

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

IN THE MATTER OF THE APPLICATIONS

O&G Case No. 10-2013

QUARTZ OPERATIONS FOR

PERMITS TO DRILL OIL / GAS WELLS

FINDINGS OF FACT,

AT THE FOLLOWING LOCATIONS:

CONCLUSIONS OF LAW, AND

WELL "NORTHERN POINTS 1",

ORDER

In the Northwest Quarter of the
Northwest Quarter of Section 7,
Township 1 North, Range 14 East,
Pennington County, South Dakota;

And

WELL "NORTHERN POINTS 2",

In the Northeast Quarter of the
Northeast Quarter of Section 12,
Township 1 North, Range 13 East,
Pennington County, South Dakota.

The South Dakota Board of Minerals and Environment conducted a contested case proceeding in the above entitled matter on March 21, 2013. The Minerals and Mining Program of the Department of Environment and Natural Resources ("DENR") was represented by Deputy Attorney General Roxanne Giedd and Assistant Attorney General Richard Williams. Quartz Operations, LLC was represented by counsel, Brett Koenecke of May, Adam Gerdes and Thompson, LLP.

After hearing the testimony and evidence presented by the Parties, the Board of Minerals and Environment ("Board") hereby adopts the following:

FINDINGS OF FACT

1. Quartz Operations has submitted two complete applications for permits to drill oil/gas wells at the following locations:

"NORTHERN POINTS 1" WELL: Located in the Northwest Quarter of the Northwest Quarter of Section 7, Township 1 North, Range 14 East, Pennington County, South Dakota;

And

"NORTHERN POINTS 2" WELL: Located in the Northeast Quarter of the Northeast Quarter of Section 12, Township 1 North, Range 13 East, Pennington County, South Dakota.

2. The applications for permits to drill filed by Quartz Operations LLC as identified above are complete.
3. The applications propose the drilling of wildcat oil/gas wells.
4. The applications for permits to drill disclose that the wells proposed are relatively deep wells that require significant site preparation and equipment, and must be drilled by large oil drilling rigs with a capacity to drill to significant depths.
5. The applications for permits to drill disclose that the depth of the wells is approximately 9700 feet below surface, and the target formation of the wells is the Precambrian formation.
6. While oil wells have been drilled in South Dakota and other neighboring states to a depth of approximately 9700 feet below surface, the target formations of such wells have been above the Precambrian formation.
7. The Precambrian formation is a geologic formation from which neither oil nor gas has been discovered in economic quantities in South Dakota or neighboring states, and is not a formation traditionally associated with the discovery of oil and gas.
8. The target formation in South Dakota of the proposed wells has not previously been found to contain oil or gas in quantities that would be economic to produce.

9. Quartz Operations has not submitted any documentation or information substantiating that oil or gas is likely to exist in economic quantities in the Precambrian formation in the locations of the proposed wells.
10. The cost of drilling an oil well to a depth of approximately 9700 feet in other more easily drilled target formations is approximately \$3 million per well.
11. Quartz Operations has no experience drilling oil and gas wells, or producing oil or gas.
12. Quartz Operations has no producing oil or gas wells or other related facilities in South Dakota.
13. As part of the applications for the permits to drill, Quartz Operations submitted a \$20,000 statewide Plugging and Performance Bond.
14. DENR estimates the costs to the State of plugging each oil well and reclaiming the affected surface land proposed in the drilling permit applications identified above in accordance with plugging and reclamation laws to be approximately \$130,000 per well.
15. The \$20,000 Statewide Plugging and Performance Bond is insufficient to pay the costs that will accrue to the DENR for plugging the oil wells and reclaiming affected surface lands proposed in the drilling permit applications identified above, if Quartz Operations fails to comply with its obligations to plug the wells and reclaim the affected surface lands.
16. The circumstances associated with the applications for oil well drilling permits identified above, require additional surety bond (over and above the submitted Statewide Plugging and Performance Bond) to ensure the performance of the duty to plug each dry or abandoned well, restore the premises of the wells, and properly perform the requirements of law.
17. DENR is recommending *conditional approval* of these permits to drill, with the conditions as set forth below:
 - a. This permit is conditioned on compliance with all applicable requirements of SDCL Title 45-9 and ARSD Article 74:12.
 - b. That the operator shall submit additional surety bonds for each well to be held in addition to the \$20,000 Statewide Plugging and Performance Bond already submitted. The additional bond required for the first well is \$110,000 and for the second well, \$130,000. The form of the surety bond may be in the form of a certificate of deposit in the name of the Board of

Minerals and Environment or a surety bond. The additional bond for each well must be submitted and approved by the Department before site preparation and drilling may begin.

- c. The operator shall provide the Department with the name of the drilling contractor before the drilling commences.
- d. A 12-mil woven, reinforced high-density polyethylene liner must be used for pits or cuttings storage areas.
- e. Surface runoff must be diverted around the drill site.
- f. The surface hole must be drilled with fresh water.
- g. Cement must be circulated to the ground surface on the surface casing.
- h. Vertical deviation survey results must be submitted to the department within 30 days of completion of the well pursuant to rule 74:12:02:15.
- i. If production casing is set:
 - (1). The casing and cementing program submitted with the application, including cementing the production casing from total depth to surface, shall be followed.
 - (2). A cement bond log must be run and filed with the department within 60 days of completion of the well as required by rule 74:12:02:12.
 - (3). A completion report must be submitted to the department within 30 days of completion of the well as required by rule 74:12:02:17.
- j. Technical reports and well logs must be submitted to the department as required by rule 74:12:02:17.
- k. If abandoned:
 - (1). If production casing is left in the wellbore, a mechanical integrity test (MIT) must be conducted to verify the integrity of the casing as required by rule 74:12:03:02(4)(b)(ii).
 - (2). With production casing:
 - (a). A cast iron bridge plug and a 20-foot cement plug must be installed immediately above any perforations.

(b). If a portion of the production casing is retrieved, a 100-foot cement plug, half in and half out of the top of the casing stub after the retrievable part of the production casing has been removed, must be installed.

(c). A 100-foot cement plug, half in and half out of the top of the following formations: Deadwood, Red River, Interlake, Minnelusa, Minnekahta, and Inyan Kara, must be installed.

(d). A 100-foot cement plug, half in and half out of the base of the surface casing, must be installed.

(e). A 25-foot cement plug must be installed at the top of the surface casing.

(3). Without production casing:

(a). 100-foot cement plugs must be installed, half in and half out of the top of the following formations: Deadwood, Red River, Interlake, Madison, Minnelusa, Minnekahta, and Inyan Kara.

(b). A 100-foot cement plug, half in and half out of the base of the surface casing, must be installed.

(c). A 25-foot cement plug must be installed at the top of the surface casing.

(d). Heavy, mud-laden fluid must be used between all open hole plugs.

(4). The casing string must be cut off at least three feet below the final ground surface contour. A plate with the name of the operator, well name and number, and legal location by quarter-quarter section, township and range must be welded to the casing stub. The location of the abandoned well must be surveyed with high resolution global positioning system equipment or other appropriate survey methods sufficient to accurately locate the well. Survey coordinates must be included in the final abandonment report.

(5). A plugging report must be submitted to the department within 30 days after plugging and abandonment operations are complete as required by rule 74:12:03:01.

k. Surface reclamation of the site must be completed within one year of plugging and abandoning the well.

l. A washed set of sample cuttings (or cores, if cut) must be shipped, free of charge, to:

Derric Iles
Geological Survey Program
Akeley-Lawrence Science Center
University of South Dakota
414 Clark Street
Vermillion, SD 57069-2390

18. While the majority of the conditions recommended by the DENR are standard conditions imposed on permits to drill oil/gas wells, the additional surety bond condition requires Board action.

19. Circumstances, including the location of the proposed wells, the depth of the proposed wells, the target formation of the proposed wells, and the lack of experience in oil and gas development and production by Quartz Resources LLC, require additional surety to ensure that the drilled oil/gas wells are properly plugged and affected surface lands properly reclaimed if oil/gas in economic quantities are not discovered.

CONCLUSIONS OF LAW

1. The Board of Minerals and Environment has jurisdiction over this matter under the provisions of SDCL 45-9-1, -4, -15, -54, -56 and -57.
2. The Minerals and Mining Program of the Department of Environment and Natural Resources, hereinafter "DENR", is authorized to issue certain oil well drilling permits pursuant to SDCL 45-9-4 and ARSD ch. 74:12:02.
3. The Board of Minerals and Environment has retained jurisdiction of and authority for the issuance of drilling permits which require additional surety under SDCL 45-9-15.
4. SDCL 45-9-15 states as follows:

Without limiting its general authority, the Board of Minerals and Environment may require, or may delegate to the secretary of environment and natural resources, specific authority to require the furnishing of a plugging and performance bond in the amount of five thousand dollars per

well drilled, or twenty thousand dollars blanket, with good and sufficient surety, conditioned for the performance of the duty to plug each dry or abandoned well, to restore the premises, insofar as possible, to the condition that existed before the filing of the application to drill; and conditioned on the proper performance of all of the requirements of §§ 45-9-5 to 45-9-18, inclusive. The condition of the bond insofar as it relates to restoration of the surface is deemed to have been complied with if the landowner or lessee and the producer or driller adopt a different plan as approved by the board. *The board may require additional bond if the circumstances require.*

5. Under the circumstances set forth in the Findings of Fact, above, the Board has the authority to require additional surety bond for the proposed permits to drill.
6. The applications for permits to drill filed by Quartz Operations LLC meet the requirements for issuance of drilling permits with the conditions recommended by DENR, including that imposing additional bond.

WHEREFORE, the Board of Minerals and Environment hereby ORDERS:

That the applications for permits to drill identified above are hereby approved subject to the following terms and conditions:

- a. Each permit is conditioned on compliance with all applicable requirements of SDCL Title 45-9 and ARSD Article 74:12.
- b. That the operator shall submit additional surety bonds for each well to be held in addition to the \$20,000 Statewide Plugging and Performance Bond already submitted. The additional bond required for the first well is \$110,000 and for the second well, \$130,000. The form of the surety bond may be in the form of a certificate of deposit in the name of the Board of Minerals and Environment or a surety bond. The additional bond for each well must be submitted and approved by the Department before site preparation and drilling may begin.
- c. The operator shall provide the Department with the name of the drilling contractor before the drilling commences.
- d. A 12-mil woven, reinforced high-density polyethylene liner must be used for pits or cuttings storage areas.
- e. Surface runoff must be diverted around the drill site.
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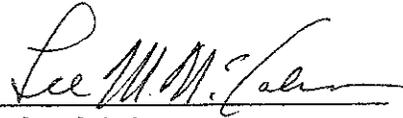
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[SIGNATURES CONTINUE ON FOLLOWING PAGE]

Dated this 21st day of March, 2013.

A handwritten signature in cursive script, appearing to read "Lee M. M. Sweetman", written over a horizontal line.

Vice- Richard C. Sweetman
Chairman
Board of Minerals and Environment