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October 7, 2016

Tennessee Valley Authority
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Closure and Post Closure Plan
Slag Stilling Pond 2C
EPA Final CCR Rule
TVA Paradise Fossil Plant
Drakesboro, Kentucky

1.0 PURPOSE

This letter documents AECOM's certification of the closure and post-closure plan for the TVA Paradise Fossil Plant's Slag Stilling Pond 2C.

2.0 CLOSURE AND POST-CLOSURE PLAN

The closure plan describes the steps necessary to close the CCR unit at any time during the life of the unit, and is subject to the requirements described in 40 CFR 257.102(b). The post-closure plan describes the monitoring and maintenance activities to be performed during the post-closure period of the unit, and is subject to the requirements of 40 CFR 257.104(d).

3.0 SUMMARY OF FINDINGS

The attached closure and post-closure plan demonstrates compliance with the requirements set forth in 40 CFR §§ 257.102(b) and 257.104(d).

4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Nicholas S. Golden PE, being a Professional Engineer in good standing in the State of Kentucky, do hereby certify, to the best of my knowledge, information, and belief:

1. that the information contained in this certification is prepared in accordance with the accepted practice of engineering;

2. that the information contained herein is accurate as of the date of my signature below;

3. that the closure plan for the TVA Paradise Fossil Plant's Slag Stilling Pond 2C meet(s) the requirements described in 40 CFR 257.102(b) and

4. that the post-closure plan for the TVA Paradise Fossil Plant's Slag Stilling Pond 2C meet(s) the requirements of 40 CFR 257.104(d).

AECOM

SIGNATURE _____ DATE 10/7/16

ADDRESS: AECOM
564 White Pond Drive
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TELEPHONE: 330 836 9111

ATTACHMENTS: Closure (40 CFR 257.102(b)(1)) and Post-Closure Plan (40 CFR 257.104(d)(1)) for Coal Combustion Residuals (CCR)

COAL COMBUSTION PRODUCT DISPOSAL PROGRAM

TENNESSEE VALLEY AUTHORITY – PARADISE FOSSIL PLANT
SLAG PONDS 2A AND 2B AND SLAG STILLING POND 2C
DRAKESBORO, KENTUCKY

CLOSURE (40 CFR 257.102(b)(1)) AND POST-CLOSURE PLAN (40 CFR 257.104(d)(1)) FOR COAL COMBUSTION RESIDUALS (CCR) EXISTING SURFACE IMPOUNDMENTS

Prepared for

Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402-2801

October 7, 2016 – Rev0

Prepared by

AECOM

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1.0 INTRODUCTION

This U.S. Environmental Protection Agency Final Coal Combustion Residual Rule (EPA Final CCR Rule) closure and post-closure plan (Plan) is conceptual and is subject to the completion of environmental reviews. It describes the Coal Combustion Residual (CCR) closure and post-closure activities at the TVA Paradise Fossil Plant (PAF) to demonstrate that Slag Ponds 2A and 2B and Slag Stilling Pond 2C will be closed and maintained in accordance with the CCR closure and post-closure requirements of 40 CFR §§257.102 and 104, respectively.

2.0 WRITTEN CLOSURE PLAN - 40 CFR 257.102(b)(1)

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

(i) A narrative description of how the CCR unit will be closed in accordance with this section.

(ii) If closure of the CCR unit will be accomplished through the removal of CCR from the CCR unit, a description of the procedures to remove the CCR and decontaminate the CCR unit in accordance with paragraph (c) of this section.

(iii) If closure of the CCR unit will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with paragraph (d) of this section, and the methods and procedures to be used to install the final cover. The closure plan must also discuss how the final cover system will achieve the performance standards specified in paragraph (d) of this section.

(iv) An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR unit.

(v) An estimate of the largest area of the CCR unit ever requiring a final cover as required by paragraph (d) of this section at any time during the CCR unit's active life.

(vi) *A schedule for completing all activities necessary to satisfy the closure criteria in this section, including an estimate of the year in which all closure activities for the CCR unit will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR unit, including identification of major milestones such as coordinating and obtaining necessary approvals and permits from other agencies, the dewatering and stabilization phase of CCR surface impoundment closure, or installation of the final cover system, and the estimate timeframes to complete each step or phase of CCR unit closure.*

2.1 CLOSURE ACTIVITIES- §257.102(b)(1)(i)

Slag Ponds 2A and 2B and Slag Stilling Pond 2C is proposed to be closed in three portions; Slag Pond 2A (16.5 acres), Slag Pond 2B (11.5 acres), and Slag Stilling Pond 2C (1.2 acres). Slag Pond 2A is proposed to be closed in place. The final cover system installed over this area will be designed and constructed to meet 40 CFR 257.102(d). Slag Pond 2B will have sediment removed and have a combination final cover/liner system installed as it will be repurposed for future use as a non-CCR waste water pond. Sediment excavated will be decanted and re-utilized as fill material in Slag Pond 2A. The proposed non-CCR waste water pond will assure 40 CFR 257.102 and 104 requirements are met. Slag Stilling Pond 2C will be closed by removal of CCR materials. CCR material excavated from Stilling Pond 2C will be decanted and re-utilized as fill in Slag Pond 2A.

In summary, closure activities include, but are not limited to, decanting, subgrade preparation and stabilization, site grading, sediment removal, CCR removal, final cover system installation, combination final cover system/ liner system installation, and existing spillway modification. See **Appendix A** for the Slag Ponds 2A and 2B and Slag Stilling Pond 2C Closure Schematic.

TVA is subject to the National Environmental Policy Act, and pursuant to that statute has performed a programmatic environmental impact statement analyzing the environmental impacts resulting from the two primary closure methods set forth in the CCR Rule, as well as a "no action" alternative. At a programmatic level, TVA determined that closure-in-place would have fewer overall adverse environmental impacts than closure-by-removal and generally would be environmentally preferable. In addition, TVA performed a site-specific review of 10 CCR impoundments that tiers off the programmatic level review. To the extent a site-specific review has not been performed, the closure method set forth in this document is a preferred alternative still pending further environmental review.

2.2 CLOSURE TYPE/CLOSURE BY REMOVAL - §257.102(b)(1)(ii)

The closure of Slag Stilling Pond 2C is proposed to be accomplished through closure by removal of CCR materials. The existing CCR materials will be excavated, decanted, and re-utilized as fill material in Slag Pond 2A to construct design grades prior to the installation of the final cover system. Groundwater monitoring will be performed in accordance with the 40 CFR 257, Subpart D to demonstrate that the groundwater monitoring concentrations will not exceed the groundwater protection standard for constituents listed in Appendix IV of 40 CFR 257, in accordance with 257.102(c).

2.3 CLOSURE TYPE/CLOSURE IN PLACE - §257.102(b)(1)(iii)

The closure of Slag Pond 2A is proposed to be accomplished by leaving the CCR in place, thus requiring a final cover system and closure design elements enabling it to meet the CCR closure in-place performance standards with 257.102(d)(1) described in **Section 2.9**.

2.4 MAXIMUM CCR INVENTORY - §257.102(b)(1)(iv)

The estimated maximum inventory of CCR ever on-site over the active life of Slag Ponds 2A and 2B and Slag Stilling Pond 2C is estimated to be approximately 0.46 million cubic yards (CY). This volume was estimated using a comparison of a 2014 bathymetric survey to an assumed bottom elevation. It is to be noted that the current volume is being taken as the estimated maximum inventory of CCR ever on-site due to the regular dredging operations that occur at this impoundment.

2.5 LARGEST AREA REQUIRING FINAL COVER - §257.102(b)(1)(v)

The estimated largest area of Slag Ponds 2A and 2B and Slag Stilling Pond 2C requiring a final cover at any time during the active life of the CCR unit is approximately 16.5 acres. This represents the area of Slag Pond 2A only. It is to be noted that Slag Pond 2B is not included in the before mentioned area since a combination final cover/liner system is to be installed in that area versus solely a final cover system.

2.6 SCHEDULE OF CLOSURE ACTIVITIES - §257.102(b)(1)(vi)

The following sequential steps necessary for completing the closure activities of 40 CFR 257.102 and their estimated scheduled completion dates are provided as follows:

Table 1: Schedule of Closure Activities

	Closure Activity	Estimated Date
1.	Coordinate with and obtain necessary approvals and permits from regulatory agencies	2016-2019
2.	Decanting surface impoundment, removal of CCR material and sediment	2020
3.	Subgrade stabilization and site grading, spillway modification	2021
4.	Final cover installation, combination final cover system/ liner system installation	2022
5.	Completion of closure activities	2023
6.	Completion of post-closure period	2053

2.7 ESTIMATED YEAR OF CLOSURE COMPLETION- §257.102(b)(1)(vi)

The estimated year for completion of all closure activities is 2023.

2.8 REQUEST FOR TIME EXTENSION

If it is estimated that the time required to complete closure will exceed the regulatory timeframes, a demonstration for a time extension under 257.102(f)(2)(i) will be prepared and

placed in the operating record. This request will include site-specific information, factors and considerations will be provided to support any time extensions.

2.9 PERFORMANCE STANDARDS: CCR CLOSURE IN-PLACE - 40 CFR 257.102(d)(1)

40 CFR 257.102(d)(1). *Closure performance standard when leaving CCR in place –*

(1) The owner or operator of a CCR unit must ensure that, at a minimum, the CCR unit is closed in a manner that will:

(i) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;

(ii) Preclude the probability of future impoundment of water, sediment, or slurry;

(iii) Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period;

(iv) Minimize the need for further maintenance of the CCR unit; and

(v) Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.

2.9.1 CONTROL OF INFILTRATION AND RELEASES - §257.102(d)(1)(i)

TVA will control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere, by:

1) Installation of a final cover system that minimizes infiltration. Design specifications of the final cover system are described in **Section 2.11.2**.
2) Using appropriate erosion and sediment control.
3) Surface grading described in **Section 2.9.2**.
4) The implementation and maintenance of the groundwater monitoring network described in Section **3.1.3**.

2.9.2 PREVENTION OF FUTURE IMPOUNDMENT OF WATER, SEDIMENT, OR SLURRY - §257.102(d)(1)(ii)

TVA will preclude the probability of future impoundment of water, sediment, or slurry at Slag Pond 2A, as illustrated in the Slag Ponds 2A and 2B and Slag Stilling Pond 2C Closure Schematic in **Appendix A**, through the following measures:

1) Final Cover System: The final cover system will be designed to minimize infiltration. See Section **2.11.2**.

2) Surface Grading: The final cover preliminary grading plan is designed to promote the conveyance of stormwater off of the final cover system through drainage channels.

2.9.3 SLOPE STABILITY MEASURES - §257.102(d)(1)(iii)

TVA will include measures that reduce the risk of sloughing or movement of the final cover system during the closure and post-closure period, including:

1) The impoundment will be decanted sufficiently to remove free water.
2) Moisture conditioning and/or compaction of the subgrade to provide a stable and competent base for the construction of the final cover system will be performed prior to final cover installation.
3) The site will be designed and graded to prevent sloughing or movement of the final cover system during the closure and post-closure by the selection of cover materials with adequate internal and interface shear strength to yield acceptable cover system stability factors.

2.9.4 CCR UNIT MAINTENANCE - §257.102(d)(1)(iv)

TVA will design and construct the final closure system to minimize the need for further maintenance of the CCR unit.

The final cover system will be vegetated or covered with rip rap or other revetment, or synthetic turf to minimize erosion and future maintenance requirements. Preparation of the vegetative cover will include seeding, mulching, and any necessary fertilization at a minimum. Temporary erosion control blankets will be used if necessary to provide seedbed protection and prevent wash-out of seed and fertilization in concentrated flow areas during vegetation establishment.

2.9.5 COMPLETION OF CLOSURE - §257.102(d)(1)(v)

Closure will be completed in the shortest amount of time practical, consistent with recognized and generally accepted good engineering practices.

2.10 DRAINAGE AND STABILIZATION OF SURFACE IMPOUNDMENTS - §257.102(d)(2)

40 CFR 257.102(d)(2). *Drainage and stabilization of CCR surface impoundments.*

The owner or operator of a CCR surface impoundment or any lateral expansion of a CCR surface impoundment must meet the requirements of paragraphs (d)(2)(i) and (ii) of this section prior to installing the final cover system required under paragraph (d)(3) of this section.

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

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

Prior to installation of a final cover system to a CCR surface impoundment:

- Free liquids will be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues; and
- Remaining wastes will be stabilized sufficient to support the final cover system.

2.11 FINAL COVER SYSTEM DESIGN (OR ALTERNATIVE) - §257.102(d)(3)

40 CFR 257.102(d)(3). *Final cover system. If a CCR unit is closed by leaving CCR in place, the owner or operator must install a final cover system that is designed to minimize infiltration and erosion, and at a minimum, meets the requirements of paragraph (d)(3)(i) of this section, or the requirements of the alternative final cover system specified in paragraph (d)(3)(ii) of this section.*

(i) The final cover system must be designed and constructed to meet the criteria in paragraphs (d)(3)(i)(A) through (D) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.

(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.

(C) The erosion of the final cover system must be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.

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

(ii) The owner or operator may select an alternative final cover system design, provided the alternative final cover system is designed and constructed to meet the criteria in paragraphs (d)(3)(ii)(A) through (C) of this section. The design of the final cover system must be included in the written closure plan required by paragraph (b) of this section.

(A) The design of the final cover system must include an infiltration layer that provides an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (d)(3)(i)(A) and (B) of this section.

(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 (d)(3)(i)(C) of this section..

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

2.11.1 FINAL COVER SYSTEM DESIGN STANDARDS - §257.102(d)(3)(i)

An alternative final cover system is proposed for the closure of this facility.

2.11.2 ALTERNATIVE FINAL COVER SYSTEM DESIGN - §257.102(d)(3)(ii)

The alternative final cover system will be designed to minimize infiltration and erosion, consisting of the following elements;

- Geosynthetics: A 40-mil liner low density polyethylene (LLDPE) geomembrane will serve as the infiltration layer. The permeability of this geomembrane is significantly less than $1x10^{-5}$ cm/s; a geocomposite drainage layer will manage pore water buildup above the geomembrane;
- Cap Cover Soil: An 18-inch protective cover soil layer to protect the integrity of the geomembrane;
- Top Soil: A minimum 6-inch erosion layer that contains earthen material that is capable of sustaining native plant growth; and

Disruption of the integrity of the final cover system will be minimized through a design that accommodates settling and subsidence.

Refer to **Figure 1** for an illustration of the Alternative Final Cap and Cover Detail.

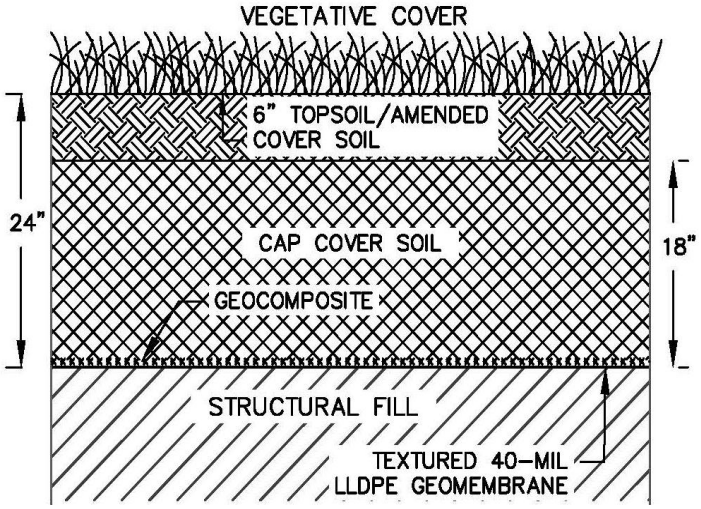


Figure 1: Alternative Final Cap and Cover Detail

A second alternative consisting of an engineered synthetic turf system may be evaluated for some or all of this area. This second alternative will also be designed to minimize infiltration and erosion, and will have a permeability no greater than or 1 x 10-5 cm/s.

2.11.3 METHODS AND PROCEDURES FOR INSTALLATION OF FINAL COVER - §257.102(b)(1)(iii)

As required by 40 CFR 257.102(b)(1)(iii), the following methods and procedures will be used in the installation of the final cover.

After the completion of decanting, drying and stabilization, if necessary, the existing subgrade in Slag Pond 2A will be compacted to provide a stable and competent base for the final cover system. Fill material (required to bring the area to design grades prior to final cover system construction) will be excavated from Slag Pond 2B and Slag Stilling Pond, decanted, and placed and compacted in the southern portion of the impoundment to achieve design grades.

Once design grades have been achieved, the final cover system will be installed over Slag Pond 2A in the following order; geosynthetics (geomembrane and geocomposite), 18-in cap cover soil, and 6-in of top soil to provide for vegetation. See **Figure 1** for Alternative Final Cap and Cover Detail.

2.11.4 PROFESSIONAL ENGINEER CERTIFICATION - § 257.102(d)(3)(iii)

40 CFR 257.102(d)(3)(iii). *The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer that the design of the final cover system meets the requirements of this section.*

A professional engineer will provide a written certification stating that the design of the final cover system meets the requirements of 40 CFR 257.102. The certification will be included in the facility's notification of intent to close the Slag Ponds 2A and 2B and Slag Stilling Pond 2C, as per 40 CFR 257.102(g).

3.0 WRITTEN POST-CLOSURE PLAN - 40 CFR 257.104(d)(1)

40 CFR 257.104(d)(1). *Written Post-Closure Plan. (1) Content of the plan. The owner or operator of a CCR unit must prepare a written post-closure plan that includes at a minimum, the information specified in paragraph (d)(1)(i) through (iii) of this section.*

(i) A description of the monitoring and maintenance activities required in paragraph (b) of this section for the CCR unit, and the frequency at which these activities will be performed;

(ii) The name, address, telephone number, and email address of the person or office to contact about the facility during the post-closure care period;

(iii) A description of the planned uses of the property during the post-closure period. Post-closure use of the property shall not disturb the integrity of the final cover, liner(s), or any other component of the containment system, or the function of the monitoring system unless necessary to comply with the requirements in this subpart. Any other disturbance is allowed if the owner or operator of the CCR unit demonstrates that disturbance of the final cover, liner, or other component of the containment system, including any removal of CCR, will not increase the potential threat to human health or the environment. The

demonstration must be certified by a qualified professional engineer, and notification shall be provided to the State Director that the demonstration has been placed in the operating record and on the owner's or operator's publicly accessible internet site.

3.1 MONITORING AND MAINTENANCE ACTIVITIES - §257.104(d)(1)(i)

40 CFR 257.104(b). *Post-closure care maintenance requirements. Following closure of the CCR unit, the owner or operator must conduct post-closure care for the CCR unit, which must consist of at least the following:*

(1) Maintaining the integrity and effectiveness of the final cover system, including making repairs to the final cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;

(2) If the CCR unit is subject to the design criteria under §257.70, maintaining the integrity and effectiveness of the leachate collection and removal system and operating the leachate collection and removal system in accordance with the requirements of §257.70; and

(3) Maintaining the groundwater monitoring system and monitoring the groundwater in accordance with the requirements of §§257.90 through 257.98.

In accordance with 40 CFR 257.104(d)(1)(i), post-closure care for Slag Ponds 2A and 2B will address the following systems as required under 40 CFR 257.104(b), along with the frequencies for the identified monitoring and maintenance activities:

- Final cover system;
- Leachate collection and removal system; and
- Groundwater monitoring system.

3.1.1 FINAL COVER SYSTEM - § 257.104(b)(1)

TVA will maintain the integrity and effectiveness of the final cover system, and make repairs as necessary to correct the effects of settlement, subsidence, erosion, and other events, and prevent run-on and run-off from eroding or otherwise damaging the final cover.

The final cover will be maintained by inspection and corrective measures. Vegetated areas will be mowed a minimum of two times per growing season, or more frequently as needed. Deep rooted vegetation will be prohibited as vegetative cover and controlled during routine maintenance. If the area has less than approximately 75 percent coverage by grass based on visual inspections, the area will be reworked and reseeded. Fertilizer or other soil amendments may be applied, as necessary, to promote the re-establishment of a self-sustaining vegetative cover.

3.1.2 LEACHATE COLLECTION AND REMOVAL SYSTEM - §257.104(b)(2)

No leachate collection and removal system is associated with the Slag Ponds 2A and 2B and Slag Stilling Pond 2C.

3.1.3 GROUNDWATER MONITORING SYSTEM - §257.104(b)(3).

The groundwater monitoring system will be designed and maintained in accordance with the EPA Final CCR Rule, 40 CFR §§257.90 through 98.

All monitoring devices including groundwater wells will be maintained throughout the active life and post-closure period of the Slag Ponds 2A and 2B and Slag Stilling Pond 2C.

3.2 CONTACT INFORMATION - §257.104(d)(1)(ii)

The following contact information is provided for the Paradise Fossil Plant for the post-closure period:

Owner:	Tennessee Valley Authority, as agent for the United States of America
Contact:	Civil Projects & CCP Management, Strategy and Engineering
	1101 Market Street.
	Chattanooga, TN 37402
Phone:	844-342-0012
Email:	tvainfo@tva.com

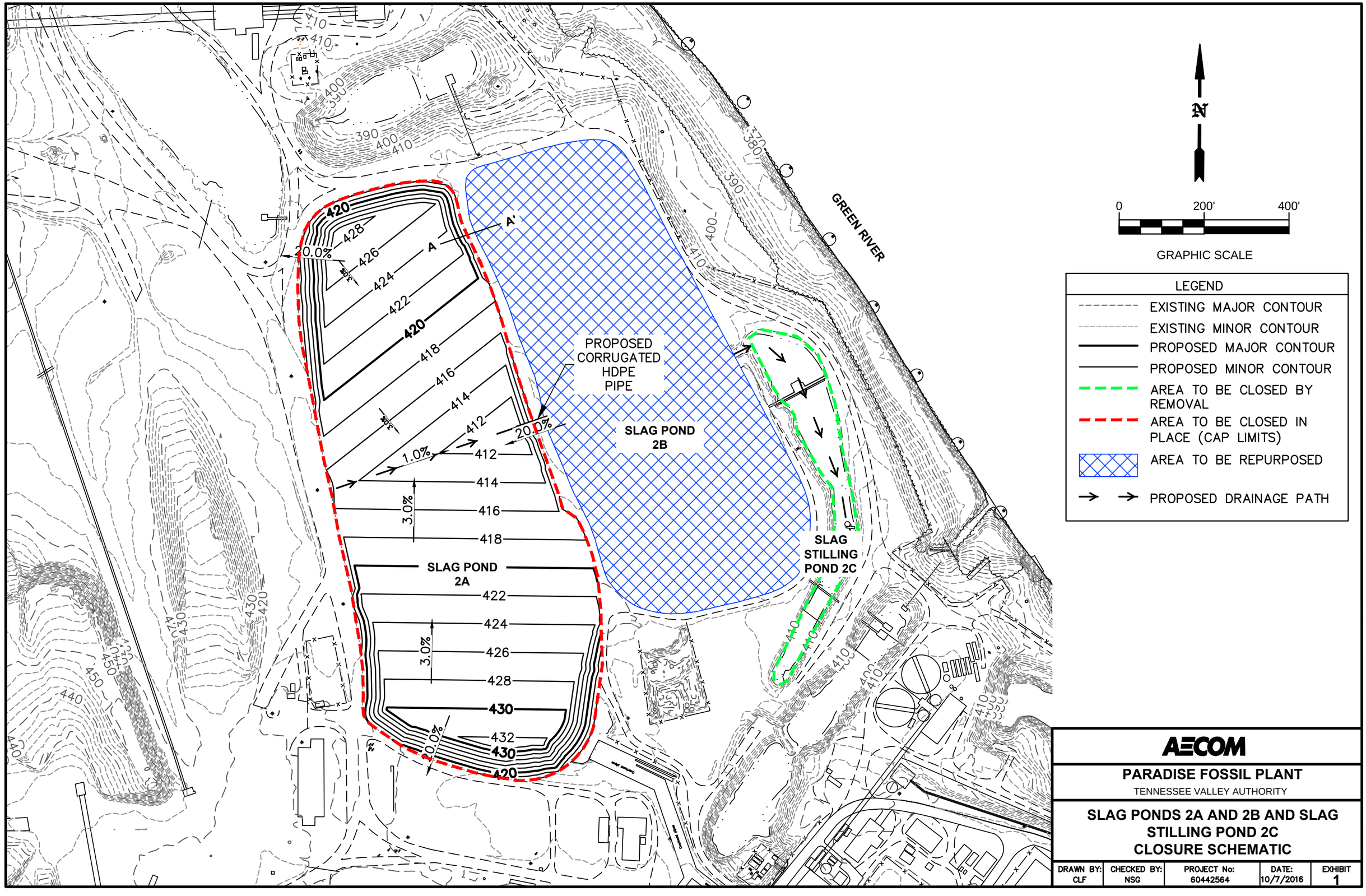
3.3 PLANNED USES - §257.104(d)(1)(iii)

The planned use of the property encompassing Slag Pond 2A during the post-closure period is a green space, while Slag Pond 2B will be repurposed as a non-CCR waste water pond for future use by TVA PAF.

Post-closure use of the property will not disturb the integrity of the final cover, liner(s), or any other component of the containment system, or the function of the monitoring systems, unless necessary to comply with the requirements of the EPA Final CCR Rule under 40 CFR Part 257.

Any other disturbance is allowed if the owner or operator of the CCR unit demonstrates that disturbance of the final cover, liner, or other component of the containment system, including any removal of CCR, will not increase the potential threat to human health or the environment. The demonstration must be certified by a qualified professional engineer, and notification shall be provided to the State Director that the demonstration has been placed in the operating record and on the owner's or operator's publicly accessible internet site.

APPENDIX A


N
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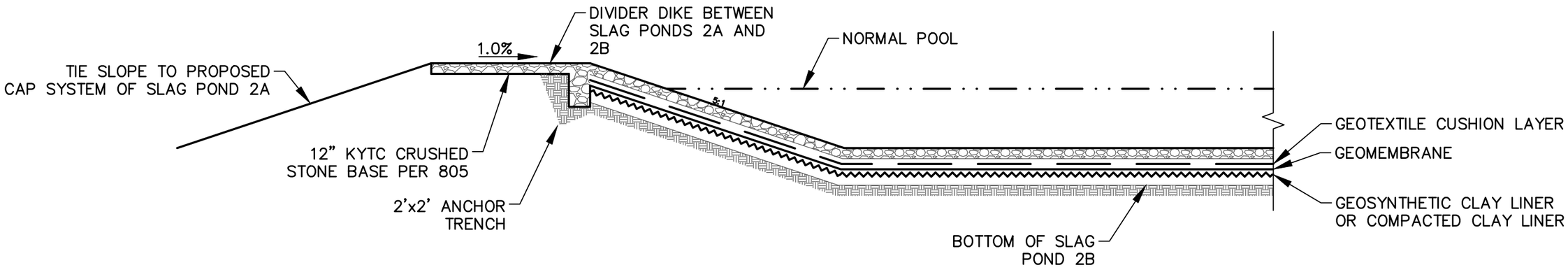
200'
400'
GRAPHIC SCALE
LEGEND
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
PROPOSED MAJOR CONTOUR
PROPOSED MINOR CONTOUR
AREA TO BE CLOSED BY REMOVAL
AREA TO BE CLOSED IN PLACE (CAP LIMITS)
AREA TO BE REPURPOSED
PROPOSED DRAINAGE PATH
GREEN RIVER
PROPOSED CORRUGATED HDPE PIPE
SLAG POND 2B
SLAG POND 2A
SLAG STILLING POND 2C
A
A'
20.0%
1.0%
3.0%
420
428
426
424
422
418
416
414
412
430
432
440
450
400
390
380
410
AECOM
PARADISE FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
SLAG PONDS 2A AND 2B AND SLAG STILLING POND 2C CLOSURE SCHEMATIC
DRAWN BY: CLF
CHECKED BY: NSG
PROJECT No: 60442564
DATE: 10/7/2016
EXHIBIT 1



COMBINATION CAP/LINER SYSTEM CROSS-SECTION A-A'

NOT TO SCALE

AECOM

PARADISE FOSSIL PLANT

TENNESSEE VALLEY AUTHORITY

SLAG PONDS 2A AND 2B AND SLAG STILLING POND 2C CROSS-SECTION A-A'

DRAWN BY:	CHECKED BY:	PROJECT No:	DATE:	EXHIBIT
CLF	NSG	60442564	10/7/2016	2