Nancy E. Vehr (6-3341)
Sr. Assistant Attorney General
123 Capitol Building
Cheyenne, WY 82002
PH: (307) 777-6946
Fax: (307) 777-3542

Attorney for the State of Wyoming
Department of Environmental Quality

BEFORE THE ENVIRONMENTAL QUALITY COUNCIL
STATE OF WYOMING

IN THE MATTER OF	)	
MEDICINE BOW FUEL & POWER	)	Docket No. 09-2801
AIR PERMIT CT-5873	)	

AFFIDAVIT OF JAMES (JOSH) NALL
IN SUPPORT OF DEQ'S MOTION FOR SUMMARY JUDGMENT

STATE OF WYOMING)
) ss.
County of Laramie)

James (Josh) Nall, 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 Geophysics which I received from the University of Wyoming in 1984, and a Master of Science degree in Environmental Sciences which I received from the University of Colorado - Denver in 1999.

4. In 1986, I completed U.S. Air Force Officer Training School in San Antonio, Texas, and completed the Air Force's Basic Meteorology Program at Florida State University in the spring of 1987.

5. In 1987, I was assigned as a Weather Officer/Staff Meteorologist to the U.S. Air Force Weapons Laboratory (AFWL) at Kirtland Air Force Base in Albuquerque, New Mexico. My job responsibilities included sound propagation forecasting for the AFWL's testing of high-explosives, other technical support to the AFWL, and weather forecasting support to the base weather station.

6. In 1990 and continuing through 2006, I worked for environmental consulting firms, including positions with Applied Environmental Consultants in Arizona; and Ebasco, ENSR, Radian, and CH2M Hill in Colorado. My primary job responsibility in each position was conducting and directing dispersion modeling analyses; but also included the installation and maintenance of meteorological and ambient air quality monitoring stations, data processing, report writing, and project management.

7. In October 2006, I began work with the Wyoming Department of Environmental Quality, Air Quality Division (DEQ/AQD) with a job title of Environmental Scientist 1/Environmental Principal. My current job responsibilities include: organizing, directing, and reviewing air quality modeling analyses in support of the New Source Review (NSR) program, negotiating technical requirements necessary to protect air quality and to assure compliance with rules and regulations of the DEQ, serving as project leader on projects requiring air dispersion modeling, including Best Available Retrofit Technology (BART) and Regional Haze modeling analyses;

enhancing and maintaining the DEQ's databases and GIS capabilities; and updating permitting and modeling guidance.

8. In my experience, I have conducted or reviewed the dispersion modeling analyses for an estimated 50 Prevention of Significant Deterioration (PSD) permits. A PSD modeling analysis involves, in part, assessing and evaluating dispersion modeling results to determine the impact that a proposed project will have on the existing air quality.

9. In my experience, I am familiar with air quality regulations that govern PSD modeling analyses, and EPA modeling guidance such as the Guideline on Air Quality Models.

10. Typically, DEQ meets with prospective applicants before submittal of a PSD permit application to discuss modeling requirements and the procedures, or protocol, by which modeling will be conducted. I was involved in reviewing the modeling protocols that were submitted by the applicant for this project. A copy of Medicine Bow's modeling protocol is attached hereto as Exhibit 3.

11. My role for the permit application for the Medicine Bow Facility was lead reviewer of the dispersion modeling that was submitted by the applicant. As part of the permitting process for the Medicine Bow Facility, I also reviewed various documents submitted by the applicant.

12. On January 10, 2008, I requested Medicine Bow submit revised meteorological data processing that was needed for analyzing near-field impacts. A copy of this request is attached hereto as Exhibit 28.

13. On March 3, 2008, URS (Medicine Bow's consultant) responded to my request and submitted the revisions. A copy of URS' response letter is attached hereto as Exhibit 29.

14. On March 18, 2008, I requested Medicine Bow submit additional information regarding the near-field (AERMOD) impact analysis. A copy of my request is attached hereto as Exhibit 30.

15. On April 23, 2008, URS responded to my request. A copy of URS' response is attached hereto as Exhibit 9.

16. On October 3, 2008, I requested additional information from Medicine Bow regarding health risks associated with HAP emissions from the Facility. A copy of my request is attached hereto as Exhibit 32.

17. On November 5, 2008, Medicine Bow responded to my request. A copy of Medicine Bow's response is attached hereto as Exhibit 33.

18. The dispersion modeling for the impacts of sulfur dioxide (SO_2) from the project included all sources of SO_2 at the proposed plant.

19. Modeled short-term (3-hour and 24-hour) emissions of SO_2 from the flares reflected worst-case (cold start) hourly conditions. Results of the modeling were below

the 3-hour and 24-hour WAAQS and NAAQS. More than 99% of the modeled 3-hour and 24-hour impacts were attributable to the LP Flare operating in cold-start mode.

20. Release parameters for the IGL Plant flares, including effective stack heights and effective diameters, were calculated by the applicant and verified by the DEQ.

21. Sources of PM_{10} emissions from the plant were modeled to compare the predicted impacts to the NAAQS/WAAQS and PSD increments. PM_{10} was also used as a surrogate to represent the impacts of $PM_{2.5}$, because a complete set of modeling tools, including well-established emission factors for all sources, modeling significance levels, and PSD increments are not yet available for $PM_{2.5}$.

22. Fugitive sources of PM_{10} were not required by DEQ to be included in the 24-hour dispersion modeling for the project, but were included in the modeling for the annual averaging period. This approach reflects a policy that DEQ has established to avoid the high degree of uncertainty in modeling short-term fugitive impacts. Uncertainty is introduced, not only in the treatment of short-term impacts from fugitive sources within the dispersion models, but also through the estimation of short-term emissions from the various activities that are conducted at a facility such as the IGL Plant.

23. The AERMOD Implementation Guide is a document regularly updated by the EPA to provide the modeling community with recommendations for the use of AERMOD. The Implementation Guide describes that the current formulation of AERMOD lacks "plume meander" for area sources, and as a result, concentration

predictions for area sources may be overestimated under very light wind conditions. This is problematic for modeling fugitive emissions from the IGL Plant because area sources provide the best representation of the size and extent of many of the fugitive PM sources. This is also part of the reason DEQ places emphasis on modeling only long-term impacts for fugitive sources. Any effects of the lack of area-source plume meander in AERMOD would be less pronounced over a full year of meteorology. A copy of the AERMOD Implementation Guide is attached hereto as Exhibit 39.

DATED this 16th day of November, 2009.

James (Josh) Nall
Air Quality Meteorologist
Lead NSR Dispersion Modeler
DEQ/AQD

State of Wyoming)
) ss.
County of Laramie)

Subscribed and sworn before me by James (Josh) Nall on this 16th day of November, 2009.

Witness my hand and official seal.

Notary Public

My commission expires: 10-05-2011.