

common with coal-fired power plants. The technology approved in the Permit is neither conventional coal-fired power generation, nor a liquid coal facility.

MBFP stated in its air permit application that it intends to market carbon dioxide for enhanced oil recovery which will sequester it. The Facility plans to capture a significant portion of the total carbon dioxide produced.

The MBFP Facility will also enhance national energy security and contribute to energy independence by providing a domestic source of gasoline. The potential benefits to Wyoming's economy through enhanced tax revenue and job creation were documented as part of the proceeding for MBFP's Industrial Siting Permit, Dkt. No. 07-01. The importance of the development of alternative uses of Wyoming's vast coal resource with projects that are consistent with the policies and purposes of the Wyoming Environmental Quality Act (the Act) has been a state interest for at least a generation.

Under Section 801 of the Act, Wyo. Stat. § 35-11-801, the WDEQ has an affirmative duty to issue permits once it determines that the applicant has met the requirements of the Act and its accompanying regulations. The WDEQ has met its obligations under the Act, with review of the MBFP application, requests for supplemental information, a public hearing and response to public comments. The Sierra Club, through the EQC, is not entitled to reopen the permitting process to ask this body to substitute its judgment for the expertise of the WDEQ, nor is it entitled to demand that MBFP prove again that it has met the requirements of the Act for its Permit. This Council also does not need to revisit rulings it recently made in *In the Matter of the Basin Electric Power Cooperative, Dry Fork Station, Permit CT-4631, Dkt. 07-2801*, now on appeal to the Wyoming Supreme Court. Rather, it is the Sierra Club's burden to present

evidence, not merely speculation that the WDEQ erred in its determination to issue the Permit to MBFP.

Project Overview

The Facility approved in the Permit will consist of the IGL plant and Saddleback Hills Mine, an underground coal mine which will be constructed to provide bituminous coal to the gasifiers. The IGL plant will rely on proven technologies, including GE coal gasification, Selexol® gas clean-up, Davy methanol from syngas, and ExxonMobil Methanol-to-gasoline (MTG) processes. Arch Coal will construct and operate the underground mine.

The Facility will produce gasoline for transportation fuel to be sold into the regional market. The Facility is designed to allow the capture of carbon dioxide and MBFP plans to capture and compress the carbon dioxide to make it salable for enhanced oil recovery. Additional potential waste products produced by the Facility including elemental sulfur and slag will be sold for reuse.

The project will have no process wastewater discharge, but will reuse this water in the process. Brine water will go to an evaporation pond from which salts will be periodically removed for solid waste disposal. The only water discharged will be from collected rainfall or stormwater when that water is of acceptable quality. Water use by the Facility has been substantially reduced by the selection of air cooling (similar to the radiator in a car) instead of conventional evaporative cooling towers. The water use rate by the Facility will be comparable to the amount the State of Wyoming authorizes for irrigation of approximately 70 acres.

MBFP is owned by DKRW Advanced Fuels. Arch Coal, a company with a long history in Wyoming, is a partner and investor in DKRW Advanced Fuels.

WDEQ Permit Review Process

MBFP submitted its application under Chapter 6 of the Wyoming Air Quality Standards and Regulations (WAQSR) for a Prevention of Significant Deterioration (PSD) permit to construct a major emitting facility on June 19, 2007, as revised on December 31, 2007. The permit application was reviewed by the WDEQ until June 19, 2008, when the WDEQ issued the draft permit and its application analysis.

Consistent with the requirements of WAQSR, Chapter 6, Section 2(m), the WDEQ made the draft permit available for public comment. A public hearing to accept public comment was held on August 4, 2008 in Medicine Bow, Wyoming. During the public comment process, WDEQ received many comments in favor of the permit as proposed, as well as those seeking modifications or rejection of the permit.

The WDEQ, Air Quality Division, carefully reviewed the public comments, sought additional information from MBFP, and developed responses to public comments over a period of approximately seven months. In response to the comments, WDEQ revised and added some conditions in the final Permit. On March 4, 2009, the WDEQ issued Permit CT-5873 and an accompanying Decision Document, including its analysis and response to comments. Thus, the Facility application received a thorough review over a period of nineteen months. The Decision Document includes responses to the comments from Sierra Club. Both the Permit and the Decision Document accompany this Response.

Standard of Review

Sierra Club has filed this appeal and it bears the burden of demonstrating that the WDEQ decision to issue the Permit is contrary to the Act and the WAQSR. It is not enough for the Sierra Club to state that the Facility will emit pollutants into the atmosphere, as it states

throughout its Petition. It must prove that the emissions will violate air quality standards and PSD permitting requirements. Sierra Club has the burden of coming forward with initial evidence to challenge the validity of the Permit, and the ultimate burden of persuasion that the Permit issuance was in violation of the relevant air quality standards. If the Sierra Club fails to meet its burden of coming forward with evidence, the Petition need not proceed to a full hearing. The Council must deny the appeal unless the Sierra Club meets its burden of persuasion.

The air quality appeal process is not simply another opportunity for a third party to comment on a now, final permit. Sierra Club participated in the public comment process and cannot use this appeal to raise allegations that should have been brought forward at the draft permit stage. Nor can the Sierra Club use this process to simply reiterate their public comments or comments by others and ask this Council to revisit issues resolved by the WDEQ by its responses to the public comments. It is not sufficient for the Sierra Club to rely on WDEQ's alleged failure to agree with its public comments or those of other entities.

It is improper, as the Sierra Club has done in its Petition, to base its allegations on an incomplete review of the record. The record for this Permit is established and over the period of the air permit review process, the process and the file have been open to the public, including the Sierra Club. The Sierra Club has had more than ample time—sixty days under the WDEQ Rules of Practice-- to review the entire public record, including the application, the analysis, supplemental information and the final Decision Document for the purpose of developing its case.

The decision of the WDEQ is entitled to deference, as a matter of law. As the agency charged with administering the Act and the WAQSR, its judgment and its interpretations of the WAQSR should not be disturbed absent evidence of an error. The WDEQ has administered

successfully its federally-approved PSD permitting program for nearly thirty years. It has issued a Permit to MBFP protective of human health and the environment that meets the requirements of the Act and the WAQSR. To succeed with its Petition, the Sierra Club must do more than ask this Council to second-guess the WDEQ.

Response to Specific Allegations in Sierra Club Petition:

I. The Sierra Club allegation regarding the Medicine Bow Plant and Coal Mine

1. MBFP submitted its original permit application on June 19, 2007 and then, submitted a revised application on December 31, 2007. MBFP denies that the facility is a "liquid coal plant." Liquid coal is not a raw material, process intermediate, or product of the Facility. A liquid coal process converts coal directly to a product similar to crude oil which then requires further refining. Each and every subsequent allegation in the Petition referring to the MBFP facility as a liquid coal plant is hereby denied. The planned facility is an Industrial Gasification and Liquefaction (IGL) facility that gasifies coal, cleans the resulting gas and then converts that clean gas to methanol. The final step converts the methanol to gasoline and it is therefore an IGL Facility.

2. MBFP admits that WDEQ on June 19, 2008 issued an analysis and draft permit as stated in paragraph 2.

3. MBFP admits there was a public hearing and parties submitted comments on the draft MBFP permit as stated in paragraph 3.

4. MBFP admits that on March 4, 2009 WDEQ issued the MBFP Permit CT-5873 and a Decision Document in response to public comments.

5. MBFP admits that the process description in paragraph 5 is consistent with the Permit.

6. MBFP admits that the Facility will produce approximately 198 Million Standard Cubic Feet per Day (“MMscfd”) of carbon dioxide or, 2.5 million to 3.25 million tons per year (tpy) but MBFP denies that the allegations related to the emission of greenhouse gases or their effects on global warming are relevant to the appeal because the WDEQ has no authority to regulate carbon dioxide. Further, the project plans to capture a significant portion of the total potential carbon dioxide from the process.

7. MBFP admits that during normal operations the Permit authorizes the annual emissions as alleged in Paragraph 7 for nitrogen oxides, sulfur dioxide, carbon monoxide, volatile organic compounds and hazardous air pollutants (HAPs). MBFP denies that the Permit authorizes the emission of 310 tpy of particulate matter. Sierra Club added peak mine particulate emissions of 114.5 tpy allowed during year 2 of the mine construction period, as stated in Table I of the Permit, to particulate emissions of 196 tpy from operation of the IGL plant, as described in Table II of the Permit. The construction period for the mine precedes the operation of the IGL Facility and thus, the Permit does not authorize particulate emissions of 310 tpy.

II. The Sierra Club allegations regarding Environmental Impacts from Medicine Bow Liquid Coal Facility

8. MBFP denies the allegations in paragraph 8 because Section 109(b) (1) of the Clean Air Act (CAA), 42 U.S.C. § 7401(b) (1), requires that EPA adopt national ambient air quality standards (NAAQS) “allowing an adequate margin of safety,” that is “requisite to protect the public health.” Wyoming’s air program, through its State Implementation Plan (SIP), must meet the federal requirements. 42 U.S.C. § 7410. As required in its PSD review, the Permit sets limits that will require the MBFP Facility to meet the WAQSR. The limits are protective of human health. WDEQ also established monitoring requirements to assure limits will be met during operation of the Facility.

9. MBFP admits the allegations in paragraph 9 to the extent they provide definitions for particulate matter with a diameter of 10 micrometers (PM10) or less and particulate matter with a diameter of 2.5 micrometers (PM2.5) or less. MBFP denies the remainder of the allegations to the extent they disregard the fact that the United States Environmental Protection Agency (EPA) has promulgated particulate standards, incorporated into the WAQSR, that are protective of human health and the environment.

10. MBFP denies the allegations in paragraph 10 describing the health and environmental effects of nitrogen oxide to the extent they disregard the promulgation of standards that are protective of human health and the environment by the EPA, as incorporated into the WAQSR.

11. MBFP admits the allegations in paragraph 11 only to the extent they describe how sulfur dioxide and nitrogen oxide may lead to the formation of nitrate and sulfate particles. MBFP denies the remainder of the allegations to the extent they disregard the promulgation of standards for these pollutants by the EPA that are protective of human health and the environment, as incorporated into the WAQSR.

12. MBFP denies that the allegations in paragraph 12 related to greenhouse gas emissions are relevant to the appeal, since the WDEQ has no authority to regulate greenhouse gas emissions. *In re Basin Electric Power Cooperative Dry Fork Station Air Permit CT-4631, EQC Docket No. 07-2801, Order (August 21, 2008)*. MBFP further denies the allegations of paragraph 12 to the extent that they suggest the Facility is not designed to allow capture of carbon dioxide. MBFP further denies the allegations to the extent they suggest its Facility is comparable to conventional coal-fired power plants. The MBFP Facility will use a gasification

process, not conventional combustion of the coal, to create a gas that will then be converted to methanol and then to gasoline. The reports of the EPA and the Intergovernmental Panel on Climate Change and other studies are public records and allegations related to these documents require no response. To the extent the Sierra Club is providing its own analysis or interpretation of the reports, those allegations are denied.

13. MBFP denies the allegations in paragraph 13 to the extent they suggest that the Permit will allow emissions of methanol in violation of the requirements of the WAQSR. The Permit defines the Facility as a minor source of methanol, with potential emissions under ten (10) tpy. Permit conditions assure that MBFP will confirm that the Facility will operate as a minor source of methanol.

III. The Sierra Club allegations of Adverse Impacts to Sierra Club

14. MBFP denies the allegations in paragraph 14 to the extent they suggest that the Permit allows emissions in violation of the Act or the WAQSR.

15. MBFP denies the allegations in paragraph 15 to the extent they suggest that the Facility is a coal power plant, rather than an IGL facility, and to the extent they suggest that the WDEQ has authority to regulate greenhouse gas emissions. MBFP is without sufficient knowledge to admit or deny the remainder of the paragraph and therefore, denies the same.

16. MBFP admits that Sierra Club submitted public comments to the WDEQ as part of the permitting process. Sierra Club's participation in the permitting process is in the WDEQ record and speaks for itself, requiring no response from MBFP. WDEQ addressed the Sierra Club's comments in its Decision Document. To the extent that the allegations in paragraph 16 suggest that Sierra Club public comments identified any basis under the WAQSR and the Act for denying the MBFP Permit, MBFP denies the allegations.

17. MBFP is without sufficient knowledge to admit or deny how the MBFP facility will affect Sierra Club members. To the extent Sierra Club alleges that the facility will emit pollutants in amounts that will adversely affect human health and the environment, MBFP denies such allegations. The MBFP Permit complies with all applicable air quality standards and regulations, which have been adopted to protect human health and the environment. WDEQ issues permits in compliance with the WAQSR to protect all citizens of Wyoming and in applying the WAQSR, the WDEQ is in fact protecting the health of the Wyoming Sierra Club members and protecting their environment.

18. MBFP denies the allegations in paragraph 18. The emissions of HAPs from the Facility are not subject to MACT because the Facility emissions do not cause it to be defined as a "major source". A major source has the potential to emit considering controls, in aggregate, 10 tons per year or more of any individual hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants as defined in Section 112(a)(1) of the CAA. 42 U.S.C. § 7412(a)(1).

19. MBFP denies these allegations as they are not relevant to the issuance of the Permit. WDEQ has no jurisdiction over greenhouse gases.

PREVENTION OF SIGNIFICANT DETERIORATION PERMITTING REQUIREMENTS

20. The 1977 amendments to the CAA creating the PSD program, as codified at 42 U.S.C. § 7401, described in Paragraph 20 are a statement of the law and the allegations require no response. MBFP denies the Sierra Club's characterization of the purpose of the PSD program. Congress adopted the PSD program to protect those areas where air quality was cleaner than required by NAAQS through, in part, requirements for the permitting of major

emitting facilities. The PSD program allows ongoing development provided that NAAQS are met and the facility's emissions do not exceed PSD increments.

21. The allegations in paragraph 21 describing the permitting requirements for a "major emitting facility" are a summary of the law and require no response.

22. The allegations in paragraph 22 describing the responsibility of states with SIPs, approved by EPA, to administer the CAA are a summary of the law and require no response.

23. MBFP admits that Wyoming has a PSD SIP, approved by the EPA, including the WAQSR, Chapter 6, Sections 2 & 4, for PSD permitting.

24. MBFP admits that the WAQSR, Chapter 6 contains PSD permitting requirements, but denies the allegations in paragraph 24 to the extent that Sierra Club is stating its own characterization or interpretation of the regulations.

25. MBFP admits that the PSD regulations contain significance thresholds for certain pollutants, known as criteria pollutants. To the extent the Sierra Club is providing its own characterization or interpretation of the PSD regulations in paragraph 25, MBFP denies the allegations.

26. The definition of "Regulated NSR pollutant" is a statement of law that requires no response. MBFP denies the allegations in paragraph 26 to the extent that the Sierra Club is providing its interpretation or characterization of the regulatory definition.

27. The portion of the definition for Best Available Control Technology (BACT) in the WAQSR and the federal regulations quoted in paragraph 27 is a statement of the law and requires no response. MBFP denies that paragraph 27 contains the complete definition of BACT as the Sierra Club has omitted a significant portion of the definition found in both 6 WAQSR § 4(a) and 40 C.F.R. § 52.21(b)(12).

MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY PERMIT REQUIREMENTS

28. The allegations in paragraph 28 contain the definition of HAPs and assert that Section 112 of the CAA, 42 U.S.C. § 7412, regulates HAPs. These allegations are a statement of the law and require no response.

29. MBFP admits the allegations in paragraph 29 that the WAQSR contains a program to regulate the permitting of HAPs, including requirements for the application of Maximum Achievable Control Technology (MACT). MBFP denies that the allegations in paragraph 29 are relevant to the extent they allege that MBFP is subject to MACT requirements under the WAQSR.

30. The allegations in paragraph 30 state that a major source of HAPS is defined as a source with emissions that exceed 25 tpy of total HAPs or emissions that exceed 10 tpy of individual HAPs. 42 U.S.C. § 112(a)(1); 40 C.F.R. § 63.41; 6 WAQSR § 6(f)(v). To the extent that these allegations misstate the definition of major source for HAPs under the CAA since a major source is defined not as one that exceeds 10 tpy of an individual HAP or 25 tpy of total HAPs, but as a source that meets or exceeds those limits, the allegations are denied.

31. The allegations in paragraph 31 that state the definition of potential to emit (PTE) and the requirements for limiting PTE are statements of law and do not require a response. To the extent the allegations in paragraph 31 interpret or characterize the regulations and guidance for PTE, they are denied. MBFP further denies that the requirements for limiting PTE with federally enforceable limits in order to qualify as a "synthetic minor source" of HAPs have any relevance to this appeal, since the Facility's PTE does not exceed HAP major source thresholds.

32. The allegations in paragraph 32 describing the requirements under Section 112(d) of the CAA and the parallel regulations under the WAQSR for requiring the application of

MACT to control major sources of HAPs are statements of the law and do not require a response. To the extent that the Sierra Club is characterizing or interpreting the regulations, those allegations are denied. MBFP further denies that the regulations described in this paragraph have any relevance to this appeal, since the Facility is not a major source of HAPs.

33. The allegations in paragraph 33 quoting a portion of the MACT requirements are a statement of law and do not require a response. MBFP denies, however, that the MACT requirements have any relevance to this appeal since the Facility is not a major source of HAPs.

34. The allegations in paragraph 34 quoting a portion of the definition of MACT are statements of the law and do not require a response. MBFP denies that the allegations have any relevance to this appeal. The regulations only impose MACT requirements on major sources of HAPs and the Facility is not a major source of HAPs. 42 U.S.C. § 7412(d).

ISSUES PRESENTED FOR REVIEW—VIOLATIONS OF THE PSD AND MACT PERMITTING REQUIREMENTS

I. The Sierra Club alleges WYDEQ Failed to Consider Significant Sulfur Dioxide Emissions from Flares in Determining the Sources' Potential to Emit and Failed to Apply BACT to Flares

35. MBFP denies the allegations in paragraph 35 that WDEQ failed to comply with Wyoming PSD and MACT requirements under the CAA in issuing the Permit.

36. MBFP admits the allegations in paragraph 36 that the project design includes construction of both a high pressure and a low pressure flare. MBFP denies the remainder of the paragraph to the extent that it mischaracterizes the purpose of and the normal operation of the flares. The flares are emission control devices which will usually operate in standby mode with only a pilot flame. The flares will combust process emissions infrequently during startup, shutdown and maintenance events.

37. MBFP admits the allegations in paragraph 37 that the flares are emission sources, but denies the remainder of the allegations of paragraph 37. WDEQ included flaring emissions in its calculation of PTE in accordance with the WAQSR and appropriate EPA guidance.

38. MBFP denies that the allegations in paragraph 38 related to refinery flares in the San Francisco Bay Area have any relevance to WDEQ's permitting decision. Whatever is or is not occurring at refineries in the Bay Area has no bearing on the validity of the WDEQ's analysis of the PTE for sulfur dioxide emissions from the MBFP Facility.

39. MBFP denies that the allegations in paragraph 39 related to refinery flaring emissions from startup, shutdown and maintenance events and a third-party study of such emissions have any relevance to the WDEQ approval of the MBFP Permit. The WDEQ's obligation is to analyze the potential emissions of the facility under consideration and to establish appropriate permit requirements.

40. MBFP denies the allegations in paragraph 40 that WDEQ failed to impose BACT on the flares and further denies that the sulfur dioxide emissions from the MBFP Facility exceed the major source significance threshold for PSD. WDEQ considered flare emissions from normal operations and maintenance in the Facility's total PTE. The total sulfur dioxide PTE from the Facility from normal operations and maintenance is 36.6 tpy, which is less than the PSD significance threshold. However, WDEQ determined that BACT was required for the flares and that the Startup, Shutdown and Minimization (SSM) Plan, required by the Permit, is BACT for the flares. (Decision Document at III.1, III.3 and IV.6)

41. MBFP denies paragraph 41 that WDEQ was obligated to consider emissions from a cold start in its calculation of PTE. (Decision Document at III.1) Cold starts are a non-routine event, occurring during the initial startup and commissioning of the Facility before it achieves

normal operation. Thus cold start-up emissions are not routine and the emissions from cold starts are not included in PTE calculations.

42. MBFP admits the allegations in paragraph 42 that the potential amount of SO₂ emissions from anticipated malfunctions and other non-routine events could be 150.16 tpy, but to the extent that Sierra Club is suggesting these emissions should have been included in the calculations for determining whether the Facility is a major source of SO₂, MBFP denies the allegations. WDEQ correctly concluded that the Facility is not a major source of SO₂.

43. MBFP denies the allegations in paragraph 43 to the extent they provide an inaccurate description of the correspondence between MBFP and WDEQ. In a letter to WDEQ, dated October 14, 2008, MBFP stated that potential sulfur dioxide emissions would exceed PSD significance thresholds *if startup emissions are included in facility PTE*. In response to inquiries from WDEQ, MBFP submitted additional information on November 11, 2008 that distinguished routine emissions from non-routine emissions. PTE for routine emissions of sulfur dioxide is 36.6 tpy, which is below the PSD major source threshold. (Decision Document at III.1)

44. MBFP denies the allegations in paragraph 44 that WDEQ incorrectly evaluated the potential sulfur dioxide emissions from the Facility and that the Facility is a major source of sulfur dioxide for PSD purposes. WDEQ concluded that the sulfur dioxide emissions from the MBFP facility did not trigger the PSD significance threshold. MBFP denies that the Facility is a major source of sulfur dioxide emissions. MBFP denies the allegations in paragraph 44 that assert that WDEQ reached the wrong conclusion. MBFP further denies that WDEQ did not set emission limits for the flares. WDEQ included flare emissions from routine and maintenance

operations in the PTE and emission limits for the flares are included in Table II of the final permit. (Decision Document at III.1)

45. MBFP denies the allegations in paragraph 45 that WDEQ failed to apply BACT to all sources of SO₂, failed to consider all control options or failed to utilize proper process in defining BACT for the SO₂ sources in the Facility. Sierra Club mischaracterizes the stringency of the SSM Plan. The SSM Plan is a prescriptive approach to reduce emissions during all periods of start up and shut down requiring detailed planning prior to startups, careful equipment operation during startup, and close monitoring of all flaring activity.

46. MBFP admits the allegations in paragraph 46 to the extent they simply confirm that the facility emissions for volatile organic compounds, carbon monoxide and oxides of nitrogen trigger the PSD significance thresholds. MBFP denies that WDEQ did not apply BACT to control emissions of these pollutants from the flares. The SSM Plan represents BACT for flares.

47. MBFP denies the allegation in paragraph 47 since WDEQ determined the SSM Plan is BACT for flares.

II. The Sierra Club alleges WYDEQ Improperly Quantified HAP Emissions from Fugitive Component Leaks and Failed to Apply BACT to VOC Emissions From Fugitive Component Leaks

48. MBFP admits the allegations in paragraph 48 that there are fugitive component leaks from valves, pumps, compressors, and connectors in the Facility which are a source of VOC emissions, including HAPs, such as methanol. These leaks, however, are minor and normal course in a facility of this type have been properly mitigated under EPA/WDEQ regulations, identified as minor under HAP guidelines, and pose no harm to the population.

49. MBFP denies the calculation of HAP emissions from fugitive sources was based on outdated emission factors, as alleged in paragraph 49. Sierra Club fails to identify the alleged outdated emission factors. The final emission calculations were based on EPA's *Protocol for Equipment Leak Emission Estimates*, most recently updated in May 2008. The WDEQ also concluded that the emission estimates were conservative (Decision Document at II.14). MBFP further denies Sierra Club's allegation that the application lacked a final count of components, because this allegation has no legal relevance. Emission estimates were based on the best available estimate of components that can be made prior to construction of the facility. Permit Condition No. 19 requires MBFP to "submit a demonstration that fugitive HAPs emissions are as represented in the application (minor source of HAPs) based on a final equipment count ... of the as-built facility prior to startup of the facility." Condition 20 requires annual reporting of actual fugitive emissions from the Facility.

50. MBFP denies the allegations in paragraph 50 to the extent Sierra Club asserts that WDEQ relied on inaccurate, unreliable and biased emission factors in calculating the Facility's PTE.

51. MBFP denies the allegations in paragraph 51. WDEQ concluded that the MBFP Leak Detection and Repair (LDAR) Program is BACT. Conditions 20 and 21 of the Permit impose ongoing LDAR monitoring of actual fugitive emissions of HAPs from the facility. MBFP will comply with New Source Performance Standard (NSPS) requirements of Subpart VVa of 40 CFR part 60, with a minimum monitoring frequency of every 6 months.

52. MBFP denies the allegations in paragraph 52. To the extent that paragraph 52 is a statement of the requirements of BACT, the allegations are a statement of law that do not require a response. To the extent the Sierra Club asserts legal conclusions regarding the relationship

between NSPS and BACT, MBFP denies those assertions. Sierra Club's claims that science and engineering for LDAR have improved and that the facility must employ the best available LDAR are not legally relevant. The BACT regulations require consideration of emission control technologies on a case-by-case basis taking into account energy, environmental and economic impacts, as well as technical achievability. WAQSR Ch. 6 § 2(c) (v); WAQSR Ch. 6, § 4(a) (vii).

III. The Sierra Club Alleges WYDEQ Erroneously Concluded that Medicine Bow is a Minor Source of Methanol and Failed to Conduct a Case-by-Case MACT Determination to Control Methanol and other HAP Emissions.

53. MBFP denies the allegations in paragraph 53 and incorporates by reference the response to paragraph 49 above.

54. MBFP denies the allegations in paragraph 54 and incorporates by reference the response to paragraph 49 above. MBFP denies that the Application and WDEQ Application Analysis estimate of 10 tpy is relevant to its protest of the final permit, as it does not represent the entire WDEQ record on methanol emissions. MBFP determined that replacing manual sampling connections with closed-loop sampling systems would significantly reduce HAP emissions at reasonable cost. Consequently, equipment leak emission estimates were reduced to below the 10-tpy major HAP threshold for methanol in the final permit Decision Document. Permit Conditions Nos. 19-21 require that MBFP determine final component counts and monitor methanol emissions to ensure that they remain below the major source threshold.

55. The allegations in paragraph 55 describe MACT requirements for major sources. As a statement of law, they do not require a response. MBFP denies that the allegations are relevant as the Facility is not a major source of HAPs.

56. MBFP denies the allegations in paragraph 56. The Sierra Club is misstating EPA's comments. EPA stated: "In the event that the requirement to complete case-by-case

MACT determinations applies to this source, under section 112 of the CAA, the determinations must be completed before the commencement of any construction at the proposed site.” (EPA Region 8 Comments on the Draft Prevention of Significant Deterioration Permit AP-5873, dated August 4, 2008). EPA did not determine that a case-by-case MACT analysis was required nor did it conclude that WDEQ must conduct a case-by-case MACT analysis.

57. WDEQ’s Decision Document speaks for itself. MBFP denies the allegations in paragraph 57 to the extent Sierra Club provides an incomplete description of the WDEQ analysis and to the extent Sierra Club asserts that the WDEQ erred in concluding that the Facility will be a minor source of methanol. MBFP’s response incorporates by reference its response to paragraph 53 above. (WDEQ Decision Document at III.14)

58. The allegations in paragraph 58 suggest that the Permit must contain a federally-enforceable requirement to limit methanol emissions below 10 tpy. MBFP denies the allegations in this paragraph as they are not legally relevant. This demand that the Permit establish synthetic minor requirements for the MBFP facility is not applicable since the WDEQ concluded that the facility’s PTE is below the major source threshold of 10 tpy for methanol. A synthetic minor condition may be appropriate when a facility’s PTE is above major source levels and the objective is to establish the facility as a minor source. The synthetic minor tool has no place here since the WDEQ has concluded that the facility is a minor source of methanol with estimated emissions of 9.2 tpy.

59. MBFP denies the allegations in paragraph 59 that the Facility is a major source of HAPs, requiring a case-by-case MACT analysis.

IV. The Sierra Club alleges WYDEQ Improperly Dismissed Coal Cleaning As BACT for Mercury and Particulate Matter

60. MBFP denies these allegations to the extent they suggest the WDEQ failed to apply the proper BACT analysis to any pollutant. MBFP further denies that a coal cleaning or drying process is even reasonable to consider without changing the Facility gasifier design basis to dry gasifiers. The Facility is designed to utilize wet slurry gasifiers, and therefore coal drying will be inefficient since the coal enters the gasifiers as a wet-slurry (it would take out moisture that would then be put back in). Additionally, as stated in the application, the MBFP mercury capture technology (carbon beds) provides for the capture of 99.98% of the mercury.

61. MBFP denies the allegations in paragraph 61 that WDEQ had a legal obligation to evaluate coal cleaning as part of its BACT analysis. The EQC has previously ruled that BACT regulations do not require the agency to evaluate emission control technologies that could not be achieved without a redesign of the facility. *In re Basin Electric*, supra.

V. The Sierra Club alleges WYDEQ Failed to Model Impacts of Fugitive Emissions of Particulate Matter.

62. MBFP admits, consistent with WDEQ's longstanding policy and 1994 Memorandum of Agreement (MOA) with the EPA, it did not model the impacts of fugitive emissions of particulate in short-term 24-hour modeling. Annual fugitive particulate emissions, however, were modeled. To the extent paragraph 62 suggests the modeling required by WDEQ is inadequate, MBFP denies the allegations.

63. EPA's comments on particulate modeling are in the permitting record and speak for themselves, as does the WDEQ's response to the EPA comments. (Decision Document at III. 14) MBFP denies that there was any error in WDEQ's decision regarding short-term modeling.

64. MBFP fails to see the relevance of whether short-term fugitive emission modeling for particulate matter is required in new source review actions in other jurisdictions and thus, denies the same. The allegation is also irrelevant to a review of the MBFP permitting decision.

Regardless of the practices in other jurisdictions, WDEQ is obligated to issue permits in accordance with the requirements of the WAQSR and the Act, which includes the longstanding 1994 EPA/WDEQ MOA. MBFP further denies that the WDEQ failed to provide adequate justification for its decision. (Decision Document at III.14)

65. MBFP denies the allegations in paragraph 65 and incorporates by reference the response to paragraph 63 above. WDEQ correctly concluded that the Facility will not cause or contribute to NAAQS or increment violations under Chapter 6 of the WAQSR and 42 U.S.C. § 7475(a)(3). The WDEQ required modeling for fugitive emissions was in compliance with the law.

VI. The Sierra Club alleges WYDEQ Failed to Conduct Proper BACT Analysis of PM Control Options for Coal Pile Storage

66. MBFP agrees that WDEQ determined stacker tubes in pits are BACT for controlling particulate emissions from the coal storage pile.

67. MBFP denies the allegations in paragraph 67. MBFP provided cost data and WDEQ used it in its assessment of our application. (See Decision Document at III.2).

68. EPA's comments are in the WDEQ record and speak for themselves. MBFP denies the allegations in paragraph 68 to the extent that Sierra Club characterizes or interprets EPA's comments. MBFP denies that WDEQ failed to respond to EPA comments. (See Decision Document at III.2).

69. MBFP denies the allegations in paragraph 69 that WDEQ's BACT determination for controlling PM from the coal storage pile violates state and federal regulations.

VII. The Sierra Club alleges WYDEQ Failed to Regulate PM_{2.5} Emissions.

70. MBFP agrees with the definition of PM2.5 in paragraph 70, but denies the relevance of the health effects allegations given WDEQ used the EPA Surrogate Policy . (See Decision Document at II.9).

71. MBFP agrees that EPA adopted a NAAQS for PM2.5, but denies that the remainder of the allegations in paragraph 71 related to the health effects of PM2.5 are relevant. (See Decision Document at II.9).

72. MBFP is without sufficient information or knowledge to admit or deny the scope of data available to WDEQ alleged in paragraph 72 and therefore, denies the same. MBFP further denies the relevance of the allegation as WDEQ relied on EPA's PM10 Surrogate Policy. (Decision Document at II.9)

73. The requirements for PSD permit issuance alleged in paragraph 73 are a statement of law and do not require a response. MBFP denies that it failed to demonstrate compliance with the PM2.5 NAAQS or applicable PSD increment. (See Decision Document at II.9).

74. MBFP denies the allegations in paragraph 74 that WDEQ failed to conduct a BACT evaluation or establish BACT-based emission limits for PM2.5. (See Decision Document at II.9).

75. MBFP denies the allegations in paragraph 75 that WDEQ's reliance on EPA's PM2.5 Surrogacy Policy in its decision to issue the Permit was unlawful. (See Decision Document at II.9).

76. MBFP denies the allegations in paragraph 76. WDEQ's use of PM10 as a surrogate for PM2.5 is not contrary to PSD permitting requirements. Sierra Club relies on a recent letter from the EPA Administrator, Lisa Jackson, remanding the PM2.5 New Source Review Implementation Rule, as a basis for invalidating WDEQ's PM2.5 analysis. The review

of the Surrogacy Policy does not apply in Wyoming, since it is a SIP-approved program. In addition EPA's statement occurred after the date of Permit issuance. EPA also specifically approved Wyoming's use of the Surrogacy Policy in Wyoming's Interstate Transportation of Pollution SIP. (Decision Document at II.9).

77. MBFP denies the allegations in paragraph 77 that WDEQ issued a Permit that violates the PM2.5 NAAQS or PSD increment and further denies any related allegations in paragraph 77. (Decision Document at II.9).

VIII. The Sierra Club alleges WYDEQ Failed to Consider Greenhouse Gas Emissions.

78.-86. The allegations contained in these paragraphs are not within the authority of the EQC and should be dismissed. The EQC recently ruled in *In re Basin Electric*, cited above, that greenhouse gases are not subject to regulations under the CAA or the WAQSR and as a result, PSD permits need not contain conditions to control greenhouse gases. The issuance of an endangerment finding by EPA does not call into question the EQC result in *Basin Electric*. Greenhouse gas emissions are still not subject to regulation and therefore, fall outside the scope of PSD. This interpretation is supported by Section 213 of the Act, Wyo. Stat. § 35-11-213, as it prohibits the WDEQ from regulating greenhouse gas emissions until federally required to do so.

General Denial—To the extent that any of the allegations contained in the Petition have been neither admitted, nor denied in the above response, those allegations are hereby denied.

AFFIRMATIVE DEFENSES

1. Petitioner has failed to state a claim upon which relief may be granted and as a result, should be dismissed.

2. Petitioner has no right to a hearing under the Environmental Quality Act, Wyo. Stat. § 35-11-801.

3. Petitioners are not an aggrieved party within the meaning of the Environmental Quality Act and thus, lack standing.

4. Contrary to WDEQ Rules of Practice and Procedure, Chapter 1, Section 3, Petitioners have failed to set forth any facts in support of their Petition.

5. Contrary to WDEQ Rule of Practice and Procedure, Chapter 2, Section 6, the Petition was not filed by attorneys authorized to practice law in Wyoming and therefore, was improperly filed.

6. MBFP reserves the right to raise any additional affirmative defenses as may be warranted as the appeal proceeds.

WHEREFORE, Medicine Bow Fuel and Power, LLC, respectfully requests that the Council affirm the decision of the WDEQ to issue Permit CT-5873.

DATED this 3rd day of June 2009

MEDICINE BOW FUEL AND POWER, LLC

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CERTIFICATE OF SERVICE

I, Mary A. Throne, hereby certify that on this 3rd day of June 2009 a true and correct copy of the foregoing **PERMITTEE'S RESPONSE TO APPEAL** was served in accordance with the requirements of Chapter I, Section 3(b) of the Department of Environmental Quality Rules of Practice and Procedure and Rule 5 of the Wyoming Rules of Civil Procedure, by U.S. mail, and electronic mail to:

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Mary A. Throne

BEFORE THE
ENVIRONMENTAL QUALITY COUNCIL
STATE OF WYOMING

IN THE MATTER OF:)
MEDICINE BOW FUEL & POWER, LLC) DOCKET NO. 09-2801
AIR PERMIT CT-5873)

EXHIBIT 1
PERMITTEE'S RESPONSE TO APPEAL

IN THE MATTER OF A PERMIT APPLICATION (AP-5873) FROM MEDICINE BOW FUEL & POWER, LLC TO CONSTRUCT AN UNDERGROUND COAL MINE AND INDUSTRIAL GASIFICATION AND LIQUEFACTION PLANT TO BE KNOWN AS THE MEDICINE BOW IGL PLANT

DECISION

I. Introduction

The Air Quality Division received a permit application from Medicine Bow Fuel & Power, LLC on February 14, 2007, to construct an underground coal mine and industrial gasification and liquefaction (IGL) plant that will produce transportation fuels and other products. The underground coal mine (Saddleback Hills Mine) is expected to have a maximum production rate of 8,700 tons per day (TPD) of coal or approximately 3.2 million tons per year (MMTPY) of coal as feed to the IGL Plant. The plant will gasify coal to produce synthesis gas (syngas) to produce the following products: 18,500 barrels per day (bpd) of gasoline, 42 tons per day (tpd) of sulfur, 198 million standard cubic feet per day (MMscfd) of carbon dioxide (CO₂) and 712 tpd of coarse slag. The Medicine Bow IGL Plant would be located in Section 29, T21N, R79W, approximately eleven (11) miles southwest of Medicine Bow, in Carbon County, Wyoming.

The Division conducted an analysis of this application and on July 3, 2008, published in the Daily Times, in Rawlins, Wyoming, a public notice and notice of public hearing of the proposed intent to approve the application. A copy of the application and Division's analysis was placed in the office of Carbon County Clerk in accordance with regulations. The public notice period ran from July 3, 2008 to August 4, 2008 and a public hearing was held on August 4, 2008, at the Medicine Bow Senior Center, located at 520 Utah Street, in Medicine Bow, Wyoming.

The Division received twenty (20) comment letters on the proposed permit during the public comment period: 1) a July 22, 2008 letter from Virginia Clarke; 2) a July 24, 2008 letter from A. Josef Greig, PhD; 3) a July 24, 2008 letter from Kathy Moriarty, PhD; 4) a July 28, 2008 letter from the Wyoming Outdoor Council; 5) a July 31, 2008 letter from DKRW Advanced Fuels, LLC; 6) an August 1, 2008 letter from Earthjustice; 7) an August 4, 2008 letter from William and Denise Sherwood; 8) an August 4, 2008 letter from the Carbon County Economic Development Corporation; 9) an August 4, 2008 letter from the Biodiversity Conservation Alliance; 10) an August 4, 2008 letter from the Powder River Resource Council; 11) an August 4, 2008 letter from Rev. Rebekah Simon-Peter; 12) an August 4, 2008 letter from an unknown sender due to an incomplete fax; 13) an August 4, 2008 letter from EPA Region VIII; 14) slides from a presentation August 4, 2008 at the public hearing from DKRW; 15) an August 4, 2008 letter submitted at the public hearing by Kirby Hornbeck; 16) an August 4, 2008 letter submitted at the public hearing by Rita Clark; 17) an August 4, 2008 letter submitted at the public hearing by John Johnson; 18) an August 4, 2008 letter submitted at the public hearing by Connie Wilbert; 19) an August 3, 2008 letter submitted at the public hearing by Reese Johnson; and 20) an August 5, 2008 letter submitted by Casey & Nellie Palm.

Due to the number of public comments with similar concerns, the Division grouped individual comments and developed summary comments and responses. Comments from EPA, Environmental Groups, and DKRW (Medicine Bow Fuel & Power, LLC) are addressed individually. The comments and responses are presented on the following pages. The Division also received positive comments supporting this project. The Division appreciates these comments but they are not included in this document as no response is required.

II. Analysis of Public Comments:

- II.1 **Control of Mercury Emissions** – Comments were received regarding the need to control mercury emissions from the facility.

Response – Mercury emissions from the facility are to be controlled with two (2) mercury guard beds (activated carbon) with an estimated removal efficiency of 99 percent, as determined by best available control technology (BACT). Additionally, Condition 10 of the permit limits mercury emissions from each turbine to 4.33×10^{-5} tons per year (0.087 lb/yr).

- II.2 **Carbon Dioxide Sequestration (Greenhouse Gases)** – Comments were received regarding sequestration of carbon dioxide.

Response – CO₂ emissions are not currently “subject to regulation” for DEQ/AQD permitting purposes, including BACT. *See In re Basin Electric Power Cooperative Dry Fork Station Air Permit CT-4631*, EQC Docket No. 07-2801, Order (August 21, 2008) (recognizing that Wyoming does not have any emission standards or control requirements for CO₂ and declining to find that CO₂ data collection encompasses regulation).

Medicine Bow Fuel & Power, LLC stated as part of their application for this facility that they intend to capture carbon dioxide (CO₂) from the process and sell CO₂ for enhanced oil recovery. In 2008, Wyoming adopted carbon sequestration laws addressing the legal framework for storing carbon dioxide underground. *See Wyo. Stat. Ann. § 35-11-313*. Except for the enhanced recovery of oil or other minerals approved by the oil and gas conservation commission, geologic sequestration of carbon dioxide will require a separate DEQ permit. Such action is outside the scope of this air quality permit.

- II.3 **Financing** – Comments were received which recommend that the Division ensure that Medicine Bow Fuel & Power, LLC has adequate financing for the project before issuing the permit for the proposed facility.

Response – The Wyoming Air Quality Standards & Regulations (WAQSR) does not require companies to provide documentation that adequate finances are available to complete a proposed project.

- II.4 **Ozone** – Comments were received regarding the impact this facility would have on ozone levels in the area and whether this facility would show compliance with the National Ambient Air Quality Standard (NAAQS) for ozone (0.075 ppm 8-hour) and whether ozone monitoring should be required.

Response – Because ozone is a pollutant that forms due to emissions from a large number of sources over larger (regional) areas, ozone modeling to demonstrate compliance with the NAAQS is not typically performed for single facilities. Ozone monitoring data was examined to determine the current ambient ozone levels. The Division operates a monitoring station approximately 100 kilometers west of the proposed project near the town of Wamsutter, Wyoming in an area of concentrated oil and gas development. Fourth-high 8-hour readings from that site for 2006-2008 are below the new EPA 8-hour standard of 0.075 part per million (ppm). Another monitor is located approximately 19 kilometers south-southeast of the proposed project near Centennial, Wyoming. The three-year averages of the fourth-high 8-hour readings from that site for 2005-2007 are also below the new EPA 8-hour standard of 0.075 ppm. Data from the two monitoring stations are summarized in the tables below. Both monitoring stations show a slight downward trend in the three-year averages of the 4th high readings. The Division does not feel that an ozone monitor at the proposed project site is needed, given the regional nature of ozone formation and the existence of the two existing ozone monitors in the region.

CASTNET Monitor CNT169 (Centennial, WY) Ozone Data

Year	4 th Highest 8-Hour Ozone Concentration (ppm)	Three-Year Average (ppm)
2003	0.079	--
2004	0.072	--
2005	0.066	0.072
2006	0.070	0.069
2007	0.066	0.067

Note:

To attain the 8-hour standard, the 3-year average of the fourth-highest daily maximum 8-hour average concentrations must not exceed 0.075 ppm. Data obtained from <http://www.epa.gov/castnet/data.html#ozone>

Wamsutter, WY Ozone Data

Year	4 th Highest 8-Hour Ozone Concentration (ppm)
2006	0.067
2007	0.064
2008	0.064

Notes:

To attain the 8-hour standard, the 3-year average of the fourth-highest daily maximum 8-hour average concentrations must not exceed 0.075 ppm.

Monitoring began in March of 2006. Data for 2008 through September 30, 2008.

- II.5 **PM₁₀ Increment** – The Division received several comments that emission controls should be stronger because of the predicted increment consumption for PM₁₀.

Response – Emission controls for the project will consist of best available control technology (BACT). The Division's modeling analysis showed that 85% of the allowable PSD increment for PM₁₀ for the annual averaging period would be consumed near the proposed plant. The PSD increments are set at levels well below the NAAQS, and are designed to prevent newer sources from degrading the air quality in areas that attain the NAAQS. The area of relatively high increment consumption (> 50% of allowable level) is limited to an area on the western edge of the proposed facility boundary, which is contained within the boundary of the Carbon Basin Mine and not within the area considered "ambient" air available for public access. The extent of the modeled increment consumption is shown in Figure 1.

- II.6 **WY Department of Health involvement** – A comment was received regarding the need to have the Wyoming Department of Health examine and comment on the permit.

Response – The Division required a Tier 1 inhalation risk assessment from the applicant to assess the potential health effects from project emissions (see response to Public Comment II.10 and responses to Environmental Groups Comments IV.17 and IV.18 of Exhibit 1 of the Earthjustice letter dated August 1, 2008). Division staff reviewed the risk assessment to confirm that it was conducted in accordance with EPA guidelines. The Division consulted with the Wyoming Department of Health regarding the need for additional analysis, and no further analyses were suggested. Additionally, the modeled impacts for the proposed project were below all health-based (WAAQS/NAAQS) standards for criteria pollutants.

- II.7 **Class I Projections and Rock River WA** – Comments were received regarding the lack of analysis conducted for the Rock River wilderness.

Response – The Division requires a PSD applicant to evaluate impacts at Class I areas that may be affected by a proposed project. The Rock River area is not listed as a Class I area in Wyoming. For this project, the applicant evaluated the project's impact on visibility at eight Federal Class I areas in Wyoming and Colorado as well as a State Class I area in Wyoming (Savage Run WA), and all results were below the level of concern.

- II.8 **Cumulative Modeling Sources** – Comments were received regarding the cumulative modeling analyses and whether all sources within 50 km were included.

Response – All sources within 50 km of the proposed project were considered for the cumulative modeling. Appendix A of the Division's analysis lists the outside sources that were included in the cumulative modeling, including one source that is located 47.8 km from the proposed project. Appendix A also identifies the facility associated with each of the outside sources. The Division included each outside source listed in Appendix A in the NAAQS/WAAQS and PSD increment modeling runs.

II.9 **Fine particulate matter** -- Comments were received regarding the lack of analysis for PM_{2.5}.

Response -- The Division analyzed PM_{2.5} using EPA's PM₁₀ Surrogate Policy and has established emission limits in the permit for particulate matter that are protective of air quality. In October 1997, EPA issued guidance allowing states to use PM₁₀ as a surrogate for PM_{2.5} in meeting PSD permitting requirements ("PM₁₀ Surrogate Policy"). See *Interim Implementation of New Source Review Requirements for PM_{2.5}*, EPA, John S. Seitz, Memorandum, October 23, 1997. Subsequently, in April 2005, the EPA reaffirmed continued use of the PM₁₀ Surrogate Policy. See *Implementation of New Source Review Requirements in PM_{2.5} Nonattainment Areas*, EPA, Stephen D. Page, Memorandum, April 5, 2005. Again, in September 2007, the EPA reaffirmed that states could continue using the PM₁₀ Surrogate Policy until such time as EPA had approved the state's revised SIP. 72 Federal Register 54112, 54114 (September 21, 2007). Finally, in May 2008, the EPA reiterated that states may continue using the PM₁₀ Surrogate Policy until the state's SIP was revised. See *Implementation of the New Source Review ("NSR") Program for Particulate Matter less than 2.5 micrometers (PM_{2.5})*, 73 Fed. Reg. 28321, 23341 (May 16, 2008). The Division has incorporated the 1997 PM_{2.5} NAAQS into the WAQSR, but has not yet amended the rules or SIP to incorporate the 2006 standards established by EPA. See 2 WAQSR § 2. Since EPA's promulgation of the PM_{2.5} NAAQS in 1997, the Division has followed and applied EPA's PM₁₀ Surrogate Policy. On May 8, 2008, EPA approved Wyoming's Interstate Transport of Pollution SIP effective as of July 7, 2008. See 73 Fed. Reg. 26019. Wyoming's SIP states, "Wyoming will implement the current [PSD] rules in accordance with EPA's interim guidance using PM₁₀ as a surrogate for PM_{2.5} in the PSD program." See Wyoming State Implementation Plan, Interstate Transport, at pg. 3 (December 11, 2006).

PM₁₀ includes all particulate matter less than 10 micrometers and smaller, which means PM₁₀ also includes PM_{2.5}. The Division's review of DKRW's modeling analysis concluded that the total PM₁₀ ambient impacts were less than the PM₁₀ NAAQS/WAAQS and PSD increment standards. Furthermore, the permit established BACT emission limits for PM_{2.5} precursors: nitrogen oxides (NO_x), sulfur dioxide (SO₂), and volatile organic compounds (VOCs).

II.10 **Toxic and hazardous chemicals** -- Comments were received regarding the omissions of several compounds from the Tier 1 inhalation risk assessment.

Response -- The applicant revised the Tier 1 inhalation risk assessment to include all known carcinogens that are expected to be emitted from the facility. Individual risk factors were summed to arrive at a total estimated cancer risk, as shown in the table below. Note that the total estimated cancer risk is dominated by the individual risk for benzene, which was already considered with the initial Tier 1 assessment. The extent of the estimated cumulative 1/million cancer risk is shown graphically in Figure 2. As shown in the figure, the nearest residence is outside of the 1/million isopleth. The EPA considers 1 per ten thousand persons, i.e., 100 per one million persons, to be the upper bound of "acceptable risk" [see EPA benzene NESHAP, Federal Register, 54: 38044, September, 1989]. For this project, the maximum predicted increased cancer risk from all HAP was predicted to occur within the Carbon Basin Mine boundary, and was calculated to be 88 per million persons.

Health risk screening is conducted in connection with PSD permit issuance for public information purposes. No ambient standards have been established for hazardous air pollutants (HAP), but current Division policy requires PSD applicants to conduct a Tier 1 inhalation risk assessment for HAP in accordance with EPA guidelines and to compare predicted risks to reference levels [see 6 WAQSR § 4(b)(iv); DEQ/AQD Guidance for Submitting Major Source/PSD Modeling Analyses § 5.G (January 2008); see also EPA's Air Toxics Risk Assessment Reference Library, Volume 2, Facility-Specific Assessment (April 2004)].

A top-down best available control technology (BACT) analysis was conducted for each of the pollutants determined to be subject to PSD for the project, and all predicted impacts of criteria pollutants were below allowable ambient standards.

Tier 1 Inhalation Risk Assessment Results (Cancer Risk)			
Parameter/HAP	Factors/Risk		
	EC _L (µg/m ³)	IUR [1/(µg/m ³)]	Risk
Cancer Risk			
Acetaldehyde	0.00689	0.0000022	1.52E-08
Benzene	11.3	0.0000078	8.81E-05
1,3-Butadiene	0.00022	0.00003	6.60E-09
Dichlorobenzene	0.00007	0.000011	7.70E-10
Formaldehyde	0.047	5.50E-09	2.59E-10
Napthalene	0.0002	0.000034	5.78E-09
PAH	0.0002	0.0011	2.53E-07
Propylene Oxide	0.00354	0.0000037	1.31E-08
Total			8.84E-05

Note: The total estimated risk of 8.84E-05 is equivalent to 88.4 per million
 EC_L = exposure concentration based on a lifetime of continuous inhalation exposure to an individual HAP (µg/m³)
 IUR = inhalation risk estimate for that HAP [1/(µg/m³)]
 Risk = excess lifetime cancer risk estimate (unitless)

- II.11 **Flaws in air quality and visibility analysis, no nearby visibility analysis, Class I areas in the Snowy Range** – A comment was received that there were “significant flaws” in the methods used to evaluate air quality and visibility impacts. No nearby (within 20 km) visibility analysis was done, and Class I areas in the Snowy Range were not evaluated.

Response – The visibility modeling, as described in detail in the Division’s analysis, was performed in accordance with Federal Land Manager (FLM) guidance. No specific flaw was identified in the comment, and therefore the Division cannot specifically respond to the comment. The Division did not identify any scenic views that would require protection near the proposed project, and therefore did not require any near-field (within 50 km) visibility modeling with the VISCREEN model. No Class I areas have been designated in the Snowy Range. The applicant did evaluate the project’s impact on visibility in eight Federal Class I areas as well as a State Class I area (Savage Run WA), and all results were below the level of concern.

- II.12 **Short-term impacts** – A comment was received that stated short-term impacts were incorrectly modeled with annual average emissions.

Response – Sources for the proposed project were modeled with worst-case, short-term emission rates for all comparisons to short-term air quality standards. Cumulative sources were required to be included in the modeling for carbon monoxide (CO) and nitrogen dioxide (NO₂). Air quality standards for NO₂ are based on an annual averaging period, and therefore cumulative sources were modeled with annual-average emissions. Air quality standards for CO are based on 1-hour and 8-hour averaging periods, and cumulative sources were modeled with short-term allowable emissions.

- II.13 **Lack of Adequate Public Notice** – A comment was received requesting to extend the public notice as 30 days is not an adequate enough time for public comment on the proposed facility.

Response – The 30-day public notice period required by Chapter 6, Section 2(m) of the Wyoming Air Quality Standards and Regulations (WAQSR) applies to all applications. The 30-day public notice period meets the requirements of Chapter 6, Section 2(m) and, therefore, the request to extend the public notice period was denied. The Division notes that the commenter was able to provide written comment during the public notice period and attended the public hearing on August 4, 2008.

- II.14 **Case-by-Case Maximum Achievable Control Technology (MACT) Analysis** – A comment was received requesting that the facility undergo a case-by-case maximum achievable control technology (MACT) evaluation under Section 112 of the Clean Air Act.

Response – DKRW reevaluated the engineering information for the design of the facility, and based on this design information they have revised the fugitive emission calculations for the facility. Revised emission calculations now indicate that the facility is a minor source of HAPs as the facility is less than 10 tpy of any individual HAP or 25 tpy of any combination of HAPs, which is shown in the table below.

Medicine Bow IGL Plant HAP Emissions (tpy)		
Pollutant	HAPs as Represented in Analysis	Revised HAPs based on component count
Benzene	8.5	8.5
Formaldehyde	0.7	0.7
Hexane	1.3	1.3
Methanol	10.3	9.2
Toluene	1.8	1.8
Other Haps	2.2	2.1
Total HAPs	24.8	23.6

Based on HAP emissions being less than major source levels, a case-by-case MACT analysis for the facility under Section 112 of the Clean Air Act (Chapter 6, Section 6 of the WAQSR) is not required. It should be noted that the Division considers fugitive emission estimates to be conservative as emissions are based on all connections and pumps leaking at the proposed leak detection and repair (LDAR) levels (500 ppm for valves/flanges and 2000 ppm for pumps).

With estimated HAP emissions being revised the Division will include as a condition of the permit a demonstration that fugitive HAP emissions are as represented in the application based on a final equipment count (equipment as defined in 40 CFR part 60, subpart VVa) of the as-built facility prior to startup of the facility, and will require the submittal of a report showing actual fugitive HAP emissions based on measured leak detection rates during operation of the facility. The Division will also include a condition in the permit requiring the monitoring of leaks under the LDAR program in accordance with 40 CFR part 60, subpart VVa to be conducted a minimum of every six (6) months to minimize fugitive emissions from equipment leaks, as the monitoring frequency under Subpart VVa can be greater than six (6) months.

II.15 **Allowed particulate matter** – An individual commented that the plant will contribute up to 85% of the allowed particulate matter for the area, and raised several related questions:

- What is current % of allowed particulate matter?
- Will this bring us into non-compliance?
- How large is our area defined as and does it take in the Medicine Bow National Forest?
- Will this restrict any other industry from coming to the area?

Response – The projected increment consumption was modeled with the proposed IGL plant sources and other nearby sources such as the neighboring coal mine, and therefore the current increment consumption (pre-IGL plant) was not considered. The results of the modeling indicate that the proposed facility will not prevent the attainment or maintenance of any air quality standard. The modeling domain did not extend to the Medicine Bow National Forest, which is located approximately 18 km to the southeast of the proposed project. The area of relatively high (> 50% of allowable level) increment consumption is predicted for an area at the west end of the boundary for the proposed project (see Figure 1).

The Division cannot predict what effect this facility will have on future growth in the area based on the modeled PM_{10} increment consumption. Increment consumption in any given area is driven by numerous factors, such as the amount of pollutant emitted by the facility, whether the source was constructed before or after the baseline date, and the type and number of surrounding sources; to name a few. If another facility were to be built near the Medicine Bow IGL Plant, an ambient impact analysis would need to be conducted to assess the amount of increment consumption for comparison with the PM_{10} increment.

II.16 **Volatile Organic Compounds (VOC)** – An individual commented that there are other VOCs produced in this process, and raised several related questions:

- What is the projected area that will be affected?
- What is the safe distance from the fallout for someone to live?

Response – In the impact analysis for the project, the applicant considered all VOC that are classified as hazardous air pollutants (HAP). The applicant submitted a revised Tier 1 inhalation risk assessment that included a graphic depiction of the extent of the increased cancer risk from the cumulative effects of all emitted HAP. See response to Public Comment II.10.

II.17 **Medicine Bow River** – An individual commented that the Medicine Bow River is relatively close and downwind of the proposed facility, and raised several related questions:

- What might be the projected dust load to the river?
- How will mercury be contained and what is the likelihood of it coming in contact with the river?
- Is this going to degrade the water quality to the point it will no longer be able to be classified as a cold water fishery?

Response – The WAQSR does not require that an applicant assess the dust loading to a water body. The air quality analysis did include an assessment of the deposition rates of sulfur and nitrogen compounds to Class I areas, and predicted levels were below the level of concern. Additionally, the modeling analysis included an assessment of the ambient concentrations of particulate matter within 10 km of the proposed plant, and the results of the analysis were below the allowable Federal and State ambient air quality standards.

Mercury was included in the Tier 1 inhalation risk assessment and was addressed under BACT (see response to Public Comment II.10 and II.1). Total mercury (concentration in precipitation and flux in wet deposition) is monitored on a regional basis by the National Atmospheric Deposition Program: Mercury Deposition Network. The closest MDN site is at Buffalo Pass – Summit Lake in Colorado and is 135 kilometers south-southwest of the proposed facility.

Impacts to water quality and classification are regulated by the Water Quality Division and such actions are outside the scope of this air quality permit. See also response to Environmental Group Comment IV.2.

II.18 **Sage grouse and mule deer** – An individual commented that there are known sage grouse leks and critical winter range for mule deer in the immediate area, and raised several related questions:

- What forage degradation will occur as a result of the particulate matter and other VOC that might become airborne?
- In regards to the sage grouse, is this one more step in getting them listed as an endangered species?

Response – State regulations require applicants to evaluate impacts to soils and vegetation, but not animals. 6 WAQSR § 4(b)(i)(B). The applicant analyzed the effects on vegetation of the pollutants emitted in the largest quantities (NO_x and SO₂). See response to EPA Comment III.9.

Emissions from the proposed project are not anticipated to be in such quantities as would cause an exceedance of the primary or secondary NAAQS or WAAQS. See Permit Application Analysis pages 37-47. EPA sets primary NAAQS at a level designed to protect public health with an adequate margin of safety. See 40 CFR § 50.2. EPA sets secondary NAAQS at a level designed to protect public welfare from any known or anticipated adverse effects of a pollutant. *Id.*

As a result of the comment, the Division contacted the Wyoming Game and Fish Department and was directed to the Industrial Siting Permit. The Division reviewed the Findings of Fact, Conclusions of Law, Order and Decision of the Industrial Siting Council (ISC), noting that the ISC concluded that "the proposed facility will not pose a threat of serious injury to the environment" and requiring the applicant to provide fish and wildlife training during the construction of the project. See *In re Industrial Siting Permit Application of Medicine Bow Fuel and Power, LLC*, ISD Docket No. 07-01, Findings of Fact, Conclusions of Law, Order and Decision (March 30, 2008) at ¶ 27, Decision at ¶ 4.

The Division is not and has not been made aware of any air quality impacts to mule deer or sage grouse which may occur as a result of emissions from the proposed project that fall below the secondary NAAQS or WAAQS.

- II.19 **Carbon dioxide capture** – An individual commented that DKRW has stated they will be making the capital investment to capture the carbon dioxide produced to be used in enhanced oil recovery and asked if the air quality permit could be issued contingent upon this.

Response – See response to Public Comment II.2.

III. Analysis of Comments from EPA:

- III.1 **PSD Applicability for SO₂** – EPA commented that SO₂ emissions should have gone through a prevention of significant deterioration (PSD) analysis due to emissions of SO₂ during a cold startup year (256.9 tpy).

Response – The Division does not agree with EPA that SO₂ emissions from the facility should have gone through a PSD analysis. The Division considers emissions represented in Table Va (Cold Startup Year Emissions) as emissions associated with commissioning (startup) activities for the plant, which are temporary in nature and are not routine as represented in the application. It has been the Division's consistent practice to make applicability determinations based on consideration of a facility's routine operations. In this case the facility's routine operations include startup and shutdown emissions the sum of which are 40 tons per year. The Division, however, did request DKRW to evaluate the facility to ensure that all routine (planned) activities were accounted. Based on this request, DKRW provided information that due to planned maintenance activities on the gasification units SO₂ emissions from the facility during normal operations will increase from 32.9 tpy to 36.6 tpy of SO₂. Since SO₂ emissions during normal operation of the facility remain less than 40 tpy, a PSD analysis for SO₂ under Chapter 6, Section 4 of the WAQSR is not required. See also response to Environmental Groups Comment IV.6.

Source	SO ₂ Emissions (tpy)
Facility Emissions	32.9
Preheater Emissions	0.0154
Planned Maintenance Emissions Gasifiers	3.64
Total	36.6

- III.2 **BACT Procedure** – EPA commented that the Division’s BACT analyses should be expanded, and should include a more detailed description of cost effectiveness and other factors that form the basis for the rejection and selection of control options.

Response – A top-down BACT analysis was conducted for each of the pollutants determined to be subject to PSD, and the Division considers the Chapter 6, Section 4 BACT determinations in the analysis to justify the control strategies selected for each emission unit.

- III.3 **Pollutants and Emitting Units that Need BACT Analysis** – EPA commented that the Division must revise the application analysis to include: a NO_x BACT determination for FL-1, FL-2; a CO BACT determination for FL-1, FL-2, and CO₂ VS; a VOC BACT determination for FL-1, FL-2, and the FW-Pump; and PM/PM₁₀ BACT determination for previous listed sources under NO_x, CO, and VOC including Gen-1 through 3.

Response – Sources FL-1, FL-2, and CO₂ VS were addressed under the startup and shutdown operations portion of the analysis for the facility, and the startup/shutdown emission minimization plan (SSM) was determined to represent BACT for these sources. BACT for PM/PM₁₀ emissions were addressed under the SSM plan and under the PM/PM₁₀ emissions portion of the analysis. Additionally, the Division considers compliance with Subpart III for the FW-Pump as representing BACT for PM and VOCs emissions for this unit, based on the expected utilization of this source.

- III.4 **PSD BACT Limits** – EPA commented that limits need to be established for all units that will emit nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter/particulate matter less than ten microns (PM/PM₁₀).

Response – The Division did not establish emission limits for sources that do not have add on controls and combust natural gas and/or treated process gas from the facility as these sources were considered to have an insignificant emission rate and ambient air quality impact during routine operation of the facility. This is consistent with previously issued PSD and minor source permits by the Division. Sources without emission limits are shown in the following table, and sources FL-1 (HP Flare), FL-2 (LP Flare), and CO₂ VS (CO₂ Vent Stack) are addressed under the SSM plan.

ID	Emission Unit	Pollutant	Emission Rate (tpy)
AB	Auxiliary Boiler	VOC	1.6
		SO ₂	0.2
		PM ₁₀	2.2
B-1	Catalyst Regenerator	VOC	0.5
		SO ₂	0.1
		PM ₁₀	0.7
B-2	Reactivation Heater	VOC	0.3
		SO ₂	0.1
		PM ₁₀	0.4
B-3	HGT Reactor Charge Heater	VOC	0.1
		SO ₂	0.1
		PM ₁₀	0.1
GP-1 – GP-5	Gasifier Preheaters 1-5	VOC	0.1
		PM ₁₀	0.1
Gen-1 – Gen-3	Black Start Generators 1-3	PM ₁₀	insig
FW-Pump	Firewater Pump Engine	VOC	0.3
		PM ₁₀	0.1

III.5 **BACT Compliance** – EPA commented that based on the units it considers to need BACT limits established; initial and continuous compliance demonstrations need to be established.

Response – The Division has set testing requirements for each emission unit where emission limits have been established.

III.6 **VOC BACT Limit** – EPA commented that the VOC emission limit for the turbines do not include averaging times.

Response – The averaging time for VOCs for the turbines is specified by the performance testing requirement in Condition 9. The ppm and lb/hr VOC emission limits are based on the average of three (3) 1-hour tests as specified in Condition 9.

III.7 **Combustion Units PM/PM₁₀ BACT Analysis** – EPA commented that the Division should provide information indicating how effective current filtration options are, and compare this with the estimated grain loading from the combustion turbines.

Response – The Division conducted a top-down BACT analysis for PM/PM₁₀ emissions, and considered good combustion practices as representing BACT for PM/PM₁₀ for the combustion turbines as represented in the analysis.

III.8 **Coal Conveyor PM/PM₁₀ BACT Analysis** – EPA commented that the Division should clarify whether “enclosed” means fully enclosed or partially enclosed (3/4 covered), and if fully enclosed conveyors represent BACT.

Response – Based on the Division’s experience permitting coal conveyors, the Division considers 3/4 covered conveyors, which are designed and installed based on predominant wind direction, to be representative of BACT.

- III.9 **Soils and Vegetation Analysis** – EPA commented that the applicant’s soils and vegetation analysis did not fully justify the statement that soils in the area do not have significant commercial or recreational value, and did not take into account the project’s impacts to soils.

Response – PSD applicants must assess impacts to soils and vegetation. See 6 WAQSR §4(b)(i)(B); DEQ/AQD Guidance for Submitting Major Source/PSD Modeling Analyses § 5.G (January 2008), see also EPA NSR Manual, Chapter D (Draft 1990). However, the depth of the analysis depends in part on the sensitivity of local soils and vegetation. See 6 WAQSR § 4(b)(i)(B)(analysis is not needed if vegetation has “no significant commercial or recreational value”). Typically, ambient concentrations lower than the secondary NAAQS or WAAQS will not result in harmful effects to soils or vegetation [see NSR Manual, including the secondary levels].

Attachment 3 of DKRW’s October 17, 2007 letter in response to Division comments on the initial application submittal describes the land surrounding the proposed project site as having very low commercial productivity. Primary land use and vegetation cover within 10 km of the proposed project is fallow or shrubland. The US Department of Agriculture has compiled a detailed list of soil types in Carbon County. Land capability is classified between Class 3 (soils with severe limitations that reduce choice of plants) to Class 8 (soils with limitations that nearly preclude use for crop production). Only one percent of the surveyed land in the area produces alfalfa or hay without using irrigation.

- III.10 **NAAQS/WAAQS Analysis** – EPA commented that the close approach of modeled impacts to air quality standards may warrant a more thorough analysis of modeling parameters and sources.

Response – The Division conducts a thorough review of all modeling inputs/outputs associated with PSD permit applications, and the application for the IGL Project was no exception.

- III.11 **Background Source Selection** – EPA commented that the permit application and supporting information did not indicate how outside sources were selected or whether they were modeled for NAAQS/WAAQS and/or PSD increment. Also, the application indicates that only sources within 35 km were considered, and Table 6.3 in the application only provides outside sources by number and not by name.

Response – See response to Public Comment II.8.

- III.12 **Short-term SO₂** – EPA commented that it was unclear why the differences in predicted short-term and annual SO₂ concentrations was so small (in Tables 6.10 and 6.11) given the large difference between the short-term and annual emission rates. Additionally, they suggest that the short-term emission rates listed in Table 6.2 should be checked to ensure that they match the AERMOD *.LST files.

Response – The differences between the predicted short-term impacts and long-term impacts for the NAAQS/WAAQS modeling are actually large, as reflected in Table 6.10 of the permit application and Table XIX of the Division's analysis. On the other hand, the difference in the predicted short-term and long-term impacts for PSD increments, as shown in Table 6.11 (application) and Table XX (analysis) are much smaller, due to the absence of the flare sources from the increment modeling. All sources and short-term emissions listed in Table 6.2 of the application were included in the latest version of the modeling, as verified by the Division.

- III.13 **Inclusion of SO₂ Emissions from Flares in Increment Modeling** – EPA commented that the HP and LP flares should have been included in the PSD increment modeling.

Response – Emissions from the flares that were included in the NAAQS modeling represented worst-case emissions associated with start-up or malfunction (non-routine operation). The Division does not include infrequent, non-routine operation in assessments of PSD increment consumption.

- III.14 **Haul Road Fugitive Dust** – EPA commented that the fugitive PM₁₀ emissions from the project haul roads should have been included in the short-term (24-hour) modeling.

Response – Current Division policy does not endorse short-term (24-hour) modeling for predicting impacts from fugitive particulate sources because of the uncertainties in the performance of the recommended EPA models. The State and EPA Region VIII entered into a Memorandum of Agreement in 1994 which allows the Division to conduct monitoring in lieu of short-term modeling for coal mine particulate concentrations in the Powder River Basin, and this practice has been applied to modeling of PM₁₀ fugitive sources in other parts of the state.

- III.15 **Mine Receptors** – EPA commented that model receptors should be included around mining areas if they are ambient air.

Response – The Division established a 500-m receptor buffer around the area sources that represented mining activity outside of the MBFP plant boundary to avoid excessive overpredictions near those sources (source IDs MineA_SP and MineA_S2). Predicted impacts from area sources within AERMOD can be excessive, as described in the latest *AERMOD Implementation Guide* from the EPA (January 2008). The Implementation Guide states that concentration predictions for area sources may be overestimated under very light wind conditions because of the lack of “plume meander” in the area source algorithm (page 14 of implementation guide). Additionally, the two area sources in question are located within the facility boundaries of Arch Coal's Carbon Basin Mine, and as such are not located in ambient air. Figure 3 shows the relative location of the coal mine areas sources and modeled receptors.

IV. Analysis of Comments from Earthjustice, Sierra Club, Wyoming Outdoor Council, Powder River Basin Resource Council, and Biodiversity Conservation Alliance (Environmental Groups):

- IV.1 **Carbon monoxide** – The Powder River Basin Resource Council commented that the predicted CO impacts barely meet the WAAQS/NAAQS and asked how many hours of venting per year were assumed for the modeling of the CO₂ vent.

Response – The WAAQS/NAAQS for CO are based on 1-hour and 8-hour averaging periods. The assessment of the CO₂ vent's impact was based on worst-case hourly emissions from the vent. Essentially, the modeling conservatively assumed that the vent would operate continuously.

- IV.2 **Mercury Emissions** – The Powder River Basin Resource Council and the Wyoming Outdoor Council commented that the Division needs to ensure that a proper MACT analysis is conducted for mercury, and that there is an enforceable emission limit for mercury in the permit. The Biodiversity Conservation Alliance along with PRBRC and WOC expressed concern with the impact of mercury on fish in Pathfinder and Seminoe Reservoirs and associated tributaries.

Response – As the facility is not a major source of HAPs (see response to Public Comment II.14) a case-by-case MACT analysis is not required for the facility. Condition 10 of the permit limits mercury emissions from each turbine (see response to Public Comment II.1). See response to Public Comment II.17. The Wyoming Department of Health and Game & Fish Department have conducted surveys on major reservoirs around the state for mercury. Fish from the majority of waters exhibited low levels of mercury, and a few have warranted additional testing. Fish consumption advisories have been issued by the Wyoming Department of Health based on results of scientific studies indicating that methylmercury is more toxic than previously thought. Based on the study results, the guidelines that are used for Wyoming fish advisories have been lowered to protect the most sensitive populations. Methylmercury is not a pollutant known to be emitted from coal combustion or gasification.

- IV.3 **Financing** - The Powder River Basin Resource Council commented that DKRW needs to demonstrate to the Division that they financing lined up, and have buyers for the sulfur and carbon dioxide. Additionally, the Powder River Basin Resource Council is concerned that the limits in the permit may not represent BACT while DKRW obtains financial backing for the plant.

Response – See response to Public Comment II.3. Under Chapter 6, Section 2(h) of the WAQSR approval to construct or modify a facility shall become invalid if construction is not commenced within 24 months of receipt of approval (permit date) or if construction is discontinued for a period of 24 months or more. The Administrator may extend this period based on satisfactory justification of the requested extension. Additionally, if an extension is requested, the Administrator may require a demonstration that emission limits continue to represent BACT.

IV.4 **PM₁₀ Increment** – The Powder River Basin Resource Council, Wyoming Outdoor Council and Biodiversity Conservation Alliance commented that if the facility were allowed to consume 85 percent of the PM₁₀ Class II annual increment it would “cause significant deterioration of existing ambient air quality in the region”, and should require a major reduction in particulate emissions. Additional comments were made as to what impact the increment consumption would have on future development in the area.

Response – See response to Public Comments II.5 and II.15.

IV.5 **Leak Detection And Repair (LDAR)** – The Powder River Basin Resource Council commented that LDAR levels which are set at 500 ppm for valves and 2000 ppm for pumps should be evaluated for lower threshold levels.

Response – The LDAR levels which were determined to represent BACT for VOCs from fugitive equipment leaks from the facility are consistent with levels established in new source performance standards (NSPS) and national emission standards for hazardous air pollutants (NESHAP). Additionally, the facility is considered to be a minor source of HAP emissions (see response to Public Comment II.14).

IV.6 **SO₂ Emissions from HP and LP Flares** – The Powder River Basin Resource Council commented that a BACT analysis should be conducted for SO₂ from the HP and LP flares. It was also commented that the permit should protect against operation of the flares for more than 50 hours per year, and conditions should include a reporting requirement for all venting episodes as well as a cumulative time that each vent may be open during a given year.

Response – Emissions from the flares during startup and shutdown of the facility are addressed under the SSM plan for the facility, which was determined to represent BACT for this type of operation. Venting to the flares during non-routine events, such as malfunctions, is addressed under Chapter 1 of the WAQSR and is subject to Division approval. The Division will require monitoring of SO₂ emissions from the flare as part of the permit. DKRW has indicated that this can be accomplished by installing flow monitoring equipment and by either direct sampling of the flow to the flares or sampling of the coal. Also see response to Environmental Group Comment IV.35.

IV.7 **24-hour impact of fugitive sources of PM₁₀** – The Powder River Basin Resource Council commented that the discussion of modeled 24-hour PM₁₀ impacts is misleading. The analysis provides the Division’s policy for not modeling fugitive sources for 24-hour impacts, but does not provide an alternative method to account for these sources.

Response – See response to EPA Comment III.14.

- IV.8 **Maximum modeled concentrations and significant impact areas** – Earthjustice et al. commented that the PSD application did not include the maximum predicted concentrations or significant impact areas (SIA) from the proposed project. This information would be used to determine whether cumulative modeling and on-site monitoring will be required.

Response – Preliminary modeling (i.e. determining the SIA from the proposed project only) is typically performed to determine which pollutants do not have to be carried forward to a full-impact analysis (FIA), which includes outside sources and often requires extensive computing time. For this project, the applicant anticipated that project emissions would result in predicted impacts that were above the significant impact levels for all modeled pollutants, and given the scarcity of outside sources, they proceeded directly to full-impact modeling. Additionally, SIA modeling to determine the need for pre-construction monitoring was not necessary because the Division deemed the background concentrations proposed by the applicant to be adequately representative.

- IV.9 **Outside sources for cumulative modeling** – Earthjustice et al. commented that cumulative modeling only includes sources within 35 km of the MBFP project. Normally, cumulative sources within 50 km would be considered.

Response – See response to Public Comment II.8.

- IV.10 **Annual-averaged emissions from cumulative sources** – Earthjustice et al. commented that short-term impacts from cumulative sources were underestimated because annual-average emissions were used in the modeling.

Response – See response to Public Comment II.12.

- IV.11 **Fugitive emissions and 24-hour PM₁₀ modeling** – Earthjustice et al. commented that AERMOD has an improved algorithm for handling area sources, and that fugitive PM₁₀ area sources should be included in the 24-hour AERMOD modeling.

Response – See response to EPA Comment III.14. The AERMOD model does not contain an improved algorithm for handling area sources. In fact, the latest *AERMOD Implementation Guide* from the EPA (January 2008) states that concentration predictions for area sources may be overestimated under very light wind conditions because of the lack of “plume meander” in the area source algorithm (page 14 of Implementation Guide).

- IV.12 **Proposed PSD increment and NAAQS compliance for PM_{2.5}** – Earthjustice et al. commented that predicted PSD increment consumption for PM₁₀ should be compared to the proposed increments for PM_{2.5} and predicted NAAQS impacts for PM₁₀ should be compared to the proposed NAAQS for PM_{2.5}.

Response – See response to Public Comment II.9.

- IV.13 **PSD increment analysis and flare emissions** – Earthjustice et al. commented that the flare sources should have been included in the PSD increment modeling.

Response – See response to EPA Comment III.13.

- IV.14 **CO background concentrations** – Earthjustice et al. commented that the modeled CO impacts would have exceeded the NAAQS with higher background concentrations. They also pointed out that some older data from the site used by the applicant for background concentrations are higher than those used in the modeling analysis.

Response – DKRW searched the AirData website (<http://www.epa.gov/air/data/geosel.html>) to find monitored CO data from within the state of Wyoming. Data from a single site (Yellowstone NP) was available, and the applicant chose data from the latest year (2005) that was available at the start of preparation of the permit application. Contrary to the footnote in Table XI of the Division's analysis that stated the chosen values were 2nd high values for the year, the chosen values of 1.7 ppm for 1-hour and 0.8 ppm for 8-hour represent the overall highest values measured during 2005. The highest values for the more current available years (2006 and 2007) are the same or lower than the values from 2005. Beginning in December of 2006, ambient CO data has been collected at a station located to the north of Evanston, Wyoming at Murphy Ridge. Since the start of monitoring, and through the 3rd quarter of 2008, the highest 1-hour (0.87 ppm) and 8-hour (0.69 ppm) values measured at the station are lower than those used by the applicant. The Division is satisfied that the values chosen by the applicant represent conservative estimates of the background CO concentrations in the area of the proposed project.

- IV.15 **Ozone air quality** – Earthjustice et al. commented that ozone modeling should be performed to assess the impacts of project emissions on ozone air quality.

Response – See response to Public Comment II.4.

- IV.16 **Plume blight** – Earthjustice et al. commented that the VISCREEN model should have been used to estimate the degree to which the project's plumes would be visible.

Response – See response to Public Comment II.11.

- IV.17 **Health risks of toxic chemicals** – Earthjustice et al. commented that several toxic chemicals (acetaldehyde, acrolein, mercury, naphthalene, PAH, propylene oxide) that have been identified as carcinogens were not included in the inhalation risk assessment, and that a multi-pathway risk assessment should be conducted for the facility.

Response – The applicant revised the Tier 1 inhalation risk assessment to include all known carcinogens that are expected to be emitted from the facility (see response to Public Comment II.10). Regarding the need for a multi-pathway risk assessment, the applicant used information in the EPA document *Air Toxics Risk Assessment Reference Library, Volume 2, Facility-Specific Assessment*, to evaluate the need for such an assessment. As described in the EPA document, a multi-pathway assessment may be required if air toxics are emitted that “persist” and which may “bioaccumulate” (namely, “PB-HAP”). For the proposed facility, the only PB-HAPs that will be emitted are mercury and polycyclic aromatic hydrocarbons (PAH). These compounds will be

emitted from the three proposed turbines. Total emissions of these two compounds are estimated to be less than 0.1% of the total HAP emissions from the facility. Mercury emissions from the facility are to be controlled with two (2) mercury guard beds (activated carbon) with an estimated removal efficiency of 99 percent, as determined by best available control technology (BACT). In addition, the PAH emissions from the turbines were conservatively estimated as uncontrolled for input into the Tier 1 inhalation risk assessment. Oxidation catalysts on the turbines will remove 85-90% of the organic HAPs.

- IV.18 **Acute noncancer risks** – Earthjustice et al. commented that the sum of the individual hazard quotients (HQ) for acute noncancer health effects summed to more than one (1), and therefore are significant.

Response – A top-down best available control technology (BACT) analysis was conducted for each of the pollutants determined to be subject to PSD for the project. No ambient standards have been established for hazardous air pollutants (HAPs), but current Division policy requires PSD applicants to conduct a Tier 1 inhalation risk assessment for HAPs in accordance with EPA guidelines. This assessment is not required by the WAQSR, but the assessment is included in the permit application package for public information purposes. The EPA document *Air Toxics Risk Assessment Reference Library, Volume 2, Facility-Specific Assessment* (pg 43) provides a suggested method to sum individual acute risk factors, but also cautions that this approach is not as well-defined as the method for estimating long-term effects. As stated in the EPA reference: “although this appears similar to the process for combining chronic HQs, the summing of acute HQs is complicated by several issues that do not pertain to chronic HQs. First, acute dose-response values have been developed for purposes that vary more widely than chronic values. Some sources of acute values define exposures at which adverse effects actually occur, while other sources develop only no-effect acute values. Second, some acute values are expressed as concentration-time matrices, while others are expressed as single concentrations for a set exposure duration. Third, some acute values may specifically consider multiple exposures, whereas others consider exposure as a one-time event. Fourth, some sources of acute values are intended to regulate workplace exposures, assuming a population of healthy workers (i.e., without children, seniors, or other sensitive individuals). Such occupational values may also consider cost and feasibility, factors that EPA considers the province of the risk manager rather than the risk assessor.”

As an example of the complications in an analysis of cumulative acute effects, the applicant determined individual risk factors using the dose-response values from the California reference exposure levels (REL) and the imminently dangerous to life and health (IDLH/10). The sum of the individual acute risk factors using the REL approach was well above the “threshold” value of one, while the IDLH/10 approach was much less than one. The large difference is brought about by the REL dose-response value for acrolein, which is several orders of magnitude lower than the IDLH/10 dose-response value ($0.19 \mu\text{g}/\text{m}^3$ vs. $460 \mu\text{g}/\text{m}^3$). The acute hazard is estimated by dividing the modeled exposure concentration by the acute dose-response value:

$$\begin{aligned} \text{Estimated acrolein risk using REL: } & 7.30 \mu\text{g}/\text{m}^3 \div 0.19 \mu\text{g}/\text{m}^3 = 38.4 \\ \text{Estimated acrolein risk using IDLH/10: } & 7.30 \mu\text{g}/\text{m}^3 \div 460 \mu\text{g}/\text{m}^3 = 0.016 \end{aligned}$$

The applicant produced a toxicological assessment for acrolein that compares the expected acrolein concentrations from the plant to the lowest concentrations at which effects of acrolein are actually perceived. The highest modeled 1-hour impacts of acrolein were approximately 0.003 ppm. This is significantly lower (by factor of about 20) than the level expected to cause minor eye irritation (and no other adverse effects), as cited by numerous studies. The toxicological assessment report (URS, Attachment 2 to November 5, 2008 letter) also notes that the conservative REL value for acrolein is based on a study that was published in 1960 and is not cited in any of the 10+ other studies reviewed by the applicant.

- IV.19 **Project SO₂ emissions and soils/vegetation** – Earthjustice et al. commented that the modeled concentrations of SO₂ exceed threshold values for damage to sensitive soils and vegetation.

Response – The applicant provided an analysis of the recreational/commercial value of soils and vegetation in the project area (see response to EPA Comment III.9). As stated in the Division's analysis document, more than 99% of the modeled WAAQS/NAAQS impacts for short-term SO₂ are attributable to the project flares in cold start or malfunction modes, which will be infrequent and temporary.

- IV.20 **Ozone impacts on sensitive soils and vegetation** – Earthjustice et al. commented that ozone impacts (or VOC impacts as a surrogate) have not been assessed for sensitive crops and plants.

Response – See response to EPA Comment III.9.

- IV.21 **Greenhouse gas emissions** - Earthjustice et al. commented that CO₂ emissions from the proposed plant should be quantified and that BACT measures to capture and sequester them should be discussed.

Response – See response to Public Comment II.2.

- IV.22 **Scale of meteorological data used for CALPUFF modeling** – Earthjustice et al. commented that the 36-km MM5 data and 4-km CALMET windfield are too coarse to model the complex terrain in the modeling domain.

Response – The Division is satisfied that the 36-km MM5 data that were resolved by the CALMET model down to 4-km spacing provided an adequate 3-dimensional meteorological field with which to drive the CALPUFF model. The experience of the Division's modelers with progressive resolution of CALMET fields to 2-km or 1-km spacing is that such efforts tends to drive the predicted impacts downward. A recent presentation at the 2008 EPA Regional/State/Local Modeler's Workshop titled *Scale Effects of Topography on Modeled Impacts* (Bowman, 2008) concluded that windfields with progressively higher resolution for several analyses in complex terrain in the Pacific Northwest tended to produce progressively lower modeled impacts. Given that the modeled visibility results for the proposed project were (at most) 65% of the 5% FLAG significance threshold, predicted criteria pollutant impacts were (at most) 19% of Class I area modeling significance levels, and predicted deposition levels were (at most) 18% of the National Park Service's Deposition Analysis Thresholds (DAT), the Division does not believe that further resolution of the MM5 data or CALMET windfield would produce results more conservative than those already presented.

- IV.23 **Accuracy and validity of meteorological data** – Earthjustice et al. commented that the windfields generated by the CALMET preprocessor were not evaluated before their use in the CALPUFF modeling.

Response – The applicant conducted an analysis of the CALMET windfield which included comparisons of the predicted wind flows to actual observations. As described in Attachment 3 of *Response to Comments for Air Quality Permit Application (AP-5873)* (URS, 2007), the applicant used the PRMET program to produce graphical representations of CALMET windflows. Several days were examined to confirm that the model was properly simulating the influence of terrain on the windflows. The 24-hour period that yielded the highest predicted visibility impact was also examined for proper windflows. This worst-case day corresponded to the unusually strong winter storm that occurred in March of 2003, and the applicant was able to use a research paper authored by UCAR/NOAA to confirm that the CALMET flows agreed with observed conditions on that day. The applicant also extracted wind roses from several points in the CALMET domain to compare to observed wind roses from Aspen and Craig, Colorado and Laramie, Wyoming. The wind roses extracted from CALMET showed very good agreement with the observed winds. The Division is satisfied that the meteorological inputs used to drive CALPUFF were adequately evaluated for quality.

- IV.24 **Savage Run receptors** – Earthjustice et al. commented that the receptor spacing used for Savage Run Wilderness Area was too coarse (2 km) and that peak concentrations may have been missed because the National Park Service (NPS) normally uses spacing of 1 km.

Response – The 30 receptors used to represent the Savage Run Wilderness Area were placed along five rows with spacing in the X direction of approximately 1.3 km and spacing in the Y direction of approximately 1.8 km. An examination of the spacing used in the NPS receptor database to represent Rocky Mountain National Park reveals that the NPS spacing is nearly identical. The Division feels that the receptor spacing for Savage Run was adequate.

- IV.25 **Top of modeling CALPUFF domain** – Earthjustice et al. commented that the top of the CALPUFF domain may have been set too low (3,500 meters), and that the CALPUFF modeling should be repeated with a domain top of 4,500 meters (m) to prevent loss of mass and the underprediction of visibility impacts.

Response – The Division created a CALMET windfield with a higher domain top of 4,500 m for test purposes. Differences between the predicted visibility and SO₂ impacts at the nearest Class I area (Mt Zirkel) and one of the more distant Class I areas (Bridger Wilderness) using the CALPUFF original domain top of 3,500 m and the domain top of 4,500 were negligible. Specifically, the largest difference brought about by the domain change was 0.5% in the predicted annual SO₂ concentration at Bridger WA. The predicted maximum visibility impacts were identical at both areas. The Division is confident that the CALPUFF domain capped at 3,500 m provides an adequate vertical dimension to model the impacts from the project.

- IV.26 **Class I increment and visibility impacts (flares and intermittent sources)** – Earthjustice et al. commented that impacts have been understated due to the omission of intermittent sources such as the flares, gasifier preheaters, black start generators, CO₂ vent, and firewater pumps.

Response – See response to EPA Comment III.13. As stated in the Division’s analysis: “Several sources proposed for the facility were not included in the CALPUFF modeling. The HP and LP flares were not included because they would only be significant sources of visibility-reducing or criteria pollutants during cold starts or malfunctions. The same applies to the Gasifier Preheaters, Black-Start Generators, CO₂ Vent Stack, and Firewater Pump.”

- IV.27 **Class I increment analysis for PM_{2.5}** – Earthjustice et al. commented that a PM_{2.5} Class I increment analysis has not been performed.

Response – See response to Public Comment II.9.

- IV.28 **Standards for Petroleum Refineries** – Earthjustice et al. commented that new source performance standards (NSPS) and national emission standards for hazardous air pollutants (NESHAP) for petroleum refineries should apply to the Medicine Bow IGL Plant based on a 1980 EPA determination that solvent refining of coal (SRC II process) is applicable to Subpart J.

Response – The Division requested Medicine Bow Fuel & Power evaluate the applicability of the refinery NSPS and NESHAP standards for the facility based on Earthjustice’s comment. Medicine Bow Fuel & Power submitted documentation which contrasted the SRC II process and the proposed coal-to-liquid plant. While the feed to the SRC II process and the proposed facility are similar, the mechanisms for producing gasoline in the two processes are different. The SRC II process dissolves coal into a crude oil-like liquid, which is then fractionated to recover products. These products, such as naphtha, can be further treated in units such as reformers. The process proposed by Medicine Bow Fuel & Power converts syngas to methanol. The methanol is then converted to a gasoline range product through dehydration, polymerization, and cyclization. The gasoline product is then treated to remove durene. When comparing the two processes to the NSPS definition of a petroleum refinery the SRC II process fits the definition. The proposed coal-to-liquid process does not meet the definition of a petroleum refinery as the facility does not produce gasoline through distillation of petroleum or through redistillation, cracking, or reforming of unfinished petroleum derivatives. Therefore, the facility is not subject to the NSPS or NESHAPs for petroleum refineries.

- IV.29 **PM_{2.5}** – Earthjustice et al. commented that BACT analyses for PM_{2.5} needs to be conducted and a demonstration that PM_{2.5} emissions from the facility will comply with the National Ambient Air Quality Standards (NAAQS).

Response – See response to Public Comment II.9.

- IV.30 **PM₁₀ (Condensable and Filterable)** – Earthjustice et al. commented that a top-down BACT analysis should be conducted for total PM₁₀ comprising the sum of filterable plus condensable particulate matter.

Response – After additional review of the particulate emissions from the turbines it was determined that the potential to emit for these units and top-down BACT analysis was based on filterable plus condensable PM₁₀ emissions. Therefore, the Division will clarify in Condition 10 that the particulate limit is based on filterable plus condensable PM₁₀, and will clarify that particulate testing in Condition 9 for the turbines includes EPA Reference Method 5 and 202.

- IV.31 **Case-by-Case MACT analysis for HAPs (CO)** – Earthjustice et al. commented that a case-by-case maximum available control technology (MACT) analysis needs to be conducted for HAPs (CO is used as surrogate) as the NESHAP for Industrial, commercial, and institutional boilers and process heaters was vacated (40 CFR part 63, subpart DDDDD).

Response – See response to Public Comment II.14.

- IV.32 **Acid Rain Provisions** – Earthjustice et al. commented that the Medicine Bow IGL Plant should be subject to the Acid Rain Provisions of 40 CFR part 72 as the facility will export power.

Response – The application, as submitted, did not show that the facility would export power. However, it is noted that the application for the Industrial Siting Permit indicated that power would be exported from the facility. DKRW provided clarification to the Division that the facility will not export power. Therefore, the facility is not subject to the Acid Rain Provision of 40 CFR part 72.

- IV.33 **Clean Air Mercury Rule** – Earthjustice et al. commented that with 40 CFR part 60, subpart HHHH being vacated and the facility exporting power as an electric steam generating unit a case-by-case MACT analysis needs to be conducted for mercury.

Response – The application, as submitted, did not show that the facility would export power. However, it is noted that the application for the Industrial Siting Permit indicated that power would be exported from the facility. Medicine Bow Fuel & Power provided clarification to the Division that the facility will not export power. Additionally, the facility is not a major source of HAPs (See response to Public Comment II.14). Therefore, a MACT analysis is not required for mercury.

- IV.34 **Title V** – Earthjustice et al. commented that the permit should contain a condition requiring the submission of complete Title V application within 12 months of startup of the facility and notification of actual startup.

Response – Condition 3 of the permit requires Medicine Bow Fuel & Power, LLC to obtain an operating permit in accordance with Chapter 6, Section 3 of the WAQSR. Chapter 6, Section 3(c)(i) details the requirements for submitting an application for an operating permit for a major source. Additionally, Condition 5 of the permit requires Medicine Bow Fuel & Power, LLC to provide the anticipated date of initial startup along with the actual date of initial startup.

- IV.35 **Startup/Shutdown Emissions GE Gasifier and SynGas Cleanup** – Earthjustice et al. commented that since the GE Gasifier and SynGas Cleanup process vent to the HP/LP flares during startup/shutdown/malfunction (SSM) BACT emissions limits should be applied to the flares instead of a general SSM plan. Earthjustice also commented that the flares should be identified as VOC control devices during startup and should be monitored during startup such as ensuring the presence of a pilot flame and the flow rate for vent gases to the flares. Additionally, it was suggested that the permit should contain work practices (minimum loads for startup, maximum duration of startup, and maximum number of startups per year) and should also require recordkeeping of the occurrence of startups and shutdowns and the duration of these events.

Response – The Division did not establish emission limits for the flares as emission limits would not be practically enforceable as these units cannot be tested using traditional EPA reference methods to determine compliance with emission limits. However, the Division considered the SSM plan to represent BACT for the flares during startup/shutdown operations. DKRW has also indicated that the SSM for the facility will continuously be evaluated for improvements to minimize emissions. It should be noted that any revisions to the SSM plan by DKRW are subject to approval by the Division.

The Division agrees that the flares need to be monitored to ensure compliance, and has included conditions in the permit requiring monitoring and recordkeeping for the presence of a pilot flame, along with provisions requiring the flares to smokeless as defined in Chapter 5, Section 2(m) of the WAQSR. See also response to Environmental Group Comment IV.6.

- IV.36 **Sour Water Stripper** – Earthjustice et al. commented that BACT emissions limits should be applied to the Sour Water Stripper during startup operations.

Response – During normal operation and flow rates above 20% of design during startup operations, the sour gas from the sour water stripper is directed toward the SRU. At flow rates below 20% the sour gas is routed to the flares for control. The sour water stripper is included in the SSM plan for the facility, which the Division considers to represent BACT for SSM operations.

- IV.37 **Startup/Shutdown Emissions Sulfur Recovery Unit and Solexol Acid Gas Removal** – Earthjustice et al. commented that BACT emissions limits need to be applied to the sulfur recovery unit (SRU) and flare during startup.

Response – There are no emissions points associated with the SRU at the Medicine Bow IGL Plant; therefore, there are no emission limits to establish for the SRU. During normal operations of the SRU tail gas is routed back to the Solexol unit for recovery. However, during startup of the facility gases from the Solexol unit are routed to the flare until there is sufficient capacity for the SRU to commence operation as described in the SSM plan. The Division considers the SSM plan to represent BACT for the SRU and flares during startup/shutdown operations.

- IV.38 **CO₂ (Greenhouse Gas) Emissions** – Earthjustice et al. commented that Medicine Bow Fuel & Power, LLC should quantify CO₂ emissions and should review technically feasible control options for minimizing CO₂ emissions during startup of the facility or any other time that CO₂ export is not feasible.

Response – See response to Public Comment II.2.

- IV.39 **Startup emissions from the two flares and the Sour Water Stripper** – Earthjustice et al. commented that the ambient impact analysis should include startup emissions from the two flares and the Sour Water Stripper.

Response – The ambient air quality impact analysis did include worst-case (startup/malfunction) emissions from the proposed flares. The worst-case emissions from the flares include any contribution from the Sour Water Stripper during less than 20% design flow during stripper startup (DKRW, September 30, 2008 response letter). During normal operation and above 20% design flow during startup, sour gas from the stripper will be directed to the SRU and consumed in the SRU furnace.

- IV.40 **Inclusion of elemental mercury and mercury compounds in the risk assessment** – Earthjustice et al. commented that elemental mercury and mercury compounds (mercury chloride and methylmercury) should be included in the risk assessment.

Response – The applicant revised their Tier 1 inhalation risk assessment (DKRW, November 5, 2008 letter) to include several compounds that were omitted from the initial analysis. Elemental mercury was included in the revised analysis, and the estimated chronic non-cancer and acute effects were quantified. The estimated chronic non-cancer risk is 4.7E-06 and the estimated acute non-cancer risk is 2.22E-05. Cancer risk was not quantified because mercury is not listed as a carcinogen.

According to the applicant's letter dated December 30, 2008, the project will not emit the other mercury compounds. Methylmercury is not a pollutant known to be emitted from coal combustion or gasification. Any mercury chloride that might be produced would be removed in the syngas scrubbers or in the water wash prior to the mercury guard beds.

- IV.41 **Ambient impact analysis does not include ozone preconstruction monitoring** – Earthjustice et al. commented that preconstruction ozone monitoring should have been required, the applicant should demonstrate compliance with the NAAQS for ozone, and WDEQ ozone monitoring was inadequate at the Boulder station in 2007.

Response – Monitored data near the proposed site shows compliance with the ozone NAAQS (see response to Public Comment II.4). The Boulder monitor is located approximately 270 km west-northwest of the proposed project. Data used to represent the conditions for the project were taken from much closer stations (Wamsutter, WY and Centennial, WY).

- IV.42 **Benzene Risk** – Earthjustice et al. commented that the predicted cancer risk for benzene was almost two orders of magnitude higher than the unit risk provided by the EPA.

Response – See response to Public Comment II.10. The receptors that yield the highest predicted benzene risk are located within the boundary of the Carbon Basin Mine (see Figure 2).

- IV.43 **Sulfur Fuel Content (Turbines/Black Start Generators)** – Earthjustice et al. commented that the permit should contain a condition to ensure that the SO₂ emission rates from the turbines and Black Start Generators are limited to meet BACT.

Response – The Division established SO₂ emission limits for the turbines in the permit. Additionally, NSPS standard 40 CFR part 60, subpart KKKK sets SO₂ limits and establishes monitoring requirements for the turbines. The Division did not establish SO₂ emissions from the generators as these units are fired on natural gas and have limited operating hours. See response to EPA Comment III.4.

- IV.44 **PM₁₀ from Ash Storage or Handling** – Earthjustice et al. commented that the Air Quality Division did not address ash storage and/or handling as an emission source, and did not apply BACT for PM₁₀ to this source.

Response – The gasification process produces a byproduct commonly referred to as slag, which Earthjustice has referred to as ash. The application indicates that the slag is not expected to become airborne and will be periodically treated with water. The Division will include as a condition of the permit that the slag storage and handling be treated with water, and will be subject to a no visible emission limit as determined by Method 22 of 40 CFR part 60, Appendix A.

- IV.45 **Coal Cleaning and Drying Process** – Earthjustice et al. commented that a top-down analysis for mercury and particulate matter should have considered the use of coal cleaning and drying processes.

Response – The Division does not agree that the use of coal cleaning and drying processes should have been considered in the top-down BACT analyses for the facility. The utilization of these technologies would require changes to the process proposed by the applicant and would redefine the source, which is not considered in BACT determinations.

- IV.46 **Opacity Limits** – Earthjustice et al. commented that the Division should have established lower opacity limits less than 20%, as lower opacity limits have been established by BACT requirements by other agencies.

Response – WAQSR Chapter 3, Section 2 limits opacity to 20% and this limit is included in the permit. The definition of BACT contains the phrase “including a visible emission standard.” It is the Division’s position that this phrase allows but does not require an opacity limit other than the 20% limit. Opacity cannot be directly correlated to particulate emissions. Therefore, it is not feasible to perform a BACT analysis on visible emissions, and any limit other than 20% would be arbitrary. However, sources which have been identified as having no particulate emissions (i.e. passive enclosure control systems) are subject to a no visible emission limit as determined by Method 22 of 40 CFR part 60, Appendix A. If visible emissions are detected DKRW is required to take and document any corrective action.

V. **Analysis of Comments from DKRW:**

- V.1 **Saddleback Hills Mine** – DKRW commented that the application analysis states that 2.1 MMTPY of coal is to be mined during the 3-year development period. The amount of coal mined should reflect a total of 2.5 MMTPY.

Response – The Division acknowledges that 2.5 MMTPY of coal will be mined during the 3-year development period of the Saddleback Hills Mine, and noted that projected emissions in the application were based on 2.5 MMTPY.

- V.2 **Development Period Emissions** – DKRW commented that PM₁₀ emissions shown for the development period of the Saddleback Hills Mine are higher as the table shown in the analysis did not include emissions from conveying and loading operations.

Response – The Division acknowledges that these emissions should have been included in Table I of the analysis. Emissions in Table I were shown to provide information about the activities which would occur prior to normal operation of the facility. Table I has been revised in the permit to include emissions from conveying and loading operations.

- V.3 **Coal Storage** – DKRW comments that emissions from the coal conveyance system were not included in the total for coal storage in Table III.

Response – The Division acknowledges that these emissions should have been included in Table III of the analysis. Table III from the analysis has been revised in the permit (Table II) to include emissions from coal conveyance.

- V.4 **Cold Start Turbine Emissions** – DKRW commented that the NO_x and CO emissions in Table Va (Cold Startup Year Emissions) should be higher based on the type of fuels utilized during startup in a cold start year.

Response – The Division does not agree with the assessment that NO_x and CO emissions should be higher based on the different types of fuels utilized during a cold start year. Emissions limits for NO_x and CO from the turbines were established on a 30-day rolling average through the BACT analysis regardless of the fuel type combusted, and included periods of startup and shutdown. Therefore, the Division considers the emissions for the turbines in Table Va as being representative of a cold start year.

- V.5 **Hourly Cold Start Year Emissions** – DKRW commented that the maximum hourly emission rates in Table Vb for the turbines, gasifier preheaters, HP flare and LP Flare do not match rates presented in the application.

Response – The maximum hourly emission rates for PM₁₀, CO, SO₂ and NO_x in Table Vb reflect the maximum hourly emission rates utilized in the ambient impact analyses for the facility which corresponds with Table XIII in the analysis.

- V.6 **HAP Major Source Applicability** – DKRW commented that the facility is only a major source of HAPs as a single pollutant is greater than 10 tpy and not any combination of HAPs greater than 25 TPY.

Response – DKRW originally commented that the facility is only a major source of HAPs as a single pollutant was projected to be greater than 10 tpy (Methanol). However, DKRW has subsequently revised HAP emissions and is no longer a major source of HAPs (See response to Public Comment II.14).

- V.7 **Annual emission rates for turbines** – DKRW requested that the annual emission rates for the turbines be revised to account for cold startup year emissions.

Response – The Division established annual emission rates for the turbines in Condition 10 based on the 30-day rolling average emission limit determined through BACT, which included periods of startup and shutdown. Therefore, the annual emission limits for the turbines remain unchanged.

- V.8 **Short term NO_x and CO limits for turbines** – DKRW requested that the pound per hour (lb/hr) limits for NO_x and CO be revised to account for changes in the ambient temperature as turbine emissions vary by ambient temperature.

Response – The pound per hour limits for NO_x and CO are based on 4 ppm_v NO_x and 6 ppm_v CO with the installation of SCR to control NO_x and an oxidation catalyst to control CO. These output limits were established independent of ambient temperature through the BACT analyses for these pollutants, and was not addressed as an issue of technical feasibility in the application. The Division considers the control equipment proposed as BACT for NO_x and CO as capable of meeting the proposed emission limits for the turbines independent of ambient temperature. Therefore, the pound per hour limits for the turbines remain unchanged.

- V.9 **Black Start Generators** – DKRW requested that the operating hours of each Black Start Generator be increased to 360 hours per year instead of the originally requested 250 hours per year. DKRW noted that 360 hour per year of operation was utilized in the ambient impact analysis for these units.

Response – The Division requested clarification on the need to increase operating hours of the Black Start Generators. DKRW responded that the increase to 360 hours of operation was necessary for operations during the cold-start year (commissioning activities), and is not required for normal operation. Therefore, the Division will revise Condition 16 to allow 360 hours of operation for the initial year of operation (commissioning activities), and 250 hours of operation per year thereafter.

- V.10 **Synthetic Organic Chemical Manufacturing Industry (SOCMI) NSPS Applicability** – DKRW commented that they believe that the facility is not subject to the requirements of 40 CFR part 60, subpart VVa and 40 CFR part 63 subparts H and EEEE as the facility doesn't meet the definition of a product under the subparts.

Response – The Division does not agree with DKRW that the facility is not subject to 40 CFR part 60, subpart VVa. Methanol is listed as one of the chemicals in Subpart VVa §60.489a which is covered under this subpart. Additionally, the EPA considers either of the following downstream uses as indicative of the production of a listed chemical as a product: (1) production for sale as that listed chemical, or (2) use in another process where that listed chemical is needed. The production and use of methanol in the MTG process at the facility meets the definition of a product as described under item two. Therefore, the Division has kept the requirement for DKRW to comply with the applicable requirements of 40 CFR part 60, subpart VVa.

Based on the revisions to the estimated HAPs at the facility (now a minor source of HAPs), the facility is no longer subject to the requirements of 40 CFR part 63 subparts H and EEEE and the respective conditions have been removed.

- V.11 **Typographical Error** – DKRW commented that proposed Condition 32 incorrectly references Condition 29(a) instead of Condition 33(a).

Response – The Division has corrected this condition to reference the appropriate condition in the permit.

VI. **Decision:**

On the basis of comments received during the public comment period and at the public hearing, an analysis of those comments, and representations made by Medicine Bow Fuel & Power, LLC in the application, the Department of Environmental Quality has determined that the permit application filed by Medicine Bow Fuel & Power, LLC complies with all applicable Wyoming Air Quality Standards and Regulations and that a permit will be issued to Medicine Bow Fuel & Power, LLC allowing construction of Medicine Bow IGL Plant as described in the application. All of the conditions proposed in the Division's analysis will be included in the permit with the following changes and additions:

1. The Division has included as a condition of the permit (Condition 19) a demonstration that the facility is a minor source of HAPs based on a final component count of the as-built facility prior to startup of the facility (See response to Public Comment II.14).

That Medicine Bow Fuel & Power shall submit a demonstration that fugitive HAPs emissions are as represented in the application (minor source of HAPs) based on a final equipment count (equipment as defined in 40 CFR part 60, subpart VVa) of the as-built facility prior to startup of the facility.

2. The Division has included as a condition of the permit (Condition 20) an annual submittal of HAP emissions based on the measured leak detection rates at the facility (See response to Public Comment II.14).

Medicine Bow Fuel & Power, LLC shall submit, on an annual basis, a report on actual fugitive HAP emissions for the facility. Actual fugitive HAP emissions shall be calculated using the methodology in the permit application, and the average measured leak detection rates for the past calendar year. The frequency of reporting fugitive HAP emissions may be revised without amending the permit, but revisions to the frequency must be approved by the Division prior to implementation. This report shall include the following:

- a. *Total fugitive HAPs emissions for the facility in tons per year*
- b. *Speciated fugitive HAP emissions for the facility in tons per year*
- c. *Average leak detection rate by equipment in ppm (equipment as defined in 40 CFR part 60, subpart VVa)*
- d. *Documentation of fugitive HAP emission calculations*

3. The Division has included as a condition of the permit (Condition 21) a requirement for the monitoring of leaks under the LDAR program to be conducted a minimum of every six (6) months (See response to Public Comment II.14).

Medicine Bow Fuel & Power, LLC shall utilize a LDAR program in accordance with 40 CFR part 60, subpart VVa. Monitoring under the LDAR program shall be conducted a minimum of every six (6) months. Records of monitoring and repair measures shall be kept for a period of at least 5 years and shall be made available to the Division upon request.

4. The Division has revised Condition 9 to include EPA Reference Method 202 in addition to Reference Method 5, and has revised Condition 10 to clarify the particulate emission limit for the turbines includes both filterable and condensable PM₁₀ (See Environmental Group Comment IV.30).

5. The Division has included as a condition of the permit (Condition 22) a requirement to monitor SO₂ emissions from the HP and LP flares (See response to Environmental Group Comment IV.6).

Medicine Bow Fuel & Power, LLC shall monitor SO₂ emissions from the HP and LP flares. Monitoring of SO₂ emissions shall consist of installing flow monitoring equipment to the flares, and by either direct sampling of the flow to the flares or sampling of the coal. Records shall be kept for a period of at least 5 years and shall be made available to the Division upon request.

6. The Division has included as a condition of the permit (Condition 23) a requirement for the HP and LP to be smokeless per Chapter 5, Section 2(m) of the WAQSR (See response to Environmental Group Comment IV.35).

That the HP and LP flares shall be designed, constructed, operated and maintained to be smokeless, per Chapter 5, Section 2(m) of the WAQSR, with no visible emissions except for periods not to exceed a total of five (5) minutes during any two (2) consecutive hours as determined by Method 22 of 40 CFR part 60, Appendix A.

7. The Division has included as a condition of the permit (Condition 24) a requirement for the HP and LP flares to be maintained and operated during all periods of active operation of the facility (See response to Environmental Group Comment IV.35).

Medicine Bow Fuel & Power, LLC shall maintain and operate the HP and LP flares during all period of active operation such that the controls remain effective as viable emission control devices.

8. The Division has included as a condition of the permit (Condition 25) a requirement for the monitoring of the presence of a pilot flame on the HP and LP flares along with a requirement to maintain records noting when the pilot flare is not present during active operation of the facility (See response to Environmental Group Comment IV.35).

That the presence of a pilot flame shall be monitored using a thermocouple and continuous recording device or any other equivalent device to detect the presence of a flame on the HP and LP flares. Medicine Bow Fuel & Power, LLC shall maintain records noting the date and duration of time during active operation when the pilot flame is not present in the HP and LP flares. Records shall be kept for a period of at least 5 years and shall be made available to the Division upon request.

9. The Division has included as conditions of the permit (Conditions 26, 27, 28, and 29) a requirement for the slag storage and handling to be treated with water and/or chemical dust suppressants, and a no visible emissions limit as determined by Method 22 of Appendix A, 40 CFR part 60 (See response to Environmental Group Comment IV.44).

The slag storage and handling operation shall be treated with water and/or chemical dust suppressants on a schedule such that treatment remains a viable control measure.

The slag storage and handling operation shall be operated and maintained so the operation exhibits no visible emissions as determined by Method 22 of Appendix A, 40 CFR part 60.

Medicine Bow Fuel & Power, LLC shall conduct, at minimum, daily visual observations of the slag storage and handling operation to determine the presence of visible emissions. Records shall be kept documenting whether visual emissions are noted and the corrective action taken. These records shall be maintained for a period of five (5) years and shall be made available to the Division upon request.

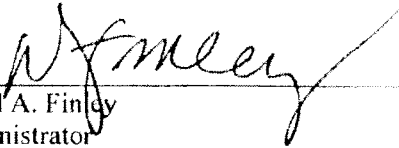
That performance tests shall be conducted on the slag storage and handling operation to determine compliance with Condition 27. Method 22 of Appendix A, 40 CFR part 60, shall be used to determine fugitive particulate emissions. Performance tests shall be at least 30 minutes in duration, with observations taken from each side of the operation. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. Results shall be submitted to this Division within 45 days of completion.

10. The Division has revised Condition 18 to allow 360 hours of operation for each Black Start Generator during the initial year of operation, and 250 hours of operation for each Black Start Generator for the subsequent years of operation of the facility (See response to DKRW Comment V.9).

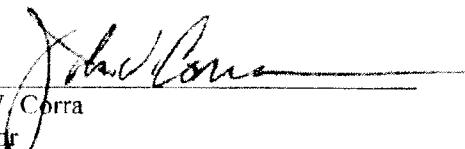
That each Black Start Generator shall be limited to 360 hours of operation during the initial year of operation of the Medicine Bow IGL Plant, and shall be limited to 250 hours of operation per year after the initial year of operation. The Fire Water Pump shall be limited to 500 hours of operation per year. Medicine Bow Fuel & Power shall install, operate and maintain a non-resettable hour meter to determine the hours of operation of each Black Start Generator and Fire Water Pump. Records of the hours of operation shall be kept and maintained and made available to the Division upon request.

11. The Division has removed proposed permit conditions 28 through 31 as the facility is no longer a major source of HAPs (See response to Public Comment II.14).
12. The Division has revised Condition 39 (proposed permit condition 32) to correct the referenced permit condition (See response to DKRW Comment V.11).
13. The Division has revised Condition 42 (proposed permit condition 35) to be consistent with previously issued permits where EPA has proposed revisions to NSPS standards.

Dated this 4th day of March, 2009



David A. Finley
Administrator
Wyoming Air Quality Division



John V. Corra
Director
Wyoming Department of Environmental Quality

Figure 1: Modeled Annual PM-10 Increment (% consumed)

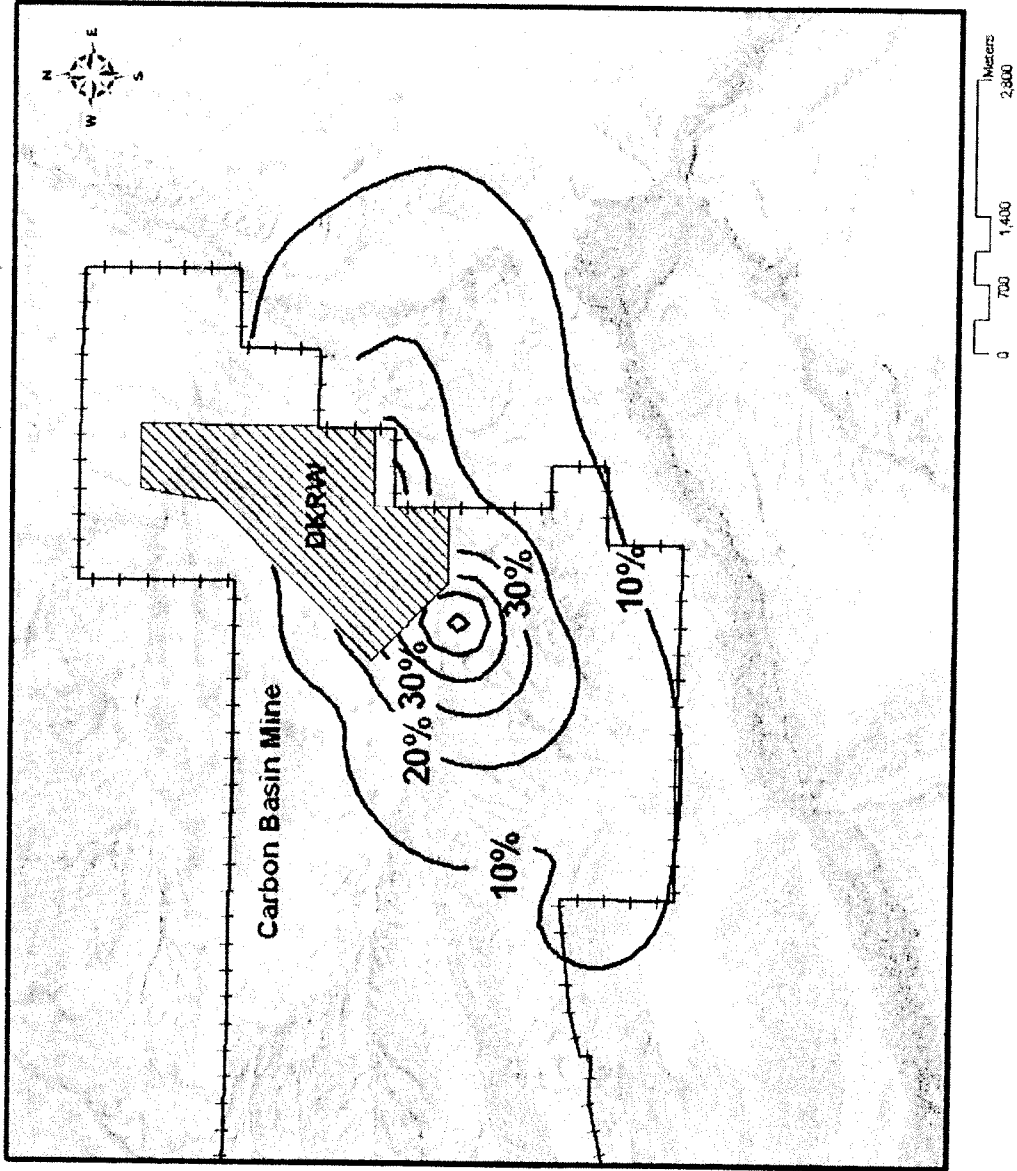


Figure 2: Estimated Extent of Total Increased Cancer Risk

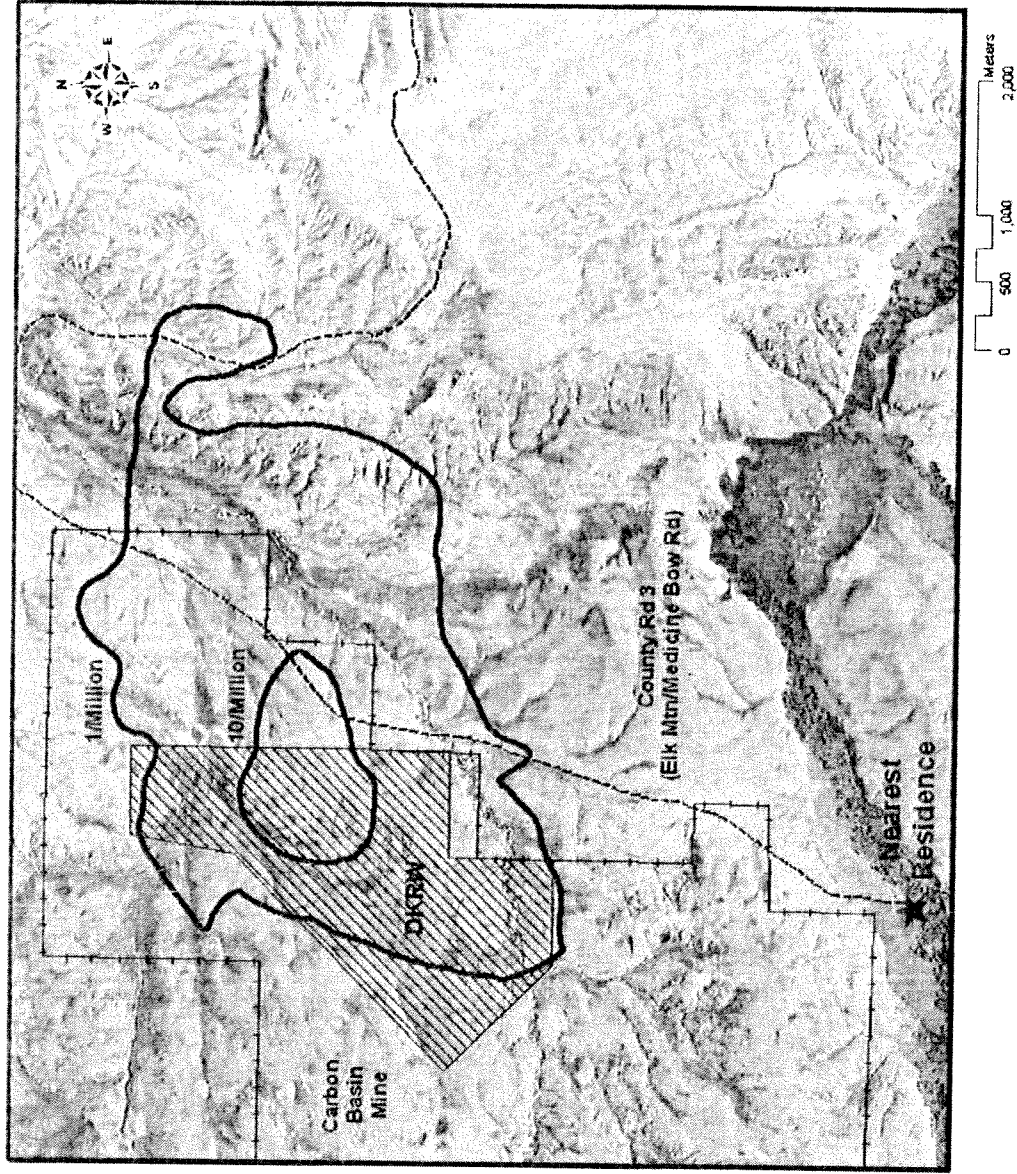
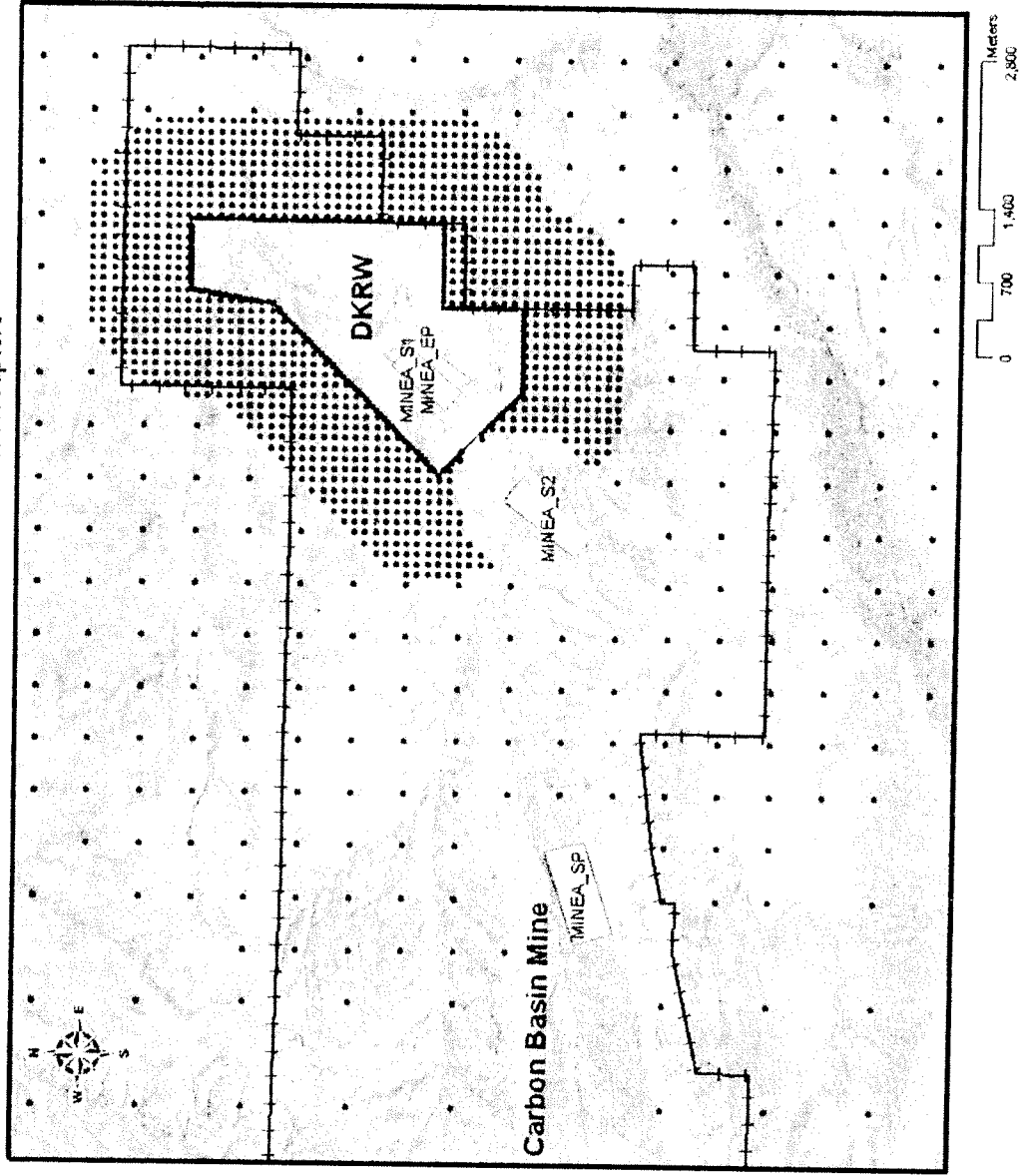


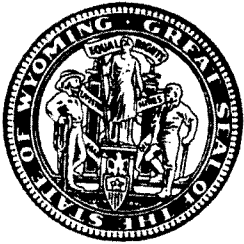
Figure 3: Mine Area Sources and Model Receptors



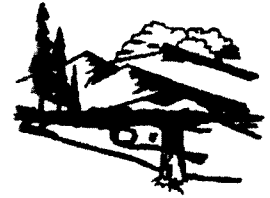
BEFORE THE
ENVIRONMENTAL QUALITY COUNCIL
STATE OF WYOMING

IN THE MATTER OF:)
MEDICINE BOW FUEL & POWER, LLC) DOCKET NO. 09-2801
AIR PERMIT CT-5873)

EXHIBIT 2
PERMITTEE'S RESPONSE TO APPEAL



Department of Environmental Quality



To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director

March 4, 2009

Mr. Jude R. Rolfes, P.E.
Senior Vice President
Medicine Bow Fuel & Power, LLC
Two Riverway, Suite 1780
Houston, TX 77056

Permit No. CT-5873

Dear Mr. Rolfes:

The Division of Air Quality of the Wyoming Department of Environmental Quality has completed final review of Medicine Bow Fuel & Power, LLC's application to construct an underground coal mine and industrial gasification and liquefaction (IGL) plant that will produce transportation fuels and other products. The underground coal mine is expected to have a maximum production rate of 8,700 tons per day (TPD) of coal or approximately 3.2 million tons per year (MMTPY) of coal as feed to the IGL Plant. The plant will gasify coal to produce synthesis gas (syngas) to produce the following products: 18,500 barrels per day (bpd) of gasoline, 42 tons per day of sulfur, 198 million standard cubic feet per day (MMscfd) of carbon dioxide (CO₂), and 712 tons per day of coarse slag. The Medicine Bow IGL Plant is located in Section 29, T21N, R79W, approximately eleven (11) miles, southwest of Medicine Bow, in Carbon County, Wyoming.

Following this agency's proposed approval of the request as published July 3, 2008 and in accordance with Chapter 6, Section 2(m) of the Wyoming Air Quality Standards and Regulations, the public was afforded a 30-day period in which to submit comments concerning the proposed new source, and an opportunity for a public hearing. Public comments have been received and a public hearing on the proposal was held August 4, 2008. Therefore, on the basis of the information provided to us, approval to construct the Medicine Bow IGL Plant as described in the application is hereby granted pursuant to Chapter 6, Section 2 and 4 of the regulations with the following conditions:

1. That 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. That 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 Medicine Bow Fuel & Power, LLC shall obtain an operating permit in accordance with Chapter 6, Section 3 of the WAQSR.
4. That all notifications, reports and correspondences associated with this permit shall be submitted to the Stationary Source Compliance Program Manager, Air Quality Division, 122 West 25th Street, Cheyenne, WY 82002 and a copy shall be submitted to the District Engineer, Air Quality Division, 152 North Durbin Street, Suite 100, Casper, WY 82601.

Herschler Building • 122 West 25th Street • Cheyenne, WY 82002 • <http://deq.state.wy.us>

ADMIN/OUTREACH (307) 777-7937 FAX 777-3610	ABANDONED MINES (307) 777-6145 FAX 777-6462	AIR QUALITY (307) 777-7391 FAX 777-5616	INDUSTRIAL SITING (307) 777-7369 FAX 777-5973	LAND QUALITY (307) 777-7756 FAX 777-5864	SOLID & HAZ. WASTE (307) 777-7752 FAX 777-5973	WATER QUALITY (307) 777-7781 FAX 777-5973
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5. That written notification of the anticipated date of initial startup, in accordance with Chapter 6, Section 2(i) of the WAQSR, is required not more than 60 days or less than 30 days prior to such date. Notification of the actual date of startup is required 15 days after startup.
6. That the date of commencement of construction shall be reported to the Administrator within 30 days of commencement. In accordance with Chapter 6, Section 2(h) of the WAQSR, approval to construct or modify shall become invalid if construction is not commenced within 24 months after receipt of such approval or if construction is discontinued for a period of 24 months or more. The Administrator may extend the period based on satisfactory justification of the requested extension.
7. That performance tests be conducted, in accordance with Chapter 6, Section 2(j) of the WAQSR, within 30 days of achieving a maximum design rate but not later than 90 days following initial start-up, and a written report of the results be submitted. The operator shall provide 15 days prior notice of the test date. If a maximum design rate is not achieved within 90 days of start-up, the Administrator may require testing be done at the rate achieved and again when a maximum rate is achieved.
8. That Medicine Bow Fuel & Power, LLC shall retain, at the Medicine Bow IGL Plant, records of the daily inspections, monthly observations, preventative maintenance records, Method 22 observations, and support information as required by this permit for a period of at least five (5) years from the date such records are generated and the records shall be made available to the Division upon request.

Medicine Bow IGL Plant

9. Initial performance testing, as required by Condition 7 of this permit shall be conducted on the following sources:
 - i. Combustion Turbines (CT-1, CT-2, and CT-3):

<u>NO_x Emissions:</u>	Testing is to be performed on a 30-day rolling average using a certified CEM and the requirements of Subpart KKKK, 40 CFR part 60.
<u>CO Emissions:</u>	Testing is to be performed on a 30-day rolling average using a certified CEM.
<u>SO₂ Emissions:</u>	Compliance tests shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 6.
<u>VOC Emissions:</u>	Compliance tests shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 25.
<u>PM/PM₁₀ Emissions:</u>	Compliance tests shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4, 5, and 202.

- Opacity: Opacity testing shall consist of three (3) 6-minute averages of the opacity as determined by Method 9 of 40 CFR part 60, Appendix A.
- Mercury Emissions: Compliance test shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 29 or an equivalent EPA reference method upon Division approval.
- ii. Auxiliary Boiler (AB):
- NO_x Emissions: Compliance tests shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 7E.
- CO Emissions: Compliance tests shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 10.
- iii. Catalyst Regenerator (B-1), Reactivation Heater (B-2), HGT Reactor Charge Heater (B-3):
- NO_x Emissions: Compliance tests shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 7E.
- CO Emissions: Compliance tests shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 10.
- iv. Gasifier Preheaters (GP-1, GP-2, GP-3, GP-4, and GP-5):
- NO_x and CO Emissions: Compliance testing for the first gasifier preheater tested shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4, 7E and 10. Testing of subsequent gasifier preheaters shall consist of one (1) twenty-one (21) minute test following EPA Reference Methods 3, 7E, 10, and 19.
- v. Black Start Generators (Gen-1, Gen-2, and Gen-3):
- NO_x, CO and VOC Emissions: Black Start Generators shall be tested in accordance with the requirements of Subpart JJJJ, 40 CFR part 60.
- vi. Fire Water Pump Engine (FW-Pump):
- NO_x and CO Emissions: The Fire Water Pump Engine shall be tested in accordance with the requirements of Subpart IIII, 40 CFR part 60.

A test protocol shall be submitted for review and approval prior to testing. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. Results shall be submitted to this Division within 45 days of completion.

10. Emissions from the turbines (CT-1, CT-2, and CT-3) shall be limited to the following, and shall apply at all times:

Pollutant		lb/hr	tpy
NO _x	4 ppm _v @ 15% O ₂ (30-day rolling)	11.6 (30-day rolling)	50.6
CO	6 ppm _v @ 15% O ₂ (30-day rolling)	10.6 (30-day rolling)	46.2
SO ₂	--	2.5	10.8
VOC	1.4 ppm _v @ 15% O ₂	1.5	6.6
PM/PM ₁₀ (Filterable + Condensable)	--	10.0	43.8
Hg	0.02 µg/Nm ³	--	4.33×10 ⁻⁵ (0.087 lb/yr)

11. That the opacity from the combustion turbines (CT-1, CT-2, and CT-3) shall be limited to 20 percent opacity as determined by Method 9 of 40 CFR part 60, Appendix A.
12. Medicine Bow Fuel & Power, LLC shall use the following in-stack continuous emission monitoring (CEM) equipment on the combustion turbines (CT-1, CT-2, and CT-3) to demonstrate continuous compliance with the emission limits set forth in this permit:
- i. Medicine Bow Fuel & Power, LLC shall install, calibrate, operate, and maintain a monitoring system, and record the output, for measuring NO_x emissions discharged to the atmosphere in ppm_v and lb/hr. The NO_x monitoring system shall consist of the following:
 - a. A continuous emission NO_x monitor located in the combustion turbine exhaust stack.
 - b. A continuous flow monitoring system for measuring the flow of exhaust gases discharged into the atmosphere.
 - c. An in-stack oxygen or carbon dioxide monitor for measuring oxygen or carbon dioxide content of the flue gas at the location NO_x emissions are monitored.
 - ii. Medicine Bow Fuel & Power, LLC shall install, calibrate, operate, and maintain a monitoring system, and record the output, for measuring CO emissions discharged to the atmosphere in ppm_v and lb/hr. The CO monitoring system shall consist of the following:
 - a. A continuous emission CO monitor located in the combustion turbine exhaust stack.
 - b. A continuous flow monitoring system for measuring the flow of exhaust gases discharged into the atmosphere.
 - c. An in-stack oxygen or carbon dioxide monitor for measuring oxygen or carbon dioxide content of the flue gas at the location CO emissions are monitored.

- iii. Each continuous monitor system listed in this condition shall comply with the following:
 - a. 40 CFR part 60 Subpart KKKK – *Standards of Performance for Stationary Combustion Turbines*.
 - b. Monitoring requirements of Chapter 5, Section 2(j) of the WAQSR including the following:
 - 1. 40 CFR part 60, Appendix B, Performance Specification 2 for NO_x, Performance Specification 4 for CO, and Performance Specification 3 for O₂ and CO₂. The monitoring systems must demonstrate linearity in accordance with Division requirements and be certified in both concentration (ppm_v) and units of the standard (lb/hr).
 - 2. Quality Assurance requirements of Appendix F, 40 CFR part 60.
 - 3. Medicine Bow Fuel & Power, LLC shall develop and submit for the Division's approval a Quality Assurance plan for the monitoring systems listed in this condition within 90 days of initial start-up.
13. Following the initial performance tests, as required by Condition 7 of this permit, compliance with the limits set forth in this permit shall be determined with data from the continuous monitoring systems required by Condition 12 of this permit as follows:
- i. Exceedance of the limits shall be defined as follows:
 - a. Any 30-day rolling average calculated using valid data (output concentration and average hourly volumetric flowrate) from the CEM equipment required in Condition 12 which exceeds the ppm_v or lb/hr limits established for NO_x and CO in this permit. Valid data shall meet the requirements of WAQSR, Chapter 5, Section 2(j). The 30-day average emission rate shall be calculated at the end of each operating day as the arithmetic average of hourly emissions with valid data during the previous 30-day period.
 - ii. Medicine Bow Fuel & Power, LLC shall comply with all reporting and record keeping requirements as specified in Chapter 5, Section 2(g). Excess NO_x and CO emissions shall be reported in units of ppm_v and lb/hr.

14. Emissions from the auxiliary boiler and heaters shall be limited to the following, and shall apply at all times:

ID	Source	NO _x			CO		
		lb/MMBtu	lb/hr	tpy	lb/MMBtu	lb/hr	tpy
AB	Auxiliary Boiler	0.05	3.2	14.2	0.08	5.4	23.8
B-1	Catalyst Regenerator	0.05	1.1	4.6	0.08	1.8	7.8
B-2	Reactivation Heater	0.05	0.6	2.7	0.08	1.0	4.5
B-3	HGT Reactor Charge Heater	0.05	0.1	0.5	0.08	0.2	0.8
GP-1 – GP-5	Gasifier Preheaters	0.05	1.0	0.3	0.08	1.7	0.4

- 15a. That annually, or as otherwise specified by the Administrator, the Auxiliary Boiler (AB), Catalyst Regenerator (B-1), Reactivation Heater (B-2), and HGT Reactor Charge Heater (B-3) shall be tested to verify compliance with the NO_x and CO limits set forth in this permit. The first annual test is required the following calendar year after completion of the initial performance test. Testing for NO_x and CO shall be conducted following EPA reference Methods. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. Results of the tests shall be submitted to the Division within 45 days of completing the tests.

- 15b. The Air Quality Division shall be notified within 24 hours of any emission unit where the testing/monitoring required by 15(a) of this condition shows operation outside the permitted emission limits. By no later than 7 calendar days of such testing/monitoring event, the owner or operator shall repair and retest/monitor the affected emission unit to demonstrate that the emission unit has been returned to operation within the permitted emission limits. Compliance with this permit condition regarding repair and retesting/monitoring shall not be deemed to limit the authority of the Air Quality Division to cite the owner or operator for an exceedance of the permitted emission limits for any testing/monitoring required by 15(a) of this condition which shows noncompliance.

16. That emissions from the Black Start Generators shall be limited to the following:

ID	Source	NO _x			CO			VOC		
		g/hp-hr	lb/hr	tpy	g/hp-hr	lb/hr	tpy	g/hp-hr	lb/hr	tpy
Gen-1-Gen-3	Black Start Generators	1.0	6.4	0.8	2.4	15.5	1.9	0.9	5.7	0.7

17. That emissions from the Fire Water Pump Engine shall be limited to the following:

ID	Source	NO _x			CO		
		g/hp-hr	lb/hr	tpy	g/hp-hr	lb/hr	tpy
FW-Pump	Fire Water Pump Engine	4.75	6.0	1.5	0.3	0.4	0.1

18. That each Black Start Generator shall be limited to 360 hours of operation during the initial year of operation of the Medicine Bow IGL Plant, and shall be limited to 250 hours of operation per year after the initial year of operation. The Fire Water Pump shall be limited to 500 hours of operation per year. Medicine Bow Fuel & Power shall install, operate and maintain a non-resettable hour meter to determine the hours of operation of each Black Start Generator and Fire Water Pump. Records of the hours of operation shall be kept and maintained and made available to the Division upon request.
19. That Medicine Bow Fuel & Power shall submit a demonstration that fugitive HAPs emissions are as represented in the application (minor source of HAPs) based on a final equipment count (equipment as defined in 40 CFR part 60, subpart VVa) of the as-built facility prior to startup of the facility.
20. Medicine Bow Fuel & Power, LLC shall submit, on an annual basis, a report on actual fugitive HAP emissions for the facility. Actual fugitive HAP emissions shall be calculated using the methodology in the permit application, and the average measured leak detection rates for the past calendar year. The frequency of reporting fugitive HAP emissions may be revised without amending the permit, but revisions to the frequency must be approved by the Division prior to implementation. This report shall include the following:
 - a. Total fugitive HAPs emissions for the facility in tons per year
 - b. Speciated fugitive HAP emissions for the facility in tons per year
 - c. Average leak detection rate by equipment in ppm (equipment as defined in 40 CFR part 60, subpart VVa)
 - d. Documentation of fugitive HAP emission calculations
21. Medicine Bow Fuel & Power, LLC shall utilize a LDAR program in accordance with 40 CFR part 60, subpart VVa. Monitoring under the LDAR program shall be conducted a minimum of every six (6) months. Records of monitoring and repair measures shall be kept for a period of at least 5 years and shall be made available to the Division upon request.
22. Medicine Bow Fuel & Power, LLC shall monitor SO₂ emissions from the HP and LP flares. Monitoring of SO₂ emissions shall consist of installing flow monitoring equipment to the flares, and by either direct sampling of the flow to the flares or sampling of the coal. Records shall be kept for a period of at least 5 years and shall be made available to the Division upon request.
23. That the HP and LP flares shall be designed, constructed, operated and maintained to be smokeless, per Chapter 5, Section 2(m) of the WAQSR, with no visible emissions except for periods not to exceed a total of five (5) minutes during any two (2) consecutive hours as determined by Method 22 of 40 CFR part 60, Appendix A.
24. Medicine Bow Fuel & Power, LLC shall maintain and operate the HP and LP flares during all period of active operation such that the controls remain effective as viable emission control devices.

25. That the presence of a pilot flame shall be monitored using a thermocouple and continuous recording device or any other equivalent device to detect the presence of a flame on the HP and LP flares. Medicine Bow Fuel & Power, LLC shall maintain records noting the date and duration of time during active operation when the pilot flame is not present in the HP and LP flares. Records shall be kept for a period of at least 5 years and shall be made available to the Division upon request.
26. The slag storage and handling operation shall be treated with water and/or chemical dust suppressants on a schedule such that treatment remains a viable control measure.
27. The slag storage and handling operation shall be operated and maintained so the operation exhibits no visible emissions as determined by Method 22 of Appendix A, 40 CFR part 60.
28. Medicine Bow Fuel & Power, LLC shall conduct, at minimum, daily visual observations of the slag storage and handling operation to determine the presence of visible emissions. Records shall be kept documenting whether visual emissions are noted and the corrective action taken. These records shall be maintained for a period of five (5) years and shall be made available to the Division upon request.
29. That performance tests shall be conducted on the slag storage and handling operation to determine compliance with Condition 27. Method 22 of Appendix A, 40 CFR part 60, shall be used to determine fugitive particulate emissions. Performance tests shall be at least 30 minutes in duration, with observations taken from each side of the operation. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. Results shall be submitted to this Division within 45 days of completion.
30. All other sources not covered by NSPS/NESHAP regulations are subject to a 20 percent opacity limit as determined by Method 9 of 40 CFR part 60, Appendix A.
31. During periods of startup, Medicine Bow Fuel & Power, LLC shall adhere to their procedures in their Startup/Shutdown Emission Minimization Plan, attached as Appendix A. This plan may be modified as deemed necessary by Medicine Bow Fuel & Power, LLC without amending the permit, but revisions to the plan shall be approved by the Division prior to implementation.
32. That Medicine Bow Fuel & Power, LLC shall comply with the applicable requirements of 40 CFR part 60, Subpart Dc for the auxiliary boiler.
33. That Medicine Bow Fuel & Power, LLC shall comply with the applicable requirements of 40 CFR part 60, Subpart Kb for the methanol, product gasoline, and heavy gasoline tanks.
34. That Medicine Bow Fuel & Power, LLC shall comply with the applicable requirements of 40 CFR part 60, Subpart Y for the coal preparation facilities.
35. That Medicine Bow Fuel & Power, LLC shall comply with the applicable requirements of 40 CFR part 60, Subpart IIII for the firewater pump engine.

36. That Medicine Bow Fuel & Power, LLC shall comply with the applicable requirements of 40 CFR part 60, Subpart JJJJ for the black start generators.
37. That Medicine Bow Fuel & Power, LLC shall comply with the applicable requirements of 40 CFR part 60, Subpart KKKK for the combustion turbines.
38. That Medicine Bow Fuel & Power, LLC shall comply with the applicable requirements of 40 CFR part 60, Subpart VVa for the IGL Plant.

Saddleback Hills Mine

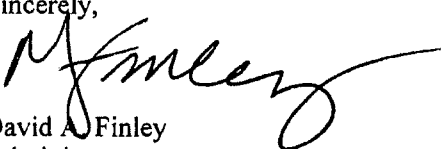
39. That performance tests shall be conducted on the passive enclosure dust control systems (PECS) and atomizer/fogger systems to determine compliance with Condition 40(a). Method 22 of 40 CFR, Part 60, Appendix A shall be used to determine fugitive particulate emissions. Performance tests shall be at least 30 minutes in duration, with observations taken from each side of the enclosure. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. Results shall be submitted to this Division within 45 days of completion.
40. That the following requirements shall be met for all passive enclosure control systems (PECS) and atomizer/foggers systems at the mine:
 - a. The PECS and atomizer/foggers systems shall be operated and maintained so the system enclosure exhibits no visible emissions as determined by Method 22 of Appendix A, 40 CFR part 60.
 - b. That the atomizer/fogger systems and associated monitoring equipment shall be operated during all times that the respective coal preparation facilities are in operation.
 - c. Medicine Bow Fuel & Power, LLC shall conduct, at minimum, daily visual observations of the passive enclosure control systems (PECS) and atomizer/fogger systems to determine the presence of visible emissions. Records shall be kept documenting whether visual emissions are noted and the corrective action taken. These records shall be maintained for a period of five (5) years and shall be made available to the Division upon request.
 - d. Medicine Bow Fuel & Power, LLC shall institute a monthly preventative maintenance plan for the atomizer/fogger systems.
41. That the coal preparation facilities are subject to 40 CFR part 60, Subpart Y. Subpart Y limits opacity from any coal processing and conveying equipment, including coal crushers and breakers, coal storage systems, and coal transfer and loading systems to less than 20 percent.
42. That Medicine Bow Fuel & Power, LLC shall submit a report detailing the impact of the final Subpart Y rule on the conditions of this permit. The report shall include an applicability determination with respect to the new Subpart Y regulations for each emission unit affected by the rule.

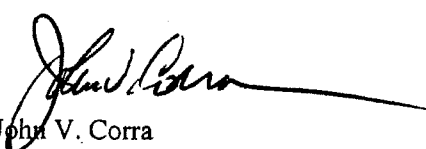
43. The maximum coal production by calendar year at the Saddleback Hills Mine shall not exceed a total production rate of 3.2 million tons as described in the mine plan contained in the application. Medicine Bow Fuel & Power, LLC shall keep and maintain records of annual coal production for the Saddleback Hills Mine.
44. That the dead sealed stockpile shall not exceed 300,000 tons of coal in size. Medicine Bow Fuel & Power, LLC shall keep and maintain records of the size of the stockpile, amount of sealant applied to the storage pile, and dates of when the storage pile is accessed and restored.
45. That the underground mine stockpile shall not exceed a total size of 300,000 tons of coal. Medicine Bow Fuel & Power, LLC shall keep and maintain records of the size of the storage pile and coal throughput of the pile.
46. That the underground mine stockpile shall be treated with water, to the extent necessary, to minimize fugitive emissions. Medicine Bow Fuel & Power, LLC shall keep and maintain records of water treatment on the stockpile.
47. That all unpaved portions of haul roads, access roads, and work areas shall be treated with water and/or chemical suppressants on a schedule sufficient to control fugitive dust from vehicular traffic and wind erosion.

It must be noted that this approval does not relieve you of your obligation to comply with all applicable county, state, and federal standards, regulations or ordinances. Special attention must be given to Chapter 6, Section 2 of the Wyoming Air Quality Standards and Regulations, which details the requirements for compliance with conditions 5, 6 and 7. Attention must be given to Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations, which details the requirements for compliance with condition 3 (major sources). Any appeal of this permit as a final action of the Department must be made to the Environmental Quality Council within sixty (60) days of permit issuance per Section 16, Chapter I, General Rules of Practice and Procedure, Department of Environmental Quality.

If we may be of further assistance to you, please feel free to contact this office.

Sincerely,


David A. Finley
Administrator
Air Quality Division


John V. Corra
Director
Dept. of Environmental Quality

cc: Chris Hanify

Year	PM ₁₀ tpy
1	29.8
2	114.5
3	75.8

ID	Description	NO _x	CO	VOC	SO ₂	PM/PM ₁₀
CT-1	Combustion Turbine	50.6	46.2	6.6	10.8	43.8
CT-2	Combustion Turbine	50.6	46.2	6.6	10.8	43.8
CT-3	Combustion Turbine	50.6	46.2	6.6	10.8	43.8
AB	Auxiliary Boiler ¹	14.2	23.8	1.6	0.2	2.2
B-1	Catalyst Regenerator ¹	4.6	7.8	0.5	0.1	0.7
B-2	Reactivation Heater	2.7	4.5	0.3	0.1	0.4
B-3	HGT Reactor Charge Heater	0.5	0.8	0.1	0.1	0.1
Tanks	Storage	--	--	102.6	--	--
EL	Equipment Leaks	--	--	59.6	--	--
CS	Coal Storage	--	--	--	--	61.1
FW-Pump	Firewater Pump Engine ²	1.5	0.1	0.3	--	0.1
GP-1 – GP-5	Gasifier Preheaters 1-5 (Planned Maintenance)	<0.1	<0.1	<0.1	<0.1	<0.1
FL-1	HP Flare	0.5	1.0	3.0	3.6	--
FL-2	LP Flare	0.1	0.3	0.7	--	--
Totals		175.9	176.9	188.5	36.6	196.0

¹ Emissions from these units were estimated based on full load and 8760 hours per year.

² Emissions are based on 500 hours of operation per year.

Pollutant	Facility Wide Potential ¹	Largest Emission Source
Benzene	8.5	Equipment Leaks
Formaldehyde	0.7	Turbines
Hexane	1.3	Auxiliary Boiler
Methanol	9.2	Equipment Leaks
Toluene	1.8	Turbines
Other Haps	2.1	--
Total HAPs	23.6	--

¹ Rounded to the nearest tenth of a ton.

Appendix A

Startup/Shutdown Emission Minimization Plan

Rev 0
Startup/Shutdown Emission Minimization Plan
Medicine Bow Fuel & Power

40 CFR §60.11(d): At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

The goal of this Plan is to provide guidelines and suggestions for steps that will minimize air emissions during startup and shutdown periods, in accordance with Clean Air Act permits and regulations, including the provisions from 40 CFR 60 as cited above.

Specific startup and shutdown operating procedures for all process units in the Plant shall incorporate the elements of this Plan to the greatest extent possible.

Flaring Associated with Startup – General Comments

- Commission all downstream equipment and prepare them for operation prior to gasifier startup. This will include preparation of the:
 1. Low Temperature Gas Cleanup (LTGC),
 2. Sour Water Stripper,
 3. Acid Gas Removal (AGR),
 4. Sulfur Recovery Unit (SRU) - Claus Plant,
 5. CO₂ compression, and
 6. Methanol synthesis loop.
- Preparation will include completion of commissioning activities and final signoff, establishment of normal operating levels for fluids, preheating of required components, and start of circulating pumps as necessary.

Flaring Associated with Startup – Activities Following Gasifier Startup

Once a gasifier is started up certain conditions must be met prior to introducing syngas to subsequent stages. These conditions include:

- Gasifier
 - One gasifier will be started at a time at 50% design flow rate. Subsequent gasifiers will not be started until the downstream equipment is ready to receive the increase in syngas volume.
 - After light off a leak check of gasifier piping and components is required.
 - A low pressure and normal operating pressure check are required.
 - Raw syngas will be diverted to flare until after checks are complete. At this stage pressure can be bled into downstream piping to equalize pressures and then the control valve can be fully opened and placed in automatic control.

**Startup/Shutdown Emission Minimization Plan
Medicine Bow Fuel & Power**

- The amount of syngas sent downstream will be determined by the startup and status of downstream units.
- Start-up flaring will be at a reduced rate due to a planned slow ramp up of the plant.
- LTGC
 - Leak checks are required after pressurization, but not to delay input to the AGR system.
 - This stage includes several steam generators needed to ensure the syngas temperature is in spec for downstream components. Failure to cool down the syngas can result in a high temperature scenario requiring flare to avoid damage to downstream equipment and catalysts.
 - The syngas temperature must be monitored as the system heats up to prevent a high temperature trip. Temperature setpoints to be defined by AGR vendor and by catalyst vendors for COS and Sour Shift catalysts.
- Sour Water Stripper
 - The sour water unit will send low pressure sour gas to the Claus plant for conversion of ammonia and H₂S to N₂, H₂O, and SO₂. Base case is to flare this stream during startup until the SRU is started up. The SRU can start operations at approximately 20% design conditions.
- AGR
 - The AGR will be slowly ramped up at an estimated 10% of design syngas flow per hour.
 - Syngas temperature must be maintained below AGR vendor specifications.
 - The clean high pressure syngas must be vented to flare until the total sulfur in the syngas comes into the specification of less than 0.5 ppmv.
 - Start-up flaring will be at a reduced rate due to slow ramp up of plant.
- Claus Plant
 - When the acid gas reaches approximately 40% H₂S content it can be sent from the AGR to the SRU. Prior to this we will assume the acid gas is flared.
 - Start-up flaring will be at a reduced rate due to slow ramp up of plant.
- Methanol Synthesis
 - No syngas can be sent to the Methanol synthesis loop until sulfur is in spec. Syngas sulfur content must be less than 0.5 ppmv prior to sending to methanol synthesis.
 - If CO₂ is out of spec (>2% vol) for several hours it will result in high water content in the methanol which is not acceptable.
 - Syngas flow rate must be at least 50% of design flow rate prior to being sent to methanol synthesis to prevent compressor surge. This rate will be reviewed and verified during compressor design and surge protection design.
 - After the Methanol step the effluents are primarily low sulfur fuel gases sent to the power block and liquid methanol sent to storage or MTG. No further flaring events as part of startup are expected.

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Startup/Shutdown Emission Minimization Plan
Medicine Bow Fuel & Power

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Venting Associated with Startup

- CO₂ Capture
 - CO₂ produced from AGR will need to be vented until sufficient flow is produced to start the compressors. This flow rate is expected to be 25% of design flow rate assuming two compressor trains and a 50% turndown capacity. *This will require confirmation from compressor vendor during FEED engineering.*
 - Start-up venting will be at a reduced rate due to slow ramp up of plant.
 - If during startup export of CO₂ is not feasible then CO₂ will continue to be vented.

- Gasifier heaters
 - Initially all five heaters will be online. Heaters will be started shortly after the refractory is installed to cure the refractory. After refractory cure, the heaters will need to remain in operation to prevent moisture accumulation; otherwise another multiday heater dryout session will be required prior to startup.
 - Medicine Bow will attempt to startup as soon as possible after refractory cure is complete to minimize heater operations. This is the basis of the current plan to commission units from the end of the process to the beginning to ensure that as soon as the gasifiers are commissioned, the plant will be ready to startup and receive syngas. This plan is dependent on the construction and commissioning schedule and a situation may develop where light off is delayed after cure is complete. The time of this delay will determine if the heaters will remain on or be shutdown.
 - As each gasifier is prepared for startup the heaters will be turned off and removed. After full startup is complete, only one heater will be in operation on the spare gasifier.

- MTG heaters
 - These heaters will be brought on line when the unit is prepared to receive methanol and be operated per design.

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Startup/Shutdown Emission Minimization Plan
Medicine Bow Fuel & Power

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- Power block
 - The ASUs, which are the major power load for the plant, will be started several days in advance of the gasifier light-off to establish required temperatures in the cold box to generate purified oxygen. Two turbines with heat recovery steam turbine power will be required to start up both ASUs. If the steam turbine is not available, then all three gas turbines at reduced load will be required to startup the ASUs.
 - During plant startup most process units will begin to draw power in preparation for gasifier light off. The main exceptions are the CO₂ Compressors, Methanol Synthesis compressor, and MTG compressor units. All three gas turbines with heat recovery steam power are required to support the plant as it is prepared for full start-up.
- Fugitive emissions
 - Fugitive emissions will be at a reduced rate until Methanol and gasoline are synthesized
 - Tank emissions will be at a reduced rate initially as storage tanks are filled.
- Aux boiler
 - The boiler will be in operation during startup. At a minimum it will be turned down and floated on the system if the heat recovery steam generators are able to support plant steam requirements. *If more steam is required as defined in the FEED, then the aux boiler may be operated at its maximum rate.* After syngas is routed to methanol and the startup steam loads are reduced and process steam is available, the auxiliary boiler can be reduced to minimum.
- Flare pilots
 - Pilots will be lit as part of preparation for gasifier light off.