IN THE OFFICE OF STATE ADMINISTRATIVE HEARINGS
STATE OF GEORGIA

FRIENDS OF THE CHATTAHOOCHEE, INC., and SIERRA CLUB, Petitioners, v. F. ALLEN BARNES, DIRECTOR, ENVIRONMENTAL PROTECTION DIVISION, GEORGIA DEPARTMENT OF NATURAL RESOURCES, Respondent, LONGLEAF ENERGY ASSOCIATES, LLC, Intervenor-Respondent.	DOCKET NO: OSAH-BNR-AQ-1115157-60- HOWELLS

PETITIONERS' PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

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COME NOW Friends of the Chattahoochee, Inc., and Sierra Club ("Petitioners") and respectfully file these Proposed Findings of Fact and Conclusions of Law, pursuant to this Court's Prehearing Order dated December 28, 2010, and Office of State Administrative Hearings ("OSAH") Rule 616-1-2-.04.

I. INTRODUCTION

Petitioners Friends of the Chattahoochee, Inc., and Sierra Club appeal the issuance of Permit Amendment No. 4911-099-0033-P-01-2 to Intervenor-Respondent Longleaf Energy Associates, LLC ("Longleaf" or "Intervenor"). The Permit Amendment was issued on November 8, 2010 by F. Allen Barnes, Director of the Environmental Protection Division ("EPD" or "Respondent") of the Georgia Department of Natural Resources. The Permit Amendment modifies Permit No. 4911-099-0033-P-01-0, which was issued to Longleaf on May 14, 2007. Together, the Permit and Permit Amendment authorize Longleaf to construct and operate a 1,200 megawatt (MW) coal-fired steam electric generating station in Early County, Georgia (the "proposed facility").

Petitioners oppose issuance of the Permit Amendment because they assert that it violates provisions of the Georgia Air Quality Act, O.C.G.A. §§ 12-9-1, *et seq.*, the Georgia Rules for Air Quality Control, GA. COMP. R. & REGS. r. 391-3-1-.01, *et seq.*, the Georgia State Implementation Plan, GA. COMP. R. & REGS. r. 391-3-1-.01, *et seq.*, and the federal Clean Air Act, 42 U.S.C. §§ 7401, *et seq*. Specifically, Petitioners assert that the Permit Amendment unlawfully and arbitrarily reclassifies the proposed facility from a major to a minor source of hazardous air pollutants ("HAPs"). Petitioners contend that the proposed facility is a major source of HAPs based upon its potential to emit such pollutants and that provisions of the Permit Amendment

designed to limit its potential to emit to minor source levels are neither federally nor practically enforceable.

For the reasons stated below, Respondent's decision to issue the Permit Amendment is **VACATED** and **REMANDED** for further proceedings consistent with this Order.

II. PROCEDURAL BACKGROUND

On May 14, 2007, the Director of EPD issued Prevention of Significant Deterioration ("PSD") Air Quality Permit No. 4911-099-0030-P-01-0 ("Permit") to Longleaf for the construction and operation of a nominal 1,200 MW pulverized coal-fired steam electric generating facility in Early County, Georgia. When the Permit was issued, a rule known as "the Delisting Rule" was in effect. Under the Delisting Rule, which United States Environmental Protection Agency ("EPA") promulgated on March 29, 2005, coal-fired power plants like the proposed Longleaf facility were removed from the list of sources whose emissions are regulated under section 112 of the Clean Air Act. 70 Fed. Reg. 15994 (March 29, 2005). A companion rule, known as the Clean Air Mercury Rule ("CAMR"), set performance standards pursuant to section 111 of the Clean Air Act for new coal-fired power plants. CAMR established total mercury emission limits for States and certain tribal areas along with a voluntary cap-and-trade program for new and existing coal-fired power plants. 70 Fed. Reg. 28606 (May 18, 2005). As a result of these rules, the proposed Longleaf facility was exempt from regulation as a source of hazardous air pollutants under Section 112 of the Clean Air Act. *Id*. at 28608.

In February 2008, the United States Court of Appeals for the D.C. Circuit struck down the Delisting Rule and CAMR, finding that EPA's attempt to remove coal-fired power plants from the list of sources regulated under section 112 was unlawful. *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008). Thereafter, Longleaf submitted an application to obtain preconstruction

review and approval under Section 112(g)(2)(B) of the Clean Air Act and its accompanying regulations, 40 C.F.R. §§ 63.40-44. Longleaf made this submittal, entitled Application for Notice of MACT Approval, on October 6, 2008. (Ex. J007).

"MACT" refers to Maximum Achievable Control Technology. When EPA has not yet promulgated a MACT standard for a listed source category (as is currently the case with coal-fired power plants), section 112(g) of the CAA requires a permitting authority like EPD to issue a case-by-case MACT determination for all of the hazardous air pollutants to be emitted by a "major source." Section 112 defines a "major source" of hazardous air pollutants as one that "emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants." 42 U.S.C. § 7412(a)(1). *See also* Ga. Comp. R. & Regs. r. 391-3-1-.02(9)(b)(16) (incorporating by reference 40 C.F.R. Parts 63.40 through 63.44). Longleaf's Application for Notice of MACT Approval was premised upon the assumption that the facility would be a major source of hazardous air pollutants. (*See generally* Ex. J007).

In June 2009, EPD issued a draft Notice of MACT Approval for the Longleaf facility, including proposed MACT limits for several categories of hazardous air pollutants: mercury, non-mercury metals, acid gases, and organic hazardous air pollutants. (Ex. J012). EPD provided notice of and received comment on a draft permit amendment that incorporated the case-by-case MACT limits. (Ex. J010). Petitioners, along with numerous other organizations and individuals, provided comments on the draft document. (Ex. RI008).

On December 22, 2009, Longleaf submitted a request to EPD that it be considered a "minor source" of hazardous air pollutants exempt from MACT. (Ex. J014). The submittal included a series of proposed permit provisions designed to ensure that the proposed facility

would emit hazardous air pollutants at "minor source" levels. The submittal also included revised estimates of the facility's potential hazardous air pollutant emissions. In response, on April 9, 2010, EPD issued a permit amendment (No. 4911-099-0030-P-01-1) that was designed to make Longleaf a minor source of HAPs. (Ex. J017). The permit amendment was not put out for public comment.

On May 27, 2010, EPD withdrew the proposed permit amendment. In its place, EPD issued Draft Permit Amendment No. 4911-099-0030-P-01-2 on June 1, 2010. The permit conditions in Draft Permit Amendment No. 4911-099-0030-P-01-2 were identical to those in the withdrawn permit amendment. (Resp-ST-2 at ¶ 37 (Aponte)). Following public comment, EPD issued a final version of the Permit Amendment on November 8, 2010. (Ex. J023).

On December 8, 2010, Petitioners filed a Petition for Hearing alleging that the Permit Amendment was unlawful and invalid. The Petition asserted two counts. In Count I, Petitioners alleged that the Permit Amendment is invalid because it lacks adequate terms and conditions to limit the facility's potential to emit hazardous air pollutants below major source thresholds. In Count II, Petitioners alleged that Permit Amendment fails to include necessary limits reflective of MACT.

Longleaf filed a motion to dismiss Count II. Longleaf argued, among other grounds, that this Tribunal's adjudication of Count I would necessarily moot Count II. On January 18, 2011, this Tribunal granted Longleaf's motion to dismiss Count II, entering a Consent Order that was without prejudice to Petitioners' right to seek administrative review of any final EPD determinations that occur on any remand of this Tribunal's adjudication of Count I. The Consent Order was based on Longleaf's acknowledgment that if the Permit Amendment does not contain federally and practically enforceable conditions that require Longleaf to operate at minor source

emission levels, Longleaf would be a major source of HAPs and unable to commence construction without a case-by-case MACT determination. (Tr. at 19). Thus, Count I is the only claim requiring adjudication by this Tribunal.

A hearing in this matter was held on February 8th through 10th, 2011. The Court heard testimony from the following witnesses on behalf of the parties:

A. Petitioners' Witnesses

Petitioners produced two expert witnesses, Dr. Ranajit Sahu and Mr. James Southerland.

Ranajit Sahu, Ph.D.

Dr. Sahu testified as an expert in coal plant combustion, environmental engineering as it relates to air pollution control, and air permitting and compliance. (Tr. at 94). Dr. Sahu has over twenty years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment; soils and groundwater remediation; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Clean Air Act and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, and NEPA, as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality new source review and prevention of significant deterioration permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, and others), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders. (Pet-ST-5 at ¶ 3 (Sahu)).

Dr. Sahu has a B.S., M.S., and Ph.D. in Mechanical Engineering, the first from the Indian Institute of Technology (Kharagpur, India) and the latter two from the California Institute of Technology (Caltech) in Pasadena, California. His research specialization was in the combustion of coal and, among other things, understanding air pollution aspects of coal combustion in power plants. (Pet-ST-5 at ¶ 4).

Dr. Sahu has over eighteen years of project management experience and has successfully managed and executed numerous projects, including basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public. (Pet-ST-5 at ¶ 5).

Dr. Sahu has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past eighteen years have included various steel mills, petroleum refineries, cement companies, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, and various entities in the public sector including the U.S. Environmental Protection Agency (EPA), the states of New York, New Jersey, New Mexico, Maryland, Pennsylvania, the U.S. Department of Justice, the California Department of Toxics Substances Control, and various municipalities. He has performed projects in 48 U.S. states, numerous local jurisdictions, and internationally. (Pet-ST-5 at ¶ 6).

In addition to consulting, for the past seventeen years Dr. Sahu has taught numerous courses in several southern California universities including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management). Dr. Sahu has also taught at Caltech, the University

of Southern California (air pollution), and Cal State Fullerton (transportation and air quality). (Pet-ST-5 at ¶ 7).

James H. Southerland, QEP

Mr. Southerland testified as an expert in the creation and use of emission factors. (Tr. at 45-46). Mr. Southerland has had a long career in the field of air pollution control. From 1967 to 1996, he was a commissioned officer in the U.S. Public Health Service. Upon the formation of U.S. EPA in 1970, he was detailed to and worked for EPA the rest of his federal career. On many occasions over that time span, he had a primary responsibility to manage and produce updates of AP-42, a compilation of emission factors discussed in more depth below. For the last six years of his EPA career, Mr. Southerland was leader of the group responsible for issuing the fully updated Fifth Edition of that compilation. (Pet-ST-2 at ¶ 7 (Southerland)).

Mr. Southerland graduated from Tusculum College in Greeneville, TN with a Bachelor of Science (with majors in Chemistry, Mathematics and Physics) in 1964. He then obtained a second Bachelor of Science degree in Civil Engineering from the University of Tennessee in 1966. (Pet-ST-2 at ¶¶ 8-9).

In March 1967, Mr. Southerland was commissioned into the U.S. Public Health Service (one of the seven uniformed services) and was initially assigned to the Technical Assistance Branch of the National Center for Air Pollution Control, Cincinnati, Ohio, for a four-month training effort. During that period, he assisted in efforts in Washington, DC and New York City to develop the first ever emission inventories for those areas. From there, he was assigned to co-lead a similar (17 month) study in the Chattanooga, Tennessee area. After that assignment was completed, Mr. Southerland was assigned to the Abatement Program of the U.S. Public Health Service. (Pet-ST-2 at ¶ 10).

After receiving a Master's Degree in Environmental Engineering from the University of North Carolina in 1970, and nearly coincident to the formation of U.S. EPA, Mr. Southerland was assigned to develop, manage, and edit the Second Edition of EPA's compendium of emission factors, known as AP-42, and several other emission inventory publications. (Pet-ST-2 at ¶ 12). In later assignments, spanning several years, Mr. Southerland was also given the responsibility as the air lead and developed and implemented a national study of chlorinated dioxin compounds from combustion sources as part of an agency-wide, multimedia, coordinated project, and created an award winning (EPA's Bronze Medal) stack test and ash collection and analysis program, culminating in a multi-volume Report to Congress. (*Id.* at ¶ 13).

In 1987, Mr. Southerland became Chief of the Pollutant Characterization Section in the Non-Criteria Pollutant Programs Branch of EPA's Office of Air Quality Planning and Standards. His group was responsible for two major programs involving hazardous air pollutants: (1) the urban air toxics program and (2) the air toxics emission estimation program. Each of these programs was national in scope. Mr. Southerland received another EPA Bronze Medal for his work on this assignment. (Pet-ST-2 at ¶ 14).

In 1990, Mr. Southerland became Chief of Emission Factor and Methodologies Section of the Emission Inventory Branch at EPA's Office of Air Quality Planning and Standards. In this role, his duties included development and execution of a multimillion-dollar emission factor update program including a plan for a future emission factor testing program. (Pet-ST-2 at ¶ 15).

EPA's Office of Air Quality Planning and Standards was reorganized in 1994, and a number of administrative sections were eliminated, including those in the Emission Inventory Branch. At that point, Mr. Southerland became the leader of two working groups. The main activity of the 8 member "AP-42 Group" was the development of emission factors and related

guidance for use in emission inventories and (by default) the air pollution permit programs of the Agency. The Clearinghouse for Inventories & Emissions Factors ("CHIEF") team was responsible for various information transfer activities which included the CHIEF web pages, help lines, and publications, including a cover to cover update of AP-42. From 1990 until he retired from EPA and the Public Health Service in 1996, Mr. Southerland managed and was technical editor of a major (about $6 million) project to update AP-42, culminating in the Fifth Edition in 1995. For his work as a member of EPA's senior staff, Mr. Southerland received the highest medal given to Commissioned Officers in the U.S. Public Health Service upon retirement in April 1996. (Pet-ST-2 at ¶¶ 16, 18).

From April 1996 to April 2008, Mr. Southerland worked as a Senior Environmental Engineer for North Carolina Division of Air Quality Planning Section. In that role, he was responsible for state-wide coordination for use of emission factors. (Pet-ST-2 at ¶ 19).

In April 2008, Mr. Southerland retired from the North Carolina Division of Air Quality. He has since worked as a part-time employee and as a consultant on a number of air quality related issues, including a project exploring how to update emission factors in a large energy/emissions model used by EPA's Office of Research and Development and the inventory of greenhouse gases for a major Department of Energy facility. (Pet-ST-2 at ¶ 20).

B. Intervenor's Witnesses

Longleaf presented testimony from three witnesses: Michael Vogt, Kathy French and Ralph Roberson.

Michael Vogt

Mr. Vogt is employed by LS Power Development, LLC. (Tr. at 227). He is the project manager for the proposed facility and is responsible in that role for all aspects of the project,

including permitting and community relations. (*Id.*). LS Power does not currently operate any coal-fired power plants. (Tr. at 234). LS Power has one coal-fired power plant currently under construction, the Sandy Creek facility in Texas. (*Id.*). In that instance, LS Power will manage the operations of the plant by hiring a third-party to serve as the actual plant operator. (*Id.*). Mr. Vogt testified that he does not currently know whether LS Power or one of its affiliates will actually operate the proposed facility in Early County, Georgia. (Tr. at 235).

Kathy French, P.E.

Ms. French has been employed by LS Power since March 2001. Her current position is Assistant Vice President, Environmental. (Int-ST-2 at ¶¶ 1-2 (French)). Ms. French received her Bachelor of Science Degree in General Engineering from Harvey Mudd College in Claremont, California in 1997, and her Master of Science Degree in Environmental Engineering from Drexel University in Philadelphia, Pennsylvania, in 1999. (*Id.* at ¶ 1). Ms. French has ten years of experience in environmental engineering permit applications for the utility industry in Georgia and other states. (*Id.* at ¶ 3).

Ms. French was the lead preparer of the case-by-case MACT and minor source evaluations for Longleaf. (Int-ST-2 at ¶ 5). At trial, Ms. French was tendered as an expert in air pollution permitting and compliance at electric generating units, including coal-fired power plants. (Tr. at 256). The Court permitted Ms. French to testify regarding air permitting and whatever compliance she had experience with. (Tr. at 275). However, there was no showing that Ms. French had experience or expertise in compliance specifically as related to coal-fired power plants. (Tr. at 274-75).

Ralph Roberson

Mr. Roberson testified as an expert in emission measurement from coal-fired power plants, the use and specification of continuous emission monitoring systems at coal-fired power plants, and the development and use of emission factors from coal-fired power plants. (Tr. at 348-49). Mr. Roberson is employed by R&B Consulting and Research, which is located in Raleigh, North Carolina. (Tr. at 342). R&B Consulting and Research is a consulting firm that specializes in providing technical support in monitoring, measurements and quality assurance for a number of pollution source categories. (*Id.*). Mr. Roberson's focus is on monitoring and emission measurements from combustion sources, primarily coal-fired power plants. (Tr. at 343). Mr. Roberson estimated that he devotes 90 percent of his time to working with coal-fired power plants in some capacity. (*Id.*).

Mr. Roberson has performed work on a contract basis for the Electric Power Research Institute ("EPRI") at various points since 1982. (Tr. at 343). EPRI is a non-profit institution that was established in 1973. (Tr. at 354). EPRI is funded by electric utility companies throughout the United States, and its purpose is to conduct collaborative research to benefit the electric utility companies who make up its membership. (*Id.*).

Mr. Roberson worked on the original (1995) version of EPRI's Emission Factor Handbook, a compendium of emission factors that EPRI established as an alternative to EPA's AP-42 as well as to assist its members with toxics release inventory or "TRI" reporting. (Tr. at 359). However, Mr. Roberson did not work on the current (2002) version of the EPRI Handbook. (Tr. at 360).

Mr. Roberson has been directly involved in four out of five attempts by coal-fired power plants to claim minor source status. (Tr. at 393-94; 450-51). Longleaf first contacted Mr.

Roberson in October 2009. (Tr. at 361). Mr. Roberson provided information and sample calculations suggesting that it was "worth exploring" a minor source option for the Longleaf facility. (Tr. at 362). Mr. Roberson had previously done a minor source analysis "on paper" for a similarly large, two-unit facility. However, when the application for that unit was actually made, it was for a smaller, one unit facility. (*Id.*).

C. Respondent's Witnesses

The Respondent presented the testimony of two witnesses: Anna Aponte and James A. Capp.

Anna Aponte

Ms. Aponte testified as an expert in permitting and the regulatory requirements for permitting of stationary sources in Georgia. (Tr. at 495). Ms. Aponte is currently employed as an Environmental Engineer in the NO_X Permitting Unit, Stationary Source Permitting Program of the Air Protection Branch of the EPD. Ms. Aponte has held this position since September 2000. (Resp-ST-2 at ¶ 2).

Ms. Aponte was responsible for reviewing Longleaf's case-by-case MACT analysis and supporting documentation and for issuing EPD's Notice of MACT Approval with respect to the proposed facility. (Resp-ST-2 at ¶ 31). After Longleaf proposed that it be considered a minor source of hazardous air pollutants, Ms. Aponte reviewed the additional information and supporting documentation. (*Id.* at ¶ 35). Ms. Aponte drafted the Permit Amendment and the Final Determination and Narrative that accompanied its issuance. (*Id.* at ¶ 36). Ms. Aponte has drafted previous minor source permits, but the Permit Amendment is the first minor source permit she has drafted for a power plant. (Tr. at 505-06).

James A. Capp

Mr. Capp is the Chief of EPD's Air Protection Branch. (Tr. at 540). Mr. Capp holds a Bachelor of Science in Mechanical Engineering from the University of Illinois and a Master of Science in Mechanical Engineering from the Georgia Institute of Technology. (Tr. at 547). Mr. Capp has been employed by EPD since 1992, when he was hired as a permit and compliance engineer. (Tr. at 540). In 1999, Mr. Capp became the unit manager of agency's NO_X permitting unit, which is one of five units in the agency's air permitting program. (*Id.*). In 2003, he became the program manager of the Industrial Source Monitoring Program, which is one of the seven programs within the Air Branch. (*Id.*). In 2006, Mr. Capp became manager of the Air Branch's permitting program and served in that role until December 2008, when he became the Air Protection Branch Chief. (*Id.*). Mr. Capp testified as an expert in the regulatory requirements for permitting, monitoring, testing and enforcement of stationary sources of air pollution. (Tr. at 550-52).

III. FINDINGS OF FACT

1. Coal-fired power plants emit numerous hazardous air pollutants. Hydrogen chloride ("HCl") and hydrogen fluoride ("HF") are emitted in the largest quantities, but coal-fired power plants also emit approximately 60 other hazardous air pollutants. (Pet-ST-5 at ¶ 14 (Sahu)). Such hazardous air pollutants include mercury, non-mercury metals, acid gases (hydrogen chloride and hydrogen fluoride), and various organic compounds. (*See generally* Ex. J007).

2. On May 14, 2007, EPD issued a Prevention of Significant Deterioration ("PSD") Air Quality Permit ("Permit") to Longleaf. (Ex. J005). The Permit authorized Longleaf to

construct and operate a 1,200 MW coal-fired generating station in Hilton, Georgia. *Id.* The Permit did not address MACT requirements. (Pet-ST-5 at ¶ 16 (Sahu)).

3. The proposed facility would include two 600 MW pulverized coal-fired boilers and a 175 MMBtu/hr auxiliary boiler. The boilers would be equipped with the following air pollution control devices: low nitrogen oxide ("NOx") burners/over-fire air, selective catalytic reduction, a dry scrubber, and a fabric filter baghouse. (Ex. J005 at 2).

4. The Permit includes a provision limiting the maximum hourly heat input capacity of each of the main boilers to 6,139 million British Thermal Units heat input ("lb/MMBtu") per hour regardless of the type of fuel burned. (Ex. J005 at Condition 2.17). Longleaf has indicated this to be the maximum capacity of the boilers. (Ex. J001 at 3-1).

5. The Permit allows Longleaf to burn Powder River Basin ("PRB") coal, which is a subbituminous coal from the Powder River Basin in central to northern Wyoming and extending into eastern Montana; Central Appalachian ("CAPP") coal, which is a bituminous coal from the Central Appalachian region of West Virginia, Virginia, and Kentucky; and clarifier sludge. (Ex. J005, Condition 2.10). The amount of clarifier sludge is limited to no more than 1.0 percent of the total heat input (or 61.4 MMBtu/hr in any calendar day). (*Id.*, Condition 2.14). However, the permit also allows the blending of other sources of bituminous coal and/or pet coke (also called petroleum coke) as long as those fuels do not contain more than 3.0 percent sulfur by weight. (*Id.*, Conditions 2.10 and 2.11).

6. On October 6, 2008, Longleaf submitted an Application for Notice of MACT Approval to EPD. (Ex. J007). EPD subsequently issued a Notice of MACT Approval for the facility, which was premised on the assumption that the Longleaf facility would be a major source of hazardous air pollutants. (Tr. at 506 (Aponte)).

7. In June of 2009, EPD issued a draft permit amendment that incorporated proposed case-by-case MACT emission limitations into the Permit. (Ex. J010).

8. On December 22, 2009, Longleaf proposed to EPD that it be considered a minor source of HAPs. (Ex. J014). Longleaf proposed a series of new permit conditions designed to "ensure its status as a minor source of HAP emissions." (*Id.*, Att. A at 12).

9. Longleaf also submitted revised emissions estimates that it claimed showed that "emissions of no single HAP is expected to be greater than 10 tons per year, and the combined total of all HAP emissions is not expected to exceed 25 tons per year." (*Id.*).

10. Longleaf's original estimates had shown that the facility's two main boilers would emit 25 tons per year of organic HAPs, almost 15 tons per year of non-mercury metal HAPs, and more than 10 tons per year each of hydrochloric acid and hydrogen fluoride, putting the facility well above "major source" thresholds. (Tr. at 507 (Aponte)). In its revised estimates, Longleaf claimed the total HAP emissions would amount to approximately 23.33 tons per year – under but within 10 percent of the 25 tons per year major source threshold. (Ex. J014, Att. A at 11 & Table 10) (Tr. at 507 (Aponte)).

11. In requesting that it be considered a minor source of HAPs, Longleaf did not propose to reduce the size of the facility, to add any new pollution controls beyond those already required by the original Permit (Ex. J005), to burn only PRB coal, to its restrict hours of operation, or to lower the heat input levels that were the basis of the original Permit. (Tr. at 508-09 (Aponte)).

12. EPD issued a permit amendment (No. 4911-099-0033-P-01-2) on November 8, 2010 (the "Permit Amendment"). (Ex. J023). The Permit Amendment imposed new conditions intended to limit the potential to emit of the Longleaf facility to minor source status. In Clean

Air Act terminology, the new permit conditions were designed to make the Longleaf facility a "synthetic minor" source of hazardous air pollutants. A "synthetic minor" source is one that would be considered a major source based on its potential to emit but that is subject to federally and practically enforceable limits on its emissions to assure the permitting agency and the public that its emissions will actually be less than major source emission thresholds. (Pet-ST-5 at ¶ 21 (Sahu)). *See also* Ga. Comp. R. & Regs. r. 391-3-1-.01(cccc) ("'synthetic minor permit' means a Permit issued to a facility which imposes federally enforceable limits to restrict potential emissions to below major source thresholds ").

13. EPD views the Permit Amendment as containing a "complex but effective equation" for calculating daily, monthly and yearly HAP emissions for the facility. (Tr. at 506 (Aponte)). While EPD has issued previous synthetic minor source permits, this is the first time it has done so for a coal-fired power plant. (*Id.*).

14. The Permit Amendment does not include any limitations on the amount of electricity that can be produced, on number of hours that the main boilers can operate, or on the amount of material that can be processed. (Pet-ST-5 at ¶ 32 (Sahu); Tr. at 509-10 (Aponte)).

15. EPD has recently permitted another coal-fired power plant known as Plant Washington. Although the proposed Plant Washington facility would have just one boiler, as compared to the two boiler configuration proposed for Longleaf, and is a smaller plant, EPD permitted Plant Washington as a major source of HAPs. (Tr. at 501 (Aponte)).

A. <u>Air Pollutants at Issue</u>

16. Petitioners focus their claim that the Permit Amendment lacks practically enforceable limitations on HAP emissions at two categories of hazardous air pollutants emitted

by coal-fired power plants like the proposed Longleaf facility: organic HAPs and acid gas HAPs.

i. Organic HAPs

17. Organic HAPs include volatile and semi-volatile organic compounds as well as dioxins and furans, and polycyclic organic matter. (Pet-ST-5 at ¶ 39 (Sahu)). Although not an organic compound, cyanide compounds (including hydrogen cyanide) are a hazardous air pollutant listed in section 112 of the Clean Air Act. 42 U.S.C. § 7412(b). The Permit Amendment groups hydrogen cyanide with organic HAPs for purposes of its testing provision, Condition 4.2.j. For that reason, in this Order, hydrogen cyanide is analyzed with the organic HAP group.

18. Emissions of organic HAPs from coal-fired boilers can vary significantly from hour to hour, depending on such factors as the heat input or load into the boiler, the fuels being burned, the combustion conditions in the boiler (such as mixing, air/fuel ratio, temperature profiles, and residence time of the gases), the overall maintenance condition of the boiler, the operating conditions of the various pollution control devices, and many other factors. Thus, even when the boilers appear to be running at the same heat input or steam output conditions, the emissions of organic HAPs from the boiler can and will vary. (Pet-ST-5 at ¶¶ 45, 51 (Sahu)).

19. Conditions such as the buildup of coal ash or slag, air leakage, and deterioration of the coal pulverizers and burners can all lower the combustion efficiency of the boiler, causing more elevated rates of organic HAP emissions. (Pet-ST-5 at ¶ 48 (Sahu)).

20. The emissions of organic HAPs have not been found to be correlated based on the type of pollution controls or based on the rank of coal. Furthermore, there is often large measurement variability of organic HAPs. (Ex. I001 at 1-22).

21. Longleaf's original estimates showed that it would emit 25.0 tons per year of organic HAPs. In its revised estimates, Longleaf claims that the facility will emit only 5.78 tons per year of such HAPs. (J014, Att. A at 6).

ii. Acid Gas HAPs

22. Acid gas HAPs include hydrogen chloride (also known as hydrochloric acid or "HCl") and hydrogen fluoride (HF). On an individual basis, these pollutants are emitted in the largest quantities in comparison to the emissions of the other HAPs from coal-fired boilers. (Pet-ST-5 at ¶ 95 (Sahu)). Longleaf's original estimates showed the controlled emissions of HCl from each boiler would be between 16 to 62 tons per year, with the lower value based on burning subbituminous coal and the higher value based on burning bituminous coal. Longleaf also originally estimated that the plant would emit between 5.1 to 5.4 tons per year of HF from each boiler. *See* Ex. J007-000036. In its revised estimates, Longleaf claims that when burning subbituminous PRB coal, the facility's total emissions (both boilers included) will be only 5.14 tons per year of HCl and 8.35 tons per year of HF. (J014, Att. A, pp. 3-4). Longleaf did not provide any revised estimates of HCl emissions when burning Central Appalachian bituminous coal.

B. <u>The Minor Source Permit Conditions</u>

23. The Permit Amendment includes Condition 2.25, which states that the facility "shall not discharge . . . any single hazardous air pollutant . . . in an amount equal to or exceeding 10 tons during any twelve consecutive months, or any combination of such listed pollutants in an amount equal to or exceeding 25 tons during any twelve consecutive months." (Ex. J023, Condition 2.25). EPD and Longleaf rely on Condition 2.25 as establishing the facility's potential to emit hazardous air pollutants. (Tr. at 555 (Capp)); Tr. at 282 (French)).

24. Pursuant to Condition 8.25, Longleaf is required to report any twelve-consecutive month period when the permit's monitoring and reporting scheme yields estimates of emissions of any individual HAP that are equal to or greater than 10 tons and any twelve-consecutive month period when estimates of combined HAP emissions from the facility are equal to or greater than 25 tons. (Ex. J023, Condition 8.25.xx and .xxi).

25. Pursuant to Condition 8.27, Longleaf is required to calculate the monthly emissions from the two main boilers of hydrochloric acid (HCl), hydrogen fluoride (HF), non-mercury metals, selenium, and "all other substances listed in section 112 of the Clean Air Act." Longleaf must notify EPD in writing if these calculations yield estimates of emissions that exceed 0.83 tons (i.e., 1/12 of 10 tons) of any individual HAP or 2.08 tons (i.e., 1/12 of 25 tons) of all combined HAPs during any calendar month. (Ex. J023, Condition 8.29).

26. These monthly emission calculations are used to derive estimates of twelve-month rolling totals of the emissions of individual HAPs and all combined HAPs. (Ex. J023, Condition 8.30). Longleaf is required to notify EPD if these estimates show that emissions of any individual HAP exceed 10 tons during any consecutive twelve-month period or if any combined HAP emissions exceed 25 tons during any consecutive twelve-month period. (*Id.*).

i. Provisions Specific to Organic HAPs

27. For organic HAPs, as well as for hydrogen cyanide and phosphorus, compliance with the limits established by Condition 2.25 is to be determined, in part, through a stack test "conducted once every 5 years or as requested by the Division." (Ex. J023, Condition 4.2.j). The Permit Amendment specifies the use of Method 0031 to determine the emission rates of volatile organic HAPs from the two main boilers and Method 0010 to determine the emission rates of semi-volatile organic HAPs. (Ex. J023, Condition 4.1.v). The resulting emission factors

are used to estimate monthly emissions under Condition 8.27 and to determine reporting obligations under Conditions 8.29 and 8.30. (*See generally* Ex. J023, Conditions 8.27, 8.29 & 8.30).

28. Specifically, under Condition 8.27.e, the determination of monthly emissions of all HAPs other than hydrogen chloride, hydrogen fluoride, non-mercury metals, selenium and mercury is performed as follows: hourly emissions are calculated by multiplying the actual hourly heat input by an emission factor derived from the stack testing results under Condition 4.1.v. Those hourly emissions are then summed up for the month. (Ex. J023, Condition 8.27.e).

29. The Permit Amendment does not require continuous monitoring of organic HAP emissions because no such technology currently exists. (Tr. at 524 (Aponte)).

30. The once-per-five year stack test required under Condition 4.2.j will measure organic HAP emissions during the period of the test (typically three one-hour runs). It will not measure emissions of such HAPs during the 43,821 hours between stack tests (5 years x 8,760 hours/year plus one leap day minus the three hour test). In other words, under the Permit Amendment's testing and monitoring scheme, there will be no measurement of actual emissions of organic HAPs 99.99% of the time the facility will operate. (Tr. at 520 (Aponte)).

31. EPD views stack tests as "mere snapshots in time" that say nothing about how the facility is operating outside of the three-hour period of the test. (Tr. at 523 (Aponte)). Stack tests account for variability during the period of the test but not the variability that occurs at all other times. (*Id.*; Tr. at 595-96 (Capp)).

32. Stack tests on the boiler are typically done at or close to maximum load when the combustion of the coal will result in more complete destruction of volatile organic HAPs than will occur at lower loads. (Pet-ST-5 at ¶ 46 (Sahu)). Even the most highly utilized electric

utility steam generating units have periods of lower load, typically during the nighttime hours when demand is low. (*Id.*). The permit requires stack testing of volatile organic compounds at both base load and 50 percent load, but does not similarly require testing of organic HAPs at 50 percent load. (Pet-ST-5 at ¶ 47; Ex. J023, Condition 4.2.a).

33. The Permit Amendment fails to specify how stack test results below detection limits will be used to determine an emission factor for estimating monthly emissions. Due to the low concentrations of organic HAPs in the flue gas relative to such criteria pollutants as sulfur dioxide or particulate matter, testing can sometimes result in no detection of the pollutant. That does not mean the pollutant is not present in the flue gas stream; it just means that for the period of the test, it is being emitted at rates lower than the detection limit of the monitoring method. (Tr. at 302-3 (French); Tr. at 452 (Roberson); Pet-ST-5 at ¶ 52 (Sahu)).

34. Because the Condition 4.1.v only requires a minimum sampling time of one hour per run, it is unlikely that an adequate sample volume for pollutant quantification will be obtained. If Longleaf treats any test result that is below the detection limit of the monitoring method as an indication that organic HAPs are not present at all, the resulting emission factor is likely to underestimate actual organic HAP emissions. (Pet-ST-5 at ¶¶ 52-53, 67-68 (Sahu)). A test result below the detection limit could mean that actual emissions are anywhere from zero up to the detection limit. (Tr. at 302-3 (French)).

35. By relying on a once-per-five year stack test to establish an emission factor that is then used to calculate hourly and monthly emissions of organic HAPs, EPD is assuming that the stack test result will be a good predictor of the emissions occurring during the remaining 99.99% of the time. (Tr. at 520 (Aponte)).

36. However, as Ms. Aponte acknowledged in her testimony, actual organic HAP emissions could exceed the levels predicted by the once-per-five year stack test, and neither EPD nor the public would know when this occurred. (Tr. at 524 (Aponte)). Longleaf's expert, Mr. Roberson, also acknowledged that emissions from a coal-fired power plant are not constant over time. (Tr. At 443 (Roberson)).

37. According to Condition 4.1 of the Permit Amendment, the methods for determining compliance with emission limits listed in section 2.0, including Condition 2.25 of the permit, are listed in Condition 4.1. (J023, Condition 4.1).

38. The test methods specified in Condition 4.1 of the permit for organic HAPs – Methods 0031 and 0010 – will not reliably capture at least five organic HAPs: acetaldehyde, acrolein, formaldehyde, methyl chloride and dioxins/furans. (J023, Condition 4.1.v; Pet-ST-5 at ¶ 54-62 (Sahu)). The potential emissions of just these five pollutants could be 5.34 tons per year. (*Id.* at ¶ 65 & Table 1). In other words, the emissions estimation scheme established by the Permit Amendment could miss up to 5.34 tons of organic HAPs per year. (*Id*. at ¶ 66).

39. In its 2009 Information Collection Request ("ICR") to electric utilities, EPA recommended the use of EPA Method 320 for stack testing for formaldehyde and specified RCRA Method 0011 as an alternative method. (Ex. J029 at -000036 (Part B of EPA's Supporting Statement for ICR)). Neither method is listed in Condition 4.1 of the Permit Amendment.

40. EPD has pointed to other provisions that it claims will "have the effect" of limiting the facility's potential to emit organic HAPs. Specifically, EPD has pointed to the Permit Amendment's carbon monoxide ("CO") limit and requirement for continuous emissions monitoring system (CEMS) for CO emissions. EPD contends that Longleaf's effort to minimize

CO will in turn reduce organic HAP emissions. (Resp-ST-2 at ¶ 54 (Aponte)). However, as Ms. Aponte conceded at trial, any relationship between good combustion practices (as measured by CO CEMS) and resulting organic HAP emissions would hold true for any boiler, including those at facilities that are "major sources" of HAPs. (Tr. at 528 (Aponte)). Thus, good combustion practices and CO CEMS will not of themselves ensure that the proposed facility is emitting organic HAPs at minor source levels.

41. Furthermore, there is no basis for concluding that a relationship between CO emissions and resulting organic HAP emissions at coal-fired power plants can be established. A recent EPRI White Paper found no statistically significant correlation between CO levels and resulting emissions of three organic HAPS, benzene, toluene, and napthalene. (Ex. RI056 at 20; Tr. at 529-30 (Aponte)). At trial, EPD sought to diminish this finding by pointing to other statements in the White Paper to the effect that the great majority of organic HAP measurements were below detection. (Tr. at 535 (Aponte)). However, EPRI focused on the above three pollutants precisely because "they were detected at a higher frequency than other VOCs and SVOCs." (Ex. RI056 at 20; Tr. at 530).[1]

ii. Provisions Specific to Acid Gas HAPs

42. In addition to the 10 and 25 ton per year limits on individual and total HAP emissions established in Condition 2.25, the Permit Amendment includes specific restrictions on the emission rates of acid gases. Specifically, it includes an emission limit on hydrogen chloride of 0.0006 pounds per MMBtu heat input ("lb/MMBtu") when the units are burning PRB coal and 0.0024 lb/MMBtu when burning CAPP coal, or a computed weighted average of these limits.

[1] Ms. Aponte testified that she reviews EPRI White Papers from time-to-time as part of her job and considers EPRI a reputable source of information related to coal-fired power plants. (Tr. at 517, 529).

(Ex. J023, Condition 2.15.o). It also includes an emission limit on fluorides measured as hydrogen fluoride of 0.0002 lb/MMBtu. (*Id.* at Condition 2.15.k).

43. The HCl and HF emission limits in Condition 2.15 were derived from EPD's previous MACT determination for the Longleaf boilers, which was premised on the assumption that the Longleaf facility would be a major source of HAPs. In its proposed Notice of MACT Approval, EPD found that these limits reflected MACT for acid gases at the Longleaf boilers with the dry scrubber/fabric filter pollution controls. (J012 at 3, 27). EPD stated:

> MACT limits must be continuously achievable. That is, they must be able to be met continuously under reasonably foreseeable worst-case conditions [fn 3]. Thus, there is a need for a "safety margin" in setting MACT emission limits. Coal quality, boiler operation, and the control devices are subject to variability in operation, and that variability needs to be addressed in developing emission rates. Coal properties that affect emissions vary widely from mine to mine, from seam to seam and even within a single seam.
>
> In addition, EGU boilers experience different operating conditions, including, but not limited to, varying load operation and maintenance activities such as on line soot blowing. A unit must be able to attain those standards under all operating conditions. Thus, any enforceable permit limit must account for reasonable variations in coal properties, operating conditions, and other factors in order to ensure that MACT limits are continuously achievable.

(*Id.* at 5).

44. EPD withdrew the MACT determination when it issued the Permit Amendment and determined that the Longleaf facility would be a minor source exempt from MACT. (Resp-ST-2 at ¶ 34). However, the HCl and HF emission limits from the MACT determination were retained as Conditions 2.15.k. and 2.15.o "to provide an upper ceiling limit." EPD has acknowledged that Conditions 2.15.o and .k alone would not keep the facility under the major source threshold. (Tr. at 526 (Aponte)). Potential emissions from the Longleaf boilers based on these limits could be 32.3 to 129.1 tons per year of HCl (depending on the type of coal burned) and 10.76 tons per year of HF. (Pet-ST-5 at ¶ 35 (Sahu)).

45. Estimates of HCl and HF emissions are to be determined through a combination of daily coal sampling and periodic stack testing. Condition 8.3 requires the facility to "obtain a representative sample of the coal (and clarifier sludge, if fired, for purposes of enforcing minor source status) as-fired on a daily basis for analysis" of, among other things, its chlorine and fluorine content. (Ex. J023).

46. The purpose of Condition 8.3 is to provide a daily measurement of the amount of chlorine, fluorine, and other constituents in the coal that is fed into the facility's boilers. However, the daily coal sampling will not by itself provide any indication of the controlled level of HCl or HF emissions coming out of the facility's stack on a daily basis. (Tr. at 521 (Aponte)).

47. A recent EPRI White Paper based on a review of the ICR data for the best performing 130 coal plants found "that there is no correlation between the coal chloride levels and HCl emissions within this data set." (Ex. RI056 at 17). Ms. Aponte testified that she reviews EPRI White Papers from time-to-time as part of her job and considers EPRI a reputable source of information related to coal-fired power plants. (Tr. at 517, 529).

48. To estimate stack emissions of HCl and HF, the Permit Amendment requires periodic stack testing with the sampling time for each run consisting of a minimum of one hour. (Ex. J023, Condition 4.1.m). The facility is required to calculate the percent removal of HCl and HF at the time of the test. (*Id.*). The removal efficiency of HCl and HF (as well as selenium) is determined after each such test, using a formula set forth in Condition 4.1.y.

49. Initial stack tests for HCl and HF are required within 60 days after the facility achieves the maximum production rate on each coal type (PRB and CAPP), but not later than 180 days after the initial startup of each boiler for each coal type. (Ex. J023, Condition 4.2).

Stack tests on each boiler for fluoride emissions (as HF) and hydrochloric acid (HCl) are required thereafter on a quarterly basis. (*Id.* at Conditions 4.2.d, 4.2.g and 4.2.h).

50. However, stack tests for HCl and HF could occur as infrequently as once per year. Conditions 4.2.k and 4.2.l state that if the 12-month rolling total of HCl or HF emissions is below 9.0 tons at the completion of the calendar months of December, March, or June, then the next quarterly test (first, second or third) is not required. Only the fourth quarterly test is required "every year regardless of the emissions of HCl that are recorded during the preceding 12-month period." (Ex. J023, Conditions 4.2.k and .l).

51. Monthly emissions of HCl and HF are to be estimated according to the equations set forth in Condition 8.27 of the Final Permit Amendment. Those equations take into account the average chlorine and fluorine content of the coal (as determined through daily sampling under Condition 8.30), the percent removal of HCl and HF as determined through quarterly stack tests, and the hourly heat input into the boilers. The hourly emissions are estimated based on these factors, and then tallied up into monthly emission estimates. The monthly emission estimates then become subject to the reporting provisions of Conditions 8.29 and 8.30, whereby the facility is required to report when estimates of emissions of any individual HAP exceed 0.83 tons over any one month or 10 tons over any 12 months.

52. The Permit Amendment does not require the installation and operation of continuous emissions monitoring systems for HCl or HF. (Tr. at 525 (Aponte)). Such CEMS are required only if "at any time prior to commencement of operations of the facility, the Director determines" that such devices exist that can "reliably and accurately measure hydrochloric acid and/or hydrogen fluoride emissions from the PC-fired boilers in the operating concentrations required by this permit." (Ex. J023 at Condition 5.2.h). In such event, the facility

would be required to install HCl of HF CEMS within 12 months of receiving written notice from the Director or prior to startup of each boiler, whichever is later. (*Id.*).

53. Although HCl and HF CEMS do currently exist, EPD does not believe that the current technology would accurately and reliably detect HCl and HF emissions at the "low concentrations" of those gases that are "expected in the exhaust stream at Longleaf." (Resp-ST-2 at ¶ 45 (Aponte)). However, EPD concedes that the detection limit values of currently available technology are lower than the expected HCl and HF emissions from the Longleaf facility. (*Id.*). Therefore, it is unclear when and under what circumstances EPD will determine that CEMS exist that can "reliably and accurately measure" HCl and HF emissions within the meaning of Condition 5.2.h.

54. The State of Kentucky required the installation of an HCl CEMS on a coal-fired power plant that had been permitted as a minor source after the facility was shown to have emitted at major source levels based on compliance tests. In that instance, the CEMS device is not being used to determine compliance on a continuous basis. However, the device is being used to show if an when emission spikes occur. (Tr. at 396-99 (Roberson)). Similarly, even if Longleaf's HCl or HF emissions are below the detection limit of current CEMS models, the use of such technology would allow EPD and the public to know with certainty that the facility's emissions were no higher than the detection limit and would capture any emissions spikes when they occur. (Pet-ST-5 at ¶ 126 (Sahu)).

55. Because the Permit Amendment does not mandate CEMS for HCl or HF (in contrast to nitrogen oxide, sulfur dioxide, mercury and filterable particulate matter, for which CEMS are mandated), there is no requirement for continuous monitoring of HCl and HF emissions. (Tr. at 525 (Aponte)). Instead, the monthly emissions of those HAPs are estimated

based on removal efficiencies calculated from stack tests that occur, at most, on a quarterly basis. (Tr. at 521).

56. The use of stack test results to determine the control efficiency of HCl or HF is based upon the assumption that the removal efficiencies remain constant for all time periods outside the three-hour period of the tests. However, the removal efficiency of the control device for these pollutants can and will vary outside of the periodic stack tests. (Tr. at 524 (Aponte); Tr. at 624-625 and 629-630 (Sahu, discussion regarding Ex. RI025 at 7)).

57. The pollution control device for capturing HCl and HF at the facility will be the spray dry scrubber, which is also the main device for capturing sulfur dioxide (SO_2). In this type of scrubber, a sorbent (typically lime or limestone) is introduced as a slurry, in fine droplet form. The contaminants in the flue gas – SO_2, HCl, HF and other acid gases – are supposed to interact with the slurry droplets and be physically and/or chemically absorbed in the slurry. As the slurry droplets then drop in the scrubber, the water evaporates and the resulting dry powder is captured in a downstream control device, such as a baghouse. (Pet-ST-5 at ¶ 111 (Sahu)).

58. In actual practice, the HCl and HF removal efficiencies at a coal-fired boiler can vary hour-by-hour and day-by-day depending on many factors. (Pet-ST-5 at ¶ 109 (Sahu)). Those factors include the temperature of the gas, the ratio of slurry injection rate to the gas flow rate, the pH of the slurry, the relative concentrations of the pollutants in the flue gas, the concentration of particulates in the gas, the manner in which the slurry is atomized, the mean diameter of the slurry droplets, the degree to which the droplets avoid coalescing (thereby reducing available surface area), the details of competing reactions with other gases present, and other factors. (*Id.* at ¶ 112 (Sahu)). Thus, the determination of HCl and HF removal efficiencies

during a stack test provides no assurance of what removal efficiency will be achieved in the intervening time periods. (*Id.* at ¶¶ 110, 114).

59. Low removal efficiencies from spray dryers are not abnormal and merely reflect the operating conditions of the dryer. (Pet-ST-5 at ¶ 113 (Sahu)). When the removal efficiency falls below the value calculated from the periodic stack tests, HCl and HF emissions will go up and EPD will have no way of knowing it. (Tr. at 524 (Aponte)).

60. The Permit Amendment imposes a requirement that Longleaf continuously monitor and record the sorbent feed rate of the dry scrubber. (Ex. J023, Condition 5.2.i). Longleaf is required to report any three-hour block average for which the sorbent injection rate falls to less than the level established from the most recent stack test for HCl and/or HF. (*Id.* at Condition 8.25.c.ii). However, the Permit Amendment does not require any adjustments to the HCl of HF emission rates if the sorbent injection rate falls below the injection rate recorded during the stack test. (Pet-ST-5 at ¶ 119 (Sahu)).

61. EPD has asserted that the requirement to monitor the sorbent feed rate of the dry scrubber and operate thereafter within the range set at the time of the stack test "will help ensure that the scrubber is operating at levels determined to be appropriate for the designated removal efficiency of HCl." (Res-ST-1 at ¶ 44). However, EPD provided no data to show a correlation between sorbent injection rate to the dry scrubber and HCl or HF removal. (Pet-ST-5 at ¶ 109 (Sahu)). Indeed, Ms. Aponte conceded in her testimony that she had reviewed no studies establishing a link between sorbent injection and HCl control. (Tr. at 527).

62. Because the control efficiency of the dry scrubber depends on many more variables than the sorbent feed rate, continuous tracking of the sorbent feed rate will not capture

the complex variables that cause the removal efficiency to vary over time. (Tr. at 173-74 (Sahu)).

63. EPD and Longleaf have pointed to the Permit Amendment's requirement for continuous SO_2 monitoring as another indirect indicator of the performance of the dry scrubber in controlling HCl emissions. (Resp-ST-2 at ¶ 61 (Aponte); Int-ST-2 at ¶ 37(e) (French)). However, in its recent White Paper, EPRI concluded based upon the most recent available data that there was no correlation between SO_2 and HCl removal in dry scrubber systems. (Tr. at 305; Ex. RI056 at 17)

64. Furthermore, for emissions monitoring of one pollutant or control mechanism to be used as an indirect indicator of the emissions level of another pollutant at a given source, testing is required to establish the necessary correlation. (Tr. at 455-6 (Roberson)). EPA has identified a methodology to be followed when relying on such parametric monitoring as an indication of continuous compliance with an emission limit. (Pet-ST-5 at ¶ 121 (Sahu)). EPA has stated:

> In order to make the parametric monitoring conditions enforceable, a correlation needs to be developed between the control equipment parameter(s) to be monitored and the pollutant emission levels. The source needs to provide an adequate demonstration (historical data, performance test, etc.) to support the approach used. In addition, an acceptable performance range for each parameter that is to be monitored should be established.

(Ex. P10 at 8).

65. Here, however, the Permit Amendment does not require any validation testing to determine the correlation, if any, between the sorbent injection rate to the dry scrubber and HCl or HF emissions. (Pet-ST-5 at ¶ 122 (Sahu)).

66. Considering the various factors that can affect the removal rate of HCl across a dry scrubber, it is not unusual to see different levels of HCl removal even when the same coal is

burned. (Pet-ST-5 at ¶ 115 (Sahu)). A test of HCl emissions conducted last year at MidAmerican Company's Walter Scott Energy Center's Unit 4 showed that the emission rates differed by a factor of five over a five-hour period. (*See* Ex. RI025 at RI025-000015-16).

67. The Permit Amendment does not impose any limitation on the amount of CAPP coal that the facility can burn, despite the higher chlorine content of CAPP coal. (Pet-ST-5 at ¶¶ 128-129 (Sahu)). Longleaf has admitted that it can burn little, if any, CAPP coal and remain under the major source threshold. (Ex. J014, Att. A at 3; Ex. J021 at 9). However, neither EPD nor Longleaf has quantified how much CAPP coal can be burned at the facility before exceeding the threshold. (Tr. at 526-27 (Aponte)); Ex. J021 at 9).

68. CAPP coal is known for having some of the highest chlorine contents of any U.S. coal. (Pet-ST-5 at ¶ 129 (Sahu); Ex. P09 at 2).

69. Ms. French testified that Longleaf may want or need the flexibility to burn "relatively large quantities of low chlorine content CAPP coal." (Int-ST-2 at ¶ 64 (French)). Although Ms. French testified that such low chlorine CAPP coal may be available, no documentation was entered into evidence to support her assertion. (*Id.*). Mr. Vogt testified that Longleaf has no coal contracts for the Longleaf facility. (Tr. at 235 (Vogt)).

70. Dr. Sahu calculated that the Longleaf facility could only burn CAPP coal of maximum chlorine content for 2 to 9.5 days before exceeding the 10-ton per year threshold for HCl and that the facility could only burn CAPP coal of average chlorine content 16 to 41 days before exceeding the threshold. (Pet-ST-5 at ¶¶ 136-38 (Sahu); Ex. P07; Ex. J07 at 26).

71. Thus, Longleaf's HCl emissions could exceed 10 tons per year when burning CAPP coal before Longleaf would be required to test HCl emissions under the Permit Amendment's testing requirements. (Pet-ST-5 at ¶ 140 (Sahu); Ex. J023 at Condition 4.2).

C. Basis for Longleaf's Revised Emission Estimates

i. Organic HAPs

72. In both its original and revised estimates of the facility's emissions of organic HAPs, Longleaf relied upon emission factors. (Ex. J014, Att. A at 4).

73. An emission factor is a representative value that attempts to relate/estimate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant for a specific process. These factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., pounds of particulate matter emitted per ton of coal burned). Emission factors facilitate the estimation of emissions from various sources of air pollution, and are commonly used when there is a lack of specific emissions test or monitoring data (measurements) for a particular source, as when a facility has not yet been built. (Pet-ST-2 at ¶ 2 (Southerland); Tr. at 378-79 (Roberson)).

74. The most commonly used source of emission factors for most air pollution sources is AP-42, Compilation of Air Pollutant Emission Factors, which was first published by the United States Public Health Service in 1968, and has been periodically updated by the U.S. EPA since 1970. AP-42 is EPA's primary reference for emission factors and related information. It contains emission factors and process information for more than 200 air pollution source categories and constituent processes, including coal-fired power plants, and is used all around the world as a reference. (Pet-ST-2 at ¶ 3 (Southerland)).

75. EPA follows a peer-reviewed process in developing emission factors for inclusion in AP-42. While EPA sometimes relies upon data furnished by industry and trade associations

like EPRI, EPA tries to avoid relying upon any test result for which the underlying test report has not been made available to EPA for review. (Pet-ST-2 at ¶¶ 26-35 (Southerland)).

76. EPA published the Fifth Edition of AP-42 in January 1995 and has published supplements and updates to the fifteen chapters since then. The latest AP-42 emission factors published by EPA are available at the following website: http://www.epa.gov/ttnchie1/ap42. (Pet-ST-2 at ¶ 6).

77. The EPA's emission factors for bituminous and subbituminous coal combustion are found in Section 1.1 of AP-42. (Pet-ST-5 at ¶ 81; *see generally* Ex. J025 (Section 1.1 of AP-42). EPA added emission factors to Section 1.1 for organic HAPs in Supplement B to the 5th edition of AP-42, in October 1996. (Ex. J025 at 1.1-11 (AP-42 Section 1.1).

78. EPD has specified that AP-42 emission factors should be used ahead of any other emission factor method when an owner or operator of a stationary source of air pollution will be determining the potential to emit of that source. (Ex. J024 at E-2; Tr. at 515 (Aponte)).

79. In its original PSD Permit Application in November 2004, Longleaf relied primarily upon AP-42 emission factors for estimating emissions of organic HAPs. (Ex. J014, Att. A at 4).

80. Longleaf's estimates using AP-42 emissions factors showed that the organic HAP emissions from the facility's boilers alone would total 25.0 tons per year. (Ex. J014, Att. A at 6).

81. In its December 22, 2009 submission claiming minor source status, Longleaf relied primarily upon emission factors for organic HAPs developed by the Electric Power Research Institute ("EPRI"). (Ex. J014, Att. A at pp. 4-6).

82. EPRI is a non-profit trade association that was established in 1973. (Tr. at 354 (Roberson)). EPRI is funded by its dues-paying members, who are electric utilities throughout

the United States. (*Id.*). Its purpose is to conduct collaborative research for the benefit of its membership. (*Id.*).

83. Longleaf claimed that it used the EPRI emission factors because the data upon which they were based were more recent than the data underlying AP-42. (Ex. J014, Att. A, p. 4). However, as Mr. Roberson testified, the EPA's AP-42 emission factors for organic HAPs for bituminous and subbituminous coal combustion are probably based on the same EPRI tests from the late-1990s that the emission factors in the EPRI Handbook is based on. (Tr. at 432-433 (Roberson)). A review of the references cited by EPA in its emission factors for organic HAPs in Table 1.1-14 of Section 1.1 of AP-42 shows that EPA cited references 35 through 53, which include "EPRI reports" as well as other test reports that do not appear to be part of the EPRI testing (e.g., reference 36 is not cited as an EPRI report). (Ex. J025 at Table 1.1-14 and at 1.1-48 to 1.1-49 (AP-42 Section 1.1)). As Mr. Roberson testified, EPA chose a different approach for estimating emissions than EPRI "from basically the same set of data." (Tr. at 435-36).

84. In or around 1993, EPRI provided data to EPA for use in the agency's Report to Congress regarding HAP emissions from the electric utility industry. (Tr. at 356 (Roberson)). Pursuant to section 112(n)(1)(A) of the Clean Air Act, EPA was mandated to conduct a study of the health risks posed by HAP emissions from the electric utility industry. (*Id.*) Believing that a lot was at stake for its members, EPRI undertook to conduct an independent risk assessment of HAP emissions. (Tr. at 359 (Roberson)). EPRI provided EPA with its independent test data, which included emission test data, fuel types, types of controls, and evaluations of control efficiency, along with identification of the locations where the tests were conducted. (Tr. at 358 (Roberson)).

85. After the data had been collected for submission to EPA, EPRI decided the information would be useful to its membership for reporting their toxic emissions pursuant to the Emergency Planning and Community Right-to-Know Act ("EPCRA"). To assist its members with such toxic release inventory or "TRI" reporting, EPRI compiled its data into a document entitled "Emission Factors Handbook: Guidelines for Estimating Trace Substance Emissions from Fossil Fuel Steam Electric Plants, EPRI Report #1005402 (2002)" (hereinafter "the EPRI Handbook"). (Ex. I001). The initial version of the Handbook was released in the mid-1990s. The current version was published in 2002. (Tr. at 359-60 (Roberson)).

86. In its December 22, 2009 submittal, Longleaf relied primarily upon EPRI emission factors to recalculate the emissions estimates for twenty-seven organic HAPs. After doing so, Longleaf's emissions estimate for organic HAPs dropped from 25.0 tons per year to 5.78 tons per year. (Ex. J014, Att. A at 6).

87. EPD did not have access to the EPRI Handbook prior to issuing the Permit Amendment. (Tr. at 511 (Aponte)). EPD simply relied upon the numbers set forth in Longleaf's December 22, 2009 submittal. (Tr. at 513 (Aponte)). Despite not having the Handbook, Ms. Aponte considered EPRI reputable source of emissions data based on her periodic review of their research papers. (Tr. at 517).

88. Ms. Aponte testified that she did not know EPRI emission factors were based upon a geometric mean rather than an arithmetic mean or that they were accompanied by two additional values expressing the upper and lower confidence intervals of the data upon which the emission factors were based. (Tr. at 513-14). Further, Ms. Aponte was not aware whether EPRI had attached any caveats to its emission factors or what those caveats were. (Tr. at 516).

89. In issuing the Permit Amendment based upon Longleaf's revised estimates for organic HAPs, EPD elevated the EPRI factors above the AP-42 factors, contrary to its own guidance. (Tr. at 517 (Aponte)).

90. EPRI's web site says the Handbook is available to EPRI members for a cost of $9500. (Ex. P03).

91. EPD did not review the EPRI Handbook until it was produced by Longleaf three days prior to the hearing in this matter. (Tr. at 511 (Aponte)). Ms. Aponte testified that this was the first time she had ever seen the Handbook and that she has never reviewed the underlying data upon which the Handbook is based. (*Id.*). To her knowledge, EPD has never been in possession of the Handbook. (*Id.*).

92. Longleaf produced the EPRI Handbook pursuant to a Confidentiality Order that requires Petitioners to return or destroy it within 10 days of their submission of Proposed Findings of Fact and Conclusions of Law. Longleaf agreed to share the EPRI Handbook with EPD only on condition that the latter agree to treat it as Confidential Business Information. (Longleaf's Prehearing Submission at Attachment A, n.1).

93. The EPRI Handbook does not contain the underlying test reports upon which the emissions are based. Although the Handbook lists the number of test sites from which a given emission factor is calculated, it is impossible from reviewing the Handbook alone to determine where those sites are located or when they were tested. (Tr. at 437 (Roberson)).

94. In contrast, for AP-42, EPA has provided background documentation for the organic HAP emission factors for bituminous and subbituminous coal combustion in Section 1.1, including information on each test site and the test results. (Pet-ST-5 at ¶¶ 83 to 84 (Sahu); Ex. P01, App. C (AP-42 Background Document)). The test reports upon which EPA relied in

developing the organic HAP emission factors for coal-fired boilers are readily available to the public from EPA. (Pet-ST-5 at ¶ 84).

95. Unlike AP-42 emission factors, which are based primarily upon the arithmetic mean (i.e., average) of test data, EPRI emission factors for organic HAPs are based on the geometric mean of the data points. (Tr. at 391-92 (Roberson)).

96. A geometric mean is calculated by taking the n-th root of the product of all the values in a distribution of values. (Pet-ST-3 at ¶ 11 (Southerland)). As a matter of mathematical law, the geometric mean of a set of data points can never be higher than the arithmetic mean. (Tr. at 600 (Sahu)). The geometric and arithmetic means can be equal, but only in the rare case that all of the data points are the same number (e.g., 2, 2, 2, 2, 2, etc.). (*Id.*). In every case involving a set of different non-zero, positive numbers, the geometric mean is always lower than the arithmetic mean. (Tr. at 633 (Sahu)). As a result, emission estimates derived from the use of EPRI emission factors based on the geometric mean will always be lower than estimates derived from AP-42 emission factors based on an arithmetic mean.

97. In developing the AP-42 emission factors for coal-fired power plants, EPA adopted some emission factors developed by EPRI. However, EPA rejected EPRI's emission factors for organic HAPs specifically because they were based on the use of the geometric mean. (Ex. P001 at 2-10) ("The organic emission factors were not used for AP-42 because they are a geometric, instead of arithmetic, mean.").

98. Mr. Roberson testified that a geometric mean is a better representation of the "central tendency" of a log normal distribution of data points. (Tr. at 391, 444). However, Mr. Roberson could not say whether the data distribution for each organic HAP in the EPRI Handbook was log normal. (Tr. at 444-45).

99. In addition to the geometric mean, the EPRI Handbook provides lower and upper confidence intervals for each organic HAP. The confidence interval provides a means of estimating at some level of probability how high or low the mean value could be. If the same set of tests were conducted 100 times for a given organic HAP, the mean of the tests should fall within the range expressed by the confidence interval 95 out of 100 times. (Tr. at 438-39 (Roberson)).

100. The EPRI Handbook cautions that the confidence interval can span one or two orders of magnitude, meaning that there is a 95% probability that the results within the range could be 50 times higher or lower than the geometric mean. (Tr. at 440 (Roberson)).

101. The EPRI Handbook also warns that measurements of HAP emissions can vary from the mean emission factors by several orders of magnitude and that among the facilities tested there was a wide variation in the emission results. Mr. Roberson believed these statements to be true based on his experience. (Tr. at 440-41 (Roberson)).

102. The EPRI Handbook also warns that use of its emission factors may not be appropriate at any particular facility. Mr. Roberson believed that to be a true statement based on his experience. (Tr. at 442).

103. The EPRI Handbook also warns that organic HAPs may not be generally and effectively controlled by either particulate or SO_2 control devices, which Mr. Roberson believed to be a true statement. (Tr. at 443).

104. The EPRI Handbook states that the reason it provides a 95 percent confidence interval is so that there can be more precision in the estimates that the Handbook provides. Mr. Roberson testified that the cautionary language in the Handbook "applies in double" when using its values for estimating short term emissions of organic HAPs. (Tr. at 443).

105. If the upper confidence values for organic HAP emissions from the EPRI Handbook are used in place of the geometric mean values for purposes of calculating the facility's potential to emit, the Longleaf facility's estimated organic HAP emissions would exceed 25 tons per year. (Tr. at 611-613 (Sahu); Ex. P032).

ii. Acid Gas HAPs

106. In revising its estimate of the facility's HCl emissions, Longleaf considered new stack test data from PRB-fired power plants. (Tr. at 294 (French); Ex. J014, Att. A at 2). The new test results were set forth in Table 1 of Longleaf's December 22, 2009 letter requesting minor source status. (*Id.*). For the revised HCl emission factor, Longleaf ignored the four highest reported emission rates. (Tr. at 298 (French)). Longleaf determined that those values were "outliers" based on discussions with those facilities. (Tr. at 299 (French)). Longleaf did not make any similar inquiry of the test results it chose not to discard. (*Id.*).

107. Longleaf submitted with its December 22, 2009 letter the test reports underlying the results reported in Table 1. Longleaf submitted the test reports so that EPD could independently validate and verify the numbers listed in the letter. (Tr. at 278 (French)).

108. Neither EPD nor Longleaf has estimated the facility's HCl emissions while burning CAPP coal. Longleaf has proposed that the stack testing and analyses required under Conditions 4.2 and 8.3 of the Permit Amendment will be used "to calculate how much CAPP coal can be burned without exceeding the HAP emission limitations in the Permit Amendment." (Ex. J021 at 9). When asked how much time the Longleaf facility could burn Central Appalachian coal, Mr. Vogt stated, "[i]t all depends on how well the facility does when we test it." (Tr. at 232 (Vogt)).

109. In revising its estimate for the facility's HF emissions, Longleaf considered new stack test data for PRB-fired power plants. (Ex. J014, Att. A at 3-4). In determining an emission factor from this data, Longleaf discarded the test results that recorded a non-detect value, even though a non-detect value does not mean the pollutant is not present. (*Id.* at 4; Tr. at 302-3 (French)).

110. Longleaf provided EPD the test reports underlying the HCl and HF emission rates summarized in its December 22, 2009 letter. Longleaf submitted the test reports so that EPD could independently validate and verify the stack test data identified in the letter. (Tr. at 278 (French)).

D. Emission Estimates Excluding Reliance on EPRI Emission Factors

i. Organic HAPs

111. If one takes Longleaf's emissions estimate in its December 2009 submission and uses AP-42 emission factors (or EPA's 1998 Report to Congress, Ex. J027, Vol. 2, Appendix A, Table A-4, when AP-42 does not specify an emission factor) in lieu of emission factors from the EPRI Handbook, the potential to emit of just organic HAPs from the facility's two boilers is 31.11 tons per year, an amount over the major source threshold. (Pet-ST-5 at ¶ 89 & Table 3).

112. EPA rates the emission factors in AP-42 with letter grades. An "A" rating signifies that the emission factor was developed "from only A-rated test data taken from many randomly chosen facilities in the industry population. The source category is specific enough so that variability within a source category population may be minimized." (Ex. J025 at p. 3-4). In the organic HAP group, EPA has given the "A" rating to the emission factors for three pollutants: benzene, toluene and formaldehyde.

113. If one takes Longleaf's emissions estimate in its December 2009 submission, Ex. J014, and substitutes AP-42 emission factors for only those three organic HAPs that have an "A" rating, the potential to emit organic HAPs from the facility's two boilers is 27.4 tons per year, again an amount over the major source threshold. (Pet-ST-5 at ¶¶ 92 & 93 & Tables 4 & 5).

ii. Acid Gas HAPs

114. Condition 2.15.o imposes a limit on HCl emissions of 6.0×10^{-4} lb/MMBtu when burning PRB coal or 2.4×10^{-3} lb/MMBtu when burning CAPP coal, or a computer weighted average based on the proportion of energy output in MMBtu input contributed by each coal rank. Condition 2.15.k limits fluoride emissions, to be measured as HF, to 2.0×10^{-4} lb/MMBtu. These emission limits yield annual emissions of between 32.3 to 129.1 tons per year of HCl (depending on coal type) and 10.76 tons per year of HF, each of which is over the 10 ton per year major source threshold for emissions of any individual HAP. (Pet-ST-5 at ¶¶ 143-44 (Sahu)).

iii. Total HAP Emissions

115. The most probable estimate of the facility's potential to emit is hazardous air pollutants is 173.016 tons per year. This estimate is derived by added Longleaf's own estimates of emissions for non-mercury metals, mercury and other HAPs, excluding cyanide; the estimate for calculation of organic HAPs and cyanide in Paragraph 110 above, i.e., 31.11 tons per year; and the estimate for maximum annual emissions of HCl and HF from the previous paragraph. This estimate is well in excess of the major source threshold. (Pet-ST-5 at ¶¶ 146-47 (Sahu) & Table 6).

IV. CONCLUSIONS OF LAW

1. This is a *de novo* proceeding. GA. COMP. R. & REGS. r. 616-1-2-.21(3) ("OSAH Rule 21"). This Tribunal is required "to make an independent determination on the basis of

competent evidence presented at the hearing," OSAH Rule 21(1). The independent determination and *de novo* hearing mandated by these rules require this Tribunal "to consider the applicable facts and law anew, without according any deference or presumption of correctness to EPD's decision, and to render an independent decision on whether [Petitioners] carried their burden to prove by the preponderance of the evidence that the permit should not have been issued." *Longleaf Energy Associates, LLC v. Friends of the Chattahoochee, Inc., et al.,* 298 Ga. App. 753, 768 (2009).

2. The parties agree that if a new coal-fired power plant has the "potential to emit"10 tons or more of any single hazardous air pollutant ("HAP") or 25 tons of any combination of these pollutants, then the plant will be a "major source" and must obtain a permit with emission limits reflective Maximum Achievable Control Technology ("MACT"). (*See* Resp-ST-2 at ¶17 (Aponte); Int-ST-2 at ¶ 6 (French); Tr. at 567 (Capp)). The parties also agree that Longleaf has not obtained a MACT permit and that but for Condition 2.25 in the Permit Amendment, the facility would be a major source. (*See* Ex. J021-000041; Ex. J022-000001; Ex. J020-000030-31; Tr. at 18, 20, 504, 564; Pet-ST-5 at ¶¶146, 147 (Sahu)).

3. A source is considered a "major source" of HAPs if it has the potential to emit at least 10 tons per year of any single such pollutant or at least 25 tons per year of any combination of such pollutants. *See* 40 C.F.R. § 63.41, incorporated by reference into GA. COMP. R. & REGS. r. 391-3-1-.02(9)(b)(16). Condition 2.25 is intended to make the proposed facility a minor source by restricting its HAP emissions to below these thresholds. (Tr. at 555 (Capp)).

A. <u>Legal Framework</u>

4. "Potential to emit" is defined by regulation as "the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or

operational limitation on the capacity of the stationary source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable." 40 C.F.R. §§ 63.2, 63.41, as incorporated by reference at GA. COMP. R. & REGS. r. 391-3-1-.02(9)(a) and (b)(16).

5. In 1995, EPA authorized EPD to issue synthetic minor permits like the one at issue to create federally enforceable restrictions to limit potential to emit. *See* 60 Fed. Reg. 45048 (Aug. 30, 1995). Under EPD's rules as approved by EPA, such permits must be "enforceable as a practical matter." GA. COMP. R. & REGS. r. 391-3-1-.03(2)(h). EPD has further amplified how potential to emit is to be determined through its own guidance (the "EPD Guidance" or "Guidance"), Ex. J024, which all parties have recognized applies in this case. (*See* Tr. at 514 (Aponte); Tr. at 564-66 (Capp); Int-ST-2 at ¶ 27 (French)).

6. According to EPD's Guidance, to determine potential to emit, one should use allowable emission rates or the maximum hourly uncontrolled emission rate ("MHUER"), whichever is lower. (Ex. J024-000004 at Section (C)(iii)). Potential to emit is to be based on the maximum hourly emission rate assuming continual operation throughout the year. (*Id.* at 000003 & App. E). In addition, "potential to emit must be calculated under worst-case conditions for each pollutant emitted by the facility." (*Id.*).

7. The Guidance goes on to say that "practically enforceable limits" can be used to limit potential to emit and refers one to Appendix F "to determine whether these limits exist." (*Id*. at 2 Section (C)(v)). Appendix F stresses that emission limits will be considered "enforceable as a practical matter" if (1) there is a clear legal obligation, and (2) compliance can be verified:

> A permit limit is enforceable as a practical matter (or practically enforceable) if permit conditions establish a clear legal obligation for the source ***and allow compliance to be verified***. It is important that permit conditions be unambiguous and do not contain language which may intentionally or unintentionally prevent enforcement. *Permit limits or other applicable requirements must have associated monitoring, recordkeeping, and reporting to make it possible* ***to verify compliance*** *and provide for documentation of noncompliance.*

(Ex. J024-000014 (emphasis added)).

8. The provision in Appendix F regarding the necessity for verifiable limitations is consistent with other authority regarding potential to emit going back over twenty years. In *United States v. Louisiana Pacific Corp.*, 682 F. Supp. 1122 (D. Colo. 1987), the court addressed an EPA enforcement action alleging that the construction of a new waferboard unit triggered application of the prevention of significant deterioration program. The company claimed that it could rely on permits issued by the state that attempted to create synthetic minor status for the facility. Similar to the permit conditions in this case, the permit conditions there placed "blanket" annual restrictions, *id*. at 1131, on the amount of pollutants that the facility could emit. The district court, interpreting essentially the same definition of potential to emit at issue here, noted that "compliance with blanket restrictions on actual emissions would be virtually impossible to verify or enforce" and ruled that while operational and fuel use limitations can be used to restrict potential to emit, blanket restrictions on actual emissions cannot. *Id*. at 1133.

9. Immediately in the aftermath of *Louisiana Pacific*, EPA issued guidance on limiting potential to emit. *See* Hunt & Seitz, "Guidance on Limiting Potential to Emit in New Source Permitting," (June 13, 1989), attached as Exhibit A hereto. This guidance discussed the *Louisiana Pacific* holding and stated that permits must include independently enforceable limits on production or operation in addition to emission limits in order to limit potential to emit of a pollutant. EPA noted two narrow exceptions to the prohibition on the use of blanket emission

limits to limit potential to emit. *Id.* at 7-8. First, if setting operating parameters for control equipment is infeasible, then a blanket emission limit can be used, but only if emission limits are short term (e.g., pounds per hour) and a continuous emissions monitoring system ("CEMS") will be used to verify compliance. The second exception is not applicable here: it applies to volatile organic compound ("VOC") surface coating operations. *Id.* The key point to be derived from this guidance is EPA's insistence on the use of CEMs to verify compliance if a blanket limitation is imposed. CEMs do not estimate emissions; they measure them all the time, providing verification that a limit is being met. *Id.*

10. Significantly, when EPA approved Georgia's operating permit program for creating synthetic minor permits, it evaluated the adequacy of Georgia's program based on guidelines EPA had established in 1989. *See* 60 Fed. Reg. at 45048 (Ex. J036), *citing to* Requirements for the Preparation, Adoption, and Submittal of Implementation Plans; Air Quality, New Source Review; Final Rules, 54 Fed. Reg. 27274 (June 28, 1989), attached as Exhibit B hereto. The fourth criterion for evaluating this program is that limitations must be "practically enforceable." *See* 60 Fed. Reg. at 45049 (Ex. J036) and 54 Fed. Reg. at 27283/2. In describing the practically enforceable criteria, EPA noted that: "an emissions limit expressed only in tons of pollution per year would not be considered practically enforceable." *Id.*

B. <u>Practical Enforceability of the Permit Amendment</u>

11. There is no dispute that neither the Permit Amendment nor the original Permit that it modifies restricts the plant's hours of operation or the quantity of fuel it may combust. (*See* Ex. J023; *see also* Pet-ST-5 at ¶32 (Sahu)); Tr. at 509-10 (Aponte)). Rather, the vehicle used by EPD in an attempt to give Longleaf "synthetic minor" status is a blanket emission limit, Condition 2.25 of the Permit Amendment. (Ex. J023-000005; Tr. at 555 (Capp)). As noted, this

condition provides that in any 12 consecutive months, the facility may emit no more than 10 tons of any one HAP or 25 tons of any combination of HAPs. This is the very type of limitation that EPA has identified as not practically enforceable. *See* 54 Fed. Reg. at 27283/2.

12. The EPD Guidance discussed above makes clear that emissions subject to a limitation must be verifiable in order for the limitation to be "practically enforceable." Therefore, this Tribunal must determine whether the blanket emission limit in Condition 2.25 passes this verification test. As Longleaf has acknowledged, if the Permit Amendment does not contain federally and practically enforceable conditions that require Longleaf to operate below the limits of 10 and 25, Longleaf would be a major source of HAPS and cannot commence construction without a MACT determination. (Tr. at 20).

13. Review of the Permit Amendment on its face as well as evidence elicited through the hearing shows that the monitoring scheme for the pollutants covered by Condition 2.25 will yield little information about the facility's actual emissions of HAPs. The HAPs that will be emitted by Longleaf can be divided into six broad categories: mercury, HCl (an acid gas), HF (an acid gas), organics plus cyanide, non-mercury metals, and "other." (Pet-ST-5, ¶ 146 (Sahu)). Mercury emissions will be monitored continuously through the use of a continuous emissions monitoring system or CEMS. The Permit Amendment requires similar continuous monitoring of non-HAP pollutants like NOx, emissions of which are subject to a 12-month rolling average, with compliance to be determined using CEMS. (*See* Ex. J023, Conditions 2.15(b) and 4.1(r)). Thus, for pollutants like NO_X and mercury, assuming the CEMS are on-line and functioning, these monitors will measure actual emissions 100% of the time the plant is in operation.

14. In contrast, none of the facility's HAP emissions, other than mercury, will be subject to continuous monitoring. HCl and HF emissions will be measured only during stack

tests, which typically consist of three 1-hour runs. Thus, at most, actual emissions of HCl and HF will be tested through four tests per year (i.e., 12 hours per year), and it could be as little as one test (i.e., 3 hours per year). Non-mercury metal HAPs are required to be tested once every three years, which would be a total of 6 hours over a five-year period. Organic and "other" HAPs will actually be measured only once every five years.

15. Except for mercury, the Permit Amendment's HAP monitoring scheme fails to meets the standard set out in EPA's 1989 guidance on potential to emit that allows blanket, annual emission limits only when actual emissions are monitored by CEMs. Actual measurement of HAP emissions other than mercury will occur for only about a tenth of a percent of operating time, or less. For the remaining 99.8% of the time, levels of most HAP emissions will merely be estimated, not actually measured. Mercury emissions, which the facility will be required to continuously monitor, will contribute only 0.075 tons per year (or about 0.3%) of the 25 ton per year total emissions cap. In contrast, organic HAP emissions, which Longleaf will be required to test only once every five years, could contribute anywhere from 25% to 100% of the 25 ton per year emissions cap based on Longleaf's emission estimates. (*See* Ex.J014-000009 and 000011).

i. Practical Enforceability of Provisions for Organic HAPs

16. The estimation scheme established by the Permit Amendment for organic and "other" HAPs is neither conservative nor accurate for two reasons. First, while the Permit Amendment requires that an emission factor be generated using the once-per-five year stack test, it does not require that a margin of compliance or margin of safety be added to that emission factor, even though the emission rate of these pollutants could vary significantly from the rates determined through stack testing. Second, some organic and "other" HAPs will not be measured

under the permit's monitoring scheme at all.

17. Turning to the first point, estimates of 12-month totals of organic and "other" HAPs are to be derived from an emission factor determined by one stack test conducted every five years, multiplied by the facility's hourly heat input; estimated hourly emissions are then summed over to derive 12-month totals. (Ex. J023, Condition 8.27.e.; Pet-St-5 at ¶41 (Sahu)). When establishing emission limits, EPD always adds a "margin of compliance" or "safety factor" to account for variability. (*See* Tr. at 595-6 (Capp)); *see also Friends of the Chattahoochee, Inc. v. Couch*, Docket No: OSAH-BNR-AQ-0732139-60 Howells, slip op. at 69-70 (April 2, 2010) (noting that one reason for adding such a factor is to account for inevitable variability)). Under the monitoring scheme of the Longleaf permit, however, EPD provides no mechanism for adding such a margin of compliance or safety factor when establishing an emission factor from a once-per-five year stack test.

18. EPD's failure to account for variability cannot be reconciled with its past practice nor is it consistent with the evidence and testimony in this case. EPD considers a stack test a "mere snapshot in time" that provides certainty only as to the levels of emissions occurring during the period of the test. (Tr. at 523 (Aponte)). Stack tests do not account for the variability in emissions and performance of control equipment that occurs outside of the test. (*Id.*). The Permit Amendment's author, Ms. Aponte, testified that emissions levels recorded during a stack test would not necessarily be indicative of actual emission levels during other periods. (Tr. at 523-4). Ms. Aponte's testimony on this point was consistent with the testimony of Dr. Sahu, who noted that emissions of organic HAPs could vary significantly from hour-to-hour and over longer periods of time. (Pet-St-5 at ¶ 45).

19. Variability in emissions from a coal-fired power plant can occur hour-to-hour and

day-to-day for a variety of reasons. Hour-to-hour variability can be caused by combustion conditions in the boiler, including changes in the air-fuel ratio, temperatures and temperature profiles, and residence time of the gases in the boiler. (Pet-ST-5 at ¶¶ 45, 51 (Sahu)). Such variability can be caused by the composition of the fuel and the operating conditions of the pollution control devices. (*Id.*). Consequently, even when the boilers appear to be running at the same heat input or steam output conditions, the emissions of HAPs from the boiler can and will vary. (*Id.*).

20. Combustion conditions in the boiler can also change over time, again causing variability. For example, if Longleaf tests for these pollutants immediately after a boiler overhaul or boiler tuning, there will be more complete combustion than at a point in time more removed from such overhaul or tuning. (Pet-ST-5 at ¶ 48 (Sahu)). Another contributor to this type of variability is the buildup over time of coal ash or slag inside the boiler, which can alter heat release patterns and temperature profiles, which will in turn affect the organic hazardous air pollutant emission rates. (*Id.*). There can also be air leakage from the boiler, and that in turn can affect air/fuel ratios and combustion conditions (such the degree of mixing and gas path residence times). The plant's pulverizers will also deteriorate, affecting the fineness of the coal and its resulting combustibility, and burner efficiency may decline, also lowering combustion efficiency. (*Id.*). Such longer term variability is an important consideration because the Longleaf facility could be in operation for 60 or more years. (Tr. at 646 (Capp)).

21. Stack tests on the boiler are typically done at close to maximum load, when the combustion of the fuel (coal) will result in more complete destruction of volatile organic HAPs than the destruction achieved when the unit is operating at lower loads. (Pet-ST-5 at ¶ 46). Even the most highly utilized electric utility steam generating units have periods of lower load,

typically during the nighttime hours when electricity demand is low. Therefore, during these lower loads periods, one should expect a more elevated emission rate for these types of pollutants from the boiler than under maximum load conditions. (*Id.*). Significantly, although the permit actually requires volatile organic compounds to be tested at 50 percent load to assess compliance with the best available control technology limit for the volatile organic compounds, the permit does not require testing under that scenario for organic HAPs. (*Id.* ¶ 47).

22. For all of these reasons, EPD's assumption, which is built into the Permit Amendment's HAP emission estimation formula, that the hourly rate at which these pollutants will be emitted will be constant and at the same rate as that occurring during the infrequent three-hour stack tests is fundamentally flawed. A significant safety factor would have to be added to the emission factor before one could be comfortable that the emissions estimate for organics yielded by the formula in Condition 8.27(e) is at or above the levels at which organic HAPs will actually be emitted. To be able to verify that emissions are under the 10/25 ton per year limits of Condition 2.25, EPD must insure that the emission factor it uses never underestimates the emission rate.

23. The second major reason that the Permit Amendment's monitoring scheme will not yield an accurate estimate of actual emissions of organic and "other" HAPs is that it will not actually test for at least five of those pollutants. The test methods specified in the permit will not capture at least the following HAPs: acetaldehyde, acrolein, formaldehyde, methyl chloride, and dioxins. (*See* Pet-St-5 ¶¶ 54-66 (Sahu)). This testimony from Dr. Sahu was never controverted by either Mr. Roberson or Mr. Capp, both of whom have considerable experience with monitoring and testing, or by any other testimony. The potential emissions of just these five pollutants could be 5.34 tons per year. (*Id.* at 65 & Table 1). In other words, the emissions

estimation scheme established by the Permit Amendment could easily underestimate emissions of organic HAPs by up to 5.34 tons per year.

24. While EPD and Longleaf contend that the Permit's requirement for continuous monitoring of CO emissions will provide an "indirect indicator" of organic HAP emissions, EPRI's review of the most recent available data found no correlation between CO emissions and emissions of three commonly detected organic HAPs. (Tr. at 530 (Aponte); Ex. RI056). This is significant in that both EPD and Longleaf consider EPRI a reliable source of research data pertaining to coal-fired power plants. EPRI has similarly determined that SO_2 and particulate control devices like the dry scrubber and baghouse that will be employed at the proposed facility are not effective at controlling organic HAPs, which Mr. Roberson testified that he believed to be a "true statement." (Tr. at 443).

25. Further, the permit does not require any correlation testing to verify that CO emissions below a certain emission rate will equate to a certain emission rate of organic HAPs. EPA has objected to permits that purport to use such parametric monitoring but which are not based on an analysis of the correlation between the parameter to be monitored and the pollutant emissions that the parameter is intended to represent. (Ex. P10 at 8 (EPA Review of Title V Permit for Tampa Electric)). Thus, the Permit Amendment's "indirect indicators" of organic and other HAP emissions do not make Condition 2.25 practically enforceable.

26. Given the flaws in the permit's estimation methodology for organic and other HAPs, the emissions estimates yielded by the Permit Amendment's monitoring scheme could be significantly inaccurate. This potential for inaccuracy underscores the lack of practical enforceability of Condition 2.25. The issue is not whether Longleaf will react to reduce emissions if the Permit Amendment's emission estimation scheme shows Longleaf trending out

of compliance. Rather, the problem is that the estimates may indicate that the facility is in compliance, when in fact actual HAP emissions will be over major source thresholds. As Ms. Aponte conceded, actual organic HAP emissions could exceed the levels predicted by the once-per-five year stack test, and neither EPD nor the public would know. (Tr. at 524). This concession acknowledges that it is impossible under the Permit Amendment's monitoring scheme to "verify" compliance with the blanket emission limits in Condition 2.25. Consequently, those blanket limits are not practically enforceable.

ii. Practical Enforceability of Provisions for Acid Gas HAPs

27. Turning to HCl and HF, the Permit Amendment's estimation methodology suffers from similar flaws. As detailed previously, to estimate the emission of these pollutants, the permit calls for the use of a formula that multiplies the hourly heat input by a value for the content of the element in the coal (either chlorine or fluorine) by the assumed removal efficiency for each pollutant. (Ex. J023, Conditions 8.27(a) and (b); *see also* Pet-St-5 at ¶¶ 98-105 (Sahu)). While heat input will be measured by a continuous monitor, and chlorine and fluorine content in the coal will be estimated by daily grab samples, the assumed removal efficiency will be determined by the latest stack test, which could occur as infrequently as once per year. (*Id*.). As Ms. Aponte testified, while the daily coal samples will provide information about what is "going in" on a daily basis, they will not tell her (or anyone) anything about what is "coming out" on a daily basis. (Tr. at 521). Further, EPRI, whose research findings EPD considers authoritative (Tr. at 517), has found no correlation between coal chloride levels and HCl emissions. (Ex. RI056 at 17).

28. Thus, for estimating HCl emissions, the Permit Amendment relies upon stack tests to calculate a removal efficiency. (Tr. at 521). Here again, the Permit Amendment's

estimation scheme assumes that the removal efficiency of the pollution controls will be constant between stack tests. There is no reasoned basis for that conclusion. The removal efficiency of the spray dryer, the main device for capturing the acid gases, could vary hour-by-hour and day-by-day. (Pet-ST-5 at ¶ 110 (Sahu)). A number of factors can influence the removal efficiency of the spray dryer, including the temperature of the gas, the ratio of the slurry injection rate and the gas flow rate, the pH of the slurry, the relative concentration of the pollutant and other pollutants that may be present in the gas, the concentration of particulates in the gas, the manner in which the slurry is atomized, the mean diameter of the slurry droplets, the degree to which the droplets avoid coalescing (thereby reducing available surface area), the details of competing reactions (such as between HCl, $S0_2$, HF, and other gases present), and the degree to which there are any leakage paths (thereby allowing for less slurry gas contact). (*Id*. ¶ 112).

29. As Petitioners conceded, the Permit Amendment's requirement to monitor the mass of slurry or absorbent that is fed to the scrubber "is a good idea." (Pet-ST-5 at ¶ 114 (Sahu)). However, because of all of the other factors mentioned above that could impact removal efficiency, monitoring that one parameter will not guarantee constant removal efficiency. (*Id*. ¶ 114). There is no documentation in the record to support that monitoring the sorbent injection rate ensures any level of HCl removal efficiency. Ms. Aponte acknowledged at trial that she had "not reviewed any studies" establishing such a link. (Tr. at 527). Indeed, because the removal mechanism for HCl removal in a spray dryer absorber differs from the removal mechanism for SO_2, for which the spray dryer absorber is primarily designed and operated, the Permit Amendment's requirement to monitor SO_2 emissions cannot provide any assurance that a certain level of HCl removal efficiency is being obtained. (*See* RI-056 at 000016-000017).

30. The Permit Amendment does not include any requirement for Longleaf to establish a correlation between either the sorbent injection rate and HCl/HF emissions or between SO_2 emissions and HCl/HF emissions. As previously stated, EPA has objected to permits that rely on parametric monitoring to show compliance with an emission limit without a demonstration of correlation between the parameter to be monitored and the emissions of the pollutant in question. (Ex. P10 at 8 (EPA Review of Title V Permit for Tampa Electric)). Thus, the Permit Amendment's requirement to monitor sorbent injection and SO_2 as indicators of HCl and HF emissions do not make Condition 2.25 practically enforceable.

31. Ms. Aponte was, again, in agreement with Petitioners: Ms. Aponte agreed that the removal efficiency of the dry scrubber could vary, and that if it went down, HCl and HF emissions would go up, and because there is no CEMS for HCl and HF, no one would ever know. (Tr. at 524-525).

32. In addition, if the Longleaf boilers burn Central Appalachian coal, as the Permit Amendment allows, total emissions of HCl could exceed 10 tons per year in 2 to 41 days, before a stack test is required to be conducted. (*See* Pet-Ex-5, ¶¶ 137, 138 and 140; Ex. P07). When asked how much time the Longleaf facility could burn Central Appalachian coal, Mr. Vogt answered "[i]t all depends on how well the facility does when we test it." (Tr. at 232). By that point, however, the facility could easily have already exceeded the 10 ton per year limit.

33. Although EPD and Longleaf point to the Permit Amendment's requirement for continuous SO_2 monitoring as an indirect indicator of HCl emissions, EPRI has recently found no correlation between SO_2 and HCl removal at units equipped with dry scrubbers. (Ex. RI056 at 17).

34. Hence, as with organic and "other" HAP emissions, the issue is not whether

Longleaf will take action to reduce emissions if the Permit Amendment's emission estimation scheme shows Longleaf trending out of compliance; the issue is that the estimates may indicate that the facility is in compliance, when in fact actual HAP emissions will be over major source thresholds. Because neither EPD nor the public would know when that was happening, there is no ability to verify compliance. As such, Condition 2.25 cannot be considered federally or practically enforceable.

35. In summary, the Permit Amendment's monitoring scheme will yield almost no information regarding what the actual 12-month HAP emission totals will be. Instead, the monitoring scheme will only generate estimates, potentially significantly inaccurate estimates, of such emissions. Since this estimation scheme makes it impossible to verify that actual emissions of HAPs will comport with the blanket emission limitations in Condition 2.25, that condition is not practically enforceable. Consequently, under EPD's guidance, Longleaf's potential to emit must be determined using the maximum hourly uncontrolled emission rate, which all parties acknowledge would be over the major source threshold.

C. <u>Reasonable Estimates of Longleaf's Potential to Emit</u>

36. This Court's finding as to the lack of federal and practical enforceability of Condition 2.25 is sufficient to require remand. As Longleaf itself has acknowledged, if the Condition 2.25 is unenforceable, the facility is a major source. (Tr. at 19-20). However, given that Condition 2.25 is not enforceable as practical matter, the EPD Guidance dictates that potential to emit be evaluated based upon the maximum hourly uncontrolled emission rate or "MHUER." (Ex. J024-00004). Therefore, it is necessary to consider whether the proposed facility could be reasonably deemed a minor source of HAPs based upon its MHUER.

37. Longleaf's revised estimate showing that the facility would emit at minor source

levels was made in its December 2009 submission to EPD. (Ex. J014). This estimate is unreliable for two reasons. First, the estimate for acid gases is based on a flawed and biased methodology. Second, the estimate for organic hazardous air pollutants is improperly based on emission factors from the EPRI Emission Factor Handbook in lieu of AP-42.

i. Acid Gas HAPs

38. First, in putting together the revised acid gas estimate, Ex. J014-000005-7, Longleaf discarded high values as outliers after making calls to the plants where those test occurred. (Tr. at 295-300 (French)). However, Longleaf did not make similar attempts to contact the other sources tested in her survey. (Tr. at 299-300 (French)). Dr. Sahu testified that he would not have discarded the HCl results that Longleaf deemed "outliers" because "such variability in HCl emissions is to be expected even when coal from the same mine is used and similar pollution controls are used." (Pet-ST-5 at ¶¶ 115-117). Longleaf's approach of inquiring about and then excluding only those test results that would have required a major source determination was inherently biased and unreliable, and should not have been accepted by EPD.

39. Similarly, when a test recorded a non-detect value, Longleaf discarded the result, Ex. J014-000005-7, even though, as Ms. French acknowledged in her testimony, a non-detect value does not mean the pollutant is not present. (Tr. at 302-3). Finally, Longleaf attempted no estimate for acid gas emissions when Longleaf burns CAPP coal. Consequently, the HF and HCl estimates in the December 2009 letter are not a reliable basis upon which to conclude that the proposed facility will emit HCl and HF at minor source levels.

40. Since Longleaf's estimate for HCl and HF emissions is unreliable, one must default to the other conditions in the permit that limit the plant's emissions of these pollutants. It

is undisputed that the HCl and HF emission limits, established in Condition 2.15, do not limit Longleaf's emissions of either HCl or HF under the 10 ton per year threshold for individual HAPs. (Tr. at 526 (Aponte)). Therefore, based on those allowable emissions alone, Longleaf is a major source of HAPs under Section 112 of the Clean Air Act and may not proceed with construction without a MACT determination and appropriate MACT limits.

ii. Organic HAPs

41. The second reason that Longleaf's minor source estimate for the proposed facility is unreliable is that it was based upon EPRI emission factors for estimating organic HAP emissions.

42. The EPD Guidance specifically contemplates that emission factors may be used to determine potential to emit. (Ex. J024 at Appendix E). Specifically, Appendix E of the Guidance describes, in order of priority, the methods that can be used for estimating the maximum hourly uncontrolled emission rate. The highest ranked method for estimating maximum emission rates applies to printing and coating operations and thus is not applicable here. (Ex. J024 at E-2). Methods 2 through 4 pertain to the use of recent and representative emission test data from either the source in question or similar sources. (*Id.*).

43. In the absence of representative test data, the Guidance allows for the use of emission factors to determine MHUER. The Guidance directs that the owner or operator "shall obtain emission factors from the following publications," and proceeds to list several publications "in order of priority." (J024 at E-2). The Guidance also contains the following cautionary language regarding the use of emission factors to estimate emissions at a particular facility:

> Emission factors should only be used to calculate PTE as a last resort when better sources of information (as described in items 1-4 above) are not available.

> Whenever factors are used, one should be aware of their limitations in accurately representing a particular facility, and the risks of using emission factors in such situations should be evaluated against the costs of further testing or analyses. The use of inaccurate (with low bias) emission factors has led to many enforcement cases in Georgia and across the country. The penalties for using such an inaccurate emission factor can be very severe.

(*Id.*).

44. The Guidance lists EPA's AP-42, "Compilation of Air Pollutant Emission Factors," as revised, as the highest ranked source of emission factors. (Ex. J024 at E-2, Section 5.i.). The second highest ranked source is another U.S. EPA document, the "AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants," as revised. (*Id.* at Section 5.ii.). The third highest ranked source is "emission factors developed by industry or trade associations or government regulatory agencies." (J024 at E-2, Section 5.iii.). The EPRI emission factors fall into this third category of emission source information.

45. It is clear that if EPA's AP-42 emission factors are used to estimate the facility's potential to emit (in conjunction with a few other reasonable assumptions), the facility's emissions will be far over the major source threshold. (*See* Pet-St-5 ¶ 146 (Sahu)). Indeed, Longleaf's own original estimate for organic HAPs alone, based primarily upon AP-42, pegged emissions from the boilers alone at 25 tons per year. (Ex. J014-000008-9 (Table 3 - Previous lb/MMBtu Emission Factor)). It is also undisputed that by accepting Longleaf's revised estimates for organic HAPs, EPD elevated EPRI emission factors above AP-42 emission factors, and in doing so, acted contrary to the Guidance. (Tr. at 517 (Aponte)). For the following reasons, this Tribunal declines to do the same.

46. The EPRI factors come from the EPRI Handbook, which is not part of EPD's permitting record. EPD did not have access to the Handbook before issuing the Permit Amendment. EPD has access to the Handbook now only because it has agreed, at Longleaf's

insistence, to treat the document as Confidential Business Information. For purposes of this proceeding, the Handbook has been filed under seal. Longleaf's claim of confidentiality over the Handbook makes it unavailable as a source of emissions estimates for the facility as a matter of law. Under the Georgia Air Regulations, it is unlawful for EPD (or this Tribunal in a proceeding challenging EPD's decision) to rely upon emissions information that the State is not at liberty to release. The Air Quality Regulations provide, in pertinent part:

> **Confidentiality of Information. Amended**.
>
> Information relating to secret processes, devices, or methods of manufacture or production obtained by the Division shall be kept confidential. Provided, however, ***reports on the nature and amounts of stationary source emissions obtained by the Division shall be available for public inspections from the Division.***

Ga. Comp. R. & Regs. 391-3-1-.08 (emphasis added). The above provision was incorporated into the Georgia State Implementation Plan in 1976. *See* 42 Fed. Reg. 35184 (Aug. 20, 1976). Thus, while EPD is certainly free to consider EPRI emission factors in estimating emissions of the proposed Longleaf facility, it cannot do so while withholding the source of that information from the public.

47. Review of the EPRI Handbook itself, Ex. I00-1, reveals that it does not contain the data underlying the creation of the factors. Specifically, it is impossible to tell from review of the Handbook which facilities were tested, how they were tested, or when. Mr. Roberson testified that the data in the Handbook may be the same as the data underlying Section 1.1 of AP-42 (Ex. J025), but he did not know for sure, despite having participated in creating the original version of the Handbook. (Tr. at 429-30).

48. Mr. Southerland, who is an expert in the creation and use of emission factors, testified that he would not substitute EPRI emission factors for AP-42 emission factors because neither the Handbook nor the underlying test data were available for peer-review outside EPRI,

and the Handbook itself costs $9,500 to obtain. (Pet-ST-2 at ¶ 41). After being granted temporary access to the EPRI Handbook under the Confidentiality Agreement in this case, Mr. Southerland's opinions did not change. He testified that the Handbook did not provide enough detail about the tests and calculations used to warrant using the EPRI data in lieu of the AP-42 emission factors "for which individual tests are documented, analyzed, and presented without restrictions on public information and transparency." (Pet-ST-3 at ¶ 2).

49. The evidence established that EPA relied on EPRI data in creating AP-42's set of emission factors for organic HAPs. (Ex. J025-000032-35, 000048-49). However, it was not established that the data cited to by EPA in AP-42 (Ex. J025-000048-49) are the same data underlying the version of the Handbook that Longleaf introduced into evidence.

50. It is noteworthy that in revising its acid gas emissions estimates, Longleaf provided EPD with the facility test reports upon which it relied in recalculating its emissions. Longleaf provided those test reports so that EPD could independently validate the numbers set forth in the letter. (Tr. at 278 (French)). For the revised estimates of organic HAPs, however, EPD had neither the EPRI Handbook nor the underlying test reports upon which the EPRI emission factors are based. Therefore, unlike the AP-42 emission factors, for which both the source document and underlying test reports are a matter of public record, EPD here had no ability to independently validate and verify Longleaf's revised emissions calculations for organic HAPs.

51. Another reason to reject use of the Handbook is that in developing emission factors for the organic HAP subset, the Handbook used a methodology based on the geometric mean. (Ex. I001 at -000012). Mr. Roberson testified that when data fit a log normal distribution, then the geometric mean can indicate a "central tendency." Dr. Sahu agreed with this point, but

only when the distribution has been demonstrated to be log normal. (Tr. at 603-604). The Handbook indicates that data for some of the pollutants it analyzed fit a log normal distribution, Ex. I001 at -000010, but it does not say which ones, and it is obviously not all. Mr. Roberson testified he could not say that EPRI verified that all of the emissions data fit a log normal distribution. (Tr. at 445).

52. Mr. Southerland testified that in creating thousands of emission factors in his career, he had never used the geometric mean, and more importantly, that there was nothing about a collection of emission data that warranted a comparison based on the geometric mean. (Pet-ST-3 at ¶¶ 12-13). However, since the geometric mean is always less than or equal to the arithmetic mean (Tr. at 599-600), it provides a means for lowering an emissions estimate, regardless of whether it makes sense. Thus, it is significant that in the 1990s, EPA rejected EPRI's suggestion of using the geometric mean to develop emission factors for organic HAPs. (Ex. P01-000014-15).

53. The use of a geometric mean may be appropriate for helping EPRI member facilities avoid over-reporting their toxic emissions for TRI reporting purposes (which is the reason for which the Handbook was created). However, when estimating potential to emit for the purpose of determining whether a large stationary source can avoid an entire regulatory scheme like MACT, a conservative approach is warranted. The EPD Guidance specifies that determinations of potential to emit must be based on "worst-case" assumptions. (J024-000003). Consistent with this principle, the EPD Guidance properly elevates the more conservative AP-42 emission factors above industry-generated factors like those found in the EPRI Handbook. It was error for EPD to disregard its own Guidance and give precedence to the lower bias EPRI factors, particularly when EPD lacked access to the data needed to validate their use in this

instance.

54. The Court also notes the number of cautionary statements contained in the EPRI Handbook regarding the use of its emission factors to estimate the potential to emit of a given facility. First, the Handbook notes that its emission factors have "a 95% confidence interval spanning one to two orders of magnitude." (Ex. I001-000008). Furthermore, "actual measurements of HAPs emissions can vary from estimated levels by several orders of magnitude." Consequently, "emission estimates developed from such data distributions may differ significantly from measured values. (*Id*. at I001-000009). In addition, the Handbook states that "there is some probability that any given value will be exceeded some of the time. Therefore, the emission factors suggested in this document may or may not be appropriate for a particular unit." (Ex. I001-000011).

55. While AP-42 contains similar cautionary language, it is a more conservative source of emission factors for the reasons noted. To the extent that the EPRI emission factors could be considered a reliable substitute for AP-42 in analyzing potential to emit, the Handbook's many cautionary statements indicate that the 95% upper confidence interval for each factor should be used.

56. As confirmed by Mr. Roberson, a 95% upper confidence interval means that if the all of the tests underlying a particular factor were performed 100 times, 95 out of 100 times, the mean will lie somewhere in the confidence interval range. (Tr. at 438-440). Furthermore, if the confidence interval spans two orders of magnitude, the upper end of the range could be 50 times higher than the mean emission factor itself. (*Id.* at 440).

57. The Handbook's warnings must be considered in light of the EPD Guidance, which provides that: "potential to emit must be calculated under **worst case conditions**." (Ex.

J024-000003 (emphasis added)). Furthermore, Mr. Roberson noted that the Handbook's cautions apply "in double" when estimating short-term emissions. (Tr. 443-444). The estimation methodology that is used to determine potential to emit is not a 12-month rolling average. Rather, it is a sum of the maximum hourly uncontrolled emission rate over each hour of operation in one year (i.e., 8,760 hours). (*See generally* Ex. J024, Condition 8.27; Tr. at 610-11, 619-20 (Sahu)). Consequently, Mr. Roberson's doubly cautious approach applies here.

58. Therefore, to ensure that "worst case" assumptions are made when using the Handbook to make a potential to emit calculation, Dr. Sahu concluded that one should, at a minimum, use upper confidence interval values, not the emission factor values themselves. (Tr. at 610-611). Dr. Sahu recalculated Longleaf's potential to emit estimate, making his suggested substitution for organic HAPs only. (Ex. P032; Tr. at 611-613). The resulting estimate shows Longleaf has the potential to emit of a major source. (Ex. P032; Tr. at 617).

59. The only other evidence regarding the reasonableness of Longleaf's December 2009 revised emission estimate came from the testimony of Ms. French. The Court did not find Ms. French's testimony persuasive. The entire premise of the testimony was flawed. Ms. French was attempting to validate conclusions based on one set of data (the unavailable data underlying the EPRI Handbook) by evaluating a completely different set of data (the draft data collected by EPA pursuant to its recent Information Collection Request ("ICR") to electric utilities) that is not yet in final form. Ms. French did not attempt to derive an estimate from the ICR data of what HAP emissions for the facility will actually be. Nevertheless, despite this lack of quantification, Ms. French offered a qualitative opinion that Longleaf will probably stay under the major source threshold. Since the question of whether a source is major is very much a quantitative exercise, the Court declines to give Ms. French's qualitative opinion any weight.

60. In the evidence presented the Court, Petitioners calculated potential to emit of the HAPs to be emitted by the Longleaf facility in several ways, and all of them show that the Longleaf facility will be a major source of HAPs. These approaches included minor revisions to Longleaf's "estimate" of HAP emissions from its December 22, 2009 minor source application, such as replacing the EPRI organic HAP emission factors with the AP-42 emission factors, replacing the EPRI emission factors with only the A-rated AP-42 emission factors, determining potential to emit of HCl and HF based on the specific HCl and HF emission limits identified in the Permit Amendment, and using the upper confidence interval values for the organic HAPs from the EPRI Emission Factor Handbook. (*See generally* Pet-ST-5 at ¶¶ 34, 35, 89, 93, 144, 146; P-32; Tr. at 617 (Sahu)). It is clear, then, that because Condition 2.25 is practically enforceable, Longleaf should be considered a major source.

V. CONCLUSION

For all of the foregoing reasons, the Permit Amendment is **VACATED** and **REMANDED** to EPD for an appropriate MACT analysis and accompanying MACT limits.

Respectfully submitted this 23rd day of February, 2011.

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IN THE OFFICE OF STATE ADMINISTRATIVE HEARINGS
STATE OF GEORGIA

FRIENDS OF THE CHATTAHOOCHEE, INC., and SIERRA CLUB, Petitioners, v. F. ALLEN BARNES, DIRECTOR, ENVIRONMENTAL PROTECTION DIVISION, GEORGIA DEPARTMENT OF NATURAL RESOURCES, Respondent, LONGLEAF ENERGY ASSOCIATES, LLC, Intervenor-Respondent.	DOCKET NO: OSAH-BNR-AQ-1115157-60- HOWELLS

CERTIFICATE OF SERVICE

I hereby certify that on this date I served a true and correct copy of the foregoing **PETITIONERS' PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW** upon all counsel of record by regular and electronic mail to the following:

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