Dirk Andy File AP-5873

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October 14, 2008

Chad Schlichtemeier
Wyoming Department of Environmental Quality
Air Quality Division / NSR Program Manager
Herschler Building
122 West 25th Street
Cheyenne, WY 82002

Subject: Medicine Bow Fuel & Power LLC
Proposed Integrated Gasification and Liquefaction Plant
(PSD Air Quality Permit Application AP-5873)
Response to Public Comment/WDEQ Information Request

Dear Mr. Schlichtemeier:

This letter is provided in response to a letter from Mr. Andrew Keyfauver, dated September 5, 2008, requesting additional information regarding ozone and normal startup emissions from the proposed Medicine Bow Fuel & Power, LLC (MBFP) industrial gasification and liquefaction (IGL) plant. Responses to these items are below each specific comment from the WDEQ (shown in italics).

WDEQ Comments

1. *Given that the Medicine Bow IGL Plant is a significant source for ozone (i.e., VOC emissions are over 40 tpy) and the permit application did not address potential ozone impacts, the Division requests that MBFP provide additional information to address ozone impacts from the proposed project.*

   Ozone impacts from individual proposed new emission sources cannot be reasonably assessed with existing modeling tools. Photochemical modeling is used to assess ozone impacts on a regional basis, but regional modeling is not appropriate for use in determining the ozone impact from an individual source. As stated in the WDEQ's July 2008 Interim Policy on Demonstration of Compliance with WAQSR Chapter 6, Section 2(c)(ii) for Sources in Sublette County, *"...there are no good, practical models available to evaluate the impacts of a single permitted discharge of ozone precursors on ambient air quality for ozone."* Thus, photochemical or other air quality modeling is not an option to evaluate potential ozone impacts from the proposed MBFP facility.

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In the past, ozone impacts from proposed new sources were evaluated with a tool known as the "Scheffe Tables," consisting of a lookup table of maximum potential incremental ozone concentration impacts due to a source based on its VOC/NOx emissions. The incremental ozone concentration derived from the table would then be added to the maximum measured background ozone value and the total would be compared to the 1-hour ozone NAAQS. However, the EPA (specifically, developer Richard Scheffe from the EPA's Office of Air Quality and Planning Standards) opposes continued use of the Scheffe Tables because they were designed for assessing maximum 1-hour ozone impacts, while the new ozone standard is based on 8-hour averaging times. As a result, the Scheffe tables cannot be used to determined potential 8-hour ozone impacts from the proposed facility.

Since no accepted tool exists to provide an assessment of the proposed MBFP's ozone impacts, we are providing updated emissions inventory and available ambient ozone data. First, the most recent emission inventory for Carbon County was updated with new available information plus emissions for the proposed MBFP facility. The revised emission inventory data is an attachment to this letter. It shows that the proposed MBFP facility will contribute a small percentage to the county's emission inventory. Second, ozone data from the two nearest monitors (at Wamsutter and Centennial, WY) were reviewed and are discussed in this letter.

Please note that by presenting and discussing the county's emission inventory data and the monitored ozone values, DKRW is not suggesting any direct cause-and-effect relationship, or any correlation, to the proposed MBFP emission rates and monitored ozone levels. Ozone formation is highly complex and influenced by many factors such as sunlight, temperature, NOx and VOC emissions and their ratio to each other, weather conditions, terrain and other factors. Ozone formation is not a linear function, and DKRW does not wish to imply a linear relationship by the presentation of this data. In the absence of any other tools to assess the proposed facility's contribution to ozone levels, this quasi-comparative approach provides additional information to the WDEQ regarding Carbon County emissions totals.

The emission inventory data, as well as the ozone monitoring data, are provided on a CD included with this submittal.

Carbon County Emission Inventory

NOx and VOC emissions for Carbon County inventoried by the Western Regional Air Partnership (WRAP) are presented in Table 1 below. These values reflect the "2002 WRAP Inventory." But the emissions from oil and gas operations have been updated

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to reflect oil and gas data gathered in 2006. The MBFP NOx and VOC emissions have also been added.

As shown in Table 1, the largest contributor to Carbon County NOx emissions are the on-road and non-road mobile emissions, at 70% of the total, and the largest VOC contributor is biogenic sources at 80% of the total. The proposed MBFP facility will contribute only 1.3% and 0.2% of the county's total NOx and VOC emissions, respectively, and only 1.4% and 1.0%, respectively, of the county's anthropogenic NOx and VOC emissions.

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Table 1. WRAP Emission Inventory for Carbon County, WY (including proposed MBFP Facility)[1]

	NOx [ton/yr][2]	*Percent of Total County NOx*	VOC [ton/yr][2]	*Percent of Total County VOC*
Anthropogenic				
WRAP Oil & Gas[3]	1,453	*11%*	13,915	*15%*
Point Sources	1,559 [1]	*12%*	2,031 [1]	*2%*
Area Sources	487	*4%*	806	*1%*
Onroad Mobile	4,535	*34%*	1,079	*1%*
Nonroad Mobile	4,811	*36%*	674	*1%*
Subtotal	12,845		18,505	
Non-Anthropogenic				
Fires	44	*<1%*	76	*<1%*
Biogenic	566	*4%*	72,602	*80%*
Subtotal	610		72,678	
Total	13,454		91,184	

Notes

1. The proposed MBFP facility will have permit limits of 176 tons/year NOx (PTE) and 187 tons/year VOC (PTE). These values are included in the table with the Point Sources.
2. Slight rounding errors may be present in this table; refer to the inventory spreadsheet file submitted with this letter for additional detail.
3. Oil & gas sources are noted separately here, and are not included (i.e., not double-counted) in the county's point or area source emissions.

Wamsutter WDEQ Air Quality Monitor

The WDEQ placed a "special purpose" air monitoring station in south central WY, two miles to the west of the town of Wamsutter, in early 2006. This monitoring station will be used in the future to assess compliance with the ozone NAAQS. General information about the monitor can be found on the following WDEQ website: http://www.wyvisnet.com/wams1/index.html. This monitor is located approximately

90 miles slightly southwest of the proposed MBFP plant site, at an elevation of approximately 6700 ft above sea level. The MBFP plant is at about 7000 ft elevation

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but there is elevated terrain between the two locations. Figure 1 is a graphical display of the Wamsutter 8-hour maximum daily ozone values collected since the monitor began operation on March 7, 2006 through March 31, 2008.

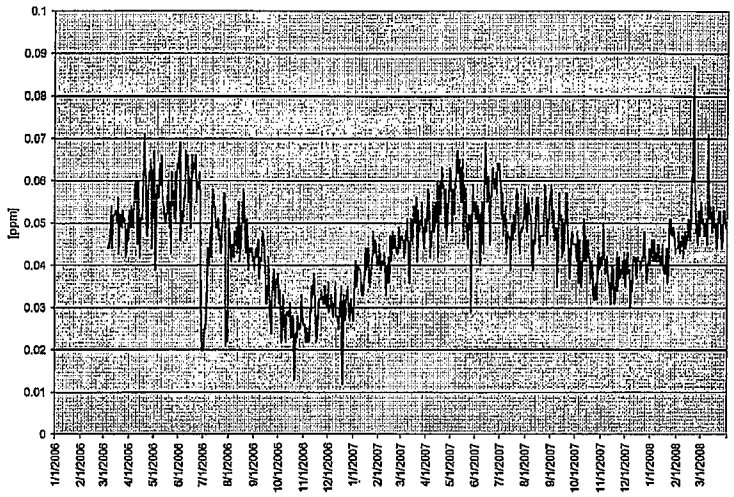

Figure 1. Daily Maximum 8-hr Ozone Values at Wamsutter AQS Site (ID 56-037-0200).

As shown in Figure 1, as expected the daily maximum 8-hr ozone values vary by season, and range from approximately 0.025 ppm to 0.067 ppm (excluding the possible outliers). However, compliance with the ozone NAAQS is not determined on the basis of individual daily 8-hour maximum values. Rather, compliance is based on the ozone "design value," which is the annual fourth-highest 8-hour daily maximum concentration averaged over three years. The Wamsutter monitor has not operated long enough to calculate a three year design value; therefore, no ozone determination for the monitor can be made at this time. In lieu of design values, Table 2 presents the 4th highest 8-hour ozone concentration for the operating hours in 2006, 2007, and year-to-date for 2008. As shown in Table 2, conservatively including the potential outlier data points, the values are below the NAAQS ozone "design value" (standard) of 0.075 ppm.

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Table 2. Wamsutter Monitor (ID 56-037-0200) 4th Maximum Ozone Values

Year	4th Highest Ozone Concentration[2] [ppm]
2006[1]	0.067
2007	0.065
2008 (YTD)	0.060

Notes

1. The monitor began operation on March 7, 2006.
2. The NAAQS for ozone is 0.075 ppm, based on a 3-year average of the 4th highest ozone concentration in each year.

In conclusion regarding Wamsutter, based on the data in Table 2, it is reasonable to conclude the first ozone "design value" from this monitor will show compliance with the NAAQS, even after the proposed MBFP facility is in operation. There certainly is no indication of an upward trend for ozone at this location. The prevailing winds are west to east.

Centennial CASTNET Monitor

Monitoring data and wind direction from the Clean Air Status and Trends Network (CASTNET) monitoring site near Centennial, WY (CNT169) was reviewed and is discussed below. The CASTNET air monitoring system was implemented across the United States by the EPA and National Oceanic and Atmospheric Administration (NOAA) to assess the impact and effectiveness of the Acid Rain program, and with the idea of supporting the Interagency Monitoring of Protected Visual Environments (IMPROVE) program. These monitors are typically located in rural areas. This monitor is located near the town of Centennial, approximately 30 miles south and slightly east of the proposed MBFP site, at an elevation of 10,426 feet. More information about this monitor and the CASTNET program can be found at http://www.epa.gov/castnet/index.html, or through various texts on air monitoring.

The Centennial monitor measures ground-level ozone, as well as a variety of other data. However, this ozone monitor cannot be used to determine compliance with the ozone NAAQS, because not all of the quality assurance and quality control (QA/QC) audits required for EPA-approved State and Local Monitoring Stations (SLAMS) compliance monitors are performed on it. The EPA is working to upgrade this monitor so that it can be used for compliance status.

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The potential for ozone impact of the proposed MBFP facility on this monitor was assessed through a review of 'ozone roses' for each data year at the Centennial CASTNET monitor. Refer to Figures 3 through 7, attached to this letter and on CD. Each figure provides an illustration of the annual ozone concentration range occurring when the wind is blowing from specific directions. As shown in each figure, the wind direction at this monitor is primarily from the west, northwest, or southwest, with very few hours each year from other directions. The consistent wind direction and high ozone frequencies associated with wind direction do not seem to implicate sources located north of the monitor, such as the proposed MBFP facility. Thus it is unlikely that ozone-forming emissions from the proposed facility would transport to this monitor, or that ozone near the Centennial monitor would transport to the proposed MBFP site.

The best use of CASTNET ozone data from this monitor is to review the ozone trend at Centennial. Figure 2 is a graphical display of the 8-hour maximum daily ozone values collected from the monitor for years 2003 through 2007.

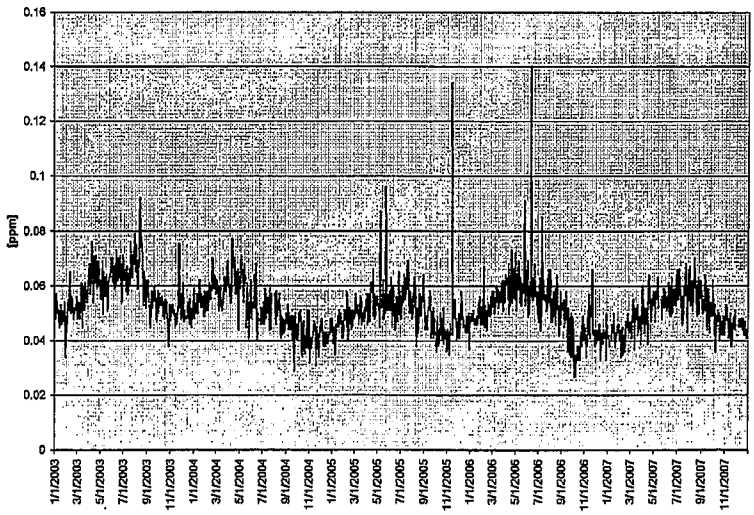

Figure 2. CASTNET Monitor CNT169 (Centennial, WY) 8-hour Daily Maximum Ozone, Years 2003-2007.

In general, ozone concentrations measured at this monitor are greater than those measured at the Wamsutter site. This is expected for monitors located at extremely

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high elevations, such as this. Due to its high elevation, the Centennial monitor likely experiences stratospheric intrusion in which certain weather patterns cause stratospheric ozone to fold down into the troposphere in the spring when it is not expected to have elevated concentrations.

Seasonal trends in ozone concentration can be seen in Figure 2, similar to seasonal trends shown in Figure 1 for the Wamsutter monitor. Many of the daily 8-hour maximum values are below 0.07 ppm. However, several possible outlier data points can be seen in this trend, particularly in 2005 and 2006. Excluding these outliers, the data shows a general trend of stable, or possibly a slight decrease in, ozone concentrations in the area over the five year period.

The potential outlier points in the data set (ozone concentrations above 0.08 ppm) have an impact on the calculated three-year average of the 4th highest daily 8-hour average maximum ozone concentrations, shown in Table 3. Note as indicated above these values cannot used for NAAQS compliance because the QA/QC methods used for this monitor do not meet EPA requirements for compliance monitors.

Table 3. CASTNET Monitor CNT169 (Centennial, WY) Ozone Data

Year	4th Highest Ozone Concentration [ppm]	Three-Year Average[1] [ppm]
2003 [2]	0.79	--
2004 [3]	0.71	--
2005 [2]	0.87	0.79
2006 [2]	0.73	0.77
2007 [3]	0.66	0.75

Notes
1. This is the 3-year average of the 4th highest daily 8-hour average maximum concentrations.
2. Greater than 98% valid days.
3. Greater than 95%, but less than 96%, valid days.

The data in Table 3 includes all data gathered for the site, including the potential outlier data points. Based on the design values in Table 3, it is difficult to conclude that ozone NAAQS compliance could be met at this monitor. However, it is important

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to note that (as stated earlier) this monitor cannot be used to determine compliance with the ozone NAAQS because the QA/QC methods used for this monitor do not meet EPA requirements for compliance monitors.

In conclusion regarding the Centennial monitor, the QA/QC on this monitor disqualifies it as a compliance monitor. Also it is unlikely based on the ozone rose that ozone-forming emissions from the proposed MBFP facility would transport to this monitor, or that ozone near the Centennial monitor would transport to the proposed MBFP site. Nor would ozone concentrations at the Centennial site be likely to predict ozone concentrations at the proposed MBFP site.

General conclusions regarding the potential for ozone impact by MBFP: (1) ozone in the general area is likely to be below the National Ambient Air Quality Standard based on the Wamsutter data; (2) the increase in NOx and VOC emissions from MBFP will contribute only 1.3% and 0.2% to the existing total county emissions respectively; (3) we are not suggesting any direct cause-and-effect relationship, or any correlation, to the proposed MBFP emission rates and monitored ozone levels..

2. *Medicine Bow Fuel & Power LLC provided startup emissions for the plant resulting from initial commissions activities (cold startup emissions). These emissions are not considered for PSD applicability based on EPA policy. However, emissions from the plant during routine operations including normal startup emissions (those emissions that would occur with any startup) are considered for applicability under PSD. Given that SO_2 emissions are relatively close to the significant emission rate for PSD applicability , the Division requests that Medicine Bow Fuel & Power, LLC address PSD applicability for SO_2 emissions from the plant during routine operations including normal startup emissions.*

   In response to this request, DKRW reviewed the estimated plant emissions resulting from both the initial commissioning/startup activities and subsequent plant startups occurring after the plant has entered a period of normal operations (i.e., normal startups). Potential emissions from initial commissioning/startup activities and normal startups are expected to be equivalent. They are expected to be equivalent because although the initial startup year emissions per startup will be higher than normal years thereafter, the number of startups in that initial year is expected to be less than in subsequent years due to a lower expected plant availability during that startup year and longer unplanned shutdowns during that startup year. After the startup year, normal startup emissions per startup are expected to be reduced by half compared to the initial

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startup year, but the number of normal startups per year is expected to be double those in that first year. The number of normal year startups are driven by shutdowns for burner changeout during normal plant operations. Therefore, total potential SO_2 emissions in the initial year of operation and also in following years, including normal startups, are both estimated to be 227.7 tons per year.

Given the fact, as stated in your letter, that emissions from normal startups must be considered for PSD applicability, DKRW acknowledges that SO_2 emissions are above the 100 ton per year major source threshold for this facility and that these emissions must undergo PSD review.

PSD review, in this case, includes (1) air quality impact, also called an air dispersion modeling, analysis and (2) a BACT analysis, for SO_2 emissions from both the routine (non-startup) operations and the normal startup activities. Both of these elements have been addressed, for both types of activities, as summarized below:

1. Air Quality Impact Analysis, Routine Operations and Normal Startup Activities: DKRW has completed air quality impact analysis for both the routine and normal startup operations, due to the fact that the modeling analysis included SO_2 emissions from both routine operations and normal startup emissions.

2. BACT Analysis, Routine Operations: A BACT analysis was completed for the routine operations and is discussed in the WDEQ permit application analysis document.

3. BACT Analysis, Normal Startup Activities: Regarding SO_2 BACT for normal startup emissions, the WDEQ included a discussion of startup/shutdown emission requirements in the permit application analysis document addressing the combustion turbines, boiler and process heaters, engines, HP/LP Flares, and CO_2 vent stack. Requirements presented in this section include the expectation to comply with BACT limits during all times, including startup and shutdown

4. periods. BACT for SO_2 emissions during routine operations was found to be the use of physical absorption acid gas removal to address SO_2 emissions from the turbines and re-routing tail gas back to the Selexol™ unit to address SO_2 emissions from the sulfur recovery unit. During startup and shutdown periods, when these options are not available for SO_2 emission control, the HP and LP Flares will be utilized. Proposed Condition No. 20 states that "during periods of startup, Medicine Bow Fuel & Power, LLC shall adhere to their procedures in their Startup/Shutdown Emission Minimization Plan." This specific condition

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5. requiring MBFP to abide by the written plan will ensure that flaring activities are kept to a minimum, and thus, SO_2 startup and shutdown emissions will be minimized in a safe manner which utilizes best available controls. As stated in the EPA's December 1978 memo to Anita B. Turpin (titled 'PSD Applicability – Temporary Emissions'), *"equipment or work practice standards may be specified for BACT if an emission standard is not feasible."* Therefore, DKRW considers the written emission minimization plan to sufficiently meet SO_2 BACT for normal startup activities.

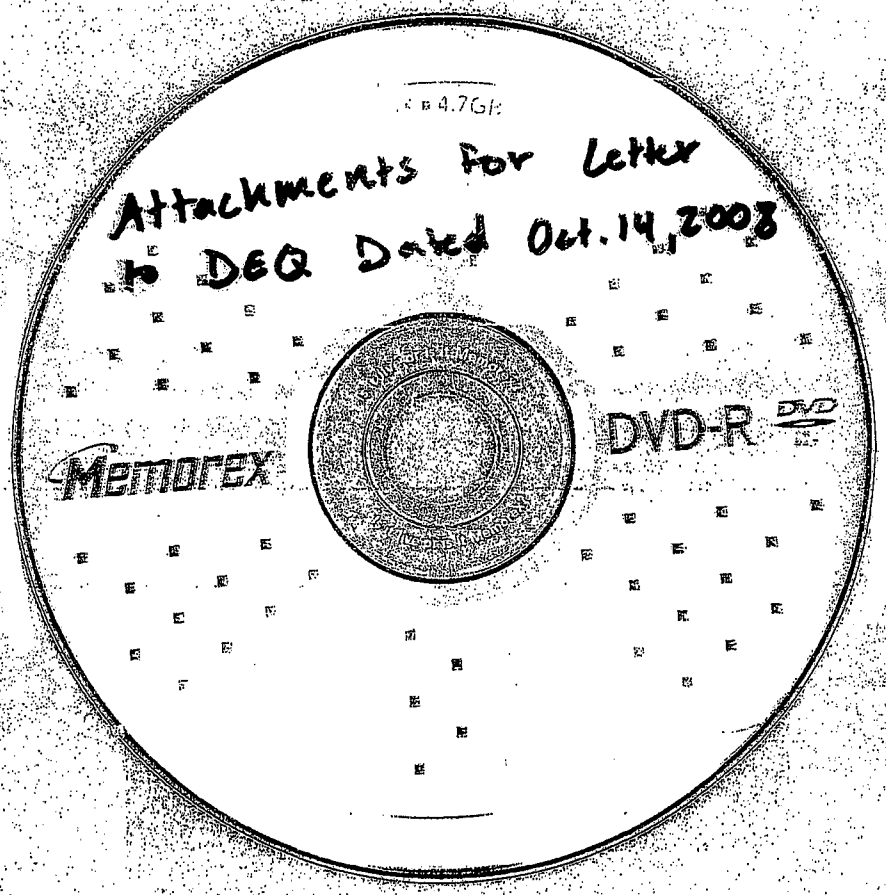
MBFP appreciates this opportunity to provide additional comment to the WDEQ on issues raised during the public comment period. We hope this information is useful for you, and encourage you to contact us if you have any more questions or if you need clarification on any of the points raised in this letter.

Sincerely,

Jude R. Rolfes
Senior Vice President

cc: Andrew Keyfauver (WDEQ)
Robert Moss (DKRW)
Susan Bassett (URS)

Enclosures (on CD) Wamsutter WSEQ Air Quality Monitor Ozone Data
Centennial CASTNET Monitor Ozone Data
Carbon County Emission Inventory
Ozone roses - Centenial
December 1978 Memo from EPA to Anita Turpin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Attachments for Letter
to DEQ Dated Oct. 14, 2008
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