

STATE OF SOUTH DAKOTA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
BOARD OF MINERALS AND ENVIRONMENT

IN THE MATTER OF THE APPLICATION OF)	O&G CASE NO. 17-2010
NAKOTA ENERGY, LLC, LITTLETON, COLORADO)	
FOR AN ORDER TO ESTABLISH A FIELD FOR THE)	
PRODUCTION OF OIL AND GAS CONSISTING OF)	AMENDED
ALL OF SECTION 14 AND THE NORTH HALF OF)	FINDINGS OF FACT,
SECTION 23, TOWNSHIP 6 NORTH, RANGE 5 EAST,)	CONCLUSIONS OF LAW,
MEADE COUNTY, SOUTH DAKOTA, WITH)	AND ORDER
SPACING OF ONE WELL PER 40-ACRE TRACT,)	
EACH WELL TO BE LOCATED NOT CLOSER THAN)	
500 FEET FROM THE SPACING UNIT BOUNDARY,)	
AND NOT CLOSER THAN 1,000 FEET TO THE)	
NEAREST WELL DRILLED TO OR PRODUCING)	
FROM THE STRATIGRAPHIC INTERVAL)	
DESCRIBED AS FROM THE TOP OF THE)	
SUNDANCE TO THE BASE OF THE MINNELUSA)	
FORMATIONS;)	
)	
AND)	
)	
IN THE MATTER OF THE REHEARING OF OIL AND)	
GAS CASE NO. 17-2010 FOR THE PURPOSE OF:)	
TAKING PUBLIC INPUT PURSUANT TO SOUTH)	
DAKOTA CODIFIED LAWS (SDCL) 1-19A-11.1)	
CONCERNING PROTECTION OF CULTURAL)	
RESOURCES RELATED TO THE BEAR BUTTE)	
NATIONAL HISTORIC MONUMENT; AND)	
CONSIDERATION OF WHETHER TO AUTHORIZE)	
OR REVOKE ORDER 17-2010, OR AMEND ORDER)	
17-2010 WITH CONDITIONS TO MITIGATE)	
POTENTIAL IMPACTS TO CULTURAL RESOURCES)	
RELATED TO OPERATION OF THE GULLICKSON)	
OIL FIELD IN ALL OF SECTION 14 AND THE)	
NORTH HALF OF SECTION 23, TOWNSHIP 6)	
NORTH, RANGE 5 EAST, MEADE COUNTY, SOUTH)	
DAKOTA, APPROXIMATELY ONE AND ONE-HALF)	
MILES WEST OF BEAR BUTTE AND ABOUT FOUR)	
MILES NORTHEAST OF THE CITY OF STURGIS,)	
S.D.)	

Nakota Energy, LLC (“Nakota”) filed a Petition with the South Dakota Board of Minerals and Environment (“Board”) seeking an Order: (a) establishing a field for the

production of oil and gas to be known as the Gullickson Field, with the Field consisting of all of Section Fourteen (14) and the North Half (N ½) of Section Twenty-Three (23), Township 6 North, Range 5 East of the Black Hills Meridian (T6N, R5E, BHM), Meade County South Dakota; and (b) establishing temporary spacing units for the orderly development of the pool or pools of oil or gas or both within the Field boundaries, with the temporary spacing units to consist of one well per 40-acre tract, each well to be located not closer than five hundred (500) feet from the spacing unit boundary on which that well is drilled, and not closer than one thousand (1,000) feet from the nearest well drilled to or producing from the stratigraphic interval from the top of the Sundance to the base of the Minnelusa formations.

Following due, proper, and timely notice, the Board held a hearing on this Petition in Pierre, South Dakota, on November 18, 2010. A quorum of the Board was present at the hearing. A majority of the Board voted to adopt Findings of Fact, Conclusions of Law, and an Order (Oil & Gas Order 17-2010) establishing the Gullickson Field and its temporary spacing and field rules.

On February 23, 2011, the Department of Environment and Natural Resources (“DENR”) filed a Petition for Rehearing of Oil & Gas Case 17-2010 for the purpose of reauthorizing, revoking, or amending Oil & Gas Order 17-2010, as deemed necessary by the Board, to comply with SDCL 1-19A-11.1. This action was necessitated as a result of the discovery by DENR that a portion of the Gullickson Field lies within the boundary of the Bear Butte National Historic Landmark District, and that the Gullickson Field was considered to be within the environs of Bear Butte, which is listed on both the State and National Registers of Historic Places.

Following due, proper, and timely notice, the Board held a hearing on the Petition for Rehearing in Pierre, South Dakota, on April 21 and May 18, 2011. A quorum of the Board was

present at the rehearing. A majority of the Board voted to revoke Oil & Gas Order 17-2010 issued on November 18, 2010, and, after considering the testimony and evidence presented by the Parties, to issue an amended order as further described herein that re-establishes the Gullickson Field with amended field rules. The Board hereby makes, enters and adopts the following Findings of Fact, Conclusions of Law, and Order in support of that decision.

FINDINGS OF FACT

1. To the extent any Conclusion of Law set forth below may be deemed a Finding of Fact, it is incorporated herein by reference the same as if set forth in full.

2. Nakota filed a Petition with the Board seeking an Order: (a) establishing a field for the production of oil and gas to be known as the Gullickson Field, with the Field consisting of all of Section Fourteen (14) and the North Half (N ½) of Section Twenty-Three (23), Township 6 North, Range 5 East of the Black Hills Meridian (T6N, R5E, BHM), Meade County South Dakota; and (b) establishing temporary spacing units for the orderly development of the pool or pools of oil or gas or both within the Field boundaries, with the temporary spacing units to consist of one well per 40-acre tract, each well to be located not closer than five hundred (500) feet from the spacing unit boundary on which that well is drilled, and not closer than one thousand (1,000) feet from the nearest well drilled to or producing from the stratigraphic interval from the top of the Sundance to the base of the Minnelusa formations.

3. Nakota served a due and timely Notice of Hearing for the initial hearing held on the Petition. The Notice of Hearing was served on all persons within the proposed Field boundary who had a pecuniary interest that would be directly and immediately affected by the relief requested of the Board. The Notice of Hearing was served by certified mail, return receipts requested.

4. The initial Notice of Hearing for the hearing on Nakota's Petition was also served by two publications in each of the following newspapers: The *Rapid City Journal*, Rapid City, Pennington County, South Dakota, with circulation in Meade County, South Dakota; the *Capital Journal*, Pierre, Hughes County, South Dakota, the official state newspaper; and the *Meade County Times-Tribune*, Sturgis, Meade County, South Dakota, with circulation in Meade County, South Dakota.

5. Nakota filed an Affidavit of Service by Mail with the DENR Oil and Gas Section, indicating that service by certified mail, return receipt requested, of the Petition and Notice of Hearing was completed by depositing the same in the United States Mail on October 8, 2010, which date is more than twenty days prior to the deadline for intervention (November 2, 2010) established in the Notice of Hearing.

6. No persons or entities sought leave to intervene in the initial hearing on the Petition.

7. The Petition seeks to establish a new field for the production of oil and gas on the following described property:

All of Section Fourteen (14) and the North Half of Section Twenty-Three (23), Township 6 North, Range 5 East of the Black Hills Meridian (T6N, R5E, BHM), Meade County, South Dakota

To be hereafter known as the Gullickson Field ("the Gullickson Field").

8. Nakota seeks to establish temporary spacing units within the Gullickson Field of one well per forty (40) acres, more or less, with each forty (40) acre spacing unit being comprised of one governmental quarter-quarter section.

9. Nakota seeks to establish field rules for the Gullickson Field pursuant to which no one well may be drilled closer than five hundred (500) feet from the boundary of the spacing unit

in which that well is drilled, nor less than one thousand (1,000) feet from any existing oil well within said field drilled to or producing from the stratigraphic interval from the top of the Sundance Formation to the base of the Minnelusa Formation.

10. The target formations for the production of oil and gas in the Gullickson Field are the Sundance Formation and the Minnelusa Formation.

11. The size, location, slope, shape, and contours of the oil and gas bearing structures in the Sundance Formation within the Gullickson Field area has been delineated based on mapping, seismographic investigation, analysis of wellbore logs, and other sources of geological data.

12. The size, location, slope, shape, and contours of structure in the Minnelusa Formation reasonably believed to be a prospect for the development of oil and gas production within the Gullickson Field has been delineated through surface mapping and seismographic investigation.

13. The Circus Flats Pluton is an igneous pluton that exists as a subsurface feature immediately to the east of the Gullickson Field area.

14. In the far geologic past, the Circus Flats Pluton intruded into the subsurface geological features in the area just to the east of the Gullickson Field, thereby affecting the slope and plane of adjacent geologic structures in the Gullickson Field area.

15. The oil bearing structures in the Sundance Formation and in the Minnelusa Formation within the boundaries of the Gullickson Field are anticlines that were created as the result of this intrusion of the Circus Flats Pluton into adjacent geological structures.

16. These structures have created a "trap" for oil. The subsurface extent of this trap is unknown and will remain unknown unless and until further wells are drilled in the area.

17. The prospect of the presence of oil and gas in commercial quantities within the area of the proposed Gullickson Field was first identified through "oil shows" discovered in the process of drilling water wells within the boundaries of the proposed Gullickson Field, and by the presence of oil seeps on the surface of the earth in the area to the east of the proposed Gullickson Field (between the Field area and the land area underlain by the Circus Flats Pluton).

18. Surface mapping of geologic structures in the area of the proposed Gullickson Field suggest the presence of the anticline now known to be the oil bearing structure in the Sundance Formation in that location.

19. Building on these indicators of the presence of oil and gas in the Sundance Formation in this area, a seismological investigation was conducted that delineated the location, shape, contours, and size of the anticline that is the oil bearing structure in the Sundance Formation within the Gullickson Field area.

20. A discovery well was drilled into the Sundance Formation within the Gullickson Field area.

21. The discovery well is identified as the #1 Traub Well and is located in the Northeast Quarter of the Southwest Quarter (NE $\frac{1}{4}$ SW $\frac{1}{4}$) of Section Fourteen (14), Township 6 North, Range 5 East, Black Hills Meridian (T6N, R5E, BHM), Meade County, South Dakota.

22. The surface of the earth in the location where the #1 Traub Well described above was drilled is 3,090 feet above sea level.

23. The Kelly Bushing on the drilling rig used in the drilling of the #1 Traub Well was located 4 feet above ground level at the well location, or 3094 above sea level.

24. The top of the Sundance Formation in the #1 Traub Well was located at 290 feet below the Kelly Bushing.

25. The bottom of the Sundance Formation in the #1 Traub Well was located at 602 feet below the Kelly Bushing.

26. The Sundance Formation from the depth of 290 feet below the Kelly Bushing to the depth of 602 feet below the Kelly Bushing in the #1 Traub Well is a heterogeneous formation consisting of alternating layers of sandstone and fractured shale, all of which are in communication with one another.

27. Information gathered during the process of the drilling of the #1 Traub Well demonstrates that oil and gas is located throughout the entire cross-section of the Sundance Formation in the #1 Traub Well.

28. An oil sample produced from the #1 Traub Well was submitted for testing to Humble Geochemical Services.

29. The test results disclose that the crude oil from the Sundance Formation recovered from the #1 Traub Well is a medium grade crude oil that is readily commercially marketable.

30. Information from the #1 Traub Well discloses that there is a relatively low percentage of water relative to oil in the oil bearing formation.

31. The Minnelusa Formation within the confines of the Gullickson Field is located approximately 1,000-1,200 feet below the surface of the earth.

32. The Minnelusa Formation is known from studies of the geology in the vicinity of the Black Hills in western South Dakota, and from well information from other oil and gas wells drilled into the Minnelusa Formation near the Black Hills in western South Dakota, to consist of sandstone, shale and carbonates that are of the type and quality associated with the production of oil and gas from the Minnelusa Formation.

33. From geologic studies and from the seismographic study conducted within the Gullickson Field, it has been adequately demonstrated to the Board that the geologic structure of the Minnelusa Formation within the Gullickson Field is of such a size, shape, slope and contour as to be a reasonable prospect for the production of oil and gas, and that this structure is generally of the size and shape of the structure that has been identified in the Sundance Formation in this location.

34. There are no water wells within the boundaries of the Gullickson Field.

35. The most common source of water for domestic wells in the near vicinity of the Gullickson Field is the Lakota Formation.

36. The intrusion of the Circus Falts Pluton into the geologic structures just to the east of the Gullickson Field has caused the Lakota Formation to be pushed upward in that area, as compared to the depth of the Lakota Formation elsewhere in the area.

37. Through geologic time, erosion has brought the Lakota Formation to the surface of the earth within the confines of the Gullickson Field area, thereby eliminating the Lakota Formation as a source of domestic water within the Gullickson Field.

38. The land proposed for spacing in the proposed Gullickson Field is, absent a Field Order, subject to state-wide 40 acre spacing regulations.

39. The #1 Traub Well has shown that crude oil can be produced from the target formations.

40. There are no adjacent oil fields or pools of oil.

41. The #1 Traub Well, and the wells contemplated for drilling in the Gullickson Field are shallow oil wells that can be drilled by small "water well" drilling sized drilling equipment.

42. Only relatively small pumps are needed to lift the shallow oil from the Sundance and Minnelusa formations in the area of the proposed Gullickson Field.

43. Relatively small gathering and collection tanks are needed to produce oil from wells in the area of the proposed Gullickson Field.

44. Nakota will test produced water from the formation to determine if it is fresh enough to discharge onto the ground, and will comply with DENR discharge permits as necessary. If produced water cannot be discharged, it will be hauled off-location to an approved underground injection well.

45. Nakota will use currently existing farm trails and roads, or gravel constructed field trails, to access wells and production equipment. Because of the small volume of oil involved, excessive truck traffic on these trails and roads is not anticipated.

46. Nakota presently projects drilling six to twelve wells in the Gullickson Field.

47. Nakota is the owner of more than a majority of the oil and gas leasehold interest in the area proposed as the new field.

48. Upon the testimony and evidence introduced at hearing, Nakota persuasively demonstrated that the geologic structures in the Sundance and Minnelusa Formations from which oil and gas is to be produced is a local geologic structure in the nature of an anticline; the extent of this local geologic structure cannot be determined with finality until further well control exists.

49. The target pool of oil and gas in the Sundance Formation has been adequately delineated as being located within the boundaries of the proposed Gullickson Field at this time to support issuance of a temporary spacing order.

50. The target pool of oil and gas in the Sundance Formation is reasonably believed to underlie all or substantially all of the lands proposed to be included in the Gullickson Field and supports issuance of a temporary spacing order.

51. The accumulation of oil and gas in the Sundance Formation in the area of the proposed Gullickson Field is a "pool" of oil and gas as defined in Chapter 45-9 of the South Dakota Codified Laws and constitutes a common accumulation of oil or gas or both.

52. Oil has not yet been produced from the #1 Traub Well.

53. There is not adequate information available at the present time from which to make a final determination as to whether a pattern of spacing units smaller than forty (40) acres would better serve to efficiently and economically drain the oil in the Gullickson Field, avoid waste, avoid the drilling of unnecessary wells, and protect correlative rights.

54. Based on presently available information, the 40 acre spacing requested by Nakota will allow the orderly development of the Gullickson Field pending the obtaining of information required to determine the ultimate spacing pattern of the Gullickson Field, and is of a size that is not smaller than the maximum area that can be efficiently and economically drained by one well in the pool.

55. The shape of each temporary spacing unit within the proposed Gullickson Field shall be a governmental quarter-quarter section.

56. Based on presently available information, the Board finds that spacing the Gullickson Field on the basis of forty (40) acres, with each spacing unit consisting of a governmental quarter-quarter section, is a size and shape of spacing unit that will promote a reasonable uniform spacing plan for the Gullickson Field.

57. The temporary forty (40) acre spacing shall remain in effect pending the development of the Field and further information required for the Board to make a determination as to what the permanent spacing will be within the Gullickson Field.

58. Further information from production operations of wells in the Gullickson Field is necessary to determine whether oil can be commercially produced from the Field.

59. As a result, and pending the development of further information from production and the drilling and operation of additional wells in the Gullickson Field, the Board on November 18, 2010, issued Oil & Gas Order 17-2010. This Order found that: one well located in a forty (40) acre spacing unit consisting of a governmental quarter-quarter section is not smaller than the size and shape of a spacing unit that will efficiently and economically drain the pool of oil and gas in the Sundance Formation underlying the Gullickson Field and any separate pool of oil and gas that may thereafter be established as existing in the Minnelusa Formation underlying the Gullickson Field; this spacing would result in the efficient and economical development of the pool as a whole; this spacing would lead to the drilling of no more wells than are necessary to adequately drain the field; and this spacing established a spacing pattern necessary to prevent waste, avoid the drilling of unnecessary wells, and protect the correlative rights of all interested parties.

60. The Board's November 18, 2010, Order also restricted the location of oil wells drilled within the Gullickson Field to: one oil and gas well allowed per spacing unit, with that well to be drilled at a location that is not closer than five hundred (500) feet from the boundary of the spacing unit in which that well is drilled, and not closer than one thousand (1,000) feet from the nearest well drilled to or producing from the stratigraphic interval from the top of the Sundance Formation to the base of the Minnelusa Formation.

61. Following issuance of the Board's November 18, 2010, Order, Nakota drilled a second well within the Gullickson Field. The second well, called the Norstegaard well, is located on the Southeast Quarter of the Southwest Quarter (SE ¼ SW ¼) of Section Fourteen (14), Township Six North, Range Five East (T6N, R5E) of the Black Hills Meridian, Meade County, South Dakota.

62. Oil has not yet been produced from the Norstegaard well.

63. After the Board issued its November 18, 2010, Order, DENR became aware that part of the Gullickson Field is within the boundary of the Bear Butte National Historic Landmark, and that the South Dakota Office of History ("Office of History") considered the Gullickson Field to be within the "environs" of Bear Butte, a historic place listed on the National and State Historic Registers.

64. DENR filed a Petition for Rehearing with the Board on February 23, 2011, requesting the Board to grant a rehearing in Oil and Gas Case 17-2010 for the purpose of taking public input pursuant to SDCL 1-19A-11.1 concerning protection of cultural resources related to the Bear Butte National Historic Landmark, and consideration of whether to reauthorize or revoke Order 17-2010 or amend Order 17-2010 with conditions to mitigate potential impacts to cultural resources related to operation of the Gullickson Oil Field.

65. Notice of the Rehearing was published in the *Meade County Times Tribune*, Meade County, South Dakota; the *Capital Journal*, Pierre, South Dakota; the *Rapid City Journal*, Rapid City, South Dakota; and the *Black Hills Pioneer*, Spearfish, South Dakota. The Notice of Rehearing was also mailed to the chairmen and tribal historic preservation officers of the Tribes in South Dakota and neighboring states, and sent by electronic mail to a mailing list of persons interested in oil and gas matters kept by the DENR Oil & Gas Program.

66. The Notice of Rehearing provided interested persons with the opportunity to file written comments and to appear at a public hearing to provide oral comments on the project's impacts, if any, on the cultural resources related to the Bear Butte historic property and National Historic Landmark and the revocation, reauthorization, or amendment of Oil & Gas Order 17-2010 with conditions to mitigate potential impacts to the Bear Butte site resulting from operation of the proposed Gullickson Oil Field.

67. Bear Butte was placed on the federal National Register of Historic Places in 1973.

68. Bear Butte was listed on the State Register of Historic Places in or around 1994, as a result of the adoption of a state rule that places everything listed on the National Register of Historic Places on the State Register.

69. Bear Butte was established as a National Historic Landmark by the Secretary of the United States Department of Interior in or around 1981, with an area around Bear Butte designated as the landmark boundary.

70. The Bear Butte National Historic Landmark Boundary was created as a result of Bear Butte's designation as a National Historic Landmark.

71. The files on the National Historic Landmark maintained by the Office of History do not disclose the basis for the established boundary, and do not disclose whether private property owners within that boundary were notified of the designation.

72. The basis for the Bear Butte's listing on the federal National Register of Historic Places and designation as a National Historic Landmark was premised, inter alia, on the Bear Butte site as a historic place and on its association with the beliefs and importance placed on Bear Butte by Native American tribes.

73. SDCL 1-19A-11.1 requires that state agencies go through the Office of History's "11.1 review" process if they are undertaking a project that will encroach upon, damage, or destroy any historic property on the national or state registers of historic properties.

74. The issuance of a license, permit, approval, or order is a project undertaking as that term is used in SDCL 1-19A-11.1.

75. The issuance of an oil and gas field order in an area that encroaches upon a historic property on the national or state registers of historic properties is statutorily subject to the Office of History's 11.1 review.

76. SDCL 1-19A-11.1 and applicable law require the state agency undertaking a "project" such as issuance of a license, permit or other form of approval, to submit a case report containing the information required by the Office under ARSD 24:52:07:03, to the Office of History.

77. In practice, the applicant for a license, permit or other form of agency approval often submits a case report to the Office of History on behalf of, or in conjunction with, a state agency.

78. Nakota and DENR's Oil & Gas Program submitted a case report to the Office of History.

79. The Office of History determined that the case report provided by Nakota and DENR provided sufficient information to allow it to conduct a review and issue comments and a recommendation on the proposed project.

80. The Office of History issued the following recommendation:

[The] office received the *Gullickson Project Case Report* on February 25, 2011 and on April 1, 2011 we also received copies of the written public input. The project involves the drilling and installation of associated access roads, electrical lines, drilling pads, and pumping and storage equipment. Nakota Energy states in the Case Report that they

expect “a maximum expansion from six to twelve wells”, but the current spacing order for the field allows up to 24 wells in the 960-acre spacing unit (or one well per forty acres).

Two wells and associated equipment currently exist within the field, known as the Traub and Norstegaard wells. Given their size and location, these two wells have not damaged or destroyed the Bear Butte National Register site. However, if the oil field is developed to its current permitted potential (i.e. 24 wells with associated equipment and access roads), the oil field will potentially visually encroach upon the historic property.

Therefore, we encourage the South Dakota Board of Minerals and Environment to adopt the following recommendations to help minimize any potential visual encroachment onto the Bear Butte National Register site, some of which Nakota Energy has proposed and already implemented.

1. Allow only smaller pump jacks and storage tanks the same size or less as the jacks (approximately 8 foot tall) and tanks (15 foot wide x 12 foot high) currently in place at the Traub and Norstegaard wells.
 2. Require neutral-color equipment to help minimize any potential visual effects. The color of the existing tanks at the Traub and Norstegaard wells is preferred.
 3. Minimize the number of storage/production tanks by employing a shared or centralized tank system whenever possible.
 4. Given the proximity and frequency of other identified historic and archaeological sites in the vicinity, including the Bismarck to Deadwood Trail and the Fort Meade military reservation, we recommend having an archaeologist that meets the Secretary of the Interior’s Professional Qualification Standards accompanied with a tribal monitor conduct a survey prior to any ground disturbing activity and provide a written report on the findings to the State Archaeologist and the State Historic Preservation Office.
 5. Avoid any identified archaeological sites by having the archaeologist delineate the sites with a ten-foot buffer.
 6. Utilize existing farm access trails whenever possible to avoid the need to construct new access roads.
 7. If new access roads must be constructed, only use local gravel from a commercial gravel source to avoid the accidental disturbance of unidentified archaeological sites.
 8. Implement measures to control dust on access trails or roads as needed.
 9. Locate wells and equipment to minimize visibility from Bear Butte.
 10. Reclaim and revegetate all disturbed areas, including access roads and well sites, following abandonment.
81. The Office of History acknowledged that, while its proposed mitigation measures would help minimize and mitigate any potential visual effects, “no measure can mitigate

potential impacts to the spiritual or religious qualities that make Bear Butte significant to many people.”

82. The Office of History testified that its proposed mitigation measures should apply to the Gullickson Field whether or not that portion of the Gullickson Field that lies within the National Historic Landmark boundary was removed from the Field because of the potential for encroachment on the site and its environs.

83. Lana M. Gravatt, a member of the Yankton Sioux Tribe and Tribal Historic Preservation Officer, representing herself; the Lower Brule Sioux Tribe, represented by Tara L. Adamski; the Rosebud Sioux Tribe, represented by Matthew L. Rappold; the Standing Rock Sioux Tribe, represented by Chase Iron Eyes; and Conrad Fisher, a member of the Northern Cheyenne Tribe and Tribal Historic Preservation Officer, representing himself; requested and were granted leave to intervene in the rehearing before the Board.

84. The Board took extensive public comment on the potential impacts of the Gullickson Field on the Bear Butte historic property and National Historic Landmark.

85. The Board received and considered the written comments submitted by interested persons on the potential impacts of the Gullickson Field on the Bear Butte historic property and National Historic Landmark, including comments filed by the National Park Service of the United States Department of Interior and the National Trust for Historic Preservation.

86. Historic places such as Bear Butte are important both for protection of the cultural resource and for tourism.

87. The “Section 106” process of the National Historic Preservation Act is not applicable to state undertakings.

88. The land within the Gullickson Field is entirely owned by private citizens.

89. The land within the Bear Butte National Historic Landmark Boundary is owned by private citizens, private entities, and the State.
90. Nakota was notified of the Office of History's recommended mitigation measures.
91. The Lower Brule Sioux Tribe owns land to the north and east of the Bear Butte National Historic Landmark boundary.
92. The Lower Brule Sioux Tribe uses its property and Bear Butte itself as a site for retreat and rejuvenation through native spiritual methodologies for tribal members, and for cultural practices.
93. The Rosebud Sioux Tribe owns property on the west side of Bear Butte, within the Bear Butte National Historic Landmark Boundary.
94. The Rosebud Sioux Tribe uses its property and Bear Butte itself as a site for retreat, spiritual purposes, and cultural practices.
95. The Standing Rock Sioux Tribe uses Bear Butte as a site for spiritual purposes.
96. The Northern Cheyenne Tribe owns property adjacent to the Bear Butte State Park, within the Bear Butte National Historic Landmark boundary.
97. The Northern Cheyenne Tribe's oral history and cultural beliefs are centered on Bear Butte.
98. The Northern Cheyenne Tribe uses Bear Butte as a site for spiritual purposes and cultural practices.
99. The spiritual uses of Bear Butte by the Tribes are associated with Bear Butte itself.
100. Bear Butte has a cultural and historical significance to the Sioux Tribes and the Northern Cheyenne Tribe, as well as other Native American Tribes.

101. Photographs of the #1 Traub and Norstegaard oil wells drilled within the Gullickson Field from State Highway 79 and Meade County Road #29 near Bear Butte demonstrate that the wells and associated equipment are not readily visible.

102. Orientation of wells so that the long dimension of the pump jack is parallel to the line-of-sight from Bear Butte (an east-west orientation rather than a north-south orientation) will further minimize the visibility of wells drilled within the Gullickson Field from Bear Butte.

103. Oil & Gas Order 17-2010 issued on November 15, 2010, was issued without compliance with SDCL 1-19A-11.1.

104. The Board is by statute obligated to prevent waste, avoid the drilling of unnecessary wells, provide for the operation and development of oil and gas properties in a manner that provides a greater ultimate recovery of oil and gas, protect the correlative rights of all owners, comply with the procedural requirements of SDCL 1-19A-11.1, and consider the comments of the Office of History regarding a project that encroaches or damages historic properties listed on the State or National Registers of Historic Places.

105. The recommendation of the Office of History will minimize to the extent possible the potential encroachment and damage to the values protected by the listing of Bear Butte on the State and National Registers of Historic Places and its National Historic Landmark designation and the uses of Bear Butte by the Tribes, particularly if no wells are drilled within the National Historic Landmark boundary and if the wells are oriented so that the long dimension of the pump jack is parallel to the line-of-sight from Bear Butte.

106. The geologic data currently available suggests that the pool of oil in the Sundance and Minnelusa formations within the Gullickson Field extends to the spacing units along the east

border of the Field, but additional well control and geologic data is necessary in order to determine whether the pool actually underlies the spacing units along the east border of the Field.

107. The drilling and production of oil and gas from the Gullickson Field as conditioned herein will protect the rights of mineral property owners within the Field by allowing production of their oil and gas under reasonable operating conditions.

108. The geologic data currently available does not suggest that the pool of oil and gas within the Gullickson Field lies outside of the Field boundaries.

Upon the foregoing Findings of Fact, the Board does hereby make and enter the following:

CONCLUSIONS OF LAW

1. Any Conclusions of Law contained in the foregoing Findings of Fact are incorporated herein by reference.

2. The Notice of Hearing for Nakota's Petition prepared and served as indicated above is in conformance with the requirements of SDCL 1-26-17 and ARSD 74:09:01:11.

3. The Notice of ReHearing was served and published in conformance with the law.

4. Due, legally sufficient, and timely notice of the time, place and purpose of the Hearing and of the Rehearing has been afforded to all interested parties and is in all respects as required by law. All parties have been afforded an opportunity for hearing after reasonable notice.

5. The Board has jurisdiction over the subjects embraced herein and over all the interested parties, and has the jurisdiction to make and promulgate the Order hereinafter set forth.

6. The land described as All of Section Fourteen (14) and the North Half of Section Twenty-Three (23), Township 6 North, Range 5 East of the Black Hills Meridian (T6N, R5E,

BHM), Meade County, South Dakota, has been demonstrated by the evidence and determined by the Board to be underlain by a common pool of oil and gas as defined in SDCL Chapter 45-9 and to encompass all of the land determined and believed to be underlain by that common pool of oil and gas.

7. To provide for the orderly and uniform development of the pool of oil in both the Sundance Formation and the Minnelusa Formation in the Gullickson Field, to prevent or assist in preventing the waste of oil or gas produced therefrom, to protect correlative rights, and to avoid the drilling of unnecessary wells, a Field must be established with designated spacing units and Field rules.

8. As a portion of the Gullickson Field lies within the boundary of the Bear Butte National Historic Landmark, and as the Gullickson Field itself potentially encroaches upon the listed historic property of Bear Butte, the Board is required to comply with the requirements of SDCL 1-19A-11.1 and consider the Office of History's recommendations, including the alternative of requiring Nakota to implement measures to mitigate the impacts of the drilling in the Gullickson Field on the listed historic property.

9. The Board also is required to consider whether the Gullickson Field should be established.

10. The Board concludes that issuance of a Field Order establishing the Gullickson Field with specified Field Rules will prevent waste, protect correlative rights, and allow orderly development of oil and gas resources in a manner that minimizes the potential impact and encroachment upon the listed Bear Butte historic property and protects the multiple uses of Bear Butte and the rights and interests of property owners.

11. The Gullickson Field shall be temporarily spaced at one well per forty (40) acre spacing unit, with each forty (40) acre spacing unit consisting of a governmental quarter-quarter section.

12. Wells drilled within the Gullickson Field shall be located not closer than five hundred (500) feet from the boundary of the spacing unit in which it is drilled, and not closer than one thousand (1,000) feet from the nearest well drilled to or producing from the stratigraphic interval from the top of the Sundance Formation to the base of the Minnelusa Formation.

13. No wells shall be drilled at this time on areas of spacing units that lie within the Bear Butte National Historic Landmark Boundary.

14. Only five (5) wells (including the two (2) wells currently existing in the Gullickson Field) may be drilled on spacing units within the Gullickson Field at this time.

15. Nakota may petition for drilling additional wells within the Gullickson Field after additional information regarding the commercial viability of the wells and the extent of the structure as demonstrated by additional well control is available.

16. All wells within the Gullickson Field must be drilled, completed, and produced in compliance with the following conditions:

- a. Only smaller pump jacks and storage tanks the same size or less as the jacks (approximately 8 foot tall) and tanks (15 foot wide x 12 foot high) currently in place at the Traub and Norstegaard wells may be used.
- b. Neutral-color equipment to help minimize any potential visual effects must be used. The color of the existing tanks at the Traub and Norstegaard wells is preferred.
- c. The number of storage/production tanks shall be minimized by employing a shared or centralized tank system whenever possible.
- d. Given the proximity and frequency of other identified historic and archaeological sites in the vicinity, including the Bismarck to Deadwood Trail and the Fort Meade military reservation, an archaeologist that meets the Secretary of the Interior's Professional Qualification Standards accompanied with a tribal monitor

must conduct a survey prior to any ground disturbing activity and provide a written report on the findings to the State Archaeologist and the State Historic Preservation Office.

- e. Any identified archaeological sites must be avoided by having the archaeologist delineate the sites with a ten-foot buffer.
- f. Existing farm access trails shall be utilized whenever possible to avoid the need to construct new access roads.
- g. If new access roads must be constructed, only local gravel from a commercial gravel source shall be used, so as to avoid the accidental disturbance of unidentified archaeological sites.
- h. Measures to control dust on access trails or roads must be utilized as needed.
- i. Wells shall be aligned and equipment shall be located in a manner that minimizes visibility from Bear Butte.
- j. All disturbed areas, including access roads and well sites, shall be reclaimed and revegetated following abandonment in accordance with the oil and gas rules.

17. In addition, wells shall be oriented so that the long dimension of the pump jack is parallel to the line-of-sight from Bear Butte (an east-west orientation rather than a north-south orientation) to further minimize the visibility of wells drilled within the Gullickson Field from Bear Butte.

18. Each forty (40) acre spacing unit with one well producing oil or gas or both, is an area that is not smaller than the size of spacing unit that will efficiently and economically drain the recoverable oil or gas, or both, underlying the lands included in the Gullickson Field.

ORDER

Upon the foregoing Findings of Fact and Conclusions of Law, and good cause appearing for granting the relief hereinafter granted, now, therefore, it is hereby ORDERED:

1. That an oil and gas field to be hereafter known as the Gullickson Field is hereby established;
2. That the Gullickson Field shall encompass and contain the following described lands: All of Section Fourteen (14) and the North Half of Section Twenty-Three (23), Township

6 North, Range 5 East, of the Black Hills Meridian (T6N, R5E, BHM), Meade County, South Dakota;

3. Pending further Order of this Board, the Gullickson Field shall be, and hereby is, temporarily spaced for purposes of oil and gas production from the Sundance Formation and the Minnelusa Formation at forty (40) acres per spacing unit, with each such forty (40) acre spacing unit to consist of a governmental quarter-quarter section, with one oil and gas well allowed per spacing unit;

4. Pending further Order of this Board, a total of five wells may be drilled on the spacing units within the Gullickson Field, with none of the wells drilled within the Bear Butte National Historic Landmark Boundary which is depicted in pink shading on Attachment A;

5. All wells drilled within the Gullickson Field must be at a location that is not closer than five hundred (500) feet from the boundary of the spacing unit in which that well is drilled and not closer than one thousand (1000) feet from the nearest well drilled to or producing from the stratigraphic interval from the top of the Sundance Formation to the base of the Minnelusa Formation;

6. All wells drilled within the Gullickson Field must be drilled, completed, and produced in compliance with the following conditions:

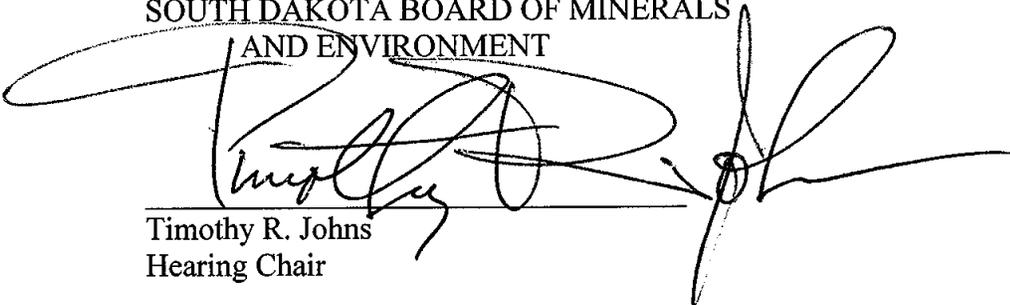
- a. Only smaller pump jacks and storage tanks the same size or less as the jacks (approximately 8 foot tall) and tanks (15 foot wide x 12 foot high) currently in place at the Traub and Norstegaard wells may be used.
- b. Neutral-color equipment to help minimize any potential visual effects must be used. The color of the existing tanks at the Traub and Norstegaard wells is preferred.
- c. The number of storage/production tanks shall be minimized by employing a shared or centralized tank system whenever possible.
- d. Given the proximity and frequency of other identified historic and archaeological sites in the vicinity, including the Bismarck to Deadwood Trail and the Fort Meade military reservation, an archaeologist that meets the Secretary of the Interior's Professional Qualification Standards accompanied with a tribal monitor

Must conduct a survey prior to any ground disturbing activity and provide a written report on the findings to the State Archaeologist and the State Historic Preservation Office. Nakota shall contact the Tribal Preservation Office of one of the intervening tribes or tribal landowners to identify an approved tribal monitor. Once an individual is identified notices should be sent to each of the intervening tribes' Tribal Historical Preservation Office for any objection.

- e. Any identified archaeological sites must be avoided by having the archaeologist delineate the sites with a ten-foot buffer.
- f. Existing farm access trails shall be utilized whenever possible to avoid the need to construct new access roads.
- g. If new access roads must be constructed, only local gravel from a commercial gravel source shall be used, so as to avoid the accidental disturbance of unidentified archaeological sites.
- h. Measures to control dust on access trails or roads must be utilized as needed.
- i. Wells shall be aligned and equipment shall be located in a manner that minimizes visibility from Bear Butte.
- j. All disturbed areas, including access roads and well sites, shall be reclaimed and revegetated following abandonment in accordance with the oil and gas rules.
- k. All wells shall be placed and oriented so that the long dimension of the pump jack is parallel to the line-of-sight from Bear Butte (in an east-west orientation rather than a north-south orientation).

Dated this 25th day of July, 2011.

SOUTH DAKOTA BOARD OF MINERALS
AND ENVIRONMENT



Timothy R. Johns
Hearing Chair