, reliability, and ease of implementation and potential impact of appropriate remedies, the time required to complete the remedy and the institutional requirements, such as state or local permits or other environmental or public health requirements that may substantially affect the implementation of the remedy. According to 40 C.F.R. § 257.97(b), the selected remedy must, among other things, attain the GWPS and remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible.

According to 40 C.F.R. § 257.97(a), the owner or operator must, as soon as feasible, select a remedy that, at a minimum, meets the standards listed in 40 C.F.R. § 257.97(b), including attaining the GWPS and removing from the environment as much of the contaminated material that was released as is feasible. Furthermore, according to 40 C.F.R. § 257.97(a), upon selection of a remedy, the owner or operator must prepare a final report describing the selected remedy and how it meets the standards specified in 40 C.F.R. § 257.97(b). The owner or operator must obtain a certification from a qualified professional engineer that the remedy selected meets the requirements of 40 C.F.R. § 257.97. The owner or operator must also prepare a semiannual report describing the progress in selecting and designing the remedy.

On or about July 26, 2019, a QPE certified in a one-page document that the long-term corrective measures for the surface impoundments would consist of closure and/or retrofitting the surface impoundments. See 2019 CMA Completion Notice. The QPE stated that CWLP had not decided which of these measures it would implement but that CWLP initiated the alternate closure requirements of 40 C.F.R. § 257.103(a)(1) and would update the status of the surface impoundments in the May 2020 annual progress report. Information was not provided on how CWLP would address the contaminated groundwater or its schedule for implementation of either closure or retrofitting the surface impoundments.

CWLP's 2016 closure plan for the surface impoundments does not address retrofitting of the surface impoundments, a schedule for implementing closure or retrofitting of the surface impoundments, or actions that will be taken to address contaminated groundwater. See, Closure Plan for Coal Combustion Residue Surface Impoundments, October 2016. (2016 Closure Plan).

In May of 2020, CWLP stated that it had not determined a date for initiation of closure of the surface impoundments. See *Annual Progress Report for Alternate Closure Requirements in Accordance with 40 C.F.R. § 257.103(c)(2)*. (2020 Annual Alternate

Closure Report).

On November 24, 2020, CWLP submitted a request for a site-specific alternative deadline to initiate closure of the surface impoundments pursuant to 40 C.F.R. § 257.103(f)(1). (2020 Request for Alternate Closure). In this document, CWLP indicates that it is planning on closing the surface impoundments. Although it does not specifically identify or discuss the long-term remedy for the contaminated groundwater, the 2020 Request for Alternate Closure suggests abandoning and retrofitting the impoundments and using selected closure as the long-term solution for contamination releases. CWLP identifies October 2023 as the earliest possible date for discontinuing use of the surface impoundments. The 2020 Annual Report indicates that CWLP has modeled the final cover that it will use and determined the cover will reduce surface water infiltration, which will reduce solute movement beneath the impoundments. However, this does not address the nature, rate, and extent of existing ground water contamination or the steps it will take to clean-up the contaminated groundwater. Additionally, CWLP has not identified a date for initiation or completion of surface impoundment closure, the remedy it will implement to address the contaminated groundwater, or a schedule for implementation of a remedy for the contaminated groundwater.

In its annual progress report filed in May of 2021, CWLP did not provided further information than what was included in the November 24, 2020, Request for Alternate Closure. See *Annual Progress Report for Alternate Closure Requirements in Accordance with 40 C.F.R. § 257.103(c)(2)* (2021 Annual Alternate Closure Report).

12. Since at least February 8, 2018, CWLP failed to comply with 40 C.F.R. § 257.93(d) and (h), which requires the owner or operator of a CCR unit to establish background levels and determine whether there is a significant increase over background levels for each constituent required in the particular groundwater monitoring program. In determining whether there is an SSI, the owner or operator must use background quality as a point of comparison. Additionally, the owner or operator must make the determination of whether there was an SSI within ninety days of completing sampling and analysis from its monitoring wells.

    CWLP completed its sampling and analysis from its monitoring wells on November 7, 2017. It was required to determine if there was an SSI by February 7, 2018. CWLP completed its determination of whether there was an SSI in February 2018. CWLP used well AP-4 and AP-5 in its statistical analysis. However, as discussed in Paragraph 1, above, both wells were not capable of correctly detecting background. Consequently, CWLP's reliance on the data from AP-4 and AP-5 resulted in inaccurate background concentrations. This resulted in an inaccurate determination of whether there was an SSI of constituents. Therefore, CWLP failed to comply with 40 C.F.R. § 257.93(d) and (h).

CWLP – Lakeside and Dallman Ash Ponds
Groundwater Monitoring Systems
Violations of 40 CFR § 257.90 et seq.
Statistical Analysis and Background

CWLP failed to comply with 40 CFR 257.91(a)(1), 93(a), (b), (g)(5) and 94(b). Together these rules require use of accurate background and statistical methods that meet the requirements of the rules and are based on approved methods and practical quantitation limits that are the lowest concentration levels that can be reliably achieved. Accurate and representative background data is needed to conduct a successful statistical groundwater monitoring program. See, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Unified Final Guidance* USEPA, March 2009 (Unified Guidance) at p.5-1. Background data must be appropriate to the statistical test with older data discarded in favor or more recent measurements in order to construct an appropriate comparison. Id at 5-2. It should be periodically reviewed and revised as necessary.

CWLP submitted an undated document entitled *Groundwater Monitoring Program*. Appendix C of that document is entitled Statistical Methods for Determination of Background. It cites to the Unified Guidance as its only reference. The violations identified in this document are based on a review of items placed on the City Water, Light, and Power ("CWLP" or "Dallman") *CCR Rule Compliance and Data Information* website (federal website) as of January 31, 2022 and submitted by CWLP in response to the information request dated May 2, 2022. After reviewing information provided, EPA has identified the following deficiencies:

1. CWLP used sampling results from 2012-2013 for many Appendix III and Appendix IV constituents. These sampling events yielded background concentrations that are significantly higher than sampling results during the regulatory 2017-2021 period. For example, statistical comparisons using the Tarone-Ware two-sample test for multiple detection limits was used to compare the eight boron and lead sample results from 2012-2013 to the 2014-2020 boron and lead results from background well AP-5. The 2012-2013 data were statistically elevated compared to the 2014-2020 data for both boron and lead at p-values of 5.7018E-6 and 6.2333E-4, respectively. These statistical results reflect either a change in background quality since 2013 and/or artifacts from well installation and/or improper well development and/or sampling errors that may have occurred at AP-5 in 2012-2013. Inclusion of pre-rule groundwater data in the background database should be justified by proper two-sample statistical comparisons showing that the pre-rule data is not statistically different than the regulatory (i.e., 2017 to present) data.

2. CWLP used unjustified, high practical quantitation limits (PQL) for many of the constituents in their selected statistical method for calculating a background-based groundwater protection standard (GPS). The PQLs used were frequently at or even greater than the tabulated maximum concentration limits (MCL) (e.g., PQL of 0.05 mg/L for arsenic, vs. MCL of 0.01 mg/L), which may have additionally led to high-biased statistical limits for those constituents.

3. The two wells utilized to characterize upgradient groundwater (AP-4, AP-5) are not able to accurately represent the background quality of groundwater. Potentiometric maps provided in CWLP's Alternate Deadline to Initiate Closure demonstrate groundwater flow beneath the southwest corner of the Lime Softening Ponds, near AP-4, flowing in a northwest direction. This would indicate that groundwater encountered at AP-4 is coming from beneath the limits of waste from the original placement of the unlined Lakeside Ash Pond. The radial flow illustrated on the potentiometric surface maps indicates that AP-4 is potentially affected by CCR waste and could not be used as an upgradient well.

   AP-5 is not properly screened in the upper most aquifer described as the basel sand unit for the surface impoundments. Based on the recorded well construction log, AP-5 is only screened from 17.82 feet to 27.15 feet below ground surface (BGS), ending in gray silty sand. This does not match the consistency of other screened wells, which end in various combinations of light to dark gray clayey slit or dark gray shale. This determination is supported by the site hydrogeology and stratigraphy described in the "Alternate Deadline to Initiate Closure." AP-5 should have been screened in the bottom 10 feet of the boring (36 to 46 feet BGS), which contains a mix of clayey silt, silty sands, silty clay and ending in 1 to 2 feet of the gray shale bedrock. The ability of AP-5 to represent the same groundwater flowing through the surface impoundment monitoring wells is in question and cannot be utilized as an accurate representative of upgradient groundwater for the surface impoundments.

4. The *Groundwater Monitoring Program* document failed to discuss the following:

   a. It did not describe the statistical method for determining if a constituent in Appendix IV is statistically elevated above a GPS. The document provided tabulations for "proposed background value" for Appendix IV constituents based on a non-parametric prediction limit, but did not include information on the actual comparison between assessment well results and the prediction limit (i.e. direct, single sample comparison, 95% lower confidence limit, etc.). The document does not include how many future samples the analysis was predicting of comparison method.

   b. It failed to include information on resampling (e.g., 1-of-2, 1-of-3).

   c. It did not discuss adjustments to the confidence level or other parameters that affect whether the prediction limit approach is "as effective as any other approach."

40 C.F.R. § 257.91(a) provides that the owner or operator of a CCR unit must install a groundwater monitoring system that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that, *inter alia*, accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit. 40 C.F.R. § 257.91(a)(1). 40 C.F.R. § 257.93(a) provides that the groundwater monitoring program must include consistent sampling and analysis

procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and downgradient wells required by § 257.91. 40 C.F.R. § 257.93(b) requires the use of sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples. 40 C.F.R. 257.93(g)(5) requires any practical quantitation limit that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility. 40 C.F.R. 257.94(b) required the collection of a minimum of eight independent samples from each background well that were to be analyzed for the constituents listed in appendix III and IV no later than October 17, 2017.

Based on the above identified issues, CWLP's groundwater monitoring program did not yield groundwater samples that accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit, in violation of 40 C.F.R. § 257.91(a). Further, CWLP's groundwater monitoring program is not designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and downgradient wells, in violation of 40 C.F.R. § 257.93.

CWLP – Lakeside and Dallman Ash Ponds
Federal CCR Website
Violations of 40 C.F.R. § 257.107

The violations identified in this document pertain to the regulatory sections identified above for the surface impoundments and whether items required to be posted to the federal CCR website were on the City Water, Light, and Power federal CCR website as of August 31, 2022. It does not address the adequacy of documents that are posted to its federal CCR website.

According to 40 CFR § 257.107(a), each owner or operator must maintain a publicly accessible internet site (CCR website) containing the information specified in this section. The website must ensure that all information required to be posted is immediately available to anyone visiting the site. All required information must be clearly identifiable and must be able to be immediately printed and downloaded by anyone accessing the site.

1. CWLP violated 40 C.F.R. § 257.107(i)(4) when it failed to post the following documents to its federal CCR website:
    - *Final Closure Plan for Coal Combustion Residuals Surface Impoundments,* February 2022,
    - *Closure Alternatives Assessment and Assessment of Corrective Measures,* February 2022; and
    - *Post-Closure Care Plan for Coal Combustion Residuals Surface Impoundments,* February 2022.

    40 C.F.R. § 257.107(i)(4) requires the owner or operator of a CCR unit to place the written closure plan, and any amendment of the plan, specified under 40 C.F.R. § 257.105(i)(4) to its CCR Website. 40 C.F.R. § 257.105(i)(4) requires the owner or operator of a CCR unit to place the written closure plan, and any amendment of the plan, as required by § 257.102(b), to its CCR Website. CWLP posted to its federal CCR website *Closure Plan for Coal Combustion Residuals Surface Impoundment,* October 2016 and *Post-Closure Plan for Coal Combustion Residuals Surface Impoundments,* October 2016. In February of 2022 CWLP developed and submitted to Illinois EPA the three documents identified above. CWLP did not post any of the February 2022 documents to its federal CCR website. Consequently, CWLP is in violation of 40 C.F.R. § 257.107(i)(4).

2. CWLP violated 40 C.F.R. § 257.107(e) when it failed to place the *Wetland Assessment Report for Coal Combustion Residual Surface Impoundments* (2021 State WAR) on its CCR Website.

    40 C.F.R. § 107(e) requires the owner or operator of a CCR unit to place each demonstration specified under § 257.105(e) on the owner or operator's CCR Website. 40 C.F.R. § 257.105(e) requires the owner or operator of a CCR unit to place the demonstrations documenting whether or not the CCR unit is in compliance with the

requirements under, *inter alia*, 40 C.F.R. § 257.61(a), as it becomes available, in the facility's operating record. 40 C.F.R. § 257.61(a) provides that new CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located in wetlands, as defined in § 232.2 of this chapter, unless the owner or operator demonstrates, by the dates specified in paragraph (c) of this section, that the CCR unit meets the requirements of paragraphs (a)(1) through (5) of this section.

On July 5, 2022, in response to a U.S. EPA information request, CWLP provided EPA with a copy of a document entitled, *Wetland Assessment Report for Coal Combustion Residual Surface Impoundments*. This document was created in order to comply with 35 Ill. Admin. Code § 845.310(a), which states that existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments, must not be located in wetlands unless the owner or operator can make specific demonstrations.

The *Wetland Assessment Report for Coal Combustion Residual Surface Impoundments*, though created for the purposes of complying with 35 Ill. Admin. Code § 845.310, is a demonstration documenting whether or not the CCR unit is in compliance with 40 C.F.R. § 257.61(a). Therefore, according to 40 C.F.R. § 257.107(e), CWLP was required to place it on its federal CCR website. The CWLP federal CCR website does not contain the *Wetland Assessment Report for Coal Combustion Residual Surface Impoundments*, and as such CWLP is in violation of 40 C.F.R. § 257.107(e).

3. CWLP failed to prepare a periodic inflow design flood control within five years of the initial inflow design flood control plan, as required by 40 C.F.R. § 257.82(c)(4). The initial and periodic inflow design flood control plans are required to be posted on the CWLP federal CCR website as specified by 40 C.F.R. § 257.107(g)(4). Based on the review of the documents that are posted in the CWLP federal CCR website as of August 31, 2022, the website does not include a periodic inflow design flood control plan.

ATTACHMENT A.1
NOTICE OF VIOLATION
City Water, Power & Light
Lakeside and Dallman Ash Ponds

Structural Stability Assessment Review – CWLP, Site Inspection Report
CTI and Associates, Inc. (CTI),
September 12, 2022, Inspection Report.

/

Protecting, Enhancing, and Restoring Our Environment

September 12, 2022

LETTER OF TRANSMITTAL

To: Richard Clarizio/Andrew Futerman, U.S. EPA, Region 5

From: Nick Golden, P.E./Wes Galeti, E.I., CTI and Associates, Inc.,

Cc: Andrea Dierich/Spiros Bourgikos, U.S. EPA, Region 5
Joseph Watson/Devamita Chattopadhyay, Ph.D, Eastern Research Group, Inc

Re: Structural Stability Assessment Review – CWLP
Site Inspection Report

Greetings:

On April 27, 2022, CTI along with representatives from USEPA and Illinois EPA visited the CWLP Power Station located in Springfield, Illinois. This visit was performed to support the work CTI is currently performing on behalf of ERG involving the review of the Structural Stability Assessment documents submitted by the station owner to USEPA in response to the USEPA Coal Combustion Residuals Rules.

Attached are the resulting inspection forms and photolog generated as a result of the visit.

We appreciate the opportunity to work with your team.



Nick Golden

CCR POND INSPECTION CHECKLIST
(Embankment Dam)

Owner of Pond: City Water, Power, and Light (CWLP) Date of Inspection: 4/27/2022

Location of Pond (State/County): Illinois/Sangamon County Inspection Type: GENERAL, FOCUSED, ANNUAL

Name of Pond: Lakeside Ash Pond Hazard Class: LOW, SIGNIFICANT, HIGH

Weather: Sunny, (50° F to 70 ° F), Light Breeze Mon./Yr. Completed: ~1958

Inspected by: Nick Golden, Wes Galeti (CTI); Spiros Bourgikos, Andrea Dierich (US EPA)

Owner P.O.C (Name/Phone): P.J. Becker, Environmental Health and Safety Manager; 217-303-9573 (mobile)

Purpose of Pond: Ash Impoundment and Wastewater Treatment Normal Pool Elev.: 564 ft

Inlet Elevation(s): Unknown Outlet Elevation(s): Unknown

If possible, photographs should be taken of the crest, upstream slope, downstream slope, spillways, and any other notable features.

"YES" responses need explanation added to "Remarks" section (i.e.: What? Where? Extent?). "NO" responses indicate no problems observed during inspection. Non-applicable items should be lined out. Check appropriate action box(es).

	Item	Yes	No	Description/Remarks	Action: Repair	Monitor	Investigate
General Conditions							
a.	Alterations to pond since initial construction?	X		Southern portion of the pond has been partially dredged and three ponds have been constructed within the limit of the original ash pond to manage the drinking water treatment plant's lime sludge byproduct.			
b.	Development in downstream floodplain?		X				
c.	Development around reservoir?		X				
d.	Is water level changed from normal?		X				
e.	Is pond lacking clearly identified signage?		X				
f.	Are access roads in need of maintenance?		X				
Outer Embankments/Slope Protection							
a.	Is any portion incised?		X				
b.	Is vegetative cover inadequate?	X		OVERGROWN, Vegetative growth consists of heavy brush, tall grass, and trees up in excess of 5 feet in height in majority of areas.	X		
c.	Are trees or brush growing on embankment?	X		Heavy brush, small trees, and tall grass should be removed/mowed.	X		
d.	Are cracks, settlement, or bulges present?	Unknown		Heavy brush, tall grass, and small trees make visual inspection for cracks, settlement, or bulges infeasible		X	
e.	Is erosion damage present?	X		Erosion on ramp in north side. Other areas of the pond are covered with heavy brush, tall grass, and small trees making inspection for erosion damage infeasible.	X		
f.	Any evidence of seepage?	Unknown		Heavy brush, tall grass, and small trees make visual inspection for seepage infeasible			X
g.	Are animal burrows or trails present?	Unknown		Heavy brush, tall grass, and small trees make visual inspection for animal burrows infeasible. One repaired animal borrow was noted, but others could potentially exist.			X
Inner Embankments/Slope Protection							
a.	Is vegetative cover inadequate?	X		OVERGROWN,	X		
b.	Are trees or brush growing on embankment?	X		Heavy vegetation growth including trees and brush are growing on the embankment	X		

Check if corrective action is noted/recommended ↑

	Item	Yes	No	Description/Remarks	Action: Repair	Monitor	Investigate
c.	Are trees growing at waterline?		X				
d.	Is drift debris present?		X				
e.	Are cracks, settlement, or bulges present?	Unknown		Heavy brush and tall grass make visual inspection for cracks, settlement, or bulges infeasible			X
f.	Is erosion damage present?		X				
g.	Any wave damage observed?		X				
h.	Is riprap inadequate?		X				
i.	Any evidence of seepage?		X				
j.	Are animal burrows or trails present?	Unknown		Heavy brush and tall grass make visual inspection of animal burrows infeasible			X
Riser/Inlet Structure. Type, No., and Size: Main pond area uses a concrete outlet structure with wooden stop logs. Dimensions are not provided in historic documents provided. Lime Pond drainage channel flows into a culvert with no headwall or structure.							
a.	Is the inlet functioning improperly?	Unknown		Unknown. One riser structure on the north central portion of the perimeter dike is constructed with wooden stop logs, which show signs of deterioration and leakage. Northwestern outlet from the Lime Ponds outlet channel.	X		X
b.	Is conduit inlet submerged?		X				
c.	Is conduit not properly supported?		X				
d.	Any deterioration/holes/corrosion observed?		X				
e.	Is concrete reinforcement exposed?		N/A				
f.	Has inlet been modified to alter water surface?	X		One of the culverts has a forcemain pipe passing through it from historical practice of using pumps to control water level. Pumps no longer active but pipe through culvert remains			
g.	Any evidence of leakage inside inlet?		X				
h.	Any evidence of seepage?		X				
Principal Spillway Outlet Structure. Type, No., and Size: Main pond area has a 24 inch reinforced concrete pipe to the clarification pond; lime pond drainage area has an approximately 12 inch PVC outlet culvert to the clarification pond.							
a.	Is the outlet functioning improperly?	Unknown		Pipes appear to be flowing correctly but no information was provided by CWLP to show if the pipe sizing is adequate.			X
b.	Is outlet submerged?	X		Outlet partially submerged. No information was provided by CWLP on the hydraulic capacity of the pipes and if this submergence is acceptable.			X
c.	Is outlet not properly supported?		X				
d.	Any deterioration/holes/corrosion observed?		X				
e.	Is concrete reinforcement exposed?		X				
f.	Has outlet been modified to alter water surface?		X				
g.	Any evidence of leakage inside outlet?		X				
h.	Any evidence of seepage?		X				
i.	Any leakage observed at pipe joints?		X				
j.	Is riprap present but inadequate?	X		No riprap at outlet. Bank seems stable with minimum erosion		X	
k.	Is trash rack/screen obstructed?		N/A				
l.	Is trash rack/screen corroded or damaged?		N/A				

Check if corrective action is noted/recommended ↑

	Item	Yes	No	Description/Remarks	Action: Repair	Monitor	Investigate
Principal Spillway Outlet Channel. Type: No outlet channel							
a.	Is spillway channel functioning improperly?		N/A				
b.	Is control section disturbed?		N/A				
c.	Is vegetative cover inadequate?		N/A				
d.	Is flow area obstructed (e.g. trees, debris, etc.)		N/A				
e.	Any deterioration/holes/corrosion observed?		N/A				
f.	Is erosion/scour protection inadequate?		N/A				
g.	Any deterioration in energy dissipators?		N/A				
h.	Are cracks, settlement, or bulges present?		N/A				
i.	Any boils, rust stains, or sediment in flow noted?		N/A				
j.	Any seepage observed?		N/A				
k.	Any animal or vehicle trails observed?		N/A				
Auxiliary/Emergency Spillway Outlet Structure. Type, No., and Size: No emergency spillway							
a.	Is spillway functioning during inspection?		N/A				
b.	Is spillway functioning improperly?		N/A				
c.	Is outlet not properly supported?		N/A				
d.	Any deterioration/holes/corrosion observed?		N/A				
e.	Is concrete reinforcement exposed?		N/A				
f.	Has outlet been modified to alter water surface?		N/A				
g.	Any evidence of leakage inside outlet?		N/A				
h.	Any evidence of seepage?		N/A				
i.	Any leakage observed at pipe joints?		N/A				
j.	Is riprap present but inadequate?		N/A				
k.	Is trash rack/screen obstructed?		N/A				
l.	Is trash rack/screen corroded or damaged?		N/A				
Auxiliary/Emergency Spillway Outlet Channel. Type: No emergency spillway							
a.	Is spillway functioning during inspection?		N/A				
b.	Is spillway functioning improperly?		N/A				
c.	Is control section disturbed?		N/A				
d.	Is vegetative cover inadequate?		N/A				
e.	Is flow area obstructed (e.g. trees, debris, etc.)		N/A				
f.	Any deterioration/holes/corrosion observed?		N/A				
g.	Is erosion/scour protection inadequate?		N/A				
h.	Any deterioration in energy dissipators?		N/A				
i.	Are cracks, settlement, or bulges present?		N/A				
j.	Any boils, rust stains, or sediment in flow noted?		N/A				
k.	Any seepage observed?		N/A				
l.	Any animal or vehicle trails observed?		N/A				
Pond Drain and Gates/Valves. Type and Size and date gate was last operated: No pond drain present							
a.	Is gate functioning improperly?		N/A				
b.	Is gate stem broken or bent?		N/A				
c.	Are components missing?		N/A				
Foundation /Toe Drains. List type and size: No toe drain installed							
a.	Is drain functioning improperly?		N/A				
b.	Is drain flowing during inspection?		N/A				
c.	Any boils or sediment laden flow observed?		N/A				
d.	Is foundation drain outlet submerged?		N/A				
e.	Is foundation drain rodent guard missing?		N/A				

Check if corrective action is noted/recommended ↑

Item		Yes	No	Description/Remarks	Action: Repair	Action: Monitor	Action: Investigate
Instrumentation:							
a.	Are there any ground water monitoring wells?	X		Several groundwater wells present around the impoundment			
b.	Are there any ground water piezometers?		X				
c.	Are there any settlement monitoring devices?		X				
d.	Are there any weirs/flumes?		X				
e.	Are there any slope inclinometers?		X				
Perimeter Fence No perimeter fence, but access roads are gated.							
a.	Is fence inadequate?		N/A	No perimeter fence present			
b.	Are gate(s) open?		X				
c.	Are there any security concerns?		X				
Other Items (list below)							
a.							
b.							
c.							
d.							
e.							
f.							
g.							
h.							
i.							

*GPM (gallons per minute): to convert from oz/sec multiply by 0.4688; to convert from ml/sec multiply by 0.01585

General Observations

Perimeter dike vegetation was significantly overgrown, limiting the ability to visually inspect the impoundment system. Discussion with CWLP staff indicated that they have had difficulty mowing the sideslopes due to lack of equipment and lack of funding. The recent practice has been to use a long reach excavator to scrape the existing vegetation off to bare soil and then to replant grass. The northwestern dike was in progress of this practice when the site inspection was performed.

Overall condition of the perimeter dike seems to be stable with no indication of current or historical movement. The western portion of the ash pond contains a channel that conveys flow from the Lime Sludge Ponds to the Clarification Pond (see Figure 1). Historically, CWLP had seen seepage along the western side, in particular when the western most sludge pond was dredged. CWLP installed a gravity seepage collection system along the west side, and they indicated that they had not seen seepage along this side since. The outlet of this seepage collection system was free flowing into the Clarification Pond and appeared to be clear.

The impoundment itself is heavily vegetated and appears to be nearly full with approximately 2 feet of freeboard. The southeastern portion of the ash pond has stockpiled material, which reduces its storage capacity for storm water. No hydraulic analyses have been presented as part of the CCR Rule documentation and the relatively small amount of freeboard gives the potential concern for the impoundment to manage the design storm event (1,000-year storm if the impoundment is classified as a Significant Hazard).

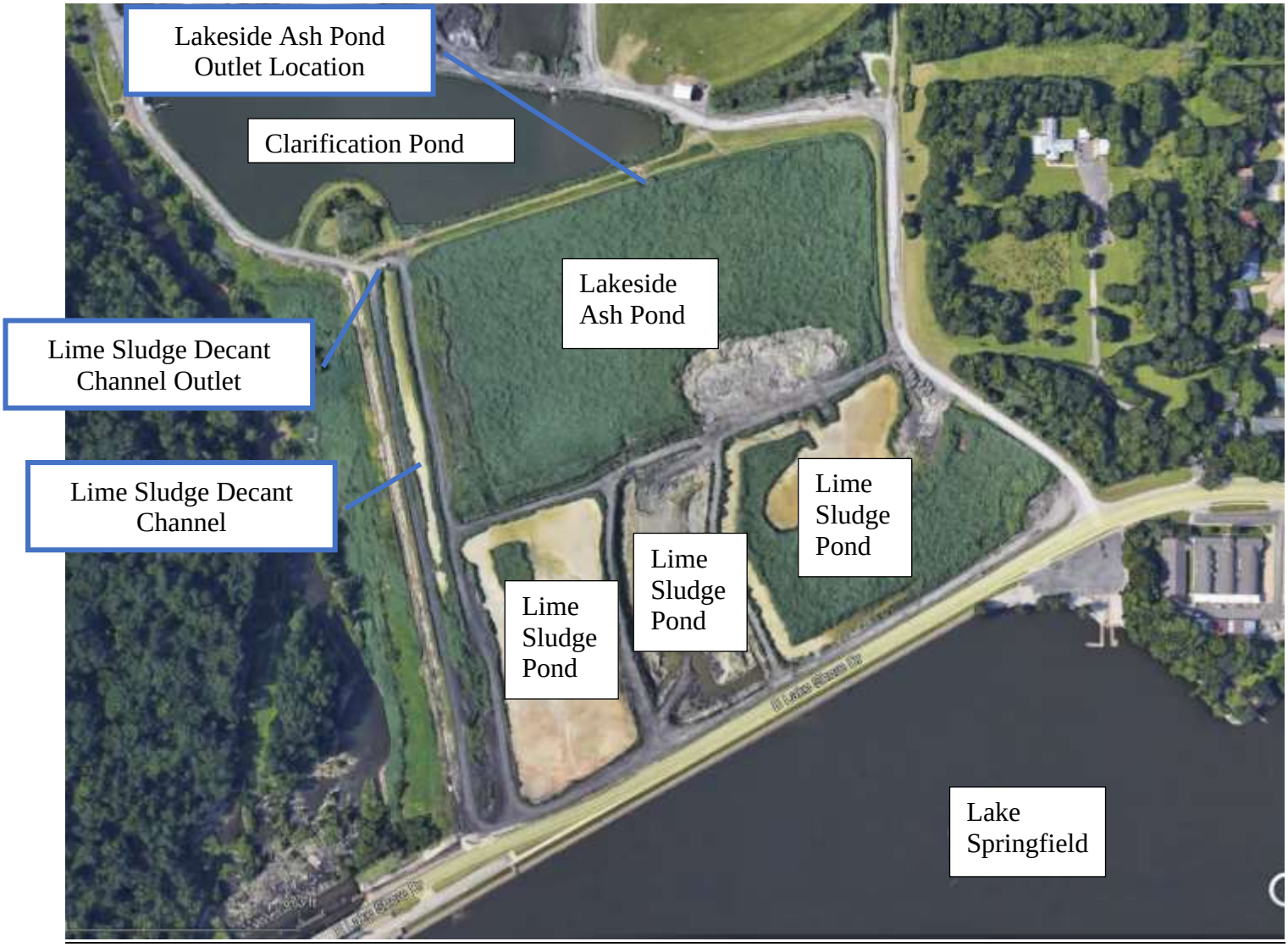


Figure 1- Site Plan

CCR POND INSPECTION CHECKLIST
(Embankment Dam)

Owner of Pond: City Water, Power, and Light (CWLP) Date of Inspection: 4/27/2022

Location of Pond (State/County): Illinois/Sangamon County Inspection Type: GENERAL, FOCUSED, ANNUAL

Name of Pond: Dallaman Ash Pond Hazard Class: LOW, SIGNIFICANT, HIGH

Weather: Sunny, (50° F to 70 ° F), Light Breeze Mon./Yr. Completed: 1976

Inspected by: Nick Golden, Wes Galeti (CTI); Spiros Bourgikos, Andrea Dierich (US EPA)

Owner P.O.C (Name/Phone): P.J. Becker, Environmental Health and Safety Manager; 217-303-9573 (mobile)

Purpose of Pond: Ash Impoundment and Wastewater Treatment Normal Pool Elev.: 557 ft

Inlet Elevation(s): Unknown Outlet Elevation(s): Unknown

If possible, photographs should be taken of the crest, upstream slope, downstream slope, spillways, and any other notable features.

"YES" responses need explanation added to "Remarks" section (i.e.: What? Where? Extent?). "NO" responses indicate no problems observed during inspection. Non-applicable items should be lined out. Check appropriate action box(es).

	Item	Yes	No	Description/Remarks	Action: Repair	Monitor	Investigate
General Conditions							
a.	Alterations to pond since initial construction?	X		Large stockpiles placed adjacent dikes inside pond. Need to investigate the effect of stockpiles on stability.			X
b.	Development in downstream floodplain?		X				
c.	Development around reservoir?		X				
d.	Is water level changed from normal?		X				
e.	Is pond lacking clearly identified signage?		X				
f.	Are access roads in need of maintenance?	X		Rutting and erosion in ramp on north side	X		
Outer Embankments/Slope Protection							
a.	Is any portion incised?	X		Eastern portion of ash pond is incised relative to the closed landfill area.			
b.	Is vegetative cover inadequate?	X		OVERGROWN Vegetative growth consists of heavy brush, tall grass, and trees up in excess of 5 feet in height in areas. Western and southern slopes had the highest growth. North slope had thinner growth, but significant portions had grass/brush in excess of 5 feet of height.	X		
c.	Are trees or brush growing on embankment?	X		Heavy brush, tall grass, and small trees on dikes.	X		
d.	Are cracks, settlement, or bulges present?	Unknown		Heavy brush, tall grass, and small trees make visual inspection for cracks, settlement, or bulges infeasible	X		X
e.	Is erosion damage present?	X		Erosion on ramp in north side. Other areas of the pond are covered with heavy brush, tall grass, and small trees making inspection for erosion damage infeasible.	X		
f.	Any evidence of seepage?	Unknown		Heavy brush, tall grass, and small trees make visual inspection for seepage infeasible	X		X
g.	Are animal burrows or trails present?	Unknown		Heavy brush, tall grass, and small trees make visual inspection for animal burrows infeasible	X		X

Check if corrective action is noted/recommended ↑

	Item	Yes	No	Description/Remarks	Action: Repair	Monitor	Investigate
Inner Embankments/Slope Protection							
a.	Is vegetative cover inadequate?	X		OVERGROWN, vegetation obscures dike.	X		
b.	Are trees or brush growing on embankment?	X		Heavy vegetative growth including trees and brush	X		
c.	Are trees growing at waterline?		X				
d.	Is drift debris present?		X				
e.	Are cracks, settlement, or bulges present?	Unknown		Heavy brush, tall grass, and large stockpiles at the inside shoulder of the dike make visual inspection for cracks, settlement, or bulges infeasible	X		X
f.	Is erosion damage present?		X				
g.	Any wave damage observed?		X				
h.	Is riprap inadequate?		X				
i.	Any evidence of seepage?		X				
j.	Are animal burrows or trails present?	Unknown		Heavy brush, tall grass, and large stockpiles at the inside shoulder of the dike make visual inspection animal burrows infeasible	X		X
Riser/Inlet Structure. Type, No., and Size: No riser, just CMP culverts inlets							
a.	Is the inlet functioning improperly?	Unknown		Unknown. Only one of the two culverts is fully functional due to obstruction by historic forcemain pipe. No hydraulic information provided by CWLP so it is unknown if this single pipe is adequate.			X
b.	Is conduit inlet submerged?		X				
c.	Is conduit not properly supported?		X				
d.	Any deterioration/holes/corrosion observed?	X		Minor hole observed in upstream culvert pipe		X	
e.	Is concrete reinforcement exposed?			n/a			
f.	Has inlet been modified to alter water surface?	X		One of the culverts has a forcemain pipe passing through it from historical practice of using pumps to control water level. Pumps no longer active but pipe through culvert remains so water level is controlled by culvert invert.			X
g.	Any evidence of leakage inside inlet?		X				
h.	Any evidence of seepage?		X				
Principal Spillway Outlet Structure. Type, No., and Size: 2 culvert pipes, approximately 18" dia., one partially obstructed with an approx.. 12" forcemain pipe							
a.	Is the outlet functioning improperly?	Unknown		Unknown. Only one of the two culverts is fully functional due to obstruction by historic forcemain pipe. No hydraulic information provided by CWLP so it is unknown if this single pipe is adequate.			
b.	Is outlet submerged?		X				
c.	Is outlet not properly supported?	X		Pipes are cantilevered due to erosion	X		
d.	Any deterioration/holes/corrosion observed?		X				
e.	Is concrete reinforcement exposed?		N/A				
f.	Has outlet been modified to alter water surface?		X				
g.	Any evidence of leakage inside outlet?		X				
h.	Any evidence of seepage?		X				
i.	Any leakage observed at pipe joints?		X				
j.	Is riprap present but inadequate?	X		No riprap at outlet	X		
k.	Is trash rack/screen obstructed?		N/A				
l.	Is trash rack/screen corroded or damaged?		N/A				

Check if corrective action is noted/recommended ↑

	Item	Yes	No	Description/Remarks	Action: Repair	Monitor	Investigate
Principal Spillway Outlet Channel. Type: No outlet channel							
a.	Is spillway channel functioning improperly?		N/A				
b.	Is control section disturbed?		N/A				
c.	Is vegetative cover inadequate?		N/A				
d.	Is flow area obstructed (e.g. trees, debris, etc.)		N/A				
e.	Any deterioration/holes/corrosion observed?		N/A				
f.	Is erosion/scour protection inadequate?		N/A				
g.	Any deterioration in energy dissipators?		N/A				
h.	Are cracks, settlement, or bulges present?		N/A				
i.	Any boils, rust stains, or sediment in flow noted?		N/A				
j.	Any seepage observed?		N/A				
k.	Any animal or vehicle trails observed?		N/A				
Auxiliary/Emergency Spillway Outlet Structure. Type, No., and Size: No emergency spillway							
a.	Is spillway functioning during inspection?		N/A				
b.	Is spillway functioning improperly?		N/A				
c.	Is outlet not properly supported?		N/A				
d.	Any deterioration/holes/corrosion observed?		N/A				
e.	Is concrete reinforcement exposed?		N/A				
f.	Has outlet been modified to alter water surface?		N/A				
g.	Any evidence of leakage inside outlet?		N/A				
h.	Any evidence of seepage?		N/A				
i.	Any leakage observed at pipe joints?		N/A				
j.	Is riprap present but inadequate?		N/A				
k.	Is trash rack/screen obstructed?		N/A				
l.	Is trash rack/screen corroded or damaged?		N/A				
Auxiliary/Emergency Spillway Outlet Channel. Type: No emergency spillway							
a.	Is spillway functioning during inspection?		N/A				
b.	Is spillway functioning improperly?		N/A				
c.	Is control section disturbed?		N/A				
d.	Is vegetative cover inadequate?		N/A				
e.	Is flow area obstructed (e.g. trees, debris, etc.)		N/A				
f.	Any deterioration/holes/corrosion observed?		N/A				
g.	Is erosion/scour protection inadequate?		N/A				
h.	Any deterioration in energy dissipators?		N/A				
i.	Are cracks, settlement, or bulges present?		N/A				
j.	Any boils, rust stains, or sediment in flow noted?		N/A				
k.	Any seepage observed?		N/A				
l.	Any animal or vehicle trails observed?		N/A				
Pond Drain and Gates/Valves. Type and Size and date gate was last operated: No pond drain present							
a.	Is gate functioning improperly?		N/A				
b.	Is gate stem broken or bent?		N/A				
c.	Are components missing?		N/A				

Check if corrective action is noted/recommended ↑

	Item	Yes	No	Description/Remarks	Action: Repair	Monitor	Investigate
Foundation /Toe Drains. List type and size: No toe drain installed							
a.	Is drain functioning improperly?		N/A				
b.	Is drain flowing during inspection?		N/A				
c.	Any boils or sediment laden flow observed?		N/A				
d.	Is foundation drain outlet submerged?		N/A				
e.	Is foundation drain rodent guard missing?		N/A				
Instrumentation:							
a.	Are there any ground water monitoring wells?	X		Several groundwater wells present around the impoundment			
b.	Are there any ground water piezometers?		X				
c.	Are there any settlement monitoring devices?		X				
d.	Are there any weirs/flumes?		X				
e.	Are there any slope inclinometers?		X				
Perimeter Fence No perimeter fence, but access roads are gated.							
a.	Is fence inadequate?		N/A	No perimeter fence present			
b.	Are gate(s) open?		X				
c.	Are there any security concerns?		X				
Other Items (list below)							
a.							
b.							
c.							
d.							
e.							

*GPM (gallons per minute): to convert from oz/sec multiply by 0.4688; to convert from ml/sec multiply by 0.01585

General Observations

See Figure 1 for a site plan of the Dallman Ash Pond. Perimeter dike vegetation was significantly overgrown, limiting the ability to visually inspect the impoundment system. Discussion with CWLP staff indicated that they have had difficulty mowing the sideslopes due to lack of equipment and lack of funding. The recent practice has been to use a long reach excavator to scrape the existing vegetation off to bare soil and then to replant grass.

Overall condition of the perimeter dike seems to be stable with no indication of current or historical movement. There is significant stockpiling of fill material at the inside shoulder of the dike for a large portion of the pond. Based on a review of the current CCR documents these stockpiles have not been included in the stability analyses and based on their location would likely lower the factor of safety.

The area available for ponded water to manage storm events has been decreased significantly due to the stockpiled material. The available freeboard at the outlet structure appears to be approximately 4 feet from the invert. No hydraulic analyses have been presented as part of the CCR Rule documentation and the relatively small amount of freeboard along with one of the two outlet pipes being partially obstructed by a forcemain pipe gives the potential concern for the impoundment to manage the design storm event (1,000-year storm if the impoundment is classified as a Significant Hazard).



Figure 1- Site Plan

STRUCTURAL STABILITY ASSESSMENT REVIEW
PHOTO LOG, SITE VISIT – APRIL 27, 2022

CITY WATER, LIGHT & POWER
3100 STEVENSON DRIVE
SPRINGFIELD, ILLINOIS 62707

Eastern Research Group, Inc.
14555 Avion Parkway, Suite 200
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United States Environmental Protection Agency Region V
77 West Jackson Boulevard, SR-6J
Chicago, IL 60604-3590

Prepared by:
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3737 Embassy Pkwy, Ste 360,
Akron, Ohio 44333

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 1 **Date:** April 27, 2022 **Description:** South embankment, Dallman Ash Pond looking west **Location:** CWLP Station	

Photo No. 2 **Date:** April 27, 2022 **Description:** South end of closed landfill area **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 3 **Date:** April 27, 2022 **Description:** South side of CWLP landfill at southeast corner of Dallman Ash Pond **Location:** CWLP Station	

Photo No. 4 **Date:** April 27, 2022 **Description:** Clarification Pond North Bank **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 5 **Date:** April 27, 2022 **Description:** Southeast corner of Dallman Ash Pond **Location:** CWLP Station	

Photo No. 6 **Date:** April 27, 2022 **Description:** Former pump platform at southeast corner of Dallman Ash Pond, **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 7 **Date:** April 27, 2022 **Description:** Culvert outlets to Clarification Pond at Dallman Ash Pond **Location:** CWLP Station	

Photo No. 8 **Date:** April 27, 2022 **Description:** Culvert outlets to Clarification Pond at Dallman Ash Pond **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 9 **Date:** April 27, 2022 **Description:** Downstream end of Dallman Ash Pond to Clarification Pond outlet culverts. **Location:** CWLP Station	

Photo No. 10 **Date:** April 27, 2022 **Description:** Dallman Ash Pond south dike/Clarification Pond north dike. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 11

Date:

April 27, 2022

Description:

Location:
CWLP Station

Clarification Pond looking south toward Lakeside Ash Pond north embankment



Photo No. 12

Date:

April 27, 2022

Description:

Dallman Ash Pond south dike/Clarification Pond north dike. Stockpiles along dike edge. Tall vegetation.

Location:
CWLP Station



PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 13 **Date:** April 27, 2022 **Description:** Dallman Ash Pond south dike/Clarification Pond north dike. Stockpiles along dike edge. Tall vegetation. **Location:** CWLP Station	

Photo No. 14 **Date:** April 27, 2022 **Description:** Dallman Ash Pond south dike/Clarification Pond north dike. Stockpiles along dike edge. Tall vegetation. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 15 **Date:** April 27, 2022 **Description:** Dallman Ash Pond south dike/Clarification Pond north dike. Tall vegetation. **Location:** CWLP Station	

Photo No. 16 **Date:** April 27, 2022 **Description:** Dallman Ash Pond south dike/Clarification Pond north dike at southwest corner of Dallman Ash Pond.. Stockpiles along dike edge. Tall vegetation. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 17 **Date:** April 27, 2022 **Description:** Southwest corner of Dallman Ash Pond. Process water inlet. **Location:** CWLP Station	

Photo No. 18 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond at southwest corner of Dallman Ash Pond. Tall vegetation grow, stockpiled material at inside edge of ash pond. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 19 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond looking north. Dense vegetation, brush, trees. **Location:** CWLP Station	

Photo No. 20 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond looking north. Dense vegetation, brush, trees. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 21 **Date:** April 27, 2022 **Description:** Dense vegetation on west embankment of Dallman Ash Pond **Location:** CWLP Station	

Photo No. 22 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond looking north. Dense vegetation, brush, trees. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 23 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond looking north. Dense vegetation, brush, trees. **Location:** CWLP Station	

Photo No. 24 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond looking north. Dense vegetation, brush, trees. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 25 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond looking north. Dense vegetation, brush, trees. **Location:** CWLP Station	

Photo No. 26 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond at northwest corner. Dense vegetation, brush, trees. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 27 **Date:** April 27, 2022 **Description:** North embankment of Dallman Ash Pond. Dense vegetation, brush, small trees. **Location:** CWLP Station	

Photo No. 28 **Date:** April 27, 2022 **Description:** North embankment of Dallman Ash Pond at Monitoring Well. Dense vegetation, brush, small trees. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 29

Date:

April 27, 2022

Description:

Standing water at toe of north embankment. No signs of flowing seepage.

Location:
CWLP Station



Photo No. 30

Date:

April 27, 2022

Description:
North embankment of Dallman Ash Pond. Dense vegetation, brush, small trees.

Location:
CWLP Station



PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 31 **Date:** April 27, 2022 **Description:** North embankment of Dallman Ash Pond. Dense vegetation, brush, small trees, standing water at toe. **Location:** CWLP Station	

Photo No. 32 **Date:** April 27, 2022 **Description:** North embankment of Dallman Ash Pond. Phragmite-type vegetation near dike crest.. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 33 **Date:** April 27, 2022 **Description:** North embankment of Dallman Ash Pond. Phragmite-type vegetation near dike crest.. **Location:** CWLP Station	

Photo No. 34 **Date:** April 27, 2022 **Description:** North embankment of Dallman Ash Pond. Tall vegetation **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 35 **Date:** April 27, 2022 **Description:** North embankment of Dallman Ash Pond. Phragmite-type vegetation near dike crest.. **Location:** CWLP Station	

Photo No. 36 **Date:** April 27, 2022 **Description:** Unstabilized ramp at northeast corner of Dallman Ash Pond. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 37 **Date:** April 27, 2022 **Description:** Top of embankment at ramp in northeast corner of Dallman Ash Pond **Location:** CWLP Station	

Photo No. 38 **Date:** April 27, 2022 **Description:** Erosion/rutting of road at northeast corner of Dallman Ash Pond **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 39 **Date:** April 27, 2022 **Description:** Unstabilized ramp at northeast corner of Dallman Ash Pond. **Location:** CWLP Station	

Photo No. 40 **Date:** April 27, 2022 **Description:** Dallman Ash Pond at northeast corner looking southwest. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 41 **Date:** April 27, 2022 **Description:** Dallman Ash Pond at northeast corner looking west. **Location:** CWLP Station	

Photo No. 42 **Date:** April 27, 2022 **Description:** Dallman Ash Pond at northeast corner looking south. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 43 **Date:** April 27, 2022 **Description:** North dike of Dallman Ash Pond looking West. Dense vegetation, stockpiled material on inside dike shoulder. **Location:** CWLP Station	

Photo No. 44 **Date:** April 27, 2022 **Description:** North dike of Dallman Ash Pond looking West. Dense vegetation, stockpiled material on inside dike shoulder. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 45 **Date:** April 27, 2022 **Description:** North dike of Dallman Ash Pond looking West. Dense vegetation, stockpiled material on inside dike shoulder. **Location:** CWLP Station	

Photo No. 46 **Date:** April 27, 2022 **Description:** North dike of Dallman Ash Pond looking West. Dense vegetation, stockpiled material on inside dike shoulder. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 47 **Date:** April 27, 2022 **Description:** Dense vegetation at crest of north embankment of Dallman Ash Pond looking north **Location:** CWLP Station	

Photo No. 48 **Date:** April 27, 2022 **Description:** Dense vegetation at crest of north embankment of Dallman Ash Pond looking north **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 49 **Date:** April 27, 2022 **Description:** Dallman Ash Pond north embankment at northwest corner. Dense vegetation on outside slope, large stockpile on inside edge. **Location:** CWLP Station	

Photo No. 50 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond. Tall vegetation on outside slope, stockpiled material on inside slope. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 51 **Date:** April 27, 2022 **Description:** Dallman Ash Pond at ash sluice pipe discharge location. **Location:** CWLP Station	

Photo No. 52 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond. Tall vegetation on outside slope, stockpiled material on inside slope. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 53 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond. Tall vegetation on outside slope, stockpiled material on inside slope. **Location:** CWLP Station	

Photo No. 54 **Date:** April 27, 2022 **Description:** West embankment of Dallman Ash Pond at southwest corner of Dallman Ash Pond. Tall vegetation on outside slope. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 55 **Date:** April 27, 2022 **Description:** Dallman Ash Pond main pool area from top of stockpile. **Location:** CWLP Station	

Photo No. 56 **Date:** April 27, 2022 **Description:** Dallman Ash Pond main pool area from top of stockpile. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 57

Date:
April 27, 2022

Description:
Lakeside Ash Pond at northeast corner looking west.

Location:
CWLP Station



Photo No. 58

Date:
April 27, 2022

Description:
Lakeside Ash Pond at northeast corner looking southeast. Construction site of Lime Sludge Ponds in background.

Location:
CWLP Station



PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 59 **Date:** April 27, 2022 **Description:** Lakeside Ash Pond east embankment looking south. **Location:** CWLP Station	

Photo No. 60 **Date:** April 27, 2022 **Description:** Lakeside Ash Pond east embankment looking south. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 61 **Date:** April 27, 2022 **Description:** Lakeside Ash Pond at southwest corner of current ash pond and at northeast corner of Lime Sludge Ponds. **Location:** CWLP Station	

Photo No. 62 **Date:** April 27, 2022 **Description:** View of Lakeside Ash Pond from future Lime Sludge Pond construction area. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 63 **Date:** April 27, 2022 **Description:** View of Lakeside Ash Pond from future Lime Sludge Pond construction area. Pond identification sign at road. **Location:** CWLP Station	

Photo No. 64 **Date:** April 27, 2022 **Description:** Division dike between Lakeside Ash Pond and Lime Sludge Ponds. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 65 **Date:** April 27, 2022 **Description:** Division dike between Lakeside Ash Pond and Lime Sludge Ponds. **Location:** CWLP Station	

Photo No. 66 **Date:** April 27, 2022 **Description:** Culvert from Lime Sludge Pond to Lakeside Ash Pond **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 67 **Date:** April 27, 2022 **Description:** Upstream end of culvert from Lime Sludge Pond to Lakeside Ash Pond **Location:** CWLP Station	

Photo No. 68 **Date:** April 27, 2022 **Description:** Division dike between Lakeside Ash Pond and Lime Sludge Ponds. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 69 **Date:** April 27, 2022 **Description:** Division dike between Lakeside Ash Pond and Lime Sludge Ponds. Lime sludge decant water channel along south side of Lakeside Ash Pond. **Location:** CWLP Station	

Photo No. 70 **Date:** April 27, 2022 **Description:** Division dike between Lakeside Ash Pond and Lime Sludge Ponds at southwest corner of Lakeside Ash Pond. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 71 **Date:** April 27, 2022 **Description:** Southwest corner of Lakeside Ash Pond **Location:** CWLP Station	

Photo No. 72 Date: April 27, 2022 **Description:** Springfield Lake Dam at southwest corner of Lime Sludge Ponds **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 73 Date: April 27, 2022 **Description:** West embankment of Lakeside Ash Pond at southwest corner. Dense, tall vegetation on embankment. **Location:** CWLP Station	

Photo No. 74 Date: April 27, 2022 **Description:** West embankment of Lakeside Ash Pond. Dense, tall vegetation. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 75 Date: April 27, 2022 **Description:** Vegetation on west embankment at Lakeside Ash Pond **Location:** CWLP Station	

Photo No. 76 Date: April 27, 2022 **Description:** West embankment of Lakeside Ash Pond. Dense, tall vegetation. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 77	
Date: April 27, 2022	
Description: Toe seepage collection system at west embankment of Lakeside Ash Pond. Electrical control panel. **Location:** CWLP Station	

Photo No. 78	
Date: April 27, 2022	
Description: West embankment of Lakeside Ash Pond. Vegetation removed by long reach excavator. Area to be re-seeded. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

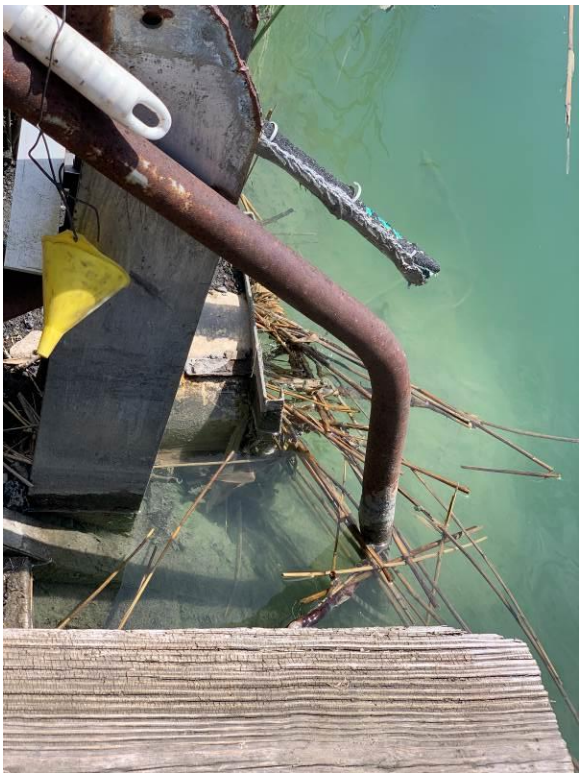
Photo No. 79 Date: April 27, 2022 **Description:** West embankment of Lakeside Ash Pond. Vegetation removed by long reach excavator. Area to be re-seeded. **Location:** CWLP Station	

Photo No. 80 Date: April 27, 2022 **Description:** West embankment of Lakeside Ash Pond at northwest corner of pond. Vegetation removed by long reach excavator. Area to be re-seeded. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 81 Date: April 27, 2022 **Description:** Lime sludge decant water channel along west side of Lakeside Ash Pond **Location:** CWLP Station	

Photo No. 82 Date: April 27, 2022 **Description:** Outlet pipe from Lime Sludge Pond decant channel to Clarification Pond. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 83	
Date: April 27, 2022	
Description: Outlet pipe from Lime Sludge Pond decant channel to Clarification Pond. **Location:** CWLP Station	

Photo No. 84	
Date: April 27, 2022	
Description: Outlet pipe from Lime Sludge Pond decant channel to Clarification Pond. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 85

Date:

April 27, 2022

Description:
Outlet pipe from Lime Sludge Pond decant channel to Clarification Pond. Dense brush along embankment.

Location:
CWLP Station



Photo No. 86

Date:

April 27, 2022

Description:

North embankment of Lakeside Ash Pond at Lime Sludge channel discharge pipe. Dense, tall vegetation

Location:
CWLP Station



PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 87 Date: April 27, 2022 **Description:** North embankment of Lakeside Ash Pond at Lime Sludge decant channel outlet to Clarification Pond. **Location:** CWLP Station	

Photo No. 88 Date: April 27, 2022 **Description:** Outlet of seepage collection system at Lakeside Ash Pond (obscured) **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 89 Date: April 27, 2022 **Description:** Outlet of seepage collection system at Lakeside Ash Pond (obscured) **Location:** CWLP Station	

Photo No. 90 Date: April 27, 2022 **Description:** North embankment of Lakeside Ash Pond looking east. Some brush removal performed for upcoming project. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 91 Date: April 27, 2022 **Description:** Unknown corrugated pipe discharge to Clarification Pond. **Location:** CWLP Station	

Photo No. 92 Date: April 27, 2022 **Description:** North embankment of Lakeside Ash Pond looking east. Some brush removal performed for upcoming project. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 93 Date: April 27, 2022 **Description:** Top of north embankment for Lakeside Ash Pond looking east. Dense vegetation on inside shoulder. Outside slope partially cleared for upcoming project. **Location:** CWLP Station	

Photo No. 94 Date: April 27, 2022 **Description:** Top of north embankment for Lakeside Ash Pond looking east. Dense vegetation on inside shoulder. Outside slope partially cleared for upcoming project. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 95

Date:

April 27, 2022

Description:
Lakeside Ash Pond outlet structure to Clarification Pond. Concrete structure with wooden stop logs.

Location:
CWLP Station



Photo No. 96

Date:

April 27, 2022

Description:

Lakeside Ash Pond outlet structure. Flow in structure from leakage between stop logs.

Location:
CWLP Station



PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 97 Date: April 27, 2022 **Description:** Lakeside Ash Pond outlet structure showing outlet pipe. **Location:** CWLP Station	

Photo No. 98 Date: April 27, 2022 **Description:** **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 99	
Date: April 27, 2022	
Description: Downstream end of Lakeside Ash Pond to Clarification Pond. Dense vegetation at outlet pipe. **Location:** CWLP Station	

Photo No. 100	
Date: April 27, 2022	
Description: Lakeside Ash Pond to Clarification Pond outlet pipe. Approximately 24 inch RCP pipe. **Location:** CWLP Station	

PHOTOGRAPHIC RECORD
CWLP City Water, Light, and Power Station

Client Name:	Site Location:	Project No.
City Water, Light, and Power	Springfield, Sangamon County, Illinois	1228070019

Photo No. 101	
Date: April 27, 2022	
Description: Lakeside Ash Pond to Clarification Pond outlet pipe. Approximately 24 inch RCP pipe. **Location:** CWLP Station	

ATTACHMENT A.2
NOTICE OF VIOLATION
City Water, Power & Light
Lakeside and Dallman Ash Ponds

Final Structural Stability Assessment Review – CWLP, Site Inspection Report,
CTI, September 12, 2022

FINAL

STRUCTURAL STABILITY ASSESSMENT REVIEW

CITY WATER, LIGHT & POWER
3100 STEVENSON DRIVE
SPRINGFIELD, ILLINOIS 62707

Submitted to:

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September 2022

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1.0 INTRODUCTION

CTI and Associates (CTI) is pleased to submit this report representing the results of a desktop review of the documents originally submitted to USEPA as part of the Structural Stability Assessment and Safety Factor Assessments for the Lakeside Ash Pond and Dallman Ash Pond (the Site) located in Springfield, IL, Sangamon County and operated by the City Water, Light & Power (CWLP). CTI is performing this work at the request of Eastern Research Group, Inc. (ERG) in accordance with the master subcontract agreement between ERG and CTI.

1.1 Purpose of Review

The purpose of this report is to provide US EPA with a review and evaluation of the documents submitted in support of the stability and safety factor assessments required by the 2015 Coal Ash Disposal Rules and determine if the operator's assessment sufficiently conforms to the relevant regulations. This review by CTI is also intended to note if any additional information is needed to make for this evaluation.

1.2 Documents Reviewed

The desktop review included a review of the following documents submitted pursuant to 40 CFR §257.73(d) Periodic structural stability assessments and (e) Periodic safety factor assessments:

- Andrews Engineering, 2016a. *Structural Stability Assessment for Coal Combustion Residuals Surface Impoundments, October 2016*
- Andrews Engineering, 2021a. *Structural Stability Assessment for Coal Combustion Residuals Surface Impoundments, October 2021*
- Andrews Engineering 2016b. Initial Safety Factor Assessment for Coal Combustion Residuals Surface Impoundments, October 2016
- Andrews Engineering 2021b. Initial Safety Factor Assessment for Coal Combustion Residuals Surface Impoundments, October 2021

Supporting documents reviewed included the following:

- Andrews Engineering, 2016c. Annual Inspection Report, January 2016 (Revised March 2016)
- Andrews Engineering, 2016d. History of Construction Report for Coal Combustion Residuals Surface Impoundments, October 2016
- Andrews Engineering, 2016e. Initial Hazard Potential Classification Assessment Report for Coal Combustion Residuals Surface Impoundments, October 2016
- Andrews Engineering, 2016f. Liner Status Report for Coal Combustion Residuals Surface Impoundments, October 2016
- Andrews Engineering, 2016g. Inflow Design Flood Control Report for Coal Combustion Residuals Surface Impoundments, October 2016
- CWLP, 2017. Annual Inspection Report for Coal Combustion Residuals Surface Impoundments, January 2017
- CWLP, 2018a. Annual Inspection Report for Coal Combustion Residuals Surface Impoundments, January 2018
- Andrews Engineering, 2018b. CCR Surface Impoundment Location Restrictions, October 2018.
- CWLP, 2019a. Annual Inspection Report for Coal Combustion Residuals Surface Impoundments, January 2019

- CWLP, 2019b. Notification of Intent to Comply with Alternative Closure Requirements in accordance with 40 CFR 257.103(a)(1), April 2019
- Hanson 2020a. Alternate Deadline to Initiate Closure, November 24, 2020
- CWLP, 2020b. Annual Inspection Report for Coal Combustion Residuals Surface Impoundments, January 2020
- CWLP, 2020c. Annual Progress Report for Alternative Closure Requirements in Accordance with 40 CFR 257.103(c)(2), May 2020
- CWLP, 2021c. Annual Inspection Report for Coal Combustion Residuals Surface Impoundments, January 2021
- CWLP, 2021d. Annual Progress Report for Alternative Closure Requirements in Accordance with 40 CFR 257.103(c)(2), May 2021
- Andrews Engineering, 2021e. Initial Hazard Potential Classification Assessment Report for Coal Combustion Residuals Surface Impoundments, October 2021
- US EPA, 2022, *INTERIM DECISION - Proposed Date to Cease Receipt of Waste for Dallman Power Station based on Interim Determination of Incompleteness of Demonstration*, January 11. 2022

CTI also reviewed publicly available aerial photos via Google Earth Pro on the internet. For reference, a site plan is included as **Figure 1**.

As a response to an information request from USEPA, CWLP provided the following additional documents, which were reviewed as part of this review:

- Attachment 1a – Unit 2 Landfill Site Wetland Determination – 1993
- Attachment 1b – Wetlands Assessment Report for Coal Combustion Residuals Impoundments, Andrews Engineering, October 2021
- Attachment 2a – Groundwater Monitoring Program, Andrews Engineering (undated)
- Attachment 2b – Groundwater Monitoring System Certification, Andrews Engineering, April 2018
- Attachment 3a – Dallman Construction Plan Drawings
- Attachment 3b – 1994 Stability Analysis by Testing Service Corporation (TSC)
- Attachment 3c – Lakeside Ash Pond Construction plans for the vertical expansion – July 1987
- Attachment 3d – Coal Ash Impoundment Site Assessment 2011
- Attachment 3e – Historical Aerial Photographs (April 1995 – March 2014)
- Attachment 3f – Construction Grading Plan for Dallman Ash Pond (August 1976)
- Attachment 4 – Drilling Data for Cell No. 2
- Attachment 5 – Engineering Report Proposed Embankment Modifications, Hanson Engineers, July 1987
- Attachment 6a – Dallman Ash Pond Construction Drawings
- Attachment 6b – Ash Pond Assessment, Stabilize, Inc., September 22, 2010
- Attachment 7 – Report of Stability Analysis, FGDS Landfill Unit 2, Andrews Environmental Engineers, September 1994
- Attachment 8 – Weekly Inspection Forms, 10/16/2015 through 4/7/2021.
- Attachment 9 – Lakeside and Dallman Ash Pond outlet structure drawings
- Attachment 10 – Proposed Date to Cease Receipt of Waste for Dallman Power Station based on Interim Determination of Incompleteness of Demonstration, CWLP, March 25, 2022

- Attachment 11 - Groundwater Monitoring Program, Andrews Engineering (undated)

1.3 Assumptions

The following assumptions were made which underly the conclusions noted in the remainder of this report.

- The evaluations required by the US EPA CCR rules should be based on site-specific data where practicable and minimize reliance on engineering judgment for items where conflicting assumptions can reasonably be made.
- Review comments reflect what we believe is consistent with recognized and generally accepted good engineering practices and is defined in 257.53 as engineering, maintenance, or operation activities based on established codes, widely accepted standards, published technical reports, or a practice widely recommended throughout the industry. Such practices generally detail approved ways to perform specific engineering, inspection, or mechanical integrity activities. These comments do not purport to consider all the possible interpretations, obligations, and nuances associated with compliance with the CCR Rules.
- Documentation of safety factors should follow standard industry procedures regardless of the consequences of failure; that is, large and small impoundments have essentially the same data quality requirements as it relates to compliance with the CCR rules.



Figure 1- Site Plan

2.0 STRUCTURAL STABILITY ASSESSMENT

2.1 Report Summary

Pursuant to 40 CFR §257.73(d), the initial structural stability assessment is intended to document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein.

The Structural Stability Assessment was reported in 2016 and 2021 by Andrews Engineering, Inc. located in Springfield, IL (Andrews Engineering 2016a and Andrews Engineering 2021a). Each report covered both the Dallman and Lakeside Ash Ponds. The Lakeside Ash Pond was constructed originally in 1958 and raised vertically using upstream dike raising methods in 1988. The original Lakeside Ash Pond was divided into four separate ponds, three lime softening ponds, and a settling pond. Lakeside Ash Pond ceased receiving ash in 2009 but continues to receive non-CCR wastewater from the drinking water treatment system. The Lakeside Ash Pond has not been closed. The Dallman Ash Pond was placed into service in 1976 and continues to receive sluiced fly ash and bottom ash. Neither the Dallman Ash Pond nor the Lakeside Ash Pond is constructed with a formal liner system meeting the requirements of the CCR Rule.

The reports are brief and generally provide commentary on each of the applicable CCR Rule's requirements. Few changes were made between the 2016 and 2021 reports and no additional information appears to have been gathered as part of the 2021 update.

Based on the information available, the sites have a long history of performance. with minimal historic structural/geotechnical issues noted in the historical record. Historical seepage from the west dike of the Lakeside Ash Pond has been observed and two seepage collection systems have been installed to manage the seepage. The site has also reported minor erosion issues and has a demonstrated history of overgrown vegetation which limits the ability to inspect the dikes. There have been no reported events of significant geotechnical instability such as sloughs or toe failures which required repair. Almost no data was provided in the other associated reports such as the Inflow Design Flood Control Plan demonstrating that the site hydraulics have been adequately characterized and no geotechnical data was gathered as part of CWLP's response to the CCR Rule requirements. The demonstration relied on limited, historic information from which to conclude.

Each of the individual regulatory requirements outlined in the CCR rules to document and support the conclusions in the assessment is detailed in the following sections along with CTI's comments regarding the adequacy of the assessment.

2.2 Foundations and Abutments

40 CFR §257.73(d)(1)(i) states foundations and abutments must be stable.

2.2.1 Performance Standard

Evaluating the existing facility foundation and abutments in accordance with recognized and generally accepted good engineering practice should involve the following steps:

1. Examine the available historical documentation from previous evaluations and/or existing data that can be used as input for a new evaluation. Required data typically includes soil characteristics such as strength, grain size distribution, permeability, erodibility, stratigraphy, and geometry. It also includes identifying groundwater and surface water conditions.
2. Identify any data gaps between the existing data and the information needed to properly perform the required stability analyses.
3. Gather the required missing information as needed to perform a site-specific stability evaluation for the structural foundations and abutments under review. This typically includes a field exploration program involving advancement of soil borings, in situ field testing, and retrieval of samples for laboratory testing.
4. Once all the data has been obtained, perform a site-specific evaluation of the critical cross section(s) based on the available information and the specific requirements prescribed by Rule. Discussion of how the critical sections were determined should also be included.

2.2.2 Lakeside Ash Pond

Although comments on the adequacy of the foundation of the landfill that is adjacent to Lakeside Ash Pond were provided, little discussion was provided concerning the adequacy of the foundation and abutments for the Lakeside Ash Pond based on existing boring information for the Lakeside Ash Pond. The foundation material encountered during the landfill investigation may be relevant in that it discusses the soil materials in the area, but they do not necessarily represent the conditions of the foundation and abutments under the dike system. Site specific data taken through or directly adjacent to the dike foundations should be provided and discussed.

2.2.3 Dallman Ash Pond

Although comments on the adequacy of the foundation of the landfill that is adjacent to Dallman Ash Pond were provided, little discussion was provided concerning the adequacy of the foundation and abutments for the Dallman Ash Pond based on existing boring information for the Dallman Ash Pond. Some discussion was provided based on the historic construction drawings related to the planned removal of the sediment in the existing creek channel and banks prior to the construction of the dikes, but no data was provided verifying that this was done.

2.3 Slope Protection

40 CFR §257.73(d)(1)(ii) states slopes must have adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown

2.3.1 Performance Standard

Evaluating the existing facility slopes in accordance with recognized and generally accepted good engineering practice should involve an evaluation and discussion of the adequacy of slope protection measures in place to guard against excessive surface erosion, wave action, and the adverse effects of sudden drawdown.

2.3.2 Lakeside Ash Pond

The documents state that the dikes were protected by vegetation on the inside and outside slopes. The document also states that there were no signs of erosion of the slopes during the 2016 and 2021 Annual Inspections (Andrews Engineering 2016c and CWLP 2021c).

2.3.3 Dallman Ash Pond

The 2016 report states that the downstream slope of the embankment is protected against erosion by vegetation. The 2016 and 2021 Structural Stability Assessment reports say that ruts and gullies in the downstream slope, when observed, are filled with soil and monitored with weekly inspections. The 2016 and 2021 reports concluded that no significant signs of erosion have been observed for the upstream slopes. Observations during April 27, 2022 site visit found several areas with signs of erosion, especially on the unstabilized access ramp on the north dike for the Dallman Ash Pond.

2.4 Dike Compaction

40 CFR §257.73(d)(1)(iii) states dikes must be mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit

2.4.1 Performance Standard

Evaluating the existing facility slopes in accordance with recognized and generally accepted good engineering practice should include a review of historical as-built data such as compaction data. It is not uncommon for existing surface impoundments to not have such compaction data. In those cases, a discussion of the adequacy of the dike compaction should be based on site specific boring data, in-situ testing data, and laboratory testing data for borings conducted through the dike system.

2.4.2 Lakeside Ash Pond

The documents state that no as-built documentation is available for the Lakeside Ash Pond. They also state that the expansion berms were to be constructed by placing cohesive material in thin lifts and compacted. No data was provided showing that the adequacy of the compaction of the dikes was verified as part of this evaluation.

No new geotechnical information was gathered as part of the CCR Rule compliance. Existing borings were advanced through the original dikes in 1987 prior to the construction of the expansion berms but no commentary on those borings demonstrating that the dikes were adequately compacted was provided.

2.4.3 Dallman Ash Pond

The documents state that no as-built documentation is available for the Dallman Ash Pond. It states that the construction plans called for dike materials to be compacted to at least 90% of the minimum density at optimum moisture as determined by AASHTO-T99. This compaction density, if it were followed, coupled with the long history of stable dike slopes (i.e., no failures or sloughs requiring maintenance) would adequately demonstrate meeting this portion of the CCR Rule. If no as-built information is available, then recognized and generally accepted good engineering practice would be to use confirmatory borings to demonstrate that the material was adequately and consistently compacted.

2.5 Dike Vegetation

40 CFR §257.73(d)(1)(iv) states vegetated slopes of dikes and surrounding areas are not to exceed a height of six inches above the slope of the dike

2.5.1 Performance Standard

Evaluating the existing facility slopes in accordance with recognized and generally accepted good engineering practice should include a comparison of the actual height of the dike vegetation to the 6-inch height standard in 257.73(d)(1)(iv). It should also include a discussion of the maintenance program to maintain the vegetation at an acceptable height.

2.5.2 Lakeside and Dallman Ash Ponds

No information was provided on the height of the vegetation in the Structural Stability Assessment. It appears that CWLP misunderstood the information needed noting that they did not have information on the thickness of the vegetated soil layer (i.e., the topsoil).

Based on the site inspection on April 27, 2022, the site is heavily overgrown with vegetation on the inside and outside of the dikes exceeding 5 feet in height. Vegetation present on both the Dallman and Lakeside Ash Ponds included small trees, bushes, brush, and grasses. This heavy vegetation makes it impracticable to visually perform routine and annual dike inspections including the weekly inspections being performed by CWLP personnel.

Historical documents provided by CWLP as part of the CWLP Answers to Request for Information, this condition of overgrown vegetation appears to be a problem identified to CWLP for a long period of time. Overgrown vegetation including trees and brush were identified in the dam inspection report dated June 2, 1987 provided in Attachment 5, with a recommendation to remove the vegetation and conduct regular mowing in the inspection report and in the provided June 1987 maintenance plan. Vegetation control was also identified as a “Priority 1 Recommendation” in the Coal Ash Impoundment Site Assessment Final Report (Kleinfelder 2011) where the inspector noted overgrown vegetation including trees. In addition to the overgrown vegetation being out of compliance with the CCR Rule, the overgrown vegetation makes daily, weekly, monthly, and annual inspections ineffective.

2.6 Spillways Physical Characteristics

40 CFR §257.73(d)(1)(v) states a single spillway or a combination of spillways must be configured as specified in paragraph (d)(1)(v)(A). 40 CFR §257.73(d)(1)(v)(A) states all spillways must be either: (1) Of non-erodible construction and designed to carry sustained flows; or (2) Earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected

2.6.1 Performance Standard

Evaluating the existing facility spillways in accordance with recognized and generally accepted good engineering practice should include an evaluation of the existing spillway in relation to the spillway materials and orientations and demonstrate how those spillways have been designed to be either of non-erodible construction and designed to carry sustained flows or earth- or grass-lined and designed to carry short term, infrequent flows at non-erosive velocities.

2.6.2 Lakeside and Dallman Ash Ponds

The document states that the Lakeside Ash Pond and Dallman Ash Pond do not have constructed or natural spillways. It appears that CWLP interprets that a spillway is an open channel discharge from the impoundment. According to the Association of State Dam Safety Officials, the definition of a spillway is "a structure over or through which flow is discharged from a reservoir." Based on this definition, CWLP has at least two spillway systems at Lakeside Ash Pond (one conveying the water from the main portion of the ash pond and one conveying the flow from the Lime Decant Channel), and a spillway comprised of culverts at the Dallman Ash Pond system.

2.7 Spillway Hydraulics

40 CFR §257.73(d)(1)(v) states the combined capacity of all spillways designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the event as specified in paragraph (d)(1)(v)(B). 40 CFR §257.73(d)(1)(v)(B) states the combined capacity of all spillways must adequately manage flow during and following the peak discharge from a:

(1) Probable maximum flood (PMF) for a high hazard potential CCR surface impoundment; or

(2) 1000-year flood for a significant hazard potential CCR surface impoundment; or

(3) 100-year flood for a low hazard potential CCR surface impoundment.

2.7.1 Performance Standard

Evaluating the existing facility spillways in accordance with recognized and generally accepted good engineering practice should include an evaluation of the spillway hydraulics is to discuss the ability of the spillway(s) to manage the design storm event without overtopping the dam. This typically includes developing a hydraulic model of all the significant structures that control or direct surface water on site and determine the resulting water elevations in each reservoir for a given hazard level/design flood.

2.7.2 Lakeside Ash Pond

The document discusses the Lakeside Ash Pond outlet structure being constructed from a 24-inch RCP pipe and some information on the construction of the pipe. No information on the structure's ability to manage the peak discharge is provided in this document. A review of the 2016 Inflow Design Flood Control Report shows that the adequacy of the impoundment's outlet structure is due to the freeboard in the pond being greater than the depth of the rainfall event. It also states that the design storm event should be the 100-year flood since CWLP has classified this impoundment as a low hazard potential CCR Impoundment (Andrews Engineering 2016e and Andrews Engineering 2021e).

Given the information provided, CTI believes that the Lakeside Ash Pond may be incorrectly classified in accordance with rule 257.53 and should be classified as "Significant hazard potential" due to the potential for likely environmental damage should a failure occur. There is a potential for the ash to flow into the adjacent Lake Springfield or the adjacent Sugar Creek or flow beyond the property line. If the classification was originally incorrect, other CCR Rule requirements should be updated, including the revision of the design storm for the Inflow Design Flood Control Report to be a 1000-year flood and the development of an Emergency Action Plan.

The impoundment appears to be largely dry, contains some material stockpiles, and some areas of the impoundment may be above the outlet structure elevation. The analysis should also consider the maximum process water flow during the design storm event.

Based on the site inspection on April 27, 2022, it appears that the process water flow from the Lime Sludge Ponds built over the southern portion of the Lakeside Ash Pond may be hydraulically isolated from the rest of the ash pond. Effluent from the decanting of the lime sludge flows into a dedicated channel along the south and western portion of the Lakeside Ash Pond and through a dedicated spillway to the Clarification Pond. A separate hydraulic analysis for this ditch and outlet structure may be warranted.

2.7.3 Dallman Ash Pond

The 2016 and 2021 Structural Assessment reports discuss the Dallman Ash Pond outlet structure being constructed from a 24-inch HDPE. No information on the structure's ability to manage the peak discharge is provided in this document. A review of the 2016 Inflow Design Flood Control Report (Andrews Engineering 2016g) shows that the adequacy of the impoundment's outlet structure is due to the freeboard in the pond being greater than the depth of the rainfall event. They state that the design storm event should be a 100-year flood since CWLP has classified this impoundment as a low hazard potential CCR Impoundment.

Based on the information provided, CTI believes that the Dallman Ash Pond may be incorrectly classified in accordance with rule 257.53 and might be classified as "Significant hazard potential" due to the potential for likely environmental damage should a failure occur due to the potential for ash to flow into the adjacent lake or the adjacent stream or to flow beyond the property line. If the classification was

originally incorrect, other CCR Rule requirements should be updated, including the revision of the design storm for the Inflow Design Flood Control Report to be a 1000-year flood.

Based on the site inspection performed on April 27, 2022, it appears that the outlet structure consists of two CMP pipes of approximately 18" to 24" in size (size couldn't be verified). One of the two culverts has a 12-inch HDPE forcemain pipe through it from this historical practice of controlling the pond level through a pump system. The pump system is now inactive, but the historic forcemain pipe remains, obstructing one of the culverts. The freeboard of the pond from the culvert invert to the top of the dike appeared to be visually approximately 4 feet. No evidence that this freeboard is adequate has been provided.

In addition, although the pond is largely diked above grade, there appear to be some small areas that may run into the pond from offsite including the top of the dikes which appear to be pitched inward and potential drainage from the adjacent landfill. The analysis should also consider assuming the maximum process water flow during the design storm event.

Based on the site inspection performed on April 27, 2022, a significant portion of the Dallman Ash Pond contains stockpiled material piled above the elevation of the perimeter dikes. These stockpiles reduce the ability of the impoundment to manage the storm events. The actual stage-storage curve based on current conditions should be utilized in analyzing the hydraulic capacity of the impoundments and outlet structures.

2.8 Hydraulic Structures

40 CFR §257.73(d)(1)(vi) states hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit must maintain structural integrity and be free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.

2.8.1 Performance Standard

Evaluating the existing facility hydraulic structures in accordance with recognized and generally accepted good engineering practice should include a visual inspection of the condition of the structures and a discussion of the adequacy of the inspection program implemented at the site. If portions of the hydraulic structures are difficult to perform a traditional visual inspection due to size or geometry constraints as the horizontal conduit of a vertical outlet spillway system, camera surveys are often implemented to evaluate the condition of the structure.

2.8.2 Lakeside and Dallman Ash Ponds

The 2016 and 2021 Structural Assessment reports state that the outlet structure appears to be structurally sound with no observed signs of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, or debris. However, the documents do not discuss the basis of these conclusions.

Based on the site inspection on April 27, 2022, the Dallman outlet structure had significant erosion on the downstream side with the outlet pipes now cantilevered. One of the two outlet pipes is obstructed by a

historic forcemain that is no longer in service. The Lakeside Ash Pond structure appeared to show signs of deterioration on the wooden stop logs of the outlet structure. CTI was not able to view the condition of the buried portion of the pipe.

2.9 Flooding and Sudden Drawdown

40 CFR §257.73(d)(1)(vii) states for CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes must maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

2.9.1 Performance Standard

Evaluating the existing facility downstream slope stability in accordance with recognized and generally accepted good engineering practice should include an evaluation of the hydraulic model to establish critical water levels under the flood/drawdown conditions followed by a site-specific stability analysis using the revised pore water pressures levels estimated based on the model.

2.9.2 Lakeside Ash Pond

The documents discuss the adjacent Sugar Creek and the CWLP Clarification Pond as adjacent water bodies. They note that the stability analyses performed in the Initial Safety Factor Assessment assume that both Sugar Creek and the CWLP Clarification Pond were performed assuming that both were at minimal levels. No discussion of the potential for rapid drawdown for either of these water bodies was provided and no discussion of the potential for a rapid drawdown of Lake Springfield was made.

2.9.3 Dallman Ash Pond

The documents discuss the adjacent Sugar Creek and the CWLP Clarification Pond as adjacent water bodies. They note that the stability analyses performed in the Initial Safety Factor Assessment assume that both Sugar Creek and the CWLP Clarification Pond were performed assuming that both were at minimal levels. No discussion of the potential for rapid drawdown for either of these water bodies was provided.

2.10 Identification of Structural Deficiencies and Corrective Measures

40 CFR §257.73(d)(2) states the periodic assessment described in paragraph (d)(1) must identify any structural stability deficiencies associated with the CCR unit in addition to recommending corrective measures. If a deficiency or a release is identified during the periodic assessment, the owner or operator unit must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken.

2.10.1 Lakeside Ash Pond

CWLP identified that there is periodic seepage between the original dike and the raised dike. No discussion was provided on if this was being addressed or if it had the potential to cause structural instability in the dam. CWLP also states that there are no other visual indications of actual or potential

weaknesses of the surface impoundment and that there have been no observed indications of mass movement on the constructed berm of the surface impoundment. The documents did not discuss the overgrown vegetation and the adequacy of the hydraulic structures to safely pass the 1,000-year storm event required by a significant hazard dam.

2.10.2 Dallman Ash Pond

CWLP identified that there are periodic erosion ruts and gullies on the north and west outer berms of the Dallman Pond. CWLP states that these ruts and gullies are immediately filled with soil and monitored in the observed locations. CWLP also states that there are no other visual indications of actual or potential weaknesses of the surface impoundment and that there have been no observed indications of mass movement on the constructed berm of the surface impoundment.

Based on the site inspection on April 27, the northeast corner of the Dallman Ash Pond showed signs of erosion at an unstabilized road leading from the top of the dike to the toe of the dike. In addition, the site contained heavy vegetation significantly exceeding the requirements of the CCR Rule. These issues may have arisen after the completion of the Stability Assessment reports, but vegetation appears to have potentially been a problem for several years and should have been noted in the reports.

2.11 Engineer Certification

40 CFR §257.73(d)(3) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial assessment and each subsequent periodic assessment were conducted in accordance with the requirements of this section.

The 2016 Structural Stability Assessment for CWLP Dallman and Lakeside Ash Pond was sealed by a registered engineer in the State of Illinois stating that the site complied with the requirements of 40 CFR §257.81. This is the incorrect reference. In addition, the 2021 certification statement refers to State of Illinois requirements. Given that Illinois is not an authorized state under the CCR Rule program, this certification should also include a statement that this has been prepared in accordance with the CCR Rule.

3.0 SAFETY FACTOR ASSESSMENT

3.1 Report Summary

Pursuant to 40 CFR §257.73(e)(1), the initial safety factor assessment is intended to document whether the calculated factors of safety for each CCR unit achieve the minimum safety factors specified in paragraphs (e)(1)(i) through (iv) for the critical cross section of the embankment. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading conditions. The safety factor assessments must be supported by appropriate engineering calculations.

The Safety Factor Assessment was performed in 2016 and 2021 by Andrews Engineering, Inc. (Andrews Engineering 2016b and Andrews Engineering 2021b) for CWLP's Dallman Ash Pond and Lakeside Ash Pond located in Springfield, IL. Each report covered both the Dallman and Lakeside Ash Ponds. Like the Structural Stability Assessment Reports, the Safety Factor reports are brief and generally provide commentary on each of the applicable CCR Rule's requirements. Few changes were made between the 2016 and 2021 reports and no additional information appears to have been gathered as part of the 2021 update.

Based on the information available, the sites have a long history of performance. Historical seepage from the west dike of the Lakeside Ash Pond has been observed and two seepage collection systems have been installed to manage the seepage. The site has also reported minor erosion issues and has a demonstrated history of overgrown vegetation which limits the ability to inspect the dikes. There have been no reported events of significant geotechnical instability such as sloughs or toe failures which required repair. However, a limited amount of data was available to develop the assumptions and draw conclusions. No new geotechnical data was gathered as part of CWLP's response to the Safety Factor Assessment requirements of the CCR Rule. The demonstrations relied on limited, historic information, some of which was gathered before major changes to the impoundments such as the vertical expansion of Lakeside Ash Pond were constructed in 1987. The analysis of the Lakeside Ash Pond appears to be based on geotechnical borings conducted in 1987 (Attachment 5 to the EPA Information Request). The Dallman Ash Pond analyses appear to be based on borings conducted as part of a piezometer installation activity in 2010 (Attachment 6b to the EPA Information Request), although the boring location map is illegible, so it is not possible to determine where the borings were conducted relative to the perimeter dike system. As a result, each of the individual regulatory requirements outlined in the CCR rules to document and support the conclusions in the assessment is detailed in the following sections along with CTI's comments regarding the adequacy of the assessment.

3.2 Critical Cross Section Location Selection

The critical cross section should be chosen generally with consideration of the following:

- Length and steepness of the slope
- Accurate representation of subsurface materials and groundwater conditions

- Liquefaction potential
- Consequences of failure/release of ash into the environment

3.2.1 Lakeside Ash Pond

No discussion on the process of selection of the critical cross section was provided in the reports. No drawings showing legible topography were provided as part of the reports or in the 2016 History of Construction (Andrews Engineering 2016d). Excerpts from the historic drawings from the 1987 dike raising were used to develop the geometry and subsurface conditions. The geometry used by CWLP to model the upstream dike raise is not consistent with the typical cross-section shown in Figure 2 – Proposed Embankment Modifications (Andrews Engineering 2016d), shown below.

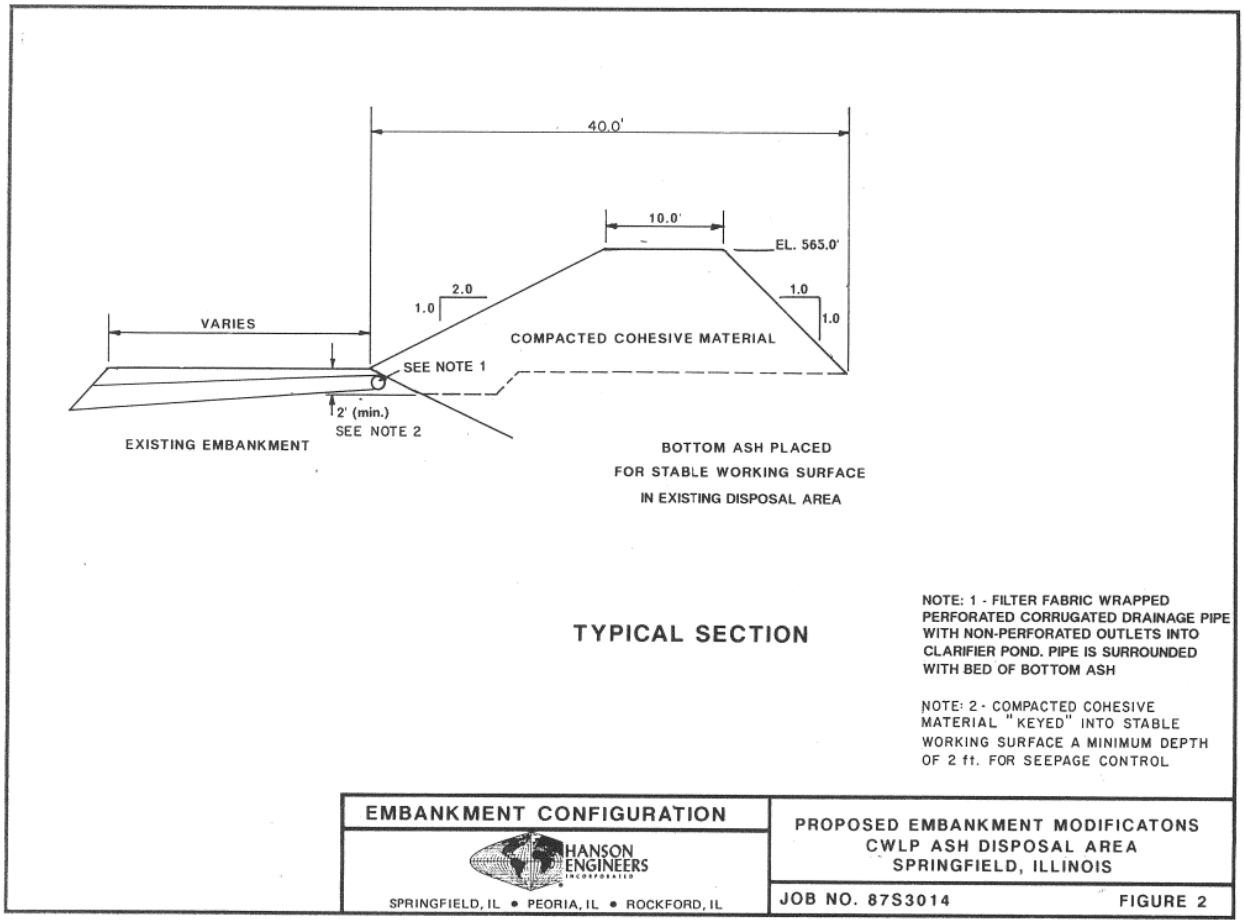


Figure 2- Design Drawing Cross Section for Upstream Dike Raise

Instead, the geometry modeled in the slope stability analysis shows the thickness of the compacted cohesive dike material, which is considerably stronger than sluiced fly ash, as being significantly thicker than presented in the Figure 2 geometry. See the geotechnical cross section below from the Safety Factor Assessment (Andrews Engineering 2016b).

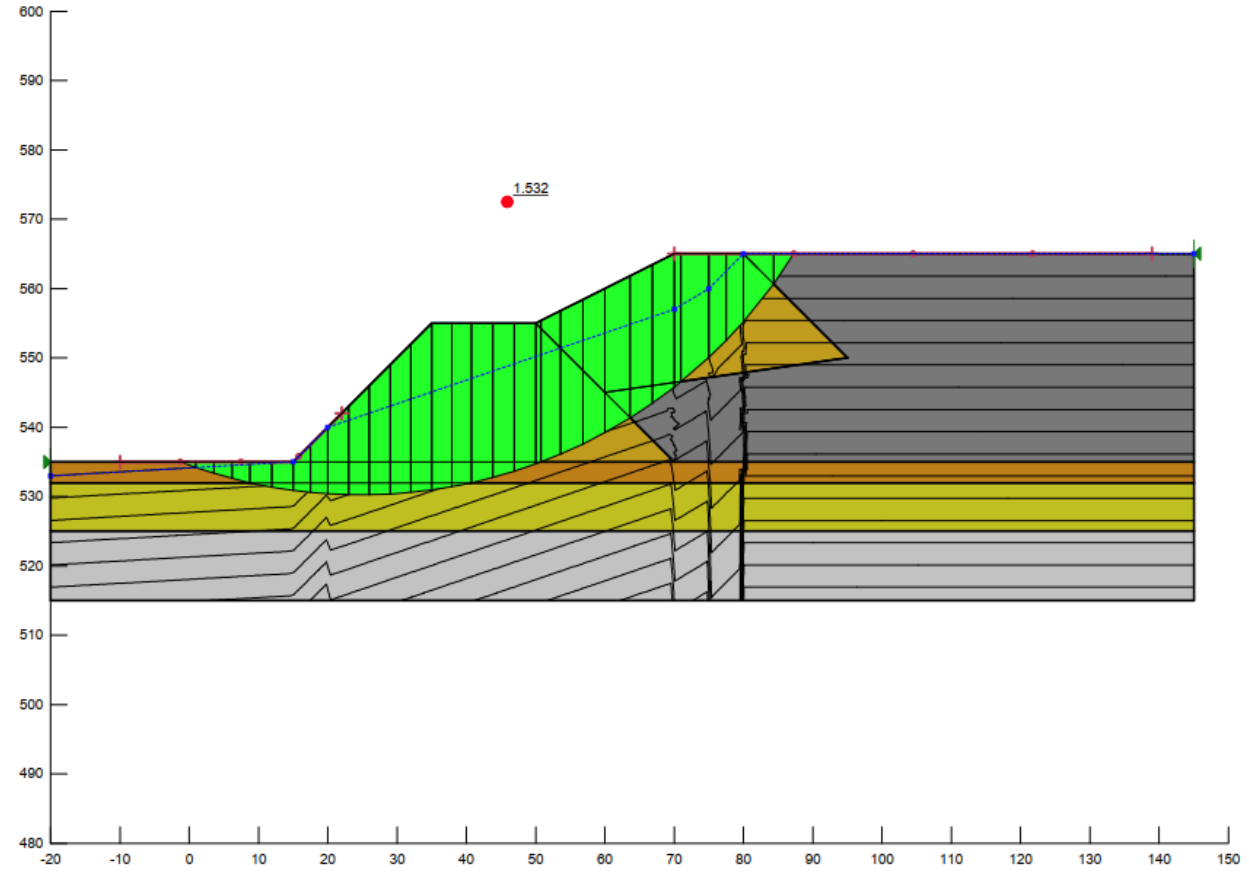


Figure 3- Geotechnical Analysis Cross Section for Lakeside Ash Pond

The cross section in Figure 2 looks more typical for an upstream dike raise in a pond that is partially full of ash and is a more conservative geometry than the geometry analyzed as part of the Safety Factor Assessment for Lakeside Ash Pond. The only boring logs provided in the reports were from borings conducted prior to the upstream dike raise and therefore, there is no way to determine if the modeled thickness of the upstream dike raise is correct in lieu of the geometry shown in Figure 2 – Proposed Embankment Modifications.

Additionally, the critical cross section should consider the potential for weak materials or materials potentially susceptible to liquefaction. For the Lakeside Ash Pond, it was stated that the Lakeside Ash Pond is not susceptible to liquefaction since the embankment is constructed of sandy silty clays and is cohesive. Historic borings show that subgrade materials for the original dike and the upstream dike seem to include non-cohesive materials such as silt (loess), sand, and fly ash which may be saturated and may be potentially susceptible to liquefaction. See borings B-1 and B-2 (Andrews Engineering 2016b and Andrews Engineering 2021b).

Another potential consideration in the selection of the critical cross section is the piezometric surface upstream, within, and downstream of the perimeter dikes. Although the piezometric levels assumed in

the stability analyses is potentially reasonable, no information was provided indicating how the piezometric water level was determined for the analyses. The analyses do not discuss any existing piezometers being located near the Lakeside Ash Pond. These piezometric water levels do not appear to be consistent with the periodic seepage seen during the annual inspections between the original and raised dikes and the historic toe seepage on the west dike of the Lakeside Ash Pond, which indicates a potentially higher piezometric level than used in the analyses.

3.2.2 Dallman Ash Pond

No discussion on the process of selection of the critical cross section was provided in the reports. No drawings showing legible topography were provided as part of the reports or in the 2016 History of Construction. The cross-section presented in the Safety Factor Assessment reports references a 1976 construction plan prepared by Burns and McDonnell, and this is not provided as part of these reports or in the history of construction. Because of this, there is no way to tell if this cross section represents the most critical geotechnical cross section for the site.

Additionally, the critical cross section should consider the potential for weak materials or materials potentially susceptible to liquefaction. For the Dallman Ash Pond, it was stated that the Dallman Ash Pond is not susceptible to liquefaction since the embankment is constructed of sandy silty clays and is cohesive. Historic borings show that subgrade materials for the original dike and the upstream dike seem to include non-cohesive materials such as silt that are saturated and have low SPT blow counts along with fly ash material. See borings AP-1, AP-2, AP-3, and AP-4 (Andrews Engineering 2016b and Andrews Engineering 2021b). Because the boring location map was illegible, it is not possible to tell where these borings are in relation to the pond dikes.

Another potentially critical area of dike construction is where the dike is constructed over the former Sugar Creek and has the potential to have soft sediment remaining below the dikes. Some discussion was provided based on the historic construction drawings related to the planned removal of the sediment in the existing creek channel and banks prior to the construction of the dikes, but no data was provided showing that this removal was done. It is common practice to perform verification borings at locations where the dikes cross potentially weak materials such as an old stream bed if there is no historic as-built information recording that soft sediment was removed.

Another potential consideration in the selection of the critical cross section is the piezometric surface upstream, within, and downstream of the perimeter dikes. Although the piezometric levels assumed in the stability analyses is potentially reasonable, no information was provided indicating how the piezometric water level was determined for the analyses. The boring logs provided are for piezometers, but the location map for the borings is illegible and it is not possible to see how the water levels shown on the boring logs were used in the stability analyses. Seasonal or operational variation in piezometric water levels is common, so it is difficult to tell if the levels shown in the logs are typical, worst case, or the water levels at the time of the borings.

Additionally, during the site inspection on April 27, 2022, CTI observed large stockpiles in excess of 10 feet high of fill material at the inside edge of the embankment along the west and north side of the Dallman Ash Pond. These stockpiles provide additional load on the dike and act as a destabilizing force, decreasing site factor of safety. These were not included in the modeled geometry in the 2016 or 2021 Safety Factor Assessments. These stockpiles appeared to have been in place in April 2012 (Google Earth Pro imagery from 5/12/2012).

3.3 Subsurface Stratigraphy

Typically, a geotechnical subsurface exploration is conducted to assess the subsurface stratigraphy to close any data gaps in the existing information. Only a small number of historic borings were provided for the impoundments with the latest exploration being from 2010. Although obtaining new geotechnical data was not specifically required by the CCR Rule, no additional geotechnical data obtained as part of the response to the CCR Rule (i.e., after 2015) was provided.

3.3.1 Lakeside Ash Pond

The stratigraphy included in the stability analysis is reported to be based on the borings B-1, B-2, and B-3 from 1987 (Andrews Engineering 2016b and Andrews Engineering 2021b). The layers used in the slope stability analyses are not labeled in the outputs for the analysis, so it is difficult to tell how the material properties were assigned and to correlate them with the borings. As previously discussed, the geometry of the upstream raised dike does not match the typical detail provided in Figure 2 in the history of construction and no boring was conducted in the upstream dike raise to justify the thickness of the compacted cohesive dike layer for the embankment. Not all of the layers encountered were modeled including the potentially loose sand layer encountered in boring B-2.

Additionally, the piezometric levels assumed in the analyses are not consistent with the observed wet seeps periodically seen during the inspections between the original and raised dikes. This indicates that the piezometric water level would be high enough to daylight at the interface between the two dikes. Therefore, the piezometric head used in the analyses may not be representative.

3.3.2 Dallman Ash Pond

The stratigraphy included in the stability analysis is reported to be based on historical boring logs AP-1 through AP-4 (Andrews Engineering 2016b and Andrews Engineering 2021b). The layers used in the slope stability analyses are not labeled in the outputs for the analysis, so it is difficult to tell how the material properties were assigned and to correlate them with the borings. The plan drawing for the historic borings is illegible, so it is not possible to review the subsurface conditions indicated by the borings relative to geotechnical cross sections. The piezometric heads assumed in the analyses seem to be conservative to the water level through most of the dike system being near the ground surface, but it is not possible to verify if the piezometric head found in the borings is consistent with these findings due to the illegibility of the plan drawing. It is also difficult to tell if any of the borings coincide with points where the dike

crosses the historic Sugar Creek, which may potentially have soft sediment if it was not completely removed as indicated in the plan drawings (Andrews Engineering 2016d).

3.4 Material Input Parameter Selection

Strength and unit weight parameters were chosen based on the engineering judgment and based on a limited amount of SPT data. No actual strength testing was conducted for any of the soil materials and no correlation of material type and SPT value to strength was presented in the reports. No liquefaction analysis was performed on the non-cohesive subgrade soils including low blow-count silt, sand, and fly ash to determine if liquefied strengths may be warranted in some analysis cases.

3.4.1 Lakeside Ash Pond

The reports reference "*a previous geotechnical investigation and stability analysis*." No historic stability analyses were provided as part of the reports and no discussion on if the material parameters chosen in these reports are based on the previous stability analyses. Not all of the layers encountered during the geotechnical investigation were modeled including the potentially loose sand layer encountered in boring B-2. No liquefaction analysis was performed on the non-cohesive subgrade soils including low blow-count silt, sand, and fly ash to determine if liquefied strengths may be warranted in some analysis cases.

There is no indication that any of the material input parameters were based on laboratory testing data. A statement was made in the reports that "*highly conservative geotechnical parameters based upon the previous geotechnical investigation*" were utilized in the Safety Factor Assessments. Although the material parameters utilized for the materials in the model may be reasonable, they do not appear to be necessarily "*highly conservative*."

3.4.2 Dallman Ash Pond

The reports reference a "*recent site investigation*" which "*provide the stratigraphic and in-situ strengths of the earthen materials*." It is unclear if the reference is talking about laboratory testing data on critical layers as the in-situ strengths or if this is a reference to SPT testing performed during the borings. If laboratory testing was performed, this data should be provided. No liquefaction analysis was performed on the non-cohesive subgrade soils including silt, sand, and fly ash to determine if liquefied strengths may be warranted in some analysis cases.

There is no indication that any of the material input parameters were based on laboratory testing data. A statement was made in the reports that "*conservative geotechnical parameters*" were utilized in the Safety Factor Assessments. Although the material parameters utilized for the materials in the model may be reasonable, they do not appear to be necessarily "*conservative*."

3.5 Stability Analysis Procedures

The procedures used in the analysis generally follow accepted industry practice for evaluating slope stability under static conditions. However, some items should be included either on the output or in the narrative that cannot be evaluated as presented. These include:

- Perform a liquefaction screening analysis on potentially liquefiable subgrade soil layers such as sand, silt, and fly ash to determine if the material is potentially liquefiable.
- An indication of which soil layers the piezometric surface is assigned so that it can be determined if pore water pressures were considered in the software model
- Ensure that the extent of the critical surface appears well within the range of entry/exit nodes so that there is assurance that the critical surface is located accurately.
- In the absence of testing information for loads such as earthquakes, the undrained strength should be reduced by 15% to account for the lower expected dynamic strength of soil materials (assuming the soil is not liquefiable). Liquefied strengths should be used for soils identified as potentially liquefiable by a liquefaction screening analysis.

The Safety Factor Assessment seismic stability analyses used the Peak Ground Acceleration (PGA) from USGS directly in the seismic stability analysis. This PGA is the Maximum Horizontal Acceleration at the Bedrock (MHArock). Justify the use of MHArock and not adjust this acceleration to what the expectant acceleration would be to the dike and/or subgrade materials such as the procedure outlined by Makdisi and Seed (Makdisi, F. I., and Seed, H. B. 1978. Simplified procedures for estimating dam and embankment earthquake induced deformations. Journal of the Geotechnical Engineering Division-ASCE, 104, 849-867.1978) or other methods.

3.6 Factor of Safety Results

The required safety factors are as follows:

(i) The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.

(ii) The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.

(iii) The calculated seismic factor of safety must equal or exceed 1.00.

(iv) For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

No liquefaction analyses or liquefaction screening analyses for non-cohesive subgrade soils were performed.

3.7 Engineer Certification

40 CFR §257.73(e)(2) states the owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial assessment and each subsequent periodic assessment specified in paragraph (e)(1).

The 2016 Safety Factor Assessment for CWLP Dallman and Lakeside Ash Pond was sealed by a registered engineer in the State of Illinois stating that the site complied with the requirements of 40 CFR §257.73(e) and (f). This is a correct certification.

The 2021 certification statement refers to State of Illinois requirements. Given that Illinois is not an authorized state under the CCR Rule program (https://www.epa.gov/coalash/permit-programs-coal-combustion-residual-disposal-units#individual), this certification should include a statement that this has been prepared in accordance with the Federal CCR Rule