

**BLACKWOOD & NICHOLS CO.
A LIMITED PARTNERSHIP**

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March 7, 1991

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OIL CON. DIV.
DIST. 3

Mr. Ernie Busch
New Mexico Oil Conservation Division
1000 Rio Brazos Drive
Aztec, NM 87410

RE: Pump Mesa SWD #1 *N-36-31N-8W*
Sidetrack hole departure from
vertical

Dear Ernie:

The following is a summary of our sidetrack operations on the Pump Mesa SWD #1.

We section milled the 9-5/8" liner from the liner hanger top at 3621' to 3877'. We then set a cement plug on top of the liner and dressed it off to 3795'. A Dyna-Drill mud motor with a 2-1/2° bent sub was used to kick off the cement plug. Prior to kicking off, a survey at 3760' gave 2°. After drilling 40 feet a survey at 3800' gave 1° indicating we were drilling off the low side of the hole. Drilling continued with the Dyna-Drill to 3875' at which point the motor was replaced with a stiff BHA. The stiff BHA was replaced at 4131' with a conventional BHA and the well bore was allowed to drop back to near vertical.

The following is a tabulation of the surveys taken in the original hole and the sidetracked hole. The departure column is the distance of the side tracked hole from vertical.

Mr. Ernie Busch
 March 7, 1991
 Page two

<u>ORIGINAL WELLBORE</u>	<u>SURVEY ANGLE</u>	<u>SIDETRACKED WELLBORE</u>	<u>SURVEY ANGLE</u>	<u>CUMULATIVE DEPARTURE</u>
3775	1-1/4°	3795	0°	0.0
--	--	3833	2-1/4°	0.7
--	--	3895	5-3/4°	5.0
--	--	3934	5-3/4°	8.9
3978	1°	3965	5-1/2°	11.9
--	--	4028	5°	17.4
4445	1-1/4°	4125	4-1/2°	25.4
4950	1-3/4°	4352	3-1/2°	41.2
5194	1-3/4°	4722	2°	60.0
5378	2°	5126	2°	74.1

The departure feet are determined by taking the vertical difference between consecutive surveys times the sin of the median angle between surveys. For example the departure between 3833 and 3895 is:

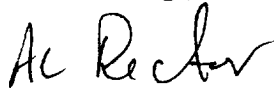
$$(3895' - 3833') \left(\sin \left(\frac{5-3/4^\circ + 2-1/4^\circ}{2} \right) \right) = 4.3 \text{ feet}$$

This number is then added to the previous departure (0.7') to get a cumulative departure.

Our maximum departure from vertical at 5126' is 74.1 feet. This, of course, assumes the departures are all in the same direction and the wellbore did not start to spiral after the Dyna-Drill was pulled.

If you have any questions please call.

Sincerely,



Al Rector
 Operations Engineer

AR/avd