REPORT

CLOSURE PLAN ADDENDUM NO. 1

Martin Lake Steam Electric Station - PDP-5
Rusk County, Texas

Submitted to:

Luminant Generation Company LLC

Submitted by:

WSP GOLDER

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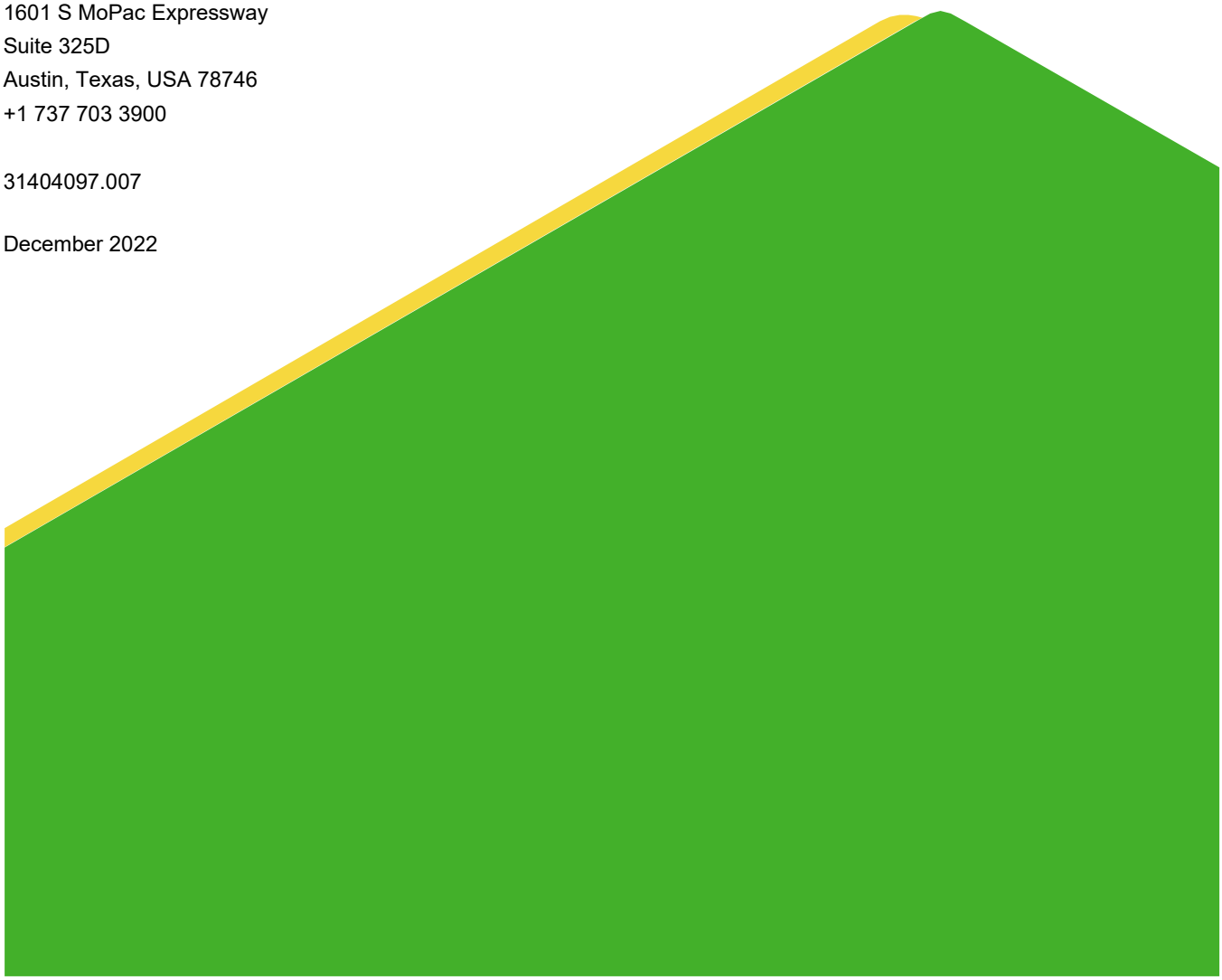
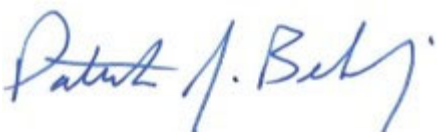
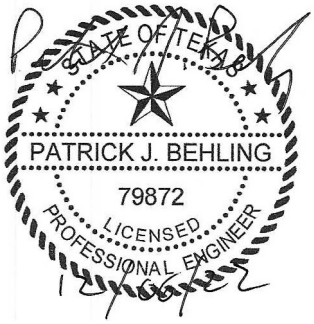
December 2022



PROFESSIONAL CERTIFICATION

This document and all attachments were prepared by WSP Golder under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I hereby certify that Addendum No.1 to the Closure Plan for PDP-5 at the Martin Lake Steam Electric Station has been prepared in accordance with the requirements of 40 C.F.R. §257.102(b).





Patrick J. Behling, P.E.
Principal Engineer
WSP Golder
Texas Firm Registration No. 22771

Table of Contents

DOCUMENT REVISION RECORD

Issue No.	Date	Details of Revisions
Revision 0	October 2016	Original Document
Addendum 1	December 2022	Revised configuration of final cap/cover system for PDP-5, added equivalency determination for proposed alternative final cover system, added cap settlement evaluation, added confirmation that cap slope stability will be modeled using site-specific geotechnical data during final closure design, removal of HELP Modeling from Closure Plan, revised closure schedule to state closure will be completed within five years and add estimated completion year, added section addressing the initiation of closure, and added section to address notification citations.

1.0 INTRODUCTION

On behalf of Luminant Generation Company LLC (Luminant), WSP Golder (Golder) has prepared this Addendum No. 1 to the Closure Plan for Permanent Disposal Pond No. 5 (PDP-5) located at the Martin Lake Steam Electric Station (MLSES) in Rusk County, Texas (hereafter, the "Site"). Coal Combustion Residuals (CCR) including flue gas desulfurization (FGD) wastewater and bottom ash generated as part of MLSES operation are managed in PDP-5. PDP-5 is regulated as an Existing CCR Impoundment under 40 C.F.R. § 257, Subpart D (the "CCR Rule").

The original Closure Plan for PDP-5 was prepared in October 2016 in accordance with 40 C.F.R. §257.102(b) and placed in the MLSES operating record in accordance with 40 C.F.R. §257.105(h)(10) (PBW, 2016). This Addendum No. 1 updates the Closure Plan to reflect the following:

- Revisions to the configuration of the PDP-5 final cap/cover system;
- Addition of equivalency determination for proposed alternative final cover system for PDP-5;
- Addition of cap settlement evaluation;
- Confirmation that the slope stability of the PDP-5 cap/cover system will be modeled using site-specific geotechnical data during design of the final closure of the impoundment;
- Removal of HELP Modeling from Closure Plan;
- Revisions to the PDP-5 closure schedule to state closure will be completed within five years and add estimated completion year;
- Addition of section addressing the initiation of PDP-5 closure; and
- Addition of section to address notification citations.

2.0 PDP-5 FINAL CAP/COVER SYSTEM

PDP-5 is an approximately 31-acre surface impoundment that was constructed in 2010 over three closed PDPs. PDP-5 was constructed above grade and is surrounded by earthen embankments that extend approximately 10 to 15 feet above the adjacent ground surface.

PDP-5 is constructed with a compacted clay liner (CCL) measuring 3 feet thick on the sides of the perimeter berms and 2 feet thick on the bottom of the impoundment. The CCL exhibits a hydraulic conductivity of no more than 1 X 10^{-7} cm/sec. The PDP-5 CCL is:

- Not a composite liner that meets the requirements of 40 C.F.R. §257.70(b) as specified in §257.71(a)(1)(ii) of the CCR Rule; and
- Not an alternative composite liner that meets the requirements of 40 C.F.R. §257.70(c) as specified in §257.71(a)(1)(iii) of the CCR Rule.

In November 2021, pursuant to 40 C.F.R. §257.71(d)(1)(ii), Luminant submitted an Alternate Liner Demonstration (ALD) for PDP-5 to USEPA to demonstrate that, based on the construction of PDP-5 and surrounding site conditions, there is no reasonable probability that operation of PDP-5 will result in concentrations of Appendix IV constituents in the uppermost aquifer at levels above a groundwater protection standard beyond the boundaries of the CCR Unit (Golder, 2021). To date, Luminant has not received a response from USEPA regarding the ALD.

A final cap/cover system will be constructed over the CCR placed in PDP-5 as part of unit closure as described in the 2016 Closure Plan (PBW, 2016). The 2016 Closure Plan included two options for the final cap/cover system: a compacted clay cap system and a geosynthetic cap system; however, the final cap/cover system for PDP-5 has been revised to consist of the following (from bottom to top):

- a geosynthetic clay liner (GCL) with a maximum hydraulic conductivity of 5x10^{-9} cm/sec and a minimum thickness of 6 mm;
- a 40-mil linear low-density polyethylene (LLDPE) textured geomembrane;
- a geosynthetic drainage layer; and
- a 18-inch erosion layer consisting of 12 inches of general fill overlain with 6 inches of soil capable of supporting native vegetation.

The proposed final cap/cover system for PDP-5 is an alternative final cover system that must comply with the requirements of 40 C.F.R. §257.102(d)(3)(ii)(A) through (C):

(A) The design of the final cover system must include an infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs 40 C.F.R. §257.102(d)(3)(i)(A) and (B).

(B) The design of the final cover system must include an erosion layer that provides equivalent protection from wind or water erosion as the erosion layer specified in paragraph 40 C.F.R. §257.102(d)(3)(i)(C).

(C) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.

2.1 Equivalent Infiltration Reduction – PDP-5 Cap/Cover System

The final cap/cover system for PDP-5 must include an infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs 40 C.F.R. §257.102(d)(3)(i)(A) and (B):

(A) The permeability of the final cover system must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less.

(B) The infiltration of liquids through the closed CCR unit must be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material.

2.1.1 Permeability Comparison Between PDP-5 Cap System and Liner System

Compliance of the final cap/cover system to the requirements of 40 C.F.R. §257.102(d)(3)(i)(A) was determined by comparing the estimated liquid flow rate through the low permeability components of the PDP-5 final cap/cover system to the estimated liquid flow rate through the 2-feet thick PDP-5 CCL (The permeability of the GCL component of the PDP-5 cap/cover system is less than $1 \text{ X } 10^{-5}$ cm/sec, so this criterion is not applicable). The results of the comparison are presented below.

- Estimated Liquid Flow Through PDP-5 Final Cap/Cover System

  The low permeability components of the PDP-5 cap/cover system are a GCL with a maximum hydraulic conductivity of $5\text{x}10^{-9}$ cm/sec and a minimum thickness of 6 mm and a 40-mil LLDPE geomembrane. The liquid flow rate through the cap (per acre of cap area) was estimated using the Giroud Equation as follows (Giroud, 1997):

  - Giroud Equation: $Q = N \text{ X } C \text{ [1 + 0.1(h/t)}^{0.95}\text{]} \text{ X } a^{0.1} \text{ X } h^{0.9} \text{ X } k^{0.74}$

    where: Q = flow rate through the liner (m^3/s)

    N = number of geomembrane defects per acre of cap area

    C = contact coefficient (0.05 for excellent, 0.21 for good, and 1.25 for poor)

    h = head above liner (m)

    t = thickness of soil portion of the liner (m)

    a = assumed area of defect in geomembrane through which leak occurs (m^2)

    k = hydraulic conductivity of the GCL portion of the liner (m/s)

  - Assumptions:

    1) The GCL is assumed to have a maximum hydraulic conductivity of $5\text{x}10^{-9}$ cm/sec and a minimum thickness of 6 mm.

    2) The hydraulic head above the cap geomembrane and GCL is assumed to be 12 inches (30.48 cm). This is a conservative assumption for the cap, since the final cap/cover system will be sloped and includes a geosynthetic drainage layer to divert water that infiltrates through the overlying erosion soil layer away from the cap.

    3) Geomembranes are nearly impermeable to liquids; however, liquids typically pass through holes/defects in the geomembrane. The area of a hole (defect) in the geomembrane was estimated to be 1 cm^2. For a typical geomembrane installed using good installation techniques, it is estimated that 4 defects (holes) occur per acre of geomembrane.

  - Liquid Flow Rate Through Cap Geomembrane and GCL

    N = 4 per acre (assume good geomembrane installation)

    C = 0.21 (assume good contact between geomembrane and GCL)

h = 1 foot x 30.48cm/ft = 30.48 cm (0.3048 m)

t = 6 mm x 0.001 m/mm = 0.006 m for GCL

a = 1 cm^2 (0.0001 m^2) for the area of the hole (defect) in the geomembrane

k = $5x10^{-9}$ cm/sec ($5 X 10^{-11}$ m/sec) for GCL

$Q = 4 X 0.21 [1 + 0.1(0.3048/0.006)^{0.95}] X 0.0001^{0.1} X 0.3048^{0.9} X (5EE-11)^{0.74}$

$= 0.84 [1 + 4.1742] X 0.3981 X 0.3433 X 2.38EE-8$

= $1.42 X 10^{-8}$ m^3/s per acre of cap or 0.32 gallons per day per acre of cap

- Estimated Liquid Flow Through PDP-5 CCL

  PDP-5 is lined with a 2-feet thick CCL with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec. Flow rate through the PDP-5 CCL (per acre of cap area) was estimated using Darcy's Law for gravity flow through porous media as follows:

  - Darcy Equation: $Q=A X k X (h/t+1)$

    Where:

    Q = flow rate through the CCL (m^3/s)

    A = CCL area perpendicular to the flow (m^2)

    h = head above CCL (m)

    t = thickness of CCL (m)

    k = hydraulic conductivity of CCL (m/s)

  - Assumptions:

    1) The 2-feet thick CCL is assumed to have a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec.
    2) The hydraulic head above the CCL was assumed to be 12 inches (30.48 cm). This is a reasonable assumption for the CCL, since the CCR in PDP-5 will be dewatered prior to capping/closure.
    3) CCL area is assumed to be 1 acre to match area used for the above PDP-5 geomembrane/GCL cap flow rate evaluation.

  - Flow Rate Through 2-feet Thick CCL

    A = 1 acre (4046.86 m^2)

    k = $1x10^{-7}$ cm/sec ($1 X 10^{-9}$ m/sec)

    h = 1 foot x 30.48 cm/ft = 30.48 cm (0.3048 m)

    t = 2 feet X 30.48 cm/ft = 60.96 cm (0.6096 m)

    $Q = (4046.86 m^2) x (1x10^{-9} m/sec) x ((0.3048 m / 0.6096 m) + 1)$

    = $6.07x10^{-6}$ m^3/s per acre of cap or 138 gallons per day per acre of cap

The final cap/cover system for PDP-5 complies with the requirements of 40 C.F.R. §257.102(d)(3)(i)(A), since the estimated liquid flow rate through the final cap/cover system (0.32 gallons per acre per day) is significantly less than the estimated liquid flow rate through the 2-feet thick PDP-5 CCL (138 gallons per acre per day).

2.2.2 Infiltration Comparison of PDP-5 Cap to 18-Inch Earth Infiltration Layer

Compliance of the final cap/cover system to the requirements of 40 C.F.R. §257.102(d)(3)(i)(B) was determined by comparing the estimated liquid flow rate through the low permeability components of the PDP-5 final cap/cover system to the estimated liquid flow rate through the specified minimum of 18 inches of earthen material. The results of the comparison are presented below.

- Estimated Liquid Flow Through PDP-5 Final Cap/Cover System

  As shown above, the estimated liquid flow rate through the final cap/cover system is estimated to be 0.32 gallons per acre per day.

- Estimated Liquid Flow Through 18-inch Earthen Infiltration Layer

  The 18-inch earthen infiltration layer is assumed to consist of compacted clay with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec. Flow rate through the infiltration layer was calculated using Darcy's Law for gravity flow through porous media as follows:

  - Darcy Equation: Q=A X k X (h/t+1)

    Where:

    Q = flow rate through the Infiltration Layer (m^3/s)

    A = Cap area perpendicular to the flow (m^2)

    h = head above Infiltration Layer (m)

    t = thickness of Infiltration Layer (m)

    k = hydraulic conductivity of Infiltration Layer (m/s)

  - Assumptions:

    1) The 18-inch infiltration layer is assumed to have a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec.
    2) The hydraulic head above the infiltration layer was assumed to be 12 inches (30.48 cm). This is a conservative assumption for the infiltration layer, since the final cap/cover system will be sloped to divert water that infiltrates through the overlying erosion soil layer away from the infiltration layer.
    3) Cap area for evaluation is assumed to be 1 acre to match area used for the above PDP-5 geomembrane/GCL cap evaluation.

  - Flow Rate Through 18-inch Infiltration Layer

    A = 1 acre (4046.86 m^2)

    k = $1x10^{-7}$ cm/sec ($1 X 10^{-9}$ m/sec)

    h = 1 foot x 30.48 cm/ft = 30.48 cm (0.3048 m)

    t = 18 inches X 2.54 cm/in = 45.72 cm (0.4572 m)

$Q = (4046.86\ m^2) \times (1 \times 10^{-9}\ m/sec) \times ((0.3048\ m / 0.4572\ m) + 1)$

$= \underline{6.75 \times 10^{-6}\ m^3/s\ per\ acre\ of\ cap\ or\ 154\ gallons\ per\ day\ per\ acre\ of\ cap}$

The final cap/cover system for PDP-5 complies with the requirements of 40 C.F.R. §257.102(d)(3)(i)(B), since the estimated liquid flow rate through the final cap/cover system (0.32 gallons per acre per day) is significantly less than the estimated liquid flow rate through an 18-inch thick infiltration layer (154 gallons per acre per day).

2.2 Equivalent Erosion Protection – PDP-5 Cap/Cover System

The final cap/cover system for PDP-5 includes an 18-inch erosion layer consisting of 12 inches of general fill overlain with 6 inches of soil capable of supporting native vegetation. This complies with the requirements of 40 C.F.R. §257.102(d)(3)(ii)(B), which states that the final cover system must use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.

2.3 Settling and Subsidence – PDP-5 Cap/Cover System

40 C.F.R. §257.102(d)(3)(i)(D) states that the disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence. An evaluation of potential settlement for the final cap/cover system for PDP-5 is attached as Appendix A to this Addendum. The PDP-5 Closure Plan will be updated to include a cap/cover system settlement evaluation using site-specific data during design of the final cap/closure system for PDP-5.

2.4 Slope Stability – PDP-5 Cap/Cover System

The PDP-5 Closure Plan will be updated to include cap/cover system slope stability modeling using site-specific geotechnical data during design of the final cap/closure system for PDP-5.

2.5 HELP Modeling in 2016 Closure Plan

The 2016 Closure Plan for PDP-5 included Hydrologic Evaluation of Landfill Performance (HELP) model evaluations to compare the permeability of the then-proposed cap options against each other and to the PDP-5 bottom liner system (PBW, 2016). The HELP model evaluations in the 2016 Closure Plan have been replaced by the infiltration evaluations presented above for the new cap/cover system and have been deleted from this amended Closure Plan.

2.6 Conclusions

The final cap/cover system for PDP-5 described above is an alternative final cover system that complies with the requirements of 40 C.F.R. §257.102(d)(3)(ii)(A) through (C).

3.0 PDP-5 CLOSURE SCHEDULE AND NOTIFICATION UPDATES

The closure schedule for PDP-5 is described in Section 2.7 and Appendix E of the 2016 Closure Plan (PBW, 2016). The 2016 PDP-5 Closure Schedule is updated as follows:

- Initiation of PDP-5 Closure. For the purposes of the PDP-5 Closure Schedule, Luminant estimates that the MLSES will cease operations in approximately 2045. However, CCR and related waste will continue to be generated after plant operation has terminated as part of facility decommissioning and demolition and the CCR and related waste may be managed in PDP-5. In accordance with 40 C.F.R. §257.102(e)(2)(i), PDP-5 will commence closure within two years of the date of final receipt of either CCR or non-CCR waste; however, in accordance with 40 C.F.R. §257.102(e)(2)(ii) an additional two years may be required to initiate closure provided Luminant provides written documentation that PDP-5 will continue to accept wastes beyond the original two-year period. For the purposes of the PDP-5 Closure Schedule, Luminant estimates that PDP-5 Closure will be initiated in approximately 2047.
- Completion of PDP-5 Closure. In accordance with 40 C.F.R. §257.102(f)(1)(ii), Luminant estimates that final closure of PDP-5 will be completed within 5 years of start of closure or in approximately 2052. It should be noted; however, that 40 CFR §257.102(f)(2) of the CCR Rule allow for extension of the closure schedule in the event that it is not feasible to complete closure of PDP-5 within the required timeframes due to factors beyond the facility's control.

Luminant will provide the following notifications related to closure of PDP-5:

- In accordance with 40 C.F.R. §257.102(g), Luminant will prepare a notification of intent to close PDP-5. The notice will be prepared no later than the date of closure initiation, will be sealed by a qualified professional engineer, and will be placed in the MLSES operating record as required by 40 C.F.R. §257.105(i)(7).
- In accordance with 40 C.F.R. §257.102(h), Luminant will prepare a notification of closure of PDP-5 within 30 days of completion of closure. The notice will be sealed by a qualified professional engineer and will be placed in the MLSES operating record as required by 40 C.F.R. §257.105(i)(8).
- In accordance with 40 C.F.R. §257.102(h) Luminant will provide deed notification for the PDP-5 Closure.

4.0 REFERENCES

Giroud, J.P., “Equations for Calculating the Rate of Liquid Migration Through Composite Liners Due to Geomembrane Defects”, Geosynthetics International, Vol. 4, Nos. 3-4, pp. 335-348, 1997.

Golder Associates (Golder), 2021. Alternate Liner Demonstration – Martin Lake Steam Electric Station PDP-5. November 30.

Pastor, Behling & Wheeler, LLC (PBW), 2016. CCR Closure Plan – Permanent Disposal Pond 5, Martin Lake Steam Electric Station. October.

APPENDIX A

Evaluation of Cap/Cover System Settlement

Bullock, Bennett & Associates, LLC

www.bbaengineering.com

165 N. Lampasas St. • Bertram, Texas 78605 • (512) 355-9198

December 6, 2022

Mr. Pat Behling
WSP Golder
1601 S MoPac Expressway
Suite 325D
Austin, Texas, USA 78746

Re: Evaluation of Potential for Impoundment Cap Settlement, PDP-5 – Martin Lake Steam Electric Station, Rusk County, Texas

Dear Mr. Behling:

As requested by WSP Golder, Bullock, Bennett & Associates, LLC (BBA) has evaluated the proposed cap system at the PDP-5 surface impoundment at the Martin Lake Steam Electric Station (MLSES) located in Rusk County, Texas – specifically in regard to the suitability of the proposed cap system to accommodate anticipated settlement. This evaluation is based on the most recent design drawings dated September 2016, provided to BBA by WSP Golder. No site-specific geotechnical data for the coal combustion residuals (CCR) fill material was provided to BBA for this analysis, and no site-specific consolidation or settlement data for on-site soils were provided; therefore, general assumptions regarding typical soil and CCR properties are made in this evaluation. It is BBA's understanding that site-specific soils and CCRs will be tested for engineering properties and that a detailed engineering settlement analysis using the on-site data and final design criteria will be completed prior to final cap construction activities.

The original Closure Plan for PDP-5 was prepared in October 2016 (PBW, 2016). The 2016 Closure Plan included options for two different cap configurations, one including synthetic components and the other including use of a compacted clay liner system. On December 6, 2022, WSP Golder prepared Addendum No.1 to the PDP-5 Closure Plan and revised the PDP-5 final cap/cover system to be as follows, from bottom to top (WSP Golder, 2022):

- a geosynthetic clay liner (GCL) with a maximum hydraulic conductivity of $1x10^{-9}$ cm/sec and a minimum thickness of 6 mm;
- a 40-mil linear low-density polyethylene (LLDPE) textured geomembrane;
- a geosynthetic drainage layer; and
- an 18-inch-thick erosion layer consisting of 12 inches of general fill overlain with 6 inches of soil capable of supporting native vegetation.

The grades, slopes, etc. for the revised PDP-5 final cap/cover system will remain as presented in the 2016 PDP-5 Closure Plan.

The cap system will tie into the perimeter earth embankment system, which has a crest height of approximately 405.5 feet MSL, ranging from approximately 10- to 15- feet above the surrounding natural grades. The perimeter earth embankment was constructed in thin lifts of compacted embankment fill meeting engineering specifications.

Engineering Properties of CCR Fill Material Underlying the Proposed Cap System:

CCR fill materials for PDP-5 include bottom ash and flue gas desulfurization material (FGD, or gypsum). These CCRs are non-plastic and moderately to highly permeable (typically drain better than clays and silts) and are well suited as fill materials[1,2,3]. The coefficient of consolidation of bottom ash when compared to typical soils is typically low and decreases with incremental loading and time. This indicates the bottom ash possesses load taking ability and that structures, or in this case a cap system, lying above the ash will undergo gradual settling and not suffer large deformation - making ash well suited as a fill material.[1] According to the American Coal Ash Association approximately 3.63. million metric tons (4.0 million tons) of bottom ash were used in structural fill applications in 2006 (ACAA 2007). Structural fill and embankment material is the largest use of bottom ash in the US.[2] FGD material has engineering properties that also make it suitable for use as embankment fill.[3] BBA has experience in capping multiple impoundments and landfills in Texas containing bottom ash and gypsum and has performed annual engineering inspections for years following final capping activities at these facilities and has observed very little cap settlement.

Based upon review of the PDP-5 bottom and proposed cap elevations, it appears there will be a layer of CCRs approximately 10- to 15-feet thick under the proposed cap system. These CCR materials will be dewatered prior to initiating cap construction activities.

Subsurface Conditions:
PDP-5 was constructed above three closed in-place, non-CCR Rule regulated, former coal ash surface impoundments (PDP-1, PDP-2 and PDP-3) that historically received similar coal ash waste to that of PDP-5. The bottom liner system of PDP-5 is separated from the top of the underlying closed and capped PDP-1, 2 and 3 units by approximately 10- to 15-feet of compacted clay fill material. The closed PDP-1, 2 and 3 units contain ash up to 20-feet thick in areas (below their compacted clay caps) - the ash was dewatered prior to closure of PDP-1 and 2 in the early 1980s, and PDP-3 in approximately 2010.

Native soils underlying the former PDP-1, 2 and 3 appear to be compacted clay fill, silts and sand. Based on the description of subsurface conditions, large settlement of subsurface soils is not expected.

Based on review of the proposed cap system and technical specifications for materials and placement, evaluation of typical CCR engineering properties, the perimeter embankment system, and the site underlying subsurface conditions, it appears the cap design for PDP-5 is designed appropriately to accommodate settling and subsidence and will minimize the disruption of the integrity of the final capping system. Final cap grade designs include a 3% slope that will promote storm water drainage off the cap

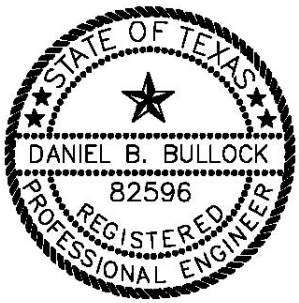
system, and these slopes appear sufficient to accommodate anticipated settlement while continuing to maintain positive surface water drainage. In addition, MLSES will conduct regularly scheduled cap inspections during post-closure care, and any settlement identified will be addressed to maintain cap design functions.

Please feel free to contact me at (512) 355-9198 if you have any questions about this submittal, or if I can be of any further assistance.

Sincerely,

Bullock, Bennett & Associates, LLC

Dan Bullock, PE (TX 82596)
Principal Engineer
Texas Professional Engineering Firm No. F-8542



12/06/2022

(1) One-Dimensional Consolidation of Sedimented Stowed Pond Ash, Devi Presad Mishra and Samir Kumar Das Document: Geotech Geol Eng (2012) 30:685-695 DOI 10.1007/s10706-011-9486-x
(2) User Guideline for Coal Bottom Ash and Boiler Slag in Green Infrastructure construction, Craig H. Benson and Sabrina Bradshaw. December 2011. Recycled Materials Resource Center, University of Wisconsin-Madison.
(3) User Guideline for Flue Gas Desulfurization Material in Green Infrastructure construction, Craig H. Benson and Sabrina Bradshaw. December 2011. Recycled Materials Resource Center, University of Wisconsin-Madison