



United States Department of the Interior



BUREAU OF LAND MANAGEMENT

Montana State Office

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Billings, Montana 59107-6800

IN REPLY TO:

SDR-922-94-05
NDM 32696 ACQ
3165.3 (922.PL)

April 21, 1994

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DECISION

David L. Robertson)
1023 Emerald Hills Drive)
Billings, Montana 58101)

SDR No. 922-94-05

REVERSED AND REMANDED

Mr. David L. Robertson, on behalf of Sunbehm Gas, Inc. (Sunbehm), requested (Enclosure 1) a State Director Review (SDR) of the April 5, 1994, Dickinson District Office (DDO) decision to not approve the casing program proposed for the Federal Darling No. 5H well (Enclosure 2). The DDO's decision to not approve the surface casing program is based upon a District policy that the Fox Hills must be protected by setting the surface casing 50 feet into the Pierre shale, and, if production casing is run, cement be brought above the uppermost porosity interval in the Dakota group.

The SDR was delivered by Mr. Robertson to this office on the afternoon of April 7, 1994. The request is considered timely filed in accordance with 43 CFR 3165.3(b).

The proposed well is located within Federal oil and gas lease No. NDM 32696 Acq., in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 158 N., R. 85 W., Renville County, North Dakota. The Application for Permit to Drill (APD) for the proposed well was filed with the DDO on February 10, 1994 (Enclosure 3).

On February 22 and March 10, 1994 (Enclosures 4-5), Mr. Robertson was notified by the DDO of deficiencies with the APD. Mr. Robertson corrected the deficiencies in his March 16, 1994, letter (Enclosure 6). On April 5, 1994, the DDO accepted Mr. Robertson's response to all of the deficiencies, except the surface casing setting depth. In this letter, the DDO stated that, "In approving the drilling of Federal wells in North Dakota, District policy has been to protect the Fox Hills by requiring that fresh water be used to drill to the surface casing setting depth, surface casing be set 50 feet into the Pierre shale,...."

Based upon this policy, the DDO required Mr. Robertson to amend the casing design by setting the surface casing to a minimum of 890 feet. This would position the surface casing shoe approximately 50 feet into the Pierre shale. The DDO believed that this requirement would "protect shallow sources of usable water" as stated in the DDO's February 22, 1994, letter. The DDO also indicated in its April 5, 1994, decision that the District policy is consistent with the minimum requirements of Onshore Order #2 (OO#2).

The reasoning Mr. Robertson presented in his SDR request is no different than that of his March 16, 1994, letter to the DDO. Mr. Robertson stated that his "...proposed casing program is in compliance with the requirements of Onshore Order #2, however, is not in compliance with the Dickinson District's internal policy of requiring that surface casing be set 50 feet into the Pierre shale on all wells in North Dakota regardless of circumstances."

The following are Mr. Robertson's specific arguments:

1. The surface casing set through the Glacial Till will isolate the fresh water zones from the Fox Hills formation.
2. The production casing cemented from the shoe up to above the Dakota Sands will isolate the Fox Hills sand stringers from the saline water-bearing Dakota Sands.
3. There is no permeable source of saline water existing in the area between the Fox Hills formation and the Dakota Sands. As evidence, he supplied the dual laterolog from Sunbehm's Federal Darling #1 well, located in the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 1.
4. All of the producing wells in the area have surface casing set between 407 and 484 feet.
5. Sunbehm plans to use a closed mud system consisting of steel tanks for handling drilling fluid on this well. This will facilitate maintaining water loss control when drilling the main hole below surface casing, and will allow accurate monitoring of the mud system. Additionally, the mud filter cake that would be established around the wellbore would also prevent further loss of fluids into the Fox Hills. Since the mud column in the well would be overbalanced to formation pressures while drilling this section of hole, it would not allow cross-flow between zones.
6. The DDO did not require casing to be set into the Pierre shale in the approved casing program for the Mustang Oil Federal Darling #31-2 well, the last Federal well drilled in the Lake Darling field.

The DDO did not address Mr. Robertson's reasoning, as outlined in his March 16, 1994, letter, that the casing program is adequate in regard to the protection of the usable water in the Fox Hills formation. The DDO's April 5, 1994, letter merely cited OO#2 and District policy as rationale for rejecting Mr. Robertson's casing program. This is not adequate. Each APD must be reviewed on a case by case basis to determine if all usable water zones will be protected and/or isolated in accordance with OO#2.

Since Mr. Robertson agreed that the water in the Fox Hills formation must be protected, what is needed is to determine the adequacy of Mr. Robertson's casing program to protect the usable water in the Fox Hills formation. To reiterate, Sunbehm proposes to: 1) drill the well to the Sherwood formation at a depth of 5400 feet; 2) set surface casing at approximately 450 feet and cement to surface; and 3) set production casing at approximately 5220 feet, with cement from shoe up to approximately 2900 feet.

Onshore Order #2, Part III B, states that "the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones." By policy, the Bureau does not develop additional requirements on a statewide or districtwide basis that would go beyond the procedures provided for in the regulations and onshore orders without a formal process.

We agree with Mr. Robertson's response to points 1 through 5: setting the surface casing to a depth of 450 feet would isolate the fresh water sands in the glacial till from deeper aquifers with poorer water quality. In addition, the production casing cemented from the shoe above the Dakota Sands would isolate the Fox Hills sand stringers from the saline water-bearing Dakota Sands. Also, Sunbehm opted to use a closed mud system during drilling and completion operations. This would assist maintaining water loss control when drilling the main hole below the surface casing.

Other factors we used in our review include the following

- 1) Well logs do not show any permeable source of saline water between the Fox Hills formation and the Dakota Sandstone.
- 2) The Lake Darling field rules established by the North Dakota Industrial Commission require that surface casing be set at a point not higher than 300 feet below the surface of the ground. The surface casing setting depth of the existing wells in the Lake Darling field area ranges from 307 feet to as much as 607 feet (Enclosure 7).

We disagree with the DDO decision that the proposed casing and drilling program do not meet the objectives of the applicable minimum standards of OO#2.

Therefore, it is our finding that the DDO's decision for requiring the surface casing setting depth to 890 feet is not necessary. The surface casing program proposed by the operator is adequate to isolate and protect the usable water in the Fox Hills formation.

We hereby reverse the DDO decision to not approve the APD for the Federal Darling #5H well, and remand the case to the DDO for processing the APD. Setting the surface casing at the proposed depth of 450 feet and bringing the cement above the Dakota formation are adequate to protect the Fox Hills formation. As long as other necessary conditions are met, the APD may be approved.



Howard A. Lemitt
Deputy State Director
Division of Mineral Resources

7 Enclosures

- 1 - DLR SDR, dated April 7, 1994 (5 pp)
- 2 - DDO Decision Letter dated April 5, 1994 (2 pp)
- 3 - APD Filed February 10, 1994 (10 pp)
- 4 - BLM Deficiency Letter dated February 22, 1994 (2 pp)
- 5 - BLM Deficiency Letter dated March 10, 1994 (2 pp)
- 6 - Sunbehm's Letter dated March 16, 1994 (3 pp)
- 7 - Surface Casing Setting Depth - Lake Darling field (1 p)

cc:

Sunbehm Gas, Inc., 726 20th Avenue SW, Minot, North Dakota 58701
Dickinson DO