Big Rivers Electric Corporation
Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule
CCR Impoundment Liner Assessment Report

CCR Surface Impoundment Information

Name:	Green Station CCR Surface Impoundment
Operator:	Sebree Generating Station
Address:	9000 Highway 2096 Robards, Kentucky 42452

Qualified Professional Engineer

Name:	David A. Lamb
Company:	Associated Engineers, Inc.
Kentucky P.E. Number:	17822

Regulatory Applicability

Per 40 CFR § 257.71, it must be determined if an existing CCR surface impoundment was constructed with a liner that meets CCR Final Rule specifications.

Liner design criteria for existing CCR surface impoundments (§ 257.71)

No later than October 17, 2016, the owner or operator of an existing CCR surface impoundment must document whether or not such unit was constructed with any one of the following:

(1) A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec;
(2) A composite liner that meets the requirements of § 257.70(b); or
(3) An alternative composite liner that meets the requirements of § 257.70(c).

An existing CCR surface impoundment is considered to be an existing unlined CCR surface impoundment if either the owner or operator of the CCR unit determines that the CCR unit is not constructed with a liner that meets the requirements of this section, or if the owner or

operator of the CCR unit fails to document that the CCR unit is constructed with a liner that meets the requirements of this section.

Site Topography and Geology

The Geologic Map of the Robards Quadrangle indicates that bedrock underlying the site consists of units of the lower Lisman and upper Carbondale Formations. This interval is generally composed of interbedded sandstone, sandy shale, and shale with minor limestone, coal, and fireclay beds. The Nos. 11, 12, and 13 coal beds occurring within the interval are thin to absent. No faults are mapped in the vicinity of the sites. In the topographically lower areas, alluvial deposits associated with the Green River and tributaries occur above bedrock. Thickness of unconsolidated material can exceed 50 feet. On the uplands, the thickness of loess and residual soils is generally less than 20 feet.

Impoundment History and Construction Review

The Green CCR surface impoundment is a combined incised/earthen embankment structure with a footprint area of approximately 25 acres. Embankments form the west, south and east sides of the impoundment and the north side is incised. Green River is located approximately 400 feet east of the structure. Due to surface relief, only the toe area of the south dike is potentially subject to flooding. The predominant features were small stream valleys draining eastward to Green River. Most of the central portion of the south dike was constructed on a subdued ridge. The toe of the outboard slope intersected a lower drainage area. Underlying preconstruction soils consisted of Loring-Grenada, Loring-Zanesville-Wellston (Henderson County) and Loring-Wellston-Zanesville (Webster County) soil associations which are generally characterized as well drained to moderately well drained soils on nearly level to sloping uplands and were not compacted during construction per § 257.71 (a)(1) and (2) specifications.

The west dike is generally less than five feet in height and the south dike reaches a maximum height of 19.5 feet. The east dike reaches a maximum height of approximately eight feet and is buttressed with a secondary parallel embankment that serves as a 40-foot wide roadway. The Burns and Roe, Inc. Engineering and Consultants June 30, 1978 site grading plans show

the original construction layout and ground contours for the impoundment site. Bottom ash has been placed above the normal pool along the inboard side, essentially creating reclaimed land. The impoundment is listed in the Kentucky State Dam Inventory System under ID No. 0980 and has been given a "Low" hazard rating. Coal combustion waste stored in the pond consists primarily of bottom ash.

Liner Assessment

Based on the information reviewed and discussion with Big Rivers Electric Corporation and Associated Engineers, Inc. personnel, it was determined that the Green CCR surface impoundment was not constructed with any one of the following:

(1) A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec;
(2) A composite liner that meets the requirements of § 257.70(b); or
(3) An alternative composite liner that meets the requirements of § 257.70(c).

Sources of Information

Geotechnical information provided by Associated Engineers, Inc.

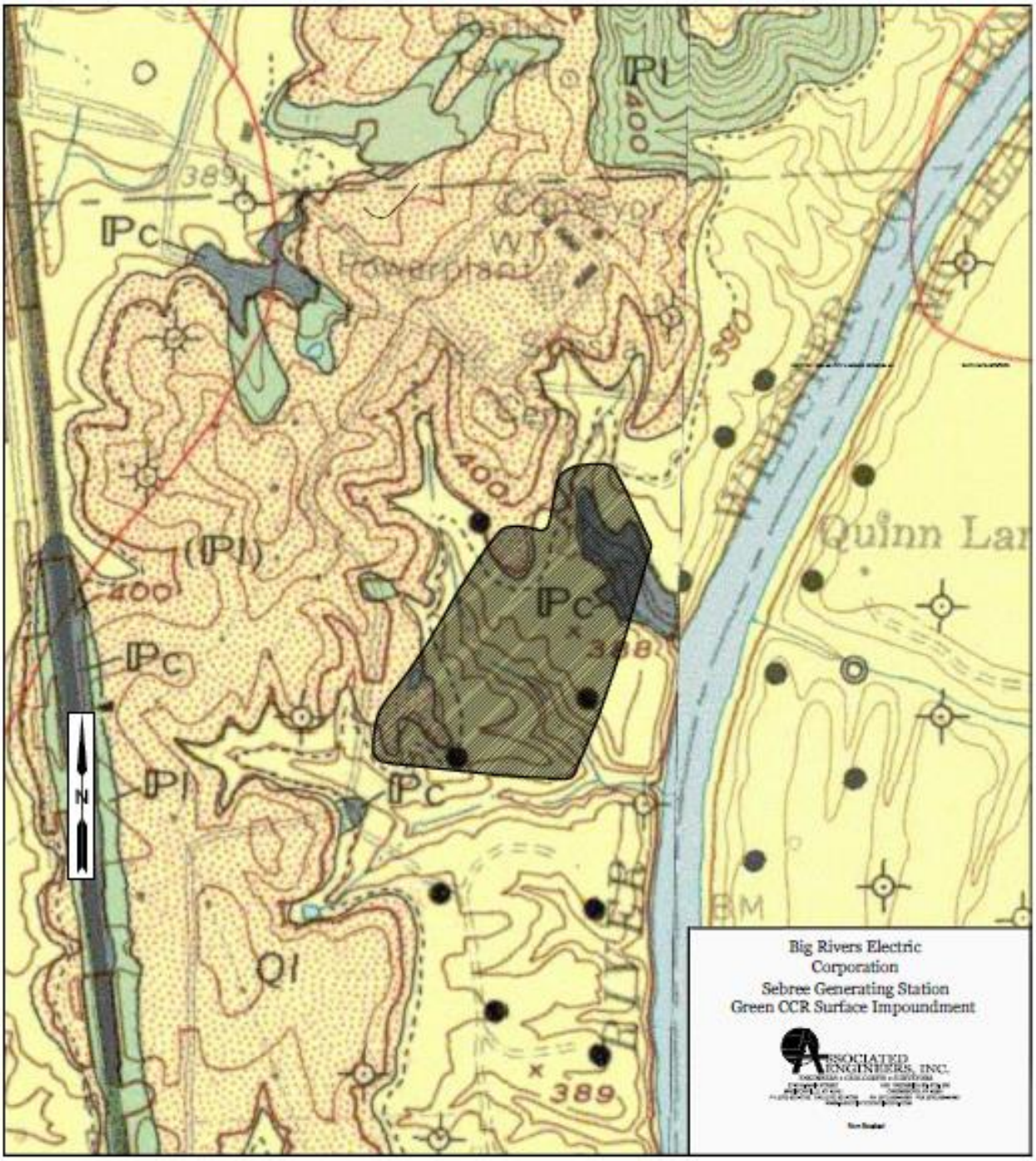
Engineering design drawings and geologic information provided by Big Rivers Electric Corporation

United States Geological Survey Topographic and Geologic Maps (Robards and Delaware Quadrangles)

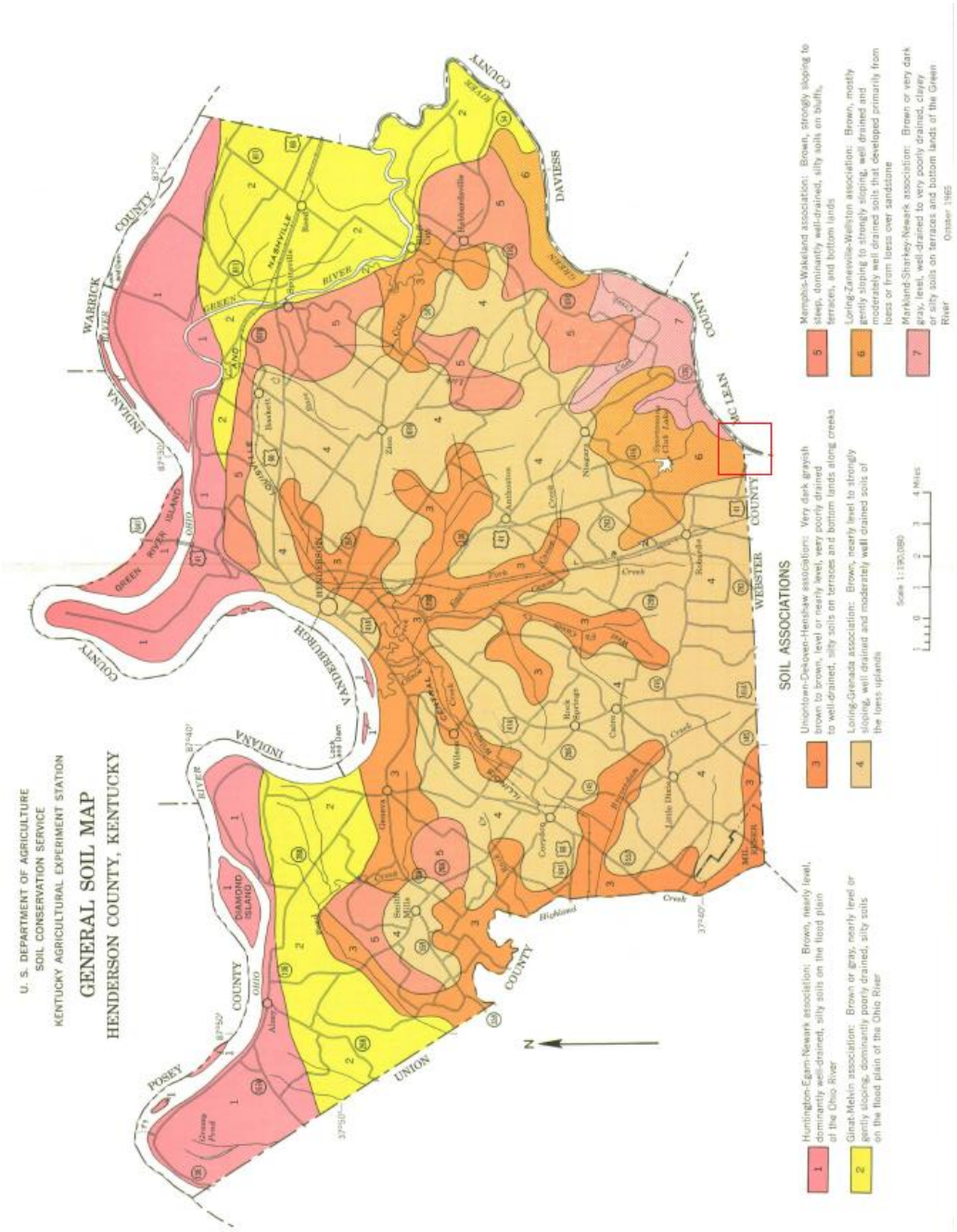
United States Department of Agriculture Natural Resources Conservation Service Soil Survey Maps (Henderson County and Union and Webster Counties)

Site Aerial Photo

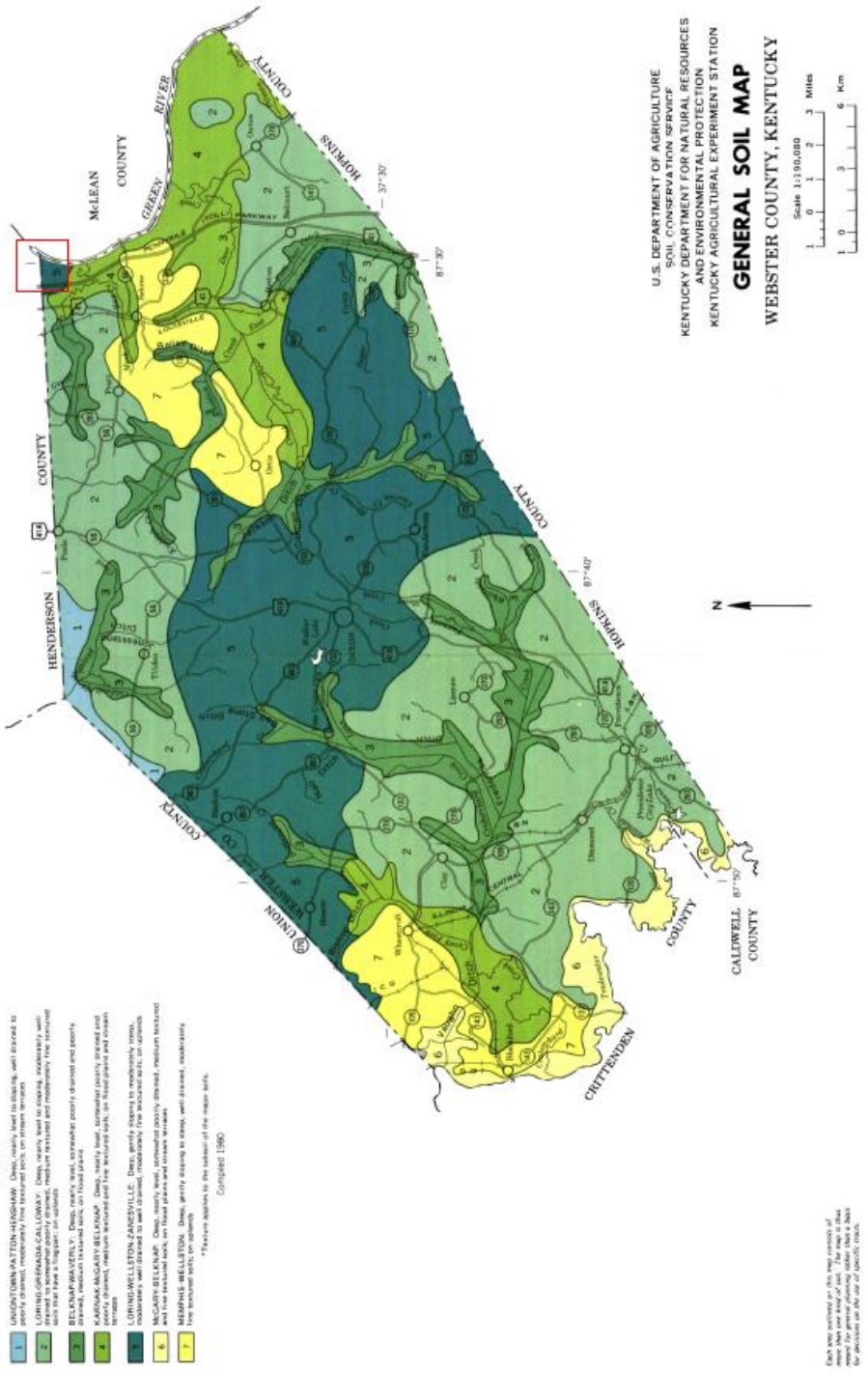
Site Preconstruction Topographic Map



Site Preconstruction Geologic Map



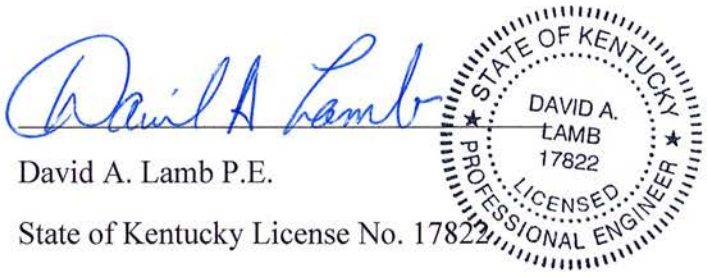
Henderson County Preconstruction Soils Map



Webster County Preconstruction Soils Map

Green Station CCR Impoundment Liner Assessment Report
Professional Engineer Certification [Per 40 CFR § 257.71(b)]

I hereby certify that myself or an agent under my review has prepared this Surface Impoundment Liner Assessment Report (Report), and being familiar with the provisions of the final rule to regulate the disposal of coal combustion residuals (CCR) as solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA), attest that this Report has been prepared in accordance with good engineering practices and meets the intent of 40 CFR Part 257.71. To the best of my knowledge and belief, the information contained in this Report is true, complete, and accurate.



David A. Lamb P.E.

State of Kentucky License No. 17822

Date: 6/28/2016

Big Rivers Electric Corporation
Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule
CCR Impoundment Liner Assessment Report

CCR Surface Impoundment Information

Name:	Reid/HMPL Station CCR Surface Impoundment
Operator:	Sebree Generating Station
Address:	9000 Highway 2096 Robards, Kentucky 42452

Qualified Professional Engineer

Name:	David A. Lamb
Company:	Associated Engineers, Inc.
Kentucky P.E. Number:	17822

Regulatory Applicability

Per 40 CFR § 257.71, it must be determined if an existing CCR surface impoundment was constructed with a liner that meets CCR Final Rule specifications.

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operator of the CCR unit fails to document that the CCR unit is constructed with a liner that meets the requirements of this section.

Site Topography and Geology

The Geologic Map of the Robards Quadrangle indicates that bedrock underlying the site consists of units of the lower Lisman and upper Carbondale Formations. This interval is generally composed of interbedded sandstone, sandy shale, and shale with minor limestone, coal, and fireclay beds. The Nos. 11, 12, and 13 coal beds occurring within the interval are thin to absent. No faults are mapped in the vicinity of the sites. In the topographically lower areas, alluvial deposits associated with the Green River and tributaries occur above bedrock. Thickness of unconsolidated material can exceed 50 feet. On the uplands, the thickness of loess and residual soils is generally less than 20 feet.

Impoundment History and Construction Review

The Reid/HMPL CCR surface impoundment is a combined incised/earthen embankment structure with a footprint area of approximately 24 acres. Embankments form the west, south and east sides of the impoundment and the north side is incised. The original terrain on which the pond was constructed generally sloped toward the west. Although the Green River is located less than 0.5 miles from the site, the structure does not extend significantly into the floodplain. Underlying preconstruction soils consisted of Loring-Grenada, Loring-Zanesville-Wellston (Henderson County) and Loring-Wellston-Zanesville (Webster County) soil associations which are generally characterized as well drained to moderately well drained soils on nearly level to sloping uplands and were not compacted during construction per § 257.71 (a)(1) and (2) specifications.

The embankment reaches its greatest relief of approximately 42 feet on the west side. The Burns & McDonnell Engineering Co. October 8, 1971 design drawings show the inboard slope and central core portion of the dike to be constructed of compacted soil fill and the outboard slope to be consisted of sand fill. A sand blanket drain was designed for the outboard third of the base of the dike for the majority of the length and the plans show a crushed limestone drainage layer with a minimum thickness of 18 inches topped with a

minimum six inches thick sand layer which extends across the entire width of the dike cross section in the southwest corner. The plans also show a cut-off trench in the original ground below dike crest and extending for the entire length of the dike. The impoundment is listed in the Kentucky State Dam Inventory System under ID No. 0855 and has been given a "Moderate" hazard rating. The impoundment originally received fly ash and bottom ash, but stopped receiving fly ash in approximately 1985 when the Boothe system was placed in operation.

Liner Assessment

Based on the information reviewed and discussion with Big Rivers Electric Corporation and Associated Engineers, Inc. personnel, it was determined that the Reid/HMPL CCR surface impoundment was not constructed with any one of the following:

(1) A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec;
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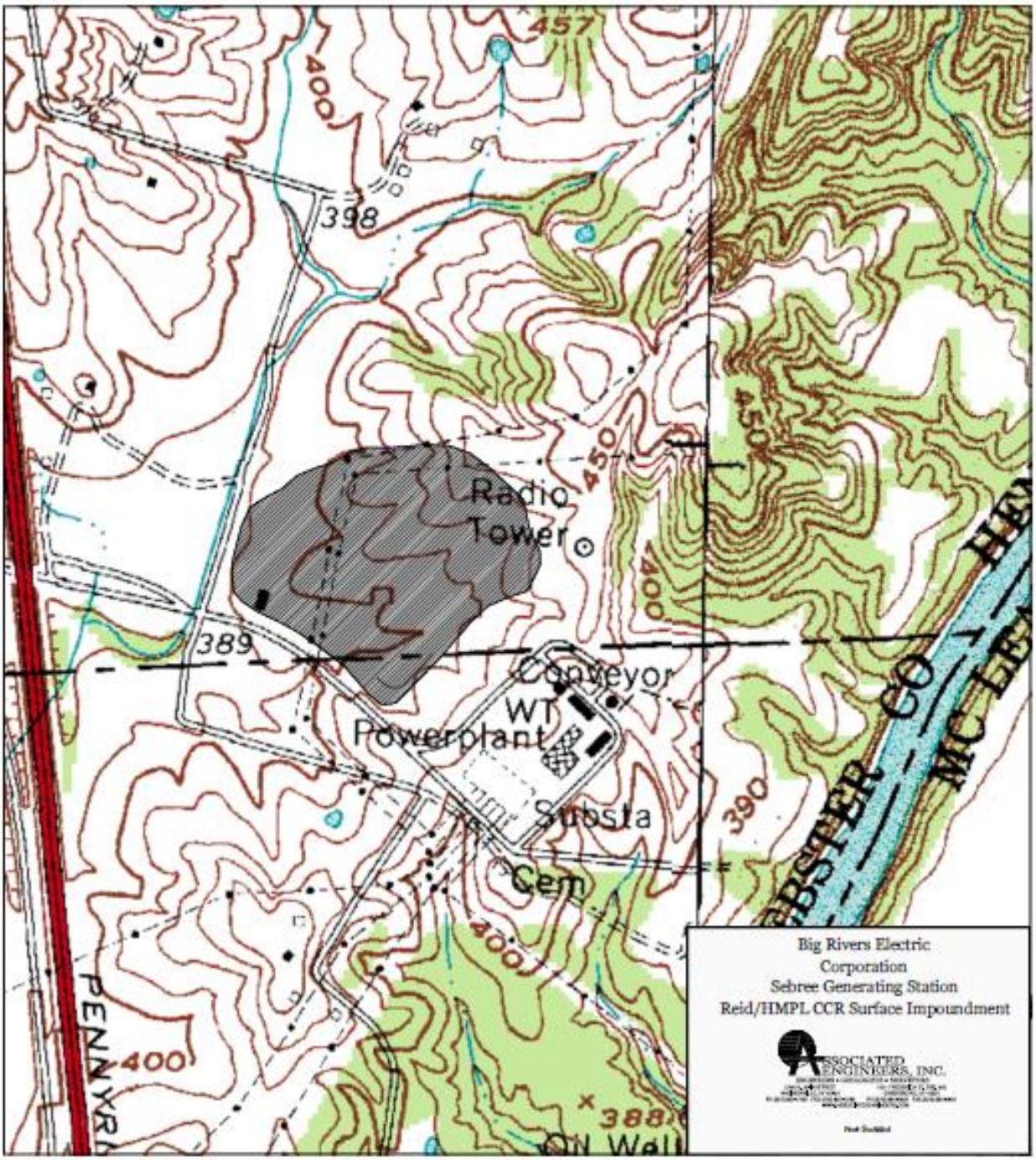
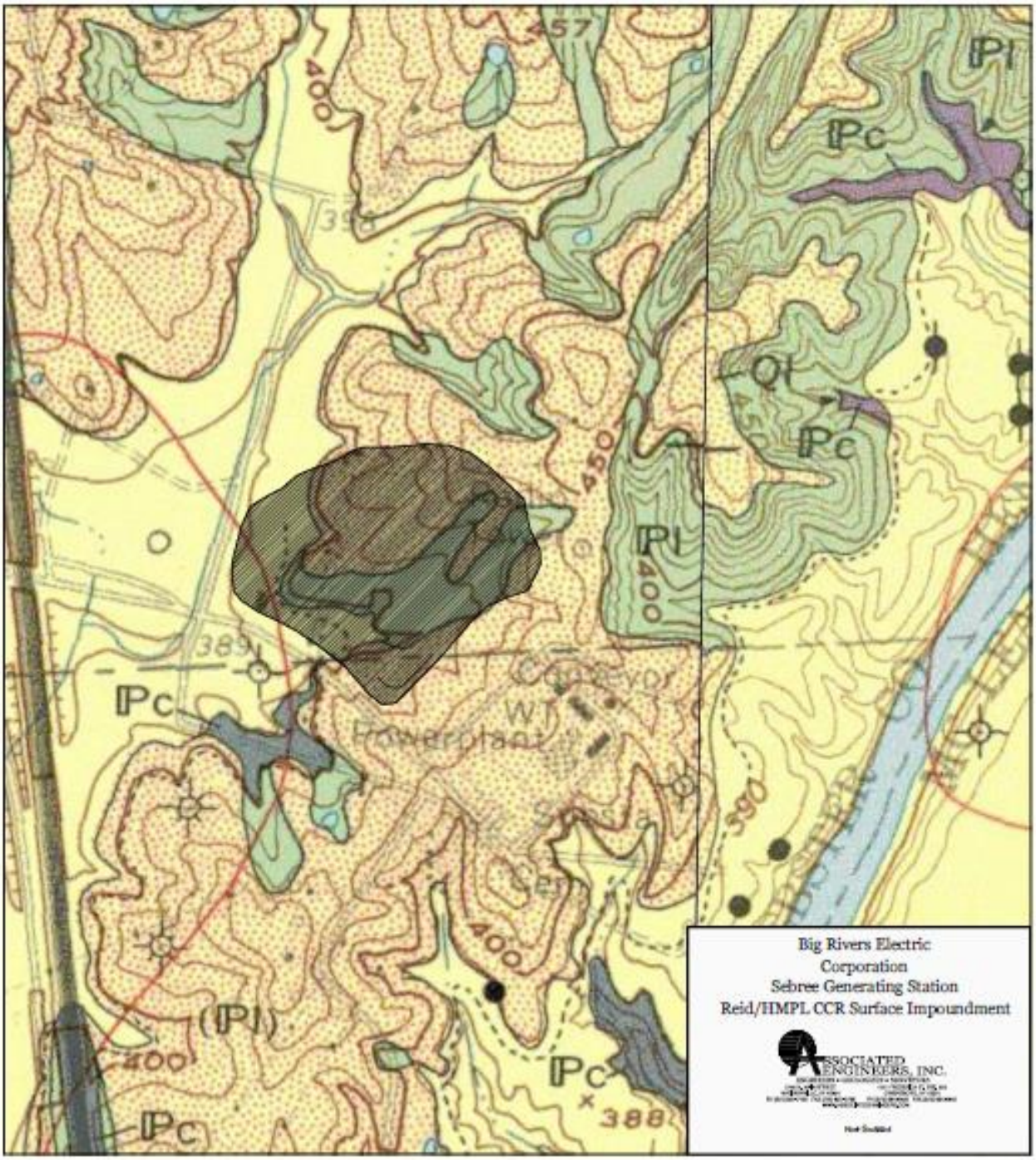
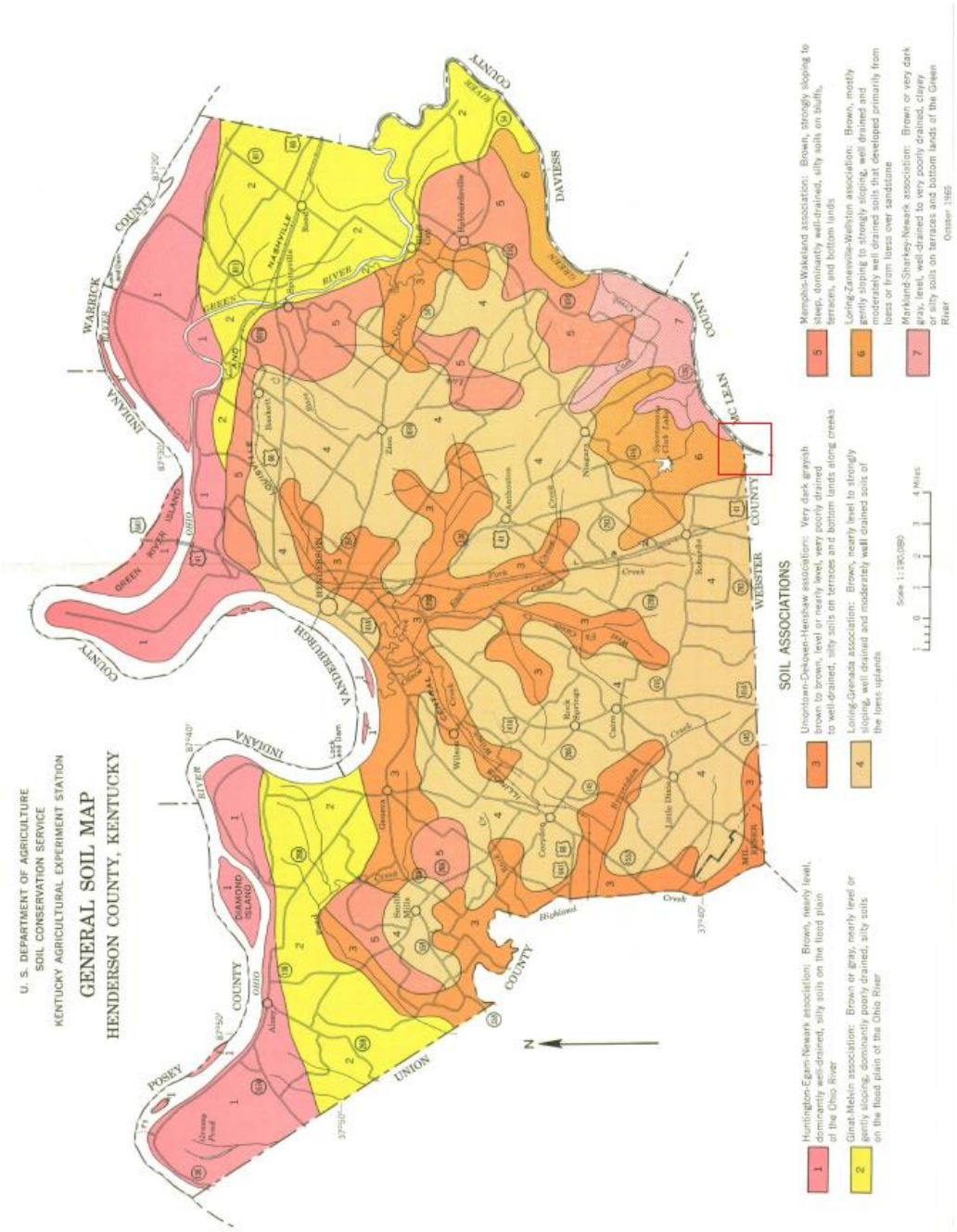


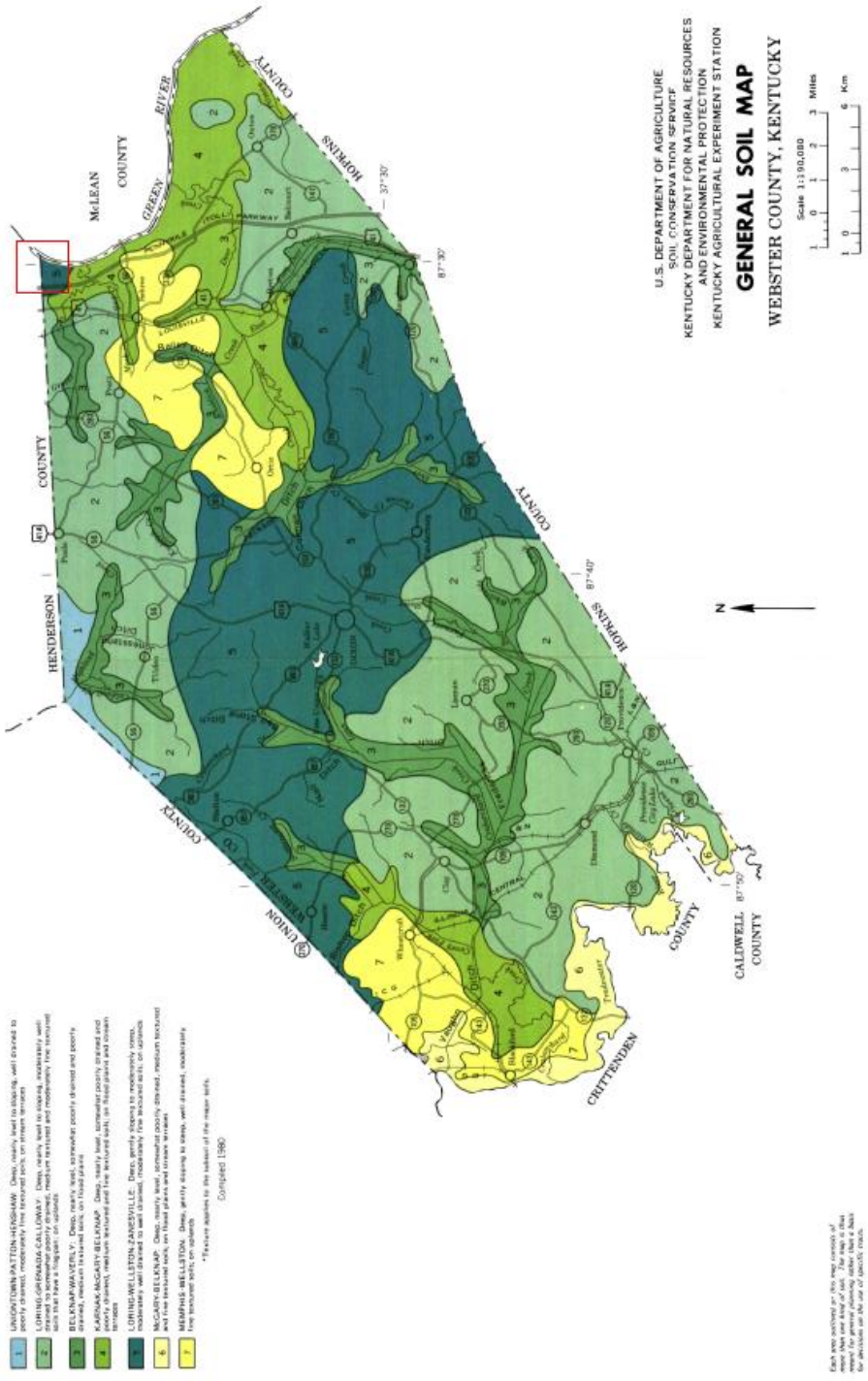
Site Preconstruction Topographic Map



Site Preconstruction Geologic Map



Henderson County Preconstruction Soils Map



Webster County Preconstruction Soils Map

Reid/HMPL Station CCR Impoundment Liner Assessment Report
Professional Engineer Certification [Per 40 CFR § 257.71(b)]

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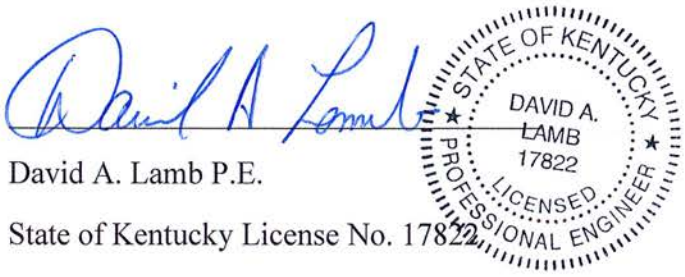

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