

**BEFORE THE
BOARD OF MINERALS AND ENVIRONMENT
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**

IN THE MATTER OF THE)	
PREVENTION OF SIGNIFICANT)	
DETERIORATION (PSD) AIR)	
QUALITY PERMIT APPLICATION)	PERMIT #28.0701-PSD
OF HYPERION ENERGY CENTER -)	
HYPERION REFINING LLC)	
)	
)	
Draft Permit Issued: 9-08)	
Final Proposed Permit Issued: 12-08)	

FINDINGS OF FACT AND CONCLUSIONS OF LAW

The South Dakota Board of Minerals and Environment (Board) hereby adopts the following Findings of Fact and Conclusions of Law:

INTRODUCTION

This matter before the South Dakota Board of Minerals and Environment was for a contested case hearing on the issuance of an Air Quality PSD Preconstruction Permit for the Hyperion Energy Center ("HEC") located in Elk Point, South Dakota. The Board conducted a Public Comment Hearing and Site Tour of the HEC on April 14 and 15, 2009.

The contested case hearing for this matter was held on on May 19-22, 2009, June 23-26, 2009, July 15, 2009 and August 20, 2009. The Applicant appeared by and through its attorneys, Frederick W. Addison, III (pro hac vice) and Amy Rickers (pro hac vice) of the Dallas, Texas based Munsch Hardt Kopr & Harr, PC law firm, as well as Todd Meierhenry of the Sioux Falls, South Dakota based Meierhenry Sargent, LLP firm. DENR appeared by and through its attorneys Deputy Attorney General Roxanne Giedd and Assistant Attorney General Scott R. Swier. Citizens Opposed to Oil Pollution, Save Union County, and Sierra Club (collectively

"Citizens") appeared by and through their attorneys Robert L. Graham (pro hac vice), Allison A. Torrence (pro hac vice), Jennifer L. Cassel (pro hac vice) and Gabrielle Sigel (pro hac vice) of the Chicago, Illinois based Jenner & Block lawfirm, as well as John H. Davidson of Vermillion, South Dakota. Following the close of the contested case hearing, the Board accepted proposed findings of fact and conclusions of law from any party to the matter desiring to file such and also heard oral closing arguments on August 20, 2009.

Based on the evidence presented, the testimony of the witnesses, and the administrative record for this matter as well as the arguments and presentations of counsel for the parties, the Board hereby enters its Findings of Fact and Conclusions of Law in support of its Final Decision, as well as its Final Decision. The Board's Final Decision authorizes and directs DENR to prepare and issue the PSD Preconstruction Permit in the Board's name as set out in the Findings of Fact and Conclusions of Law and Final Decision.

FINDINGS OF FACT

I. Overview

1. All findings of fact have been established by a preponderance of the evidence introduced or stipulated to at the contested case hearing and are supported by substantial evidence.
2. Citations to specific evidence herein are not intended to be exhaustive; rather they are representative of some of the evidence to support the individual findings.
3. To the extent any of the following findings of fact may be determined to be conclusions of law or mixed findings of fact and conclusions of law, the same are incorporated by reference as a conclusion of law as if set forth in detail.

II. Background (DENR and Permit)

4. DENR's Air Quality Program administers the air quality permitting as required by the Clean Air Act as well as state and federal statutes and regulations. (Transcript of Contested Case Hearing ("Tr.") pp. 647 - 648)
5. A PSD permit is required, for any regulated pollutant, prior to construction of new major stationary sources in areas designated as in attainment with the National Ambient Air Quality Standards ("NAAQS") under section 107 of the Clean Air Act.
6. In December 2007, Hyperion submitted its Prevention of Significant Deterioration (PSD) Permit Application ("Application") for the HEC to DENR. (Ex. 23, and Tr. p. 194 ln. 10 - 11)
7. In January 2008, EPA approved South Dakota's Air Quality Program State Implementation Plan ("SIP") for the PSD Program. (Tr. p. 651 ln. 19, p. 656 ln. 8 - 11; p. 657 ln. 4 - 5)
8. EPA has established NAAQS for criteria pollutants, including particulate matter (PM), sulfur dioxide (SO₂), nitrogen oxides (NO_x), ozone (volatile organic compounds (VOCs)), carbon monoxide (CO), and lead (Pb). (Tr. p. 652 ln. 9 - 15)
9. There is no NAAQS for CO₂. (Tr. pp. 652 ln. 25 – 653 ln. 2)

III. Parties

10. Hyperion Refining, LLC is the applicant for an Air Quality PSD Preconstruction Permit to construct the Hyperion Energy Center, a refinery for production of clean transportation fuels and supporting IGCC power plant.

11. South Dakota Department of Environment and Natural Resources is the state department tasked with review and issuance of Air Quality PSD Preconstruction Permits in the state of South Dakota.

12. Citizens Opposed to Oil Pollution, Save Union County, and Sierra Club (collectively "Citizens") are environmental organizations whose members allege they will be impacted by the HEC facility. Citizens allege a right to intervene to ensure their interests and those of their members are represented throughout the contested case hearing process.

IV. Hyperion Energy Center

13. HEC will comprise a greenfield petroleum refinery and integrated gasification combined cycle ("IGCC") power plant. (Ex. 23 p. 1)

14. HEC will be located in Union County, South Dakota, north of Elk Point, South Dakota, south of Spink, South Dakota, in the Siouxland region of southeastern South Dakota. (Ex. 23 p. 2)

15. More than 30 potential locations for HEC were considered and Union County, South Dakota was determined to be the best option. (Tr. pp. 67 – 70)

16. HEC will cover approximately 3300 acres of land. (Tr. p. 81)

17. Approximately 2,000 acres of the HEC project site will be industrial land. (Ex. 23 p. 2, and Tr. p. 82 ln. 3 - 5)

18. Approximately 1,300 acres will be dedicated for a transition zone with 80% of the transition zone set aside for open space. (Tr. p. 82 ln. 5 - 6)

19. HEC is currently expected to be an approximately \$10 billion investment. (Ex. 23 p. 1)

20. HEC will have significant positive economic impact on the Elk Point, South Dakota area, employing a substantial workforce and providing economic stimulus for the area and the state. (Ex. 23 p. 2 - 3)
21. HEC represents a responsible way to create new refining capacity for the United States, helping to improve our energy independence and security by reducing our reliance on imported crude oil. (Tr. p. 60 ln. 14 - 20)
22. HEC is designed for a maximum capacity of 400,000 barrels of crude oil a day. (Tr. p. 88 ln. 17 - 18)
23. Pollutants to be emitted from HEC at rates that are significant under the PSD regulation include: Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Particulate Matter (PM), Particulate Matter less than 10 microns (PM₁₀), Particulate Matter less than 2.5 microns (PM_{2.5}), Sulfur Dioxide (SO₂), Volatile Organic Compounds (VOC), Hydrogen Sulfide (H₂S), and Sulfuric Acid Mist. (Ex. 23 p. 2)
24. HEC will produce approximately 19 million total tons per year CO₂ from the petcoke gasification, turbine exhaust, and refinery heaters, a combination of the refinery and IGCC processes. (Tr. pp. 428 ln. 9 - 429 ln. 7)
25. HEC is designed with technology to capture CO₂ from the IGCC power plant. (Tr. p. 273 ln. 18 - 19 and p. 404 ln. 1 - 7)
26. There are unanswered questions regarding the impacts of injecting CO₂ into underground formations. (Tr. p. 415 ln. 2 - 6)
27. HEC will utilize Foster Wheeler's delayed coking process. (Tr. p. 107 ln. 18 - 21)
28. Petroleum coke ("petcoke") is a by-product of the coking process of the refinery and will provide feed stock for the IGCC facility. (Tr. p. 108 ln. 1 - 3)

29. It is environmentally responsible to use petcoke, a byproduct of refining, to avoid the need for purchase of power off the traditional electrical grid and offsite disposal of the byproduct. (Tr. pp. 110 ln. 23 – 111 ln. 4)
30. HEC will require the purchase of approximately 50 megawatts of electricity from third party generators. (Tr. p. 128 ln. 6 - 9)
31. HEC will require the use of approximately 12 million gallons of water per day. (Tr. p. 124 ln. 13 - 16)
32. HEC is designed to reuse water within the facility 3-5 times. (Tr. p. 111 ln. 16, and p. 233 ln. 20 - 23)
33. An acceptable flare minimization plan will be developed for HEC. (Tr. p. 112 ln. 17 - 20)
34. The flare minimization plan will be available for public comment during the Title V permitting process for HEC. (Tr. pp 904 ln. 24 – 905 ln. 2)
35. Refinery flaring at HEC will not be for operational purposes. (Tr. p. 114 ln. 18 - 19)
36. Flaring at the HEC refinery will only occur in extreme circumstances of unavoidable malfunction. (Tr. p. 114 ln. 4 - 5, p. 231 ln. 9 - 11; and p. 804 ln. 10 - 11)
37. HEC will employ the most advanced vapor recovery system of any refinery built in the United States. (Tr. p. 114 ln. 5 - 7)
38. The HEC refinery flare gas recovery system will be designed to handle every release known in the refinery design. (Tr. p. 231 ln. 7 - 9)
39. The 350 mph exit velocity for the refinery flare was confirmed as correct. (Tr. p. 560 ln. 5 - 24)

40. The flare exit velocity for the refinery, as calculated to 117 feet/second, will comply with 40 C.F.R. 60.18 (c)(iii)(i)(A). (Tr. pp. 1354 ln. 22 – 1356 ln. 14)
41. The refinery flare operating at 350 mph will lead to greater dispersion of the pollutants, making their concentration in air negligible. (Tr. p. 1046 ln. 3 - 8)
42. IGCC flares at HEC will be used for startup and shutdown. (Tr. pp. 114 ln. 21 – 115 ln. 1)
43. Most off-specification syngas from startup of the IGCC facility will be recycled and not flared. (Tr. p. 277 ln. 20 – 24)
44. Use of the IGCC flare gas recovery system to compress CO and Hydrogen and use them in the refinery is not feasible. (Tr. p. 331 ln. 12 - 16)
45. Only desulfurized syngas may be flared at HEC IGCC. (Tr. p. 332 ln. 10 - 12)
46. Only above ground storage tanks will be utilized at HEC. (Tr. p. 115 ln. 9 - 12)
47. All tanks containing volatile or emitting materials will be designed with internal floating roofs to minimize emissions. (Tr. p. 236 ln. 17 - 18, and p. 237 ln. 8 - 9)
48. Cooling to less than 130° at the HEC site requires cooling water and cannot be accomplished by air cooling. (Tr. p. 240 ln. 6 - 17)
49. DENR verified the proposed 105°F dry bulb temperature represented by Hyperion. (Tr. p. 915 ln. 2 - 6)
50. The dry bulb temperature is due to the heat island effect that occurs at a refinery. Lower estimates of 90°F do not account for the increased heat produced at a refinery. (Tr. pp. 1357 ln. 16 – 1358 ln. 14)
51. The sole function of the IGCC plant is to support the refinery and its production of transportation fuels. (Tr. p. 247 ln. 18 - 21)

52. Hyperion will install leakless technologies in appropriate applications at HEC. (Tr. p. 259 ln. 18 - 22)

53. As is customary in the industry, the final engineering designs and equipment purchases for HEC have not been completed at this time. (Tr. pp. 62 ln. 19 – 63 ln. 14)

V. DENR Action on Hyperion's Permit Application

54. In December 2007, Hyperion submitted its Application to DENR. (Ex. 23, and Tr. p. 194 ln. 10 - 11)

55. On January 15, 2008 DENR notified the National Park Service ("NPS"), Environmental Protection Agency Region VIII (EPA), and the Iowa Department of Natural Resources that Hyperion's Application had been received, and forwarded a copy of the Application for their review. (Ex. 27; and Tr. p. 674 ln. 7 - 12)

56. On January 17, 2008 DENR notified the Nebraska Department of Environmental Quality and the Minnesota Pollution Control Agency that Hyperion's Application had been received, and forwarded a copy of the Application for their review. (Ex. 29; Tr. p. 674 ln. 7 - 12)

57. DENR determined the HEC application complete on February 20, 2008. (Ex. 30; and Tr. p. 670 ln. 20 - 23)

58. Hyperion's Application was supplemented in May 2008, August and September 2008, and October 2008. (Ex. 31A, 32, and 36 - 40; and Tr. p. 195 ln. 3 - 4 and 10 - 14)

59. DENR proposed a Draft PSD Air Quality Preconstruction Permit on September 11, 2008. (Ex. 43)

60. DENR also submitted a Statement of Basis regarding the Permit in September 2008. (Ex. 44)

61. The Board has considered and adopts DENR's Statement of Basis regarding the Permit, incorporating it herein by reference with any changes noted herein.
62. In September 2008 DENR published the "Notice of Prevention of Significant Deterioration Permit Application and Draft Permit" soliciting public comment on the initial Draft PSD Permit. (Ex. 46; and Tr. p. 679 ln. 1 - 9)
63. In October 2008 DENR published notice of an extension of the public comment period for an additional 30 days to November 14, 2008. (Ex. 87B)
64. The public comment period ended on November 14, 2008. (Tr. p. 904 ln. 15 - 17)
65. DENR received approximately 3,000 comments regarding the Draft Permit. (Tr. p. 680 ln. 7 - 8)
66. Approximately 2,800 of the comments received were from proponents of HEC. (Ex. 223; and Tr. p. 681 ln. 9 - 21)
67. DENR reviewed, considered, and responded to the 3,000 comments in its Response to Comments ("RTC") and where appropriate, DENR incorporated changes to the Permit based on these comments. (Ex. 251; and Tr. p. 683 ln. 15 - 18)
68. DENR conducted a due diligence review of the Application and comments for the HEC Permit, including thousands of hours of review time. (Tr. p. 1459 ln. 11 - 13)
69. The Board has considered the public comments received during the public notice period and adopts DENR's response to comments, incorporating it herein by reference with any changes noted herein.
70. DENR proposed a PSD Air Quality Preconstruction Permit for HEC on December 15, 2008 ("Permit"). (Ex. 252; and Tr. p. 685 ln. 15 - 18)

71. In December 2008, DENR sent a copy of the Permit and its Response To Comments to those persons and entities who submitted comments, notifying them of Hyperion's request for contested case hearing. (Ex. 254 - 256)

72. A Public Comment Hearing and Site Tour were held on April 14 and 15, 2009 at the Elk Point High School in Elk Point, South Dakota.

73. The Board finds that the public was provided meaningful and reasonable opportunity to review and comment in writing and in person on the proposed permit and that documents regarding the Application and Permit were made available for viewing in person or via the DENR website at <http://denr.sd.gov/hyperionaq.aspx> as well as through the Hyperion website at <http://www.hyperionec.com/cms/siouxland-site-air/>.

VI. Procedural History

74. On October 6, 2008 Hyperion, in accordance with ARSD 74:09:01:01, filed a Petition for Contested Case Hearing regarding the Draft PSD Air Quality Preconstruction Permit.

75. On November 7, 2008, Citizens Opposed to Oil Pollution, Save Union County, and Sierra Club filed a Request to be Heard at Prehearing Conference.

76. On November 12, 2008, NPS filed comments regarding the Draft PSD Permit for HEC. (Ex. 168, and Tr. pp. 353 ln. 21 – 354 ln. 1)

77. On November 13, 2008, Citizens filed comments regarding the Draft PSD Permit for HEC. (Ex. 196A)

78. On November 14, 2008, EPA Region VIII Air Program filed comments regarding the Draft PSD Permit for HEC. (Ex. 213, and Tr. p. 344 ln. 24 – 25, p. 681 ln. 22, and p. 682 ln. 4)

79. A Prehearing Conference regarding the Petition for Contested Case Hearing was held on November 20, 2008.

80. The Board appointed Lee M. McCahren, its Vice-Chairman, as the Hearing Chair for the Proceeding.

81. On December 22, 2009, Hearing Chair Lee McCahren issued an Order for Contested Case Hearing and Scheduling Order.

82. By granting Hyperion's request for a contested case hearing, the Board determined that Hyperion's request was proper and complied with ARSD 74:09:01:01.

83. On January 8, 2009 Citizens filed a Petition to Intervene in the Contested Case Hearing and an Answer and Affirmative Defenses to the Petition for Contested Case Hearing.

84. A Prehearing Conference was held on February 11, 2009 to consider Citizens' Petition to Intervene

85. On February 11, 2009, Hearing Chair Lee McCahren issued an Order Granting Petition to Intervene and setting a prehearing conference.

86. DENR filed a Motion for Summary Judgment regarding Citizens claim that DENR improperly exercised its authority and discretion in not performing an Environmental Impact Statement ("EIS") regarding HEC.

87. On May 19, 2009 the Board heard arguments from counsel for parties regarding the DENR Motion for Summary Judgment on the EIS issue and the Board granted DENR's Motion for Summary Judgment.

88. DENR also filed a Motion to Voir Dire of Members of the Board of Minerals and Environment regarding Ex Parte Communications.

89. On May 19, 2009 the Board considered and granted DENR's Motion for Voir Dire of Members of the Board of Minerals and Environment regarding Ex Parte Communications at which time such voir dire was conducted. (Tr. pp. 20 ln. 24 – 32 ln. 25)

90. The Contested Case Hearing was properly noticed and held pursuant to SDCL 1-26-27 and 34A-1-21, and ARSD 74:36:09:03(6) on May 19-22, 2009, June 23-26, 2009, July 15, 2009 and August 20, 2009. The contested case hearing consisted of live testimony presented from eight witnesses and testimony taken by affidavit and stipulation of three additional witnesses.

91. DENR presented testimony from the following witnesses:

a. Brad Schultz: Mr. Schultz is an Environmental Senior Scientist and Team Leader for the Air Monitoring Section of DENR. Mr. Schultz holds a Plant Science degree in Agronomy from South Dakota State University. Mr. Schultz is responsible for the implementation of the ambient air quality monitoring network for South Dakota and oversees special studies on air monitoring as well as reviewing PSD projects. Mr. Schultz has spent over 19 years in DENR's Air Monitoring Section. (Tr. p. 598 – 600)

b. Kyrik Rombough: Mr. Rombough is a Natural Resources Engineering Director with DENR. Mr. Rombough holds a Bachelors Degree in Chemical Engineering from the South Dakota School of Mines and Technology. He has been with the DENR Air Quality Program since 1999. As Team Leader of the Air Quality Permitting Section, he assigns work and reviews work of colleagues regarding permitting issues, is the lead permit writer for the PSD Program and is

responsible for maintaining and updating the South Dakota rules and regulations. Mr. Rombough has been involved in all PSD permits issued in South Dakota. (Tr. p. 643 - 647)

c. Erik Nelson: Mr. Nelson is the State GIS Coordinator with the South Dakota Bureau of Information and Telecommunications. Mr. Nelson holds a Bachelor of Science Degree in Geography. Mr. Nelson has been with the Bureau of Information and Telecommunications for six years. He is responsible for coordinating GIS activities within state government and for acting as a liason to local, federal, and tribal entities creating GIS work in South Dakota. (Tr. p. 1426 – 1429)

92. Hyperion presented testimony from the following witnesses:

a. Preston Phillips: Mr. Phillips is Vice-President of Hyperion Refining, LLC. He holds a Bachelor of Science in Electrical Engineering from Texas A & M University and a Masters in Business Administration from the University of Texas at Austin. Mr. Phillips is Project Executive regarding HEC. (Tr. p. 57)

b. Colin Campbell: Mr. Campbell is a Project Manager with RTP Environmental Associates, Incorporated out of Raleigh, North Carolina. Mr. Campbell is the Project Manager over HEC at RTP. RTP conducted all ambient air quality impacts analyses for the HEC Application. He holds Bachelor of Science degrees in Mechanical Engineering and Economics from North Carolina State University. Mr. Campbell has worked in air quality consulting since 1991 and often teaches courses to government entities, private citizens and industry representatives regarding environmental permitting, particularly regarding PSD

permitting. Mr. Campbell has done extensive air quality analysis and PSD permitting work with refinery projects. (Tr. p. 183 - 188)

c. David Keen: Mr. Keen is a Senior Project Manager at RTP Environmental Associates, Incorporated out of Raleigh, North Carolina. Mr. Keen prepared the air dispersion modeling analysis for the HEC Application. Mr. Keen holds a Bachelor Degree in Biology from Presbyterian College and a Masters degree in Environmental Management from Duke University. He is a Qualified Environmental Professional. Mr. Keen has been working in air modeling and analysis for over 20 years. Mr. Keen has done air modeling for a number of refinery projects. (Tr. p. 471 – 473)

93. Citizens presented evidence from the following witnesses:

a. Kevin Kelley: Those facts to which Mr. Kelley would testify were presented by stipulation. Mr. Kelley is a member of the Sierra Club and a resident of Union County, South Dakota. (Tr. p. 1001)

b. Edward L. Cable: Those facts to which Mr. Cable would testify were presented by stipulation. Mr. Cable is a member of Save Union County and is a resident of Union County, South Dakota. (Tr. p. 1003)

c. Jason Quam: Those facts to which Mr. Quam would testify were presented by stipulation. Mr. Quam is a member of Citizens Opposed to Oil Pollution and a resident of Union County, South Dakota. (Tr. p. 1004)

d. Peter Drivas: Mr Drivas works as an independent consultant in air quality. Mr. Drivas specializes in modeling of accidental releases of materials. He holds a Bachelor and Masters Degree in Chemical Engineering from MIT and a Ph.D. in

Chemical Engineering from Cal Tech University. Mr. Drivas has worked in general air quality consulting for over 30 years. He is a member of the American Meteorological Society, the Air and Waste Management Association, the American Institute of Chemical Engineers, and the American Chemical Society. Mr. Drivas has published technical papers and coauthored books on modeling accidental releases. Mr. Drivas has never worked on a PSD permit for a refinery. (Tr. p. 1008 – 1015)

e. William Powers: Mr. Powers works as an independent air quality consultant. Mr. Powers holds a degree in Mechanical Engineering from Duke University and a Masters Degree in Public Health and Environmental Sciences from the University of North Carolina at Chapel Hill. Mr. Powers has been working as an engineer for approximately 25 years. He is a Registered Professional Mechanical Engineer in the state of California. Mr. Powers works in the areas of air permitting, Best Available Control Technology evaluations, Title V operating air permits, energy studies specializing in greenhouse gas reduction and expert review and testimony. (Tr. p. 1185 – 1190)

VII. General Findings Regarding Contested Case Hearing and Permit

94. Throughout the ten days of the Contested Case Hearing, presentation of witnesses, evidence, and argument, the Board had the opportunity to observe the witnesses and assess their credibility in person and consider the testimony they provided through direct, cross and Board examination.

95. Considering all the evidence presented, the Board finds the testimony of Hyperion's witnesses and DENR staff to be more credible and convincing than Citizens' witnesses.

96. With the exception of Citizens' witness William Powers, the Board finds that the witnesses of Hyperion and DENR have more relevant experience and knowledge with regard to air permitting and evaluation for refinery projects, the IGCC facility, and specifically as to the requirements for HEC.

97. The Board finds that the witnesses of Hyperion and DENR employed accepted, reasonable, and prudent methodologies and analyses and finds their underlying data and conclusions more reliable and convincing.

98. Regarding Citizens' expert Peter Drivas: Mr. Drivas admitted he has never worked on a PSD permit regarding a refinery (Tr. p. 1013 ln. 4 – 6; and pp. 1075 ln. 15 – 1076 ln. 1). He also admitted he did not conduct any independent air modeling regarding HEC (Tr. pp. 1072 ln. 24 – 1073 ln. 2). With respect to conclusions stated in his testimony, he did not calculate any rate of error to determine the accuracy of his claims (Tr. p. 1071 ln. 16 – 22). The opinions of Mr. Drivas were generated exclusively for this litigation. (Tr. p. 1080 ln. 5 - 8)

99. Regarding Citizens' expert William Powers: Mr. Powers did not calculate a rate of error in producing his opinions (Tr. p. 1285 ln. 17 - 20). The opinions of Mr. Powers regarding HEC were generated exclusively for purposes of this litigation. (Tr. pp. 1285 ln. 23 – 1286 ln. 8)

100. Information submitted in the Application and the subsequent submissions of Hyperion was sufficient to review and analyze emission controls. (Tr. p. 833 ln. 11 - 15)

101. Hyperion submitted sufficient data with respect to the wastewater treatment facility and storage tanks to complete the PSD permit analyses. (Tr. p. 833 ln. 16 - 23)

102. Citizens presented no evidence during the contested case hearing regarding their claim that HEC would cause nuisance odor conditions or any other section of SDCL 34A-10. Therefore, the Board finds that any claims Citizens may have raised regarding these issues in their Answer and Affirmative Defenses are not supported by substantial evidence and are denied.

103. The Board further finds that DENR staff properly exercised their judgment in reviewing information and comments and in issuing the proposed Permit. DENR staff has substantial education, training, and experience in reviewing and issuing PSD permits and in the enforcement of federal and state air quality standards and regulations.

104. The Permit issued by DENR and the Application submitted by Hyperion reflect the activities planned at HEC. (Tr. p. 98 ln. 10 - 14)

105. Hyperion is required to construct and operate HEC in accordance with the Permit. (Tr. p. 729 ln. 10 - 13)

106. The Permit is one of many permits that the HEC must obtain, and review of the Permit is limited to air emissions considerations.

A. PSD Applicability

107. The PSD Program is exempt from NEPA EIS requirements. (Tr. p. 1325)

108. The Board previously determined with respect to DENR's Motion for Summary Judgment regarding DENR's refusal to exercise its authority and discretion and perform an EIS, that an EIS is much broader and encompasses many subject matters over which the Board has no jurisdiction. Therefore, the Board voted and ruled that an EIS is not

necessary for consideration in this matter and the DENR properly exercised its authority and discretion in choosing not to perform an EIS. (Tr. p. 19 - 20)

109. The Board continues to believe an EIS is much broader and encompasses many subject matters over which the Board has no jurisdiction, and an EIS is not necessary for consideration in this matter, and the DENR properly exercised its authority and discretion in choosing not to perform an EIS, and the Board therefore reaffirms its prior ruling.

110. South Dakota is in attainment with the NAAQS for all the criteria pollutants. (Tr. p. 654 ln. 7 - 11; and p. 657 ln. 1 - 2)

111. Union County is an attainment area.

112. HEC is proposed as a major source in an attainment area. (Tr. p. 694 ln. 9 - 11)

113. DENR was not required to perform a New Source Review because South Dakota is in attainment for all pollutants. (Tr. p. 693 ln. 11 - 19)

114. HEC's PSD review was triggered by projected emissions greater than the significant threshold for PM, SO₂, NO_x, VOC, CO, H₂SO₄, and H₂S. (Tr. pp. 671 ln. 18 - 672 ln. 6; and p. 699 ln. 3 - 19)

115. The HEC stationary source, for purposes of PSD permitting, includes the combined activities of the IGCC and the refinery. (Tr. p. 246 ln. 5 - 7)

116. The main elements of PSD review are BACT analysis and demonstration of compliance with NAAQS and PSD increment through air quality modeling and impacts analysis.

117. Tailpipe and vehicle emissions are not regulated under South Dakota's PSD Program. (Tr. pp. 722 ln. 23 - 723 ln. 5)

118. Hyperion modeled traffic for trucks coming in to load out product and increased traffic due to industrial growth stemming from HEC. (Tr. pp. 882 ln. 17 – 883 ln. 2)

119. While Citizens raised the issue of modeling additional potential sources of pollution, Citizens did not present any evidence or legal requirement that would require or justify modeling of additional potential sources of pollutants which are not covered by the PSD Program. The Board therefore, based on the evaluation of the evidence and testimony presented in this matter, finds that there is no justification or jurisdiction of DENR to require modeling or consideration of additional potential sources of pollutants not subject to the PSD Program.

120. The PSD air modeling properly utilized PM₁₀ as a surrogate for PM_{2.5} and further required PM₁₀ point sources and PM_{2.5} fugitive emissions be modeled and compared to the PM_{2.5} NAAQS. Tr.P. 715.

i. Crude Characteristics

121. Crude characteristics do not materially affect the design basis as it relates to the Permit and were not needed for preparation of the Application. (Tr. pp. 83 ln. 24 - 84 ln. 2; and p. 262 ln. 1 - 19)

122. Crude characteristics for the input to HEC were not required by DENR. (Tr. p. 83 ln. 17 - 22)

123. Emission Limits are not tied to or based on crude oil type. (Tr. pp. 264 ln. 21 – 265 ln. 25; and p. 943 ln. 11 - 12)

124. The Board recognizes EPA's comments requesting crude slate characteristics but agrees, based on the evidence and testimony presented, that the crude slate characteristics do not affect or impact the analysis to be completed under the PSD Program. The Board

further finds that because the crude slate characteristics do not impact the emissions limits or materially affect the design basis in relation to this Permit, the public was not deprived or harmed by not being presented with those characteristics during the public comment period.

ii. Operational Limits

125. Operational Limit 5.1 limits the refinery to production of 400,000 barrels of crude oil per day on a 365-day rolling average. (Ex. 252 p. 54)

126. Hyperion intends to comply with Operational Limit 5.1. (Tr. p. 88 ln. 9 - 18)

127. Operational Limit 5.2 requires that hydrogen, electricity, and/or steam generated by the IGCC at HEC may only be used for on-site purposes and may not be sold outside the HEC major stationary source. (Ex. 252 p. 54)

128. Hyperion intends to comply with Operational Limit 5.2. (Tr. pp. 89 ln. 12 - 90 ln. 1)

129. Operational Limit 5.3 requires a 0.0005 percent efficient drift eliminator be installed, operated and maintained on the wet cooling tower. (Ex. 252 p. 54)

130. Hyperion intends to comply with Operational Limit 5.3. (Tr. p. 90 ln. 6 - 17)

131. Operational Limit 5.4 requires that all haul roads and parking lots within the HEC property boundaries be paved prior to initial startup of the refinery. (Ex. 252 p. 54)

132. Hyperion intends to comply with Operational Limit 5.4. (Tr. p. 91 ln. 17 - 20)

133. Operational Limit 5.5 limits the input of sulfur to 2,040 tons of sulfur per day into six sulfur recovery trains and associated thermal oxidizers. (Ex. 252 p. 54)

134. Operational Limit 5.5 was intended to refer to 2,040 long tons of sulfur per day as all calculations, in the Application and Permit, were based on long tons. (Tr. p. 226 ln. 17 - 18, and p. 384 ln. 5 - 9)

135. Operational Limit 5.5 should read: "In accordance with ARSD 74:36:09:02, as referenced to ARSD 74:36:05:16.01(8), the owner or operator shall not input more than 2,040 long tons of sulfur per day into the six sulfur recovery plant trains and associated thermal oxidizers (Unit #42a through #42f)." (Tr. p. 383 ln. 2 - 10)

136. Hyperion intends to comply with Operational Limit 5.5 as restated and limit the input of sulfur to 2,040 long tons of sulfur per day into six sulfur recovery trains and associated thermal oxidizers. (Tr. pp. 91 ln. 21 – 92 ln. 2)

137. Operational Limit 5.6 limits the operation to four of the five combined cycle combustion turbines systems at any given time and the heat input to 1,942,000 million Btus per 365-day rolling average. (Ex. 252 p. 54-5)

138. Hyperion intends to comply with Operational Limit 5.6. (Tr. pp. 92 ln. 3 - 93 ln. 8)

139. Operational Limit 5.7 limits the operation at HEC to six of the eight gasifier startup burners at any given time. (Ex. 252 p. 55)

140. Hyperion intends to comply with Operational Limit 5.7. (Tr. pp. 93 ln. 15 – 94 ln. 8)

141. Operational Limit 5.8 requires the use of generator and fire pumps to be 2008 model or newer, used less than 300 hours per 12-month rolling period, excluding emergencies. (Ex. 252 p. 55)

142. Hyperion intends to comply with Operational Limit 5.8. (Tr. pp. 94 ln. 9 – 95 ln. 13)

143. Operational Limit 5.9 establishes the information to be included in and requires the development, maintenance, implementation, and submission of a written Operation, Maintenance, and Monitoring Plan within 60 days of the initial startup of the refinery. Any additional changes must be submitted and approved by the Secretary. (Ex. 252 p. 55 - 6)

144. Hyperion intends to comply with Operation Limit 5.9. (Tr. pp. 95 ln. 17 - 96 ln. 8)

145. The Operation, Maintenance, and Monitoring Plan cannot be finalized until the equipment is fully designed. Since final engineering designs are not completed and equipment has not been ordered at this time, the plan cannot be finalized. (Tr. p. 798)

146. The public will have an opportunity to review and comment on the Operation, Maintenance, and Monitoring Plan when it is submitted and when it is reviewed in relation to a Title V permit application for operation of HEC at a later time. (Tr. p. 753 ln. 8 - 13)

147. Operational Limit 5.10 establishes the information to be included in and requires the development of a written Startup, Shutdown, and Malfunction plan to be submitted and approved by the Secretary 90 days prior to initial startup of the refinery. Any subsequent changes must be submitted to the Secretary for review and approval. (Ex. 252 p. 56 - 7)

148. Hyperion intends to comply with Operational Limit 5.10. (Tr. pp. 96 ln. 17 – 97 ln. 12)

149. It is not possible to develop a Startup, Shutdown, and Malfunction plan until all of the equipment for HEC is designed and that design has not happened at this point. (Tr. pp. 386 ln. 11 – 387 ln. 10; and pp. 749 ln. 19 - 750 ln. 16)

150. The public will have an opportunity to review and comment on the Startup, Shutdown, and Malfunction plan, the Operation Maintenance and Control Plan, the Flare Minimization Plan, and the Dust Minimization Plan when they are submitted in compliance with the conditions of this Permit and when they are reviewed in relation to a Title V permit application for operation of HEC at a later time. (Tr. p. 753 ln. 8 - 13)

151. The public had the opportunity to comment on the criteria and specifications for the Startup, Shutdown, and Maintenance Plan, the Operation Maintenance and Control Plan, the Flare Minimization Plan, and the Dust Minimization Plan. (Tr. pp. 883 ln. 24 – 884 ln. 3)

152. The Board finds that because the public was afforded an opportunity to review and comment on the requirements for the Startup, Shutdown, and Maintenance Plan, the Operation Maintenance and Control Plan, the Flare Minimization Plan, and the Dust Minimization Plan, the public had adequate opportunity to participate in the formulation of the requirements for these plans. Furthermore, based on the evidence presented by Hyperion and DENR and the lack of substantial conflicting evidence by Citizens, regarding the inability to prepare a sufficiently accurate Startup, Shutdown, and Maintenance Plan, Operation Maintenance and Control Plan, Flare Minimization Plan, and Dust Minimization Plan, it would be inappropriate and unreasonable to require the development of these plans at this time. Additionally, these plans will be available for

public comment during any Title V Permit review process and therefore the public will have an adequate opportunity to comment on those plans at that time.

153. It is not possible to establish short-term numeric emission limits for startup, shutdown, and malfunctions because performance tests cannot be performed during these times. (Tr. p. 749 ln. 11 - 13)

154. Citizens mistakenly argue that the Arizona Clean Fuels Permit limits include Startup, Shutdown, and Malfunctions. Mr. Campbell, who authored both of the Arizona Clean Fuels permits, clearly established that the permits exempt emissions during Startup, Shutdown, and Malfunctions from the BACT limits. (Tr. p. 1365 ln. 5 - 14)

155. The Board finds that Operational Limits 5.1 through 5.10 are reasonable and supported by substantial evidence as presented at the contested case hearing. Further, the Board finds that DENR's review of information, comments, and data regarding these Operational Limits was appropriate and the Board agrees with DENR's analysis finding these Operational Limits to be in compliance with applicable regulations.

iii. Thermal Oxidizers for Storage Tanks

156. In Operational Limit 5.11 DENR proposes two scenarios in which the tank farm may be operated. (Ex. 252 p. 57; Tr.P. 742-743.)

157. DENR recommends thermal oxidizers in addition to floating roofs on a majority of the storage tanks. (Tr. p. 742)

158. Thermal oxidizer technology is available, feasible, and useable for HEC. (Tr. pp. 743; 842 ln. 24 – 863 ln. 1)

159. Hyperion presented evidence regarding its cost analysis of thermal oxidizers for the additional storage tanks. (Tr. pp. 322 - 323)

160. In reviewing Hyperion's cost analysis in relation to installation of additional thermal oxidizers, DENR considered its personal experience with the cost associated with placement of thermal oxidizers on tanks associated with ethanol facilities in South Dakota and with installation of long distance piping and placement of thermal oxidizers on tanks associated with oil wells in Harding County; EPA's cost manual; and the fact that the stated accuracy of Hyperion's cost estimates was plus or minus 50%. Tr.P. 743-745.

161. DENR reviewed the appendix to the EPA Draft New Source Review Manual in reviewing the cost analysis for the additional thermal oxidizers, but did not perform its own cost analysis. (Tr. pp. 743-745; 868 ln. 3 – 870 ln. 12)

162. The South Coast Air Management District has found that external floating roofs, primary and secondary rim seals, and domed lids are BACT without thermal oxidizers on similar sources. (Tr. p. 876 ln. 1 - 4)

163. Because the technology is feasible and Hyperion has not proven by a preponderance of evidence that installation of such technology is not cost effective, requiring thermal oxidizers on the tank farm is warranted. (Tr. p. 238 ln. 22)

164. Operational Limit 5.11 is hereby adopted.

165. South Dakota's approved SIP PSD Program gives the State the final authority to issue the Permit and does not require an additional review period for EPA. (Tr. pp. 682 ln. 23 – 683 ln. 2)

B. BACT Analysis

166. The BACT requirement applies to each regulated pollutant that will be emitted from HEC in significant quantities, and to each individual new emissions unit and pollutant emitting activity with the potential to emit that pollutant.

167. The BACT analysis determines the best available control technology and establishes an emissions limit based on the maximum degree of reduction available for each emissions unit and each pollutant.

168. South Dakota has adopted the definition of BACT from 40 CFR 52.21(b)(12) establishing BACT as an emission limitation that represents the maximum reduction achievable as determined by the Secretary on a case-by-case review considering economic cost, environmental impacts and energy considerations. (ARSD 74:36:09:02, Tr. p. 694 ln. 3 - 12; and p. 695 ln. 3 - 12)

169. In setting an achievable BACT limit, DENR must recognize that the BACT emission limit must be met at all times at HEC, under worst case scenarios and over the life of the facility. (Tr. p. 706 ln. 5 - 9; and p. 1364 ln. 24 - 25)

170. "Achievable" and "available" are not explicitly defined and are subject to reasonable interpretation, judgment, and discretion.

171. In conducting and/or reviewing a BACT analysis, DENR considers site specific factors (whether the control type is available in South Dakota; whether the control is cost effective at the subject project; the types of raw materials being used; atmospheric conditions) in conducting a proper case-by-case review. (Tr. pp. 704 ln. 16 – 705 ln. 5)

172. DENR must consider whether the BACT limit is achievable for a facility in South Dakota. (Tr. p. 705 ln. 23 - 25)

173. Hyperion was required to do a BACT analysis. (Tr. pp. 698 ln. 24 – 699 ln. 1)

i. CO₂

174. In March 2009 Hyperion completed a Best Available Control Technology ("BACT") analysis for CO₂. (Tr. p. 77 ln. 17 - 18)

175. Hyperion was not required to submit a CO₂.BACT analysis. (Tr. p. 701 ln. 14 - 16)

176. On April 24, 2009, the EPA issued *Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act* in which the EPA proposes to find that greenhouse gases may cause health impacts. This proposal must be subject to public comment and at this time does not substantiate inclusion or requirement of a BACT analysis for CO₂ or any other greenhouse gas. (74 F.R. 78 pp. 18885 - 18910)

ii. CO for Large Process Heaters

177. The BACT limit for CO from process heaters at HEC as proposed by Hyperion is 0.01 lb/mmBtu. (Tr. p. 308 – 309; and p. 379 ln. 21 - 22)

178. The BACT limit for CO for process heaters at HEC, as proposed by Hyperion is more stringent than for any other refinery in the United States. (Tr. p. 312 ln. 4 - 9)

179. DENR recommends a CO limit of 0.007 lb/mmBtu for large process heaters. (Tr. p. 746 ln. 4 - 6; and p. 850 ln. 16 - 18)

180. To establish the BACT limit for CO for large process heaters at 0.007 lb/mmBtu, DENR relied on several permits, including Bay Town Refinery, Cenco Refining, Bay West Refining, and testing that California conducted that indicated that the limit was achievable. Tr. P. 746-747.

181. DENR relied upon the Baytown facility for recommending the 0.007 lb/mmBtu limit for large process heaters, and on a verbal conversation with the California air quality agency that indicated that the 0.007 lb/mmBtu limit has been achieved at that facility. Tr. P. 854-855.

182. DENR also relied upon the CENCO facility for support of the 0.007 lb/mmBtu limit for large process heaters. Although not operational and without performance data, the CENCO facility permit contains a 0.007 lb/mmBtu limit that must be considered along with other information and permits, so that the BACT limits continue to move toward a greater degree of control of the emission of air pollutants. (Tr. P. 746-748; 855 ln. 14, and p. 856 ln. 1 – 6, p. 926.)

183. The actual CO limit for large process heaters at the CENCO facility is not expressed as 0.007 lb/mmBtu and DENR performed a calculation, using EPA methodology, to obtain an equivalent lb/mmBtu number. (Tr. p. 856-857)

184. DENR also relied upon the Big West Refinery to support its 0.007 lb/mmBtu limit for CO from large process heaters. However, the Big West Refinery modification application that involved the addition of process heaters was withdrawn and no performance data exists indicating that 0.007 lb/mmBtu is achievable. (Tr. p. 857 ln. 10 - 19; and p. 858 ln. 8 - 9)

185. EPA cautions against the use of cancelled permits for BACT analysis. (Tr. p. 988 ln. 7 - 16)

186. DENR also based its proposed limits on permits issued to the Tosco facility and the Air Products facility. DENR obtained and reviewed performance test data from Tosco, which burned both refinery gas and natural gas. T. P. 861.

187. A preponderance of the evidence establishes that the limit of 0.007 lb/mmBtu for CO for large process heaters is achievable for refinery process heaters.

188. A limit of 0.007 lb/mmBtu for CO for large process heaters is achievable at HEC.

iii. Cooling Towers

189. A numeric BACT limit for cooling tower emissions is infeasible because there is no way to perform a stack test on the cooling tower. (Tr. p. 316 ln. 17 - 19)

190. Citizens argue that air cooling should be required for both the IGCC and refinery at HEC. (Tr. p. 1253 – 1260)

191. Citizens' witness William Powers bases his conclusions that air cooling is appropriate for IGCC at the HEC because it is employed at facilities other than IGCC power plants. (Tr. p. 1254 ln. 7 - 9)

192. HEC is a combined refinery and IGCC co-located on the HEC site.

193. In relation to cooling at the HEC refinery, Citizens' witness William Powers bases his conclusion that air cooling is acceptable and feasible on the fact that he requested a bid for a 10 degree delta dry cooling system and was able to obtain a bid for such equipment. (Tr. p. 1257 ln. 10 - 22)

194. Mr. Powers did not supply any testimony or evidence regarding the relation of the parameters or operations for the facility he requested the dry cooling bid for, to the parameters or operations of HEC. Additionally, Mr. Powers admitted in his testimony, that even with a 10 degree delta, HEC would still not have adequate cooling to reach the design temperature.

195. Citizens' witness William Powers also questioned the design temperature of 105°F and noted that documentation delivered in discovery indicated a potential design temperature of 90°F. (Tr. pp. 1257 ln. 23 – 1258 ln. 12)

196. Hyperion witness Colin Campbell offered testimony that the design temperature changed during the design evaluation process. While 90°F was originally believed to be the proper design temperature, it was discovered that refineries create a heat island effect and the proper design temperature for HEC is actually 105°F. (Tr. pp. 1357 ln. 16 – 1358 ln. 14)

197. Citizens failed to produce any evidence or testimony establishing any inaccuracy in the justification for a 105°F design temperature for HEC.

198. Based on the exhibits and testimony presented, the Board finds substantial evidence to support the necessity of wet cooling at HEC in order to achieve the 105°F design temperature, and the heat island impacts of a refinery make dry cooling inadequate at HEC for either the IGCC or refinery.

iv. Storage Tanks

199. Internal floating roofs on the vacuum residuum storage tank at HEC are not feasible for the storage tanks at HEC. (Tr. p. 319 ln. 10 - 16)

200. There is not a storage tank at any refinery in the United States configured in the manner proposed by DENR. (Tr. p. 325 ln. 16 - 20) However, this fact must be considered along with other information and permits, so that BACT limits continue to move toward a greater degree of control of the emission of air pollutants.

201. The use of a thermal oxidizer to control emissions from storage tanks as proposed by DENR is achievable, but would require the use of auxiliary fuel. (Tr. p. 322 ln. 8 - 10)

202. The use of a thermal oxidizer to control emissions from storage tanks as proposed by DENR would result in collateral emissions from combustion of auxiliary fuel. (Tr. p. 322 ln. 11 – 16; Tr. P. 746-747.)

203. The use of a thermal oxidizer to control emissions from storage tanks as proposed by DENR would involve some cost, but the preponderance of evidence regarding this cost does not demonstrate that it is not cost effective. (Tr. p. 322 ln. 11 – 20; Tr. P. 743-745.)

v. Loading Racks

204. The permitted loading rack capacity is less than 4 percent of the total refinery capacity. (Tr. p. 239 ln. 9 - 12)

205. The BACT limit established by DENR for loading racks at HEC is more stringent than for any other refinery in the United States. (Tr. pp. 326 ln. 14 – 327 ln. 1)

vi. NO_x for Process Heaters

206. The BACT limit established by DENR for NO_x from process heaters at HEC is more stringent than for any other refinery in the United States. (Tr. p. 304 ln. 14 - 21)

207. EPA's request for selective catalytic reduction for process heaters is not cost effective and does not account for the environmental impacts associated with such implementation. Specifically, requiring selective reduction would not meet the automatic offset ratio established by EPA, as HEC would be reducing NO_x by 20 tons but would be increasing PM_{2.5} by at least a ton for each SCR required (total of 10 tons). (Tr. p. 941 ln. 5 - 24; p. 947 ln. 7 - 10; and p. 1465 ln. 7 - 18)

208. Citizens' argue that the total NO_x reduction should be considered, rather than the incremental cost effectiveness proposed by Hyperion for adding the selective catalytic

reduction systems. However, it was established at the contested case hearing that it would be arbitrary to determine cost effectiveness without considering the incremental cost effectiveness, because Hyperion would not purchase these heaters without low NO_x burners as they are not manufactured without low NO_x burners, and therefore it is not realistic to calculate reductions based on heaters without low NO_x burners. (Tr. p. 1328 ln. 11 - 15)

209. The costs presented regarding the selective catalytic reduction for the 10 small process heaters are actual costs as determined by a Certified Cost Engineer reviewing actual cost data from vendors. (Tr. pp. 1332 ln. 20 – 1333 ln. 10)

vii. VOC for Process Heaters

210. The BACT limit established by DENR for VOC from process heaters at HEC is as stringent as for any other refinery in the United States. (Tr. pp. 312 ln. 15 – 313 ln. 2)

viii. Sulfur for Process Heaters

211. The sulfur limit for process heaters of 25 parts per million expressed as total sulfur in fuel gas is the most stringent BACT limit for any refinery.

212. The BACT limit established by DENR for sulfur in fuel gas burned in process heaters at HEC is more stringent than for any other refinery in the United States. (Tr. p. 307 ln. 23 - 25)

ix. PM for Process Heaters

213. The BACT limit established by DENR for PM from process heaters at HEC is as stringent as for any other refinery in the United States. (Tr. p. 315 ln. 6 - 9)

x. Catalyst Regeneration Units

214. The BACT limits established by DENR for NO_x, SO₂, CO, and PM from the catalyst regeneration units at HEC are more stringent than for any other refinery in the United States. (Tr. pp. 315 ln. 13 – 316 ln. 4)

xi. Sulfur Recovery Plant

215. The BACT limits established by DENR for NO_x, SAM, H₂S, CO, VOC and PM from the sulfur recovery plant at HEC is more stringent than for any other similar facility in the United States. (Tr. p. 318 ln. 11 - 24)

xii. Wastewater Treatment Plant

216. The BACT limit established by DENR for NO_x and VOC from the wastewater treatment plant at HEC is more stringent than for any other refinery in the United States. (Tr. p. 327 ln. 2 - 13)

xiii. IGCC

217. BACT for use of desulfurized syngas at HEC IGCC is more stringent than for any other refinery in the United States. (Tr. p. 332 ln. 10 - 12)

218. The BACT limits established by DENR for NO_x, SO₂, CO, VOC, H₂S, PM₁₀ and PM at HEC IGCC flare are more stringent than for any other similar facility in the United States. (Tr. pp. 331 ln. 25 – 333 ln. 3; and p. 338 ln. 21 - 25)

219. The BACT limits established by DENR for CO and hydrogen sulfide from the CO₂ vent at HEC are more stringent than for any similar facility in the United States. (Tr. p. 335 ln. 12 - 16)

xiv. Flare Control

220. The BACT limit established by DENR for flare control at HEC refinery is more stringent than for any other refinery in the United States. (Tr. p. 315 ln. 1 - 5)

221. The HEC refinery flares will only be allowed to flare during emergency events and other malfunctions. (Tr. p. 314 ln. 22-25)
222. The work practice standard for HEC refinery and IGCC flares complies with 40 C.F.R. 60.18. (Tr. p. 901 ln. 11 - 14)
223. Citizens' suggest that enclosed ground flares should be considered for the refinery and IGCC facilities. (Tr. pp. 1239 ln. 14 – 1240 ln. 10)
224. Enclosed ground flares are not practical at HEC because enclosed ground flares could not handle the capacity of gas that would be routed there during certain malfunctions at HEC. (Tr. pp. 1343 ln. 15 – 1344 ln. 7)
225. Refineries that employ enclosed ground flares for destruction of routinely or intermittently generated gas streams also have candlestick flares for emergency and malfunction events. (Tr. pp. 1343 ln. 15 – 1344 ln. 7)
226. The IGCC facility will have to have a candlestick flare for use in emergency and malfunction events. (Tr. p. 1464 ln. 22 - 24)
227. Citizens have produced no evidence establishing an inaccuracy in Hyperion or DENR's analysis, indicating that an enclosed ground flare would be capable of handling the capacity of gases from a potential malfunction at HEC. Furthermore, Citizens have not established that the number and type of flares proposed by Hyperion and DENR would not be needed or could be replaced with enclosed ground flares, and therefore enclosed ground flares would be additional required equipment for which Citizens produced no environmental, economic or other analysis for adequate consideration.

228. Citizens suggest that the refinery fuel gas system should be used to recover off-specification syngas from the IGCC facility at HEC. (Tr. pp. 1243 ln. 20 – 1244 ln. 3, and p. 1246 ln. 3 – 6)

229. Citizens' witness William Powers relies on the configuration of the Shell Martinez Refinery as the basis for his conclusion that off-specification syngas from the IGCC facility at HEC can be recovered. (Tr. p. 1244 ln. 9 – 23, and p. 1246 ln. 3 – 6)

230. However, the Shell Martinez Refinery does not have an IGCC plant. Instead, this refinery has a Flexicoker, which produces a low Btu fuel gas stream continuously. (Tr. p. 1246 ln. 8 – 16)

231. Unlike the Flexicoker gas used as fuel at Shell Martinez Refinery, the off-specification syngas that will be flared at the IGCC at HEC will be produced less than 200 hours per year. The process heaters at HEC cannot be designed to operate on a fuel that will be available less than 200 hours per year. (Tr. pp. 1340 ln. 15 – 1341 ln. 17)

232. The BACT analysis for the IGCC flare emissions at HEC was properly conducted and analyzed. (Tr. p. 809 ln. 18 – 21)

xv. Continuous Emissions Monitoring Systems

233. Continuous Emissions Monitoring ("CEMS") are required for NO_x, SO₂, CO, and H₂S. (Tr. p. 755 ln. 18 - 20)

xvi. Leak Detection and Repair

234. EPA defines leakless technology to be less than 500 ppm leaks. (Tr. pp. 894 ln. 24 – 895 ln. 1)

235. DENR's requirement for monthly monitoring and low 100 ppm and 500 ppm leaks will force HEC to use inherently leakless technology or reduce the amount of

equipment that leaks at HEC, and therefore is more stringent than simply requiring so-called leakless technology. (Tr. p. 895 ln. 11 - 16; and p. 1453 ln. 18 - 21)

236. Even "leakless" equipment will leak because no control technology is 100% leak efficient, and therefore requiring a Leak Detection and Repair program is appropriate. (Tr. p. 812 ln. 21 - 24; p. 815 ln. 3 - 6; p. 937 ln. 23 - 25; and p. 1216 ln. 2 - 3)

237. EPA has decided not to require leakless technology at similar sources. (72 Fed. Reg. 221; Tr. and 1295 ln. 6 – 1295 ln. 6)

238. Leakless technology and controls were not required across the board in the Arizona Clean Fuels Permit. (Tr. pp. 1317 ln. 24 – 1318 ln. 5)

239. A cost analysis was not required for LDAR because it was the top BACT option. (Tr.p. 898 ln. 18 - 20)

C. Air Modeling

240. South Dakota is in attainment for NAAQS (PM₁₀, PM_{2.5}, CO, ozone, SO₂, and NO_x). (Tr. p. 608 ln. 14 - 17, and Ex. 267)

241. Hyperion's air modeling and air quality impacts analysis was conducted by RTP Environmental Associates, Inc. (Tr. p. 188 - 189)

242. Hyperion submitted a modeling protocol to DENR in March 2007 (Ex. 1A) and provided revisions to DENR at what is marked Ex. 1B.

243. In March 2007 Hyperion submitted modeling consistent with the approved modeling protocol.

244. Hyperion's air modeling employed only EPA approved models in the most recent format available at the time the models were run. (Tr. p. 483 ln. 18 - 19; and p. 492 ln. 19 - 22)

245. Hyperion and DENR's modeling was conducted in accordance with 40 C.F.R. 52.21 Appendix W.

246. The Board finds Hyperion and DENR's methodology and data for modeling appropriate, reasonable, and representative of the HEC site and finds that all modeling conducted by Hyperion and DENR was conducted in accordance with modeling regulations and guidance.

i. Class I and Class II Modeling

247. DENR provided notice to NPS regarding Hyperion's application on January 15, 2008.

248. For purposes of the visibility modeling, all pollutants emitted from Hyperion were conservatively modeled as if exiting one hypothetical stack. (Tr. p. 1135 ln. 3 - 5)

249. There are two Class I areas in South Dakota, Wind Cave National Park and Badlands National Park, both over 400 kilometers away from HEC. (Tr. p. 672 ln. 21 - 23; and p. 673 ln. 1)

250. The Lewis and Clark National Historic Trail and the Missouri National Recreational River are not Class I areas, but rather are part of a Class II area comprising the entire state of South Dakota. (Tr. p. 356 ln. 6 - 17)

251. The Lewis and Clark National Historic Trail and the Missouri National Recreational River are within approximately 13 km of the HEC site. (Tr. p. 589 ln. 18 - 22)

252. DENR and the NPS did not require Class I visibility modeling.

253. No Class I visibility analysis was conducted for the HEC Application. (Tr. p. 513 ln. 7 - 9)

254. On July 23, 2008, the NPS confirmed that no Class I visibility analysis was required for HEC. (Ex. 35; and Tr. p. 673 ln. 5 - 13; p. 717 ln. 6 - 16; pp. 791 ln. 19 – 792 ln. 4; and p. 795 ln. 6 - 7)

255. NPS comments regarding HEC air modeling improperly requested the use of Class I-type analysis at Class II areas. (Ex. 168, and Tr. p. 579 ln. 16 - 22)

256. VISCREEN and PLUVUE-II models were used to conduct the Class II visibility analysis. (Tr. pp. 513 ln. 10 – 514 ln. 4)

257. All necessary Class II modeling was performed by Hyperion. (Tr. p. 795 ln. 12 - 14)

258. Initial visibility monitoring conducted using VISCREEN showed no impact at 4 of 5 national parks. The fifth park was remodeled using PLUEVUE II. (Tr. p. 719 ln. 19 - 25)

259. DENR determined that Hyperion properly conducted the visibility modeling, which showed no visibility impacts at the closest park. (Tr. pp. 720 ln. 24 – 721 ln. 1)

260. Method 9 visibility analysis for flare emissions is more stringent than Method 22. (Tr. p. 922 ln. 5 - 8)

261. Method 9 ensures a more accurate assessment of whether there is an actual visible plume because it requires certification for assessment and establishes criteria for evaluation of the plume. (Tr. p. 1451 ln. 9 – 22)

262. The Board agrees with DENR's analysis regarding Class I and Class II visibility modeling and its analysis of modeling results, and adopts DENR's findings.

ii. Air Monitoring Data

263. No established and verified monitoring data or background ambient data exists for Union County, South Dakota. (Tr. p. 480 ln. 12 - 14, and p. 518 ln. 5 - 6)

264. The air modeling completed for Hyperion regarding HEC used appropriate methodologies and reasonable, reliable and conservative assumptions approved by EPA.

265. Emissions from malfunctions, such as from the refinery flares at HEC, are not included in the potential to emit and are not included in the air quality impacts analysis. (Tr. p. 805 ln. 13 - 25; p. 806 ln. 4 - 5; pp. 938 ln. 24 – 939 ln. 13 and ln. 20 - 22; Alabama Power vs. EPA; and 40 C.F.R. 52.21 Appendix W)

a. Representative Data Sites

266. In determining representative meteorological data, a number of factors should be considered: 1) proximity to the proposed site location, 2) complexity of the terrain, 3) exposure of the meteorological site, 4) length of record of data collected, and 5) land use. (Tr. pp. 1029 ln. 12 – 1030 ln. 2)

267. Sioux City, Iowa is approximately 26 miles from HEC. (Tr. p. 639 ln. 15 - 18)

268. Sioux Falls, South Dakota is approximately 51 miles from HEC. (Tr. p. ln. 19 - 21)

269. The AERMOD Implementation Guide indicates that one should not rely solely on proximity to the proposed facility. (Tr. p. 1082 ln. 10 - 23)

270. Surface meteorological data used in the analysis came from the Sioux Falls, South Dakota airport. (Tr. p. 494 ln. 10 - 17)

271. Upper air meteorological data and CO background monitoring data used in the analysis were collected at the closest such monitoring site, located in Omaha, Nebraska. (Tr. p. 494 ln. 18 - 22, p. 495 ln. 10 - 12; and p. 495 ln. 13 - 16)

272. DENR recommended use of upper level meteorological data from Omaha, Nebraska. (Tr. pp. 618 ln. 25 – 619 ln. 3)
273. DENR recommended Hyperion use Sioux Falls, South Dakota data as it is more representative of the HEC site.
274. Sioux City, Iowa is located in the Missouri River Valley, which is believed to affect air quality and meteorological data. (Tr. p. 615 ln. 3 - 10; and p. 1403 ln. 3 - 6)
275. Sioux Falls, South Dakota is located in the Sioux River Valley, which has less affect on the air quality and meteorological data than the Missouri River Valley. (Tr. pp. 615 ln. 24 - 616 ln. 3; p. 618 ln. 8 - 9 and ln. 21 - 22; and p. 1424 ln. 4 - 8)
276. The terrain surrounding the Sioux Falls monitoring location is more representative of the terrain surrounding the HEC site. (Tr. pp. 766 ln. 24 – 767 ln. 3)
277. Citizens' exhibit 2035 is exaggerated, causing the elevations to be distorted. It could not be replicated by DENR. (Tr. pp. 1397 ln. 21 – 1399 ln. 11; and p. 1434 ln. 5 - 10)
278. Because of the exaggeration of the vertical elevations, Citizens' exhibit 2035 is not an accurate depiction of the topography of the HEC and Sioux City area. (Tr. pp. 1434 ln. 25 – 1435 ln. 5)
279. The Sioux Falls Airport meteorological data is more representative of the HEC site than the Sioux City meteorological data. (Tr. p. 1413 ln. 16 - 19)
280. Citizens did not perform modeling using the Sioux City, Iowa data and therefore the rate of error in calculation for the criticisms to Hyperion's permit is unknown. (Tr. p. 1071 ln. 16-22)

281. Hyperion employed ambient monitoring data from Sioux Falls, South Dakota in its modeling analysis.

282. Hyperion recommended using Sioux City, Iowa ambient data in its modeling protocol. (Tr. p. 480 ln. 20 – 23)

283. DENR has been granted the authority to determine what existing ambient data is most representative of the site. (Tr. p. 480 ln. 18 - 20)

284. DENR determined that Sioux Falls, South Dakota background data should be used. (Tr. p. 481 ln. 4 - 5)

285. Sioux Falls, South Dakota monitoring sites monitor for all criteria pollutant parameters (PM SO₂, NO_x, and VOC) needed for the review of emissions at HEC, whereas Sioux City only monitors for particulate matter. (Tr. p. 608 ln. 7 - 11, p. 615 ln. 11 - 14; p. 637 ln. 25; and p. 638 ln. 1 - 4)

286. DENR also found Sioux Falls to be more representative of HEC because it was not impacted by as many industrial activities as Sioux City. (Tr. p. 756 ln. 22 - 25)

287. In determining the appropriate monitoring data to be used, DENR considered land use, topography, and major sources in the area that may influence the site. Additionally, DENR considered how the monitoring sites were set up, emissions inventories around the monitoring sites, and obstructions that may interfere with the monitoring. Such considerations were well reasoned and appropriate. (Tr. p. 613 ln. 20, p. 614 ln. 3; and pp. 614 ln. 18 – 615 ln. 1)

288. Sioux City, Iowa monitoring showed higher PM values than found at Sioux Falls, South Dakota. (Tr. p. 615 ln. 2 - 3)

289. Citizens propose use of the Lowell Elementary School in Sioux City, Iowa for obtaining background ambient monitoring data. (Tr. p. 1099 ln. 14 - 17)
290. A number of activities with potential PM emissions exist near the Lowell Elementary School, overly exaggerating PM concentrations expected at the HEC site. (Tr. pp. 1109 ln. 21- 1111 ln. 19)
291. The Sioux Falls Hilltop PM_{2.5} and PM₁₀ data are more representative of the HEC site than the Lowell Elementary School site data from Sioux City. (Tr. pp. 1413 ln. 20 – 1414 ln. 1)
292. Citizens' modeling expert, Richard Drivas did not visit or investigate the Sioux Falls, South Dakota Hilltop site. (Tr. p. 1116 ln. 14 - 17)
293. Citizens did not perform modeling using the Sioux City, Iowa data and therefore the rate of error in calculation for the criticisms to Hyperion's permit is unknown. (Tr. p. 1071 ln. 16 - 22)
294. DENR initiated monitoring at the HEC site on January 1, 2009 to collect background data and monitor during construction and operation of HEC. (Tr. p. 609 ln. 3 - 15)
295. Data from DENR's on-site monitoring at HEC is not currently publicly available as it is undergoing review.
296. Initial review of the on-site data for HEC indicates that pollutant concentrations at HEC are lower than at the Sioux Falls monitoring site. (Tr. p. 612)
297. Both Sioux Falls and Sioux City have higher background pollutant concentrations than expected at HEC because both are more urbanized and industrial than Union County. (Tr. p. 756 ln. 9 - 17)

298. Like DENR, the Board finds that Sioux Falls, South Dakota monitoring data is more representative of HEC than Sioux City, Iowa. (Tr. p. 615 ln. 17 - 18, p. 616 ln. 22 - 24; and p. 639 ln. 7 - 10)

b. NAAQS and Increment Analysis

299. Hyperion modeled PM, SO₂, and NO_x for NAAQS and PSD increment consumption analyses. (Tr. p. 712 ln. 10 - 21)

300. AERMOD is the approved model for PM₁₀ modeling analysis. (Tr. p. 715 ln. 6 - 10)

301. DENR ran AERMOD for comparison to Hyperion's results and received the same outcomes as Hyperion, no exceedance of NAAQS or PSD increments. (Tr. p. 771 ln. 11 - 13, and ln. 16 - 18; and p. 844 ln. 21 - 23)

302. Estimates of consumption of 98% of NAAQS for PM_{2.5} is overestimated, as this total is based on monitoring data from Sioux Falls which indicates higher PM_{2.5} concentrations than are expected at the HEC site. (Tr. pp. 1445 ln. 23 - 1446 ln. 2)

303. Estimates of PM_{2.5} NAAQS impacts are also overstated because the impacts assume that the majority of emissions are PM₁₀, which is an overestimate of PM_{2.5} emissions.

304. No monitoring or modeling guidance requires the use of an average of three years of monitoring data in assessing PM_{2.5} NAAQS compliance. (Tr. p. 1128 ln. 5 - 18)

305. Modeling for PM is not required for construction of HEC, but only for operational analysis. (Tr. pp. 716 ln. 17 - 717 ln. 1)

306. Emissions during construction are not regulated by the PSD Program. (Tr. p. 819 ln. 20 - 22)

307. Hyperion submitted an adequate air quality analysis to demonstrate compliance with NAAQS and PSD increment.

308. The air modeling presented by Hyperion and DENR compared estimated emission rates for HEC and added the emission rates from nearby facilities to obtain the concentration to be added to the monitored background concentrations. This sum was then compared to NAAQS. (Tr. pp. 709 ln. 15 – 710 ln. 3)

309. Modeling conducted by Hyperion showed the PSD increment was not consumed. (Tr. pp. 712 ln. 24 – 713 ln. 1)

310. Modeling conducted by DENR resulted in the same conclusion. "[C]oncentration from the Hyperion facility plus all the other increment ones would not exceed, or would not cause or contribute to exceed the National Ambient Air Quality Standard and the PSD increments." (Tr. p. 714 ln. 3 - 7)

311. Citizens' exhibit 2041 relies on Sioux City data to analyze NAAQS compliance. Because data from Sioux City is not representative of the HEC site, exhibit 2041 is inaccurate. (Tr. p. 1447 ln. 12 - 25)

312. Exhibit 2041, created and relied upon by Citizens, contained uncertified data, making reliance on the representations of the exhibit unsubstantiated. (Tr. p. 1404 ln. 4 - 13; p. 1406 ln. 17 - 19; and p. 1407 ln. 2 - 8 and 9 - 16)

313. After review of the evidence regarding air modeling, and as further discussed below, the Board finds that the modeling conducted by RTP for Hyperion regarding HEC, and the modeling conducted by DENR, represent reasonable, reliable and appropriate demonstrations that HEC will not cause or contribute to a violation of NAAQS or PSD increment.

c. Short-Term Emission Rates

314. Short-term emission rates were used in air modeling for HEC. (Tr. p. 561 ln. 6 - 12)

315. Use of short-term emission rates creates a conservative representation of annual emissions as it does not account for downtime and assumes the source is operating at maximum emissions 365 days a year. (Tr. p. 561 ln. 16 - 22)

d. Additional Impacts Analysis

316. Hyperion had an additional impacts analysis conducted for growth, soils, and vegetation.

317. DENR determined that HEC's impact to soil and vegetation would not exceed the National Ambient Air Quality Standard. (Tr. pp. 721 ln. 24 – 722 ln. 2)

318. After review of the evidence regarding the additional impacts analysis, the Board determines that no adverse impacts are expected to air quality, visibility, or soils and vegetation as a result of HEC and associated commercial, residential, and industrial growth.

319. A health risk assessment is not required for review of a PSD permit application and Hyperion was not required to submit this assessment. (Tr. p. 691 ln. 2 – 13). Furthermore, DENR acted reasonably and appropriately in not considering a health risk assessment in issuing the HEC Permit.

iii. MACT

320. HEC constitutes a new major source of hazardous air pollutants that must comply with the MACT standards. (Tr. p. 341 ln. 17 - 21; and p. 821 ln. 15 - 19)

321. A proper MACT analysis was conducted for hydrogen chloride, VOC and possible metal constituents of PM. (Tr. p. 342 ln. 8 - 19)

322. EPA has established methods for use of surrogates in a MACT analysis. (Tr. pp. 825 ln. 24 – 826 ln. 2).

D. Other Issues.

322A. In order to address particulate matter emissions from both construction and operation of the HEC, DENR proposed a series of conditions concerning Fugitive Dust Controls. These conditions require the development of a Fugitive Dust Plan and use of best management practices to minimize dust from roads and storage piles during both construction and operation of the facility, and are premised upon the DENR's experience with particulate matter control in Rapid City. (Tr. P. 740).

CONCLUSIONS OF LAW

VIII. General

323. To the extent that any of the following conclusions of law may be determined to be findings of fact or mixed findings of fact and conclusions of law, the same are incorporated by this reference as a finding of fact as if set forth in detail.

324. The Board has jurisdiction over the parties to and subject matter of this administrative proceeding.

325. The burden of proof as to an issue on which a party bears the burden is by a preponderance of the evidence.

326. The Board has determined that it does not require any further information to assess the proposed permits or to determine if any party has met its burden of proof as to any issue in this proceeding.

327. The Board concludes that all applications, draft permits, and required filings are in conformity with South Dakota law. All procedural requirements, including public participation requirements under South Dakota law have been met. All data and exhibits have been filed and/or received into evidence during the contested case hearing.

328. The Board concludes that the application, draft permit and notices are legally and procedurally appropriate, complete, and executed. All formatting and timing requirements have been complied with. All public hearing requirements have been met.

329. A full and fair opportunity to litigate the issues involved in this matter was given to all parties prior to the Board's decision, as required by SDCL Ch. 1-26.

330. The Board concludes that the Permit, as modified herein, is supported by the testimony of witnesses and evidence presented, and that DENR and Hyperion have met their burden of proof by a preponderance of the evidence to establish that the Permit, as modified herein, should be issued.

331. The Permit and conditions thereto are enforceable.

IX. Applicable Law

332. The permit is governed by the rules in Administrative Rules of South Dakota (ARSD) §§ 74:36:05 and 74:36:09.

333. South Dakota PSD regulations ARSD 74:36:09 was determined by EPA to meet the criteria established in 40 C.F.R. 51.166 and was added by EPA to South Dakota's approved SIP. (Tr. p. 185 ln. 4 - 12)

334. South Dakota PSD regulations (ARSD 74:36:09) incorporate by reference 40 C.F.R. Part 52.21 and 51.166. (Tr. p. 657 ln. 6 - 13)
335. The Contested Case Hearing was held pursuant to SDCL 1-26-27 and 34A-1-21, and ARSD 74:36:09:03(6) on May 19-22, 2009, June 23-26, 2009, July 15, 2009 and August 20, 2009.
336. Criteria pollutant emissions are reviewed using the National Ambient Air Quality Standards. (Tr. p. 340 ln. 23 - 24)
337. Hazardous air pollutants are reviewed under the Maximum Available Control Technology ("MACT") standards. (Tr. p. 340 ln. 15 - 19)
338. The EPA standards for industrial boilers and process heaters that applied at the time the HEC Application was submitted were later vacated and the emission limits in those areas are now reviewed under the MACT standards. (Tr. p. 341 ln. 6 - 17; and p. 754 ln. 15 - 18)
339. Currently, CO₂ and other greenhouse gases are not subject to regulation under the Clean Air Act and there is therefore no regulatory basis for including CO₂ and other greenhouse gases in the HEC PSD Application or Permit. (Tr. p. 358 ln. 18 - 23, and p. 359 ln. 9 - 11)
340. While Massachusetts v. EPA does indicate that CO₂ is a pollutant, it did not state that CO₂ is regulated under the Clean Air Act. (Tr. p. 942 ln. 15 - 19)
341. Even though Hyperion performed one, no BACT analysis was required for CO₂ because it is not a regulated pollutant. (Tr. p. 344 ln. 9 - 20; p. 471 ln. 3 - 6; and p. 700 ln. 17 - 27)

342. No BACT analysis was required for methane or any other substance that is not a regulated pollutant under the Clean Air Act. (Tr. p. 700 ln. 11 - 16)

343. Applicable air modeling regulations are found at 40 C.F.R. 52.21, Appendix W. (Tr. p. 483 ln. 18 - 21)

343A. Particulate matter emissions during construction activities are not regulated under the PSD program, but are regulated by the DENR under SDCL ch. 34A-1, and premised upon this authority, the Board has the authority to impose Section 16.0 Fugitive Dust Controls of the proposed Permit on the HEC.

X. Permit

344. HEC will be a major stationary source of air pollutants. (Tr. p. 397 ln. 16 - 19)

345. Hyperion's application was submitted in accordance with South Dakota Codified Laws (SDCL) § 34A-1-21; Administrative Rules of South Dakota (ARSD) §§ 74:36:05 and 74:36:09; Federal PSD requirements, 42 U.S.C. § 7475 and 40 C.F.R. § 52.21; National Emission Standards for Hazardous Air Pollutants, 40 C.F.R. §§ 61.05 and 61.07; and National Emission Standards for Hazardous Air Pollutants for Source Categories, 40 C.F.R. §§ 63.5 and 63.43. (Ex. 23 p. 2)

346. Emissions data for all regulated pollutants were submitted to DENR and posted for viewing by the public prior to the public notice period. (Tr. p. 466 ln. 6 - 8)

347. There are criteria that must be met in order for separate emissions units or pollutant emitting activities to be treated as part of a major stationary source under the PSD Program:

- a) the unit or activity is contiguous or adjacent to the stationary source;

*
b) the operation is included in the same industrial category as the stationary source; and

c) the operation is under common control with the stationary source. (Tr. p. 245 ln. 13 - 21; and p. 836 ln. 14 - 25)

348. Third party generators of electrical power that the refinery will need to purchase, including emissions from the production and transportation of that power, do not meet the three criteria that would be required in order to be considered a part of the same stationary source as the HEC, and are not required to be included in the Permit. (Tr. p. 248 - 249)

349. Emissions from mobile sources are prohibited from regulation under the Clean Air Act stationary source regulations, and are precluded from inclusion in stationary source permits. (Tr. p. 250 ln. 2 - 21)

350. Pollution from extraction of Canadian Tar Sands does not meet the three criteria that would be required in order to be considered a part of the same stationary source as HEC. (Tr. p. 252 ln. 1 - 8; and p. 838 ln. 2 - 6)

351. Pipelines for materials to or from HEC do not meet the three criteria that would be required in order to be considered a part of the same stationary source as HEC. (Tr. p. 254 ln. 2 - 17)

352. Nonregular activities such as painting buildings, operational maintenance, codings and tank degreasing do not meet the three criteria that would be required in order to be considered a part of the same stationary source as HEC. (Tr. p. 839 ln. 6 - 20)

353. Citizens have failed to present substantial evidence of any emissions units that were not included in Hyperion's Application or the Permit that are required to be

considered under the PSD Program. Therefore, the Board finds that any claims raised by Citizens regarding additional emissions units that were not considered are denied.

i. BACT

354. BACT is the maximum degree of reduction achievable for each pollutant regulated by the Clean Air Act considering energy, environmental, and economic impacts and other costs on a case-by-case basis. (Tr. p. 368 ln. 12 - 19)

355. A proper BACT analysis was completed for each emissions unit of HEC. (Tr. p. 199 ln. 3 - 6)

356. BACT for CO for process heaters at HEC is good combustion practices and operating the heaters so they fully combust carbon in the fuel. (Tr. p. 308 ln. 19 - 22)

357. BACT for CO for large process heaters at HEC is 0.007 lb/mmBtu. (Tr. p. 746-747.)

357A. BACT for storage tanks is a floating roof plus thermal oxidizers, with the option as proposed by DENR.

358. BACT for the cooling tower at HEC is a work practice requirement, (Tr. p. 316 ln. 16 - 17)

359. A Claus process followed by a Shell off-gas treating process designed to recover 99.97% of input sulfur is BACT for the sulfur recovery plant at HEC. (Tr. p. 318 ln. 11 - 16)

360. BACT for the wastewater treatment facility at HEC is a thermal oxidizer and a catalytic oxidizer with selective catalytic reduction system. (Tr. pp. 327 ln. 14 – 328 ln. 3)

361. BACT for IGCC flare emissions is a work practice standard with a flare minimization plan. (Tr. pp. 809 ln. 24 – 810 ln. 1)

362. BACT for fugitive and non-fugitive PM at HEC is maintenance of the coke with a 10% moisture content, material handling indoors, and fabric filter baghouses for venting and exhaust on material handling areas. (Tr. p. 329 ln. 2 - 13)

363. BACT for startup burners at HEC is good air pollution control practices. (Tr. pp. 329 ln. 14 – 330 ln. 4)

364. BACT emission limit for CO in the CO₂ is 20 ppm. (Tr. pp. 33 ln. 25 – 334 ln. 2)

365. The BACT limit for hydrogen sulfide from the CO₂ vent is 3 ppm with a maximum of 4.2 lbs/hr. (Tr. p. 335 ln. 3 - 11)

366. BACT for the diesel engines is the use of engines that meet the latest requirements applicable for nonroad diesel engines, as promulgated by the EPA under its mobile source rules. (Tr. p. 339 ln. 11 - 14)

ii. Air Modeling

367. HEC air modeling analysis establishes that HEC will comply with the National Ambient Air Quality Standards for any criteria pollutant. (Tr. p. 508 ln. 12 - 21; and p. 527 ln. 16 - 23)

368. HEC air modeling analysis establishes that HEC will not cause an exceedance of the PSD increments. (Tr. p. 510 ln. 10 - 16; and p. 527 ln. 16 - 23)

369. Use of CO and PM for demonstrating compliance with emissions of organic metal hazardous air pollutants was appropriate and was done in compliance with applicable regulations. (Tr. p. 828 ln. 8 - 11)

iii. Appropriateness and Enforcability

370. The Permit terms and conditions are clear and are adequately set forth in the Permit and are therefore enforceable.

371. After consideration of the evidence, the Board finds that the record establishes the PSD permit, as revised above, is appropriate and complies with all applicable laws and regulations. (Tr. p. 1467 ln. 7 - 9)

372. The Board finds that the issues of the Permit, as modified herein, is consistent with the policies expressed in SDCL 34A-1-1 "to achieve and maintain reasonable levels of air quality which will protect human health and safety, prevent injury to plant and animal life and property, foster the comfort and convenience of its inhabitants, promote the economic and social development of the state and, to the greatest degree practicable, facilitate the enjoyment of the natural attractions of the state."

373. The Board hereby adopts the Statement of Basis and Response to Comments issued by DENR as if set out herein.

374. After carefully considering the record, the evidence, testimony and arguments of counsel, as well as all applicable laws, regulations, and statutes, the Board concludes that a preponderance of the evidence favors issuance of the Permit, as modified herein, and further concludes that all of Citizens' claims lack merit and should be denied.

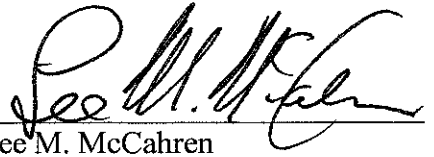
375. The Board hereby issues the Permit as set out in the Permit proposed by DENR on December 15, 2008, with the following change and clarification:

1) Revision of Operational Limit 5.5 to read:

"In accordance with ARSD 74:36:09:02, as referenced to ARSD 74:36:05:16.01(8), the owner or operator shall not input more than 2,040 long tons of sulfur per day into the six sulfur recovery plant trains and associated thermal oxidizers (Unit #42a through #42f)."

Dated this 20th day of August, 2009.

BOARD OF MINERALS AND ENVIRONMENT

By: 
Lee M. McCahren
*Hearing Chairman of the Board of
Minerals and Environment*