112(g) Case-By-Case Maximum Achievable Control Technology Determination
Plant Washington, Power4Georgians, LLC
Construction/Operation of a Coal Fired Power Plant
Located in Sandersville, Georgia (Washington County)

NOTICE OF MACT APPROVAL

SIP Permit Application No. 20397
June 2011

Reviewing Authority

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch
Stationary Source Permitting Program (SSPP)

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Executive Summary

On April 8, 2010, EPD issued Permit No. 4911-303-0051-P-01-0 to P4G authorizing construction of Plant Washington (also known as Power4Georgians, LLC – P4G), a nominal 850 megawatt coal-fired power plant. On May 10, 2010 a petition was filed with the Georgia Office of State Administrative Hearings (OSAH) appealing the Permit's case-by-case MACT and PSD Permit. Although the court ultimately affirmed the Permit in most respects, it ruled in favor of the petitioners' claims regarding both organic and non-mercury metal HAPs, finding that the emissions limitations for filterable particulate matter (PM) (established as a surrogate for non-mercury metal HAPs) and carbon monoxide (CO) (established as a surrogate for organic HAPs) were not reflective of MACT. On December 16, 2010, Judge Ronit Walker issued her ruling in which the permit was remanded back to EPD and later clarified on January 18, 2011 that this permitting action is limited to the reevaluation of the case-by-case MACT review of non-mercury metals and organic HAPs.[1]

Table I – Updated Summary of MACT for Coal-Fired Boiler

HAP	Control Technology Employed by Plant Washington	MACT Emission Limit	Performance Indicator (or surrogate)	New or Existing Requirement
Mercury (Hg)	Activated Carbon Injection (ACI)	7.64×10^{-6} lb/MW-hr (sub-bituminous) 6.82×10^{-6} lb/MW-hr (50/50 Blend)	Direct via a Mercury CEMS	Existing
Non-mercury Metal HAPs	Fabric filter	0.050 lb/MW-hr PM_{total} (equivalent to 5.6×10^{-3} lb/MMBtu)	Indirect via a PM CEMS, initial and periodic stack tests, establish ongoing $PM_{filterable}$ operating limit	New
Hydrochloric Acid (HCl)	Wet scrubber and fabric filter	3.22×10^{-4} lb/MMBtu (sub-bituminous) 1.36×10^{-3} lb/MMBtu (50/50 Coal Blend)	Direct compliance tested via stack tests: indirect monitoring via SO_2 CEMS	Existing
Hydrogen Fluoride (HF)	Wet scrubber and fabric filter	1.40×10^{-4} lb/MMBtu	Direct compliance tested via stack tests: indirect monitoring via SO_2 CEMS	Existing
Organic HAPs	Good combustion practices	No new limit	Indirect via a CO CEMS, work practice standards to ensure good combustion and relationship with NOx	New

[1] *Fall-Line Alliance for a Clean Environment v. Barnes*, Docket No. OSAH-BNR-1031707-98-Walker, Final Decision (OSAH Dec. 16, 2010); *Fall-Line Alliance for a Clean Environment v. Barnes*, Docket No. OSAH-BNR-1031707-98-Walker, Revised and Interlocutory Decision (OSAH Jan. 18, 2011).

1. Assessment

This Case-by-Case Maximum Achievable Control Technology (MACT) Assessment provides (1) background information on the Plant Washington project and its regulatory status, and (2) a MACT Assessment for mercury (Hg), non-mercury metal hazardous air pollutants (HAPs), acid gas HAPs (HF and HCl), and organic HAPs as requested by the Georgia Environmental Protection Division (EPD) – Air Protection Branch.

The Case-by-Case MACT Assessment was originally issued on April 8, 2010 in conjunction with the Prevention of Significant Deterioration (PSD) permit. All information contained in the Notice of MACT Approval dated August 2009 and in the Final Determination dated April 2010 are incorporated by reference and relevant to this re-evaluation of the non-mercury metal HAPs and organic HAPs.

a. EPA's Proposed Electric Generating Unit ("EGU") MACT

The Notice of MACT Approval dated August 2009 gives a synopsis of the regulatory journey up to this point in time. P4G provided a discussion on the next steps involving the new Proposed EGU MACT and its affects on the facility. The following is taken from Application No. 20397.

> *In the period since the Permit was initially issued in April 2010, the regulatory setting has changed substantially. On March 16, 2011, the U.S. Environmental Protection Agency (EPA) issued a proposed rule setting MACT limits for coal-fired electric steam generating units (the "Proposed EGU MACT") under § 112 of the federal Clean Air Act.[2] The Proposed EGU MACT was issued in accordance with a judicial consent decree, which requires EPA to publish a final rule on or before November 16, 2011.*
>
> *Because the Proposed EGU MACT has not yet been finalized by EPA, P4G remains subject to the requirement to obtain a case-by-case MACT determination for Plant Washington under § 112(g) of the Clean Air Act prior to commencing construction.[3] EPA's Proposed EGU MACT is nevertheless significant. The federal regulations governing case-by-case MACT determinations provide:*
>
> > *If the administrator has either proposed a relevant emission standard pursuant to section 112(d) or section 112(h) of the Act or adopted a presumptive MACT determination for the source category which includes the constructed or reconstructed major source, then the MACT requirements applied to the constructed or reconstructed major source shall have considered those MACT emission limitations and requirements of the proposed standard or presumptive MACT determination.[4]*

[2] At the time of applicant's submittal of the MACT analysis to EPD, the Proposed EGU MACT has not been published in the Federal Register. A signed version of the proposed rule is currently available on EPA's website: http://www.epa.gov/ttn/atw/utility/utilitypg.html. The Proposed EGU MACT was finally published in the Federal Register on May 3, 2011.
[3] 42 U.S.C. § 7412(g).
[4] 40 C.F.R. § 63.43(d)(4).

This requirement that case-by-case MACT determinations consider any proposed MACT standards was reiterated in the preamble to 40 C.F.R. Part 63, Subpart B:

> *In determining the appropriate level of control, this rule requires consideration of "available information." In some instances, such information sources are readily apparent. For example, if a Federal MACT standard has been proposed, but not yet promulgated, the EPA expects that a MACT determination will strongly consider that proposal. (Other information may be available in some cases, for example, based upon public comment on the MACT proposal, but such data would need to be adequate to refute the finding in the proposal).*[5]

Thus, while no EGU MACT standard existed when the original case-by-case analysis for Plant Washington was prepared, EPA's recent regulatory action and the applicable state and federal regulations compel P4G and EPD to consider this proposed regulatory action in this case-by-case determination. Accordingly, P4G's amended case-by-case analysis relies upon EPA's Proposed EGU MACT as the starting point for the analysis of the emission limits for non-dioxin/furan organic and non-mercury metal HAPs from Plant Washington.

It is important to note that, prior to promulgating the Proposed EGU MACT, EPA undertook an extensive information gathering effort. In 2009, EPA sent an Information Collection Request (ICR) to hundreds of EGUs. The ICR required the owners or operators of the surveyed EGUs to sample and report emissions of multiple pollutants, including non-dioxin/furan organic and non-mercury metal HAPs. The results of this wide-ranging testing effort, which EPA published on its website in final form on March 16, 2011 (the "ICR Data"),[6] *were then used by EPA to develop the emission limits for non-dioxin/furan organic and non-mercury metal HAPs contained in the Proposed EGU MACT. Collectively, P4G's experts have spent hundreds of hours reviewing these new data.*

In collecting the ICR Data, EPA identified 1,332 coal- or oil-fired boiler units that generated greater than 25 MW of energy. To derive a MACT floor limit for non-dioxin/furan organic HAPs, EPA identified the 175 newest coal-fired units, which were presumed to be the most efficient. EPA then selected 170 of those units to test for CO, volatile organic compounds (VOCs), and total hydrocarbons (THC). Of the 170 units selected for testing, 50 units were required by EPA to conduct additional tests for polycyclic organic matter (POM), nitrogen oxides (NOx), formaldehyde, methane, oxygen (O_2), and carbon dioxide (CO_2).

To derive a MACT floor limit for non-mercury metal HAP emissions, EPA separately selected the 170 coal-fired units with the newest PM controls installed for testing.[7]

[5] Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources, 61 Fed. Reg. 68,384, 68,394 (Dec. 27, 1996). EPA is in the process of receiving formal comments on the Proposed EGU MACT.
[6] http://www.epa.gov/ttn/atw/utility/utilitypg.html.
[7] Information Collection Request For National Emission Standards for Hazardous Air Pollutants (NESHAP) for Coal and Oil Fired Electric Utility Steam Generating Units, Part B of the Supporting Statement, available at http://www.epa.gov/ttn/atw/utility/ g1/eu_mact_icr_part_b.pdf.

b. HAPs to be considered

The following table is a complete list of the HAPs expected to be emitted from the facility and is followed by what this review will entail.

Table II – List of HAPs Emitted from Coal-Fired Power Plants

Organics		**Acid Gases**
PAHs	Methyl methacrylate	Hydrochloric Acid
Acetaldehyde	Methyl tert butyl ether	Fluoride
Acetophenone	Methylene chloride	
Acrolein	Phenol	**Non-mercury Metals**
Benzene	Propionaldehyde	Antimony (Sb)
Benzyl chloride	Tetrachloroethylene	Arsenic (As)
Bis(2-ethylhexyl)phthalate	Toluene	Beryllium (Be)
Bromoform	1,1,1-Trichloroethane	Cadmium (Cd)
Carbon disulfide	Styrene	Chromium (Cr)
2-Chloroacetophenone	Xylenes	Cobalt (Co)
Chlorobenzene	Vinyl acetate	Lead (Pb)
Chloroform	Dioxins	Manganese (Mn)
Cumene	Hexachlorobenzene	Nickel (Ni)
Cyanide	Carbon tetrachloride	Selenium (Se)
2,4-Dinitrotoluene	Quinoline	
Dimethyl sulfate	1,1-Dichloroethylene	
Ethyl benzene	N-nitrosodimethylamine	Mercury
Ethyl chloride	1,1,2-Trichloroethane	
Ethylene dichloride	Trichloroethylene	
Ethylene dibromide	Pentachlorophenol	
Formaldehyde	Trans 1,3 – Dichloropropene	
Hexane	Cresols	
Isophorone	Dibuyl phthalate	
Methyl bromide	Methyl isobutyl ketone	
Methyl chloride	Phthalic anhydride	
Methyl ethyl ketone	Methyl iodine	
Methyl hydrazine		

Given the variety of coal ranks that are to be utilized and the suitable combustion technology, it is necessary to assess each HAP that may be emitted and to determine the physical and chemical properties of that HAP that can be utilized to separate it from the flue gas and to capture it.

EPA and the courts have indicated that HAPs can be characterized and controlled together using surrogates for measuring compliance when three factors are met: 1) whether the HAPs to be regulated are "invariably present" in the emissions of the proposed surrogate; 2) whether the pollution control technology used for the surrogate "indiscriminately captures" the HAPs to be regulated along with the emission of the proposed surrogate; and 3) whether the pollution control technology used for the surrogate is the only means by which a facility could reduce the emissions of the HAPs to be regulated.[8] The case-by-case MACT Assessment provided below for Plant Washington assesses the control technologies that apply to the separate groupings of HAPs and, where appropriate, the air pollutants that are used as a surrogate. The groupings and surrogates for MACT Assessment are:

- Non-mercury Metal HAPs (filterable particulate matter as surrogate)
- Organic HAPs (carbon monoxide as an indicator of complete combustion)

Each HAP category will be addressed to determine the best control mechanism and the best indicator to show maximum control.

[8] *See Sierra Club v. EPA*, 353 F.3d at 984 (citing *Nat'l Lime Ass'n*, 233 F.3d at 639).

2. 112(g) Determination for Coal-Fired Boiler

a. MACT Determination for Mercury Emissions

This permitting action is in response to the OSAH final decision by Judge Walker on December 16, 2010, remanding the permit back to EPD for the limited purpose of re-addressing the case-by-case MACT review for non-mercury metals and organic HAPs. No changes will be made to the case-by-case MACT determinations for mercury or acid gases for the coal-fired boiler, or the case-by-case MACT determinations for the auxiliary boiler.

b. MACT Determination for Non-Mercury Metals Emissions

Applicant's Proposal

(1) PM as a Surrogate for Non- Mercury Metal HAP Emissions

Previous discussion on the use of PM as a surrogate in Application No. 17924 and Notice of MACT Approval dated August 2009 are still applicable. Plant Washington will continue to use PM as an appropriate surrogate for non-mercury metal HAPs.

(2) Non-Mercury Metal MACT Floor

The following is taken from Application No. 20397

In the Proposed EGU MACT, EPA established the MACT floor level for non-mercury metal HAPs based on the ICR Data. For some of the ICR test results, no individual test run data was available. Instead, the source only reported an average of several stack tests. Because variability could not be determined in those situations based on a single data point, EPA evaluated the next best-controlled similar source where individual test run data was available.[9]

Once EPA had identified the best-controlled similar source for a particular metal HAP, the agency incorporated data variability into determination of the MACT floor by determining the 99% Upper Prediction Limit (UPL) of the data set. This analysis used the Student t-test, which has been applied in other EPA regulatory actions (e.g., the Industrial Boiler MACT). EPA used this analysis method to derive a proposed emission limit for Total PM (per EPA Methods 5 and 202), and individual and total non-mercury metal HAPs (per Method 29). EPA established a best-controlled similar source for each individual non-mercury metal HAP, total metal HAPs, and total PM.[10]

[9] Memo regarding development of the MACT floor for the proposed EGU MACT, dated March 16, 2011, from RTI International to EPA OAQPS, available at http://www.epa.gov/ttn/ atw/utility/pro/egu_mact_floor_memo_031611.pdf.
[10] Memo regarding development of the MACT floor for the proposed EGU MACT, dated March 16, 2011, from RTI International to EPA OAQPS, available at http://www.epa.gov/ttn/ atw/utility/pro/egu_mact_floor_memo_031611.pdf; Spreadsheet entitled "floor_analysis_coal_pm_031611.xlsx" available at http://www.epa.gov/ttn /atw/utility/utilitypg.html.

In the Proposed EGU MACT, EPA has offered three options or alternatives for demonstrating compliance with the non-mercury metal HAP limitations. These options are:

1) *Demonstrate initial compliance with the surrogate Total PM limitation of 0.050 lb/MW-hr through stack testing.[11] Ongoing compliance is demonstrated through continuous emissions monitoring with a PM CEMS device measuring filterable PM, with the compliance limit for filterable PM derived by establishing an operating limit for filterable PM during the compliance test for total PM. The compliance average period for the CEMS measurements would be a 30-day rolling average.*

2) *Demonstrate initial and continuous compliance through stack testing for compliance with the established individual non-mercury metal HAP limits. Stack testing for individual non-mercury metal HAPs would be required every two months.*

3) *Demonstrate initial and continuous compliance through stack testing for compliance with the established total non-mercury metal HAPs emission limit. Stack testing for total non-mercury metal HAPs would be required every two months.[12]*

P4G has serious concerns about the achievability of the non-mercury metal HAP emission limits contained in the Proposed EGU MACT. MACT emission limits must be actually achievable in practice under the worst reasonably foreseeable circumstances.[13] P4G notes that the majority of sources in the ICR Data had actual non-mercury metal HAP emissions that far exceed the limits contained in the Proposed EGU MACT. It further notes that no boiler or air pollution control equipment vendor with whom its technical advisors have conferred are aware of any contract that has been written with a performance guarantee approaching the proposed emission limits. Finally, P4G notes that the Total PM surrogate emission limit of 0.050 lb/MW-hr contained in Alternative 1 is approximately 30% of Plant Washington's BACT Total PM limit of 0.018 lb/MMBtu. While P4G understands that its BACT emission limit does not define what an appropriate MACT emission limit should be, P4G is necessarily worried about being able to achieve such a low emission limit for Total PM on a continuous basis. At least one air pollution control equipment vendor has also noted that, while the Total PM limit in the proposed EGU MACT is based upon actual test results from a new unit, owners and operators may be unable to comply continuously with the proposed standard because any margin of compliance that may have existed between permit limits and measured emission rates has been effectively eliminated. P4G agrees with and shares this vendor's concerns.

These serious considerations notwithstanding, P4G understands that EPA's Proposed EGU MACT must be given strong weight in this case-by-case MACT determination and that it would be bound by any final source category MACT emission limits promulgated by EPA, even if those limits are lower than the limitation established by EPD on a case-by-case basis. Therefore, in light of these considerations and with the understanding that the Director would have discretion to amend P4G's final Permit in the event that EPA ultimately revises upward the emission limits contained in the Proposed EGU MACT, P4G has determined that, based on its analysis of the ICR Data and consultations with design experts in the field, Alternative 1 (the PM surrogacy option) should be employed at Plant Washington.

P4G has conferred with Fluor to determine what, if any, improvements could be made to Plant Washington's conceptual design to achieve a total PM emission limit of 0.050 lb/MW-hr. Fluor, after re-iterating its concerns that achieving such an emission rate on a continuous basis might be nearly impossible, nevertheless suggested several design element enhancements for the fabric filter (baghouse) that might improve the possibility of meeting this emission limit:

[11] For Plant Washington, 0.050 lb/MW-hr is approximately equal to 0.0056 lb/MMBTU.
[12] Proposed EGU MACT, proposed 40 C.F.R. § 63.1000(c)(1).
[13] 40 C.F.R. § 63.43(d)(1); *Sierra Club v. EPA*, 167 F.3d 658, 665 (D.C. Cir. 1999).

1) *Use of state-of-the-art fabric filter bags (e.g. Teflon coated bags and/or pleated bags). Fabric filter bag technologies were evaluated and discussed within the Plant Washington $PM_{2.5}$ BACT analysis submitted in May 2009.[14] Use of state-of-the-art filter bags could, in theory, improve the PM capture efficiency of the control device because the coating on the surface of the bag (e.g. Teflon) reduces the pore size between fibers, thereby improving removal efficiency for smaller particles.*

2) *Ensure the baghouse design has a very conservative air-to-cloth ratio. The air to cloth ratio is the amount of flue gases (ft^3/min) entering the baghouse divided by the total square feet of cloth in the baghouse. By maintaining a conservative air-to-cloth ratio, a sufficient ratio of airflow to filter media will be maintained, which should theoretically improve system collection efficiency.*

3) *Size ductwork and gas pathways to slow down the velocity of the flue gas. Slowing the velocity of the airflow should, in theory, improve the potential collection efficiency of the system.*

4) *Include in the design additional compartments for the baghouse system. This would provide for additional PM removal.*

All of these changes will add complexity and cost to the air pollution controls that Plant Washington will require. Based upon initial estimates, P4G believes that these enhancements could add $25 million to the initial cost of Plant Washington's air pollution control train, which already exceeds $500 million. P4G also believes that the cost of maintaining the air pollution control train will rise as much $1 million per year.

As specified in the Proposed EGU MACT, Plant Washington will demonstrate compliance for non-mercury metal HAPs through the PM surrogacy option, which will require the facility to conduct an initial compliance test for Total PM, per Method 5 and 202 (filterable and condensable PM). Plant Washington will also be required to conduct additional compliance stack tests once every 5 years.[15]

During compliance testing for total PM, the Proposed EGU MACT also requires that Plant Washington establish an ongoing operating limit for PM surrogacy. As EPA states:

> *For units combusting coal or solid oil-derived fuel and electing to use PM as a surrogate for non-Hg HAP metals, you must install, certify, and operate PM CEMS in accordance with Performance Specification (PS) 11 in Appendix B to 40 CFR part 60, and to perform periodic, ongoing quality assurance (QA) testing of the CEMS according to QA Procedure 2 in Appendix F to 40 CFR Part 60. You must determine an operating limit (PM concentration in mg/dscm) during performance testing for initial PM compliance. The operating limit will be the average of the PM filterable results of the three Method 5 performance test results. To determine continuous compliance, the hourly average PM concentrations will be averaged on a rolling 30 boiler operating day basis. Each 30 boiler operating day average would have to meet the PM operating limit.[16]*

By adopting Alternative 1, Plant Washington will be required to maintain the particulate emissions concentration (mg/dscm) measured by the PM CEMS "at or below the highest 1-hour average measured

[14] Available on Georgia EPD Air Protection Branch website at http://www.georgiaair.org/airpermit/downloads/permits/psd/dockets/plantwashington /facilitydocs/additionalinfo051409.pdf.
[15] Proposed EGU MACT, proposed 40 C.F.R. § 63.10006(a).
[16] Proposed EGU MACT, proposed 40 C.F.R. § 63 63.10011(d).

during the most recent performance test demonstrating compliance with the total PM emissions limitation."[17, 18]

P4G also notes that it will install and maintain a fabric filter bag leak detection system, which will ensure that Plant Washington's main particulate emission control system is maintained and operated at a high level of efficiency. Because Plant Washington will demonstrate compliance with its MACT limits for non-mercury metal HAPs through the use of a PM CEMS, however, installation of the bag leak detection system will not be used to demonstrate compliance or for purposes of enforcing the MACT standards for non-mercury metal HAPs in Plant Washington's Permit. P4G believes that this approach represents better reading of the Proposed EGU MACT and that it is consistent with EPA's intent.[19]

The Proposed EGU MACT also establishes fuel sampling and testing requirements during compliance testing in Section 63.10008. Plant Washington proposes to conduct sampling and analysis per proposed EGU MACT Section 63.10008. Plant Washington will submit a testing plan to EPD no later than 60 days prior to demonstrating compliance.[20]

(3) Beyond the Floor Analysis

When conducting a beyond the floor assessment, the maximum degree of reduction in emissions of the HAP are considered, but it is appropriate to take into account costs, energy, and other environmental impacts into consideration when doing so.[21] *In the Proposed EGU MACT, EPA evaluated the possible use of additional air pollution controls, such as multiple fabric filter baghouses in series. EPA rejected the use of additional controls because the agency determined that the associated costs would be prohibitive.*[22]

EPA also investigated the possibility of fuel switching, such as the use of natural gas, as a beyond the floor option. As discussed in the Proposed EGU MACT, EPA determined that natural gas is not available at all locations or in sufficient quantities and thus, fuel switching to natural gas "would effectively prohibit new construction of coal-fired EGUs."[23] *Accordingly, EPA rejected this approach as well and dropped the use of an alternative fuel from the agency's beyond-the-floor analysis.*

P4G agrees with EPA's beyond the floor assessment that there are no emissions controls or monitoring provisions required beyond those established through the MACT floor assessment for non-mercury metal HAPs. Given the extensive, recently collected data in the ICR upon which EPA derived the MACT floor for new EGUs and the extremely low emission rates that EPA has proposed for the control of non-mercury metal HAPs, P4G concludes that any additional reduction in emissions would be cost-prohibitive and unlikely to yield meaningful emission reductions.

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[17] Proposed EGU MACT at 857, proposed 40 C.F.R. Part 63 Subpart UUUUU, Table 4. Although this portion of the Proposed EGU MACT may be in tension with the provision in Section 63.10011(d) of the proposed rule because it discusses highest 1-hr average instead of the average of the three Method 5 runs, it is consistent with EPA's discussion regarding maintaining the PM concentration at or below the level measured during the most recent performance test. While EPA may clarify this provision when it publishes the final MACT standard for EGUs, P4G proposes to use the highest single test result to establish a 30-day rolling average operating limit for filterable PM.

[18] Presently, PM/PM_{10} testing using EPA Method 5 and revised Method 202 would require each run to last a minimum of 2 hours, even though the methods call for 1-hour runs. Run time may be increased if the minimum detection of the analytical methods require it or if a specific sampling volume is required, which for Plant Washington should not be the case.

[19] Proposed EGU MACT at 858, proposed 40 C.F.R. Part 63 Subpart UUUUU, Table 4.

[20] As noted below, P4G believes that requiring fuel sampling for individual non-mercury metal HAPs is incongruous with use of the PM surrogacy option. As such, P4G requests that EPD not include such a fuel sampling requirement in the permit because compliance with the non-mercury metal HAPs standard will be through the use of the surrogate method.

[21] 40 C.F.R. § 63.43(d)(2).

[22] Proposed EGU MACT at 407.

[23] Proposed EGU MACT at 407-08.

As noted above, based upon initial estimates, P4G believes that the enhancements needed to comply with the emission limits in the Proposed EGU MACT could add well over $25 million to the initial cost of Plant Washington's air pollution control train baghouse. To increase costs above these already high levels without any assurance of meaningful emission reductions would be both wasteful and beyond the scope of state or federal law.

(4) The MACT Emissions Limitation for Non-Mercury Metal HAPs

P4G proposes to demonstrate compliance with the case-by-case MACT for non-mercury metal HAPs as follows:

1. *Compliance will be demonstrated through PM surrogacy with the Total PM emission limit of 0.050 lb/MW-hr. Compliance will be demonstrated through an initial stack test per EPA Method 5 and 202. An additional stack test for demonstration of compliance with the Total PM limit will be conducted at least once every five years.*

2. *During the initial stack test, the ongoing operating limitation for filterable PM will be established as the highest single test run reported in mg/dscm.*[24]

3. *Ongoing compliance through PM surrogacy will include use of PM CEMS, with compliance demonstrated with the filterable PM operating limit (concentration basis in mg/dscm) derived from the initial compliance test. Compliance with the derived filterable PM operating limit will be on a 30-day rolling average basis.*

4. *Plant Washington will develop a site specific fuel analysis plan for the facility as required by the Proposed EGU MACT Section 63.10008. The fuel analysis plan will be submitted to EPD no later than 60 days prior to the initial compliance demonstration for non-mercury metal HAPs.*[25]

5. *Plant Washington will prepare and submit a compliance report to EPD on a semi-annual basis. This report will include:*

    a. *Statement by a responsible official certifying the truth, accuracy, and completeness of the content of the report.*

    b. *Date of the report and beginning and ending dates of the reporting period.*

    c. *The total fuel use for the main facility boiler for each month within the semi-annual period.*

    d. *A summary of the results of the performance stack tests conducted during the semi-annual period.*

    e. *A statement of any deviations from compliance conditions such as emission limits or operating limits pertaining to non-mercury metal HAPs.*[26]

6. *Plant Washington will install a bag leak detection system to assure the proper and efficient operation of its particulate emission control equipment.*

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[24] P4G notes that certain PM CEMS may measure particulate emissions in mg per "actual" cubic meter of gas (*e.g.*, wet system (Sick Maihak FEW 200)). Because the particular PM CEMS unit has not been selected for Plant Washington, PM measures will be in the units reported by the device selected and installed.

[25] The Proposed EGU MACT seems to require fuel sampling even when the surrogate approach for metal HAPs compliance is followed. P4G believes that this is an incongruous result, and requests that EPD consider omitting such a requirement from the revised permit.

[26] Proposed EGU MACT, proposed 40 C.F.R. § 63.10031.

EPD Review

(5) PM as a Surrogate for Non-Mercury Metal HAP Emissions

Previous discussion on the use of PM as a surrogate in Application No. 17924 and Notice of MACT Approval dated August 2009 are still applicable. EPD believes that PM still meets the criteria set forth in the previous Notice of MACT Approval and EPA affirms this decision in allowing a PM alternative method for compliance in the Proposed EGU MACT.

EPD reviewed the provided information, verified footnotes and references throughout the application and additional information submittals and agrees with Plant Washington's selection of the PM as a surrogate for non-mercury metal HAP Emissions.

(6) Non-Mercury Metal MACT Floor

EPD has reviewed the Proposed EGU MACT, underlying ICR data, updated application by Plant Washington, and supporting documentation and agrees with the selection of the MACT Floor for non-mercury metal HAPs.

(7) Beyond the Floor Analysis

EPD has reviewed the Proposed EGU MACT, underlying ICR data, updated application by Plant Washington, and supporting documentation and agrees with Plant Washington's beyond the MACT floor analysis for non-mercury metal HAPs.

(8) The MACT Emissions Limitation for Non-Mercury Metals

EPD has reviewed the Proposed EGU MACT, underlying ICR data, updated application by Plant Washington, and supporting documentation and agrees in part with Plant Washington's MACT Emissions Limitations for non-mercury metal HAPs.

Plant Washington has proposed the use of fuel analysis and a baghouse leak detection system in addition to the required PM CEMS. After thorough review of the proposed EGU MACT, EPD has determined that if a performance test (and the use of PM CEMS) is used to demonstrate compliance with the PM emission limit then fuel analysis is not required. The purpose of the fuel analysis is to determine the non-mercury metal content of the fuel and correlate that to the final tested metal concentration in the flue gas. Plant Washington does not have a total non-mercury metal or individual metals limits in the permit; therefore the fuel analysis is unnecessary and does not provide useful data in regard to PM emissions.

Plant Washington has proposed the installation and operation of a bag leak detection system on the fabric filter baghouse. EPD routinely permits facilities that use a BLDS system to help ensure that the facility is operating in compliance with their air quality permit. EPD believes that the intent of the proposed MACT standard was to use a BLDS if the facility was demonstrating compliance using the fabric filter baghouse. Plant Washington is using a PM CEMS which does not require the use of the BLDS. EPD believes that the PM CEMS and routine testing is more extensive and allow for verifying compliance with the applicable permit limits.

As required in 40 CFR 63 Subpart B, EPD has carefully considered the Proposed EGU MACT as a major part of this permit review. The extensive testing done in the ICR and subsequent analysis completed by EPA in the proposed MACT standard has provided EPD with a path for the updated case-by-case MACT determination for non-mercury metals at Plant Washington.

(9) Conclusions

EPD sets as the MACT emission limitation for non-mercury metal HAPs the use of a fabric filter and wet scrubber and a PM_{total} emission limit of 0.050 lb/MW-hr on a 3-hour average. Initial compliance is demonstrated through stack testing. PM CEMS will be utilized as a surrogate for the direct measurement of non-mercury metal HAPs with the use of a filterable PM compliance limit that will be determined during initial compliance testing. The PM_{total} limit will be verified by a stack test once every 5 years. Plant Washington will use a continuous emissions monitoring system (CEMS) to comply with the $PM_{filterable}$ operating limit.

c. MACT Determination for Acid Gases

This permitting action is in response to the OSAH final decision by Judge Walker on December 16, 2010, remanding the permit back to EPD for the limited purpose of re-addressing the case-by-case MACT review for non-mercury metals and organic HAPs. No changes will be made to the case-by-case MACT determinations for mercury or acid gases for the coal-fired boiler, or the case-by-case MACT determinations for the auxiliary boiler.

d. MACT Determination for Organics

For the purposes of this review and subsequent permitting action, the subcategory organic HAPs includes the emissions of dioxins and furans.

Applicant's Proposal

A complete listing of estimated emissions from all organic HAPs is detailed in the Notice of MACT Approval application no. 17924.

The following is taken from Application No. 20397

(1) CO as a Surrogate for Organic HAP emissions

Plant Washington proposes the use of CO as a surrogate for organic HAPs. CO and organics are both products of incomplete combustion. Thus, the good combustion practices that serve as effective pollution control to reduce CO emissions will also indiscriminately act to reduce the emissions of organic HAPs. CO will also be continuously monitored with a CEMS.

(2) Organic HAP MACT Floor

As noted above, when EPA proposes a MACT standard for a source category, such as the Proposed EGU MACT, the proposed federal standard is necessarily the starting point for a case-by-case MACT determination. In the Proposed EGU MACT, EPA concludes that a work practice standard is the MACT floor for non-dioxin/furan organic HAPs. Consistent with EPA's regulations, P4G has "strongly consider[ed]" EPA's proposed MACT standard and agrees that EPA's proposed work practice standard, in fact, represents the MACT floor for non-dioxin/furan organic HAPs.

EPA's decision to adopt a work practice standard as the MACT floor was based on the fact that modern, highly efficient EGU boilers, such as will be constructed at Plant Washington, emit organic HAPs at very low levels that are frequently below the detection limits of the tests. As EPA explained:

> *EPA is proposing work practice standards for non-dioxin/furan organic and dioxin/furan organic HAP. The significant majority of measured emissions from EGUs of these HAP were below the detection levels of the EPA test methods, and, as such, EPA considers it impracticable to reliably measure emissions from these units. As the majority of measurements are so low, doubt is cast on the true levels of emissions that were measured during the tests. . . . For the non-dioxin/furan organic HAP, for the individual HAP or constituent, between 57 and 89 percent of the run data were comprised of values below the detection level. Overall, the available test methods are technically challenged, to the point of providing results that are questionable for all of the organic HAP. For example, for the 2010 ICR testing, EPA extended*

> *the sampling time to 8 hours in an attempt to obtain data above the MDL. However, even with this extended sampling time, such data were not obtained making it questionable that any amount of effort, and, thus, expense, would make the tests viable. Based on the difficulties with accurate measurements at the levels of organic HAP encountered from EGUs and the economics associated with units trying to apply measurement methodology to test for compliance with numerical limits, we are proposing a work practice standard under CAA section 112(h).*[27]

In the preamble to the Proposed EGU MACT, the agency explained that it considered use of CO as a surrogate monitoring pollutant for non-dioxin/furan organic HAPs because CO is generally a good indicator of complete combustion. To that end, the EPA Office of Research and Development conducted a series of pilot tests regarding organic HAPs at the Agency's Multi-pollutant Control Research Facility (MPCRF). EPA found, however, that "it is very difficult to develop direct correlations between the average concentration of CO and the amount of organics produced during the prescribed sampling period".[28] *This was due primarily to the following three reasons:*

1) *The large number of organic compounds that could be produced during incomplete combustion and most being below levels of detection;*

2) *The variability of CO concentrations and the concentration spikes that are produced, making it difficult to compare one unit to another; and*

3) *The fact that some organics are destroyed at elevated flue gas temperatures while CO remains stable.*[29]

For these reasons, EPA declined to establish emission limits in the Proposed EGU MACT for individual non-dioxin/furan organic HAPs or to adopt CO as a surrogate for non-dioxin/furan organic HAPs for coal-fired EGU boilers. Instead, EPA established a "work practice standard" for operation of the boilers to ensure that good combustion is occurring, thereby minimizing the amount of organic HAP emitted. The federal Clean Air Act and EPA's regulations allow the agency to establish a work practice standard in lieu of emission limits.[30]

Use of good combustion controls (also termed good combustion practices) have been established for control of non-dioxin/furan organic HAPs. The preamble to the Proposed EGU MACT states:

> *Good combustion practice (GCP), in terms of combustion units, could be defined as the system design and work practices expected to minimize the formation and maximize the destruction of organic HAP emissions. We maintain that the proposed work practice standards will promote good combustion and thereby minimize the organic HAP emissions we are proposing to regulate in this manner.*[31]

Therefore, the Proposed EGU MACT adopts good combustion practices, as implemented through a work practice standard, as the MACT floor for non-dioxin/furan organic HAPs. The facility's consultants (MACTEC and Trinity) have reviewed the ICR Data collected as well as the results of the additional testing EPA conducted set forth in the Proposed EGU MACT. Based on the review of those data and

[27] Proposed EGU MACT at 366-67.
[28] Proposed EGU MACT at 361.
[29] Proposed EGU MACT at 361-63.
[30] 42 U.S.C. § 7412(h); 40 C.F.R. § 63.43(d)(3).
[31] Proposed EGU MACT at 394.

EPA's conclusions in the Proposed EGU MACT, P4G agrees that a work practice standard represents the MACT floor for non-dioxin/furan organic HAPs.

(3) Beyond the Floor

EPA concluded that it was not appropriate to require additional controls beyond the MACT floor for non-dioxin/furan organic HAPs, explaining that it was "not aware of any measures beyond those proposed here that would result in lower emissions."[32] *P4G concurs in EPA's conclusion that there are no additional controls beyond the MACT floor that would result in lower emissions of these pollutants.*

(4) MACT Emissions Limitation for Organic HAPs

Consistent with EPA's conclusions in the Proposed EGU MACT, P4G proposes work practice standards for non-dioxin/furan organic HAPs. These standards, which are set forth below, are taken directly from the Proposed EGU MACT, Section 63.10021(a)(16)(i) through (vi).

1) *Inspect the burners, and clean or replace any components of the burner as necessary (burner inspection can be delayed until the next scheduled unit shutdown, but each burner will be inspected at least once every 18 months).*

2) *Inspect the flame pattern, as applicable, and make any adjustments to the burner necessary to optimize the flame pattern. The adjustment will be consistent with the manufacturer's specifications.*

3) *Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.*

4) *Optimize total emissions of CO and NOx. This optimization will be consistent with the manufacturer's specifications and the requirements of Permit No. 4911-303-0051-P-01-0.*

5) *Measure the concentration in the effluent stream of CO and NOx in ppm, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made).*

6) *Maintain on-site and submit, if requested by EPD, an annual report containing the following information:*

    a) *The concentrations of CO and NOx in the effluent stream in ppm by volume, and oxygen in volume percent, measured before and after the adjustments of the main boiler.*

    b) *A description of any corrective actions taken as a part of the combustion adjustment.*

    c) *The type and amount of fuel used over the 12 months prior to an adjustment, but only if the unit was physically and legally capable of using more than one type of fuel during that period.*

P4G proposes to perform each of these activities on an annual basis, unless the specific action could be conducted less frequently (e.g., Item No. 1).

[32] Proposed EGU MACT at 401.

EPD Review

(5) CO as a Surrogate for Organic HAP emissions

The measurement of CO on a continuous basis is an excellent method for determining complete combustion. Plant Washington is required to operate a CO continuous emissions monitoring system (CEMS) to verify compliance with their CO BACT limit. EPD agrees that CO is an indicator for complete combustion and organic HAPs are a product of incomplete combustion. The use of good combustion practices will indiscriminately reduce the quantity of organic HAPs in the exhaust gases from the coal-fired boiler.

(6) Organic HAP MACT Floor

EPD concurs with the determination made by EPA in the Proposed EGU MACT. EPD agrees with the determination that a work practice standard is the appropriate method for organic HAPs. This is because a significant majority of the measured HAP emissions from EGUs in the ICR were below the detection levels of the EPA test methods. Also it is impractical to reliably measure emissions on this small of an emission rate.

EPD has reviewed the Proposed EGU MACT, underlying ICR data, updated application by Plant Washington, and supporting documentation and agrees with the selection of the MACT Floor for organic HAPs.

(7) Beyond the Floor

EPD has reviewed the Proposed EGU MACT, underlying ICR data, updated application by Plant Washington, and supporting documentation and agrees with Plant Washington's beyond the MACT floor analysis for organic HAPs.

(8) MACT Emissions Limitation for Organic HAPs

EPD has reviewed the Proposed EGU MACT, underlying ICR data, updated application by Plant Washington, and supporting documentation and agrees with Plant Washington's MACT Emissions Limitations for organic HAPs.

As required in 40 CFR 63 Subpart B, EPD has carefully considered the Proposed EGU MACT as a major part of this permit review. The extensive testing done in the ICR and subsequent analysis completed by EPA in the proposed MACT standard has provided EPD with a path for the updated case-by-case MACT determination for organic HAPs at Plant Washington.

(9) Conclusions

EPD sets as MACT for organic HAP emissions at the Plant Washington facility the use of good combustion practices. CO CEMS will be used to continuously monitor and ensure good combustion and compliance with the existing PSD BACT limit on CO. The facility is required to complete annual tune-ups on the boiler in which the facility must document the updates and changes to the system.

3. Auxiliary Boiler Case-by-Case MACT

This permitting action is in response to the OSAH final decision by Judge Walker on December 16, 2010, remanding the permit back to EPD for the limited purpose of re-addressing the case-by-case MACT review for non-mercury metals and organic HAPs. No changes will be made to the case-by-case MACT determinations for mercury or acid gases for the coal-fired boiler, or the case-by-case MACT determinations for the auxiliary boiler.

4. Proposed MACT Limits and Requirements (was Section 5 in previous Notice of MACT Approval)

The facility is subject to 40 CFR 63 Subpart A and Subpart B which contain the requirements for case-by-case MACT. The following sections detail the applicable requirements from these subparts. This information is not explicitly listed in the permit.

a. General Requirements

This permitting action is in response to the OSAH final decision by Judge Walker on December 16, 2010, remanding the permit back to EPD for the limited purpose of re-addressing the case-by-case MACT review for non-mercury metals and organic HAPs. No changes will be made to the case-by-case MACT determinations for mercury or acid gases for the coal-fired boiler, or the case-by-case MACT determinations for the auxiliary boiler.

This section only contails subparagraphs that have been updated as a part of this permit amendment.

b. Emission Limits

(9) Pursuant to 40 CFR 63.43(g) and Georgia Air Quality Regulation 391-3-1-.02(9)(b)16, MACT determination, the Permittee shall comply with the following emission limitations for HAP emissions for the pulverized coal-fired boiler:

Table XXII – Emission Limitations

Pollutant	Emission limit (Per Unit)	Averaging Period
Mercury	7.64 x 10^{-6} lb/MW-hr (sub-bituminous) 6.82 x 10^{-6} lb/MW-hr (50/50 Blend)	12-month rolling average
Total PM (as a surrogate for Non-Mercury Metal HAPs)	**0.050 lb/MW-hr**	**3-hour average**
Acid Gases	HCl (50/50 Blend) 1.36 x 10^{-3} lb/MMBtu HCl (sub-bituminous) 3.22 x 10^{-4} lb/MMBtu; HF – 1.40 x 10^{-4} lb/MMBtu	3-hour average
CO (as a surrogate for Organic HAPs)	**Good Combustion practices**	**none**

c. General Compliance Requirements

(10) The owner/operator must be in compliance with the emissions limitations in Table XXII, including operating limits, at all times, except as provided by applicable laws and regulations.

d. Initial Compliance Requirements

(11) In order to demonstrate initial compliance with the emissions limitations in Table XXII, the owner/operator must conduct performance tests, set operating limits, and conduct monitoring equipment performance evaluations within 60 days after achieving the maximum production rate at which the facility will be operated, but not later than 180 days after initial startup.

Table XXIII – Initial Compliance Requirements

Pollutant	Emission Limit (Per Unit)	Compliance Monitoring
Mercury	7.64×10^{-6} lb/MW-hr (sub-bituminous) 6.82×10^{-6} lb/MW-hr (50/50 Blend)	Direct via Mercury CEMS
Non-Mercury Metal HAPs	**0.050 lb/MW-hr (PM_{total} as a surrogate)**	**Indirect via a PM CEMS, initial and periodic stack tests, establish ongoing $PM_{filterable}$ operating limit,**
Acid Gases – HCl	1.36×10^{-3} lb/MMBtu (50/50 Blend) 3.22×10^{-4} lb/MMBtu (sub-bituminous)	Direct compliance tested via stack tests; indirect monitoring via SO_2 CEMS
Acid Gases – HF	1.40×10^{-4} lb/MMBtu	Direct compliance tested via stack tests; indirect monitoring via SO_2 CEMS
Organic HAPs	**None**	**Good combustion practices, annual tuning**

e. Continuous Compliance Requirements

(13) Pursuant to 40 CFR 63.43(g)(2)(ii) and Georgia Rules for Air Quality 391-3-1-.02(6)(b)1, the owner/operator shall conduct the following monitoring to assure continuous compliance with the applicable emission limitations in Table XXIII:

Table XXIV – Continuous Compliance Requirements

Pollutant	Monitoring (Per Unit)
Mercury	CEMS
Non-Mercury Metal HAPs ($PM_{filterable}$ as a surrogate)	CEMS
Acid Gases	Performance test for HCl and HF. SO_2 CEMS for continuous monitoring
Organics (CO as a surrogate)	CEMS

5. New and Modified Permit Conditions

Condition No. 2.13.b and d were modified removing the 40 CFR 63 Subpart B citation.

Condition No. 2.13.s was added to include a new case-by-case MACT PM_{total} limit.

Condition No. 2.39 was added to establish a PM filterable operational permit limit to demonstrate ongoing compliance.

Condition No. 5.2.d was modified removing the 40 CFR 63 Subpart B citation.

Condition No. 6.2.t and u were modified removing the 40 CFR 63 Subpart B citation.

Condition No. 6.2.x was added to establish method of compliance with Condition No. 2.39.

Condition 6.3.i and j were added to include initial and on-going performance tests for total PM.

Condition Nos. 7.7 and 7.8 were modified removing the 40 CFR 63 Subpart B citations.

Condition No. 7.25.b.xvi. was added to include an exceedance for the new 30-day average for filterable PM limit as specified in Condition No. 2.39.

Condition No. 7.27 was added to include the work practice standards for organic HAP emissions.

Condition 7.28 was added to establish how the facility would determine compliance with the PM filterable operational limit in Condition No. 2.39.

Condition No. 7.29 was added to require a semiannual report for the case-by-case MACT requirements in Condition 2.13.s and associated performance tests and operational limits.

Condition No. 8.3 was added to include the provisions in 40 CFR 63.44. Pursuant to this provision of the 112(g) regulations, the case-by-case MACT limits for Coal Fired Boiler S1 may be replaced by the limits of a finalized 112(d) MACT (in this case, the EGU MACT) as follows:

- If US EPA promulgates the EGU MACT before the permit is final and legally effective, then the facility must comply with the EGU MACT by the compliance date.
- If EPA promulgates the EGU MACT after the permit is final and legally effective, then it must comply with the EGU MACT limits instead of the 112(g) case by case limits as expeditiously as possible, but no longer than 8 years after rule promulgation.
- The previous bullets notwithstanding, Georgia EPD is not required to incorporate any less stringent terms of the EGU MACT in the permit and may in its discretion consider any more stringent provisions of the 112(g) case by case determination to be applicable legal requirements.