Best Controlled Similar Source Evaluation - Plant Washington

I. Introduction

The following discussion identifies the "best controlled similar source" for each of the hazardous air pollutants (HAPs) that will be emitted from Plant Washington. The permit limits and stack test data included in this analysis have been updated to reflect the most current information available to Power4Georgians (the Applicant). It should be noted that this discussion solely concerns the preliminary step of the case-by-case maximum achievable control technology (MACT) analysis. Subsequent analysis, including the Applicant's beyond-the-floor analysis, is set forth in the materials previously submitted to the Environmental Protection Division (EPD).

II. Background on "Best Controlled Similar Source"

As defined in 40 CFR Part 63, Subpart B;

The MACT emission limitation or MACT requirements recommended by the applicant and approved by the permitting authority shall not be less stringent than the emission control which is achieved in practice by the best controlled similar source, as determined by the permitting authority.

"Similar source" is defined in the regulation (40 CFR 63.41) as follows;

Similar source means a stationary source or process that has comparable emissions and is structurally similar in design and capacity to a constructed or reconstructed major source such that the source could be controlled using the same control technology.

The U.S. Environmental Protection Agency (EPA) has developed numerous MACT standards for various industries. A review of these MACT standards reveals that EPA has used various methods over time to determine the Best Controlled Similar Source. Some of those methods have included determination of the best controlled facilities and an evaluation of the control efficiency and emissions performance of method used at those facilities (Paper and Other Web Surface Coating MACT, 40 C.F.R. § 63, Subpart JJJJ), while others have included statistical evaluations of testing data of similar sources to account for the normal variability in emissions source test data and provide a reasonable estimate of the long term emissions limitation achieved (Integrated Iron and Steel MACT, 40 C.F.R. § 63, Subpart FFFFF).

Since the definition of similar source listed above is a far-reaching definition that potentially covers any type of source, as part of this review the consideration of capacity will not be strictly considered. While capacity could be a factor in a source such as a manufacturing operation where one source made 5 products a day and another made 500 a day, most utility boiler units are typically larger than 1,000 MMBtu/hr. It is assumed for purposes of this assessment that the emissions performance (lb/MMBtu) of large scale utility boilers greater than 1,000 MMBtu/hr will not significantly differ, and thus capacity was not utilized as a distinguishing factor when reviewing the available data.

The phrase used in the similar source definition "structurally similar in design," however, was used to distinguish some sources in this Best Controlled Similar Source analysis. For example, Integrated Gasification Combined Cycle (IGCC) was determined not to be a similar source for purposes of this analysis because IGCC units are not structurally similar in design.

Coal type also distinguished some sources from Plant Washington for purposes of this analysis. The primary fuels planned for use at Plant Washington are sub-bituminous coals (e.g. PRB) or a 50/50 blend of sub-bituminous and bituminous coals (e.g. PRB/Illinois #6). The design of the main boiler will be based on use of sub-bituminous coals alone or up to a 50/50 blend of sub-bituminous and bituminous coals. The boiler will not be designed to utilize lignite, and pulverized coal-fired boilers are not capable of utilizing waste coals as fuel due to the impurities present. As discussed in Section 10, pages 10-26, of the Plant Washington permit application, significant removal efficiencies are possible for mercury when combusting waste coal because of the nature of waste coal (*i.e.*, greater than 99% particle bound mercury). Therefore, in this analysis those units utilizing sub-bituminous coals and bituminous coals will be considered in the evaluation of Best Controlled Similar Source. Also, as discussed in the Plant Washington permit application, due to the lack of variability in coal fluorine concentrations only a singular limit for HF was proposed for Plant Washington. However, due to the large variability in sub-bituminous and bituminous coal chlorine contents, dual HCl and mercury limits were evaluated and established for both use of sub-bituminous coals and a blend of sub-bituminous and bituminous coals to ensure a high level of HCl and mercury removal efficiency using various coal types. The design coal chlorine content for sub-bituminous coals (PRB coal average) is 100 ppm while the design coal chlorine content for bituminous coals (Illinois #6 average) is 2700 ppm.

A review of available source testing data was conducted for the HAPs of interest, specifically the acid gases HF and HCl, mercury, non-mercury metals, and organic HAPs. The following pages provide summary testing data for the HAPs of interest and surrogate monitoring pollutants for those same HAPs. The data listed in the following tables is the most recent testing data from "similar sources" that could be identified from review of available data. Since there is no national database of such information, the information listed below was gathered from review and discussions with personnel at various State environmental agencies and review of supporting documentation submitted for various permit applications. Based on consideration of available data, the Best Controlled Similar Source will be determined by those sources that are pulverized coal-fired boilers which burn sub-bituminous and bituminous coals and have achieved compliance with the lowest permitted emission limits and have demonstrated low emissions during compliance testing.

III. Best Controlled Similar Source Analysis

A. Hydrogen Fluoride (HF)

The following Table 1 is a listing of stack testing data reviewed for the acid gas HF. Table 1 included the result of the stack test as well as the permitted HF limit for the unit.

Table 1: HF Testing Data Summary

Facility	Coal Type	Controls	Stack Test Date	Reported Emissions (lb/MMBtu)	Emission Limit (lb/MMBtu)
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	May 8-12, 2007	< 1.08×10^{-4}	9.0×10^{-4}
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Aug. 14-18, 2007	2.87×10^{-5}	9.0×10^{-4}
Weston Unit 4	PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI	July 7-11, 2008	4.00×10^{-5}	2.17×10^{-4}
Santee Cooper Cross Unit 3	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	Jan. 16-19, 2007	< 4.15×10^{-5}	3.0×10^{-4}
Santee Cooper Cross Unit 4	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	July 8, 2008	3.26×10^{-5}	3.0×10^{-4}
Wygen Unit 1	Bituminous	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber	June 6, 2005	1.35×10^{-6}	---
Wygen Unit 2	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Jan. 13, 2008	< 3.8×10^{-5}	3.0×10^{-4}
Newmont TS Power	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	April 6-14, 2008	1.15×10^{-4}	5.76×10^{-4}
Rocky Mountain Power Hardin Generating Station	Sub-bituminous (Absolaka Mine)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI (Optimization)	May 31, 2006	5.00×10^{-5}	5.1×10^{-4}
Neil Simpson II	Bituminous	Low NOx Burners, ESP, Dry Scrubber	June 13, 2005	5.59×10^{-7}	---
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	Aug. 21-25, 2006	6.3×10^{-5}	4.4×10^{-4}
OPPD Nebraska City Unit 2	PRB (WY)	SCR, Baghouse, Dry Scrubber	April 6, 2009	< 2.00×10^{-4}	4.0×10^{-4}
Holcomb Unit 1	PRB (WY)	Low NOx Burners, Baghouse, Dry Scrubber	August 5-6, 2009	< 2.8×10^{-5}	---
Stanton Energy Center Unit 2	Bituminous (KY, WV)	Low NOx Burners, OFA,Baghouse, Dry Scrubber	August 1996	6.3×10^{-5}	4.2×10^{-4}

As shown in Table 1, the lowest HF emission limit achieved in practice from a review of source testing data was 2.17 x 10^{-4} lb/MMBtu for Weston Unit 4 while utilizing PRB coal. The Applicant has therefore identified Weston Unit 4 as the best controlled similar source based on permitted unit emission limits and emissions performance during stack testing.

B. Hydrogen Chloride (HCl)

The following Table 2 is a listing of stack testing data reviewed for the acid gas HCl, indicating the result of the stack test as well as the permitted HCl limit for the unit.

Table 2: HCl Testing Data Summary

Facility	Coal Type	Controls	Stack Test Date	Reported Emissions (lb/MMBtu)	Emission Limit (lb/MMBtu)
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	May 8-12, 2007	3.8 x 10^{-5}	2.9 x 10^{-3}
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Aug. 14-18, 2007	5.77 x 10^{-5}	2.9 x 10^{-3}
Weston Unit 4	PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI	July 7-11, 2008	9.07 x 10^{-5}	2.12 x 10^{-3}
Santee Cooper Cross Unit 3	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	Jan. 16-19, 2007	2.77 x 10^{-4}	2.4 x 10^{-3}
Santee Cooper Cross Unit 4	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	July 8, 2008	4.09 x 10^{-5}	2.4 x 10^{-3}
Wygen Unit 1	Bituminous	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber	June 6, 2005	1.72 x 10^{-5}	---
Wygen Unit 2	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Jan. 13, 2008	3.8 x 10^{-4}	7.0 x 10^{-4}
Newmont TS Power	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	April 6-14, 2008	3.49 x 10^{-4}	6.26 x 10^{-4}
Rocky Mountain Power Hardin Generating Station	Sub-bituminous (Absolaka Mine)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI (Optimization)	May 31, 2006	5.00 x 10^{-5}	1.18 x 10^{-3}
Neil Simpson II	Bituminous	Low NOx Burners, ESP, Dry Scrubber	June 13, 2005	1.63 x 10^{-6}	---
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	Aug. 21-25, 2006	---	---
OPPD Nebraska City Unit 2	PRB (WY)	SCR, Baghouse, Dry Scrubber	April 6, 2009	< 2.00 x 10^{-4}	8.0 x 10^{-4}
Holcomb Unit 1	PRB (WY)	Low NOx Burners, Baghouse, Dry Scrubber	August 5-6, 2009	2.6 x 10^{-5}	---
Stanton Energy Center Unit 2	Bituminous (KY, WV)	Low NOx Burners, OFA,Baghouse, Dry Scrubber	August 1996	---	---

As shown in Table 2, the lowest HCl emission limit achieved in practice from review of source testing data was 6.26 x 10^{-4} lb/MMBtu for the Newmont TS Power facility while utilizing PRB coal. The lowest HCl emission limit achieved in practice from review of source testing data was 2.4 x 10^{-3} lb/MMBtu for Santee Cooper Cross Unit 3 and 4 while using bituminous coal. Therefore, the best controlled similar source for HCl for PRB coal would be Newmont TS Power, and the best controlled similar source from use of bituminous coal is determined to be Santee Cooper Cross Unit 4, based on permitted unit emission limits and emissions performance during stack testing.

C. Mercury

The following Table 3 is a listing of stack testing data reviewed for mercury, indicating the result of the stack test as well as the permitted mercury limit for the unit.

Table 3: Mercury Testing Data Summary

Facility	Coal Type	Controls	Stack Test Date	Reported Emissions (lb/MMBtu)	Emission Limit (lb/MMBtu)	Equivalent Reported lb/MW-hr
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	May 8-12, 2007	$< 7.2 \times 10^{-7}$	1.7×10^{-6}	---
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Aug. 14-18, 2007	1.23×10^{-6}	1.7×10^{-6}	10.5×10^{-6}
Weston Unit 4	PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI	July 7-11, 2008	1.4×10^{-6}	1.7×10^{-6}	---
Santee Cooper Cross Unit 3	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	Jan. 16-19, 2007	7.2×10^{-7}	3.6×10^{-6}	7.16×10^{-6}
Santee Cooper Cross Unit 4	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	July 8, 2008	1.74×10^{-6}	3.6×10^{-6}	15.8×10^{-6}
Wygen Unit 1	Bituminous	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber	June 6, 2005	---	---	---
Wygen Unit 2	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Jan. 13, 2008	---	---	---
Newmont TS Power	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	April 6-14, 2008	4.47×10^{-6}	20×10^{-6} lb/MW-hr	39×10^{-6}
Rocky Mountain Power Hardin Generating Station	Sub-bituminous (Absolaka Mine)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI (Optimization)	May 31, 2006	---	---	---
Neil Simpson II	Bituminous	Low NOx Burners, ESP, Dry Scrubber	June 13, 2005	---	---	---
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	Aug. 21-25, 2006	2.27×10^{-6}	6.9×10^{-6}	---
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	June 8, 2007	3.2×10^{-6}	6.9×10^{-6}	---
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	May 5-8, 2008	2.7×10^{-6}	6.9×10^{-6}	---
OPPD Nebraska City Unit 2	PRB (WY)	SCR, Baghouse, Dry Scrubber	April 6, 2009	---	---	---
Holcomb Unit 1	PRB (WY)	Low NOx Burners, Baghouse, Dry Scrubber	August 5-6, 2009	---	---	---
Stanton Energy Center Unit 2	Bituminous (KY, WV)	Low NOx Burners, OFA,Baghouse, Dry Scrubber	August 1996	1.7×10^{-6}	11×10^{-6}	15.6×10^{-6}

As shown in Table 3, the lowest mercury emission limit achieved in practice from review of source testing data was 1.7×10^{-6} lb/MMBtu by Walter Scott Jr. Energy Center, Unit 4 and Weston Unit 4 for PRB coal. The lowest mercury emission limit achieved in practice from review of source testing data was 3.6×10^{-6} lb/MMBtu by Santee Cooper Cross Unit 3 and 4 for bituminous coal. Therefore, the best controlled similar source for mercury for PRB coal would be the Walter Scott Jr. Energy Center Unit 4, and the best controlled similar source from use of bituminous coal is determined to be Santee Cooper Cross Unit 3, based on permitted unit emission limits and emissions performance during stack testing.

D. Non-Mercury Metal HAPs

The following Table 4 is a listing of stack testing data reviewed for non-mercury metal HAPs. The subsequent Table 5 is stack testing data for filterable PM, a surrogacy non-mercury metal HAPs pollutant.

Table 4: Non-Mercury Metal Testing Data Summary

Facility	Coal Type	Controls	Stack Test Date	Non-Mercury Metal	Reported Emissions (lb/MMBtu)	Emission Limit (lb/MMBtu)
Santee Cooper Cross Unit 3	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	Jan. 16-19, 2007	Antimony	1.40E-07	7.00E-07
				Arsenic	2.50E-06	1.60E-05
				Beryllium	3.40E-08	8.44E-07
				Cadmium	7.50E-07	2.10E-06
				Chromium	3.50E-06	1.40E-05
				Cobalt	2.70E-07	4.00E-06
				Lead	2.20E-06	1.69E-05
				Manganese	4.70E-05	2.00E-05
				Nickel	6.30E-06	1.10E-05
				Selenium	3.20E-05	5.20E-05
Santee Cooper Cross Unit 4	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	July 8, 2008	Antimony	2.81E-07	7.00E-07
				Arsenic	1.23E-06	1.60E-05
				Beryllium	3.29E-08	8.44E-07
				Cadmium	3.05E-07	2.10E-06
				Chromium	6.11E-06	1.40E-05
				Cobalt	2.43E-07	4.00E-06
				Lead	4.48E-05	1.69E-05
				Manganese	2.69E-05	2.00E-05
				Nickel	1.21E-05	1.10E-05
				Selenium	1.35E-05	5.20E-05
Wygen Unit 2	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Jan. 13, 2008	Antimony	5.27E-07	8.90E-08
				Arsenic	4.83E-07	1.21E-06
				Beryllium	3.10E-08	2.90E-06
				Cadmium	3.95E-07	4.91E-07
				Chromium	9.66E-07	2.54E-06
				Cobalt	4.83E-07	1.96E-06
				Lead	2.86E-06	1.58E-06
				Manganese	6.15E-07	2.36E-06
				Nickel	1.32E-06	4.15E-06
				Selenium	4.83E-07	5.52E-07
					Total Selected Metals (TSM) Reported Emissions (lb/MMBtu)	Total Selected Metals (TSM) Emission Limit (lb/MMBtu)
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	May 8-12, 2007	---	9.20E-05	1.04E-04
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Aug. 14-18, 2007	---	3.10E-05	1.04E-04

Note: The Wygen Unit 2 "Emission Limit' was not a permitted limit but an estimated emission rate from permit application data. Those shaded values shown above either exceeded the permitted emission limit for Santee Cooper Cross Unit 3 and 4 or exceeded the expected emission rate for Wygen Unit 2.

As shown in Table 4, Santee Cooper Cross Unit 3 and 4 and the Wygen II facility established emission limits for specific non-mercury metal HAPs. The Walter Scott Jr. Energy Center derived a Total Selected Metals (TSM) limit, based on the non-mercury metals arsenic, beryllium, cadmium, chromium, lead, manganese, nickel, and selenium while excluding antimony and cobalt. Based on facility emission limits and reported emissions during source testing Wygen Unit 2 would be considered the best controlled similar source for non-mercury metals with use of PRB coal, and Santee Cooper Cross Unit 3 would be considered the best controlled similar source with use of bituminous coals.

As indicated for those facilities with specified or anticipated emission rates for specific non-mercury metal HAPs, at least one non-mercury metal HAP exceeded the emission limit or anticipated emission rate for that HAP. Considering the potential variability in metals content in coal from coal shipments, the lack of recent stack test data for individual metals from which one could statistically derive an achievable emission limit, and the results of the limited testing identified for specific non-mercury metal HAPs where limits were established, the use of filterable PM as a surrogate for non-mercury metal HAPs will be a more stringent and reliable method of monitoring and restricting these HAP emissions.

The proven reliability of a filterable PM CEMS also confirms that use of filterable PM as a surrogate will be a more restrictive means of compliance monitoring than intermittent stack testing for non-mercury metals. The Applicant has explored whether comparable CEMS technology exists that would allow for continuous, reliable monitoring of individual non-mercury metal HAPs. The Applicant spoke with a vendor, Cooper Environmental Services, that markets a Multi-Metal CEMS device (Xact 640). This device has been in long-term use on a waste incinerator but has only undergone limited testing on coal-fired units. The Cooper device also currently lacks the necessary performance specifications and test methods for use on a coal-fired boiler unit. As was plainly evident from the Applicant's conversation with Cooper Environmental Services, Cooper's individual metals CEMS technology has not yet been demonstrated on a coal-fired boiler, nor has the vendor conducted the necessary product development to ensure the reliable use of this technology at the scale and under the conditions one would encounter at a coal-fired boiler facility. The knowledge the Applicant gained from its research of Cooper's individual metal CEMS further demonstrates that the use of filterable PM (and the associated PM CEMS device) will provide the most stringent and reliable method of limiting non-mercury metal HAPs from Plant Washington.

Table 5: Filterable PM (Non-Mercury Metal HAP Surrogate Pollutant) Testing Data Summary

Facility	Coal Type	Controls	Stack Test Date	Reported Emissions (lb/MMBtu)	Emission Limit (lb/MMBtu)
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	May 8-12, 2007	---	---
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Aug. 14-18, 2007	---	---
Weston Unit 4	PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI	July 7-11, 2008	0.0147	0.02
Santee Cooper Cross Unit 3	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	Jan. 16-19, 2007	0.006	0.015
Santee Cooper Cross Unit 4	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	July 8, 2008	0.007	0.015
Wygen Unit 1	Bituminous	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber	June 6, 2005	---	---
Wygen Unit 2	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Jan. 13, 2008	0.00094	0.012
Newmont TS Power	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	April 6-14, 2008	0.0036	0.012
Rocky Mountain Power Hardin Generating Station	Sub-bituminous (Absolaka Mine)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI (Optimization)	May 31, 2006	0.0072	0.015
Neil Simpson II	Bituminous	Low NOx Burners, ESP, Dry Scrubber	June 13, 2005	---	---
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	Aug. 21-25, 2006	---	---
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	June 8, 2007	0.0047	0.015
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	May 5-8, 2008	0.0013	0.015
OPPD Nebraska City Unit 2	PRB (WY)	SCR, Baghouse, Dry Scrubber	April 6, 2009	0.009	---
Holcomb Unit 1	PRB (WY)	Low NOx Burners, Baghouse, Dry Scrubber	August 5-6, 2009	0.0065	---
Stanton Energy Center Unit 2	Bituminous (KY, WV)	Low NOx Burners, OFA,Baghouse, Dry Scrubber	August 1996	---	---

As shown in Table 5, the lowest filterable PM emission limit achieved in practice from review of source testing data was 0.012 lb/MMBtu for Wygen Unit 2. Based on facility emission limits and reported emissions during source testing Wygen Unit 2 would be considered the best controlled similar source for PM. These findings for filterable PM, the surrogate monitoring pollutant for non-mercury metals, correspond with the findings of the best controlled similar source for direct non-mercury metal HAP emissions.

E. Organic HAPs

In review of Case-By-Case MACT determinations and permitted facility emission limits, no facilities could be identified with individual speciated Organic HAP limits. Instead, all recently permitted facilities are utilizing a surrogate — either carbon monoxide (CO) or volatile organic compounds (VOC) — to control Organic HAP emissions. As the Applicant explains in more detail in previous submissions to EPD, Plant Washington will also use CO as a surrogate for Organic HAPs. The following Table 6 is a listing of stack testing data reviewed for CO, indicating the result of the stack test as well as the permitted limits for the unit.

Table 6: CO (Organic HAP Surrogate Pollutant) Testing Data Summary

Facility	Coal Type	Controls	Stack Test Date	CO Reported Emissions (lb/MMBtu)	CO Emission Limit (lb/MMBtu)	CO Emission Limit Avg. Period
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	May 8-12, 2007	0.039	0.154	calendar day
Walter Scott Jr. Energy Center Unit 4	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Aug. 14-18, 2007	0.003	0.154	calendar day
Weston Unit 4	PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI	July 7-11, 2008	0.01	0.15	calendar day
Santee Cooper Cross Unit 3	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	Jan. 16-19, 2007	0.177	0.16	3-hr stack test
Santee Cooper Cross Unit 4	Bituminous (KY, WV, PA, IN)	SCR, ESP, Wet Scrubber	July 8, 2008	0.031	0.16	3-hr stack test
Wygen Unit 1	Bituminous	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber	June 6, 2005	---	---	
Wygen Unit 2	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	Jan. 13, 2008	0.067	0.15	3-hr stack test
Newmont TS Power	PRB (WY)	Low NOx Burners, OFA, SCR, Baghouse, Dry Scrubber, ACI	April 6-14, 2008	0.002	0.15	24-hr rolling
Rocky Mountain Power Hardin Generating Station	Sub-bituminous (Absolaka Mine)	Low NOx Burners, SCR, Baghouse, Dry Scrubber, ACI (Optimization)	May 31, 2006	0.001	0.15	3-hr stack test
Neil Simpson II	Bituminous	Low NOx Burners, ESP, Dry Scrubber	June 13, 2005	---	---	
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	Aug. 21-25, 2006	---	---	
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	June 8, 2007	0.016	0.15	30-day rolling
Springerville Unit 3	Sub-bituminous (NM), PRB (WY)	Low NOx Burners, SCR, Baghouse, Dry Scrubber	May 5-8, 2008	0.005	0.15	30-day rolling
OPPD Nebraska City Unit 2	PRB (WY)	SCR, Baghouse, Dry Scrubber	April 6, 2009	0.003	0.16	3-hr rolling
Holcomb Unit 1	PRB (WY)	Low NOx Burners, Baghouse, Dry Scrubber	August 5-6, 2009	---	---	
Stanton Energy Center Unit 2	Bituminous (KY, WV)	Low NOx Burners, OFA,Baghouse, Dry Scrubber	August 1996	0.13	0.15	30-day rolling

Note: CO emission limits indicated are on a 30-day rolling, calendar day, 24-hr rolling, 3-hr rolling, or 3-hr (stack test) average basis. However, reported emissions are based on a short term (3-hr) stack test on the date indicated. No CEMS data was available for review from the indicated facilities.

The lowest CO emission limit achieved in practice from review of source testing data was 0.15 lb/MMBtu. Based on permitted emission limits and the emissions achieved during source testing, the best controlled similar source is determined to be Newmont TS Power.

IV. Conclusion

The best controlled similar source was defined for specific HAPs of interest as well as surrogacy pollutants of interest. Although there are alternate methods that could have been utilized for determination of the best controlled similar source, including a statistical analysis of the available emissions testing data, based on the limited data set available to the Applicant, the methods discussed above were determined to be the most appropriate for this analysis. Specifically, the limited data set available for conducting a statistical analysis for individual HAPs of interest could lead to a wide range of error due to the large variability in emissions testing results seen for individual HAPs.

The following Table 7 is a summary of the determined Best Controlled Similar Source emission limits with a comparison to the draft permit limits for Plant Washington.

Table 7: Best Controlled Similar Sources Compared to Plant Washington

Pollutant	Coal Type	Best Controlled Similar Source Limit (lb/MMBtu)	Plant Washington Draft Permit Limit (lb/MMBtu)
HF	n/a	2.17E-04	2.17E-04
HCl	PRB (sub-bituminous)	6.26E-04	3.22E-04
	Bituminous	2.4E-03	2.4E-03
Mercury	PRB (sub-bituminous)	1.7E-06	1.46E-06[1]
	Bituminous	3.6E-06	1.46E-06[1]
Non-Mercury Metal HAPs (Filterable PM Surrogate)	n/a	0.012	0.012
Organic HAPs (CO Surrogate)	n/a	0.15	0.1

[1] Indicated value of 1.46E-06 lb/MMBtu equivalent to 13 x 10^{-6} lb/MW-hr.

As shown in Table 7, the Plant Washington draft permit limits are as stringent or more stringent than the limits of the Best Controlled Similar Sources identified in this document. Please see the Applicant’s previously submitted case-by-case MACT analysis for more information.