ORIGINAL

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Petition on behalf of Citizens of the State of Florida to require Progress Energy Florida, Inc. to refund customers $143 million	)))))	DOCKET NO. 060658-EI March 6, 2007

REBUTTAL TESTIMONY OF STEPHEN SMALLWOOD P.E.

Harold McLean
Public Counsel

Joseph A. McGlothlin
Associate Public Counsel

Office of Public Counsel
c/o The Florida Legislature
111 West Madison Street
Room 812
Tallahassee, FL 32399-1400

Attorney for the Citizens
of the State of Florida

DOCUMENT NUMBER-DATE
02053 MAR-6 07
FPSC-COMMISSION CLERK

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 060658-EI

REBUTTAL TESTIMONY OF STEPHEN SMALLWOOD, P.E.

ON BEHALF OF CITIZENS OF THE STATE OF FLORIDA

Q. Please state your name and business address.

A. My name is Stephen Smallwood, P.E. My business address is 1608 Eagles Landing, Unit 64, Tallahassee, Florida.

Q. By whom are you employed, and in what capacity?

A. I am an independent environmental consultant. I specialize in the area of air source permitting. I received a degree in mechanical engineering from West Virginia University-Institute of Technology. I have spent the last fourteen years as a consulting engineer, during the last eight of which I have been self-employed. Prior to my consulting practice, I was employed by the Florida Department of Environmental Regulation (the predecessor of the Department of Environmental Protection) as Director, first of its Air Bureau, and subsequently of its Air Division. During my tenure with the FDER, among other things I was responsible for developing the plan for obtaining delegation of federal air permitting programs from the United States Environmental Protection Agency to the FDER, and for writing the Florida nonattainment area corrective plans for ozone, particulate matter, and sulfur dioxide, that were required by the 1977 federal Clean Air Act amendments.

Prior to joining the FDER in 1978, I held similar responsibilities with the West Virginia Air Pollution Control Commission. I have attached a more detailed resume' of my experience as Exhibit __ (SS-1).

Q. What is the purpose of your testimony?

A. In my testimony I will respond to certain statements by Progress Energy Florida Inc. witness Michael Kennedy.

Q. What documents and materials have you reviewed for purposes of your testimony?

A. I have reviewed OPC's Petition and supporting testimony of Robert Sansom; Mr. Kennedy's prefiled testimony and exhibits; excerpts from the submissions of PEF's predecessor, Florida Power Corporation, in support of its application for certification of Crystal River Units 4 and 5 before the FDER and the Governor and Cabinet, sitting as the Florida Electrical Power Plant Siting Board; the Conditions of Certification relating to Crystal River Units 4 and 5 that were attached to and are part of the Certification Order that the Siting Board issued to FPC; the letter containing Conditions On Approval relating to Crystal River Units 4 and 5 that the federal Environmental Protection Agency issued to FPC in 1978; an excerpt from the 1996 application by PEF for its first Title V air permit, in which PEF listed the fuels for which it was seeking authority to burn in Crystal River Units 4 and 5, and the corresponding excerpt from the permit that was issued to become effective in January 2000; PEF's answers to OPC's Fourth Set of Interrogatories in this docket; 1999 correspondence between Florida Power Corporation and the FDEP on the subject of adding treated bituminous briquettes

to the then pending application of FPC for the initial Title V permit: PEF's application for a construction permit to conduct a test burn of PRB coal in Crystal River Units 4 and 5, dated April 4, 2006.

Q. **At page 14 of his testimony, referring to the Conditions of Certification imposed by the Governor and Cabinet on Crystal River Units 4 and 5, Mr. Kennedy states, "PEF never guaranteed that it would use a blend of sub-bituminous and bituminous coals. And neither the Conditions of Certification nor the Conditions to Approval include any requirement that PEF burn a blend of sub-bituminous coal. . . . because sub-bituminous coal was never actually burned in the units, PEF did not have unconditional authority to burn sub-bituminous coal in CR4 and CR5." What is your response to that statement?**

A. The application process under the Florida Electrical Power Plant Siting Act and the Conditions of Certification adopted by the Siting Board did not require that PEF guarantee to the Siting Board that it would use a blend of sub-bituminous and bituminous coals as a prerequisite to receiving authority from the Siting Board to burn the blend in Crystal River Units 4 and 5. The application process did not require that the Conditions of Certification prescribe the use of a blend of bituminous coal and sub-bituminous coal before PEF could say it has authority to burn the blend in Crystal River Units 4 and 5. The Conditions of Certification did not specify the coal or coals that the applicant had to burn in these units. Rather, the conditions imposed maximum emission standards with which PEF could comply with either a blend of subbituminous coal and bituminous coal, or with

bituminous coal alone. The Conditions of Certification did not preclude, and therefore encompassed and allowed, the burning of a blend of subbituminous coals and bituminous coals, as long as the applicant adhered to the maximum emissions standards of 0.10 lbs/mmBtu for Particulate Matter (PM), 1.2 lbs/mmBtu for Sulfur Dioxide, and 0.70 lbs/mmBtu for Nitrogen Oxides.

Mr. Kennedy could as easily have said that the company did not have the "unconditional authority" to burn bituminous coal, because the utility also is required to adhere to maximum emissions limitations when burning only bituminous coal. Yes, the utility would have been required to demonstrate that it was actually meeting those standards with the blend of western subbituminous coal and bituminous coal that is the subject of Mr. Kennedy's testimony, and show it had secured a source of such coal, but that is true of any fuel or blend of fuels it could have chosen within the latitude provided by the conditions of certification.

Q. **Are you familiar with the emissions standards that PEF's predecessor, Florida Power Corporation, requested and those that the Governor and Cabinet imposed on CR4 and CR5?**

A. Yes. I have reviewed answers provided by PEF to OPC's Fourth Set of Interrogatories that provide this information. The company received in the form of emissions limitations precisely what it asked for in its application for certification with respect to regulation of air emissions. Further, those emission standards are the normal standards that were applicable to units of this kind and

vintage, regardless of the type of coal being burned. I am attaching the excerpts from PEF's answers to OPC's Fourth Set of Interrogatories relating to the conditions of certification to my testimony as Exhibit __ (SS-2).

Q. Are you aware of any documents in which PEF represented to others that it possessed authority to burn the blend of subbituminous and bituminous coals under the Conditions of Certification?

A. Yes. In the application for a temporary permit to conduct a test burn of a blend of PRB and bituminous coals, dated March 3, 2006, in the Introduction and Executive Summary on page 19, PEF represented to the Florida Department of Environmental Protection that "The original Site Certification language allowed for a 50 percent blend of PRB coal. The Site Certification for Units 4 and 5 was issued prior to the effective date of the PSD program and, therefore, no construction permit was originally issued. Permit language that specified the burning of "only bituminous coal" originated in the initial Title V air operation permit, issued on January 1, 2000. Finally, as will be presented, the fuel blend, up to a maximum blend of 30 percent PRB, will have characteristics that closely match those of the bituminous coal types that are currently being burned. The above factors, in addition to the fact that no plant changes to existing process equipment are necessary to test burn the proposed blend, were presented to the Department as PEF's position that Units 4 and 5 are 'capable of accommodating' this fuel blend, and that no air permit changes are necessary." I am attaching the entire application as my Exhibit __ (SS-3).

Q. At page 9, Mr. Kennedy says the federal EPA imposed an additional standard of no greater than 20% opacity. With respect to the opacity standard, he says, ". . . it is possible I could not guarantee that PEF would not have violated the 20% opacity limit for CR4 and CR5." Do you wish to respond to that statement?

A. The situation with respect to the opacity standard is no different than the other emission limitations, in that PEF was authorized to burn the 50/50 blend so long as it adhered to this and other applicable emissions standards. "It is possible" that Mr. Kennedy "could not guarantee" that PEF will continue to meet the 20% opacity standard with bituminous coal in the future, but that does not alter PEF's authority to burn bituminous coal as long as it does comply.

Q. Have you seen any information regarding the "history" of the 20% opacity standard that the EPA prescribed for Crystal River Units 4 and 5?

A. Yes. PEF's answers to OPC's Fourth Set of Interrogatories indicate that, with respect to the Conditions On Approval issued by the EPA, PEF again received precisely the standard that it requested. Again, the 20% opacity standard was the normal standard applicable to units of that kind and vintage.

Q. Are you aware of any plant-specific information that may bear on the reason why PEF requested the 20% opacity standard?

A. I have been provided with a portion of a document, represented by OPC to be an excerpt from the Black and Veatch design manual for Crystal River Unit 5 obtained from PEF during discovery, that states the precipitators of the units were specified to meet the 20% opacity standard that the EPA placed in the Conditions

On Approval. I am informed that other OPC witnesses will testify that the designer of the precipitators for CR4 and CR5 guaranteed they would enable the units to meet the 20% opacity factor when burning the 50/50 PRB/bituminous blend of coals, and that PEF's predecessor had the right, under contract, to test the unit using the 50/50 blend and to enforce the guarantee on the designer.

Q. What is the import of this information from your viewpoint as a consultant and a former regulator?

A. The information indicates that PEF had a solid technical basis for its representation to EPA that the units were capable of meeting the 20% opacity standard when it requested the EPA to approve the construction of the units. It should be observed that, at the time the EPA issued its Conditions On Approval, no test burns had been conducted with any coal or coals.

Q. At page 20-21, Mr. Kennedy disputes the assertion by OPC witness Sansom that PEF took steps to abandon its authority to burn subbituminous coal in Crystal River Units 4 and 5 when it omitted any reference to the fuel in the section of the Title V air permit application that called on the applicant to identify the fuels it proposed to burn in the units. How do you respond?

A. As I read his testimony, Mr. Kennedy is saying that the company lost nothing, because it could come back and add subbituminous coal to the permit. In my view, by failing to designate subbituminous coal as among the fuels for which it wished authority in its initial application for a Title V permit, PEF did give up something that had value.

Q. Please explain.

A. Under the Conditions of Certification, PEF could burn the blend of bituminous coal and subbituminous coal and be in compliance as long as it met emission standards. On the other hand, the Title V permit is "fuel-specific." Once the federal Title V permit was issued in a form that did not include subbituminous coal explicitly, PEF no longer had authority to burn the blend, even though the blend continued to be permitted by the Conditions of Certification that had been issued pursuant to state statute.

Q. The first Title V air permit applicable to Crystal River Units 4 and 5 did not become effective until January 2000. Between 1996 and through 1999, what was the status of PEF's ability to burn a blend of bituminous and PRB subbituminous coals?

A. The answer is provided in FDEP Rule 62-213.420(1)(b)(2), Florida Administrative Code, which provides that, in the event a permit proceeding is delayed, the permitted entity can continue to rely on the permit authority in place at the time. The effect of the department rule on the question you pose is that, until the Title V permit became effective in January 2000, PEF could continue to rely on the authority provided by the Conditions of Certification to burn the mixture.

Q. Are you aware of the efforts of PEF to obtain authority to burn PRB coal after the Title V permit limitation became effective?

A. I am informed that PEF began a test burn in 2004, but halted it when its environmental department informed the plant that the Title V permit did not authorize PEF to burn PRB coal in CR4 and CR5. The subsequent application for

a construction permit reflects that in its first overtures to FDEP following this incident PEF argued that a permit should be unnecessary, but was rebuffed by the agency. (See Exhibit __ (SS-3) PEF's application for a construction permit to conduct a test burn was granted in April 26, 2996. PEF conducted a test burn in May 2006, then applied for a permanent construction permit for authority to burn a blend of PRB and bituminous coals in Crystal River Units 4 and 5 in September of 2006 (part of a larger permit application package) which has not yet been granted. Ultimately, that permit, when granted, will need to become an amendment to the terms of PEF's Title V air permit.

Q. Based on your experience, how difficult would it have been to include subbituminous coal as a fuel in the first Title V permit applicable to CR4 and CR5?

A. Based on my experience, I believe the inclusion of subbituminous coal would have been straightforward and simple during the utility's application for the first Title V permit.

Q. Do you have any support for that statement?

A. Yes. In my answer, I will refer to correspondence between FPC and the FDEP that is attached as exhibits to the testimony of OPC witness Robert Sansom. In February of 1999, when the application for its first Title V permit was still pending, PEF asked the FDER to allow it to burn treated bituminous coal briquettes in Crystal River Units 4 and 5. In March of 1999, PEF corresponded again. In its March 1999 letter, PEF said: "In addition, the DEP is currently reviewing FPC's submittal to allow use of 'coal briquettes' in Crystal River Units

1, 2, 4, and 5. FPC understands that approval is forthcoming, pending receipt of a $250 processing fee. Therefore, FPC also requests that the Title V permit also reflect this approval at the appropriate time." In short, only three months after filing a letter request, FPC had reason to believe approval was imminent—reason sufficient to expect the FDEP to roll the request into the pending application for a Title V permit. Further, the FDEP did so. I believe it is reasonable to expect that an amendment to the application to request subbituminous coal similarly would have been favorably received at the time, particularly in view of the fact that the blend would lower NOx and SO2 when compared to bituminous coal only.

Q. Wouldn't PEF have been required to perform a stack test?

A. Yes, that would have been my expectation. However, that is nothing new. The requirement of a stack test was placed in the original Conditions of Certification. PEF, which had stated publicly its desire to have the flexibility to burn a blend of coals, was on notice as to the necessity of a stack test, regardless of its choice of coals. Strictly from an environmental regulatory standpoint, I believe PEF would have been well advised to conduct, at the outset of operations, stack tests with the blended coal that it indicated during the certification process it wanted the flexibility and authority to burn. An early test would have facilitated either the first Title V process or a later amendment to the first Title V permit. Had PEF done so, in my opinion its subsequent argument that an entire new permit process is unnecessary would have been accepted rather than rejected, and nothing more than a freshened stack test would have been required. In my opinion, PEF's after-the-fact approach to the permitting of PRB coal has been more time consuming

and complicated because it chose not to test the units with the blend of coals when the units were first built.

Q. Does this complete your testimony?

A. Yes.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Petition on behalf of Citizens of the State of Florida to require Progress Energy Florida, Inc. to refund customers $143 million	)))))	DOCKET NO. 060658-EI Filed: March 6, 2007

NOTICE OF SERVICE

The Citizens of the State of Florida, by and through Harold McLean, Public Counsel, serve this notice that they have served Rebuttal Testimony of Stephen Smallwood P.E. to John Burnett, Associate General Counsel, Progress Energy Service Company, P.O. Box 14042, St. Petersburg, FL 33733-4042 on the 6th day of March, 2007.

Harold McLean
Public Counsel

Joseph A. McGlothlin
Associate Public Counsel

Office of Public Counsel
c/o The Florida Legislature
111 West Madison Street
Room 812
Tallahassee, FL 32399-1400

Attorney for the Citizens
of the State of Florida

DOCKET NO. 060658-EI
CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of foregoing Rebuttal Testimony of Stephen Smallwood P.E. has been furnished by U.S. Mail on this 6th day of March, 2007, to the following:

James Beasley
Lee Willis
Ausley Law Firm
P.O. Box 391
Tallahassee, FL 32302

Bill Walker
Florida Power & Light Co.
215 S. Monroe St., Suite 810
Tallahassee, FL 32301-1859

Paul Lewis
Progress Energy Florida, Inc.
106 E. College Ave., Suite 800
Tallahassee, FL 32301-7740

Norman H. Horton, Jr.
Fred R. Self
Messer Law Firm
P.O. Box 1876
Tallahassee, FL 32302-1876

John T. Butler, P.A.
Florida Power & Light Company
700 Universe Boulvard
Juno Beach, FL 33408

Lisa Bennett
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

John McWhirter, Jr.
McWhirter, Reeves Law Firm
400 North Tampa St., Suite 2450
Tampa, FL 33602

R. Wade Litchfield
Florida Power & Light Co.
700 Universe Blvd.
Juno Beach, FL 33408-0420

Susan D. Ritenour
Richard McMillan
Gulf Power Company
One Energy Place
Pensacola, FL 32520-0780

Jack Shreve
Senior General Counsel
Office of the Attorney General
The Capitol – PL01
Tallahassee, FL 32399-1050

Brenda Irizarry
Tampa Electric Company
P.O. Box 111
Tampa, FL 33602-0111

Jeffery A. Stone
Russell Badders
P.O. Box 12950
Pensacola, FL 32591

Lieutenant Colonel Karen White
Captain Damund Williams
Federal Executive Agencies
139 Barnes Drive, Suite 1
Tyndall AFB, FL 32403-5319

Cheryl Martin
Florida Public Utilities Company
P.O. Box 3395
West Palm Beach, FL 33402-3395

John T. Burnett
Post Office Box 14042
St. Petersburg, FL 33733

Gary Sasso
J. Walls
D. Triplett
Carlton Fields Law Firm
P.O. Box 3239
Tampa, FL 33601-3239

Florida Retail Federation
100 E. Jefferson Street
Tallahassee, FL 32301

Michael B. Twomey
Post Office Box 5256
Tallahassee, FL 32314-5256

Robert Scheffel Wright
Young van Assenderp, P.A.
225 S. Adams St., Ste. 200
Tallahassee, FL 32301

Joseph A. McGlothlin
Associate Public Counsel

Stephen Smallwood, P.E.
Air Quality Services

1608 Eagles Landing, Unit 64
Tallahassee, FL
850 294 - 9624

ssm97@comcast.net

CY 2007

AREAS OF SPECIALIZATION

Steve Smallwood is an independent consultant, who specializes in major air source permitting, the resolution of air enforcement cases, waste combustion issues, and mobile source issues. He is a 1966 mechanical engineering graduate of the West Virginia University - Institute of Technology, and a past Chair of the Florida Section, Air & Waste Management Association (AWMA), and a past chair of the Florida AWMA Big Bend Chapter in Tallahassee.

He worked as an air pollution control engineer and regional air program manager in West Virginia (from 1966-1978). From 1978-1980, he coordinated the FDER's development of Florida's Nonattainment Areas Corrective Plans. He served as the Director of the Florida Department of Environmental Protection's Air Bureau and later the Air Division from 1980 - 1992. For the past fifteen years he has worked as a consulting engineer, with Dames & Moore, with Environmental Resources Management, and for the past eight years, as an independent consultant dba Air Quality Services.

PROJECT EXPERIENCE

Air Quality Services

Air Permitting

Assisted several law firms in responding to EPA Notices of Violation that alleged that their client made one or more modifications to their plant without obtaining a required Prevention of Significant Deterioration (PSD) air construction permit. The law firms assisted included Amundsen & Gilroy (Tallahassee), Balch & Bingham (Birmingham, AL), and Holland & Knight (Tallahassee).

The affected facilities were utility power plants and a plywood manufacturing plant. The specific types of technical assistance included: review of client and agency permitting files, inspection of the client's facility, emissions test data and emissions factor assessment, rule applicability assessment, calculation of net emissions increases, writing technical reports, participating in the drafting of responses to the US EPA, meeting with the US EPA in Atlanta, and in some cases with the State air agency to discuss an EPA NOV.

Assisted several other law firms in assessing air rule applicability, and resolving citizen complaints. The law firms assisted included Macfarlane Ferguson & McMullen (Tampa), Greenberg Traurig (Miami), Edwards & Angell (New Jersey), Earl Blank Kavanaugh & Stotts (Miami). The types of facilities

involved included a utility power plant, airport construction activities, a hot tub manufacture, and proposed solid sulfur storage and handling operation to be located on Tampa Bay.

Issues included: whether the transfer of assets from one utility to another would result in two facilities where there had been one, resolution of citizen complaints of fugitive dust, the applicability of the CAA's case-by-case MACT (Maximum Achievable Control Technology) hazardous air pollutant (HAP) standard to a proposed change to a process line, and the applicability of the state's sulfur storage & handling rule and the applicability of PSD increments to the construction of a minor facility in Florida.

Prepared a technical report for Pasco Processing LLC's two citrus processing plants that identified the changes made to each plant since 1980, described whether any of the changes made constituted a physical or operational change that required a PSD air construction permit, and calculated each plant's potential emissions.

Prepared air permit applications, exemption requests, and annual operating reports for various companies, including an animal feed mill, a crumb rubber plant, a boxboard plant, an ink manufacturing plant, and several new-design above-ground air curtain incinerators.

Air Presentations and Training

At the 1999 Florida Section Air & Waste Management Association Meeting in Orlando, presented a paper that discussed the volatile organic compound (VOC) and nitrogen oxide (NOx) emissions reduction measures for both stationary and mobile sources that were implemented in Florida during the 1980s, which resulted in Florida attaining compliance with the ozone ambient air quality standard by the early 1990s; and concluded with a discussion of the then current ground level ozone air quality, and the then current regulatory situation in Florida.

At the 2000 Florida Chamber of Commerce Winter Environmental Short Course in Orlando, Robert Manning (Hopping Green & Sams), Paul Amundsen (Amundsen & Gilroy), and Steve Smallwood taught the Air Quality Short-course. Steve Smallwood presented an update on the EPA's proposed revisions to the PSD and Nonattainment Area new source review rules, including the optional special provisions being considered for existing coal-fired electric utility plants.

At the 2003 Florida Section Air & Waste Management Association Meeting in Orlando, chaired a technical session on waste management issues.

At the 2004 Florida Section Air & Waste Management Association Meeting in Orlando, presented a paper that discussed the various uses of the newer above ground refractory-lined air curtain incinerators, and their typical emissions compared to open burning and multiple chamber incinerators. At that same meeting, chaired a technical session on other waste management issues.

Environmental Resources Management

Air Permitting

Assisted Wheelabrator Environmental Services resolve several issues involving a special sulfur dioxide emissions test program required by the PSD permit and negotiate the final BACT emission limits for the company's Ridge Generating Station (electrical power plant) in Auburndale, Florida.

Prepared various air permit applications for industrial boilers, boat building operations, stone crushing and processing operations, an aircraft jet engine repair and testing plant, a sugar mill, boxboard plants, a fullers earth processing plant, and a sewage sludge incinerator. Prepared or assisted other ERM employees prepare the Title V air operation permit applications and annual emissions fee forms for ERM's Florida clients.

Assisted the Florida Citrus Processors Association (FCPA) respond to the Florida DEP's request that the industry determine the VOC emission rates for the citrus peel dryers and coolers that are part of most of the two dozen citrus juice processing plants in Florida. Developed a DEP approved emissions testing protocol. Inspected citrus processing plants. Reviewed the current DEP citrus plant air permits. Coordinated the testing program. Reviewed the test reports and prepared a summary report on the results. Discussed the results with the DEP. Conducted industry workshops on the testing results and on how the PSD air permitting rules would apply to a citrus plant that is subject to that rule.

All of the plants, except one, were found to be major sources for Title V due to the peel dryer VOC emissions. All of those obtained Title V air operation permits. Only a few of them had made changes that were subject to PSD review.

Several years ago, the Florida legislature adopted special state legislation (in the form a "permit by statute,") that provides for a "general air permit" for the Florida citrus plants. The state has been working with the US EPA to have the federal government approve the special Florida statute as an acceptable substitute for the US EPA air permitting rules that would otherwise apply. The legislation provided for the state law that authorized these special provisions for the Citrus Industry to automatically expire if the US EPA did not approve the special provisions as an amendment to the Florida State Air Program Implement Plan (FL SIP).

During last year's session of the legislature, the Citrus Industry needed to have the legislature extend the expiration date of the statute by one year (provided for in the original statute), since the US EPA had not yet approved the provisions in the statute. The Industry chose not to ask for the extension. The special provisions expired as state law on July 15, 2005. The owners of citrus processing plants in Florida now required to submit applications under the current EPA / FDEP air rules to obtain any required air construction and/or operation permits.

Dames & Moore

Responsible for assisting the Florida Concrete & Products Association (FC&PA) negotiate a general protocol with the FL DEP for resolving compliance issues and processing Title V air operating permit applications.

Responsible for assisting Talisman Sugar resolve an air enforcement case with Palm Beach County and the FL DEP concerning three bagasse fired boilers.

Responsible for assisting the Florida Department of Corrections (FLDC) obtain air permits for the boilers at several prisons that needed new or revised air permits. Responsible for providing technical and logistical support to the University of Central Florida (Orlando) in conducting motor vehicle "cold/hot" start operating mode traffic surveys in for Florida urban areas for the Florida Department of Transportation.

Responsible for preparing the air portion of an EIS for a Shell Western exploratory oil well on an Indian Reservation in the south Florida area.

Responsible for assisting Dames & Moore's Washington, DC office in identifying air training needs for the Duquense Light Company in Pittsburgh, PA.

Florida Department of Environmental Protection

Bureau Chief & Division Director

Responsible for assisting the Department develop and pass the state legislation that implements the Clean Air Act (CAA) Title V Air Operation Permit Program in Florida; the Florida Clean Outdoor Air Law, which created the highway motor vehicle tailpipe emissions testing program in Florida's Ozone Nonattainment Areas, and established Florida's statewide tailpipe visible emissions standards and motor vehicle pollution control equipment anti-tampering program; and an amendment to the COAL that created the Florida motor vehicle CFC ("freon") Recovery and Recycling Program.

Project Engineer - NAA SIP Revisions

Responsible for writing the Florida nonattainment area corrective plans for ozone, particulate matter, and sulfur dioxide, required by the 1977 federal CAA amendments. [By 1990, all areas of Florida were showing compliance with the National Ambient Air Quality Standards (NAAQS) and all of the nonattainment areas had been redesignated as attainment/maintenance areas or were a candidate for redesignation]. All areas of Florida are currently in compliance with all of the US EPA's National Ambient Air Quality Standards.

Responsible for developing a plan for obtaining delegation of the U.S. EPA air permitting programs in 1982. Within the following three years, the plan was implemented and the FDEP obtained delegation of all of the EPA's air permitting programs

West Virginia Air Pollution Control Commission

Regional Engineer - Northern Panhandle Office

Served as manager of the regional office located in Wheeling WV.

Implemented Air Pollution Episode source emissions reduction plans for the WV portion of the North Ohio Valley Air Quality Control Region.

Negotiated compliance schedules with power plants, steel mills, chemical plants, coal preparation plants, and other facilities subject to the federally approved WV State Implementation Plan (SIP). Established and operated a four county regional air monitoring network with a support laboratory.

Worked with the Pittsburgh and Ohio air agencies to develop a uniform tri-state air quality index for the region's new media. [The President's Council on Environmental Quality (CEQ) and the US EPA later adopted the index developed in the tri-state area as the basis for the US EPA's Pollutant Standards Index (PSI), which is now used as the national air quality index].

Staff Engineer - Headquarters' Office

Organized a stack testing team that conducted research and compliance tests. Served as a member of the project team that wrote the original WV SIP required by the 1970 CAA. Helped research and write new rules for open burning, coal preparation plants, asphalt hot mix plants, glass plants, cement manufacturing plants, industrial boilers, and utility steam electric plants.

Conducted compliance inspections for sources subject to the Commission's regulations, investigated air pollution complaints; and conducted a community air pollution survey (emissions inventory, ambient monitoring, dispersion modeling, emissions reductions options and recommendations) for Martinsburg, WV.

PUBLICATIONS

At the 2002 International Annual Meeting of the Air & Waste Management Association in Orlando, I served as the moderator for the Brownsfield Panel discussion. A representative of the Florida Department of Environmental Protection' Waste Management Division, a representative of the environmental engineering company Levine Fricke Recon, and two representatives of the environmental liability insurance industry discussed the then current Brownsfields program and the changes the US EPA was considering for the program. The discussion included short presentations by the panel members and questions and comments from the audience.

At the 2000 Florida Chamber of Commerce Winter Environmental Short Course in Orlando, Robert Manning (Hopping Green Sams & Smith), Paul Amundsen (Amundsen & Moore), and I taught the Air Quality Short-course. Presented an update on the EPA's proposed revisions to the PSD and Nonattainment Area new source review rules, including the optional special provisions being considered for existing coal-fired electric utility plants. EPA' New Source Review Reforms, (Feb 2000).

At the 1999 Florida Section Air & Waste Management Association Meeting in Orlando, I presented a paper that discussed the volatile organic compound (VOC) and nitrogen oxide (NOx) emissions reduction measures for both stationary and mobile sources that were implemented in Florida during the 1980s that resulted in Florida attaining compliance with the ozone ambient air quality standard by the early 1990s. Concluded with a discussion of the then current ground level ozone air quality and the regulatory situation in Florida. The Florida Ozone Situation, (Sept 1999)

At the 1998 Florida Section Air & Waste Management Association Meeting in St. Augustine, I presented a paper that discussed the regulatory issues and the emissions testing results based on the work done for the Florida Citrus Processors Association. Citrus Processing Plant Emission Factors: Volatile Organic Compounds. (Sept 1998).

At the 1994 Executive Enterprises' Environmental Update Conference, I presented a paper entitled Florida's Title V Program. (Feb 1994)

At the 1994 Florida Environmental Expo in Tampa, I presented a short course entitled Air Permitting Requirements. (Oct 1994).

At the 1993 Florida Chamber of Commerce Winter Environmental Short Course in Tallahassee, I presented a short course on Basic Air Permitting (Jan 93).

Made similar types of presentations at many of the Florida AWMA meetings and various other environmental groups meetings during the 1980's

Air Pollution Survey Guidelines for Army Installations, Technical Report N-5, U.S. Army, CERL, July 1976. As a consultant to the Army's Construction Engineering Research Laboratory, Urbana, IL, provided draft text and drawings for the CERL air pollution survey manual for Army installations (emissions inventory, air dispersion modeling, ambient monitoring, data analysis, and report writing).

Particulate Matter Emissions Compliance Test for Fuel Burning Units, TP-2. WVAPCC, October 1972. Wrote the procedure that was used for stack testing existing fuel-fired boilers in WV for particulate emissions. The method was similar to the method later adopted by the U.S EPA as EPA Method 17.

EDUCATION

B.S. Mechanical Engineering, West Virginia University - Institute of Technology, Montgomery, WV
USAF Officers Training School, San Antonio, TX
USAF Base Civil Engineering Course, Dayton, OH
USAF Squadron Officers Training Course, USAF Correspondence Course, Charleston, WV
US EPA Advanced Stack Sampling Course, RTP, NC

Florida Registered Professional Engineer No. 26 630

AFFILIATIONS

Member, Air & Waste Management Association, 1967 - Present
Past Chair, Florida Section AWMA
Past Chair, Florida Section, Big Bend Chapter, Tallahassee, FL

Past Advisory Director, Florida Lung Association, 1986-87
Past Advisory Director, Florida Phosphate Research Council, 1986-87

MILITARY SERVICE

USAF Civil Engineering Officer 1967 - 72
(Retired – Honorable Discharge)
130th Special Operations Squadron
Charleston, W.Va.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Petition on behalf of Citizens of the State of Florida to require Progress Energy Florida, Inc. to refund to customers $143 million	)))))	DOCKET NO. 060658-EI

PROGRESS ENERGY FLORIDA'S RESPONSES TO
OPC'S FOURTH SET OF INTERROGATORIES (Nos. 35-41)

Progress Energy Florida, Inc., ("PEF" or "Company"), responds to OPC's Fourth Set of Interrogatories (Nos. 35-41), as follows:

GENERAL RESPONSES AND OBJECTIONS

PEF incorporates and restates its General Responses and Objections to OPC's Fourth Set of Interrogatories (Nos. 35-41), served on February 5, 2007, as if those responses and objections were fully set forth herein.

INTERROGATORIES

35. For each of the years during the period 1996-2005, state the quantity of coal purchased for and burned in CR Units 4 and 5 pursuant to the "Massey Contract" to which witness Kennedy refers at page 10 of his testimony.

ANSWER:

1996: 660661 tons	2001: 653027 tons
1997: 656205 tons	2002: 315815 tons
1998: 660538 tons	2003: none under this contract
1999: 604065 tons	2004: none under this contract
2000: 660638 tons	2005: none under this contract

Some of this coal was shipped on a Synfuel spot order at a contractual reduced price.

36. With respect to the conditions of certification that relate to opacity and stack emissions of SO_2 and NO_x imposed by the Florida Electrical Power Plant Siting Board on the operation of Crystal River Units 4 and 5:

a. Did any of the conditions differ from the limits, standards, or conditions proposed by PEF's predecessor either in its application or in submissions or proposals that followed the application? If your answer is yes, please identify each such instance, and state the condition proposed by the predecessor and that approved by the Siting Board.

ANSWER: No. The proposed SO_2, NOx , and opacity limitations corresponded to the federal NSPS limits at that time. These were the limits contained in the conditions of certification.

36. With respect to the conditions of certification that relate to opacity and stack emissions of SO_2 and NO_x imposed by the Florida Electrical Power Plant Siting Board on the operation of Crystal River Units 4 and 5:

b. With respect to each of the items identified in (a) above, did PEF's predecessor object to and litigate the standard before it was imposed, or did it indicate its acceptance of the condition, whether by stipulation or otherwise?

ANSWER: No. Because the emissions limits corresponded to those proposed, there were no objections to them.

37. With respect to the Conditions to Approval issued by the federal EPA for Crystal River Units 4 and 5 in the areas of SO_2 stack emissions, NO_x stack emissions, mass emissions limits on particulates, and opacity:

a. Did any of the conditions on approval differ from standards proposed by PEF's predecessor? If so, identify each such standard, and state the proposal of the predecessor and the condition that was imposed.

ANSWER: No. The proposed SO_2, NOx , particulate matter and opacity limitations corresponded to the federal NSPS limits at that time. These were the limits contained in the Conditions to Approval issued by the federal EPA.

37. With respect to the Conditions to Approval issued by the federal EPA for Crystal River Units 4 and 5 in the areas of SO_2 stack emissions, NO_x stack emissions, mass emissions limits on particulates, and opacity:

b. With respect to each item identified in your answer to (a) above, did the predecessor object to and litigate the item, or did it indicate by stipulation or otherwise its acceptance of the limitation?

ANSWER: No. Because the emissions limits corresponded to those proposed, there were no objections to them.

Docket No. 060658
Rebuttal Testimony of OPC witness
Stephen Smallwood P.E.
Exhibit No. ____ (SS – 3)
Page 1 of 34

Progress Energy

March 3, 2006

Mr. Jeff Koerner
DEP/DARM
North Permitting Section
Division of Air Resource Management
2600 Blair Stone Road MS 5500
Tallahassee, Florida 32399-2400

Re: Crystal River Facility – Title V Permit 0170004-009-AV
Proposed Powder River Basin (PRB) Coal Test Burn
Air Construction Permit Application

Dear Mr. Koerner:

Attached is an application for an air construction permit for a proposed trial burn of PRB coal at Crystal River, as discussed during our visit to your offices on February 10, 2006. Specifically, Progress Energy Florida proposes to fire a coal blend of up to 30 percent PRB coal and 70 percent bituminous coal.

Enclosed please find an original and three copies of the application package. We would very much appreciate your expedited processing of the application.

Thank you for your help in this matter. Please contact me at (727) 820 5295 or Scott Osbourn, P.E. at (813) 287-1717 if you have any questions.

Sincerely,

for

Dave Meyer
Senior Environmental Specialist

cc: Ms. Mara Nasca, FDEP SW District (Cover Letter)

P.O. Box 14042, CX1B • St. Petersburg • Florida 33733-4042 • (727) 820-5151
A Progress Energy Company

MINOR SOURCE AIR CONSTRUCTION PERMIT APPLICATION
COMBUSTION OF POWDER RIVER BASIN (PRB) COAL
CRYSTAL RIVER ENERGY COMPLEX
CRYSTAL RIVER, CITRUS COUNTY, FLORIDA

Submitted to:

Progress Energy Florida
100 Central Avenue
St. Petersburg, Florida 33701

Submitted by:

Golder Associates Inc.
5100 West Lemon Street
Suite 114
Tampa, Florida 33609

Distribution:

4 Copies Department of Environmental Protection
2 Copies Progress Energy Florida
2 Copies Golder Associates Inc.

March 2006

053-9583

PART I – FDEP APPLICATION FOR AIR PERMIT

PART II – APPLICATION REPORT

LIST OF APPENDICES

PART I

FDEP APPLICATION FOR AIR PERMIT

Department of Environmental Protect

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit for a proposed project:

- subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- at an existing federally enforceable state air operation permit (FESOP) or Title V permitted facility.

Air Operation Permit – Use this form to apply for:

- an initial federally enforceable state air operation permit (FESOP); or
- an initial/revised/renewal Title V air operation permit.

Air Construction Permit & Revised/Renewal Title V Air Operation Permit (Concurrent Processing Option) – Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: PROGRESS ENERGY FLORIDA, INC.
2. Site Name: CRYSTAL RIVER POWER PLANT
3. Facility Identification Number:
4. Facility Location...:
   Street Address or Other Locator: NORTH OF CRYSTAL RIVER, WEST OF U.S. 19
   City: CRYSTAL RIVER County: CITRUS Zip Code: 34428
5. Relocatable Facility? ☐ Yes ☒ No
6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: DAVE MEYER, SENIOR ENVIRONMENTAL SPECIALIST
2. Application Contact Mailing Address...
   Organization/Firm: PROGRESS ENERGY FLORIDA
   Street Address: 100 CENTRAL AVE CX1B
   City: ST. PETERSBURG State: FL Zip Code: 33701
3. Application Contact Telephone Numbers...
   Telephone: (727) 820-5295 ext. Fax: (727) 820-5229
4. Application Contact Email Address: DAVE.MEYER@PGNMAIL.COM

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	
2. Project Number(s):	
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

APPLICATION INFORMATION

Purpose of Application

This application for air permit is submitted to obtain: (Check one)

Air Construction Permit

☒ Air construction permit.

Air Operation Permit

☐ Initial Title V air operation permit.
☐ Title V air operation permit revision.
☐ Title V air operation permit renewal.
☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.
☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

☐ Air construction permit and Title V permit revision, incorporating the proposed project.
☐ Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

☐ I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

Progress Energy is proposing to conduct a trial burn of a bituminous and subbituminous blend. Specifically, a trial burn will be conducted for a blend of as much as 30% powder river basin (PRB) coal with the existing bituminous coal supply. See Part II for details of the proposed trial burn.

The trial burn is proposed to begin on around May 1, 2006 and is expected to last about 60 days. The blend will be fired in Units 4 and/or 5, depending on circumstances at the time of the test burn. It's proposed to burn approximately 64,000 short tons (approximately 4 barges) of the blended fuel. This translates into roughly 226 total full load operating hours of burn time for one unit, or about 113 hours total (approximately 5 days), if both units are operating concurrently.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
004	FFSG, Unit 4		NA
003	FFSG, Unit 5		NA

Application Processing Fee

Check one: ☐ Attached - Amount: $_____ ☒ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :
   BERNIE CUMBIE, PLANT MANAGER
2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: PROGRESS ENERGY
   Street Address: 100 CENTRAL AVE CN77
   City: ST PETERSBURG State: FLORIDA Zip Code: 33701
3. Owner/Authorized Representative Telephone Numbers...
   Telephone: (352) 563-4484 ext. Fax: (352) 563-4496
4. Owner/Authorized Representative Email Address: BERNE.CUMBIE@PGNMAIL.COM
5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other requirements identified in this application to which the facility is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit.

Bernie M Cumbie — Signature

3/1/06 — Date

APPLICATION INFORMATION

Application Responsible Official Certification

Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):
   - ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.
   - ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
   - ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.
   - ☐ The designated representative at an Acid Rain source.

3. Application Responsible Official Mailing Address...
   Organization/Firm:
   Street Address:
   City: State: Zip Code:

4. Application Responsible Official Telephone Numbers...
   Telephone: ( ) - ext. Fax: ( ) -

5. Application Responsible Official Email Address:

6. Application Responsible Official Certification:

   I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

   _____ _____
   Signature Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: SCOTT OSBOURN
   Registration Number: 57557
2. Professional Engineer Mailing Address...
   Organization/Firm: Golder Associates Inc.**
   Street Address: 5100 West Lemon St., Suite 114
   City: Tampa State: FL Zip Code: 33609
3. Professional Engineer Telephone Numbers...
   Telephone: (813) 287-1717 ext.211 Fax: (813) 287-1716
4. Professional Engineer Email Address: SOSBOURN@GOLDER.COM
5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here ☐, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature SCOTT OSBOURN LICENSE NO. 57557 STATE OF FLORIDA PROFESSIONAL ENGINEER (Seal)

Date 3/3/06

* Attach any exception to certification statement.

** Board of Professional Engineers Certificate of Authorization #00001670

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone 17 East (km) 334.3 North (km) 3204.5		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) 28/57/34 Longitude (DD/MM/SS) 82/42/01	
3. Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Major Group SIC Code: 49	6. Facility SIC(s):
7. Facility Comment :			

Facility Contact

1. Facility Contact Name: DAVE MEYER, SENIOR ENVIRONMENTAL SPECIALIST
2. Facility Contact Mailing Address... Organization/Firm: PROGRESS ENERGY Street Address: 100 CENTRAL AVE CX1B City: ST PETERSBURG State: FLORIDA Zip Code: 33701
3. Facility Contact Telephone Numbers: Telephone: (727) 820-5295 ext. Fax: (727) 820-5229
4. Facility Contact Email Address: DAVE.MEYER@PGNMAIL.COM

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I. that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Facility Primary Responsible Official Email Address:

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☒ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☐ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment:	

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
PM	A	N
PM10	A	N
SO2	A	N
CO	A	N
NOx	A	N
VOC	A	N

FACILITY INFORMATION

FACILITY INFORMATION

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility Wide Cap [Y or N]? (all units)	3. Emissions Unit ID No.s Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

C. FACILITY ADDITIONAL INFORMATI

Additional Requirements for All Applications, Except as Otherwise Stated

1. Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:____ ☒ Previously Submitted, Date:____
2. Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:____ ☒ Previously Submitted, Date:____
3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:____ ☒ Previously Submitted, Date:____

Additional Requirements for Air Construction Permit Applications

1. Area Map Showing Facility Location: ☐ Attached, Document ID:____ ☒ Not Applicable (existing permitted facility)
2. Description of Proposed Construction or Modification: ☒ Attached, Document ID:PART II
3. Rule Applicability Analysis: ☒ Attached, Document ID:PART II
4. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.): ☐ Attached, Document ID:____ ☒ Not Applicable (no exempt units at facility)
5. Fugitive Emissions Identification (Rule 62-212.400(2), F.A.C.): ☐ Attached, Document ID:____ ☒ Not Applicable
6. Preconstruction Air Quality Monitoring and Analysis (Rule 62-212.400(5)(f), F.A.C.): ☐ Attached, Document ID:____ ☒ Not Applicable
7. Ambient Impact Analysis (Rule 62-212.400(5)(d), F.A.C.): ☐ Attached, Document ID:____ ☒ Not Applicable
8. Air Quality Impact since 1977 (Rule 62-212.400(5)(h)5., F.A.C.): ☐ Attached, Document ID:____ ☒ Not Applicable
9. Additional Impact Analyses (Rules 62-212.400(5)(e)1. and 62-212.500(4)(e), F.A.C.): ☐ Attached, Document ID:____ ☒ Not Applicable
10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): ☐ Attached, Document ID:____ ☒ Not Applicable

Additional Requirements for FESOP Applications

1. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.):
   ☐ Attached, Document ID:_____ ☐ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications

1. List of Insignificant Activities (Required for initial/renewal applications only):
   ☐ Attached, Document ID:_____ ☐ Not Applicable (revision application)
2. Identification of Applicable Requirements (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought):
   ☐ Attached, Document ID:_____
   ☐ Not Applicable (revision application with no change in applicable requirements)
3. Compliance Report and Plan (Required for all initial/revision/renewal applications):
   ☐ Attached, Document ID:_____
   Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.
4. List of Equipment/Activities Regulated under Title VI (If applicable, required for initial/renewal applications only):
   ☐ Attached, Document ID:_____
   ☐ Equipment/Activities On site but Not Required to be Individually Listed
   ☐ Not Applicable
5. Verification of Risk Management Plan Submission to EPA (If applicable, required for initial/renewal applications only) :
   ☐ Attached, Document ID:_____ ☐ Not Applicable
6. Requested Changes to Current Title V Air Operation Permit:
   ☐ Attached, Document ID:_____ ☐ Not Applicable

Additional Requirements Comment

PART II

APPLICATION REPORT

1.0 INTRODUCTION AND EXECUTIVE SUMMARY

The proposed Project involves evaluating the firing of various blend ratios (up to 30 percent) of Powder River Basin (PRB) and Eastern Bituminous (Central App) coal at Crystal River Units 4 and 5. This application for a minor source construction permit will allow for a trial burn as a high-level assessment that will assist Progress Energy Florida (PEF) in the performance of a first-cut evaluation to determine if PRB coal will meet expected performance and environmental criteria.

As discussed in a meeting with the Department on February 7, 2006, Crystal River Units 4 and 5 were originally designed to burn a 50/50 percent blend of Eastern bituminous (Illinois Basin) and Western sub-bituminous coal (PRB). The design specifications, provided by Babcock & Wilcox, are included in Appendix A of this application. The original Site Certification language (attached as Appendix B) allowed for a 50 percent blend of PRB coal. The Site Certification for Units 4 and 5 was issued prior to the effective date of the PSD program and, therefore, no construction permit was originally issued. Permit language that specified the burning of "only bituminous coal" originated in the initial Title V air operation permit, issued on January 1, 2000. Finally, as will be presented, the fuel blend, up to a maximum blend of 30 percent PRB, will have characteristics that closely match those of the bituminous coal types that are currently being burned.

The above factors, in addition to the fact that no plant changes to existing process equipment are necessary to test burn the proposed blend, were presented to the Department as PEF's position that Units 4 and 5 are "capable of accommodating" this fuel blend, and that no air permit changes are necessary. In spite of these factors, and at the Department's direction, PEF is submitting this application to obtain a minor source construction permit to allow for the burning of this fuel blend.

The following sections provide the Project Description (Section 2.0) and the Proposed Project Approach (Section 3.0).

2.0 PROJECT DESCRIPTION

The Crystal River Energy Complex consists of four coal-fired fossil fuel steam generating (FFSG) units with electrostatic precipitators; two natural draft cooling towers for FFSG Units 4 and 5; helper mechanical cooling towers for FFSG Units 1, 2 and Nuclear Unit 3; coal, fly ash, and bottom ash handling facilities, and relocatable diesel fired generator(s). This proposed PRB/CAPP fuel blend firing is only desired for Units 4 and 5. The PRB/CAPP fuel blend will contain up to as much as 30 percent PRB coal, the remainder consisting of the currently fired bituminous coal. The PRB and CAPP coal will be blended off-site and shipped to the Crystal River facility. This will minimize any issues associated with a perceived dust issue should PRB coal be transported and conveyed in a "non-blended" form. Typical characteristics of a 20 percent PRB blend are summarized below.

Coal Classifications

Babcock & Wilcox

Table 3
Classification of Coals by Rank[a] (ASTM D 388)

Class	Group	Fixed Carbon Limits, % (Dry, Mineral-Matter-Free Basis) Equal or Greater Than	Less Than	Volatile Matter Limits, % (Dry, Mineral-Matter-Free Basis) Greater Than	Equal or Less Than	Calorific Value Limits, Btu/lb (Moist,[b] Mineral-Matter-Free Basis) Equal or Greater Than	Less Than	Agglomerating Character
I. Anthracitic	1. Meta-anthracite	98	—	—	2	—	—	Nonagglomerating
	2. Anthracite	92	98	2	8	—	—	
	3. Semianthracite[c]	86	92	8	14	—	—	
II. Bituminous	1. Low volatile bituminous coal	78	86	14	22	—	—	Commonly agglomerating[c]
	2. Medium volatile bituminous coal	69	78	22	31	—	—	
	3. High volatile A bituminous coal	—	69	31	—	14,000[d]	—	
	4. High volatile B bituminous coal	—	—	—	—	13,000[d]	14,000	
	5. High volatile C bituminous coal	—	—	—	—	11,500	13,000	Agglomerating
		—	—	—	—	10,500[e]	11,500	
III. Subbituminous	1. Subbituminous A coal	—	—	—	—	10,500	11,500	Nonagglomerating
	2. Subbituminous B coal	—	—	—	—	9,500	10,500	
	3. Subbituminous C coal	—	—	—	—	8,300	9,500	
IV. Lignitic	1. Lignite A	—	—	—	—	6,300	8,300	
	2. Lignite B	—	—	—	—	—	6,300	

[a] This classification does not include a few coals, principally nonbanded varieties, which have unusual physical and chemical properties and which come within the limits of fixed carbon or calorific value of the high volatile bituminous and subbituminous ranks. All of these coals either contain less than 48% dry, mineral-matter-free Btu/lb.

[b] Moist refers to coal containing its natural inherent moisture but not including visible water on the surface of the coal.

[c] If agglomerating, classify in low volatile group of the bituminous class.

[d] Coals having 69% or more fixed carbon on the dry, mineral-matter-free basis shall be classified according to fixed carbon, regardless of calorific value.

[e] It is recognized that there may be nonagglomerating varieties in these groups of the bituminous class, and there are notable exceptions in high volatile C bituminous group.

Product will be pre-blended prior to site delivery.

80%CAPP/20%PRB
11,300-11,800 Btu/lb

*From Babcock & Wilcox, "Steam Book", 40th edition; pg.8-5.

Progress Energy

3.0 PROPOSED PROJECT APPROACH

PEF anticipates conducting the test burn over an extended period of time to allow the impact of PRB coal to accumulate in the boiler and other components, so that the effects of PRB coal can be determined. Ash deposits on the furnace water walls will take some time to accumulate. A short-term test burn may not show any adverse effects that will become evident later when the blend is fired on a longer duration.

PEF, therefore, proposes a test burn of four barge loads of the blended fuel. Each barge is approximately 16,000 tons of blended coal, or a total of 64,000 tons. Assuming a fuel heating value of 11,800 Btu/lb (approximate for an 80/20 percent bituminous and PRB blend) and the current heat input limit for Units 4 and 5 of 6,665 MMBtu/hr each, it would take approximately 226 total full load operating hours to combust all four barge loads. With both units operating simultaneously, it would take half the time, or roughly 113 hours of full load operation from each unit (approximately 5 days) to complete the trial burn. To accomplish this, PEF proposes a 60 day trial burn period, commencing on May 1, 2006. This 60 day window will allow for flexibility in the testing schedule, given the uncertainties in barge deliveries and PEF's reliance on an off-site third party blending facility.

PEF anticipates the following effects on pollutants of concern:

- SO_2 should be comparable or reduced;
- NOx should be comparable or reduced;
- PM/PM_{10} should be comparable (fugitive dust addressed by off-site blending); and
- CO/VOCs should be comparable.

All conditions of the existing permit related to air pollution emission limits and control equipment will remain in force during the trial burn. CEMS data will be recorded and analyzed for the duration of the trial burn for SO_2, NOx and opacity. An emission test will also be conducted and results reported for PM/PM_{10} (EPA Method 5 or 17). Daily records (i.e., mass fuel feed rates and heat input) of the boiler operations when firing the fuel blend will be maintained and reported. Performance testing will cease as soon as possible if the test boiler operations are not in accordance with current

permit conditions or this protocol. Performance testing with this coal blend will not resume until appropriate measures to correct the problem have been implemented. A test report will be submitted to the Department within 45 days of completion of the trial burn.

The exhibit below summarizes some of the predicted modeled characteristics of a 20 percent PRB blend, including the anticipated effects on NOx, SO_2 and fly ash LOI (loss on ignition). In addition, certificates of analysis are presented in Appendix C for a currently-fired Central Appalachian (CAPP) coal, PRB coal and a proposed 70/30 percent CAPP/PRB blend. As discussed previously, the characteristics of the proposed blend are similar to the Central Appalachian (CAPP) bituminous coal currently burned.

CR 5 Performance Comparison
Ranges of 4 coals

Item	Low	CAPP/PRB Blend	High	Comment (CAPP/PRB)
Higher Heating Value (Btu/lb)	11,733	11,743	12,498	OK
Moisture (%)	7	10	12	OK
Volatile Matter (%)	30.2	30.7	36.3	OK
Fixed Carbon (%)	47	50	51	OK
Ash (%)	4.8	9.4	11.5	OK
Sulfur (%)	**0.61**	**0.61**	**0.74**	**Benefit**
Hardgrove Grindability (HGI)	**48**	**54**	**55**	**Benefit**
Auxiliary Power (MW)	33	35	35	Marginal
Calculated Derate (MWg)	0	0	0	OK
Boiler Efficiency, HHV Basis (%)	88.1	88.1	89.4	Marginal
Adjusted Mill Capacity (tph)	48	54	55	OK
Required Throughput Per Mill (tph)	45	49	49	OK
Mill Power Required (kW)	**1,458.44**	**1,490.30**	**1,572.29**	**Benefit**
Opacity Actual (%) - predicted	3.1	6.6	7.0	OK
SO2 Production (lb/mmBtu)	**1.04**	**1.04**	**1.10**	**Benefit**
NOx Production (lb/mmBtu)	0.54	0.54	0.54	OK
Total Forced Outage Hours	545	573	637	OK
Total Maintenance/Availability Cost ($MM)	**1.276**	**1.291**	**1.348**	**Benefit**
Fly Ash LOI (%)	4.5	6.0	10.5	Marginal
Fly Ash Production Rate (tons/hr)	12	23	27	OK
Period Fly Ash Production (tons/yr)	84,211	172,463	194,619	OK
Annual Coal Burn Rate ('000's tons/yr)	2,051	2,291	2,291	Marginal

**The coals modeled include normal domestic calibration coal, Drummond Colombian coal, 60% CAPP/40% Venez coal and 80%CAPP/20%PRB. (See Appendix for further modeling details.)*

Progress Energy

APPENDIX A

UNITS 4 AND 5 DESIGN SPECIFICATIONS

Progress Energy

Instructions

for the

Care and Operation

of

Babcock & Wilcox Equipment

furnished on Contract

RB-588

for

Florida Power Corporation

Crystal River Plant
Unit 4

UNIT DESCRIPTION

PLANT

This unit is installed as Unit No. 4 at the Crystal River Plant located near Crystal River, Florida. Plant elevation is 11 feet above sea level.

The unit supplies steam to a GE turbine rated at 665 MW. The consulting engineer is Black & Veatch, Kansas City, Missouri.

BOILER

This is a semi-indoor, balanced draft Carolina Type Radiant Boiler designed for pulverized coal firing. The unit has 54 Dual-Register burners arranged in three rows of nine burners each on both the front and rear walls. Furnace dimensions are 79 feet wide, 57 feet deep, and 201 feet from the centerline of the lower wall headers to the drum centerline. The steam drum is 72 inches ID.

The maximum continuous rating is 5,239,600 lb/hr of main steam flow at 2640 psig and 1005° F at the superheater outlet with a reheat flow of 4,344,700 lb/hr at 493 psig and 1005° F with a normal feedwater temperature of 546° F. This is a 5% overpressure condition. The full load rating is 4,737,900 lb/hr of main steam flow at 2500 psig and 1005° F with a reheat flow of 3,959,800 lb/hr at 449 psig and 1005° F with a normal feedwater temperature of 535° F. Main steam and reheat steam temperatures are controlled to 1005° F from MCR load down to half load (2,368,900 lb/hr) by a combination of gas recirculation and spray attemperation.

The unit is designed for cycling service and is provided with a full boiler by-pass system. The unit can be operated with either constant or variable turbine throttle pressure from 63% of full load on down.

The design pressures of the boiler, economizer, and reheater are 2975, 3050, and 750 psig respectively.

Steam for boiler soot blowing is taken off the primary superheater outlet header. Steam for air heater soot blowing is taken off the secondary superheater outlet.

SCOPE OF SUPPLY

The major items of equipment supplied by B&W include:

- RBC unit pressure parts including boiler, primary and secondary superheater, economizer, and reheater.
- Fifty-four Dual-Register burners and lighters.
- Six MPS-89GR pulverizers and piping to burners.
- By-pass system including valves and piping.
- Two stages of superheat attemperators (first stage tandem) and one stage of reheat attemperation (2 nozzles); nozzles only, no block or control valves or spray water piping.
- Three Rothemuhle air heaters (one primary and two secondary).
- Ducts from secondary air heaters to windbox.

PEF-FUEL-002686

Docket No. 060658
Rebuttal Testimony of OPC witness
Stephen Smallwood P.E.
Exhibit No. ____ (SS – 3)
Page 25 of 34

Progress Energy

- Primary air system: two TLT centrifugal PA fans and ducts from fans to pulverizers.
- Gas recirculation system: one TLT centrifugal GR fan, one dust collector and flues.
- Six Stock gravimetric coal feeders and drives.
- Bailey burner controls.
- Safety valves and ERV.
- Brickwork, refractory, insulation and lagging (BRIL).
- Seal air piping and fans.
- Erection.
- Recommended spare parts.

FUEL

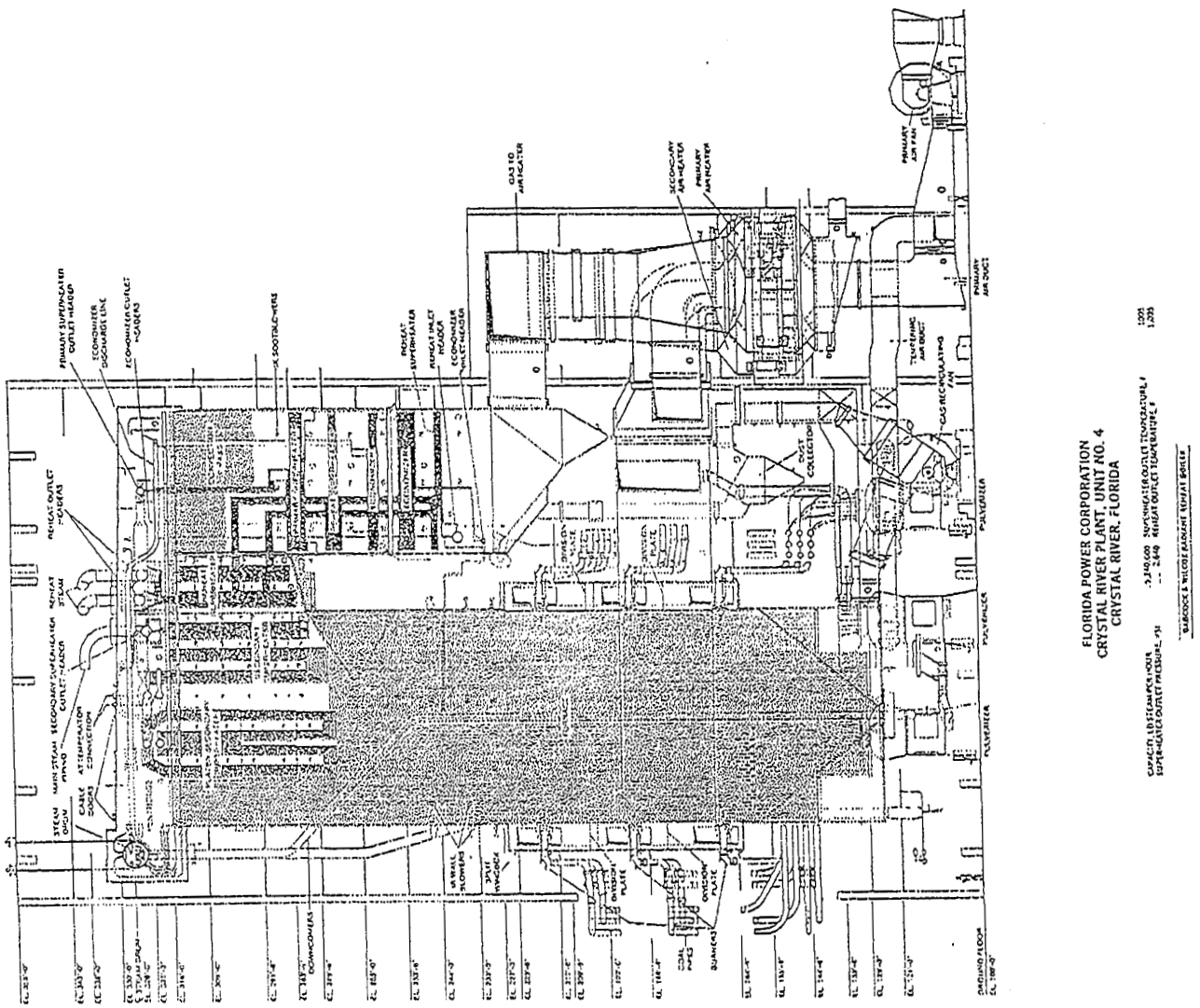
The guarantees for this unit are based on firing a 50/50 blend of Eastern bituminous and Western sub-bituminous coal. The performance coal is classified as high slagging and medium fouling. Performance was also checked on Illinois deep-mined coal which is classified as severe slagging and high fouling. The furnace and convection pass are designed for a severe slagging and severe fouling coal.

Ultimate Analysis: % by Weight

	Performance	Illinois
Ash	7.90	13.00
Sulfur	0.49	4.20
Hydrogen	3.90	4.40
Carbon	58.80	62.00
Chlorine	0.03	0.02
Water	18.50	10.00
Nitrogen	1.10	1.38
Oxygen	9.28	5.00
Total	100.00	100.00
Higher Heating Value	10285 Btu/lb	11000 Btu/lb

Progress Energy

Progress Ener



FLORIDA POWER CORPORATION
CRYSTAL RIVER PLANT, UNIT NO. 4
CRYSTAL RIVER, FLORIDA

Progress Energy

APPENDIX B

UNITS 4 AND 5 SITE CERTIFICATION LANGUAGE

Table 3.2-1. Fuel Analysis--Units 4 and 5 Design Basis Coal Blend

	Design Basis Coal Blend	
	Typical	Range
Proximate Analysis, Per Cent		
Moisture	18.5	4.0-32.0
Ash	7.9	4.4-15.4
Volatile Matter	31.0	24.6-32.1
Fixed Carbon	42.6	32.1-53.0
Ultimate Analysis, Per Cent		
Carbon	58.8	
Hydrogen	3.9	
Nitrogen	1.1	
Chlorine	0.03	
Sulfur	0.49	
Ash	7.9	
Oxygen	9.28	
Heating Value, kJ/kg (BTU/LB)		
As received	23 923 (10,285)	17 910-30 237 (7700-13,000)

APPENDIX C
CERTIFICATES OF ANALYSIS

CERTIFICATE OF ANALYSIS

COMPANY REQUESTING ANALYSIS:	SAMPLE CHRONOLOGY	
Kanawha River Terminals	DATE ANALYSED	June 23, 2005
	LAB NUMBER	999865389
	SAMPLE TAKEN BY	CLIENT

Blend Coal; Analysis 70% Appalachian Coal & 30% Powder River Basin Coal

	AS RECEIVED	DRY BASIS	M.A.F. BTU
PROXIMATE ANALYSIS			
% MOISTURE	13.52	N/A	N/A
%ASH	8.91	10.30	N/A
% VOLATILES	32.89	38.03	N/A
% FIXED CARBON	44.68	51.67	N/A
BTU	11117	12855	14331
% SULFUR	0.56	0.65	N/A
SULFUR FORMS			
% PYRITIC SULFUR	0.08	0.09	
% SULFATE SULFUR	0.24	0.28	
% ORGANIC SULFUR	0.24	0.28	
% TOTAL SULFUR	0.56	0.65	
T-250 TEMP. OF ASH		°F	

ASH FUSION	REDUCING
INITIAL, °F	2440
SOFTENING, °F	2500
HEMMISPHERICAL, °F	2560
FLUID, °F	2640

	AS RECEIVED	DRY BASIS
ULTIMATE ANALYSIS		
% MOISTURE	13.52	N/A
% CARBON	61.16	70.72
% HYDROGEN	4.40	5.09
% NITROGEN	0.89	1.03
% CHLORINE	0.06	0.07
% SULFUR	0.56	0.65
% ASH	8.91	10.30
% OXYGEN (BY DIFF.)	10.50	12.14
		%WT. IGNITED BASIS
ASH MINERAL ANALYSIS		
PHOSPHOROUS PENTOXIDE	(P_2O_5)	0.51
SILICON DIOXIDE	(SiO_2)	46.80
FERRIC OXIDE	(Fe_2O_3)	5.43
ALUMINUM TRIOXIDE	(Al_2O_3)	23.79
TITANIUM DIOXIDE	(TiO_2)	1.67
CALCIUM OXIDE	(CaO)	8.97
MAGNESIUM OXIDE	(MgO)	1.74
SULFUR TRIOXIDE	(SO_3)	4.08
POTASSIUM OXIDE	(K_2O)	0.87
SODIUM OXIDE	(Na_2O)	1.17
UNDETERMINED		4.97
HARDGROVE INDEX	48	DIMENSIONLESS

	PPM AS RECEIVED WHOLE COAL BASIS
TRACE METALS	
ANTIMONY (Sb)	
ARSENIC (As)	2.45
BARIUM (Ba)	
BERYLLIUM (Be)	
CADMIUM (Cd)	
COBALT (Co)	
COPPER (Cu)	
CHROMIUM (Cr)	
GOLD (Au)	
LEAD (Pb)	4.82
LITHIUM (Li)	
MANGANESE (Mn)	
MERCURY (Hg)	0.08
MOLYBDENUM (Mo)	
NICKEL (Ni)	
SELENIUM (Se)	
SILVER (Ag)	
THALLIUM (Tl)	
VANADIUM (V)	
ZINC (Zn)	

ID COMPONENTS	
Manganese Oxide	0.01
Barium Oxide	0.54
Strontium Oxide	0.35

FOULING FACTOR / SLAGGING FACTOR	
CHLORINE	769
FLUORINE	30.41
BROMINE	

PEF-FUEL-002694

Docket No. 060658
Rebuttal Testimony of OPC witness
Stephen Smallwood P.E.
Exhibit No. ____ (SS – 3)
Page 32 of 34

CERTIFICATE OF ANALYSIS

COMPANY REQUESTING ANALYSIS:	SAMPLE CHRONOLOGY	
Kanawha River Terminals	DATE ANALYSED	
	LAB NUMBER	
	SAMPLE TAKEN BY	

Appalachian Coal

	AS RECEIVED	DRY BASIS	M.A.F. BTU
PROXIMATE ANALYSIS			
% MOISTURE	7.97	N/A	N/A
%ASH	10.25	11.14	N/A
% VOLATILES	28.83	31.33	N/A
% FIXED CARBON	52.94	57.53	N/A
BTU	12239	13299	14966
% SULFUR	0.73	0.79	N/A
SULFUR FORMS			
% PYRITIC SULFUR	0.16	0.17	
% SULFATE SULFUR	0.07	0.08	
% ORGANIC SULFUR	0.50	0.54	
% TOTAL SULFUR	0.73	0.32	
T-250 TEMP. OF ASH		°F	

ASH FUSION	REDUCING
INITIAL, °F	2700+
SOFTENING, °F	2700+
HEMMISPHERICAL, °F	2700+
FLUID, °F	2700+

	AS RECEIVED	DRY BASIS
ULTIMATE ANALYSIS		
% MOISTURE	7.97	N/A
% CARBON	65.14	70.79
% HYDROGEN	4.66	5.06
% NITROGEN	0.98	1.06
% CHLORINE	0.08	0.09
% SULFUR	0.73	0.79
% ASH	10.25	11.14
% OXYGEN (BY DIFF.)	10.19	11.07

		%WT. IGNITED BASIS
ASH MINERAL ANALYSIS		
PHOSPHOROUS PENTOXIDE	(P_2O_5)	0.43
SILICON DIOXIDE	(SiO_2)	51.61
FERRIC OXIDE	(Fe_2O_3)	5.31
ALUMINUM TRIOXIDE	(Al_2O_3)	27.04
TITANIUM DIOXIDE	(TiO_2)	1.84
CALCIUM OXIDE	(CaO)	3.99
MAGNESIUM OXIDE	(MgO)	0.83
SULFUR TRIOXIDE	(SO_3)	0.93
POTASSIUM OXIDE	(K_2O)	1.03
SODIUM OXIDE	(Na_2O)	1.26
UNDETERMINED		4.76
HARDGROVE INDEX	46	DIMENSIONLESS

	PPM AS RECEIVED WHOLE COAL BASIS
TRACE METALS	
ANTIMONY (Sb)	
ARSENIC (As)	3.39
BARIUM (Ba)	
BERYLLIUM (Be)	
CADMIUM (Cd)	
COBALT (Co)	
COPPER (Cu)	
CHROMIUM (Cr)	
GOLD (Au)	
LEAD (Pb)	6.41
LITHIUM (Li)	
MANGANESE (Mn)	
MERCURY (Hg)	0.10
MOLYBDENUM (Mo)	
NICKEL (Ni)	
SELENIUM (Se)	
SILVER (Ag)	
THALLIUM (Tl)	
VANADIUM (V)	
ZINC (Zn)	

ID COMPONENTS	
Manganese Oxide	0.01
Barium Oxide	0.57
Strontium Oxide	0.39

FOULING FACTOR	
SLAGGING FACTOR	
CHLORINE	1026
FLUORINE	32.19
BROMINE	

CERTIFICATE OF ANALYSIS

COMPANY REQUESTING ANALYSIS:	SAMPLE CHRONOLOGY	
Kanawha River Terminals	DATE ANALYSED	
	LAB NUMBER	
	SAMPLE TAKEN BY	

Powder River Basin Coal

	AS RECEIVED	DRY BASIS	M.A.F. BTU
PROXIMATE ANALYSIS			
% MOISTURE	26.47	N/A	N/A
%ASH	6.12	8.32	N/A
% VOLATILES	39.47	53.68	N/A
% FIXED CARBON	27.94	38.00	N/A
BTU	8692	11821	12894
% SULFUR	0.24	0.32	N/A
SULFUR FORMS			
% PYRITIC SULFUR	0.01	0.02	
% SULFATE SULFUR	0.17	0.23	
% ORGANIC SULFUR	0.06	0.07	
% TOTAL SULFUR	0.24	0.32	
T-250 TEMP. OF ASH		°F	
ASH FUSION	REDUCING		
INITIAL, °F	2060		
SOFTENING, °F	2100		
HEMMISPHERICAL, °F	2170		
FLUID, °F	2220		

	AS RECEIVED	DRY BASIS
ULTIMATE ANALYSIS		
% MOISTURE	26.47	N/A
% CARBON	49.97	70.58
% HYDROGEN	3.67	5.18
% NITROGEN	0.69	0.97
% CHLORINE	0.01	0.01
% SULFUR	0.24	0.32
% ASH	6.12	8.32
% OXYGEN (BY DIFF.)	12.83	14.62
		%WT. IGNITED BASIS
ASH MINERAL ANALYSIS		
PHOSPHOROUS PENTOXIDE	(P_2O_5)	0.69
SILICON DIOXIDE	(SiO_2)	35.57
FERRIC OXIDE	(Fe_2O_3)	5.71
ALUMINUM TRIOXIDE	(Al_2O_3)	16.21
TITANIUM DIOXIDE	(TiO_2)	1.28
CALCIUM OXIDE	(CaO)	20.60
MAGNESIUM OXIDE	(MgO)	3.85
SULFUR TRIOXIDE	(SO_3)	11.43
POTASSIUM OXIDE	(K_2O)	0.49
SODIUM OXIDE	(Na_2O)	0.98
UNDETERMINED		2.45
HARDGROVE INDEX	52	DIMENSIONLESS

	PPM AS RECEIVED WHOLE COAL BASIS
TRACE METALS	
ANTIMONY (Sb)	
ARSENIC (As)	0.25
BARIUM (Ba)	
BERYLLIUM (Be)	
CADMIUM (Cd)	
COBALT (Co)	
COPPER (Cu)	
CHROMIUM (Cr)	
GOLD (Au)	
LEAD (Pb)	1.11
LITHIUM (Li)	
MANGANESE (Mn)	
MERCURY (Hg)	0.02
MOLYBDENUM (Mo)	
NICKEL (Ni)	
SELENIUM (Se)	
SILVER (Ag)	
THALLIUM (Tl)	
VANADIUM (V)	
ZINC (Zn)	

ID COMPONENTS	
Manganese Oxide	0.01
Barium Oxide	0.47
Strontium Oxide	0.26

FOULING FACTOR	
SLAGGING FACTOR	
CHLORINE	170
FLUORINE	26.25
BROMINE	