AMP
PUBLIC POWER PARTNERS

September 30, 2009

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RE: AMPGS Permit to Install 06-08138
Ohio EPA's Draft Case-by-Case MACT
Additional Response to Questions

Dear Dean and Mike:

As Ohio EPA finalizes the Section 112(g) case-by-case MACT determination for AMPGS, American Municipal Power, Inc. ("AMP") submits this letter to provide final updated information to supplement earlier submittals and to provide an additional response to NRDC's September 10, 2009 letter to Ohio EPA. As such, please consider this letter as additional information submitted by AMP relevant to Ohio EPA's case-by-case MACT process.

Use of Surrogates

AMP has previously provided Ohio EPA with a specific list of HAPs that could be present in the main boiler flue gases[1] that were grouped into two categories: (1) organic HAPs (38 were identified, including polynuclear aromatic hydrocarbons and dioxins/furans) and (2) non-mercury metal HAPs (10 were identified). AMP then identified surrogates (i.e. a pollutant is used as a surrogate or proxy for another pollutant) for the organic HAP and metal HAP categories. Specifically, CO was ultimately selected as a surrogate for organic HAPs, and PM-10 filterable was identified as a surrogate for non-mercury metal HAPs.

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[1] The HAPs that could be present was obtained from AP-42 Section 1.1 Table 1.1-12 Emission Factors for Polychlorinated Dibenzo-P-Dioxins and Polychlorinated Dibenzofurans from Controlled Bituminous and Subbituminous Coal Combustion, Table 1.1-13 Emission Factors for Polynuclear Aromatic Hydrocarbons (PAH) from Controlled Coal Combustion, Table 1.1-14 Emission Factors for Various Organic Compounds from Controlled Coal Combustion, and Table 1.1-18 Emission Factors for Trace Metals from Controlled Coal Combustion.

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The use of surrogates has been used in the establishment of several MACT standards by EPA in the past and continues to be used to date. In order to use a surrogate as a "stand-in" or proxy for other HAPs, the standard is one of reasonableness. *Natl. Lime Ass'n v. EPA* 233 F.3d 625 (D.C. Cir. 2000). While the Court in *Natl. Lime* articulated a three-prong test for the use of surrogates, this test was not mandated by the court as the only available test that can be utilized to determine reasonableness. In that case, the court concluded the use of surrogates was appropriate under the following conditions:

(1) The HAPs represented by the surrogate are invariably present in the surrogate;
(2) The surrogate control indiscriminately captures the subject HAPs along with the surrogate; and
(3) The surrogate control system is the only means by which reductions in the subject HAPs are achievable.

To meet the first prong, the HAPs represented should invariably be present in the surrogate. Invariably present means only that it is always present, even if the amount is very small or unknown. To meet the second prong, the HAPs subject to the surrogate are captured by the same equipment or technique used to capture the surrogate (the control efficiencies or amounts do not need to directly correlate). Finally, the third prong requires that there are no other appropriate and achievable methods to control the subject HAP. AMP's use of filterable PM-10 and CO in its case-by-case analysis are reasonable as explained as follows.

CO as a Surrogate for Organic HAPs

For the purposes of the CO surrogate, organic HAPs are organic compounds that are either present in the coal or formed as a product of incomplete combustion. Organic HAPs also include polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/PCDF) which are formed during the combustion of the coal and through reactions among pollutants that occur in the air pollution control system. Other organic HAP emissions are classified as polynuclear aromatic hydrocarbons (PNA). Some organic HAPs may become associated with particulate matter (such as dioxins and furans) and are included in the PM-10 filterable surrogate category. Following the three-prong test articulated in *Natl. Lime*, CO is an appropriate surrogate for the gaseous organic HAPs for the followings reasons: (1) the HAPs identified are invariably present in the gas/surrogate as a product of boiler combustion; (2) the formation of the organic HAPs will be controlled by the same methods used to limit the formation of CO (i.e., good combustion and boiler design); and (3) no other feasible control methods exist to control the organic HAPs. As a result, while the three-prong test of *Natl. Lime* is not required, AMP has utilized that test to further demonstrate the proposed use of CO as a surrogate for organic HAPs is appropriate and reasonable. The surrogate approach for organic HAPs has been used by other states and EPA regions recently when setting case-by-case MACTs for pulverized coal projects, including: South Carolina (Santee Cooper Cross and Pee Dee), Arkansas (SWEPCO Turk and Plum Point), Wisconsin (Weston), Utah (Intermountain) and Iowa (MidAmerican). AMP has already submitted copies of these permits as part of the case-by-case process.

AMP has also proposed to include the use of a continuous emission monitor (CEM) for CO to assure on-going and continuous monitoring; thus, addressing NRDC's concern that periodic stack testing is not a sufficient demonstration of compliance. *See* NRDC's June 10, 2009 comments at p. 39. While both VOC and CO are appropriate surrogates for organic HAPs, AMP proposed the use of CO given that a CEM system provides an ongoing compliance demonstration.

PM-10 Filterable as a Surrogate for Non-Mercury Metal HAPs

As determined by both AMP and Ohio EPA, PM-10 filterable is an appropriate surrogate for non-mercury metal HAPs and any organic HAPs that are associated with particulate matter emissions. Following the three-prong test articulated in *Natl. Lime*, PM-10 filterable is an appropriate surrogate for the metal and other particulate HAPs for the followings reasons: (1) some amount of these HAPs will be present in the particulate emissions. While comments submitted to Ohio EPA note that some portion of the metals may be present as a vapor, the other portions of the metals will be particulate. *See* NRDC's June 10, 2009 comments at 32. As such, the metals will be invariably present in the filterable PM-10; (2) the primary control technology for filterable PM-10 will be a pulsating jet fabric filter baghouse. The baghouse will also indiscriminately capture particulate HAPs for which filterable PM-10 is being used as a surrogate; and (3) there is no other control equipment in existence that has been demonstrated (i.e. commercially available/achieved/achievable) to control particulate HAPs. The baghouse is the means by which reductions in particulate HAPs are achievable. Therefore, while the three-prong test of *Natl. Lime* is not required, AMP has utilized that test to further demonstrate that filterable PM-10 is an appropriate and reasonable surrogate for non-mercury metal HAPs. The surrogate approach for metal HAPs (PM-10) has been used by other states and EPA regions when setting case-by-case MACTs for PC projects, including: South Carolina (Santee Cooper Cross and Pee Dee), Arkansas (SWEPCO Turk and Plum Point), Wisconsin (Weston), Utah (Intermountain), Arizona (Springerville) and Iowa (MidAmerican). AMP has already submitted copies of these permits as part of the case-by-case Section 112(g) MACT process.

Updated Tables and Addendums

Attached to this letter are two updated documents. First, Addendum 3 contains information to update earlier submittals of Addendum 3. Second, Attachment A is a table with updated information regarding design, operation and size of AMP's pollution control equipment.

Thank you in advance and please call if you have any questions.

On Behalf of the Members,

Randy Meyer
Director of Environmental Affairs

cc: Misty Parsons
Bob Hodanbosi

Addendum 3
HAP Emission Estimates

Table 1
Emissions Estimates for HAPs with Proposed Section 112(g) MACT Limitations
Boilers B001 and B002

Parameter	Maximum	Notes
Heat Input Rating (mmBtu/hr)	5,191	Design
Coal Usage Rate (tons/hr)	317	Maximum Requirement for Lowest Btu Coal Supply
SO_2 30-Day Rolling Average (Monitoring Surrogate for Acid Gas HAPs) (based on CEM)		
CEM Demonstration of compliance with BACT limits		
PM_{10} 3-Hr Average (Filterable Only) (Surrogate for non-mercury Metal HAPs) (based on stack test)		
PM_{10}-lbs/mmBtu	0.012	Engineering Estimate
PM_{10}-lbs/hr	62	Calculated as maximum lb/mmBtu x Max Heat Input
PM_{10}-tons/yr	273	Calculated as lb/hr x 8,760 hours/yr x 1 ton/2,000 lbs
Estimated Fabric Filter Control Efficiency	99.5+%	Engineering Estimate
Estimated Annual Average Hourly Uncontrolled PM_{10} (filterable) Emission Rate (lb/mmBtu)	2.40	Calculated based on 0.012 lb/mmBtu of controlled emissions and an average CE of 99.5%
CO 3-Hour Average (Surrogate for Organic HAPs) (based on CEM)		
CO-lbs/mmBtu	0.15	Engineering Estimate
CO-lbs/hr	779	Calculated as maximum lb/mmBtu x Max Heat Input
CO-tons/yr	3,410	Calculated as lb/hr x 8,760 hours/yr x 1 ton/2,000 lbs
Estimated Efficiency of Good Combustion Practices	NA	Inherent to boiler design and operation
Mercury 12-Month Rolling Average (based on CEM)		
Hg-lbs/TBtu	1.4	Engineering Estimate
Hg-lbs/hr	0.0073	Engineering Estimate
Hg-lbs/yr	63.7	Calculated as lb/hr x 8,760 hours/yr
Estimated SCR/Sorbent Injection/ACI/ Fabric Filter/ Wet-FGD /Wet-ESP Control Efficiency	90+%	Engineering Estimate

Table 1 **Emissions Estimates for HAPs with Proposed Section 112(g) MACT Limitations** **Boilers B001 and B002**		
Parameter	**Maximum**	**Notes**
Estimated Annual Average Hourly Uncontrolled Hg Emission Rate (lb/TBtu)	14.0	Calculated based on 1.4 lb/TBtu of controlled emissions and an average CE of 90%
HF 3-Hour Average (based on stack test)		
HF-lbs/mmBtu	0.0004	Engineering Estimate
HF-lbs/hr	2.1	Calculated as maximum lb/mmBtu x Max Heat Input
HF-tons/yr	9.09	Calculated as lb/hr x 8,760 hours/yr x 1 ton/2,000 lbs
Estimated Wet-FGD/Wet-ESP Control Efficiency	97+%	Engineering Estimate
Estimated Annual Average Hourly Uncontrolled HF Emission Rate (lb/mmBtu)	0.0133	Calculated based on 0.0004 lb/mmBtu of controlled emissions and an average CE of 97%
HCl 3-Hour Average (based on stack test)		
HCl-lbs/mmBtu	0.004	Engineering Estimate
HCl-lbs/hr	20.8	Calculated as maximum lb/mmBtu x Max Heat Input
HCl-tons/yr	90.95	Calculated as lb/hr x 8,760 hours/yr x 1 ton/2,000 lbs
Estimated Wet-FGD/Wet-ESP Control Efficiency	97+%	Engineering Estimate
Estimated Annual Average Hourly Uncontrolled HCl Emission Rate (lb/mmBtu)	0.1333	Calculated based on 0.004 lb/mmBtu of controlled emissions and an average CE of 97%

ATTACHMENT A

Supplemental Technical Information Regarding Control Equipment

The following chart identifies the most recent information available regarding specific pieces of control equipment proposed for AMPGS. The descriptions are based on the best vendor information available as of the date of the submittal. As such, these are best engineering estimates available to date.

Selective Catalytic Reduction (SCR)	
Reactor Dimensions	52 ft. 6 in (h) x 66 ft-8 in (w) x 39 ft-1 in (d)
Array of Modules per layer	10 (w) x 11 (d)
Catalyst Layers	2 initial, 1 future, 110 modules per layer
Catalyst Volume	625.3 m^3 (initial), 937.9 m^3 (all layers filled) (TRAC)
Catalyst Type	Babcock Hitachi TRAC (plate type)
Catalyst Life	24,000 hours
Pulse Jet Fabric Filter	
No. of Compartments	8 - 16
Bags per Compartment	704 to 1,292 (9,920 to 14,900 total)
Bag Dimensions	5 in to 6 in diameter x 26 ft-3 in to 32 ft 9in long
Bag Life	3 years
Air to Cloth Ratio	3.6:1 to 4.0:1
Pressure Drop	5.8 in wg to 7.5 in wg
Wet Flue Gas Desulfurization and Wet Electrostatic Precipitator (WFGD/WESP)	
Absorber Vessel	59 ft – 6 in diameter x 140 ft in height
Packed Column	Approximately 20 ft height
WESP Sections	Approximately 9 and 10 ft height (each)
Recirculation Pumps	2 per loop
Oxidation Air Blowers	1 and 1spare
Filter Feed Pumps	1 and 1spare
AS Liquor Recirculation	44,155 gpm (upper loop), 8,420 gpm (lower loop)
	52,575 gpm total