

GRYNBERG PETROLEUM CO.

IBLA 96-546

Decided June 8, 2000

Appeal from that part of a decision of the Colorado State Office, Bureau of Land Management, affirming as modified a decision of the Acting San Juan Resource Area Manager, Bureau of Land Management, imposing a condition of approval to a request to plug and abandon the Wild Steer Federal 32-24 well. SDR-CO-96-10.

Affirmed.

1. Administrative Procedure: Burden of Proof--Appeals: Generally--Evidence: Burden of Proof--Oil and Gas Leases: Generally--Rules of Practice: Appeals: Burden of Proof

When BLM imposes a condition of approval to an operator's request to plug and abandon a well, in order to protect a fresh water zone from contamination by gas or saline water from deeper formations, and the operator asserts that such a condition is unnecessary, the operator must show by a preponderance of the evidence that the condition is excessive in order to prevail.

2. Administrative Procedure: Burden of Proof--Appeals: Generally--Evidence: Burden of Proof--Oil and Gas Leases: Generally--Rules of Practice: Appeals: Burden of Proof

When, on the basis of differing interpretations of the same geological data, the operator of an oil and gas well and BLM disagree on the proper procedure to be used in plugging and abandoning an oil and gas well, the Secretary is entitled to rely on the reasoned opinions and conclusions of his technical experts in the field, absent a showing by a preponderance of the evidence that such opinions are erroneous.

APPEARANCES: Jack J. Grynberg, Denver, Colorado, for Grynberg Petroleum Company.

## OPINION BY DEPUTY CHIEF ADMINISTRATIVE JUDGE HARRIS

Grynberg Petroleum Company (Grynberg) has appealed from an August 22, 1996, decision of the Petroleum Engineer, Fluid Operations Team, Colorado State Office, Bureau of Land Management (BLM), which affirmed as modified in part, and rescinded in part a July 12, 1996, decision of the Acting Area Manager, San Juan Resource Area (SJRA), BLM, imposing a condition of approval to Grynberg's request to plug and abandon the Wild Steer Federal 32-24 well.

The Wild Steer Federal 32-24 well is located on Federal lease C-17055, situated in sec. 24, T. 46 N., R. 18 W., New Mexico Principal Meridian, Montrose County, Colorado. The well has been shut-in since July 1975. Grynberg is the operator of the well.

On April 18, 1996, Grynberg filed a Notice of Intent to Abandon (NIA) the Wild Steer Federal 32-24 well in which it set forth its plan to plug the well as follows:

1. Lower tubing and tag cement plug at 3207'.
2. Lay cement plug from 2380 to 2170.
3. Test plug with 500 psi for 15 minutes.
4. Set wire line BP in 9-5/8["] at +300'.
5. Perforate 9-5/8["] with 4 holes at 280'.
6. Circulate cement down 9-5/8["] and back on 9-5/8["] x 13-3/8["] annulus to surface. Leave 9-5/8["] full of cement from surface to 280'.
7. Cut off casing head and weld plate on 9-5/8["] casing stub and install dry hole marker.
8. Rehabilitate and re-seed location.
9. Space between cement plug to be filled with 9#/gal brine or mud.

In a memorandum to the case file dated May 1, 1996, a BLM geologist reported that useable water was present from the surface to the base of the Wingate formation at approximately 1,400 feet. He recommended that, if the well were plugged, cement should be circulated so that the formations from the surface to the base of the Wingate formation would be isolated or safe from "cross flow between good quality water and saline or production/hydrocarbon contaminated water from deeper formations \* \* \*." To this end, he recommended that "cement around the production casing should be circulated to the surface casing if possible."

Based on this advice, the SJRA approved the NIA on May 2, 1996, with seven Conditions of Approval (COA). The third COA stated:

Usable water is present from the surface to the base of the Wingate formation at approximately 1400 feet. The casing should be perforated at 1450 feet and cement circulated to

the surface. Isolation of the freshwater zones should be conducted so that no cross flow between good quality water and saline or production/hydrocarbon contaminated water from deeper formations occurs.

In a May 3, 1996, letter to the SJRA, Grynberg stated that it wanted to revise its plugging procedures and requested that COA No. 3 be amended to eliminate any requirements to perforate the casing. It proposed that the most ecologically sound way to plug the subject well was to

put cement across the perforations from a depth of 2380' to a depth of 2170' and then put a 50' plug at the top of the string and pump 100 [sacks] of cement between the long string and the surface casing, the long string being 9-5/8["] and the surface string being 13-3/8["] in diameter, allowing plenty of room between the two sets of casing for cement.

Id. at 2.

In a June 5, 1996, letter to Grynberg, the SJRA Manager stated that BLM had reviewed the drilling history of the well and that

[t]he drillers log indicates that occasional waters were encountered during drilling. One show occurred at 383 feet in depth as recorded in the drillers log. A BLM staff Geologist reviewed the mud log and the drilling record, and along with guidelines set forth in the Oil and Gas regulations, determined that fresh waters were present, and that aquifers needed protection down to a depth of 1450 feet. Usable waters can be found from the base of the Wingate (1400 feet) to the surface.

\* \* \* \* \*

Two potential sources of environmental degradation still remain, the possibility of natural gas seeking an avenue to the surface (and/or into groundwaters), and the commingling of saline formation waters with freshwater aquifers. The proper plugging of this well will eliminate the possibility of gas escaping, and stop any water contamination which may be already occurring at this time.

In addition to the two internal 9-5/8" casing plugs, perforating the 9-5/8" production casing at 1450 feet, and circulating cement through the 13-3/8" annular space to the surface will remediate both of these concerns. Bullheading the cement down the annular space is a last resort method of plugging wells and cannot be authorized at this time. The placement of the cement and the quality of the cement is uncertain when plugging a well with this method. During

squeezing cement with this method, cement is pumped down the annular space. Where the cement lands, and how diluted the cement becomes is an uncertainty. A good cement bond, with cement placed in critical areas is essential for a safe and functional cement plug.

By letter of June 10, 1996, Grynberg again requested BLM to allow it to amend its plugging procedure and to revise or eliminate COA No. 3 to conform with its request. Grynberg stated that it had conducted a study to analyze the subsurface conditions in order to determine if water flow from the deeper saline formation could penetrate the Wingate aquifer above 1,400 feet. It asserts that the results of that study showed that the reservoir horizons present at the depth of approximately 2,200 feet contained saline water with a potentiometric surface of +5,263 feet, that the fresh water reservoir had a potentiometric surface of +5,780 feet, and that because the fresh water potentiometric surface was considerably higher than that of the saline water, no water could flow from the saline water reservoirs into the fresh water reservoir thereby contaminating the fresh water reservoir. <sup>1/</sup>

By decision of July 12, 1996, the SJRA Manager responded to Grynberg. Having examined the data provided, including an additional cement bond log (CBL), he determined that the plugging order should be revised to include the isolation of the Cutler formation, the formation in which the well was completed. He stated: "The calculated top of [the] cement and the CBL both confirm that the Cutler has not been isolated by adequate cementing." (Decision at 1.)

He concurred with Grynberg that the potentiometric water surfaces were at +5,780 feet (freshwater), and at +5,263 feet (saline water from the Cutler). However, he stated that, in addition to those two surfaces, there was the

freshwater Wingate formation identified by the BLM. This formation is located at approximately 1400 feet in depth, or at +4963 feet potentiometric. You will notice that this is approximately 300 feet below the potentiometric surface of the saline Cutler formation that you identified. This would indicate that a high potential already exists for freshwater contamination. It is more likely that both saline water and

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<sup>1/</sup> Potentiometric surface is defined in "The Federal Glossary of Selected Terms: Subsurface-Water Flow and Solute Transport": Department of Interior, U.S. Geological Survey, Office of Water Data Coordination, August 1989, as "[a]n imaginary surface representing the static head of ground water and defined by the level to which water will rise in a tightly cased well (after Lohman and others, 1972)."

hydrocarbons from the Cutler have been contaminating the fresh water Wingate and the waters identified at +5263 feet since the well was drilled back in 1975. We would disagree, however, that without zonal isolation (cement) these zones may commingle. It is unlikely that a dynamic equilibrium will take place in a wellbore consisting of many unisolated formations. Many mechanisms exist in a wellbore including differential pressures, differential temperatures, gas expansion, and gravity separation. All aiding the mixing of all the miscible fluids (both waters and hydrocarbons) present.

BLM amended COA No. 3 to read:

Usable water is present from the base of the Wingate formation at approximately 1400 feet. Cement should be circulated through the perforations across the Cutler formation (2331'-2220') to the surface. Isolation of the freshwater zones should be conducted so that no crossflow between good quality water and saline or production/hydrocarbon contaminated water from deeper formations occurs.

Id.

Grynberg filed a timely request for State Director Review in which it offered five arguments in support of its position that the Wingate formation is isolated and that contamination from the underlying Cutler formation cannot occur. In the August 22, 1996, decision being appealed, BLM responded to each of those arguments. We will summarize in turn each argument and response.

First, Grynberg asserted, in reliance on cementing information, that the Wingate formation was isolated and could not be contaminated by the underlying Cutler formation. BLM admitted that cement had been utilized, but it pointed to the CBL, which, it claimed, showed poor cement bonding throughout. BLM concluded that isolation was questionable.

Second, Grynberg asserted that the CBL showed that the top of the cement was found at 1,650 feet, and that cement behind the pipe is present below this level. According to Grynberg, separation between the Wingate reservoir and the Cutler is proven by the fact that during testing of gas, no water was recovered. Grynberg noted that the top of the Cutler was encountered at 2,142 feet.

BLM explained that, even if the top of cement were at 1,650 feet as Grynberg contended, the Dual Induction Log run on this well indicates a probable saline zone from 1,620 feet to 1,648 feet, below the top of cement. BLM refers to a June 30, 1975, test of the Cutler formation which did not indicate the presence or absence of water, but asserts that even

the absence of water would not preclude contamination of the Wingate formation from zones above the top of the Cutler formation. It agreed that the July 15, 1975 completion report confirmed the top of the Cutler formation at 2,142 feet.

Third, Grynberg contended that no communication exists between the Wingate and the Cutler because the Wingate and the Cutler have different potentiometric surfaces which is indicative of two separate reservoirs.

BLM stated that contamination of the Wingate by water from the Cutler can exist if the potentiometric surface of the Cutler is greater than that of the Wingate. Also, it stated that gas migration could occur if the pressure of the Cutler were greater than that of the Wingate. BLM pointed out that Grynberg's own data (June 10 letter) showed the Cutler to have a potentiometric surface of 5,263 feet and a shut-in reservoir pressure of 529 pounds per square inch absolute (psia). Since that pressure is greater than the Wingate pressure (351 psia), and since the June 30, 1975, test of the Cutler confirmed the presence of gas, BLM concluded that contamination of the Wingate by gas migration could occur.

Fourth and fifth, Grynberg again offered its arguments based on location of potentiometric surfaces. Grynberg stated that the water level at 583 feet reflects maximum reservoir pressure through the open interval, or a potentiometric surface of +5,780 feet of the Wingate formation. Grynberg concludes that since the water in the well is fresh, its source is clearly the Wingate formation.

BLM responded by admitting that the potentiometric surface of the Wingate formation was not at the base of the Wingate (1,400 feet), as stated by the SJRA. However, BLM stated that

[a]ssuming the potentiometric surface of the Wingate is at +5780 feet, as you contend, and is greater than that of the Cutler at +5263 feet and should preclude water flow from the Cutler into the Wingate, the argument of potentiometric surfaces does not preclude the contamination of the Wingate by gas migration as discussed earlier.

(Decision at 5.)

In conclusion, BLM stated: "Contamination of the Wingate by the Cutler or other formations above the Cutler is possible and therefore the Wingate needs to be isolated." (Decision at 5.) BLM also rescinded the SJRA's requirement "to circulate cement through the perforations to the surface." Id.

On appeal, Grynberg asserts that BLM "agrees that water contamination between the Cutler formation and the Wingate formation does not exist." (Statement of Reasons (SOR) at 1.) Grynberg also contends that "the only way gas can migrate from the Cutler interval to the Wingate is

through the annulus." Id. It states that BLM questions the quality of the cement bonding above the external packer, but it argues that "the external packer itself can stop any gas migration." Id. In support of its contention of lack of communication between the Wingate and Cutler formations, it refers to the Daily Drilling Report for the well, which states that there was no fluid recovery during a flow test on July 2, 1975.

Grynberg contends that there is no possibility of water contamination of the Wingate from the probable saline zone from 1,620 feet to 1,648 feet. It argues that examination of the logs for that interval show that it does not have reservoir properties. It states that the gamma ray readings increase when the resistivity readings decrease, which indicates the presence of clay, and is, therefore, not indicative of saline water.

Grynberg again emphasizes its contention that if different potentiometric surface values exist for the Wingate and Cutler formations, "that means we do have separation between the two reservoirs." (SOR at 2.) It states that it does not argue that contamination between the two reservoirs could not take place, but that "at the time of measurement, such communication did not take place and the two reservoirs were separated, indicating that there is no gas migration in the annulus due to the external packer or cement." Id.

In conclusion, Grynberg asserts that it is clear that there is no communication between the Cutler and Wingate formations, and that there is no danger of contamination of fresh water in the Wingate formation by saline water or gas from underlying reservoirs. It asks that it be allowed to follow its proposed plugging procedure.

[1] The regulation governing abandonment of oil and gas wells provides, in pertinent part,

[t]he operator shall promptly plug and abandon, in accordance with a plan first approved in writing or prescribed by the authorized officer, each newly completed or recompleted well in which oil or gas is not encountered in paying quantities or which, after being completed as a producing well, is demonstrated to the satisfaction of the authorized officer to be no longer capable of producing oil or gas in paying quantities \* \* \*.

43 C.F.R. § 3162.3-4(a).

We have stated that the ultimate burden of establishing compliance with the plugging and abandonment requirements of a plan approved in writing or prescribed by the authorized officer is on appellant. Daniel C. Wychgram, 116 IBLA 89, 101-102 (1990); Coleman Oil & Gas Inc., 104 IBLA 363, 366 (1988). However, in this case the issue is not whether Grynberg complied with the approved plan because plugging has not yet taken place.

The issue herein is whether BLM's COA No. 3 for the plugging and abandonment of the Wild Steer Federal 32-24 is reasonable. In challenging that condition, Grynberg must show by a preponderance of the evidence that such a requirement is excessive. See Daniel C. Wychgram, 116 IBLA at 102.

For reasons explained below we find that Grynberg has failed to meet this burden of proof.

The evidence in this case - the scientific data of well completion reports, well logs and well test results - are capable of supporting differing inferences, interpretations, and conclusions. BLM's essential conclusion is that contamination of the Wingate "is possible." (Decision at 5.) Grynberg's conclusion, based on an interpretation of the same data, is that "there is no danger" of contamination of the Wingate. (SOR at 2.) Assuming for the sake of argument that BLM's position errs, it does so on the side of resource safety. Grynberg's position assumes that risk and pronounces it harmless. We find, based on the evidence, that the possibility of contamination is the more likely, and the more prudent, proposition.

[2] The points of dispute, including, but not limited to, the quality of the cementing, the possibility of water migration, the possibility of gas migration, pressure differentials, and potentiometric surfaces, illustrate that different conclusions were reached by BLM and Grynberg on the existing evidence concerning the well.

The file contains a CBL Analysis for the well in question signed by BLM Petroleum Engineer Hank Szymanski on August 19, 1996. Szymanski explained that a CBL was run on February 9, 1975, to evaluate the cement job. He reported that the bond log response from 1,200 feet to 2,170 feet indicated extremely poor cement bonding below about 1,650 feet, and that above 1,650 feet no cement bonding was indicated. He listed his observations which supported this conclusion. However, Szymanski noted that the CBL run time was within 24 hours of cement placement, and explained that insufficient cement set time could have contributed to the results. He suggested additional tests to adequately determine cement bond characteristics across the interval in question.

Apparently, Grynberg did not undertake any additional tests to determine cement bond characteristics, or even if it did, it has not submitted any evidence on the quality of the cement bonding across the interval in question to contradict the evidence of record. Thus, BLM's evaluation of the quality of the cement remains undisputed. We must agree with BLM's assessment at page 3 of its decision: "Therefore, isolation [of the Wingate formation] is questionable."

Grynberg states that BLM agrees in its August 22, 1996, decision that "since the Cutler potentiometric surface is lower than the Wingate, contamination of the Wingate water by Cutler water cannot take place." (SOR at 2.) We do not read the decision that way. BLM stated at page 5 of its decision: "Assuming that the potentiometric surface of the Wingate

is at +5780 feet, as you contend, and is greater than that of the Cutler at +5263 feet and should preclude water flow from the Cutler into the Wingate, the argument of potentiometric surfaces does not preclude the contamination of the Wingate by gas migration as discussed earlier."

BLM based its decision on its conclusion that gas and/or saline water contamination of the Wingate by the Cutler or other formations above the Cutler was possible. The above statement by BLM was not an admission that Grynberg was correct regarding potentiometric surfaces, but only a concession that even if Grynberg were correct, such an argument did not rule out possible gas contamination.

We have reviewed the arguments presented by Grynberg, and we conclude that it has failed to show that BLM's conclusions are unreasonable or not supported by the data. Where, based on differing interpretations of the same data, the operator of an oil and gas well and BLM disagree as to the proper procedure to be used in plugging and abandoning an oil and gas well, the Secretary is entitled to rely on the reasoned conclusions of his technical experts in the field, absent a showing by a preponderance of the evidence that such conclusions are erroneous. See Daniel C. Wychgram, 116 IBLA at 103; Harry Ptasynski, 107 IBLA 197, 202 (1989); Celeste C. Grynberg, 107 IBLA 143, 149 (1989); and cases there cited. See also Mallon Oil Co., 107 IBLA 150 (1989) (holding that the Secretary is entitled to rely on the opinion of his experts regarding the volume of gas avoidably lost by an operator, in the absence of a showing by a preponderance of the evidence that such opinion is erroneous). No such showing has been made in this case.

Therefore, pursuant to the authority delegated to the Board of Land Appeals by the Secretary of the Interior, 43 C.F.R. § 4.1, the decision appealed from is affirmed.

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Bruce R. Harris  
Deputy Chief Administrative Judge

I concur:

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Gail M. Frazier  
Administrative Judge

