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BEFORE THE ENVIRONMENTAL QUALITY COUNCIL
STATE OF WYOMING

In the Matter of:)
Basin Electric Power Cooperative) Docket No. 10-2802
Air Quality Permit No. MD-6047)
BART Permit: Laramie River Station)

**AFFIDAVIT OF CHAD SCHLICHEMEIER IN RESPONSE TO
BASIN ELECTRIC'S MOTION FOR SUMMARY JUDGMENT**

STATE OF WYOMING)
) ss.
County of Laramie)

I, Chad E. Schlichtemeier, being first duly sworn, deposes and says as follows:

1. I am over the age of 21 and am competent to make this affidavit.
2. The facts and matters stated herein are within my personal knowledge, and are true and correct.
3. I have a Bachelor of Science degree in Chemical Engineering, with a Minor in Mathematics, which I received from the Colorado School of Mines in 1988.
4. In 1989, I began working for the Wyoming Department of Environmental Quality, Air Quality Division (DEQ/AQD) as an Environmental Specialist. I was promoted to the position of Environmental Project Analyst in 1990; Environmental

Analyst in 1991; and Senior Environmental Analyst in 1992. My job responsibilities during that time period included inspecting various air pollution sources and determining compliance status; reviewing ambient monitoring network and continuous emission monitoring data; reviewing performance tests; and conducting technical analyses for air quality permit applications. I also reviewed Best Available Control Technology (BACT) analyses for minor and major (Prevention of Significant Deterioration (PSD)) emitting facilities under the direction of the District Engineer.

5. In 1994, I was promoted to the position of Environmental Program Principal. I held that position until 1998. My job responsibilities during that time period included performing higher level air quality inspections at a level which required knowledge of industrial processes, control equipment and operational practices; compiling detailed inspection reports and reviewing monitoring reports; and supervisory duties including performance evaluations and district wide work schedule management. My job responsibilities also included air quality permitting within Districts 1 and 2. I conducted technical analyses for all New Source Review (NSR) permit applications within the districts, which included minor and major (PSD) emitting facilities. Part of the technical analysis included reviewing BACT analyses.

6. In 1998, I was promoted to the position of Environmental Program Supervisor. I held that position until January, 2007. My job responsibilities during that time period included day-to-day management of the PSD and minor source construction and modification permitting programs which is also referred to as New Source Review

(NSR); assisting the program manager in directing the operational, personnel and planning functions of the NSR program; reviewing permit analyses for technical accuracy and ensuring that all applicable requirements, rules and regulations have been addressed; monitoring and delegating work related to processing applications within the regulatory time frame; meeting with applicants to discuss DEQ/AQD's interpretation of applicable regulations, policy and guidance; supervise and train staff; and provide day-to-day staff assistance regarding technical issues and regulatory interpretations.

7. On February 1, 2007, I was promoted to the position I currently have of NSR Program Manager. My current job responsibilities include overall management of the NSR permitting program; directing the operational, personnel and planning functions of the NSR program; regulation development activities; policy development activities; managing a staff of about 14; conducting final review of all PSD and Best Available Retrofit Technology (BART) permit applications; and making recommendations to the DEQ/AQD Administrator.

8. I participated in numerous meetings and telephone conferences regarding Basin Electric's BART Permit Application AP-6047 for the Laramie River Station. I also reviewed Basin Electric's BART Permit Application, the technical analysis initially completed by Cole Anderson and Josh Nall, public comments, the DEQ/AQD decision documents, correspondence and other documents before I made a final recommendation to the DEQ/AQD Administrator that the permit should be issued.

9. As part of my current and/or former job responsibilities, I have routinely applied and interpreted the Wyoming Air Quality Standards and Regulations (WAQSR), and other air quality policy and guidance documents. I am familiar with the WAQSR, federal air quality statutes and guidance documents because I have used these documents to perform my former and/or current job responsibilities.

10. Since 1996, the DEQ/AQD has issued over 15,100 construction or modification permits and waivers. Of those construction or modification permits, over 50 were PSD new source and modification permits for major sources such as refineries, large compressor stations, and coal-fired power plants.

11. There are eighteen (18) BART eligible sources (13 EGUs and 5 non-EGUs) in the State. Seven (7) permits have been issued establishing BART requirements for NO_x and particulate matter (PM) for these sources. The Division worked with each company very closely through this permitting process to develop a control strategy that meets the requirements of 40 CFR 51 Appendix Y and meets the company's objectives. Prior to public notice, there was mutual agreement with the proposed conditions with all companies. The only exception was whether installation of SCR on the PacifiCorp's Naughton Unit 3 represented BART or LTS. PacifiCorp had committed to the DEQ/AQD to install SCR, but wanted the requirement to be LTS, not BART.

12. As part of my current and/or former job responsibilities, I routinely review BACT analyses submitted by permit applicants and regulatory BACT analyses conducted by DEQ/AQD staff. I have also personally prepared, reviewed or read regulatory BACT

analyses addressing nitrogen oxide (NO_x) emissions prepared for minor and major air pollution sources such as electric power generating units combusting coal in a boiler.

13. In June, 2006, the DEQ/AQD notified Basin Electric that the Laramie River Station (LRS) had been identified as a BART Eligible Source determined to be “Subject to BART” because the LRS contributed to visibility impairment in at least one Class I area (Wind Cave National Park and Badlands National Park). Therefore, the DEQ/AQD requested Basin Electric conduct and submit a BART analysis addressing emissions of sulfur dioxide (SO₂), nitrogen oxides (NO_x), and particulate matter (PM) from the LRS boilers #1, #2 and #3. A true and correct copy of the DEQ/AQD’s letter with enclosures 2 and 3 is attached hereto as Ex. 1.

14. On March 5, 2007, the DEQ/AQD received Basin Electric’s BART review and analysis dated February 28, 2007. At that time, Basin Electric committed to meeting the presumptive level of 0.23 lb/MMBtu NO_x on a plant-wide 30-day rolling average based on a 4,471 lb/hr limit by potentially installing Over Fired Air (OFA) systems no later than five years after EPA’s approval of the Wyoming Regional Haze State Implementation Plan (RH SIP). A true and correct copy of Basin Electric’s initial BART application is attached hereto as Ex. 2.

15. On March 30, 2007, the DEQ/AQD notified Basin Electric that it had received Basin Electric’s BART application for the LRS (AP-6047). A true and correct copy of DEQ/AQD’s Application Receipt Letter is attached hereto as Ex. 3.

16. On May 3, 2007, the DEQ/AQD informed Basin Electric that despite Basin Electric's commitment to implement presumptive levels of control, Basin Electric needed to submit additional information and analysis. A true and correct copy of DEQ/AQD's May 3, 2007 Letter is attached hereto as Ex. 4.

17. On September 28, 2007, the DEQ/AQD received Basin Electric's BART application. Basin Electric identified OFA, New Low NO_x Burners (LNB) with OFA and Selective Catalytic Reduction (SCR) as possible BART controls. A true and correct copy of Basin Electric's BART analysis is attached hereto as Ex. 5.

18. On May 23, 2008, the DEQ/AQD received EPA comments on Basin Electric's BART analysis for the LRS. In part, the EPA encouraged DEQ/AQD: "to make BART determinations and to do a Reasonable Progress analysis requiring LNB/OFA/SCR and 0.07 lbs/mmBtu or lower NO_x limits at as many sources as is cost effective. Based on information provided by the sources, it appears that for many units, SCR could be considered." A true and correct copy of EPA's comment letter is attached hereto as Ex. 6.

19. On July 28, 2008, the DEQ/AQD received additional BART modeling refinements from Basin Electric. Basin Electric continued to recommend OFA as the BART NO_x control for all three units at the LRS. A true and correct copy of Basin Electric's submittal is attached hereto as Ex. 7.

20. On August 20, 2008, Dave Finley, Darla Potter, Josh Nall, Cole Anderson and myself met to discuss our preliminary BART determination for the three units at the

LRS. In preparation for the meeting, the NSR Program had developed a comparison of the cost to install NOx control equipment as BART versus recent BACT determinations and charts showing the visibility improvement for BART control technologies based on information provided in the BART applications. The comparison showed the average cost effectiveness (\$/ton) and incremental cost effectiveness (\$/ton) for installing low NOx burners (LNB), over-fire air (OFA) and selective catalytic reduction (SCR) on the three units at LRS and recent BACT determinations, which required LNB/OFA/SCR as BACT, for new electric generating units (EGU). The NSR group also put together charts showing the visibility improvement on the affected Class I areas due to the installation of NOx controls. The information was presented to the Administrator, Dave Finley and our recommendation that BART for the 3 units at LRS represents LNB/OFA/SCR. Our preliminary determination was established, on a case-by-case basis, taking into consideration (1) the costs of compliance, (2) the energy and non-air quality environmental impacts of compliance, (3) any pollution equipment in use or in existence at the source, (4) the remaining useful life of the source, and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology as required by 40 CFR 51 Appendix Y. I recall Mr. Finley concurring with our recommendation. At this time, the Division had already met with PacifiCorp regarding BART and as a result we discussed the possibility of a BART and long term strategy (LTS) package to be presented to Basin Electric for the LRS.

21. On September 8, 2008, the DEQ/AQD met with Basin Electric to discuss our preliminary BART determination. From DEQ, Dave Finley, Darla Potter, Josh Nall, Cole Anderson and myself were at the meeting. From Basin, I recall Lyle Witham, and other Basin representatives were at the meeting. I recall distributing the BART/BACT comparison and charts and reviewing the DEQ/AQD's preliminary analysis of the information Basin Electric had submitted. I recall informing Basin representatives that our preliminary BART determination was LNB/OFA/SCR for LRS Units 1, 2, and 3. A true and correct copy of the charts distributed at the meeting are attached hereto as Ex. 8. I also recall mentioning EPA's comments on Basin Electric's BART analysis. A true and correct copy of EPA's comments is attached hereto as Ex. 6. I recall discussion on the structure of Basin and how it is a co-op and the difficulty of getting funding authorization in the BART timeframe. Given this issue and one of the factors in determining BART is cost of compliance, the Division discussed with Basin representatives the possibility of not requiring SCR as BART if there was a commitment to install SCR as part the long term strategy (LTS).

22. There were lots of meetings and phone discussions between the Division and Basin Electric on this issue. I recall several discussions on interim controls and limits to postpone installation of SCR in future regional haze planning periods. I also recall a meeting where Dave Finley reminded Basin that our preliminary BART determination was SCR on all three units.

23. I also recall a meeting with Basin Electric to discuss not specifying the type of control technology in the proposed permit. I recall that Basin Electric was concerned about specifying a technology in light of pending greenhouse gas regulations.

24. From the first meeting, the Division always took the position that the BART and LTS control strategy was a package deal. Meaning, the Division accepted the LNB/OFA for all three units as representing BART based on the fact that further NO_x controls were going to be installed on all units as part of LTS. There is nothing in the public file from Basin committing to install SCR on the LRS Units 1-3. In hindsight, I should have requested Basin to put their commitment in writing. Given my dealings to date with Basin, I had no reason not to believe their verbal commitment. We worked with Basin very closely through this permitting process to develop a control strategy that meets the requirements of 40 CFR 51 Appendix Y and meets Basin's objectives. I believe this BART/LTS control strategy in Condition 16 of MD-6047 was mutually agreed upon. It should also be noted that LTS for the third Laramie River Station unit was not included in the BART permit because the installation date falls outside the second regional haze planning period (2023). This unit will be addressed in future regional haze planning periods.

25. During these discussions, I recall Basin Electric expressing concerns about being able to meet the 0.07 lb/MMBtu NO_x emission level in the future. In developing the control level, the Division takes the position that if controls are installed they should be operated as designed. Meaning, if a control technology is designed to meet 90 percent

control efficiency, the Division expects the control equipment to be operated and maintained to meet that level. Based on my experience with BACT determinations, I believe the 0.07 lb/MMBtu emission rate represents a well maintained system for a SCR retrofit application. The 0.07 lb/MMBtu was submitted by Basin as the control level for LNB/OFA/SCR. This is also consistent with New Mexico's BART determination for Public Service Company of New Mexico San Juan Generating Station, Units 1-4, which SCR plus sorbent injection and an emission rate between 0.03 and 0.07 lb/MMBtu. State of Oregon DAQ BART Report for the Boardman Power Plant recommended a NO_x emission rate of 0.07 lb/MMBtu 30-day average for the 2017 SCR installation. The Division worked closely with Basin Electric in developing this condition. I believe the control level of 0.07 lb/MMBtu in Condition 16 of MD-6047 was mutually agreed upon. I believe this is further supported by the fact that Basin did not make comments during the public comment period on this issue.

26. On September 22, 2008, the DEQ/AQD notified Basin Electric that its BART application to modify operations at the LRS was complete and DEQ/AQD would proceed with a technical analysis. A true and correct copy of DEQ/AQD's letter is attached hereto as Ex. 9.

27. On March 2, 2009, the DEQ/AQD received additional information on NO_x emission rates from Basin Electric, including a memorandum related to LNB and OFA control effectiveness. Basin Electric proposed a NO_x BART emission limit of 4,082 pounds per hour on a plant-wide 30-day rolling average. Basin Electric represented that

after implementing LNB and OFA, it predicted NO_x emissions would likely be 0.18 lb/MMBtu plus or minus 0.02. A true and correct copy of Basin Electric's submittal is attached hereto as Ex. 10.

28. On March 16, 2009, the DEQ/AQD received Basin Electric's proposal that the BART NO_x emission limit on a 30-day rolling average of 1,348 lb/hour for Unit 1; 1,348 lb/hour for Unit 2; and 1,386 lb/hour for Unit 3 as calculated from emissions of 0.21 lb/MMBtu. Basin also agreed to an annual mass emission limitation of 5,343 tons per year (TPY) for Unit 1; 5,343 TPY for Unit 2; and 5,493 TPY for Unit 3 as calculated from emissions of 0.19 lb/MMBtu. A true and correct copy of Basin Electric's proposal is attached hereto as Ex. 11.

29. On May 27, 2009, the DEQ/AQD notified Basin Electric that the DEQ/AQD had completed its initial evaluation of Basin Electric's BART permit application. A true and correct copy of DEQ/AQD's transmittal letter is attached hereto as Ex. 12.

30. The DEQ/AQD reviewed and analyzed Basin Electric's LRS visibility control options presented in its BART application for NO_x and PM emissions from each of the three coal-fired boilers using the methodology prescribed in 40 C.F.R. part 51, subpart Y, as required by WAQSR Ch. 6, Sect. 9(c)(i). The prescribed methodology, followed by DEQ/AQD, consisted of five steps: 1) identifying all available retrofit technologies; 2) eliminating technically infeasible options; 3) evaluating the control effectiveness of the remaining control technologies; 4) evaluating impacts and

documenting results; and 5) evaluating visibility impacts. A true and correct copy of DEQ/AQD's Application Analysis dated May 28, 2009, is attached hereto as Ex. 13.

31. Identifying all available retrofit technologies. DEQ/AQD noted that Basin had identified six retrofit technology configurations for NO_x emissions: Overfire Air (OFA); New Low NO_x Burners (LNB); Selective Catalytic Reduction (SCR); Selective Non-Catalytic Reduction (SNCR); SNCR/SCR Hybrid; and Natural Gas Reburn and combined application of OFA/LNB and OFA/LNB with SNCR. Ex. 13 at 000416 – 417.

32. Eliminating Technically Infeasible Options. Natural gas reburn was eliminated as a technically infeasible option due to space issues at the LRS. Ex. 13 at 000417.

33. Evaluating the Control Effectiveness of the Remaining Control Technologies. The control effectiveness of a given technology is equivalent to the permit limit that would be established for the technology and was compared to the LRS average emissions during 2001 – 2003 of 0.27 lb/MMBtu. Basin Electric said the control effectiveness for: SNCR was 0.24 lb/MMBtu; OFA was 0.23 lb/MMBtu; New LNB was 0.23 lb/MMBtu; OFA/New LNB was 0.18 lb/MMBtu plus or minus 0.02 lb/MMBtu; SNCR/SCR Hybrid was 0.20 lb/MMBtu; OFA/New LNB with SNCR was 0.12 lb/MMBtu; and SCR was 0.07 lb/MMBtu. Ex. 13 at 000418 – 419.

34. Evaluating Impacts and Documenting Results. The costs of applying the remaining NO_x controls were quantified by considering: costs of compliance, energy impacts (incl. auxiliary power consumption); non-air quality environmental impacts

(byproduct disposal or waste generation); remaining useful life (was indefinite, so a standard control life of 20 years was used to calculate capital recovery factors); and visibility. SNCR/SCR Hybrid was eliminated because of higher costs and emissions. However, the cost effectiveness and the incremental cost effectiveness of the remaining proposed NO_x BART technologies were reasonable. Ex. 13 at 000419 – 422.

35. Visibility Improvement Determination. OFA/LNB and OFA/New LNB/SCR. The DEQ/AQD required Basin Electric to model only the Class I areas most likely to be impacted by the LRS: Rawah Wilderness Area, 165 kilometers (km) to the southwest of LRS; Rocky Mountain National Park, 185 km southwest of LRS; Wind Cave National Park, 190 km northeast of LRS; and Badlands National Park, 270 km northeast of LRS. Ex. 13 at 000431 - 452.

36. Therefore, DEQ/AQD concluded in its Application Analysis that BART for each of the LRS units was New LNB with OFA with a NO_x control level of 0.23 lb/MMBtu on a 30-day rolling average (units 1, 2 and 3). This level is equivalent to EPA's presumptive limit for dry-bottom, wall-fired boilers burning sub-bituminous coal. The total annual NO_x emission reductions from New LNB with OFA is 5,645 tons. Ex. 13 at 000453, 000460.

37. The DEQ/AQD proposed requiring Basin Electric to install New LNB with OFA by no later than December 31, 2012 for Unit 1; December 31, 2013 for Unit 2; and December 31, 2014 for Unit 3. Ex. 13 at 000460. This requirement was carried forward into Condition 15 of Permit MD-6047. Ex. 21 at 000471.

38. Based on the costs and visibility improvements presented by Basin Electric in its LRS BART application, and considering the logistical challenge to Basin Electric of managing multiple pollution control installations within EPA's required 5-year regulatory timeframe, and as part of the proposed BART permit, the DEQ/AQD also proposed Basin Electric submit a permit application to install additional add-on NO_x control that could achieve an emission rate at or below 0.07 lb/MMBtu on a 30-day rolling average for one of the LRS units by December 31, 2018 and on a second LRS unit by December 31, 2023. The DEQ/AQD proposed these additional controls would form part of the Long-Term Strategy of Wyoming's Regional Haze State Implementation Plan (RHSIP). Ex. 13 at 000457. These requirements were carried forward into Condition 16 of Permit MD-6047. Ex. 21 at 000471.

39. Also as part of the BART permit, the DEQ/AQD proposed Basin Electric comply with the permitting requirements of Chapter 6, Section 4 of the Wyoming Air Quality Standards and Regulations as they apply to the installation of BART controls. Ex. 13 at 457.

40. On June 3, 2009, the DEQ/AQD advertised its proposed decision in the paper and provided for public comment through August 6, 2009. A true and correct copy of the publisher's affidavit and public notice is attached hereto as Ex. 14.

41. At the end of the public comment period, on August 6, 2009, the DEQ/AQD held a public hearing on its proposed decision. I conducted the public hearing. A true and correct copy of the public hearing record is attached hereto as Ex. 15.

42. During the public comment period, the DEQ/AQD received comments from several individuals and entities, including the EPA. I read the written comments, including EPA's comments. In part, the EPA commented that if the 0.07 lb/MMBtu was achievable at LRS, it needed "to be included as the BART level of control, not postponed under reasonable progress." A true and correct copy of the EPA comment letter is attached hereto as Ex. 16.

43. Basin Electric also submitted comments during the public comment period regarding Condition 16. Basin Electric stated:

Regarding Condition 16, Basin Electric requests DEQ to revise the time for submitting a permit application for additional add-on NOx controls from six years prior to installation to two years prior to installation. New Low-NOx Burners will be installed on the units in 2012, 2013, and 2014. Observation and evaluation of the operation of the Low-NOx Burners will be required to determine the design of new add-on technology before the technology can be specified and be included in a permit application. The engineering and analyses required for the permit application may take several years to prepare an application. This additional time could also allow for the development of emerging technologies before we would need to make a commitment for a specific technology. At the present time, we are not sure that a retrofit NOx control system can be added to the LRS units that would meet the proposed limit of 0.07 lb/mmBtu on a 30-day rolling average. The additional time we are requesting may allow additional technologies to develop that may provide a greater chance of meeting 0.07 lb/mmBtu and at a lower cost and/or greater efficiency.

A true and correct copy of Basin's comments is attached hereto as Ex. 17.

44. On August 27, 2009, the DEQ/AQD requested Basin Electric provided additional information related to NO_x controls. A true and correct copy of DEQ/AQD's request is attached hereto as Ex. 18.

45. On September 14, 2009, the DEQ/AQD received Basin Electric's response. In part, Basin Electric stated: A true and correct copy of Basin Electric's response is attached hereto as Ex. 19.

46. On December 31, 2009, the DEQ/AQD issued its decision and response to comments. The DEQ/AQD's decision noted that it would make Basin Electric's requested change to revise Condition 16 to change the time for submitting a permit application for additional add-on NO_x control from six years to two years prior to installation. A true and correct copy of DEQ/AQD's decision and response to comments document is attached hereto as Ex. 20.

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47. Also on December 31, 2009, the DEQ/AQD issued BART Permit MD-6047 to Basin Electric for the LRS. A true and correct copy of Permit MD-6047 is attached hereto as Ex. 21.

DATED this 27th day of July, 2010.

Chad Schlichtemeier
Chad E. Schlichtemeier
NSR Program Manager – DEQ/AQD

State of Wyoming)
) ss.
County of Laramie)

Subscribed and sworn before me by Chad E. Schlichtemeier on this 27th day of July, 2010.

Witness my hand and official seal.



Kaycee McMullin
Notary Public

My commission expires on: April 25, 2012