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B. Keith Overcash, Director
Division of Air Quality
Department of Environment and Natural Resources
Parker-Lincoln Building
1641 Mail Service Center
Raleigh, NC 27699-1641

Dear Mr. Overcash:

In compliance with the Order and Judgment issued on December 2, 2008, in Civil No. 1:08CV318 by the Honorable Lacy H. Thornburg, United States District Judge for the Western District of North Carolina, Asheville Division (“Order or Judgment” as the case may be) (Attachment 1), Duke Energy Carolinas, LLC (“Duke Energy”) is hereby submitting this letter and the included information¹ and seeking the determination of the Division of Air Quality (“DAQ”) pursuant to § 112 of the Clean Air Act (“CAA”), 42 U.S.C. § 7412. See Judgment ¶ 5.²

As stated in the Order, § 112(g) of the CAA prohibits construction of a major source of hazardous air pollutants (“HAPs”) without first undergoing a determination of maximum achievable control technology (“MACT”). See Order at p. 6. The Order also notes that “[w]hether Unit 6, is or will be, at best a ‘minor source’ of pollution, as Defendant alleges, and not a ‘major source’ of HAPs has yet to be determined in the appropriate proceeding required by § 112(g)(2)(B), 42 U.S.C. § 7412(g)(2)(B).” Order at p. 14. Thus, the first action that Duke Energy requests of DAQ is to determine that Cliffside Unit 6 (“CSS6”) does not fit within the regulatory definition of “construct a major source” under the applicable § 112(g) regulations.

¹ The information submitted herein is the information previously submitted to DAQ in response to DAQ’s letter to Duke Energy on June 2, 2008, requesting Duke Energy to undergo a voluntary, public MACT-like process. Specifically, the information and attachments contained in this letter are those submitted by James L. Turner of Duke Energy on July 3, 2008, August 22, 2008, and October 14, 2008; by Kris W. Knudsen on September 5, 2008 and October 14, 2008; and by Garry S. Rice on July 15, 2008.

² Judge Thornburg’s Order requires Duke Energy to make this submittal within 10 days of the Order’s issuance, or no later than December 12, 2008. Given the short deadline, Duke Energy is resubmitting the information previously submitted, as referenced in footnote 1, rather than integrating all the documents into a single cohesive document. Thus, Duke Energy’s submittal is the sum of all these documents taken together, rather than any individual document. Our hope is that this submittal will expedite review by DAQ, since DAQ is likely to be more familiar with the information as previously submitted. Judge Thornburg’s Order also directs DAQ to complete its processing of this submittal within 60 days of the Order’s issuance. Thus, expediting DAQ’s review is important to Duke Energy, but Duke Energy also recognizes that federal and state requirements for public notice and review may prevent DAQ from completing its review within the time set out in the Order.

For construction of a new process or production unit (such as CSS6) at an existing facility (such as the Cliffside Steam Station), that term means to erect a unit “which in and of itself has the potential to emit 10 tons per year of any HAP or 25 tons per year of any combination of HAP.” 40 C.F.R. § 63.41 (definition of “construct a major source means: subsection (2) [t]o fabricate, erect, or install at any developed site a new process or production unit which in and of itself emits or has the potential to emit 10 tons per year of any HAP or 25 tons per year of any combination of HAP, unless the process or production unit satisfies criteria in paragraphs (2) (i) through (vi) of this definition.) As discussed below, Duke Energy previously submitted information showing that emissions from CSS6 will be less than the major source threshold level for HAPs. Duke Energy is resubmitting this information today.³

Duke Energy has demonstrated that CSS6 is a minor source of HAPs. In calculating the potential to emit and arriving at the “minor source” conclusion, Duke Energy made worst-case assumptions that tend to overstate emissions of HAPs. Yet even with these conservative assumptions, CSS6’s potential to emit is below the major source threshold of 25 tons per year of all HAPs and 10 tons per year of any single HAP. Such a determination that installation of CSS6 does not meet the definition of construction of a major source under 40 CFR 63.41 and thus does not trigger need for a MACT limitation is a natural conclusion to the case-by-case analysis for that unit.

MINOR SOURCE DETERMINATION

The Clean Air Act requires that a major source of HAPs undergo a MACT determination pursuant to CAA § 112(g) prior to construction. In his Order Judge Thornburg held that the decision in *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008) vacating the Clean Air Mercury Rule results in the retroactive application of CAA § 112(g) to major sources of HAPs. However, because a minor source of HAPs is not subject to CAA § 112(g), a threshold issue is whether CSS6 is a major or minor source of HAPs. Because Duke Energy’s calculations demonstrate that CSS6 as designed is not capable of emitting HAPs above the major source thresholds of 25 tons per year for all HAPs and 10 tons per year for any single HAP, Duke Energy is requesting that DAQ make a determination that CSS6 as designed is a minor source of HAPs. Duke Energy also requests that DAQ act on its previous request to amend Cliffside’s air permit to include minor source limits for CSS6.⁴

³ Duke Energy on October 23, 2008, applied to amend its existing permit to include permit limits on HAPs to assure the public that CSS6 will indeed be a minor source of HAPs.

⁴ Recognizing that the Judgment has directed that this process be completed within a timeline of 60 days from its entry, Judgment ¶ 5, Duke Energy wishes to reaffirm its desire to move forward, with the requisite opportunity for any public participation that is deemed to be appropriate, Order at p. 14, as expeditiously as that task can be accomplished. Given that Duke Energy understands that its prior permit amendment submittal has been found complete (letter from Donald van der Vaart to Rick Roper dated October 28, 2008), we are hopeful that this task can be accomplished within the Court’s deadline. To that end, Duke Energy will make every effort to meet the

1. **Confirmation That Construction of CSS6 Is Not Construction of a Major Source of HAP Emissions**

In our original MACT submittal on July 3, 2008, Duke Energy assumed a removal rate for acid gases of 98% based on knowledge available at that time. DAQ staff indicated that since Session Law 2006-255 requires installation of advanced control technology designed to remove ninety-nine percent (99%) of sulfur dioxide (“SO₂”), CSS6 should achieve 99% removal of acid gases. In response to these questions and suggestions from your staff, Duke reevaluated the ability of the air emission control equipment on CSS6 to remove acid gases, and in particular, hydrochloric acid and hydrofluoric acid. The attached calculations, a recent report on emissions controls at our newly scrubbed Marshall Steam Station, and the letter from our air emission control equipment vendor, ALSTOM, demonstrate that emissions of hydrogen chloride (“HCl”) and hydrogen fluoride (“HF”) will be far lower than originally projected. The highest emissions of an individual HAP and total emissions of HAPs from CSS6 will be less than the applicable thresholds (10 tons per year (“tpy”) for an individual HAP and 25 tpy for the total of all HAPs) that would trigger a MACT assessment. More specifically:

- REPORT ON FGD FEEDBACK TEST PROGRAM PERFORMED BY CLEANAIR ENGINEERING FOR ALSTOM POWER, INC. ON MAY 29, 2007 (Attachment 2)
- DUKE ENERGY CAROLINAS – CLIFFSIDE EXPANSION – MAIN BOILERS – HAP EMISSION RATES (Attachment 3)
- LETTER REPORT FROM ALSTOM POWER ENVIRONMENTAL CONTROL SYSTEMS TO SAM ALEXANDER, GENERAL MANAGER, CLIFFSIDE MODERNIZATION PROJECT DATED OCTOBER 14, 2008 (Attachment 4)
- AN EMAIL AND CORRECTED EMISSION CALCULATIONS FROM KRIS KNUDSEN TO ED MARTIN, DATED OCTOBER 31, 2008. (Attachment 5)
- FORM A1 NCDENR/DIVISION OF AIR QUALITY – APPLICATION FOR AIR PERMIT TO CONSTRUCT/OPERATE (Attachment 6)

2. **Conclusions to be Drawn From this Information**

EPA’s regulations limit the scope of § 112(g)’s applicability at existing HAP sources to the construction or reconstruction of a major-emitting process unit – *i.e.*, “a new process or production unit which in and of itself emits or has the potential to emit 10 tons per year of any HAP or 25 tons per year (tpy) of any combination of HAPs.” 40 C.F.R. § 63.41 (definition of

Court’s deadline, acknowledging that the challenge that DAQ faces in meeting that deadline while also complying with the requirements of the applicable procedural rules.

“construct a major source”); *accord* 15A NCAC 2D .1112(c)(4). In turn, the term “process or production unit” is defined to mean “any collection of structures and/or equipment, that processes assembles, applies, or otherwise uses material inputs to produce or store an intermediate or final product. A single facility may contain more than one process or production unit.” 40 C.F.R. § 63.41 (definition of “process or production unit”); *accord* 15A NCAC 2D .1112(c)(13). Thus, CSS6 constitutes a “process or production unit.” This means that § 112(g) applies only if potential HAP emissions from CSS6 exceed the 10/25 tpy major source thresholds, which the data show they do not.

In the preamble to its final § 112(g) regulations, EPA unambiguously explained that a minor source of HAP, such as CSS6, is not subject to MACT:

[I]f a source keeps its emissions below the threshold limits for a major source through enforceable limits, it will not meet the definition of “Construct a Major Source” under section 112(g), and thus will not have to apply new source MACT. For example, if a plant to be constructed will have uncontrolled emissions of a HAP of 40 tons/year, it would normally be subject to new source MACT under section 112(g). The owners are, however, able to install emission controls achieving a 75 percent reduction in emissions of the HAP in question. By imposing on themselves this control system and making their emissions limit and operating conditions enforceable, as a practical matter they can keep their PTE below the major source threshold of 10 tons/year. Such a source would not be subject to section 112(g)...

61 Fed. Reg. 68388 (Dec. 27, 1996) (footnote omitted). At least one permit for a proposed EGU contains limitations to confirm its minor status and exemption from MACT applicability. As adopted by the South Dakota Board of Minerals and Environment on November 20, 2008, the Big Stone II permit has limits to stay below the major source thresholds of HAPs as follows: (1) 9.5 tons per year of any one HAP; (2) and 23.8 tons per year of any combination of HAPs. *See* Order of the South Dakota Board of Minerals and Environment regarding the Big Stone II permit (Attachment 24 and pp. 127-130 of the supporting Findings of Fact and Conclusions of Law (Attachment 25). Compliance is to be determined by stack tests, mass balances, emissions factors or other approved methods. The permit provides expressly for an exception from the case-by-case MACT requirement based on the unit-wide HAP limitations. A case-by-case MACT analysis as if construction had not begun is required if those limitations are relaxed or exceeded.

CSS6 is being constructed with such stringent environmental controls that it is a minor, not a major source, of HAP emissions. This information confirms that (1) CSS6, with its unique dual scrubber system is one of the best controlled, if not the best controlled, coal-fired unit in the country; and (2) HAP emissions from CSS6 are so low, it is not subject to MACT. For these reasons, we request that DAQ issue a public determination that CSS6 is a minor source and that the MACT provisions of § 112(g) do not apply. Even though the potential to emit HAPs from CSS6 is below the major source threshold, Duke Energy has also applied to amend its permit to

include federally enforceable limits as a minor source of HAP emissions to provide an additional level of certainty regarding the minor source status of CSS6. While this additional step is not necessary, Duke Energy points out that a source can be minor, and not subject to § 112(g) if either: (1) its potential to emit is less than the major source threshold; or (2) it has federally enforceable minor source permit limits that restrict its emissions to less than the major source threshold. CSS6 qualifies as a minor source of HAPs under either provision.

Duke Energy believes this demonstration further supports the efforts of DAQ to confirm that CSS6 is among the cleanest coal-fired facilities in the nation, and it is a tribute to CSS6 and its unique pollution control equipment that a coal-fired unit of its size would be so well-controlled that it is a minor source of HAPs. If DAQ agrees with Duke Energy that construction of CSS6 is construction of a minor source of HAPs, then further evaluation under CAA, § 112(g) is not required.

MACT DETERMINATION

Although the demonstration above makes it clear that construction of CSS6 is construction of a minor source that is not subject to CAA, § 112(g), Duke Energy is nevertheless providing the following MACT information to indicate what MACT limits would be appropriate if CAA, § 112(g) did apply to the construction of CSS6..

MACT Documents

Following are several documents that constitute Duke Energy's submittal to DAQ for a MACT determination, should DAQ determine that CSS6 is a major source of HAPs. These documents demonstrate what would be appropriate MACT emission limits for an 800 MW pulverized coal, supercritical electric generating unit located at the Cliffside Steam Station ("Cliffside") site and burning a blend of primarily eastern bituminous coal and up to 50% sub-bituminous coal that is also a major source of HAPs. These documents are as follows:

- CASE-BY-CASE MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY, ASSESSMENT FOR HAZARDOUS AIR POLLUTANTS, UNIT NO. 6, CLIFFSIDE STEAM STATION PROJECT WITH EXHIBITS (Attachment 7)
- LEGAL FRAMEWORK FOR A CASE-BY-CASE MACT DETERMINATION UNDER CAA § 112(G) (Attachment 8)
- NEW GENERATION DESIGN BASIS COAL SPECIFICATION AND SUPPORTING DATA (Attachment 9)
- EXCERPT OF A STUDY BY THE ELECTRIC POWER RESEARCH INSTITUTE OF THE MERCURY DATA COLLECTED IN THE 1999 ICR (Attachment 10)

- MEMORANDUM FROM WILLIAM H. MAXWELL, ENERGY STRATEGIES GROUP, OFFICE OF AIR QUALITY PLANNING AND STANDARDS, U.S. EPA CONCERNING THE “REVISED NEW SOURCE PERFORMANCE STANDARD (NSPS) STATISTICAL ANALYSIS FOR MERCURY EMISSIONS DATED MAY 31, 2006 (Attachment 11)
- ENGINEERING, FABRICATION AND DELIVERY AGREEMENT FOR THE CLIFFSIDE STEAM STATION (Attachment 12)
- GUIDANCE FOR MERCURY MEASUREMENT USING THE ONTARIO METHOD, EPRI, PALO ALTO, CA 2007 (Attachment 13)
- SANTEE COOPER CROSS GENERATING STATION MERCURY CEMS DATA ANALYSIS DATED JULY 29, 2008 (Attachment 14)
- MIDAMERICAN ENERGY COMPANY WALTER SCOTT ENERGY CENTER MERCURY ANALYSIS DATASHEET (Attachment 15)
- SUPPLEMENTAL INFORMATION ON COAL MARKETS AND FORESEEABLE WORST CASE FUEL ANALYSIS FOR MERCURY CONTROL (Attachment 16)
- CONSULTANT REPORT ON ISSUES WITH USE OF MERCURY CEMS DATA (Attachment 17)
- AN ASSESSMENT OF MERCURY EMISSIONS FROM U.S. COAL-FIRED POWER PLANTS (Attachment 18)
- CONSOL ENERGY SUMMARY REPORT: EVALUATION OF MERCURY EMISSIONS FROM COAL-FIRED FACILITIES WITH SCR AND FGD SYSTEMS. (Attachment 19)
- LONGER-TERM MERCURY EMISSION CHARACTERIZATION OF POWER PLANTS WITH SELECTIVE CATALYTIC REDUCTION AND FLU GAS DESULPHURIZATION SYSTEMS (Attachment 20)
- FEDERAL REGISTER – FRIDAY, JANUARY 30, 2004, PART IV, ENVIRONMENTAL PROTECTION AGENCY, 40 C.F.R. PARTS 60 AND 63 – PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS; AND, IN THE ALTERNATIVE, PROPOSED STANDARDS OF PERFORMANCE FOR NEW AND EXISTING STATIONARY SOURCES: ELECTRIC UTILITY STEAM GENERATING UNITS; PROPOSED RULE (Attachment 21)

- ONE OZONE SEASON OF MERCURY EMISSIONS CHARACTERIZATION FROM A BITUMINOUS COAL PLANT WITH AN SCR AND WEB FGD: SITE S12B (Attachment 22)

Legal Issues Regarding MACT

The letter also addresses several other pertinent topics by providing some relevant legal analysis, additional data and information regarding:

- (1) the role of sub-categorization in making a MACT determination consistent with CAA § 112(g);
- (2) coal properties data;
- (3) mercury removal efficiency that is achieved in practice;
- (4) the expected thermal efficiency of CSS6;
- (5) compliance determination techniques; and
- (6) additional calculations supporting the proposed MACT limit.

Duke Energy anticipates that this information, constitutes a complete request for a MACT determination, should the DAQ determine CSS6 is not a minor source, despite compelling evidence.

The substantive standards for a MACT determination are relatively well-established and understood, so Duke has not addressed them here. Nevertheless, in light of opponents to the plant who believe that the MACT standard requires the lowest conceivable emission limit without regard to the regulatory requirements, Duke Energy believes that there is some need to set out that legal framework in detail so the record is clear on the approach Duke Energy has taken. That is provided in **Attachment 8**.

1. Source Sub-categorization in the MACT determination

An important aspect of a MACT determination is an evaluation of the emission limit achieved in practice by the best controlled similar source. Regarding the proper role of sub-categorization in determining what is a similar source, the Clean Air Act provides, and legislative history makes clear, that a MACT determination should be closely tailored to the particular type of source. *See* CAA § 112(d)(1); S. Rep. No. 228, 101st Cong., 1st Sess. 166. Thus, the state is authorized by the Act to develop **appropriate categories and subcategories** for sources and to distinguish among types and sizes of sources within a category or subcategory when these differences affect the feasibility of air pollution control technology, the effectiveness of the technology and the cost of control. *Id.*; *see also*, *NRDC v. EPA*, 489 F.3d 1364, 1372 (D.C. Cir. 2007); H.R. Rep. 101-490 at 328.

In its proposed MACT rule for EGUs, EPA sub-categorized standards according to coal rank and unit design type. Coal properties, and in particular mercury and chlorine content, are critical to determining the ultimate emissions of mercury and other HAPs from electric generating units (“EGUs”). 69 Fed. Reg. 4651, 4672 (Jan. 30, 2004). The characteristics of a given coal are also the driving force in the design of boilers. *Id.* at 4665. For these reasons, EPA’s proposed sub-categorized MACT standards for EGUs based on coal rank (*e.g.*, lignite, bituminous and sub-bituminous). *Id.* at 4666, 4667. EPA also addressed coal properties as a site-specific factor in setting a MACT requirement.

Coal-fired units are designed and constructed with different process configurations partially because of the constraints, including the properties of the fuel to be used, placed on the initial design of the unit. Accordingly, these site-specific constraints dictate the process equipment selected, the component order, the materials of construction, and the operating conditions.

Id. at 4665. While EPA sub-categorized its proposed MACT standards for EGUs based on coal rank, it decided not to require coal switching (*i.e.*, requiring use of a different or “better” coal in determining MACT). *Id.* at 4669.

The EPA feels that the intent of the CAA is to develop standards that, to the greatest extent reasonably possible, are consistent across the industry and avoid actions that create regional disparities. The EPA further feels that requiring all plants to combust coal from a specific seam is not a viable long-term solution because the supply of coal from that seam would be rapidly depleted.

Id. at 4669. Thus, while DAQ neither may mandate the use of clean coal nor base its MACT determination on the use of clean coal, it can sub-categorize based on coals and unit characteristics to set a MACT limit that is achievable.

Since that time, court decisions reviewing EPA’s promulgation of MACT standards for other industries have made it clear that sub-categories need finer division if they are to account for differences among unit design and raw material quality. Without sufficient sub-categorization, the MACT definition might be internally inconsistent because it might require a limit that is “achieved in practice by the best controlled source” but, due to site specific factors, that limit might not be achievable (taking into account cost, energy requirements or environmental impacts as required by statute) for a particular source.

This issue of appropriate sub-categorization has been addressed in a case involving the MACT standard for the brick and structural ceramic manufacturing industry in which one of the issues was whether or not EPA could distinguish performance levels based on raw material quality – *i.e.*, use of “clean clay.” *Sierra Club v. EPA*, 479 F3d 875, 881 (D.C. Cir. 2007). EPA found

that such manufacturing plants were located near suitable local clay deposits, that transportation of clean clays was prohibitively expensive and that a given process could not use different raw materials without altering product characteristics. *Id.* at 883. Although it acknowledged that clay quality affected emissions, EPA contended it did not have sufficient data to quantify those effects and that a MACT floor based on clean clay would be unachievable at a kiln using another clay because of the inability of kilns to switch clays. *Id.* The court held that it was impermissible for EPA to consider only control technology and ignore such non-control technology factors as clay quality. In addressing this potential internal conflict between limits “demonstrated in practice” and limits that are “achievable” (and the possibility that interpreting the statute might require “judicial surgery”), a D.C. Circuit Court judge provided helpful guidance by recognizing EPA’s broad authority to make reasonable sub-categorizations in setting MACT limits:

Section 112(d) authorizes the Administrator to “distinguish among classes, types and sizes of sources within a category or subcategory,” and the language of subsections 112(d) (2) and (3) persuasively refers to standards for sources in each “*category or subcategory.*” The authority to generate subcategories is obviously not unqualified: at least it must be limited by the usual ideas of reasonableness. And there is not necessarily any guarantee that, even with suitable sub-categorization, every source will be able to achieve standards that meet a lawful application of § 112(d)(3) to reasonably defined subcategories. Nonetheless, one legitimate basis for creating new subcategories must be the interest in keeping the relation between “achieved” and “achievable” in accord with common sense and the reasonable meaning of the statute.

Id. at 885 (Williams, Senior Judge, concurring). Specifically with respect to CSS6, as explained below, it will burn a broader range of coals than currently in use at the station and it is capable of burning bituminous, sub bituminous and foreign coals. Therefore it does not fit into the subcategories identified by EPA in its proposed rule.

In addition to CAA § 112(d)(2) and (3) authority to subcategorize sources in setting MACT standards, CAA § 112(g) expressly requires a **case-by-case** MACT determination; therefore, the MACT analysis for CSS6 should draw further distinctions in making comparisons to other units to account for site-specific factors without setting precedent for further MACT-related deliberations. In sum, DAQ has latitude to set a reasonable MACT standard for CSS6 that takes into account the coal properties and operational variability expected at CSS6. Duke believes that characterizing CSS6 as a unit burning a wide-range of eastern bituminous coals, including Northern Appalachian, Central Appalachian, and Illinois Basin coals could be viewed as an appropriate subcategory under the preamble to the MACT rule. In any event, it would be inappropriate for DAQ to establish a MACT that, in effect, mandates that CSS6 could only use

one type of coal.⁵ DAQ is clearly authorized to set a MACT for CSS6 based on the coals reasonably anticipated to be burned there.

2. Coal properties data

Thus, in setting MACT for EGUs, EPA will take into account the difference in coal properties, but will not require the use of a particular coal properties within that rank in setting a MACT standard. The same should be true for a case-by-case MACT determination, which serves as a stop-gap measure pending EPA's promulgation of the final industry MACT. In the context of these regulatory and judicial developments, Duke Energy submits that the following information about coal is relevant in developing a reasonable case-by-case MACT standard for CSS6.

a. **Data on coal previously and currently burned at Cliffside does not represent future coal supplies for the modernized facility.**

There are data available on both the coal previously consumed (circa 1999) and the coal currently being consumed at Cliffside. However, those data are inapplicable when considering the nature of the coal to be burned in CSS6. In fact, basing a case-by-case MACT on that number would be inappropriate. Since CSS6 is a new unit, what other units have burned in the past has no bearing on CSS6. Instead, it is the mercury content (and other aspects) of the coal that will likely be burned (or is reasonably foreseeable that it will be burned) in CSS6 that should be considered in making that MACT determination; here, because of transportation, market and other considerations, as discussed below, that coal that should be considered is composed of certain types of U.S. and South American coals. We note that the chloride content of the coal influences the performance of mercury control systems as discussed in Section 4 below, and the MACT determination should consider the performance across the range of chloride values, both within a coal producing region and across the broader various types of coals the facility may reasonably be expected to burn.

The coal that was being burned – and is being currently burned – in Cliffside Units 1-5, was chosen in view of the fact that those are unscrubbed units, and, as such have to burn low-sulfur coal. That is, within the constraints of the coals that were available at the time, Duke Energy purchased low-sulfur coals because of the limitations of those units. While these coals were chosen for their sulfur characteristics, this choice of coals make their mercury content data inapplicable and irrelevant to the coal that will be used in CSS6. With the retirement of Cliffside Units 1-4, the installation of the scrubber on Cliffside Unit 5 and a full train of controls on CSS6, Cliffside will have the flexibility to burn a more diverse variety of coal. Cliffside will need this flexibility to meet its stated objective – to provide reliable, affordable base-load power and, in fact, the North Carolina Utilities Commission (“NCUC”) assumed and relied on this coal

⁵ As indicated in the preamble to the EGU MACT rule, such a MACT that had the effect of mandating the use of one type of coal would constitute an impermissible sub-categorization. 69 Fed. Reg. 4651, 4669 (Jan. 30, 2004).

flexibility in determining that CSS6 was appropriate and necessary to meet those base-load electric power needs.

CSS6 was approved and is contemplated to burn eastern bituminous coal with a possible blend of sub-bituminous coals; CSS6 is not contemplated to burn purely sub-bituminous coals. This assumed fuel mix and the supporting data on the design coal as presented to our vendors designing the boiler are reflected in Attachment 10. Specifically, this attachment contains data on eastern bituminous coal with a possible blend of sub-bituminous coals, and information from our fuels group on likely scenarios for fuel blending in order to address what is “achievable” removal as that term is defined by relevant case law.

The factors that demonstrate the reasonableness and appropriateness of this assumed mixture of coals and that they are appropriate for use and consideration in the case-by case MACT analysis are discussed below.

b. **Factors for selection of coal at CSS6**

i. ***Environmental Protection***

CSS6 has been designed as a highly efficient supercritical boiler with an unprecedented suite of emission control equipment to allow the flexibility to burn a wide range of coals in an environmentally friendly manner to meet its objectives. More specifically, fuel flexibility results from the construction of pollution control systems (in particular the wet and dry flue gas desulfurization (FGD) systems) to comply with the NC Clean Smokestacks Act by relieving a constraint on Cliffside facilities to burn low sulfur Central Appalachian coal. With the retirement of Cliffside Units 1-4 and the addition of WFGD on Cliffside Unit 5 as well as the completion of CSS6, past fuel procurement practices for Cliffside will not represent future fuel procurement. As an example, Duke Energy has already begun to incorporate greater fuel flexibility as practical and cost effective at other stations where WFGDs have been installed.

...the Company will continue to deliver growing volumes of higher SO₂ Northern Appalachian coal (leveraging Agreements from prior years) to the Marshall Steam Station, which utilizes flue gas desulfurization equipment at the plant. In 2007, approximately 1,000,000 tons of high SO₂ Northern Appalachian coal was delivered to Marshall, increasing to 1,500,000 tons in 2008 and potentially up to 2,000,000 tons into the Carolinas in 2009.

Testimony of M. Elliott Batson, Director Coal Procurement, Regulated Fuels for Duke Energy, filed July 28, 2008 (“Batson Testimony”), p.13, lines 88-14, in Annual Review of Base Rates for Fuel Costs, Docket No. 2008-3-E (S.C. Pub. Serv. Comm'n).⁶

⁶ The Batson Testimony is at the South Carolina Public Service Commission (“SCPSC”) website at: <http://dms.psc.sc.gov/attachments/6B49E628-991A-2A08-C06AD5456F2C5165.pdf>. The complete docket detail

ii. *Transportation*

The coal supplies for use at Duke Energy facilities including the Cliffside are subject to the limitations of the transportation network. Rail delivery of coal is the only practical transportation option. The rail infrastructure within the Eastern U.S. provides reliable access to sources in the major eastern coal supply regions, including Central Appalachia, Northern Appalachia, and the Illinois Basin. Cliffside is served by CSX Transportation line, which has maintained reasonable coal supply to Cliffside since the 1940's.

The reliability for timely delivery of coal from west of the Mississippi is much less certain for the Duke Energy region because of limited cross-region rail infrastructure that results in bottlenecks. Areas of the Eastern U.S. that have barge access to the Mississippi River basin have greater accessibility to western coal supplies, but this alternative is not available to Duke Energy. However, due to the significant reserves of western sub-bituminous coal and the potential future resolution of the transportation bottlenecking issues, it is important that Duke Energy have the ability to consume fuel from those markets within these constraints on transportation. The constraints on delivery are generally manageable through proper procurement practices and authorized flexibility to use alternative coals and coal blends.

Coal from South America is also an available resource through offloading ships to rail cars along Eastern U.S. ports. However, the availability of overseas coal is subject to demands on the international market coupled with a high transportation cost. While recent world events that have affected coal production as well as demand for coal, currently rendering the international market an unreliable source of fuel, international coal is a long-term potential source of fuel for Cliffside.

iii. *Dynamics of the Coal Market*

Historically, Central Appalachia coal has been the dominant fossil fuel source for Duke Energy generating stations. This is largely because of both the closer distance as compared to other eastern coal sources and the availability of low sulfur fuel that has allowed operation of the units in compliance with environmental regulations. Going forward, Duke Energy has determined that increased demand for and limitations on supply of the Central Appalachia coal may result in significant shifts in its coal supply region. The following excerpts from testimony of Elliott Batson, Director Coal Procurement, Regulated Fuels, to the Public Service Commission of South Carolina discusses the challenges the company is currently facing to secure coal supplies and manage its costs.

At this time, the market prices for Central Appalachia coal to be delivered in 2008 and 2009 are at an all-time high. The market has

increased from the mid \$40s per ton in the summer of 2007 to \$120 to \$150 per ton by July 2008. The primary reason for the dramatic increase in coal prices is the rapid change in global coal market conditions, particularly unanticipated world coal supply disruptions and increasing world coal demand. This increasing global demand has resulted in heightened demand for all United States (“US”) coal supply regions, particularly those that supply Duke Energy. After a period of declining and stable Eastern coal prices over the last two years, US coal prices are now being impacted by growing demand and supply issues in China, Australia, South Africa, and Europe

The supply of coal in the Eastern US has become largely inelastic, *i.e.*, higher market prices have not led to increasing production. The primary reasons for the inelasticity are (i) stringent environmental regulations, (ii) lengthy permitting requirements for new coal production, (iii) very significant economic barriers to entry, and (iv) uncertainty surrounding future demand in the US as a result of possible carbon legislation.

It is important to note that as coal consumers seek alternative coal sources, options are limited. Transportation complexities associated with moving coal over new, longer and more expensive routes, as well as the challenges new and different coal qualities bring to coal plant handling, operations and environmental compliance, make finding alternatives very difficult. Duke Energy Carolinas continues to have periodic discussions with rail transporters regarding future sourcing plans to ensure as much supply reliability and sourcing flexibility as possible

Duke Energy Carolinas will continue to maintain a comprehensive coal procurement strategy, the success of which has been demonstrated over the last several years by limiting average annual coal price increases and maintaining average coal costs at or well below those seen in the marketplace. Although [currently operating] Duke Energy Carolinas’ steam stations are designed to consume a typical Central Appalachia coal, we will continue to evaluate the options for coal supply delivered into the Carolinas from all US and international sources.”

Batson Testimony, p.6, *l.15* - p.7, *l.2*; p.8, *l.15* p.9, *l.5*; p.12, *ll.11-17*.⁷

⁷ See footnote 6.

Because operating constraints at existing Duke Energy units in the Carolinas will continue to favor coal typical of Central Appalachia sources even as Central Appalachia supplies are under increasing pressure, it is even more important that Cliffside have the ability to burn fuel from a broader region to avoid even further constraints on coal supply.

iv. ***Regulatory Requirements***

As a regulated utility, Duke Energy is accountable to the public utilities commissions in North Carolina and South Carolina. Because cost of fuel is such an important factor in the cost of electricity, the company must act prudently to manage its fuel costs and the utilities commissions require that the company report on fuel supply and cost before the commissions will allow for recovery of costs. To meet its regulatory requirements, it is critical for Duke Energy to be able to purchase coal from a wide range of sources due to the variability over time of coal source pricing,

c. **Coal data for CSS6**

CSS6 was designed with these market conditions, regulatory obligations and environmental requirements in mind. It will be a baseload plant designed for high capacity factor and reliable service for the life of the plant (expected life of at least 40 years). Fuel availability and reliability of delivery are critical to the business case (as approved by the NCUC) to build the plant. For these reasons, the design for CSS6 includes numerous features that assure the ability to burn a wide range of coal. This includes the choice of a super-critical pulverized coal boiler and the specifications of all equipment to provide for efficient operation over a range of expected fuel properties, and also the design of the advanced pollution control systems that will assure effective capture of all regulated pollutants. These design considerations included high efficiency control of mercury, which was incorporated into the specifications to address state and federal regulations that were in effect at the time the construction permit was issued.

In consideration of the above factors, Duke Energy concludes that Cliffside, including CSS6, can reasonably expect to procure significant quantities of coal from the various coal mining regions accessible through the rail transportation system in the Eastern U.S. Because of this, Duke Energy proposed in its MACT assessment to base the mercury content on the statistical assessment of bituminous coal as determined by the EPA in its CAMR rulemaking document for its Best Demonstrated Technology assessment. In that document, EPA concluded a mercury content of 0.20 ppm or 14.3 lb/TBtu represented the upper end of the coal that could reasonably be expected for use based on an annual average.

Duke Energy has further assessed the available fuel markets for Cliffside and has attached two spreadsheets of coal properties. First, we have provided the coal characteristics presented to our vendors early in the procurement process that included all the fuels mentioned previously (Central Appalachia, Northern Appalachia, Illinois Basin, Powder River Basin and South America). (**Attachment 9**, referred to previously.) The range of mercury values used in

this design coal was based on typical values from coal received at Duke Energy sources as well as limited vendor information for other coals. It does not represent a conclusion that these values fully address the coal characteristics of each individual fuel supply region. The range of values, regardless of the fuel region, was expected to reasonably address the requirement to demonstrate compliance with the CAMR NSPS requirements in effect at the time. Note that Duke Energy did specify that the control systems should meet our vendor requirement of 90% mercury removal for coal that included up to 0.18 ppm mercury and chlorine content as low as 183 ppm for unblended coals (excluding sub-bituminous (PRB) coals). The specification assumes that any use of sub-bituminous coal will be in a blend of at least 50% bituminous.

Second, we have included coal data from our analysis of fuels delivered to Duke Energy's coal-fired plants in the Carolinas and in the Midwest. (**Attachment 23**) This includes spreadsheets that represent each individual fuel supply region as well as the combined data for the Carolinas stations only and the combined data for all fuels received. Duke Energy has been collecting samples for mercury analysis from each shipment of coal received in the Carolinas over the past two years. Coal shipments in both the Carolinas and the Midwest are periodically analyzed for a wider range of constituents including chloride content.

In presenting information from both of these databases, Duke Energy used the same statistical equations that DAQ typically uses to account for variations in the database. For these data collected by Duke Energy, we assumed the proper design value to use in establishing an emissions limit was the average plus 1.65 times the standard deviation, to represent the range including 95% of the population of data. For mercury, we are including the upper range of the 95% population distribution and for chloride we are including the lower range of the distribution. We are also providing the average of the data and the maximum and minimum values for each parameter.

Moreover, we have concluded that for the foreseeable operation of the plant, we can reasonably expect to burn significant quantities of Northern Appalachian coal from the Pennsylvania and Ohio coal mining regions, as well as Central Appalachian and Illinois Basin coals. Because of short term and long-term market dynamics that may limit the cost or availability of coal from any specific region over the course of a year or more, it is reasonable to conclude that these Northern Appalachian coals may be the dominant fuel during the course of any given 12-month period. Attachment 18 is an excerpt of a study by EPRI of the mercury data collected in the 1999 Information Collection Request ("ICR"). EPRI provided a detailed evaluation of the coal characteristics of coal delivered to each facility. Of particular interest, EPRI has provided an analysis of the state-by-state average for mercury, chlorine, and heat content, sorted by the rank of coal. Data on coal quality for fuels Duke Energy expects to purchase for CSS6 and which represents the reasonably foreseeable worst-case coal quality, the scenarios under which Duke would burn such coal for a period of 12 months or more, and why such scenarios are reasonably foreseeable is included in Attachment 16.

Based on review of the ICR database, coal from Pennsylvania and Ohio has been demonstrated to average a mercury content of 14.3 lb/TBtu or greater, and therefore use of the

EPA statistical analysis cited above is valid and may even be conservative. Also note that for bituminous coal from Eastern states (east of the Mississippi), the chlorine content ranges from 287 ppm to 2,023 ppm, with the lowest value for coal supplies from Illinois. Because it is also reasonable that the Illinois Basin may be the dominant coal supply region in a given year, we believe that consideration of any effects of chlorine on control performance must account for the lower range of this coal chlorine content.

3. Thermal efficiency of CSS6

While most emission limits have been expressed in terms of a mass emission per unit of heat input (e.g. lb/MMBTU), in setting New Source Performance Standards for EGUs, EPA expressed a preference for output based emission limits (e.g. lb/MWhr) in order to promote energy efficiency and pollution prevention. 69 Fed Reg 4652, 4667 (Jan 30, 2004). EPA selected a gross output basis for ease of monitoring. *Id.* In order to promote efficiency EPA recognized the need to base its proposed MACT standard on a baseline efficiency; it selected a 35 % thermal efficiency or 9833 BTU/kWhr for new units. *Id.* at 4668. Use of such a baseline with an output-based standard creates incentives for units that can operate more efficiently than the baseline. Similarly, encouraging energy efficiency in setting the CSS6 limit requires use of an energy efficiency standard that represents a typical efficiency that can be achieved by all similar sources. Moreover, selection of that efficiency should reflect the standard of “achievability” – what can be achieved over the life of the plant under reasonably foreseeable worst-case circumstances. *Sierra Club v. EPA*, 167 F.3d 658, 665 (D.C. Cir. 1999), quoting *National Lime Ass’n v. EPA*, 627 F.2d 416, 431 n. 46 (D.C. Cir. 1980). While Duke Energy fully expects CSS6 to initially perform at a higher efficiency than that assumed by EPA, it expects that thermal performance to deteriorate over time. Moreover use of an assumed heat rate that is significantly better than EPA’s assumption would penalize Duke Energy for its efforts to be more efficient in the design of CSS6. For these reasons, Duke Energy recommends the use of 9833 BTU/KWhr heat rate for calculating an output-based MACT limit.

To the extent that DAQ believes that the use of the benchmark heat rate proposed by EPA and used by Duke Energy is not appropriate, we suggest the use of a heat input based MACT limit in order to avoid penalizing Duke Energy for its commitment to improved energy efficiency.

4. Mercury Removal Efficiency

There is no accepted standard for an “achievable” level of mercury removal efficiency, especially for the levels that can be regularly achieved in practice, which is the pertinent consideration for purposes of a case-by-case MACT. In fact, the analyses of the most commonly referenced database regarding mercury removal, which was generated by a 1999 Information Collection Request, produce widely varying results and conclusions as to mercury removal efficiency. EPA relied on this database regarding mercury removal when in 2005 and 2006 it issued its Best Demonstrated Technology demonstration that was referred to in the Clean Air Mercury Rule (“CAMR”). That determination concluded that for bituminous coals, BDT for

new units was represented by either wet or dry FGD with effective particulate control and SCR or SNCR.

In its analysis of that database, EPA found that, while the mean removal efficiency might range as high as 94.7%, the demonstrated or achievable removal efficiency is only 86.7%.

Memorandum from William H. Maxwell, Energy Strategies Group, Office of Air Quality Planning and Standards, U.S. EPA concerning the "Revised new source performance standard (NSPS) statistical analysis for mercury emissions." (May 31, 2006) at p. 4 (Attachment 11). This demonstrated or achievable removal efficiency of 86.7% is well below the 90% removal efficiency that Duke Energy relied on in its MACT submittal. Duke Energy felt it could utilize an assumed level better than that found by EPA to be demonstrated or achievable in practice, because the company has received a guarantee from its vendor reflecting that 90% assumption, under specified conditions, as discussed below.

Of course, others have looked at mercury removal data and reached different conclusions from EPA regarding removal higher efficiencies. For example, in 2003, the consulting firm ENSR produced a chart purporting to show higher mercury removal efficiencies. However, that chart and its conclusions were actually based on a small sample of sources during the 1999 Information Collection Request. ENSR has indicated that the chart was prepared to demonstrate a correlation between chlorine content and mercury removal efficiency. ENSR has also indicated that there are two significant limitations that prevent use of the curves in setting emission limitations: (1) the data set is small; and (2) it does not account for variability in the emission levels. Such data are not an appropriate basis for setting an achievable emissions limitation with which a unit might comply under reasonably foreseeable worst-case conditions.

Notwithstanding this, ENSR's analysis does not mandate a higher emission rate or limit lower than Duke Energy proposed in our July 3, 2008, MACT Assessment. Based on the 2003 ENSR chart, for the bituminous coal group, the 95th percentile emissions level was 2.262 LB/tBTU. Looking at the three best performing units (Mecklenburg Cogeneration Unit q, Dwayne Collier Battle Cogeneration and SEI Birchwood) the resulting average mercury emission rate is 1.70 lb/TBTU. Using the conversion factor of 9833 MMBtu/hr for new generation used by EPA in establishing CAMR, the comparable emission limit is 16.7 lb/GWhr, which is higher than the number Duke Energy derived for CSS6.

We note that in 2003, when the ENSR chart was prepared, it was not possible to obtain any guarantee for mercury emissions from EGUs. As you likely are aware, what vendor and consultant literature say about projected performance often overestimate (puffing) what is eventually guaranteed. That is because the literature is based on speculation about what might happen; whereas a guarantee is based on hard engineering data and demonstrated performance with binding commercial repercussions. Today, Duke Energy has a guarantee from our vendor,

Alstom, as part of the Company's contract with Alstom; the portions of that contract that contain the performance guarantee are provided in (Attachment 12).⁸

5. Compliance determination techniques

In making a MACT determination, the choice of compliance determination techniques is an integral part of the process, since the means of measurement can impact on what can be shown to be achievable in practice. Here, Duke Energy believes that the compliance method should be based on a periodic stack test. We are aware that the current permit for CSS6 requires that the unit be equipped with a continuous emission monitor system ("CEMS") for mercury, and we anticipate that the CEMS will be operated as required by that permit. However, it is not appropriate to use that CEMS data to determine compliance.

A given limit that is measured by CEMS is more stringent than the same limit measured by a stack test. The reason is that CEMS operate continuously, every operating hour, while a stack test is a snap-shot of operating conditions. Moreover, there are limits to the ability to detect and quantify mercury emissions at low levels using CEMS. Currently, the accuracy of mercury CEMS measuring at the very low rates expected from CSS6 is not the same high quality found in measurements of sulfur dioxide or nitrogen oxides. At 1-2 ug/Nm³ (the approximate range of the Alstom guarantee), the accuracy is +/- 0.5 ug/Nm³. The 40 CFR 75 specifications for certifying CEMS at low concentrations allows a difference of 1 ug/Nm³. The now vacated mercury CEMS program under Part 75 is based primarily on providing data for a market-based allowance system.

In fact, there are a number of Quality Assurance issues with the Part 75 CEMS program that were to be addressed before compliance with CAMR was to be required, and EPA has not taken steps to resolve those concerns. A key issue is the lack of any National Institute of Standards and Technology ("NIST") traceable standards for routine calibration of mercury CEMS. In addition, mercury CEMS that have been used to date have had significant reliability issues that may affect the ability to gather reliable data for purposes of measuring an annual average mercury concentration. With CAMR vacated, it is not clear that sufficient effort will be expended by EPA, monitoring vendors, or industrial sources to further develop the mercury monitoring technology. In fact, EPA may choose not to require monitoring in a final MACT determination for coal-fired electric utility boilers. MACT standards for many sources include

⁸ The attached Alstom letter contains information that is a confidential trade secret within the meaning of Chapters 132 and 66 of the General Statutes and has been designated as such in accordance with Section 132-1.2 and other provisions of the Public Records Act. The letter contains data and other information that is the property of Alstom as a private person within the meaning of G.S. 132-1.2(1)b; is not required for submittal under 132-1.2(1)c.; and does not contain information pertaining to the air contaminants to be emitted, which cannot be claimed to be confidential under Section 143-215.65 or other provisions of Chapter 143. Thus, this letter and the information it contains confidential information within the meaning of Section 132-1.2 and other provisions of the Public Records Act and cannot be disclosed to persons outside of DAQ.

provisions such as periodic stack testing and adherence to operation and maintenance practices as an indicator of continuous compliance.

It is important to look at not only the stack test data, but also statistical evaluation of the variability in that data to determine what is the maximum **achievable** control technology-like limit. Furthermore, an “achievable” limit is one that can be attained under reasonably foreseeable worst-case conditions. Because the stack test data are snapshots and highly variable depending on coal mercury content, heat content and operational parameters of the control equipment, isolated stack test data alone cannot determine what is achievable.

Mercury CEMS data also warrant further scrutiny as we have discussed in our previous supplemental information package to you. The current state of mercury CEMS technology is not adequate to rely on CEMS data to represent actual emissions at the low concentrations seen on a coal-fired boiler equipped with pollution controls.

6. Cross Generating Station Data & Council Bluffs Energy Center Data

Duke Energy is also providing some additional information and statistical analyses on the mercury emissions data from the Santee Cooper Cross Generating Station (Berkeley County, South Carolina) (Attachment 14) and the MidAmerican Energy Company Walter Scott Energy Center (Council Bluffs, Iowa) (Attachment 15)

Cross Generating Station

The enclosed report on the Cross Generating Station shows high variability in its data. Santee Cooper concluded that based on their statistical analysis of the Cross Generating Station data, the worst-case achievable mercury emissions rates would be 0.18 lb/Gwhr for Unit 1 and 0.010 lb/Gwhr for Unit 2. The proposed MACT limit for the CSS6 is 0.014 lb/Gwhr which falls in the middle of this range. The report also confirms of the known issues regarding the accuracy and reliability of the continuous emission monitors (“CEMs”) for mercury. The report points out that, during Unit 1 certification tests, the CEMs registered a level that was only one-third of the EPA-approved reference method for stack test measurement. Finally, Santee Cooper points out that the tests were all conducted while burning low mercury coal at Cross Generating Station, but it, like CSS6 will need the flexibility to burn other coals in response to market conditions.

The attached letter from RMB Consultants, which worked on the installation of the Hg CEMs at Cross, explains (1) that the data from the Santee Cooper Cross 1 and 2 substantially understate actual emissions, as measured by the EPA reference method; (2) the lack of EPA and National Institute of Standards and Technology (“NIST”) approved protocols for calibration; and (3) why the Hg CEMs data from Cross Units 1 and 2 cannot be used to establish MACT emission limits. (Attachment 21)

Council Bluffs Energy Center Data

The MidAmerican Energy Company mercury emissions data for Council Bluffs shows similarly high variability. Using data from tests conducted in May and August of 2007, the mercury emissions average approximately 0.7 to 1.2 lbs/TBtu, which would translate to 0.06 to 0.10 lbs/GWH (based on operating data suggesting an actual heat rate of approximately 8500 Btu/KWH). Using a statistical analysis, however, the mean emissions rate is 0.0082 lb/GWH and the upper 95% confidence level would be approximately 0.013 lb/GWH. Moreover, the Environmental Appeals Board of EPA has recognized the need to use a safety factor when using the statistical analysis. This again points to an achievable MACT limit of 0.014 lb/GWH.

The problems with mercury measurement techniques are well documented. *See, e.g., Guidance for Mercury Measurement Using the Ontario Method*, EPRI, Palo Alto, CA 2007 (Attachment 13). All of the source testing conducted for the ICR was performed using the Ontario-Hydro Method which is known to be very sensitive to testing technique and skill, and which requires the use of laboratory procedures in a field environment. In fact, in developing the proposed MACT, EPA calculated negative removal efficiencies across pollution control equipment (i.e., the test results suggest that that equipment actually produced mercury because more was measured in the emissions than in the coal burned). EPA recently approved the use of a sorbent trap test method (Method 30B) which promises to be less vulnerable to variations in testing technique. However, there is limited long-term experience with this test method. These limitations on equipment and techniques must be considered in setting a MACT limit so that it is practically enforceable.

In summary, Duke Energy proposes that compliance with a MACT standard be demonstrated on an annual basis through use of a reference method test (likely using Method 30B). Mercury CEMS should only be used as an indicator of any changes in relative mercury emissions because of the imprecision and reliability concerns with monitoring. Duke Energy would propose to develop a Compliance Assurance Monitoring protocol based on the use of CEMS or other parameters where the information gathered can be used to trigger either additional stack tests or actions to correct any apparent performance issues.

7. Calculations supporting the MACT Assessment

To illustrate Duke Energy's use of this information in developing its MACT Assessment and its proposed MACT limit of 0.014 lbs/GWH, we provide the following calculation.

Inputs:

- Mass of mercury per heat value of coal measured in pounds per trillion British thermal units (lb/TBtu)
- Mercury removal efficiency (%)

- Gross heat rate for the unit or class of units measured in British thermal units per kilowatt-hour (Btu/KWh)

Result (output based standard):

- Mass of mercury per unit of electricity generated in pounds per gigawatt-hour (lb/GWh)
- Sample equation

$$\text{Lb/GWh} = (\text{XX lb/TBtu}) \times (\text{YY Btu/KWh}) \times (1 \text{ TBtu}/10^{12} \text{ Btu}) \times (10^6 \text{ KWh}/1\text{GWh}) \times (1-\text{ZZ}\%)$$

- Calculation for CSS6

$$= (14.3 \text{ lb/TBtu}) \times (9833 \text{ Btu/KWh}) \times (1 \text{ TBtu}/10^{12} \text{ Btu}) \times (10^6 \text{ KWh}/1\text{GWh}) \times (1-.90)$$

$$= 0.014 \text{ lb/GWh}$$

Result (input based standard)

- Mass of mercury per unit of heat input measured in pounds per trillion British thermal units (lb/TBtu)

Sample equation

$$\text{Lb/TBtu} = (\text{XX lb/TBtu}) \times (1-\text{ZZ}\%)$$

- Calculation for CSS6

$$= (14.3 \text{ lb/TBtu}) \times (1-.90)$$

$$= 1.43 \text{ lb/TBtu}$$

8. Conclusion

In establishing a fair MACT limit, the following four issues are critical:

- (1) Knowing the fuel that will be burned and determining the appropriate mercury content in the fuel that on which to base the limit;
- (2) Setting the percent removal in accordance the guarantee provided by the vendor;
- (3) Establishing a thermal efficiency that will not penalize more efficient units; and
- (4) Establishing an accurate method to determine compliance.

Given the effort that has already been expended in addressing the MACT issue for CSS6, Duke Energy believes it appropriate to note that MACT regulations contemplate that when EPA promulgates an applicable industry-wide MACT limit, the permitting agency must place the promulgated categorical standard in the Title V permit for any facility that already has a case-by-case MACT limit in that facility's permit. Given the four years required to construct a coal-fired EGU any MACT limit that DAQ were to set would be a stop-gap measure and not the final word on mercury emission limits for CSS6. Therefore, when considering the long-term effect of any additional mercury limit that might be proposed in this process, DAQ should consider the interim nature of any case-by-case derived limit. Reproduced here below is Table 10 from Duke Energy's Case-by-Case MACT Assessment that is included as Attachment 7. It lists the limits Duke Energy proposes if DAQ determines CSS6 is not a minor source.

Summary of Case-by-Case MACT Assessment

HAP	Control Technology Employed by Best Controlled Similar Source	Control Technology Employed by CSS6	MACT Emission Limit	Performance Indicator (or surrogate)
Hg	SCR, SDA, FF	SCR, SDA, FF, wet FGD	0.014 lb/gross GWH, 12-month rolling average	Hg CEM
HCl	SDA / FF	SDA / FF, wet FGD	Existing SO ₂ limit of 0.12 lb/MMBtu, 30-day average	SO ₂ CEM
HF	SDA / FF	SDA / FF, wet FGD	Existing SO ₂ limit of 0.12 lb/MMBtu, 30-day average	SO ₂ CEM
HAP Metals	FF	FF	Existing PM limit of 0.012 lb/MMBtu	Stack Test for Filterable PM
Organic HAPs	Combustion Control	Combustion Control	CO limit of 0.10 lb/MMBtu	Stack Test for CO

B. Keith Overcash, Director

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December 4, 2008

FINAL SUMMARY

Duke Energy respectfully requests that DAQ review the information submitted herein and act upon it as expeditiously as possible in accordance with Judge Thornburg's Judgment, which directs DAQ to complete its review within 60 days from the date of entry of his Judgment (December 2, 2008). Duke Energy specifically requests that DAQ concur in Duke Energy's demonstration that construction of CSS6 is construction of a minor source of HAPs and therefore not subject to CAA § 112(g).

Please call me if you have any questions. Thank you for your assistance in this process.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Turner", with a large, stylized initial "J" and a horizontal line extending to the right.

James L. Turner

cc: Dr. van der Vaart