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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1146

In the Matter of)	
Application of Duke Energy Carolinas,)	TESTIMONY OF
LLC, for Adjustment of Rates and)	VANCE F. MOORE
Charges Applicable to Electric Utility)	PUBLIC STAFF – NORTH
Service in North Carolina)	CAROLINA UTILITIES
)	COMMISSION

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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

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**TESTIMONY OF VANCE F. MOORE
ON BEHALF OF THE PUBLIC STAFF
NORTH CAROLINA UTILITIES COMMISSION**

JANUARY 23, 2018

1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND PRESENT**
2 **POSITION.**

3 A. My name is Vance Moore. My business address is 1100 Crescent Green,
4 Suite 208, Cary, North Carolina. I am the President of Garrett and Moore,
5 Inc.

6 **Q. BRIEFLY STATE YOUR QUALIFICATIONS.**

7 A. I am a licensed professional engineer with over 28 years of experience
8 engineering coal ash management projects, including the design and
9 permitting of industrial landfills, the closure of coal ash impoundments, and
10 the closure of coal ash landfills. Additional qualifications are set forth in
11 Appendix A.

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1 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

2 A. The purpose of my testimony is to evaluate whether the approach taken by
3 DEC for each of DEC's CCR units located in North Carolina was the most
4 prudent and reasonable method of achieving compliance with the laws and
5 regulations governing coal ash management.

6 In addition, I also present my perspective on the prudence and
7 reasonableness of costs identified by DEC as part of its future regulatory
8 obligations related to coal ash management.

9 **Q. WHY DO YOU SAY "PRUDENT AND REASONABLE"?**

10 A. I am not an expert in utility regulation, but have relied upon guidance from
11 the Public Staff attorneys with respect to the legal standard for my
12 investigation. Those attorneys inform me that under North Carolina General
13 Statute 62-133, a utility's operating expenses must be "reasonable" to be
14 included in the revenue requirement that is the basis for setting rates the
15 utility may charge to consumers. Likewise, the cost of utility property
16 allowed in the rate base, to which an authorized return may be applied, must
17 also be "reasonable." Furthermore, I have been advised that management
18 prudence is one aspect of this statutory reasonableness, and yet some
19 costs or expenses can be prudent but still not reasonable for recovery as a
20 component of the revenue requirement used for setting rates. For purposes

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1 of my testimony, I do not attempt to present the legal theory for a distinction
2 between “prudence” and other “reasonableness”; rather, I just describe the
3 facts that led me to conclude that a particular cost or expense is not
4 reasonable for purposes of rate recovery.

5 **Q. HOW DOES YOUR TESTIMONY DIFFER FROM THAT OF PUBLIC**
6 **STAFF EMPLOYEES IN THIS CASE?**

7 A. I understand that Public Staff witnesses Junis and Maness speak to
8 disallowance for costs of environmental violations, and the appropriate
9 regulatory accounting treatment for coal ash-related costs. I do not address
10 those issues. The testimony of Public Staff witness Bernard Garrett
11 evaluated DEC’s costs with respect to its coal ash management in South
12 Carolina, and so our testimony together provides a combined perspective
13 on the prudence and reasonableness of the coal ash closure costs for which
14 DEC is seeking cost recovery in this proceeding.

15 **Q. WHAT IS THE SCOPE OF YOUR INVESTIGATION INTO THE**
16 **PRUDENCE AND REASONABLENESS OF DEC’S COAL ASH**
17 **MANAGEMENT COSTS?**

18 A. I reviewed the approach taken by DEC for each of DEC’s CCR units –
19 meaning each coal ash landfill, surface impoundment (basin), structural fill,
20 or other means of disposing of coal ash located in North Carolina to

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1 evaluate whether the approach taken by DEC was the least cost method of
2 achieving compliance with the laws and regulations governing coal ash
3 management. To the extent the approach taken by DEC was not the least
4 cost method of achieving compliance with the laws and regulations
5 governing coal ash management, I compared the costs incurred by DEC
6 from January 1, 2015, through November 30, 2017 to the estimated costs
7 for the least cost method, and recommend that the Commission disallow
8 the difference in these costs.

9 In some circumstances, DEC incurred costs associated with management
10 of coal ash from CCR units that were not required under State or federal
11 law. In those circumstances, I evaluated the specific facts and details
12 surrounding those CCR units to determine whether I agreed management
13 of those CCR units was reasonable and prudent. If management of those
14 CCR units were reasonable and prudent, I reviewed DEC's actions and
15 costs incurred to determine if I agreed with their decisions. To the extent I
16 believed that DEC's actions and costs incurred were not reasonable nor
17 prudent, I recommend that the Commission disallow these costs.

18 **Q. PLEASE DESCRIBE THE RESOURCES UTILIZED IN CONDUCT OF**
19 **YOUR INVESTIGATION.**

20 A. In order to prepare this testimony, I reviewed the testimony and work papers
21 of DEC witnesses Kerin, Wright, Bateman, and others. Through the Public

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1 Staff, I also submitted extensive discovery to DEC regarding its selection
2 and analysis of CCR unit closure options, including the technical and
3 financial basis for such decisions. I also participated in multiple meetings
4 with DEC personnel and participated in site visits to the Belews Creek,
5 Buck, Dan River, Mayo, Riverbend, and Sutton facilities.

6 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

7 A. My testimony is limited to the seven DEC facilities located in North Carolina
8 (Allen, Belews Creek, Buck, Cliffside, Dan River, Riverbend, and Marshall).
9 My testimony is divided into three parts. First, I provide a brief overview of
10 DEC's legal and regulatory obligations related to coal ash management.

11 Second, I reviewed DEC's selected method for CCR management at each
12 CCR unit to indicate my opinion on the prudence of those decisions. I also
13 reviewed costs incurred by DEC related to coal ash management from
14 January 1, 2015, through November 30, 2017 for reasonableness and
15 recommend adjustments, when applicable. For CCR units which I disagree
16 with DEC's selected method, I compare the lowest cost compliance option
17 to costs incurred by DEC related to coal ash management from January 1,
18 2015, through November 30, 2017 and recommend adjustments.

19 The third part of my testimony focuses on the technical basis for the future
20 compliance alternatives proposed by DEC as part of its recognition of future

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1 legal and regulatory obligations. While DEC does not propose to utilize
2 these future costs in this rate case for the determination of future rates, they
3 form the basis for the regulatory accounting treatment proposed by DEC.
4 As such, they require analysis as to the reasonableness of the technical
5 basis for including these costs. The adjustments that I recommend in my
6 testimony are incorporated into the rates proposed by Public Staff witness
7 Maness.

8 Public Staff Moore Exhibit 1 provides a summary of my recommended
9 disallowance of **\$72,423,182**. This amount is then included in the testimony
10 of Public Staff witness Maness in his recommendations for the appropriate
11 recovery of these costs.

12 **Q. PLEASE PROVIDE A SUMMARY OF THE REGULATORY**
13 **REQUIREMENTS FOR EACH OF DEC'S CCR UNITS LOCATED IN**
14 **NORTH CAROLINA.**

15 A. Closure of CCR units at seven of DEC's facilities located in North Carolina
16 must comply with federal regulations, including the United States
17 Environmental Protection Agency (EPA) "Hazardous and Solid Waste
18 Management System; Disposal of Coal Combustion Residuals From
19 Electric Utilities; Final Rule" published in the Federal Register Vol. 80, No.
20 74, on April 15, 2015, (CCR Rule) and various statutory requirements of
21 North Carolina, including S.L. 2014-122 ("CAMA 2014"), S.L. 2015-110

- 1 ("The Mountain Energy Act", or "MEA"), and S.L. 2016-95 ("CAMA 2016").
- 2 Through enactment of CAMA 2014, the General Assembly deemed the Dan
- 3 River and Riverbend facilities as High-Priority sites. Section 3.(c) of CAMA
- 4 2014 provides that the High-Priority sites shall be closed as follows:
- 5 (1) Impoundments located in whole above the seasonal high
- 6 groundwater table shall be dewatered. Impoundments
- 7 located in whole or in part beneath the seasonal high
- 8 groundwater table shall be dewatered to the maximum
- 9 extent practicable.
- 10 (2) All coal combustion residuals shall be removed from the
- 11 impoundments and transferred for (i) disposal in a coal
- 12 combustion residuals landfill, industrial landfill, or municipal
- 13 solid waste landfill or (ii) use in a structural fill or other
- 14 beneficial use as allowed by law. Any disposal or use of coal
- 15 combustion products pursuant to this section shall comply
- 16 with the moratoriums enacted under Section 4(a) and
- 17 Section 5(a) of this act and any extensions thereof. The use
- 18 of coal combustion products (i) as structural fill, as
- 19 authorized by Section 4(b) of this act, shall be conducted in
- 20 accordance with the requirements of Subpart 3 of Part 2I of
- 21 Article 9 of the General Statutes, as enacted by Section 3(a)
- 22 of this act, and (ii) for other beneficial uses shall be
- 23 conducted in accordance with the requirements of Section
- 24 .1700 of Subchapter B of Chapter 13 of Title 15A of the
- 25 North Carolina Administrative Code (Requirements for
- 26 Beneficial Use of Coal Combustion By-Products) and
- 27 Section .1205 of Subchapter T of Chapter 2 of Title 15A of
- 28 the North Carolina Administrative Code (Coal Combustion
- 29 Products Management), as applicable.
- 30 (3) If restoration of groundwater quality is degraded as a result
- 31 of the impoundment, corrective action to restore
- 32 groundwater quality shall be implemented by the owner or
- 33 operator as provided in G.S. 130A-309.204.

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1 The North Carolina Department of Environmental Quality (NCDEQ
2 assigned the remaining five DEC facilities in North Carolina (Allen, Belews
3 Creek, Buck, Cliffside, and Marshall), as a “low to intermediate risk
4 classification”. DEC is in the process of establishing the permanent
5 replacement water supplies required under G.S. 130A-309.211(c)(1) and
6 performing the applicable dam safety repair work. Upon completion of
7 these tasks within the timeframe provided, NCDEQ must classify the
8 impoundments at the sites as low-risk pursuant to G.S. 130A-309.213(d)(1).
9 Pursuant to CAMA, as amended, low-risk impoundments must be closed as
10 soon as practicable, but no later than December 31, 2029, and utilize one
11 of the following closure methods: (i) cap in-place; (ii) convert CCR
12 impoundment to an industrial landfill; (iii) disposed of in a coal combustion
13 residuals landfill, industrial landfill, or municipal solid waste landfill; (iv) used
14 in a structural fill; (v) or other beneficial use as allowed by law.

15 **Q. ARE THERE OTHER FACTORS THAT HAVE POTENTIALLY IMPACTED**
16 **DEC’S SELECTION OF CLOSURE OPTIONS FOR EACH OF DEC’S CCR**
17 **UNITS LOCATED IN NORTH CAROLINA?**

18 A. Yes. The Settlement Agreement between NCDEQ, DEC, and Duke Energy
19 Progress, LLC (“DEP”) required the accelerated remediation of ash basins
20 and actions to address groundwater impacts at the Sutton, Belews Creek,
21 Asheville, and H.F. Lee plants. Public Staff witness Junis’ testimony also

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1 addresses additional potential environmental violations that are still being
2 investigated that may further impact the remediation of DEC's CCR units,
3 and could therefore weigh into its selection of closure options.

4 My review, however, is based on actions taken by DEC to comply with
5 applicable state and federal regulatory requirements, not on any
6 settlements or litigation outcomes.

7 **Q. DO YOU AGREE WITH THE SUMMARY OF REQUIREMENTS**
8 **REGARDING CCR AND CLOSURE OF COAL ASH IMPOUNDMENTS**
9 **INCLUDED IN PAGES 22 THROUGH 36 OF DEC WITNESS KERIN'S**
10 **DIRECT TESTIMONY?**

11 A. Yes, I have reviewed the discussion of regulatory requirements included in
12 DEC witness Kerin's testimony and agree with his general characterization
13 of the applicable federal and State regulations addressing the management
14 and closure of CCR units in North Carolina.

15 **Q. WHAT IS YOUR OPINION REGRADING DEC's CLOSURE APPROACH**
16 **UTILIZED FOR CCR UNITS WHICH ARE CLASSIFIED BY CAMA AS**
17 **"LOW RISK"?**

18 A. As discussed above, DEC is in the process of establishing the permanent
19 replacement water supplies required under G.S. 130A-309.211(c)(1) and
20 performing the applicable dam safety repair work. Upon completion of

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1 these tasks within the timeframe provided, NCDEQ must classify the
2 impoundments at Allen, Belews Creek, Buck, Cliffside, and Marshall as low-
3 risk pursuant to G.S. 130A-309.213(d)(1).

4 DEC proposes utilizing a “cap in-place” closure method for the CCR units
5 located at Allen, Belews Creek, Cliffside, and Marshall. I take no exception
6 to DEC’s proposed “cap in-place” closure method for the CCR units located
7 at Allen, Belews Creek, Cliffside, and Marshall.

8 DEC proposes the “beneficiation” closure method for the CCR units located
9 at Buck Station. As discussed further below, I do take exception to DEC’s
10 proposed “beneficiation” closure method for the CCR units located at Buck
11 Station.

12 It is important to note that CAMA, as amended, does not call for the
13 submission of proposed closure plans for low risk impoundments until
14 December 31, 2019. As such, DEC has not submitted a Site Analysis and
15 Removal Plan (“SARP”) to NCDEQ for any CCR units which are classified
16 as “low risk”.

17 **Q. WHAT IS YOUR OPINION REGARDING THE REASONABLENESS AND**
18 **PRUDENCE OF COSTS INCURRED FOR CCR UNITS WHICH ARE**
19 **CLASSIFIED AS “LOW RISK” FOR WHICH DEC SEEKS RECOVERY IN**
20 **THIS RATE CASE?**

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1 A. For CCR units which are classified as “low risk” and DEC’s proposes “cap
2 in-place” closure method which include facilities located at Allen, Belews
3 Creek, and Marshall, it is my opinion that the costs DEC incurred for the
4 period of January 1, 2015, to November 30, 2017 were reasonable and
5 prudent. Therefore, I conclude it is reasonable for the Commission to allow
6 DEC’s requested reimbursement costs for Allen, Belews Creek, and
7 Marshall for the period of January 1, 2015, through November 30, 2017.

8 **Q. WITH REGARD TO THE CLIFFSIDE FACILITY, WHAT IS YOUR**
9 **OPINION REGARDING THE COSTS DEC INCURRED FOR WHICH DEC**
10 **SEEKS RECOVERY IN THIS RATE CASE?**

11 A. For the CCR units at Cliffside, it is my opinion that the costs DEC incurred
12 for the period of January 1, 2015, to November 30, 2017 were reasonable
13 and prudent, with the exception of certain real property acquisitions made
14 by DEC in 2017 for nine properties that were adjacent to, or in close
15 proximity, to its on-site landfill at Cliffside. In response to a Public Staff data
16 request, DEC explained its justification for the land acquisition as follows:

17 **[BEGIN CONFIDENTIAL]**

18
19
20
21
22
23
24
25 **[END CONFIDENTIAL]**

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1 I take exception to the purchase of the nine properties as shown in Public
2 Staff Moore Exhibit 2 since the purchase of these properties was not
3 required to comply with regulatory obligations related to coal ash
4 management, nor for any permit conditions associated with operation of the
5 landfill. In addition, public paved roads separate the landfill from the
6 properties that DEC bought so no physical actions by DEC necessitated the
7 purchase.

8 Therefore, I recommend that the Commission disallow \$2,000,100 for the
9 Cliffside facility for the period of January 1, 2015, through November 30,
10 2017.

11 **Q. WHY DO YOU TAKE EXCEPTION TO DEC'S PROPOSED**
12 **"BENEFICIATION" CLOSURE METHOD FOR THE CCR UNITS**
13 **LOCATED AT BUCK STATION?**

14 A. As previously discussed in my testimony in the DEP general rate case in
15 Docket No. E-2, Sub 1142, it is my opinion that DEC's selection of Buck
16 Station as one of the beneficiation sites pursuant to G.S. 130A-309.216
17 increased DEC's cost for compliance with coal ash management
18 requirements compared to other lower cost closure options that comply with
19 CAMA as described below.

20 G.S. 130A-309.216, enacted as part of CAMA 2016, required Duke Energy

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1 (DEP and/or DEC) to identify three sites located within the State of North
2 Carolina, with ash stored in the impoundments, capable of annually
3 processing 300,000 tons of ash to specifications appropriate for
4 cementitious purposes.

5 Duke Energy identified DEP's H.F. Lee Station and Cape Fear Station as
6 two of the beneficiation sites pursuant to G.S. 130A-309.216. Cost for the
7 "cementitious beneficiation" closure method for CCR units at the H.F. Lee
8 Station and Cape Fear Station are significantly less compared to other
9 closure options that comply with CAMA. Therefore, in DEP's recent general
10 rate case in Docket No. E-2, Sub 1142, I did not take exception to DEP's
11 selection of H.F. Lee Station and Cape Fear Station pursuant to G.S. 130A-
12 309.216.

13 In regard to this rate case, DEC selected Buck Station as one of the
14 beneficiation sites pursuant to G.S. 130A-309.216. It is my opinion Duke
15 Energy should have sought to establish DEP's Weatherspoon Station,
16 instead of DEC's Buck Station, as one of the beneficiation sites as required
17 by G.S. 130A-309.216 in order to minimize cost for compliance with coal
18 ash management requirements.

19 DEP's proposed closure method for the Weatherspoon Station is to
20 excavate 230,000 tons of CCR per year for recycling to the South Carolina
21 concrete industry. Cost for "beneficiation" closure method for CCR units at

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1 the Weatherspoon Station are significantly less compared to other closure
2 options that comply with CAMA. The only barrier for the Weatherspoon
3 Station meeting the requirement of G.S. 130A-309.216 is identifying an end
4 user(s) for an additional 70,000 tons per year for cementitious purposes.

5 DEC's selection of Buck Station one of the beneficiation sites pursuant to
6 G.S. 130A-309.216 has two major disadvantages. First, DEC's selection of
7 Buck Station as one of the beneficiation sites pursuant to G.S. 130A-
8 309.216 has the adverse effect of supplying an additional 300,000 tons per
9 year of CCR material to the concrete industry, thereby reducing demand for
10 the 70,000 tons per year of CCR material for the same purposes from
11 Weatherspoon.

12 Second, DEC's selection of Buck Station as one of the beneficiation sites
13 pursuant to G.S. 130A-309.216 has increased closure costs compared to
14 other lower cost closure options that comply with CAMA. CCR units at Buck
15 could have been classified as low risk upon completion of the establishment
16 of permanent replacement water supplies and completion of applicable dam
17 safety repair work, and instead may have been eligible for closure under the
18 "cap-in-place" closure method under CAMA, which would have lowered
19 closure costs by approximately **[BEGIN CONFIDENTIAL]** [REDACTED]
20 **[END CONFIDENTIAL]**.

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1 Therefore, it is my opinion DEC's selection of Buck Station one of the
2 beneficiation sites pursuant to G.S. 130A-309.216 is not the lowest cost
3 option for complying with coal ash management regulations.¹

4 **Q. WHAT IS YOUR OPINION REGARDING WHETHER DEC'S**
5 **CUSTOMERS SHOULD BE REQUIRED TO PAY FOR COSTS**
6 **INCURRED FOR CCR UNITS AT BUCK STATION FOR WHICH DEC**
7 **SEEKS RECOVERY IN THIS RATE CASE?**

8 A. It is my opinion that any costs associated with beneficiation at the Buck
9 Station are not reasonable or prudent and should be disallowed. The costs
10 incurred between January 1, 2015 to November 30, 2017 which are
11 associated with beneficiation at the Buck Station are presented on Public
12 Staff Moore Exhibit 3. Therefore, I recommend the Commission disallow
13 \$10,612,592 from DEC's request in this proceeding.

¹ It is worth noting that on September 3, 2014, following a 60-day notice of intent served on July 1, 2014, the Yadkin Riverkeeper, Inc. and Waterkeeper Alliance, Inc. filed a citizen suit against DEC alleging unpermitted discharges to surface water and groundwater violations at the Buck Station (the "Buck Federal Citizen Suit"). On January 5, 2015, DEC filed a Motion to Dismiss for failure to state a claim and an alternative Motion to Stay. On October 20, 2015, the court issued an order denying DEC's Motion to Dismiss and Motion to Stay, finding that the NCDEQ had not diligently prosecuted the state enforcement litigation against DEC and also that the groundwater claims may proceed in federal court because the groundwater serves as a conduit for contaminants to move from the ash basins to waters of the United States. On September 28, 2016, DEC attended a court-ordered mediation with Plaintiffs. Based on DEC's decision to select Buck Station as one of the three sites for beneficiation under House Bill 630, an agreement was reached to settle the Buck Federal Citizen Suit, and for Plaintiffs to dismiss the claims related to the Buck Station in the DEC State enforcement litigation.

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1 **Q. PLEASE BRIEFLY DESCRIBE DEC’S CLOSURE APPROACH UTILIZED**
2 **FOR THE DAN RIVER FACILITY.**

3 A. There are four CCR units at the Dan River facility including: 1) the Primary
4 Ash Basin; 2) the Secondary Ash Basin; 3) Ash Fill 1; and 4) Ash Fill 2. With
5 regard to regulatory obligations related to coal ash management for these
6 CCR units, CAMA requires the excavation of CCR materials from the
7 Primary Ash Basin and the Secondary Ash Basin. However, there are no
8 regulatory obligations related to coal ash management that require removal
9 of CCR materials from the Ash Fill 1 area and the Ash Fill 2 area.

10 DEC’s selected closure method for the CCR units at the Dan River Facility
11 followed this basic order: First, DEC excavated and transported all of the
12 CCR materials in Ash Fill 1 off-site to the Maplewood Landfill in Virginia for
13 disposal. Following completion of that step, DEC constructed an on-site
14 CCR landfill largely within the former footprint of Ash Fill 1. DEC is now in
15 the process of excavating and disposing all of the CCR materials from the
16 Primary Ash Basin, the Secondary Ash Basin, and Ash Fill 2 to the on-site
17 landfill.

18 **Q. WHAT IS YOUR OPINION REGARDING DEC’S CLOSURE APPROACH**
19 **UTILIZED FOR THE DAN RIVER FACILITY?**

20 A. DEC’s selection of an on-site CCR landfill located largely within the former
21 footprint of Ash Fill 1, along with their decision to excavate, transport, and

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1 off-site disposal for all CCR materials from Ash Fill 1 at substantial costs,
2 raises several issues.

3 First, DEC removal of CCR materials off-site was required prior to the
4 landfill's construction. DEC witness Kerin stated on pages 36 and 37 of his
5 testimony that:

6 In order to meet the August 1, 2019 deadline established by CAMA
7 for closure of the two Dan River ash basins, and considering that
8 during this time, the CCR landfill construction moratorium under
9 CAMA 2014 remained in effect, it was necessary that the Company
10 promptly start excavating ash, and transporting it off-site, while the
11 potential for an on-site landfill could be investigated.

12 I disagree with this statement. With regard to the moratorium under CAMA
13 2014, Section 5.(a) established a moratorium on the construction of new or
14 expansion of existing CCR landfills, defined by G.S. 130A-290(2c) as
15 follows:

16 "Coal combustion residuals landfill" means a facility or unit for the
17 disposal of combustion products, where the landfill is located at the
18 same facility with the coal-fired generating unit or units producing
19 the combustion products, *and where the landfill is located wholly or*
20 *partly on top of a facility that is, or was, being used for the disposal*
21 *or storage of such combustion products*, including, but not limited
22 to, landfills, wet and dry ash ponds, and structural fill facilities.
23 (emphasis added).

24 The moratorium prohibited the construction of new or expanded CCR
25 landfills located wholly or partly on top of the Primary Ash Basin, the
26 Secondary Ash Basin, the Ash Fill 1 area, and the Ash Fill 2 area. However,
27 the moratorium did not prohibit the construction of new or expanded CCR

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1 landfills located in other areas of the site. In data responses, DEC claims
2 they evaluated areas within its Dan River Facility parcel other than the
3 current landfill location. However, DEC also stated "No records are
4 available documenting DEC's evaluation of all areas".

5 The Public Staff then specifically requested whether DEC evaluated areas
6 between the combined cycle plant and the western property boundary for
7 an on-site landfill for CCR disposal. DEC responded:

8 DEC evaluated areas between the combined cycle plant and the
9 western property boundary for an on-site landfill for CCR disposal.
10 Primary reasons for DEC's considerations to not utilize the area
11 between the combined cycle plant and the western property
12 boundary were:

- 13 1. Avoiding potential conflict with the LCID landfill (west of
14 the CT plant);
- 15 2. Avoiding potential conflict with streams in the area (see
16 attached map);
- 17 3. Avoiding transmission lines to the northwest; and
- 18 4. Avoiding impact to neighbors to the west (golf course) and
19 northwest.

20 It is my opinion an adequately sized on-site industrial landfill could have
21 been located along the western property boundary as shown on Public Staff
22 Moore Exhibit 4 which would have addressed each of DEC's
23 considerations, as discussed below.

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1 With regard to avoiding potential conflict with the LCID landfill (west of the
2 CT plant), it is my opinion the LCID landfill is not a fatal flaw because it could
3 have been excavated and disposed off-site. Public Staff Moore Exhibit 4
4 includes costs for the LCID landfill's relocation.

5 With regard to avoiding potential conflict with streams in the area, it is my
6 opinion the streams would not be considered a fatal flaw and that mitigation
7 of on-site stream is not uncommon to allow for construction of landfills
8 Public Staff Moore Exhibit 4 includes costs for the stream mitigation.

9 With regard to avoiding transmission lines to the northwest, there appears
10 to be no conflict between the on-site industrial landfill and the transmission
11 lines to the northwest. However, there is a metal building within the
12 proposed on-site industrial landfill footprint. Public Staff Moore Exhibit 4
13 includes costs for the metal building relocation.

14 With regard to avoiding impact to neighbors to the west (golf course) and
15 northwest, the proposed on-site industrial landfill is approximately forty two
16 (42) acres, or eighteen (18) more acres than the CCR landfill located over
17 the Ash Fill 1 Area. The additional landfill acreage is for added capacity for
18 on-site disposal of 1,200,019 tons of CCR material from Ash Fill 1 Area.
19 Even with the additional acreage, the proposed on-site industrial landfill
20 could be built well within the North Carolina solid waste management
21 regulations buffer requirements for industrial landfills.

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1 With the exception of stream mitigation, an on-site industrial landfill along
2 the western property boundary could have been permitted and constructed
3 on a similar timeframe as the CCR landfill located over the Ash Fill 1 Area.
4 With regard to the added timeframe for stream mitigation, it is my opinion
5 stream mitigation could have been completed within the delay period per
6 the moratorium under CAMA 2014, Section 5.(a). Therefore, an on-site
7 industrial landfill along the western property boundary could have been
8 permitted and constructed on a similar timeframe as the CCR landfill located
9 over the Ash Fill 1 Area allowing for the timely excavation and disposal of
10 CCR materials from the Primary Ash Basin and the Secondary Ash Basin
11 in accordance with CAMA deadlines.

12 In addition, the on-site industrial landfill along the western property
13 boundary could have been permitted and constructed for a similar per acre
14 cost as the CCR landfill located over the Ash Fill 1 Area. Public Staff Moore
15 Exhibit 4 includes costs for the additional landfill acreage required for on-
16 site disposal of 1,200,019 tons of CCR material from Ash Fill 1 Area.

17 It is important to note that there are no regulatory obligations related to coal
18 ash management that require removal of CCR materials from the Ash Fill 1
19 and Ash Fill 2, particularly under the aggressive timeframes required for
20 high-priority sites under CAMA. An on-site industrial landfill along the
21 western property boundary would have eliminated the need to transport and

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1 dispose the CCR materials in the Ash Fill 1 Area off-site at substantial costs.
2 Therefore, the costs DEC incurred for transportation and off-site disposal of
3 1,200,019 tons of CCR material from the Ash Fill 1 Area were not required
4 and therefore not reasonable or prudent.

5 **Q. WHAT IS YOUR OPINION REGARDING WHETHER DEC'S**
6 **CUSTOMERS SHOULD BE REQUIRED TO PAY FOR THE ADDITIONAL**
7 **COSTS ASSOCIATED WITH THE OFF-SITE DISPOSAL OF CCR**
8 **MATERIAL FROM THE ASH FILL 1 AREA FROM THE DAN RIVER**
9 **FACILITY?**

10 A. It is my opinion that DEC's incurred costs from January 1, 2015, through
11 November 30, 2017 of \$83,531,985 to excavate, transport, and dispose of
12 1,200,019 tons of ash and soils off-site from Dan River to the Maplewood
13 landfill were not reasonable or prudent. Had DEC instead constructed an
14 on-site "greenfield" industrial landfill along the western property boundary,
15 the expense for excavation, transportation, and on-site disposal of
16 1,200,019 tons of CCR material from Ash Fill 1 could have been reduced to
17 approximately \$24,211,095, as shown on Public Staff Moore Exhibit 4.
18 Therefore, I recommend that the Commission disallow \$59,320,890 from
19 DEC's request in this proceeding, which is the net difference of the costs
20 requested by DEC compared to the estimate for the on-site "greenfield"
21 industrial landfill.

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1 Q. DO YOU HAVE ANY OTHER COMMENTS REGARDING DEC'S
2 CLOSURE ACTIVITIES AT THE DAN RIVER SITE?

3 A. As previously discussed, we requested information from DEC on all
4 transactions to acquire real property adjacent to or in close proximity to CCR
5 units since January 2014. With regard to the Dan River property, DEC
6 indicated that it purchased [BEGIN CONFIDENTIAL] [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]

11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
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24 [REDACTED]

25 [REDACTED]
26 [REDACTED]
27 [REDACTED]

² Response to Public Staff Coal Ash Data Request No. 27-2, January 5, 2018.

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1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED] [END

9 **CONFIDENTIAL]**

10 I do not take exception with DEC's acquisition of these properties, since
11 they were acquired as part of DEC's preliminary efforts to meet its
12 obligations to determine the most cost-effective closure option at the Dan
13 River facility. Further, some portion of the tracts have been utilized for
14 staging areas, to support monitoring well placement, and to provide soil
15 borrow for landfill construction at the Dan River facility. In addition, based

³ *Id.*

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1 on information provided from the Public Staff, it is my understanding that it
2 is the Commission's general policy that "it is appropriate for ratepayers to
3 receive the benefit of gains realized on the sale or transfer (disposition) of
4 property which has been obtained by the utility in the course of providing
5 regulated public utility service."⁴ Therefore, to the extent in the future DEC
6 sells any portion of these tracts, any gain or loss on sale of the property
7 could be flowed back to the ratepayers.

8 **Q. PLEASE BRIEFLY DESCRIBE DEC'S CLOSURE APPROACH UTILIZED**
9 **FOR THE RIVERBEND FACILITY.**

10 A. There are four CCR units at the Riverbend Facility including: 1) the Primary
11 Ash Basin; 2) the Secondary Ash Basin; 3) Ash Stack Area; and 4) Cinder
12 Pit. With regard to regulatory obligations related to coal ash management
13 for these CCR units, CAMA requires the excavation of CCR materials from
14 the Primary Ash Basin and the Secondary Ash Basin. However, there are
15 no regulatory obligations related to coal ash management that require
16 removal of CCR materials from the Ash Stack Area or the Cinder Pit. The
17 Ash stack and Cinder Pit at the Riverbend Station are being excavated as
18 required by Court Order.

⁴ See *Order Ruling on Proper Accounting Treatment to Record the Transfer of Certain Utility Assets* issued May 20, 1999, in Docket No. SP-122, Sub 0.

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1 DEC's selected closure methods includes excavation, transportation, and
2 off-site disposal for CCR materials from all four CCR units at the Riverbend
3 Facility.

4 The following materials have been removed from the site between January
5 1, 2015 and November 30, 2017:

- 6 • Approximately 17,000 tons of CCR material from the Ash Stack
7 Area were transported by truck to R&B Landfill in Homer,
8 Georgia between May 1, 2015, and February 1, 2016;
- 9 • Approximately 98,864 tons of CCR material from the Ash Stack
10 Area were transported by truck to Marshall between May 1,
11 2015, and February 1, 2016;
- 12 • Approximately 1,242,288 tons of CCR material from the Ash
13 Stack Area were transported by rail to the Brickhaven Structural
14 Fill facility between January 1, 2016, and October 31, 2016;
- 15 • Approximately 100,000 tons of CCR material from the Ash
16 Stack Area were transported by rail to the Brickhaven Structural
17 Fill facility between May 1, 2017, and November 30, 2017;

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- 1 • Approximately 2,067,696 tons of CCR material from the Primary
2 Ash Basin were transported by rail to the Brickhaven Structural
3 Fill facility between November 1, 2016, and November 30,
4 2017; and
- 5 • Approximately 134,479 tons of CCR material from the
6 Secondary Ash Basin were transported by rail to Brickhaven
7 Structural Fill facility between May 1, 2017, and November 30,
8 2017.

9 **Q. WHAT IS YOUR OPINION REGARDING DEC'S CLOSURE APPROACH**
10 **UTILIZED FOR THE ASH STACK AT THE RIVERBEND FACILITY?**

11 A. DEC removed approximately 98,893 tons of CCR material from the Ash
12 Stack by truck in order to construct a rail loading facility for transportation of
13 CCR material off-site. I take no exception with this activity. I do, however,
14 take exception with DEC's decision to transport an additional approximately
15 17,000 tons of CCR material from the Ash Stack Area by truck to R&B
16 Landfill in Homer, Georgia between May 2015 and February 2016. It is my
17 opinion that DEC should have utilized the DEC-owned on-site landfill at the
18 Marshall Facility for the disposal of CCR material from the Ash Stack, as
19 this would have resulted in shorter haul distances and lower disposal costs.
20 We evaluated landfill capacity at Marshall and determined it was sufficient
21 to handle additional ash from Riverbend. The decision to haul the ash

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1 materials to Brickhaven did not present any scheduling advantages or
2 reduce costs, and instead faced delays and litigation resulting from local
3 community opposition to the proposed project.

4 DEC also removed the remainder of the Ash Stack, which contained an
5 additional 1,259,250 tons of CCR materials. Despite there being no
6 regulatory requirement that mandated the removal of this additional ash
7 from the Ash Stack, I take no exception with DEC's decision to move this
8 ash, since it helped reduce future risk associated with closure and long-term
9 management of the Riverbend site. It is my opinion that DEC should have
10 utilized the DEC-owned on-site landfill at the Marshall Facility for the
11 disposal of CCR material from the Ash Stack. We evaluated landfill capacity
12 at Marshall and determined it was sufficient to handle additional ash from
13 Riverbend. The decision to haul the ash materials to Brickhaven did not
14 present any scheduling advantages or reduce costs, and instead faced
15 delays and litigation resulting from local community opposition to the
16 proposed project.

17 I take no exception to removal of CCR material from the Primary Ash Basin
18 and Secondary Ash Basin for transport and off-site disposal. I do, however,
19 take exception with DEC's decision to utilize the Brickhaven Facility for off-
20 site disposal. It is my opinion that DEC should have utilized the DEC-owned
21 on-site landfill at the Marshall Facility for the disposal of CCR material from

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1 the Ash Stack. We evaluated landfill capacity at Marshall and determined
2 it was sufficient to handle additional ash from Riverbend. The decision to
3 haul the ash materials to Brickhaven did not present any scheduling
4 advantages or reduce costs, and instead faced delays and litigation
5 resulting from local community opposition to the proposed project.

6 **Q. WHAT IS YOUR OPINION REGARDING WHETHER DEC'S**
7 **CUSTOMERS SHOULD BE REQUIRED TO PAY FOR COSTS**
8 **ASSOCIATED WITH THE OFF-SITE DISPOSAL OF CCR MATERIAL**
9 **FROM THE ASH STACK AT THE RIVERBEND FACILITY?**

10 A. I recommend that the Commission disallow the \$489,600 premium paid as
11 shown on Public Staff Moore Exhibit 5 to transport and dispose 17,000 tons
12 of CCR material from the Ash Stack as required to construct the ash loading
13 facility at the R&B Landfill in Homer, Georgia verses the Marshall Station.

14 **Q. IS IT YOUR OPINION THE 2016 TEST YEAR SPEND IS, OVERALL, A**
15 **FAIR REPRESENTATION OF ONGOING COSTS FOR THE DURATION**
16 **OF THE COMPLIANCE PROGRAM BASED ON WHAT WE KNOW**
17 **TODAY?**

18 A. No, 2016 is not a valid test year for a fair representation of ongoing costs
19 for the duration of the compliance program for two reasons.

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1 First, looking at my testimony and the testimony of Bernard Garrett
2 regarding the W.S. Lee facility, we are recommending that the Commission
3 disallow a number of costs incurred by DEC in 2016. If the Commission
4 disallows these costs, the 2016 test year would be reduced by the
5 disallowance amount.

6 Second, DEC incurred significant costs in 2016 which are associated with
7 CCR units deemed high priority by CAMA. These high-priority sites require
8 the most expensive closure method (excavation) as well as the shortest
9 compliance deadline (August 1, 2019). The 2016 compliance effort and
10 associated costs is not indicative of the compliance effort and associated
11 costs that will be required for the year 2019 and beyond. This point is further
12 reinforced by DEC witness Kerin's Exhibit 11 which projects only a single
13 year (2018) where annual costs are projected to exceed the \$287,255,783
14 incurred for 2016. All other projected annual costs from 2019 and beyond
15 are lower, some substantially so, than the \$287,255,783 incurred for 2016.

16 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

17 **A.** Yes, it does.

Qualifications of Garrett and Moore, Inc.

Garrett and Moore, Inc., specializes in engineering services for power and waste industries. We remain focused and specialized in these markets and are dedicated to continuing to advance the reputation of excellence our staff has established through the years. Our company has been responsible for the construction administration and Construction Quality Assurance for about \$90 million worth of lined landfill, final cover system, and lined wastewater pond construction since 2007, with much of that work specific to CCR landfills and ash basins. We have familiarity with the federal CCR Rule and the North Carolina Coal Ash Management Act, and have tremendous experience with CCR disposal methods and their associated costs.

Vance Moore and Bernie Garrett have specialized expertise in the following areas:

Coal Combustion Residuals

Through our firm of Garrett and Moore, Inc., we have provided engineering and consulting services to support power companies in the management of coal combustion residuals (CCRs), including but not limited to the following:

- | | |
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| <input type="checkbox"/> Groundwater Monitoring | <input type="checkbox"/> Groundwater Corrective Action |
| <input type="checkbox"/> Hydrogeological Investigations | <input type="checkbox"/> Site Characterization Studies |
| <input type="checkbox"/> Geotechnical Evaluations | <input type="checkbox"/> Stability and Liquefaction Analysis |
| <input type="checkbox"/> Ash Pond Closure Design | <input type="checkbox"/> FIN 47 Cost Liability Estimating |
| <input type="checkbox"/> Ash Pond Closure Construction | <input type="checkbox"/> Ash Pond to Landfill Conversion |
| <input type="checkbox"/> Source Remediation | <input type="checkbox"/> Dewatering Design |
| <input type="checkbox"/> Ash Landfill Siting & Design | <input type="checkbox"/> Ash Landfill Construction |
| <input type="checkbox"/> Landfill Closure & Post-Closure | <input type="checkbox"/> Federal CCR & CAMA Rule Guidance |
| <input type="checkbox"/> Regulatory Compliance | <input type="checkbox"/> Environmental / Permit Audits |

Solid Waste Engineering

Through our firm of Garrett and Moore, Inc., we have provided full-service solid waste design and permitting services for municipal solid waste (MSW), construction and

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demolition debris (C&D), land clearing and inert debris (LCID), industrial waste, tire monofills, and coal combustion ash landfills. We have a very successful track record of overseeing landfill development projects from concept to operations. Our expertise in solid waste engineering includes the following:

- | | |
|---|--|
| <input type="checkbox"/> Facility Siting Studies | <input type="checkbox"/> Engineering Design |
| <input type="checkbox"/> USEPA HELP Modeling | <input type="checkbox"/> Slope Stability & Liquefaction Analysis |
| <input type="checkbox"/> Settlement and Bearing Capacity | <input type="checkbox"/> Leachate Management System Design |
| <input type="checkbox"/> Alternative Liner Analysis | <input type="checkbox"/> Landfill Gas Planning and Design |
| <input type="checkbox"/> Stormwater Management & Design | <input type="checkbox"/> Operations Planning |
| <input type="checkbox"/> Equivalency Determinations | <input type="checkbox"/> Life of Site Analysis |
| <input type="checkbox"/> Recyclables Program Management | <input type="checkbox"/> Alternate Final Cover Evaluations |
| <input type="checkbox"/> Landfill Closure & Post-Closure | <input type="checkbox"/> Transfer Stations |
| <input type="checkbox"/> Convenience Center Planning / Design | <input type="checkbox"/> Compost Systems |
| <input type="checkbox"/> Waste Treatment & Processing | <input type="checkbox"/> Special Waste Permitting |
| <input type="checkbox"/> Landfill Gas Remediation Plans | <input type="checkbox"/> Operations & Maintenance |

Bernie Garrett and Vance Moore have been providing engineering services for CCR management projects continuously since 1995. Over the last 10 years, we have performed all engineering associated with CCR management projects at all six of SCE&G's coal fired power plants, as well as facilities owned and operated by Santee Cooper. Our credentials include the following:

■ Vance F. Moore, P.E

Mr. Moore is a principal and founding member of Garrett & Moore.

Mr. Moore has 27 years of experience providing environmental engineering and consulting services to the power and waste industries. He has provided design, permitting, construction quality assurance, and operations support for numerous RCRA Subtitle D landfill projects, ash landfill projects, ash landfill closure projects, and ash pond closures in North and South Carolina.

Registrations: Professional Engineer – Georgia, North Carolina, South Carolina

Education: B.S., Civil Engineering, North Carolina State University, 1989

Associations: North Carolina SWANA Chapter - Technical Committee.

South Carolina SWANA Chapter

■ Bernie Garrett, P.E.

Mr. Garrett is a principal and founding member of Garrett & Moore.

Mr. Garrett has 27 years of experience providing environmental engineering and consulting services to the power and waste industries. His experience and professional responsibilities have progressed from project engineer with a major national engineering firm, project manager on solid waste landfill projects with a regional engineering firm, to client/project manager responsible for comprehensive engineering and consulting at

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Garrett & Moore, Inc.

Mr. Garrett has been working on coal ash management projects continuously since 1999. He has provided design, permitting, and construction quality assurance and operations support for ash pond closures, ash landfill projects, and ash landfill closure projects.

Registrations: Professional Engineer - Georgia, North Carolina, South Carolina, Virginia.

Education: B.S. Civil Engineering, Virginia Tech (1989);

M.S. Environmental Engineering, Old Dominion University (1996)

Associations: PENC Central Carolina Chapter Board of Directors

ACEC/PENC Solid and Hazardous Waste Subcommittee

Summary of Disallowances for the North Carolina DEC Sites	
Exhibit Number	Recommended Disallowance
Exhibit 2 - Cliffside	\$ 2,000,100.00
Exhibit 3 - Buck	\$ 10,612,592.00
Exhibit 4 - Dan River	\$ 59,320,890.00
Exhibit 5 - Riverbend	\$ 489,600.00
TOTAL DISALLOWANCE	\$ 72,423,182.00

<u>Plant site</u>	<u>Property purchase date</u>	<u>Land unit</u>	<u>Acreage</u>	<u>Acquistion cost</u>	<u>Current use of property</u>	<u>Comments</u>	<u>Parcel Number</u>	<u>Deed / Plat Information</u>	<u>County</u>
Cliffside Steam Station									Rutherford
Cliffside Steam Station									Rutherford
Cliffside Steam Station									Rutherford
Cliffside Steam Station									Rutherford
Cliffside Steam Station									Rutherford
Cliffside Steam Station									Rutherford
Cliffside Steam Station									Rutherford
Cliffside Steam Station									Rutherford
Cliffside Steam Station									Rutherford
TOTAL				\$2,000,100.00					

**Duke Energy Carolinas
Response to Public Staff Data Request #42-1 & 2
Buck Beneficiation Only
as of November 30, 2017**

FHO Station	Buck Coal
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Jan 23 2018



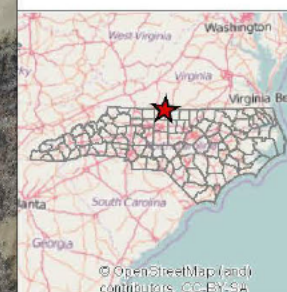
Legend

- Existing Ash Basins
- Study Area
- Streams
- Wetlands

The map shown here has been created with all due and reasonable care and is strictly for use with AMEC project number 7810-15-0297. AMEC assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.



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Miles



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June 2014

Figure 6a

ON SITE CCR LANDFILL
42 ACRES

LCID LANDFILL



San River Steam Station
Rockingham County, NC
Figure 6 - Jurisdictional Waters with Area of Interest

This map was prepared for the purpose of showing the location of the study area and is not intended to be used for any other purpose. The map is not a legal document and the user assumes all responsibility for the appropriate use of the information. The map is not a legal document and the user assumes all responsibility for the appropriate use of the information. The map is not a legal document and the user assumes all responsibility for the appropriate use of the information.

BY: NKM

MAP PROJECTION: GCS NAD83

FILE: \\dms01\Energy\Projects\Rockingham\San River Steam Station\Map\Map6a.mxd

6

Dan River
Additional "Greenfield" Landfill Capacity Cost &
On-site Disposal Cost of Ash Stack 1 CCR Material

Description	Quantity	Units	Unit Price	Total
<i>LCID Excavation & Loading</i>	<i>60,000</i>	<i>CY</i>	<i>\$ 6.00</i>	<i>\$ 360,000.00</i>
<i>LCID Hauling</i>	<i>6,000</i>	<i>Loads</i>	<i>\$ 75.00</i>	<i>\$ 450,000.00</i>
<i>Tipping Fee at Rockingham Co. Landfill</i>	<i>33,000</i>	<i>Tons</i>	<i>\$ 40.00</i>	<i>\$ 1,320,000.00</i>
LCID Relocation TOTAL (Excavation, Hauling, Disposal)				\$ 2,130,000.00
Stream Mitigation	1	LS	\$ 500,000.00	\$ 500,000.00
Building Relocation	25,000	SF	\$ 50.00	\$ 1,250,000.00
Onsite Landfill Development	17 ₂			
Excavation, Hauling, and Placement of Ash Fill 1 Material	1,200,019			
ASH STACK 1 ONSITE TOTAL				\$ 24,211,095.00

Notes:

1 - Costs per acre are based on the costs incurred by DEC for construction of the 24-acre on-site landfill base liner and final cover.

2 - Additional acres of onsite landfill area needed to provide sufficient capacity to contain Ash Stack 1 CCR materials, in addition to the 24 acres actually constructed.

3 - On-site excavation, hauling, and placement costs based on other DEC projects.

DAN RIVER DISALLOWANCE	
Paid by DEC for excavation, transport , and off-site disposal of Ash Stack 1	\$ 83,531,985.00
Cost associated with management of Ash Stack 1 on-site	\$ 24,211,095.00
Recommended Disallowance	\$ 59,320,890.00

FACILITY: Riverbend

CCR ID Ash Stack

				CCR Hauling by TRUCK			
Period Begin	Period End	CCR In-Place Period Beginning TON		CCR Hauled off-site via TRUCK TON	Unit Rate CCR Hauled off-site via TRUCK \$/TON	G&M Allowed Unit Rate for CCR Hauled off- site via TRUCK \$/TON	DISALLOWANCE Unit Rate for CCR Hauled off- site via TRUCK \$/TON
Seller				Waste Management			
Destination				R&B Landfill			
01/01/15	01/31/15	1,362,000		0	NA	NA	NA
02/01/15	02/28/15	1,362,000		0	NA	NA	NA
03/01/15	03/31/15	1,362,000		0	NA	NA	NA
04/01/15	04/30/15	1,362,000		0	NA	NA	NA
05/01/15	05/31/15	1,361,158					
06/01/15	06/30/15	1,356,762					
07/01/15	07/31/15	1,350,719					
08/01/15	08/31/15	1,345,000					
TOTALS				17,000			\$ 489,600.00

Note: