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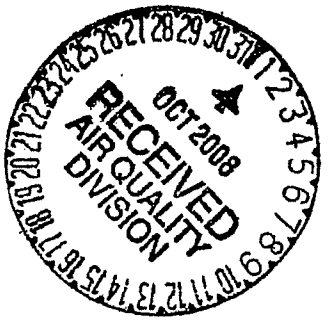

September 30, 2008

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 August 15, 2008, requesting clarification and response to specific items brought up during the public comment period for the Medicine Bow Fuel & Power, LLC (MBFP) proposed coal-to-liquids plant. Our responses to these questions are directly below each of the five items in that August 15, 2008 letter. The five specific questions from the WDEQ are shown in italics.

Responses to WDEQ Questions

1. *Public comments suggest that the applicability of Section 112(j) and 112(g) need to be addressed for the boilers and process heaters as this facility is shown to be a major source of hazardous air pollutants. Therefore, the Division requests that Medicine Bow Fuel & Power, LLC address Section 112 applicability for the facility.*

   Response: HAP emissions in the Medicine Bow Fuel & Power LLC (MBFP) Air Permit application (as revised May 12, 2008) were based on early engineering information. Subsequent to MBFP's submission of the Air Permit application, MBFP received the Process Design Package (PDP) in August 2008 from Davy Process Technology for their syngas-to-methanol technology which resulted in MBFP reviewing the original HAP calculations. This review found that traditional sample lines in methanol service were the most significant source of methanol emissions within the equipment leak category. Equipment leaks from traditional sample lines result from purging the lines to atmosphere prior to collecting a sample as part of the sampling protocol. The August 2008 Davy PDP includes 6 closed-loop sampling lines which initial engineering had shown to be traditional sample lines. So we have eliminated 6 traditional methanol sample lines from our prior HAP emission calculations based on the most recent engineering information. The 6 closed-loop sample lines can be eliminated since they

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provide 100% emission control because the sample piping is returned to the process piping at some downstream point without any purging to the atmosphere.

As a result, calculated equipment leak emissions (see attached revised emission calculations for methanol) are reduced to 9.1 tpy methanol which is below the 10 tpy threshold established in Section 112 of the Act for major source determination. Therefore, due to this new engineering information Sections 112(j) and 112(g) of the Act will not be triggered for the proposed facility.

Revised equipment leak and total facility emission calculation pages are provided with this letter.

2. *A public comment suggested that leak detection and repair (LDAR) levels need to be lowered, based on levels set for petroleum refineries in California. The Division requests that Medicine Bow Fuel & Power, LLC address the feasibility of lowering LDAR levels for the plant.*

Response: Although MBFP is not subject to the NSPS for petroleum refineries, the leak definitions in the MBFP Air Permit Application are equivalent to those in the recently promulgated New Source Performance Standard (NSPS) for petroleum refineries (thus Best Available Control Technology (BACT) for refinery leaks) and the Synthetic Organic Chemical Manufacturing Industry (SOCMI) at 40 CFR 60, Subpart VVa and GGGa, respectively, with a 500 ppm leak definition for valves/connectors and 2,000 ppm leak definition for pumps. We agree with the Wyoming DEQ that MBFP leak definitions are BACT for MBFP.

The EPA considered the more stringent California-leak standards (lower than 500 ppm for valves) when promulgating the November 2007 New Source Performance Standards (BACT) for chemical plants and refineries (40 CFR 60, Subparts VVa and GGGa.), but noted that "data gathered from facilities making a first attempt at repair on valves with leaks above 100 or 200 ppm suggests that these attempts do not always reduce emissions." (Summary of Public Comments and Responses, Docket ID NO. EPA-HQ-OAR-2006-0699-0094) EPA assessed a cost effectiveness of $5,700/ton for the SOCMI and $16,000/ton for refineries if leak definitions were lowered to less than 500 ppm for valves, and thus concluded that a leak standard below 500 ppm for valves was not cost effective (72FR64864, November 16, 2007). EPA also dismissed lower leak standards for pumps (less than 2,000 ppm) by stating they had no evidence that lowering pump leak standards would achieve significant emission reductions at a reasonable cost and noting uncertainties regarding pump repair effectiveness at low leak concentrations (72FR64864). The EPA impact analysis is available in the docket for the regulation, at Docket ID No. EPA-HQ-OAR-2006-0699.

MBFP agrees with EPA's decision to dismiss leak standards that would be lower than we have proposed in our application.

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3. *A public comment suggested that the Medicine Bow IGL Plant is subject to the refinery NSPS and NESHAP regulations based on an applicability determination by EPA in 1980. The Division requests that Medicine Bow Fuel & Power, LLC address the applicability of the refinery NSPS/NESHAP standards for the Medicine Bow IGL Plant.*

   Response: The public comment making this suggestion refers to two separate documents:

   - A 1980 EPA letter titled "Applicability Determination for Solvent Refilled Coal Plants" obtained from the EPA's Applicability Determination Index (ADI);
   - Chapter 3 of a 1981 comparative technical and economic assessment of selected synfuel technologies, titled "Selected Technical and Economic Comparisons of Synfuel Options, Final Report," written for the United States' Office of Technology Assessment as a background document to assist in preparation of a larger study report titled "Increased Automobile Fuel Efficiency and Synthetic Fuels: Alternatives for Reducing Oil Imports." The Chapter 3 title is 'Overview of Selected Synthetic Fuel Conversion Processes.' A copy of the full chapter is provided with this letter, for your reference.

   As stated in the public comment, the attached 1980 ADI letter notes that NSPS Subpart J requirements for petroleum refineries applies to affected facilities at solvent refined coal (SRC) plants. The letter also notes that "determinations of applicability of solvent refined coal plants to the NSPS for petroleum refineries should be handled on a case-by-case basis, thus, it may not be applicable to all SRC plants."

   The public comment on the MBFP permit goes on to state the "SRC II" process, which is one of the two types of SRC technologies, is similar to the MBFP methanol-to-gasoline (MTG) process, with "no distinction that would render the 1980 determination from EPA invalid." For the reasons discussed below, MBFP disagrees with this comment, based on a review of the SRC II and the MTG process technologies, petroleum refineries, the EPA's 1980 determination, and the definition of 'petroleum refinery.'

   MBFP disagrees with the public comment based on the following from Chapter 4 (attached) from that same 1981 report (i.e. Selected Technical and Economic Comparisons of Synfuel Options, Final Report) where it states on page 4.-28:

"4.6 REFINING SYNTHETIC LIQUIDS

The direct liquefaction and oil shale syfuels have to be further upgraded to end-use product quality in order to be comparable with indirect liquid products such as methanol from coal or gasoline from methanol (from coal). In a wider sense, this is also desirable in order to achieve comparability with synthetic natural gas (SNG) which can be used for a wide range of end use applications in its 'raw' manufactured state.

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The indirect processes produce refinery output (or intermediate) grade products, without the need for the "refining" of crude liquids."

The attached Chapter 4 also includes on pages 4-38 through 4-40 EXHIBITS 4-21, 4-22 and 4-23 which are flow diagrams for the "refining" of the SRC-II produced oil.

As discussed in that 1981 report, the SRC II process is a direct catalytic liquefaction process to convert coal to a crude oil-like liquid. It involves mixing hydrogen with a coal-slurry, reacting the mixture with steam and oxygen, and allowing reactions to take place in a dissolver vessel operating at high pressure and temperature (2,000 psi, 820-870° F). The coal is dissolved with the resulting solution resembling a crude oil which is then fractionated (sent through distillation columns like those used in a refinery) to recover primary products such as naphtha, fuel oil and a vacuum residue. The naphtha and fuel oil products can be further treated in downstream units. All fuel gases in these downstream units, such as catalytic crackers and naphtha reformers, will emit sour gases that will require processing to remove the sulfur. This is the same for refineries which route fuel gases to a gas processing unit to reduce sulfur content.

In contrast, the proposed MBFP facility will employ an indirect liquefaction process to produce methanol and then gasoline from methanol (not the crude oil like product of SRC II). The MBFP syngas is sent to an Acid Gas Recovery Unit where 99.8% of the sulfur is removed. Any residual sulfur in the syngas is removed in the sulfur beds, reducing the sulfur levels to the part per billion concentration necessary to protect the MBFP methanol catalyst. This is the same as in chemical processes, where sulfur has to be removed to prevent catalyst poisoning in downstream units.

The cleaned syngas produced at the proposed MBFP facility will be directed through methanol converter reactors, where the syngas will pass over a highly selective copper-based catalyst on the reactor's shell-side. Any residual sulfur in the cleaned syngas is mostly captured as a poison on the methanol catalyst, so the methanol and methanol offgases will have a sulfur content of less than 10 ppb. Carbon dioxide (CO_2) and carbon monoxide (CO) in the syngas will combine with hydrogen (H_2) to create methanol (CH_3OH). Tubes in the reactor will carry steam, which will provide temperature control for the reaction. The methanol will then be directed to the gasoline synthesis (MTG) unit, where it undergoes multiple complex reactions in reactor vessels to convert the methanol to olefins, paraffins, and aromatics, without molecular hydrogen production (without producing the SRC II crude like product that must then be distilled into liquid hydrocarbon products as happens in a refinery). The reactor effluent will be separated into a gas/vapor phase to be recycled to the reactor inlet, a liquid water phase containing a small percentage of alcohols, ketones, and acids that will be treated, and a liquid hydrocarbon phase referred to as "raw gasoline." Since the methanol is extremely low in sulfur, the gasoline produced from methanol and all associated gas streams will also be extremely low sulfur. The gas streams will not require processing as in a refinery.

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The raw gasoline stream will be directed to a stabilizer to remove LPG product. The liquid product from the stabilizer will be directed to a gasoline splitter (distillation column) so that heavy gasoline containing durene can be separated from the light gasoline and treated for durene removal in a hydrotreating process. Once durene is removed, the heavy gasoline will be re-combined with the light gasoline and directed to gasoline storage tanks. This entire process as well as the emissions profile of MBFP is much different than the SRC II process and cannot be considered as a similar process except to note that solid coal is the feed to both processes.

Thus, the SRC II process has similarities to a typical petroleum refinery due to the fact that it produces a crude oil with significant sulfur content which can then be sent through the crude distillation, cracking, and reforming processes found in most petroleum refineries (but not MBFP). These similarities between the SRC II process and a petroleum refinery can be seen in a comparison of their respective process flow diagrams. A basic process flow diagram for the SRC II process is included with this submittal (see attached Chapter 3 page 3-12 Figure 3.4 and Chapter 4 pages 4-38 through 4-40 for Exhibits 4.-21, 4-22 and 4-23) which can then be compared to a typical petroleum refinery flow diagram such as the one provided as Figure 1.1 in Gary and Handwerk's text "Petroleum Refining - Technology and Economics, 4th Ed." Or alternatively available on Wikipedia if you type in the word "refinery". The first processing step for the liquid hydrocarbon in both the SRC II flow diagram and a general petroleum refining flow diagram is crude oil distillation. In the SRC II process, this crude oil distillation takes place in the dissolver, and also in a fractionation vessel and a 'letdown/flash" system, whereas in a typical petroleum refinery, the distillation takes place in a stabilizer, atmospheric distillation tower, and a vacuum distillation tower. We have drawn a box around the letdown/flash system and fractionation system on the SRC II diagram to illustrate the distillation portion of the process. Note that products from the letdown/flash and fractionation systems in the SRC II process are similar to the products from the crude distillation unit in a petroleum refinery. Although not clearly shown on the diagram, the SRC II products will likely require additional treating in order to crack and reform hydrocarbons into gasoline and fuel oil products and to remove sulfur and aromatic compounds prior to sale, just as with a typical petroleum refinery. The proposed MBFP facility will not utilize the same distillation, cracking, and reforming processes found in petroleum refineries or the SRC II process. Also MBFP fuel gases will have sulfur in the single digit part per billion range, two orders of magnitude less than the refinery specification for fuel gases, and do not require further processing as in a refinery.

Furthermore, MBFP does not consider the proposed facility to fall under the regulatory definition of a petroleum refinery. A 'petroleum refinery' is defined at 40 CFR 60.101(a) as "any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, asphalt (bitumen) or other products through distillation of petroleum or through redistillation, cracking, or reforming of unfinished petroleum derivatives." The term

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"cracking" is used in the context of petroleum refineries to mean the breaking down of higher molecular weight hydrocarbons to lighter components. (Gary and Handwerk, 2001, Appendix A). Cracking can be accomplished through application of heat or catalytic means, and it can be simplistically visualized as 'breaking' long-chain hydrocarbons into smaller-chain hydrocarbons. The term "reforming" is used to describe a process where hydrocarbon molecular structures are re-arranged to form higher-octane aromatics with only a minor amount of cracking. (Gary and Handwerk, 2001, pg. 189) Typically, cyclization and isomerization reactions occur catalytically in a reformer. Neither 'cracking' nor 'reforming' is clarified in the regulations, and thus is taken to have these meanings. Although the proposed facility will produce gasoline, it will not be produced through distillation, redistillation, cracking, or reforming processes. Rather, as described earlier, syngas is converted into methanol, which is then processed via dehydration, oligomerization (polymeration), and cyclization into a gasoline product. The gasoline product will require some treatment to remove the 'light-end' smaller hydrocarbons (LPG), and to remove durene from the heavier constituents prior to storage, but otherwise will be a finished product.

Therefore, MBFP disagrees with the commenters who assert that affected facilities at the proposed facility are subject to petroleum refinery NSPS regulations, on the basis that the proposed facility will not meet the definition of 'petroleum refinery.'

4. *The Division requests that Medicine Bow Fuel & Power, LLC provide clarification on whether power generated at the facility will be exported to the electrical grid. The application states that it is not expected to be exported (page 1-1). If power is to be exported to the electrical grid Medicine Bow Fuel & Power, LLC will need to address the applicability of standards for electric generating units (EGUs).*

Response: MBFP confirms the statement made on page 1-1 of the application that no power generated at the facility will be exported to the electrical grid.

5. *A public comments suggested BACT needed to be applied to the sour water stripper at the facility during startup. The Division requests that Medicine Bow Fuel & Power, LLC clarify operation of the sour water stripper during startup and normal operations. If this source is vented during startup or normal operations an evaluation of control measures and/or work practices must be conducted to minimize emissions from this source during operations.*

Response: MBFP has confirmed through review of the Project Feasibility study that no emissions will be vented to atmosphere from the sour water stripper. During both normal operations and above 20% design flow during startup operations, the sour gas from the sour water stripper will be directed to the SRU and consumed in the SRU furnace. Effluent from the SRU is compressed and recycled to the Selexol system, so no emissions result from the sour gas stream in these situations.

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The Startup/Shutdown Emissions Minimization Plan erroneously states on page 2 that the sour water stripper will be vented during startup. As noted above the vent will be directed to flare or other combustion device for ammonia destruction during low flow conditions during startup. A corrected Startup/Shutdown Emission Minimization Plan is attached.

Conclusion:

A CD containing an electronic version of this letter and all enclosures will be sent to you under separate cover.

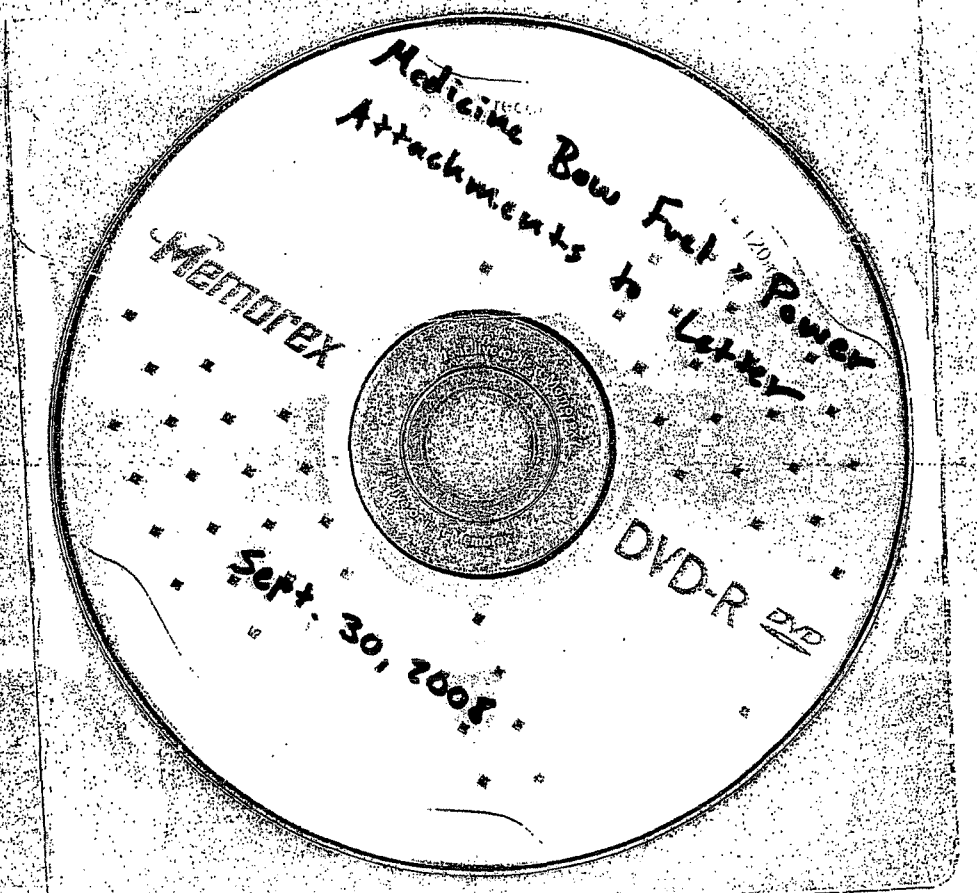
MBFP appreciates this opportunity to provide additional comment/clarifications to the WDEQ on issues raised during the public comment period. We hope this information is useful for you, and encourage you to contact us if you have any more questions or if you need clarification on any of the points raised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

Sincerely,

Jude R. Rolfes
Senior Vice President

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

Enclosures
- Revised Emission Calculation Pages for Methanol Equipment Leaks
- Copy of 1980 ADI Letter (US EPA to J.Snydor)
- Cover Page of 'Selected Technical and Economic Comparisons of Synfuel Options, Final Report, April 1981 prepared for the Office of Technology Assessment (OTA) of the United States Congress.
- Chapter 3 of 'Selected Technical and Economic Comparisons of Synfuel Options, Final Report, April 1981
- Chapter 4 of 'Selected Technical and Economic Comparisons of Synfuel Options, Final Report, April 1981
- Revised Startup/Shutdown Emission Minimization Plan


Medicine Bow Fuel & Power
Attachments to Letter
Memorex
DVD-R
Sept. 30, 2008

Medicine Bow Fuel & Power Industrial Gasification & Liquefaction Plant
Emission Summary Sheet

Normal Operations (8760 hr/yr)

ID No.	Description	Usage	Operation (hr/yr)	Potential Emissions (tpy)					HAPs Emissions (tpy)																
				NO_x	CO	VOC	SO_2	PM_{10}	1,3-Butadiene	Acetaldehyde	Acrolein	2,2,4-Trimethylpentane	Benzene	Carbonyl Sulfide	Dichlorobenzene	Ethyl Benzene	Formaldehyde	Hexane	Mercury	Methanol	Naphthalene	PAH	Propylene Oxide	Toluene	Xylene	TOTALS
CT-1	Turbine and HRSG Train 1	General Electric, 86 MW	8,760	50.6	46.2	6.6	10.8	43.6	1.37E-03	1.27E-01	2.03E-02		3.81E-02			1.02E-01	2.25E-01		4.33E-05		4.13E-03	6.98E-03	9.21E-02	4.13E-01	2.03E-01	1.23E+00
CT-2	Turbine and HRSG Train 2	General Electric, 86 MW	8,760	50.6	46.2	6.6	10.8	43.6	1.37E-03	1.27E-01	2.03E-02		3.81E-02			1.02E-01	2.25E-01		4.33E-05		4.13E-03	6.98E-03	9.21E-02	4.13E-01	2.03E-01	1.23E+00
CT-3	Turbine and HRSG Train 3	General Electric, 86 MW	8,760	50.6	46.2	6.6	10.8	43.6	1.37E-03	1.27E-01	2.03E-02		3.81E-02			1.02E-01	2.25E-01		4.33E-05		4.13E-03	6.98E-03	9.21E-02	4.13E-01	2.03E-01	1.23E+00
AB	Auxiliary Boiler	Heater, 98 MMBtu/hr [1]	8,760	14.2	25.8	1.8	0.2	2.2					5.35E-04	3.40E-04			2.13E-02	8.10E-01			1.73E-04			9.64E-04		5.33E-01
B-1	Catalyst Regenerator Heater	Heater, 21.53 MMBtu/hr [1]	8,760	4.6	7.8	0.5	0.1	0.7					1.94E-04	1.11E-04			6.93E-03	1.68E-01			6.64E-05			3.14E-04		1.74E-01
B-2	Reactivation Heater	Heater, 12 MMBtu/hr [1]	8,760	2.7	4.5	0.3	0.0	0.4					1.12E-04	6.42E-05			4.01E-03	9.62E-02			3.26E-05			1.82E-04		1.01E-01
B-3	HOT Reactor Charge Heater	Heater, 2 MMBtu/hr [1]	8,760	0.5	0.8	0.1	0.0	0.1					2.00E-05	1.14E-05			7.15E-04	1.72E-02			5.82E-06			3.24E-05		1.79E-02
Tanks	Storage Tanks	Product Storage	8,760			102.6							5.27E-01			3.78E-02		4.95E-01		2.39E+00				5.67E-01	1.68E-01	4.17E+00
EL	Equipment Leaks	Fugitives	8,760			58.5							7.90E+00	2.34E-01						6.76E+00						1.48E+01
CS	Coal Storage & Processing	Conveyance (point) & Fugitives	8,760					61.1																		6.00E+00
FW-Pump	Firewater Pump [2]	Engine, 575 HP	500	1.5	0.1	0.3	0.0	0.0	3.77E-05	7.39E-04	8.91E-05		8.99E-04				1.14E-03				8.17E-05		2.48E-03	3.94E-04	2.75E-04	6.14E-03
FL-1	HP / Emergency Flare [3]	Flare, 0.816 MMBtu/hr	8,760	0.5	1.0	3.0	0.0																			8.80E+00
FL-2	LP Flare [3]	Flare, 0.204 MMBtu/hr	8,760	0.1	0.2	0.7	0.0																			
Total Emissions				175.8	176.8	187.4	32.7	194.8	6.86	6.38	0.86	0.00	8.84	0.23	0.08	0.34	8.71	1.21	0.00	9.15	6.81	6.82	6.28	1.81	6.77	23.59

Notes:
[1] Emissions from auxiliary boiler and process heaters assume operation at full design capacity, firing natural gas; however, the equipment may not always fire at full load, and in many cases, will be firing a lower-BTU fuel gas mixture instead of
[2] SO_2 emissions from the Firewater Pump are are based on burning ultra-low sulfur diesel (15 ppm).
[3] Flare emissions include pilot emissions for 8760 hr/yr.

Malfunctions and Other Events

ID No.	Description	Usage	Operation (hours) [1]	Potential Emissions (tons)					HAPs Emissions (tpy)																
				NO_x	CO	VOC	SO_2	PM_{10}	1,3-Butadiene	Acetaldehyde	Acrolein	2,2,4-Trimethylpentane	Benzene	Carbonyl Sulfide	Dichlorobenzene	Ethyl Benzene	Formaldehyde	Hexane	Mercury	Methanol	Naphthalene	PAH	Propylene Oxide	Toluene	Xylene	TOTALS
CO2 VB	CO2 Vent Stack	CO2 Vent Stack	50		63.97	0.23							2.28E-01													2.28E-01
FL-1	HP / Emergency Flare	Flare, 0.816 MMBtu/hr	40	7.83	64.99	0.12	150.16																			8.80E+00
FL-2	LP Flare	Flare, 0.204 MMBtu/hr	8	1.15E-02	2.25E-04	6.79E-04	14.40																			
GP-1	Gasification Preheater	Heater, 21.00 MMBtu/hr	500	0.26	0.43	0.83	3.09E-03	0.04					1.08E-05		6.18E-06		3.86E-04	9.26E-03						1.75E-05		9.59E-03

Notes:
[1] The hours shown are annual estimates, except for the Gasification Preheater which is based on 500 hours per preheating event for one gasifier.

Medicine Bow Fuel & Power Industrial Gasification & Liquefaction Plant
Equipment Leaks Emission Summary

		Controlled Emissions		*Uncontrolled Emsisions*	
		SOCMI Factors		SOCMI Factors	
Process Stream	**Service Type**	VOC Emissions (ton/yr)	HAP Emissions (ton/yr)	VOC Emissions (ton/yr)	HAP Emissions (ton/yr)
Acid Gas	Gas	0.09	0.09	0.12	0.12
Flare KO Drum Drainage	Gas	4.50	1.45	6.70	2.16
Gasifier Vent	Gas	0.14	0.14	0.22	0.22
Gasoline (Gas)	Gas	9.30	3.00	12.38	3.99
Gasoline (Light Liquid)	Light Liquid	10.42	3.36	36.22	11.67
Gasoline (Heavy Liquid)	Heavy Liquid	0.17	0.05	0.26	0.09
LPG	Light Liquid	0.77	0.00	2.21	0.00
Methanol Gas	Gas	0.99	0.99	1.28	1.28
Methanol Pure Liquid	Light Liquid	0.47	0.47	1.44	1.44
Methanol Product (MeOH 1)	Light Liquid	4.83	4.82	13.78	13.75
Methanol Product (MeOH 2)	Light Liquid	0.06	0.06	0.54	0.54
Methanol Product (MeOH 3)	Light Liquid	0.06	0.06	0.54	0.54
Methanol Product (MeOH 5)	Gas	0.35	0.35	0.50	0.50
Mixed Fuel Gas	Gas	0.40	0.01	1.77	0.06
MTG Fuel Gas	Gas	3.88	0.04	5.44	0.06
Propylene	Gas	22.11	0.00	24.36	0.00
Total		**58.51**	**14.89**	**107.74**	**36.41**

	Controlled Emissions		*Uncontrolled Emsisions*	
	SOCMI Factors		SOCMI Factors	
Individual HAPs	HAP Emissions (lb/hr)	HAP Emissions (ton/yr)	HAP Emissions (lb/hr)	HAP Emissions (ton/yr)
Carbonyl Sulfide (COS)	0.05	0.23	0.08	0.35
Methanol (MeOH)	1.54	6.76	4.13	18.11
C6 - C10 Aromatics (Assumed to be Benzene)	1.80	7.90	4.10	17.96
Total	**3.40**	**14.89**	**8.31**	**36.41**

Medicine Bow Fuel & Power Industrial Gasification & Liquefaction Plant
Methanol Product (MeOH 1) Process Stream

Stream Name: Methanol Product (MeOH 1)
Service Type: Light Liquid
Hours of Operation: 8760
This piping is included in the LDAR program.

Chemical Name	CAS Number	VOC	HAP	Molecular Weight (lb/lb-mol)	Weight %	Mole Fraction	Mole Percent	
CO	630-08-0	N	N	28.01	0.02%	5.44E-06	0.02%	
H2	1333-74-0	N	N	2.02	0.00%	3.19E-06	0.01%	
CO2	124-38-9	N	N	44.01	0.30%	6.92E-05	0.22%	
H2O	7732-18-5	N	N	18.02	3.16%	1.75E-03	5.49%	
CH4	74-82-8	N	N	16.04	0.03%	1.59E-05	0.05%	
Ar	7440-37-1	N	N	39.95	0.08%	1.61E-05	0.05%	
N2	7727-37-9	N	N	28.01	0.03%	1.14E-05	0.04%	
H2S	7783-06-4	N	N	34.08	0.00%	0.00E+00	0.00%	
COS	463-58-1	Y	Y	60.07	0.00%	0.00E+00	0.00%	
NH3	7664-41-7	N	N	17.03	0.00%	0.00E+00	0.00%	
O2	7782-44-7	N	N	32.00	0.00%	0.00E+00	0.00%	
SO2	7446-09-5	N	N	64.06	0.00%	0.00E+00	0.00%	
Cl2	7782-50-5	N	Y	70.91	0.00%	0.00E+00	0.00%	
HCl	7647-01-0	N	Y	36.46	0.00%	0.00E+00	0.00%	
MeOH	67-56-1	Y	Y	32.04	96.19%	3.00E-02	94.01%	
Ethanol	64-17-5	Y	N	46.07	0.05%	1.04E-05	0.03%	
Dimethyl Ether	115-10-6	Y	N	46.07	0.03%	7.31E-06	0.02%	
Methyl Acetate	79-20-9	Y	N	74.08	0.08%	1.10E-05	0.03%	
Propanol	71-23-8	Y	N	60.10	0.02%	4.00E-06	0.01%	
Butanol	71-36-3	Y	N	74.12	0.02%	2.60E-06	0.01%	
Acetone	67-64-1	Y	N	58.08	0.00%	3.31E-07	0.00%	
MEK	78-93-3	Y	N	72.11	0.00%	1.33E-07	0.00%	
Ethane	74-84-0	N	N	30.07	0.00%	0.00E+00	0.00%	
Ethylene	74-85-1	Y	N	28.05	0.00%	0.00E+00	0.00%	
Propane	74-98-6	Y	N	44.10	0.00%	0.00E+00	0.00%	
Propylene	115-07-1	Y	N	42.08	0.00%	0.00E+00	0.00%	
Isobutane	75-28-5	Y	N	58.12	0.00%	0.00E+00	0.00%	
N-Butane	106-97-8	Y	N	58.12	0.00%	0.00E+00	0.00%	
Butylene	25167-67-3	Y	N	56.11	0.00%	0.00E+00	0.00%	
Isopentane	78-78-4	Y	N	72.15	0.00%	0.00E+00	0.00%	
C4 - C12 Paraffins	N/A	Y	N	114.23	0.00%	0.00E+00	0.00%	Assumed Octane
C4 - C12 Olefins	N/A	Y	N	112.21	0.00%	0.00E+00	0.00%	Assumed Octene
C6 - C10 Naphthenes	N/A	Y	N	112.21	0.00%	0.00E+00	0.00%	Assumed Cyclooctane
C6 - C10 Aromatics	N/A	Y	Y	78.11	0.00%	0.00E+00	0.00%	Assumed Benzene
TOTALS					100.00%	3.19E-02	100.00%	

Weight % TOC	96.42%
Weight % VOC	96.40%
Weight % HAP	96.19%

Fugitive Emissions - SOCMI Factors

Equipment Type	SOCMI Emission Factor[1] (kg/hr-source)	% Control With LDAR[2,3]	Source Count	Controlled Emissions: TOC Emission Rate (kg/hr)	Controlled Emissions: VOC Emission Rate (kg/hr)	Controlled Emissions: Hours of Operation	Controlled Emissions: VOC Emissions (tpy)	Uncontrolled Emissions: VOC Emissions (tpy)
Valves-Gas	0.00597	92.00%	0	0.0000	0.0000	8760	0.00E+00	0.00E+00
Valves-Light Liquids	0.00403	88.00%	134	0.0625	0.0625	8760	6.03E-01	5.03E+00
Valves-Heavy Liquids	0.00023		0	0.0000	0.0000	8760	0.00E+00	0.00E+00
Pump Seals-Light Liquids	0.01990	73.90%	22	0.1102	0.1101	8760	1.06E+00	4.07E+00
Pump Seals-Heavy Liquids	0.00862		0	0.0000	0.0000	8760	0.00E+00	0.00E+00
Compressor Seals-Gas	0.22800		0	0.0000	0.0000	8760	0.00E+00	0.00E+00
Relief Valves-Gas/Vapor	0.10400		0	0.0000	0.0000	8760	0.00E+00	0.00E+00
Connectors	0.00183	93.00%	96	0.0119	0.0119	8760	1.14E-01	1.63E+00
Open-ended Lines	0.00170		16	0.0262	0.0262	8760	2.53E-01	2.53E-01
Sampling Connections	0.01500		20	0.2893	0.2892	8760	2.79E+00	2.79E+00
Totals				0.50	0.50		4.83	13.78

[1] EPA-453/R-95-017 Protocol for Equipment Leak Emission Estimates (Table 2-1).
[2] EPA-453/R-95-017 Protocol for Equipment Leak Emission Estimates (Table 5-2). Assumes monthly monitoring with leak definition of 10,000 ppmv.
[3] Assumes monthly monitoring with leak definition of 2,000 ppmv for pumps in light liquid service. See Pump LDAR Control Effectiveness Calculation page.

HAP Emissions - SOCMI Factors

HAP	Individual HAP Weight %	VOC Weight %	Hours of Operation	Controlled Emissions: HAP Emissions (lb/hr)	Controlled Emissions: HAP Emissions (ton/yr)	Uncontrolled Emissions: HAP Emissions (lb/hr)	Uncontrolled Emissions: HAP Emissions (ton/yr)
COS	0.00%	96.40%	8760	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cl2	0.00%	96.40%	8760	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HCl	0.00%	96.40%	8760	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MeOH	96.19%	96.40%	8760	1.10E+00	4.82E+00	3.14E+00	1.37E+01
C6 - C10 Aromatics	0.00%	96.40%	8760	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total				1.10	4.82	3.14	13.75