



DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

Permit Application Analysis
A0002447

September 21, 2016

NAME OF FIRM: PacifiCorp Energy

NAME OF FACILITY: Naughton Power Plant

FACILITY LOCATION: Sections 32 and 33, T21N, R116W
Lincoln County, Wyoming

TYPE OF OPERATION: Coal-fired Electric Generating Plant

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1. PURPOSE OF APPLICATION

On March 25, 2014, the Division of Air Quality received an application from PacifiCorp Energy (PacifiCorp) to revise the sulfuric acid mist (H_2SO_4) emission limits for Units 1 and 2 at the Naughton Power Plant based on the Consent Decree between the State of Wyoming and PacifiCorp Energy. The Naughton Power Plant is located in sections 32 and 33, T21N, R116W, approximately four (4) miles southwest of Kemmerer, in Lincoln County, Wyoming.

A revised application was received from PacifiCorp on September 23, 2015, to replace the original application received on March 25, 2014.

Additional information was received from PacifiCorp on August 3, 2016, addressing dry sorbent injection (DSI) for sulfuric acid mist (SAM) control.

On January 10, 2013, the Naughton Plant received a Notice of Violation (NOV) alleging that Units 1 and 2 had failed to comply with the H_2SO_4 emission limit of 0.004 lb/MMBtu. Subsequent testing of the controls that have been installed on Units 1 and 2 has demonstrated that sulfuric acid emissions were underestimated, and the permit limits established cannot be met at all times.

Recent testing has demonstrated that the 0.004 lb/MMBtu emission rate is not achievable with the BACT equipment that has been installed. This permit application is to reevaluate the potential impacts of the SO_3 injection system and permit an H_2SO_4 rate that will be achievable given the specific ambient conditions and coal characteristics that exist at the Naughton Power Plant.

Per the April 10, 2015 Consent Decree, PacifiCorp shall comply with a sulfuric acid mist emission limit of 0.0055 lb/MMBtu and 10.2 lb/hr for Unit 1, and 0.0055 lb/MMBtu and 11.6 lb/hr for Unit 2.

2. RELEVANT PERMIT HISTORY

On August 20, 2010, Air Quality Permit MD-9861 was issued to authorize use of flue gas conditioning on Units 1 and 2, remove SO₃ injection limits on Unit 3, and require the installation of wet scrubbers on Units 1 and 2 by December 31, 2012 and December 31, 2011, respectively.

On May 20, 2009, Air Quality Permit MD-5156 was issued to install flue gas conditioning systems to enhance performance of the existing electrostatic precipitators (ESPs), install flue gas desulfurization systems (FGD) comprised of sodium-based (alkali) wet scrubbers, and install low NO_x burner systems on Units 1 and 2. The existing ESP on Unit 3 will be replaced with a fabric filter (baghouse) and the Unit 3 steam turbine will be upgraded. PacifiCorp also identified other capital and O&M projects on Naughton Units 1, 2, and 3 during the project. Installation of the pollution control equipment was expected to be completed by April 2014.

On March 19, 2008, PacifiCorp was issued Title V Operating Permit 3-2-121. The permit consolidates air quality regulatory requirements pertaining to the Naughton Power Plant, a major source of emissions, into one (1) document and incorporates previously issued permits and waivers for this facility.

3. FACILITY DESCRIPTION

PacifiCorp's Naughton Power Plant generates electricity through the combustion of pulverized coal in three (3) steam-electric generating units (Units 1-3). Coal is stored onsite and conveyed to each of the units where it is pulverized and combusted to generate thermal energy that heats water to generate steam. The steam is used to turn a steam turbine which drives an electric generator to produce electricity.

PacifiCorp's Naughton Power Plant is comprised of three (3) pulverized coal-fired units with a total net generating capacity of 700 megawatts (MW). Naughton Unit 1 commenced operation in 1963 and has a maximum heat input of 1,850 million British thermal units per hour (MMBtu/hr). The unit generates a nominal 160 MW. Naughton Unit 2 commenced operation in 1968, has a maximum heat input of 2,400 MMBtu/hr, and generates a nominal 210 MW. The boilers on Units 1 and 2 are tangential fired and equipped with low NO_x burners (LNB) and advanced overfire air (AOFA) to control NO_x emissions. Each EGU is equipped with an electrostatic precipitator (ESP) and a flue gas conditioning system (FGC) to control particulate emissions. SO₂ emissions are controlled by sodium-based wet flue gas desulfurization systems (WFGD) installed on each unit. Naughton Unit 3 commenced operation in 1971, has a maximum heat input of 3,700 MMBtu/hr, and generates a nominal 330 MW. The Unit 3 boiler is tangential fired and retrofitted with ALSTOM LCCFS II low NO_x burners with overfire air (OFA) installed in 1999. Particulate emissions are controlled using an ESP with FGC. SO₂ emissions are controlled using a two-tower sodium-based WFGD system that was installed in 1997.

The capacities of the units are as follows:

Unit	Firing Rate (MMBtu/hr)	Electric Generating Capacity (MW)
1	1,850	160
2	2,400	210
3	3,700	330

Source	Current Controls	NO _x	SO ₂	PM/PM ₁₀ ²
Unit 1	New LNB with AOFA, FGC, ESP, WFGD	0.75 lb/MMBtu (3-hr rolling) 0.26 lb/MMBtu (30-day rolling) 481 lb/hr (30-day rolling) 2,107 tpy	0.15 lb/MMBtu (12-month rolling) 1.2 lb/MMBtu (2-hr rolling) 833 lb/hr (3-hr block)	0.040 lb/MMBtu 74 lb/hr 324 tpy
Unit 2	New LNB with AOFA, FGC, ESP, WFGD	0.75 lb/MMBtu (3-hr rolling) 0.26 lb/MMBtu (30-day rolling) 624 lb/hr (30-day rolling) 2,733 tpy	0.15 lb/MMBtu (12-month rolling) 1.2 lb/MMBtu (2-hr rolling) 1,080 lb/hr (3-hr block)	0.040 lb/MMBtu 96 lb/hr 421 tpy

¹ Emissions limits taken from recent New Source Review application analysis for permit MD-15946.

² Averaging period is 1 hour as determined by 40 CFR 60.46 and EPA Reference Test Methods 1-4 and 5.

4. ESTIMATED EMISSIONS

Previous permitting for the flue gas condition systems on Units 1 and 2 assumed that with the prescribed controls, the units would be able to meet a 0.004 lb/MMBtu emission rate for H₂SO₄. Given this emission rate, it was determined that the addition of flue gas conditioning had the potential to cause a significant increase in H₂SO₄ emissions. Because of this potential increase, a BACT review was conducted.

Table 3 illustrates the difference in sulfuric acid mist emissions between the emissions currently permitted (MD-9861) and the proposed emissions for Units 1 and 2.

MD-9861 Permitted Emissions				Proposed Emissions			Emissions Increase	
Unit	Emission Rate (lb/MMBtu)	Emissions (lb/hr) ¹	Emissions (tpy) ²	Emission Rate (lb/MMBtu)	Emissions (lb/hr) ¹	Emissions (tpy) ²	Emissions (lb/hr)	Emissions (tpy)
Unit 1	0.004	7.4	32.4	0.0055	10.2	44.6	2.8	12.2
Unit 2	0.004	9.6	42.0	0.0055	11.6	57.8	2.0	15.8
Total	--	17.0	74.4	--	21.8	102.4	4.8	28.0

¹ Emissions based on unit designed firing rate of 1,850 MMBtu/hr (Unit 1) and 2,400 MMBtu/hr (Unit 2).

² Emissions based on unit 8,760 hours of operation per year.

5. CHAPTER 6, SECTION 4 – PREVENTION OF SIGNIFICANT DETERIORATION (PSD) APPLICABILITY

The Naughton Power Plant is subject to Prevention of Significant Deterioration (PSD) regulation under Chapter 6, Section 4 of the Wyoming Air Quality Standards and Regulations (WAQSR) because it is classified as a “major stationary source”. As a major stationary source, Naughton is a fossil-fuel fired steam electric plant of more than two hundred and fifty million British thermal units per hour (250 MMBtu/hr) heat input that emits, or has the potential to emit, one hundred tons per year (100 tpy) or more of any air pollutant for which standards are established under the PSD standards and regulations or under the Federal Clean Air Act.

Under Chapter 6, Section 4 of the WAQSR there are two (2) methodologies for determining if a significant emission increase occurs for a project. This determination consists of either an actual-to-potential emissions test or a baseline actual-to-projected actual emissions test. For this project, PacifiCorp has utilized baseline actual-to-potential emissions test (pollutant dependent) for determining if a significant increase will occur as a result of the project.

Project Affected Emission Units

PacifiCorp is required to determine the emissions units which are affected by the project. PacifiCorp evaluated all emission units at the Naughton Plant to define potential project impacts on production rates and emissions. Based on an evaluation of the emission units at the Naughton Plant, PacifiCorp determined that the units shown in Table 4 are the project affected emission units due to changes in the method of operation or increased utilization.

Table 4: Project Affected Emission Units	
Source ID	Source Description
1	Unit #1
2	Unit #2

Baseline Actual Emissions

Baseline actual emissions are emissions from any consecutive twenty-four (24) month period within a five (5) year period preceding the project for an electric utility steam generating unit. PacifiCorp submitted baseline emissions for affected pollutants including PM₁₀, PM_{2.5}, and H₂SO₄ for the five (5) year period from January 2010 through December 2014. The baseline analyses do not include emissions in excess of applicable emission limits. For operations during this time, PacifiCorp was operating at a SO₃ injection rate of 2 and 4 ppm.

Particulate baseline emissions are based on March 2010 through February 2012 for PM and PM₁₀, and January 2010 through December 2011 for PM_{2.5}. H₂SO₄ baseline emissions are based on January 2012 to December 2013. Table 5 shows the baseline actual emissions for the project affected emission units at the Naughton Power Plant.

Table 5: Baseline Actual Emissions	
Pollutant	Average (tpy)
PM ¹	808.0
PM ₁₀ ²	576.4
PM _{2.5} ³	310.5
H ₂ SO ₄ ⁴	37.2

¹ PacifiCorp has chosen March 2010 to February 2012 for establishing their baseline actual emissions.

² PacifiCorp has chosen March 2010 to February 2012 for establishing their baseline actual emissions.

³ PacifiCorp has chosen January 2010 to December 2011 for establishing their baseline actual emissions.

⁴ PacifiCorp has chosen January 2012 to December 2013 for establishing their baseline actual emissions.

Project Emissions

Project emissions were estimated based on potential to emit. The new limit is in effect for PM based on MACT UUUUU requirements of 0.03 lb/MMBtu for filterable PM for EGUs, which went into effect April 16, 2015. The potential to emit for Unit 1 is based on the UUUUU limit of 0.03 lb/MMBtu PM (filterable) + 0.007 lb/MMBtu PM (condensable) and the design firing rate of the unit. The potential to emit for Unit 2 is based on the UUUUU limit of 0.03 lb/MMBtu PM (filterable) + 0.011 lb/MMBtu PM (condensable) and the design firing rate of the unit. Condensable is based on maximum historical condensable rate plus projected incremental increase from Hg control technology. For Unit 1, the maximum historical condensable PM emission rate was 0.0070 lb/MMBtu and the incremental condensable PM increase from the mercury control technology (calcium bromide injection – CaBr₂) was projected at 0.00037 lb/MMBtu. This provides a total projected condensable PM emission rate of 0.00737 lb/MMBtu which was rounded to 0.007 lb/MMBtu in the September 22, 2015 application to permit the Unit 1 and Unit 2 H₂SO₄ emission limits at 0.0055 lb/MMBtu. For Unit 2, the maximum historical condensable PM emission rate was 0.0111 lb/MMBtu and the incremental condensable PM increase from the calcium bromide mercury control technology was also projected at 0.00037 lb/MMBtu. This provides a projected total condensable PM emission rate of 0.01147 lb/MMBtu which was rounded to 0.011 lb/MMBtu in the September 22, 2015 permit application. Note that the projected incremental CPM increase of 0.00037 lb/MMBtu from the CaBr₂ mercury control technology was included in the December 11, 2013 application to permit the Naughton plant’s mercury control technology systems.

Potential to emit for PM₁₀ and PM_{2.5} are based on the same approach, but with a scaling factor of 0.67 for PM to PM₁₀ and 0.29 for PM to PM_{2.5}. Table 6 shows the project emissions from the affected sources at the Naughton Power Plant.

Pollutant	tpy
PM	730.8
PM ₁₀	489.6
PM _{2.5}	211.9
H ₂ SO ₄	102.4

Excludable Emissions (demand growth)

Because PacifiCorp Energy has chosen to utilize a baseline actual-to-potential emissions test, the Division will not be including the demand growth in this analysis.

Applicability Test

To determine PSD applicability, the baseline emissions are subtracted from the potential emissions. This difference is then compared with the PSD significant emission rate for each pollutant. Based on potential emissions minus baseline emissions, the proposed modification at the Naughton Plant is considered a major modification as there will be a significant increase of a regulated pollutant under Chapter 6, Section 4. Table 7 shows the net emissions change for each regulated pollutant at the Naughton Power Plant.

Table 7: Significant Emission Rate Increase Determination					
Pollutant	Potential Emissions (tpy)	Baseline Emissions (tpy)	Net Emissions Change (tpy) ¹	PSD Significant Emission Rate (tpy)	PSD Review Required
PM	730.8	808.0	-77.2	25	NO
PM ₁₀	489.6	576.4	-86.8	15	NO
PM _{2.5}	211.9	310.5	-98.6	10	NO
H ₂ SO ₄	102.4	37.2	65.2	7	YES

¹ Potential emissions – Baseline emissions = Net Emissions Change.

As indicated in Table 4, sulfuric acid emissions have the potential to increase above the PSD significance level following the establishment of the 0.0055 lb/MMBtu emission limit provided in the April 2015 consent decree.

The proposed modification is subject to PSD review consisting of a Best Available Control Technology (BACT) analysis for sulfuric acid mist and an analysis of additional impacts as described in Chapter 6, Section 4(b)(i)(B) of the WAQSR. An ambient air quality impact analysis and an increment consumption analysis are not required as there are no ambient air quality standards or PSD increments established for sulfuric acid mist.

The Division is establishing total PM/PM₁₀ limits for Units 1 and 2 as described previously under Project Emissions, and by using an assumption that total PM is equivalent to total PM₁₀. PacifiCorp’s PM speciation, as presented in their permit application, is based on scaling factors of 0.67 for PM to PM₁₀ and 0.29 for PM to PM_{2.5} that were taken from EPA’s AP-42 document. There is no way for the Division to establish testing to determine that these scaling factors would be appropriate for operation of Units 1 and 2, and therefore, the Division will not be setting separate, speciated limits for PM₁₀/PM_{2.5}. Additionally, the Division does not intend to establish separate PM₁₀ and PM_{2.5} limits because the EPA test method that would be used to demonstrate compliance with such limits (Method 201A) cannot be used with stacks that contain liquid droplets or are saturated with water, and Units 1 and 2 are both equipped with wet scrubbers.

6. CHAPTER 6, SECTION 4 – BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

6.1 Sulfuric Acid Mist Emissions After Scrubber Installation

A. Identify Control Options

PacifiCorp conducted a top-down BACT analysis for controlling sulfuric acid mist emissions from Units 1 and 2. The Division is not aware of pollution control options designed specifically for controlling sulfuric acid emissions from coal fired power plants, as sulfuric acid mist control is typically a secondary benefit of SO₂ control. This analysis considered the authorized pollution controls in Air Quality Permit MD-5156 that affect sulfuric acid mist emissions, which are the existing ESP with FGC and a new alkali wet scrubber for each unit. In addition to existing controls, PacifiCorp also considered limiting the sulfur content of the coal, and installing a dry sorbent injection system (DSI).

B. Eliminate Technically Infeasible Options

PacifiCorp Energy eliminated DSI as a potential sulfuric acid mist control option for Naughton Units 1 and 2. Installing DSI systems upstream of the Units 1 and 2 ESPs will negate the beneficial aspects of the units' flue gas conditioning systems and will potentially result in increased particulate matter emissions and stack exit opacity. Furthermore, PacifiCorp determined that installing DSI systems downstream of the ESPs and upstream of the wet sodium-based scrubbers is an untested technology and would require extensive feasibility studies.

Neither installing an alkali wet scrubber nor limiting fuel sulfur content is technically infeasible.

C. Rank Remaining Technologies by Control Effectiveness

1. Alkali wet scrubber
2. Limiting fuel sulfur content

D. Evaluate Control Technologies

Coal blending of higher sulfur coal is no longer needed for Units 1 and 2 as they are currently equipped with a wet scrubber and can reduce SO₂ emissions after combustion.

The Division reviewed recent PSD determinations listed in EPA's RACT/BACT/LAER Clearinghouse (RBLC) on September 19, 2016, for determinations on sulfuric acid mist emissions from similar units. Five (5) recent determinations were reviewed, each equipped with wet flue gas desulfurization for SO₂ control (see Appendix A). Emission levels ranged from 0.0037 to 0.0075 lb/MMBtu. PacifiCorp's proposed emission rate of 0.0055 lb/MMBtu is only 0.0018 lb/MMBtu higher than the lowest reviewed sulfuric acid mist emission levels.

E. Select BACT (Conclusion)

Recent testing has demonstrated that the 0.004 lb/MMBtu emission rate is not achievable with the BACT equipment that has been installed. This permit application is to reevaluate the potential impacts of the SO₃ injection system and permit an H₂SO₄ rate that will be achievable given the specific ambient conditions and coal characteristics that exist at the Naughton Power Plant.

After evaluating the information submitted by PacifiCorp and reviewing the RBLC for similarly controlled units, the Division considers installation of alkali wet scrubbers on Units 1 and 2, meeting an emissions limit of 0.0055 lb/MMBtu, and meeting a SO₃ injection limit of 4 ppm_v, annual average of four (4) quarterly tests, to represent BACT for Units 1 and 2.

7. CHAPTER 6, SECTION 3 – MAJOR SOURCE APPLICABILITY

The Naughton Power Plant is a major source under Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations. PacifiCorp is required to modify their operating permit in accordance with Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations (WAQSR).

8. CHAPTER 5, SECTION 2 – NEW SOURCE PERFORMANCE STANDARDS (NSPS)

The Naughton Power Plant is subject to Subpart Y under 40 CFR part 60. The proposed revision to the sulfuric acid mist (H₂SO₄) emission limits for Units 1 and 2 does not change the applicability to this subpart.

9. CHAPTER 5, SECTION 3 – NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPs)

The Naughton Power Plant is subject to 40 CFR part 63, subpart UUUUU – *National Emission Standards for Hazardous Air Pollutants: Coal- and Oil- Fired Electric Utility Steam Generating Units*. The proposed revision to the sulfuric acid mist (H₂SO₄) emission limits for Units 1 and 2 does not change the applicability to this subpart.

The potential to emit for Unit 1 is based on the UUUUU limit of 0.03 lb/MMBtu PM (filterable) + 0.007 lb/MMbtu PM (condensable) and the design firing rate of the unit. The potential to emit for Unit 2 is based on the UUUUU limit of 0.03 lb/MMBtu PM (filterable) + 0.011 lb/MMbtu PM (condensable) and the design firing rate of the unit. Condensable is based on maximum historical condensable rate plus projected incremental increase from Hg control technology. Potential to emit for PM₁₀ and PM_{2.5} are based on the same approach, but with a scaling factor of 0.67 for PM to PM₁₀ and 0.29 for PM to PM_{2.5}.

10. AMBIENT IMPACT ANALYSIS

As only emissions of sulfuric acid increase following the establishment of the proposed 0.0055 lb/MMBtu emission limits, PacifiCorp evaluated the need to perform an Air Quality Related Values (AQRV) analysis for the nearest Class I area per the guidance provided by the Federal Land Managers’ Air Quality Related Values Work Group (FLAG).

Naughton Unit 1 and Unit 2 were permitted at an emission rate of 0.004 lb/MMBtu following the startup of their scrubbers through Air Quality Permit MD-9861. The Wyoming Attorney General’s Office consent decree issued in April of 2015 includes a Unit 1 and Unit 2 sulfuric acid emission limit of 0.0055 lb/MMBtu for each unit. Revising the emission limit as provided in the consent decree will result in a potential annual emission increase in sulfuric acid of 65.2 tons/year from the Naughton Plant.

As summarized in Table 8, the Unit 1 and Unit 2 baseline and future potential emissions demonstrate a potential to exceed the PSD sulfuric acid emissions increase threshold of 7 tons/year.

Table 8: Baseline and Future Potential Unit 1 & Unit 2 Sulfuric Acid Emissions			
	Baseline H₂SO₄ Emissions (tons/year)	Future Potential H₂SO₄ Emissions (tons/year)	Potential Emissions Increase (tons/year)
Naughton Unit 1 & Unit 2	37.2	102.4	65.2

Because sulfuric acid is a visibility-reducing pollutant, PacifiCorp used guidance provided in the 2010 revision to the FLAG Phase I Report to evaluate the need to perform an AQRV analysis due to potential sulfuric acid emission increases. As indicated in the FLAG guidance, the Federal Land Managers have stated that it would be reasonable to conclude that a source would not be considered to cause or contribute to AQRV impairment if the Q/D factor for a proposed project is less than ten (10). Furthermore, the FLAG guidance provides that Q is based on emissions of visibility-reducing pollutants in units of tons per year and that D is based on the distance from the emission source to a Class I area as measured in kilometers.

For this project, Q is the potential annual sulfuric acid emission increase, and as indicated in Table 5, the Q value is 65.2 tons/year. The closest Class I area to the Naughton Plant is the Bridger Wilderness Area. A review of the Bridger Wilderness Area boundary indicates a nearest proximity to the Naughton Plant of 138 kilometers.

Dividing the Units 1 and 2 emissions (Q) value of 65.2 tons/year by the Class I distance (D) value of 138 kilometers provides a Q/D factor of 0.5. The Q/D analysis was provided to the United States Department of Agriculture – Forest Service, and by letter dated March 29, 2016, the Forest Service indicated that no further analyses would be required for the project.

Additional air quality impacts, including impacts due to growth, were assessed and found to be negligible, as the facility will not be changing operational conditions due to this modification.

11. PROPOSED PERMIT CONDITIONS

The Division proposes to issue an Air Quality Permit to PacifiCorp Energy for the modification of Units 1 and 2 at the Naughton Power Plant with the following conditions:

1. Authorized representatives of the Division of Air Quality be given permission to enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution, and for determining compliance or non-compliance with any rules, standards, permits or orders.
2. All substantive commitments and descriptions set forth in the application for this permit, unless superseded by a specific condition of this permit, are incorporated herein by this reference and are enforceable as conditions of this permit.
3. That PacifiCorp shall file a complete application to modify their Operating Permit within twelve (12) months of commencing operation, in accordance with Chapter 6, Section 3(c)(i)(B) of the WAQSR. Where an existing operating permit would prohibit such construction or change in operation, the owner or operator must obtain a permit revision before commencing operation.
4. All notifications, reports and correspondence associated with this permit shall be submitted to the Stationary Source Compliance Program Manager. Submissions may be done electronically through <https://airimpact.wyo.gov> to satisfy requirements of this permit.

5. Effective upon permit issuance, sulfuric acid mist emissions from Units 1 and 2 shall be limited to the values in the following table. The limits shall apply during all operating periods. This condition shall supersede the sulfuric acid mist limits specified in Air Quality Permit MD-9861 (Condition 8). Limits are based on the average of four (4) quarterly tests.

Unit	Sulfuric Acid Mist (lb/MMBtu) ¹	Sulfuric Acid Mist (lb/hr) ¹
Unit 1	0.0055	10.2
Unit 2	0.0055	11.6

¹ Annual average based on four (4) quarterly tests.

6. The sulfur trioxide (SO₃) injection rate for each unit (Units 1 and 2) shall be limited to the following:

4 ppm_v, based on a 2-hour rolling average

Records shall be kept of the inputs to the SO₃ injection control system algorithm that is used to determine the appropriate injection rate. Inputs to this algorithm include boiler load in megawatts and the sulfur feed rate in pounds per hour to the injection system. The SO₃ injection rate shall be recorded by the plant data acquisition system.

7. That quarterly, or as otherwise specified by the Administrator, Naughton Units 1 and 2 shall be tested to verify compliance with the Sulfuric Acid Mist (SAM) limits set forth in Condition 5. Testing shall consist of three (3) 2-hour tests following EPA Reference Methods 1-4 and 8 or a Division approved Reference Method, to determine lb/MMBtu and lb/hr emissions. Testing shall be conducted at SO₃ injection rate(s) near the maximum expected rate. Sulfur trioxide injection rate(s) shall be recorded during each test and submitted with the test results. The first quarterly tests are required during the first full calendar quarter following permit issuance. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. The frequency of SAM testing may be revised without amending the permit provided a demonstration can be shown that the testing shows compliance with the limit in Condition 5, but revisions shall be approved by the Division prior to implementation.
8. Effective upon permit issuance, this condition shall supersede Conditions 5(i)(3) and 5(ii)(4) for Unit 1, and Condition 5(i)(4) for Unit 2, in Air Quality Permit MD-11725. The lb/hr and tpy limits shall apply during all operating periods. The lb/MMBtu limits shall apply during all operating periods except startup.

i. Units 1 and 2:

Total PM emissions shall be limited to the values in the following table:

Source	Pollutant	lb/MMBtu	Pounds Per Hour	Tons Per Year
Unit 1	PM / PM ₁₀	0.037	68.5	299.8
Unit 2	PM / PM ₁₀	0.041	98.4	431.0

9. That annually, Naughton Units 1 and 2 shall be tested to verify compliance with the total PM/PM₁₀ emission limits set forth in Condition 8. Testing shall consist of EPA reference test methods 1-4, 5, and 202, or equivalent EPA reference methods upon Division approval. Prior to any performance testing required by this permit, a test protocol shall be submitted to the Division for approval, at least thirty (30) days prior to testing. Results of the tests shall be submitted to this office within forty-five (45) days of completing the tests.
10. Records required by any applicable regulation or permit condition shall be maintained for a minimum period of five (5) years and shall be readily accessible to Division representatives.
11. During periods of startup and shutdown of Units 1 and 2, PacifiCorp shall adhere to the procedures in the *Sulfuric Acid Emissions Startup and Shutdown Minimization Plan*, attached as Appendix B. This plan may be modified as deemed necessary by PacifiCorp without amending the permit, but revisions to the plan shall be approved by the Division prior to implementation. This condition shall supersede Condition 15 of Air Quality Permit MD-9861 and shall supersede all previous startup and shutdown minimization plans for sulfuric acid emissions from Units 1 and 2 for the Naughton Plant.
12. All conditions from previously issued permits and waivers shall remain in effect unless superseded by a specific condition of this permit.

Appendix A

RBLC Sources

RBLC ID	State	Permit Date	Company	Facility	Heat Input (MMBtu/hr)	SO ₂ Control	Sulfuric Acid Mist Limit (lb/MMBtu)
WY-0073	Wyoming	6/17/2013	PACIFICORP ENERGY	JIM BRIDGER POWER PLANT	6,000	wet FGD	0.0040
MI-0389	Michigan	12/29/2009	CONSUMERS ENERGY	KARN WEADOCK GENERATING COMPLEX	8,190	wet FGD	0.0040
TX-0558	Texas	12/11/2009	NRG TEXAS POWER LLC	LIMESTONE ELECTRIC GENERATING STATION	8,000	wet FGD	0.0075
OH-0310	Ohio	10/8/2009	AMERICAN MUNICIPAL POWER	AMERICAN MUNICIPAL POWER GENERATING STATION	5,191	wet FGD	0.0075 ¹
OK-0118	Oklahoma	2/9/2007	WESTERN FARMERS ELECTRIC COOP	HUGO GENERATING STATION	7,125 ²	wet FGD	0.0037

¹ Based on limit of 38.9 lb/hr divided by the heat input rate.

² Heat input taken from Oklahoma Evaluation of Permit Application No. 97-058-C (M-2) (PSD).

Appendix B

Sulfuric Acid Emissions Startup and Shutdown Minimization Plan

Naughton Plant Startup and Shutdown Emission Minimization Plan

General Emissions Description

The intent of this Naughton Plant Startup and Shutdown Minimization Plan is to minimize sulfuric acid mist emissions due to operation of the Unit 1 and Unit 2 flue gas conditioning systems during periods of boiler startup and shutdown.

Startup General Description

Natural gas is the initial heat input source used during Naughton plant unit startup, with startup beginning when fuel is introduced into the boiler. As the boiler, turbine equipment and steam temperatures rise to design values, coal mills (pulverizers) are gradually placed into service concurrently with natural gas firing. As steam and equipment temperatures continue to rise while co-firing on natural gas and coal, the boiler combustion process stabilizes adequately such that natural gas firing can cease.

Shutdown General Description

Unit shutdown begins when the unit load or output is reduced with the intent of removing the unit from service. Shutdown ends at the point when fuel input to the boiler ceases.

Startup and Shutdown Sulfuric Acid Emission Minimization

The Naughton plant utilizes work practices to minimize sulfuric acid mist emissions during startup and shutdown events.

The flue gas conditioning systems on Naughton Units 1 and 2 - which are used to enhance electrostatic precipitator performance and reduce particulate matter emissions – incorporate sulfur trioxide (SO_3) injection that results in the manufacture and emission of sulfuric acid mist (H_2SO_4). Emissions of sulfuric acid mist are minimized by; (1) limiting the injection rate of SO_3 into the flue gas stream and; (2) not operating the flue gas conditioning SO_3 injection systems until all appropriate pollution control equipment is in service and operational. Pollution control equipment for sulfuric acid mist manufactured by the Units 1 and 2 flue gas conditioning systems includes electrostatic precipitators and wet flue gas desulfurization systems (scrubbers).

Naughton Unit 1 and Unit 2 Sulfuric Acid Mist Emissions Minimization

The following work practices are utilized on Naughton Units 1 and 2 to minimize sulfuric acid mist emissions during startup and shutdown events:

- The electrostatic precipitators shall be in service prior to operation of the flue gas conditioning systems.
- The wet flue gas desulfurization systems (scrubbers), shall be placed into service prior to operation of the flue gas conditioning systems.
- The flue gas conditioning system injection rates shall be limited to 4 ppm.

Recordkeeping

The following procedures shall be utilized to demonstrate compliance with the standards established in this startup and shutdown emission minimization plan. Naughton plant personnel shall record Unit 1 and Unit 2 boiler startups and log the following information for each startup event:

- a. The Unit 1 or Unit 2 boiler startup
- b. The start time of pollution control equipment startup. This includes:
 - a. The start time of the Unit 1 or Unit 2 electrostatic precipitator startup
 - b. The start time of the Unit 1 or Unit 2 wet scrubber startup
- c. The start time of the Unit 1 or Unit 2 flue gas conditioning system startup
- d. The Unit 1 and Unit 2 flue gas conditioning system SO₃ injection rates shall be continuously measured and recorded by a plant data acquisition system.