



OXY USA Inc.
6 Desta Drive, Suite 6000, Midland, TX 79705, P.O. Box 50250, Midland, TX 79710-0250
Telephone 915 685-5600 Fax 915 685-5754
April 3, 1997

New Mexico Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

*** BY FAX ***

Attention: Mr. Michael E. Stogner

Re: *Case No. 11762, Proposed Changes to Rule 111*

Dear Mr. Stogner:

OXY USA Inc. wishes to express its strong support for the proposed changes to Rule 111. We have experienced the regulatory process associated with permitting directional and horizontal wells in New Mexico, and concur that the current notice requirements are unnecessary and burdensome. The proposed rules clarify that the Rule 104 process should be used for unorthodox bottomhole locations resulting from directional and horizontal drilling projects, which adequately addresses correlative rights in these situations. The proposed changes also spell out what happens when an operator experiences excessive deviation on a vertical well, which helps in planning drilling operations.

OXY has participated in the Rule 111 work group process, and we thank the commission for this opportunity. We also wish to express our gratitude for the commission's continuing efforts to streamline and eliminate unnecessary regulatory processes.

Sincerely,

Richard E. Foppiano, P.E.
Regulatory Affairs Advisor
Western Region - Midland

REF:ref

BEFORE THE OIL CONSERVATION COMMISSION Santa Fe, New Mexico	
Case No. <u>11762</u>	Exhibit No. <u>3</u>
Submitted by <u>OCD</u>	
Hearing Date <u>4/10/97</u>	

BURLINGTON RESOURCES

MID-CONTINENT DIVISION

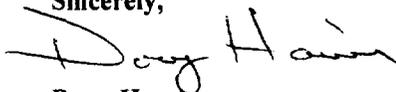
April 7, 1997

**New Mexico Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505**

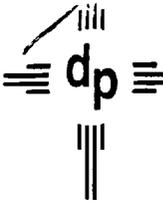
RE: Proposed Revisions to Rule 111

On behalf of Burlington Resources Oil and Gas Company, we appreciate and support all efforts to streamline the requirements of Rule 111-Deviation Tests and Directional Wells. The proposed revisions are warranted and in line with requirements of other states in which Burlington operates. We fully support the revisions as proposed and appreciate the consideration given by the NMOCD in adopting said guidelines.

Sincerely,



**Doug Harris
Division Drilling Manager**



dugan production corp.

P. O. BOX 420 • FARMINGTON, NM 87499-0420 • (505) 325-1821

Date 3-3-97

Subject Comments Re:

Revisions to General

Rule III.

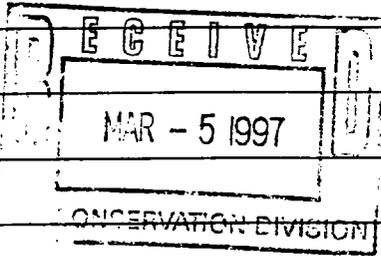
T
O

New Mexico Oil Conservation Div
ATTN: Michael Stogner - New Rule III
2040 S. Rockwood St.
Santa Fe, NM 87505

M E S S A G E

Michael - Attached is a copy of proposed Rule III (dated 2-7-97) on which I've made a few suggested changes. Hope these help. Please call if you want to discuss or need clarification.

Regards
John Roe



Signed _____

a project area, inside of which a vertical wellbore can be drilled and produced in conformity with the setback requirements from the outer boundary of a standard spacing and proration unit for the applicable pool(s).

(9) Producing Interval - means that portion of the wellbore drilled inside the vertical limits of a pool, between its penetration point and its terminus.

(10) Project Area - an area designated on Form C-102 that is enclosed by the outer boundaries of a drilling unit, a combination of complete drilling units, or an approved secondary, tertiary or pressure maintenance project.

(11) Project Well - means any well drilled, completed, produced or injected as either a deviated well or ~~as a~~ directional well.

Proposed Changes to Rule 111: Directional Drilling

February 7, 1997

111 DEVIATION TESTS AND DIRECTIONAL WELLS

111.A. Definitions: the following definitions shall apply to this Rule only:

(1) Azimuth - means the deviation in the horizontal plane of a wellbore expressed in terms of compass degrees.

(2) Deviated Well - means any wellbore which is intentionally deviated from vertical but not with an intentional azimuth. Any deviated well is subject to Rule 111-B.

(3) Directional Well - means a wellbore which is intentionally deviated from vertical with an intentional azimuth. Any directional well is subject to Rule 111-C.

(4) Drilling Unit - means the surface acreage assigned to a ~~vertical~~ wellbore in accordance with NMOCD Rule 104. Included in this definition is a "unit of proration for oil or gas" as defined by the Division ~~and all such non-standard units previously approved by the Division.~~
approved

(5) Kick-off Point - means the point at which the wellbore is intentionally deviated from vertical.

(6) Lateral - means any portion of a wellbore past the point where the wellbore has been intentionally ~~departed~~ *deviated* from the vertical.

(7) Penetration Point - means the point where the wellbore penetrates the top of the pool from which it is intended to produce.

(8) Producing Area - means all points that lie ^{within} ~~along a rectangular or square~~ window formed by plotting the measured distance from the North, South, East and West boundaries of a project area, inside of which a vertical wellbore can be drilled and produced in conformity with the setback requirements from the outer boundary of a standard spacing and proration unit for the applicable pool(s).

(9) Producing Interval - means that portion of the wellbore drilled inside the vertical limits of a pool, between its penetration point and its terminus.

(10) Project Area - an area designated on Form C-102 that is enclosed by the outer boundaries of a drilling unit, a combination of complete drilling units, or an approved secondary, tertiary or pressure maintenance project.

(11) Project Well - means any well drilled, completed, produced or injected into as either a deviated well or ~~directional~~ directional well.

vertical,

(12) Terminus - means the farthest point attained along the wellbore^{within the field important to be produced}

(13) Unorthodox - means any part of the producing interval which is located outside of the producing area.

(14) Vertical Well - means a well that does not have an intentional departure or course deviation from the vertical.

(15) Wellbore - means the interior surface of a cased or open hole through which drilling, production, or injection operations are conducted.

111.B. Deviated Wellbores:

(1) **Deviation Tests Required.** Any vertical or deviated well which is drilled or deepened shall be tested at reasonably frequent intervals to determine the deviation from the vertical. Such tests shall be made at least once each 500 feet or at the first bit change succeeding 500 feet. A tabulation of all deviation tests run, sworn to and notarized, shall be filed with Form C-104, "Request for Allowable and Authorization to Transport Oil and Natural Gas".

(2) **Excessive Deviation.** When the deviation averages more than five degrees in any 500-foot interval, the operator shall include the calculations of the maximum possible horizontal displacement of the hole. When the maximum possible horizontal displacement exceeds the distance to the nearest outer boundary line of the appropriate unit, the District Supervisor shall require that a directional survey be run to establish the location of the producing interval(s).^{allowable}

(3) **Unorthodox Locations.** If the results of the directional survey indicate that the producing interval is more than 50 feet from the approved surface location and less than the minimum setback requirements from the outer boundaries of the applicable unit, then the well shall be considered unorthodox. To obtain authority to produce such well, the operator shall file an application with the Division Director, copy to the appropriate OCD District Supervisor, and shall otherwise follow the normal process outlined in Rule 104.F(3) to obtain approval of the unorthodox location.

(4) **Directional Survey Requirements.** Upon request from the Division Director, any vertical or deviated well shall be directionally surveyed. The Supervisor of the appropriate Division District shall be notified of the approximate time any directional surveys are to be conducted. All directional surveys run on any well in any manner for any reason must be filed with the Division upon completion of the well. The Division shall not assign an allowable to the well until all such directional surveys have been filed.

111.C. Directional Wellbores:

(1) **Directional Drilling Within a Project Area.** A permit to directionally drill a wellbore may be granted by the Supervisor of the appropriate Division District if the producing interval is entirely within the producing area or at an unorthodox location previously approved by the Division.

(2) **Unorthodox Wellbores.** If all or part of the producing interval of any directional wellbore is projected to be outside of the producing area, the wellbore shall be considered unorthodox. To obtain approval for such wellbore, the applicant shall file a written application in duplicate

with the Division Director, copy to the appropriate OCD District Supervisor, and shall otherwise follow the normal process outlined in Rule 104.F(3).

(3) Allowables for Project Areas With Multiple Proration Units. The maximum allowable assigned to the project area ~~when dealing with proration pools~~ shall be based upon the number of standard proration units (or approved non-standard proration and spacing units) that are developed or traversed by the producing interval of the directional wellbore or wellbores, plus any standard proration units that are developed by vertical wellbores within the project area.

*not all pools are proration subject to depth Bon
i.e. 600/100*

(4) Directional Surveys Required. A directional survey shall be required on each well drilled under the provisions of this section. The Supervisor of the appropriate Division District shall be notified of the approximate time all directional surveys are to be conducted. All directional surveys run on any well in any manner for any reason must be filed with the Division upon completion of the well. The Division shall not assign an allowable to the well until all such directional surveys have been filed. If the directional survey indicates that any part of the producing interval is outside of the producing area, or, in the case of an approved unorthodox location, less than the approved setback requirements from the outer boundary of the applicable unit, then the operator shall file an application with the Division Director, copy to the appropriate OCD District Supervisor, and shall otherwise follow the normal process outlined in Rule 104.F(3) to obtain approval of the unorthodox location.

111.D. Additional Matters:

(1) The Division Director, at the request of an offset operator, may require any operator to make a directional survey of any well. The directional survey and all associated costs shall be at the expense of the requesting party and shall be secured in advance by a \$5,000 indemnity bond posted with and approved by the Division. The requesting party may designate the well survey company and the survey may be witnessed by the Division and the operator.

If the requested directional survey locates the producing interval to be unorthodox, all associated survey costs will be refunded to the requesting party by the wellbore operators.

(2) The Division Director, may, at his discretion, set any application for administrative approval or public hearing.

(3) Permission to deviate or directionally drill any wellbore for any reason or in any manner not provided for in this rule shall be granted only after notice and opportunity for hearing.

ENRON

Oil & Gas Company

P. O. Box 2267 Midland, Texas 79702 (915) 686-3600

April 9, 1997

New Mexico Oil Conservation Division
2040 So. Pacheco St.
Santa Fe, NM 87505

Attn.: Michael E. Stogner

Re: Proposed Revisions
to Rule 111

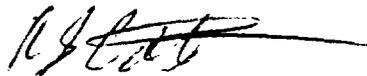
Please be advised that Enron Oil & Gas supports the proposed changes to Rule 111 - Deviation Tests and Direction Wells. We have participated with Industry Committee representatives several times in recent weeks to incorporate Enron's recommendations into the proposals. It is Enron's opinion that the Rule changes, as proposed, accomplish the intention of eliminating unnecessary requirements on industry and the NMOCD while continuing to protect correlative rights and prevent waste.

Enron asks that the Division consider adding language to cover the specific instance of existing wellbores utilized to drill a horizontal lateral (s) (see attached).

Enron appreciates and supports the NMOCD efforts to streamline and simplify our regulatory procedures.

Respectfully yours,

ENRON OIL & GAS COMPANY



Randall S. Cate
Project Reservoir Engineer

RSC/krp

Attachment

cc: Bill Carr - Santa Fe, NM
Rick Foppiano - Oyx

PROPOSED CHANGE TO RULE 111

"The 100'/600' Rule"

Enron asks the Division to consider including the following language in addition to that recommended by the Industry Committee.

111.C.(5) Use of Pre-existing, vertical or deviated wellbore for the purpose of directional drilling.

The wellbore shall be considered orthodox if the results of the directional survey as required in 111.C.(4) indicate that the penetration point is no more than 100' from the producing area, the lateral has entered the producing area no more than 600' from the penetration point, and the remainder of the lateral is entirely within the producing area.

Benefits:

- Encourages use of existing wellbores thereby conserving resources.
- Will eliminate the 2-6 month regulatory interruption of drilling operations on most pre-existing wellbores.
- The portion of the lateral outside the producing area will likely be entirely within the drainage area of the vertical completion thereby having little or no effect on offset correlative rights.

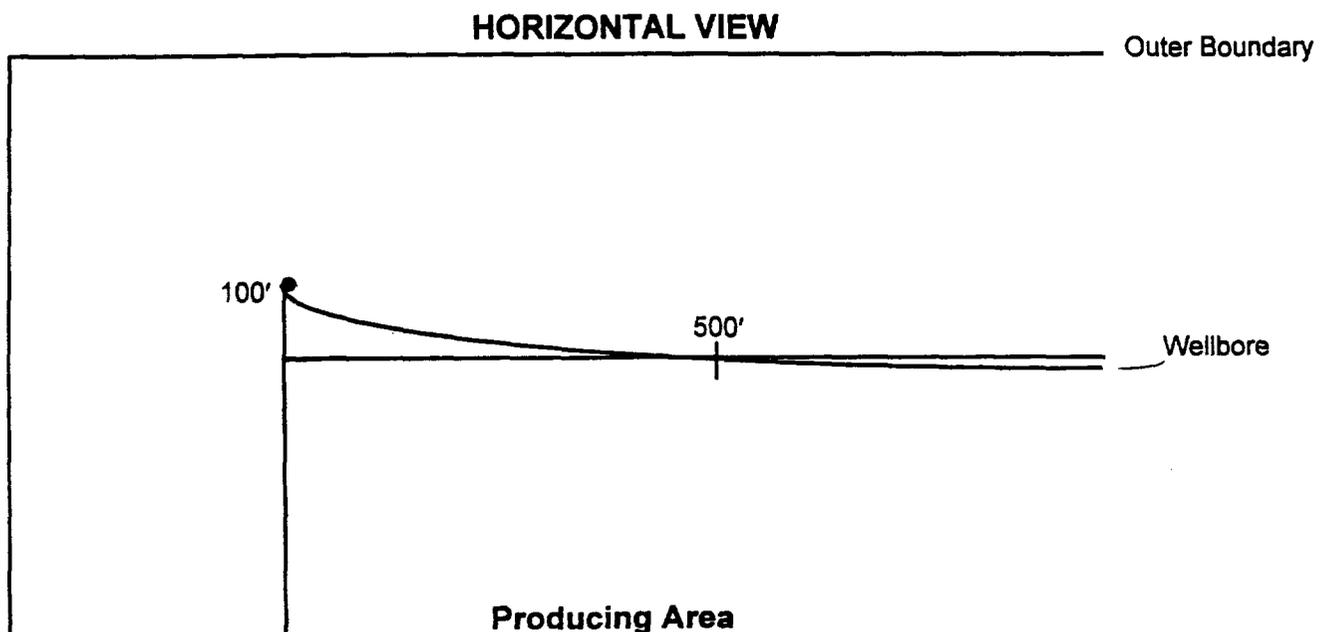
ENRON OIL & GAS COMPANY

Proposed Changes to Rule 111

“The 100' / 600' Rule”

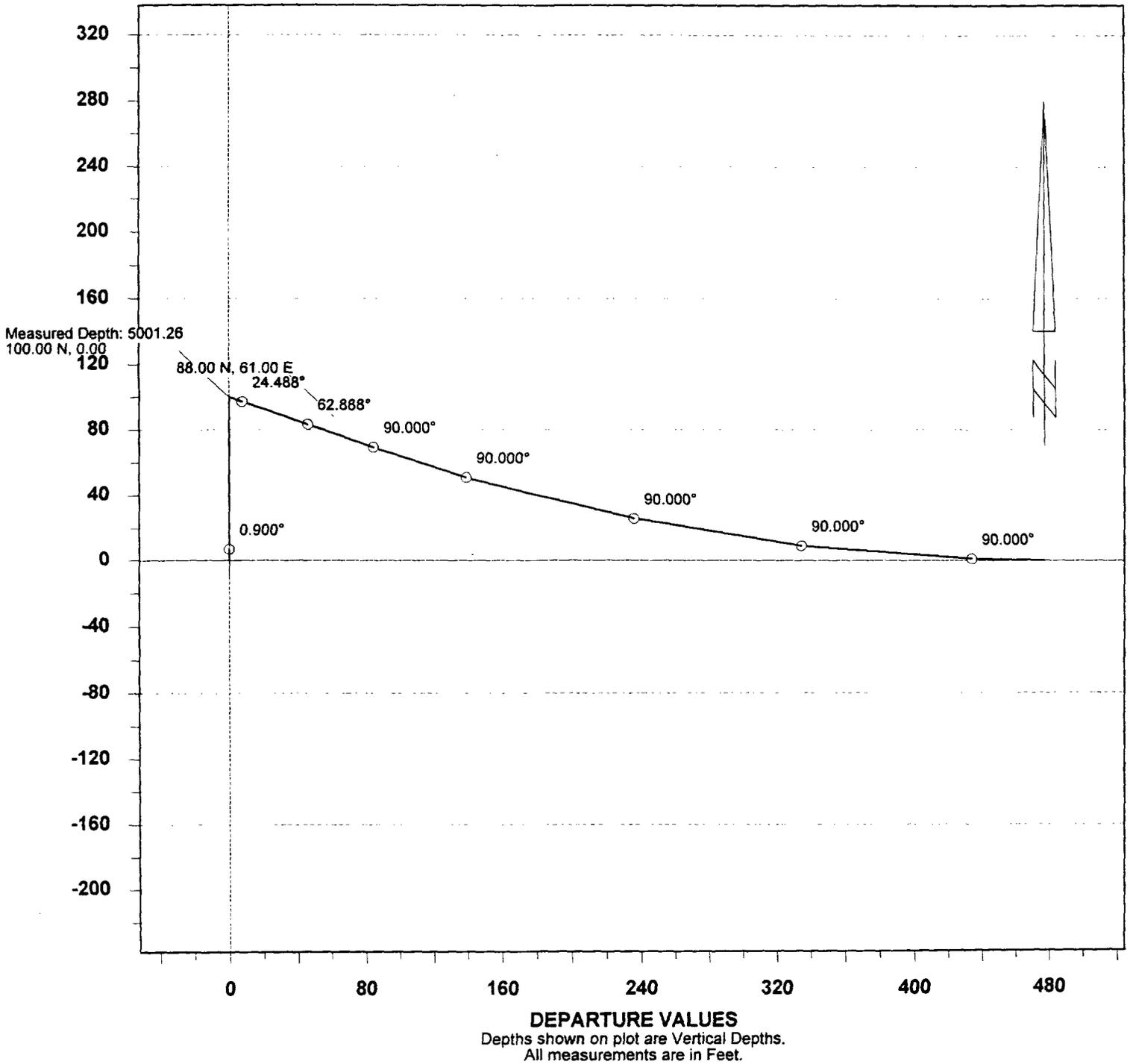
Example: 5,000' reentry with intent to drill a horizontal lateral from a short radius kickoff.

Directional survey indicates the penetration point is 100' from producing area.



SPERRY-SUN DRILLING SERVICES HORIZONTAL SECTION

LATITUDE VALUES



SPERRY-SUN DRILLING SERVICES WELL PROFILE DATA

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	VERTICAL DEPTH	LATITUDE (Ft.)	DEPARTURE (Ft.)	VERTICAL SECTION	DOG LEG	TOOL FACE
0.00	0.000	0.000	0.00	0.00	0.00	20.50		
100.00	0.100	0.000	100.00	0.09 N	0.00	20.49		
200.00	0.200	0.000	200.00	0.35 N	0.00	20.43		
300.00	0.300	0.000	300.00	0.79 N	0.00	20.34		
400.00	0.400	0.000	400.00	1.40 N	0.00	20.22		
500.00	0.500	0.000	499.99	2.18 N	0.00	20.06		
600.00	0.600	0.000	599.99	3.14 N	0.00	19.86		
700.00	0.700	0.000	699.98	4.28 N	0.00	19.63		
800.00	0.800	0.000	799.97	5.58 N	0.00	19.36		
900.00	0.900	0.000	899.96	7.07 N	0.00	19.05		
1000.00	1.000	0.000	999.95	8.73 N	0.00	18.71		
1100.00	1.100	0.000	1099.93	10.56 N	0.00	18.34		
1200.00	1.200	0.000	1199.91	12.57 N	0.00	17.93		
1300.00	1.300	0.000	1299.89	14.75 N	0.00	17.48		
1400.00	1.400	0.000	1399.86	17.10 N	0.00	17.00		
1500.00	1.500	0.000	1499.83	19.63 N	0.00	16.48		
1600.00	1.600	0.000	1599.79	22.34 N	0.00	15.92		
1700.00	1.700	0.000	1699.75	25.22 N	0.00	15.33		
1777.50	1.778	0.000	1777.22	27.57 N	0.00	14.85	0.100	0.000
2000.00	1.778	0.000	1999.61	34.47 N	0.00	13.44		
3000.00	1.778	0.000	2999.13	65.49 N	0.00	7.08		
3223.76	1.778	0.000	3222.78	72.43 N	0.00	5.65	0.000	0.000
3300.00	1.701	0.000	3298.99	74.74 N	0.00 E	5.18		
3400.00	1.601	0.000	3398.94	77.63 N	0.00 E	4.59		
3500.00	1.501	0.000	3498.91	80.33 N	0.00 E	4.03		
3600.00	1.401	0.000	3598.88	82.87 N	0.00 E	3.51		
3700.00	1.301	0.000	3698.85	85.22 N	0.00 E	3.03		
3800.00	1.201	0.000	3798.82	87.41 N	0.00 E	2.58		
3900.00	1.101	0.000	3898.80	89.42 N	0.00 E	2.17		
4000.00	1.001	0.000	3998.79	91.25 N	0.00 E	1.79		
4100.00	0.901	0.000	4098.77	92.91 N	0.00 E	1.45		
4200.00	0.801	0.000	4198.76	94.40 N	0.00 E	1.15		
4300.00	0.701	0.000	4298.75	95.71 N	0.00 E	0.88		
4400.00	0.601	0.000	4398.75	96.85 N	0.00 E	0.65		
4500.00	0.501	0.000	4498.74	97.81 N	0.00 E	0.45		
4600.00	0.401	0.000	4598.74	98.59 N	0.00 E	0.29		
4700.00	0.301	0.000	4698.74	99.21 N	0.00 E	0.16		
4800.00	0.201	0.000	4798.74	99.65 N	0.00 E	0.07		
4900.00	0.101	0.000	4898.74	99.91 N	0.00 E	0.02		
5000.00	0.001	0.000	4998.74	100.00 N	0.00 E	0.00		
5001.26	0.000	0.000	5000.00	100.00 N	0.00	0.00	0.100	180.000
5001.74	0.000	0.000	5000.48	100.00 N	0.00	0.00	0.000	0.000
5025.70	14.888	110.000	5023.48	98.97 N	2.82 E	2.97		
5057.00	30.888	110.000	5046.43	95.66 N	11.93 E	12.57		
5077.00	46.888	110.000	5065.83	90.31 N	26.63 E	28.05		
0	62.388	110.000	5080.16	83.33 N	45.79 E	48.23		
0	78.388	110.000	5088.32	75.28 N	67.91 E	71.54		
6	90.000	110.000	5090.00	69.38 N	84.13 E	88.62	64.000	110.000
3	90.000	110.000	5090.00	69.38 N	84.13 E	88.62	0.000	0.000
)	90.000	107.118	5090.00	51.04 N	138.76 E	145.85		
	97.000	102.118	5090.00	25.81 N	235.49 E	245.70		
	97.000	97.118	5090.00	9.11 N	334.06 E	345.60		
	97.000	92.118	5090.00	1.06 N	433.70 E	444.77		
	97.000	90.000	5090.00	0.27 N	476.05 E	486.39	5.000	270.000

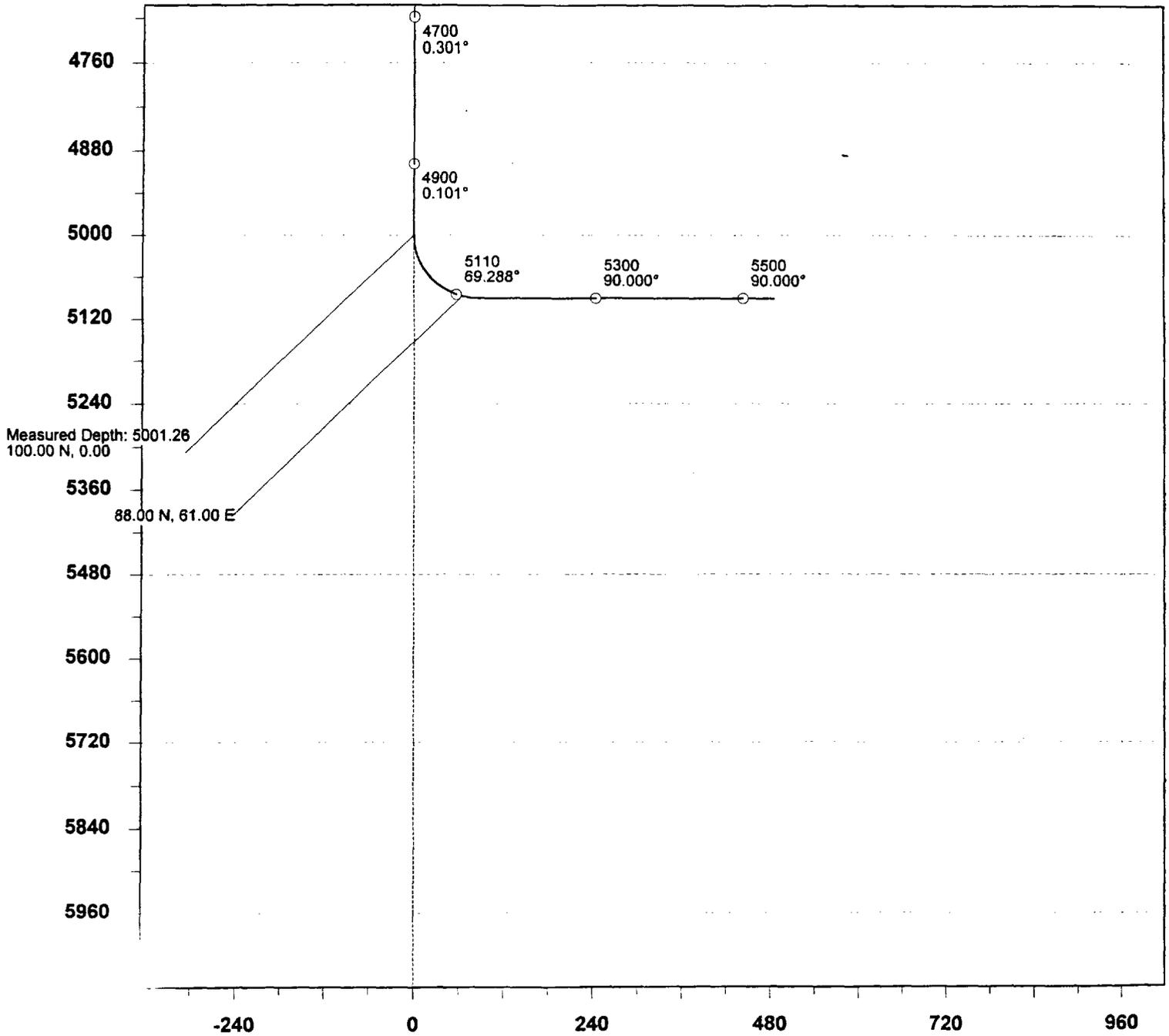
**SPERRY-SUN DRILLING SERVICES
WELL PROFILE DATA**

**The Dogleg Severity is in Degrees per 100.00 Feet
Vertical Section was calculated along an Azimuth of 101.832° (True)**

**Based upon Minimum Curvature type calculations. At a Measured Depth of 5542.36 Feet,
the Bottom Hole Displacement is 486.39 Feet, in the Direction of 101.832° (True)**

SPERRY-SUN DRILLING SERVICES VERTICAL SECTION

VERTICAL
DEPTH



VERTICAL SECTION - Direction: 101.832° (True)

Depths shown on plot are Measured Depths.

All measurements are in Feet.

ENRON

Oil & Gas Company

P. O. Box 2267 Midland, Texas 79702 (915) 686-3600

March 27, 1997

New Mexico Oil Conservation Division
2040 So. Pacheco St.
Santa Fe, NM 87505

Attn.: Michael E. Stogner

Re: Proposed Revisions to
Rule 111

Enron Oil & Gas appreciates and supports your efforts to streamline the requirements of Rule 111 - Deviation Tests and Directional Wells and hereby responds to your request for industry input.

We do disagree with two of the proposed changes and offer the following remedy:

1. EOG wishes to keep the notice requirement with some modification. Notice allows operators to police ourselves with the advance knowledge of a potential problem, thereby having the opportunity to rectify a situation before drilling monies have been spent. Horizontal wells' producing characteristics require different reservoir management and lease protection considerations.
2. EOG recommends dropping III.D (1); requirement to run a directional survey at the request of an offset operator. This portion of the rule is intrusive and the \$5,000 bond doesn't begin to cover the potential costs of the operation, liability from a mechanical failure or reservoir damage coincident with the survey operation.

EOG proposes that offset operators still be notified by certified letter, briefly outlining the wells' drilling plan. The notice would provide for any operator to elect to witness the final directional survey run at TD and to receive a copy of that survey. The offset operator then must file an objection within 10 business days if a problem is found. Otherwise, all subsequent remedies must be sought through normal OCD channels.

I have shared EOG's recommendations with Donna Williams of Burlington Resources and she plans to discuss them with the other industry representatives. I would appreciate a call or correspondence giving your thoughts on EOG's proposal and I would agree to represent this proposal at the formal hearing on April 10, 1997.

Respectfully yours,

ENRON OIL & GAS COMPANY



Randall S. Cate
Project Reservoir Engineer

RSC/krp

ENRON

Oil & Gas Company

P. O. Box 2267 Midland, Texas 79702 (915) 686-3600

April 9, 1997

New Mexico Oil Conservation Division
2040 So. Pacheco St.
Santa Fe, NM 87505

Attn.: Michael E. Stogner

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Enron asks that the Division consider adding language to cover the specific instance of existing wellbores utilized to drill a horizontal lateral (s) (see attached).

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ENRON OIL & GAS COMPANY



Randall S. Cate
Project Reservoir Engineer

RSC/krp

Attachment

cc: Bill Carr - Santa Fe, NM
Rick Foppiano - Oyx

PROPOSED CHANGE TO RULE 111

"The 100'/600' Rule"

Enron asks the Division to consider including the following language in addition to that recommended by the Industry Committee.

111.C.(5) Use of Pre-existing, vertical or deviated wellbore for the purpose of directional drilling.

The wellbore shall be considered orthodox if the results of the directional survey as required in 111.C.(4) indicate that the penetration point is no more than 100' from the producing area, the lateral has entered the producing area no more than 600' from the penetration point, and the remainder of the lateral is entirely within the producing area.

Benefits:

- Encourages use of existing wellbores thereby conserving resources.
- Will eliminate the 2-6 month regulatory interruption of drilling operations on most pre-existing wellbores.
- The portion of the lateral outside the producing area will likely be entirely within the drainage area of the vertical completion thereby having little or no effect on offset correlative rights.

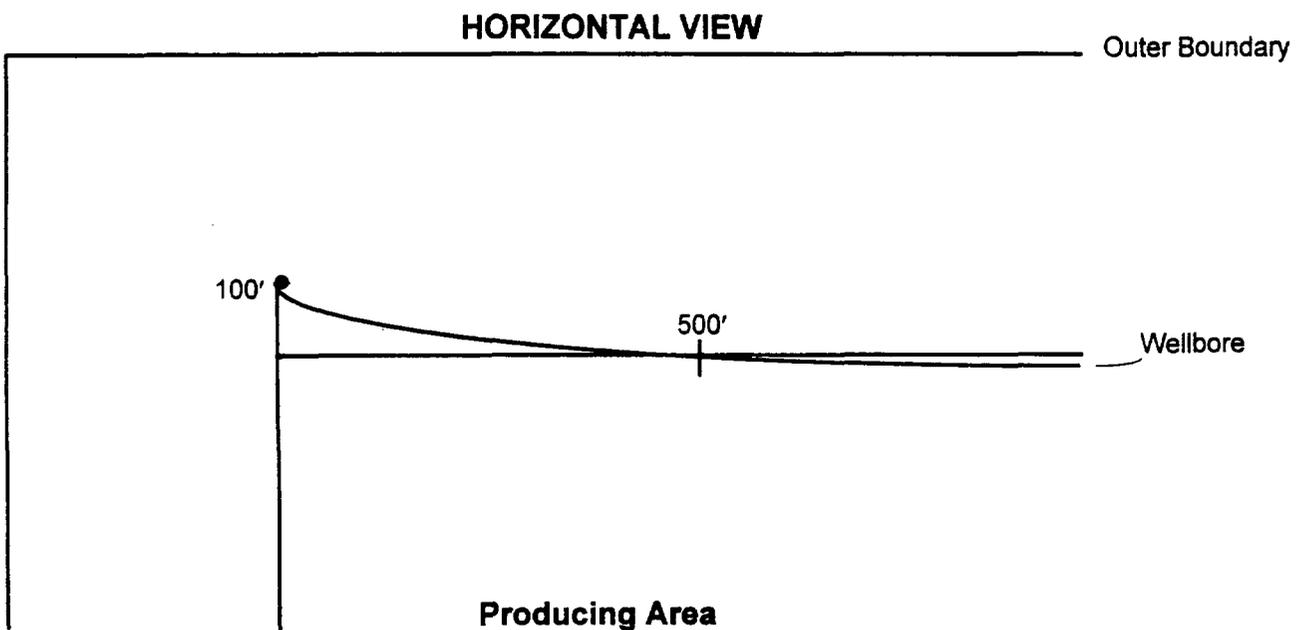
ENRON OIL & GAS COMPANY

Proposed Changes to Rule 111

“The 100’ / 600’ Rule”

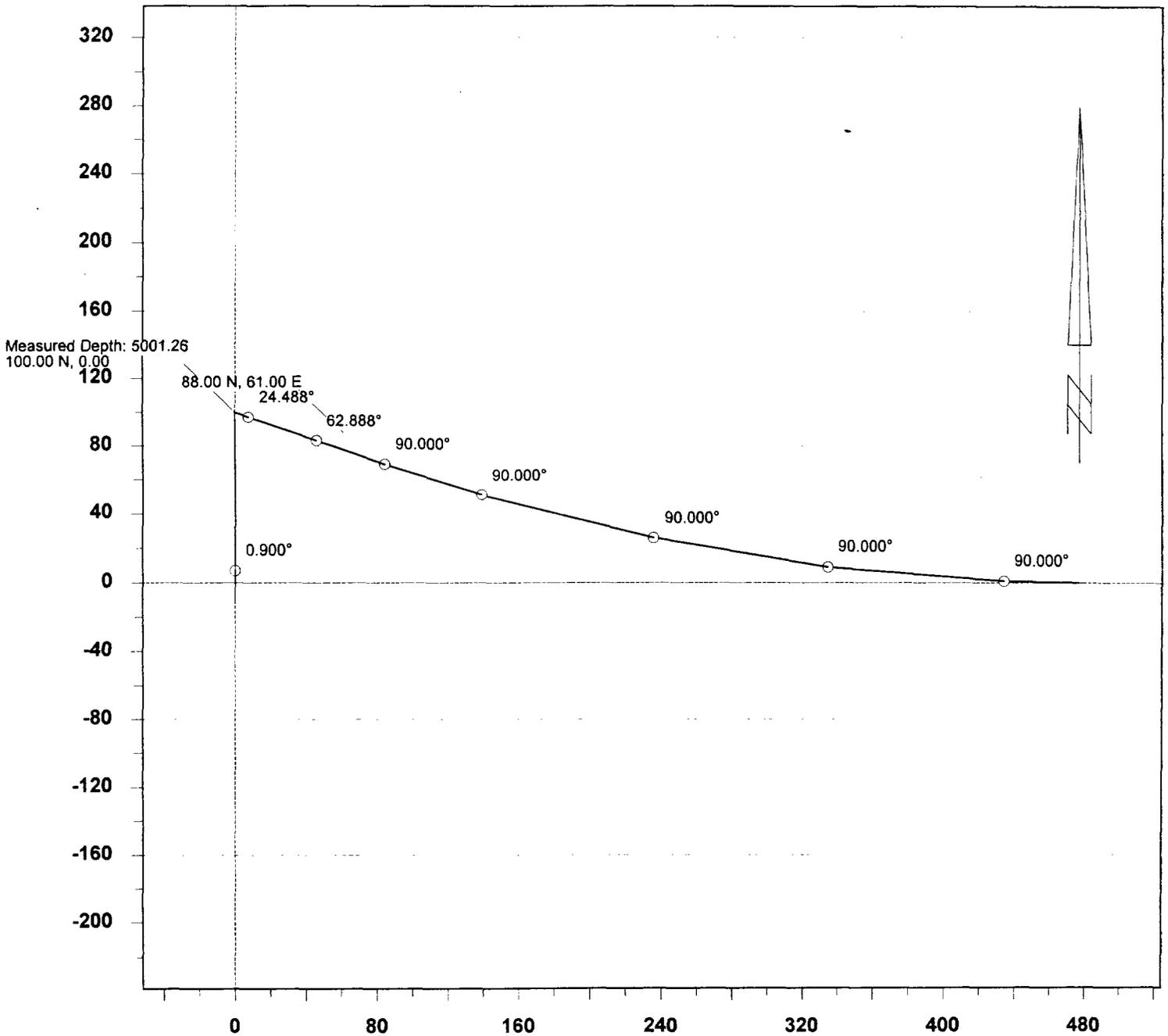
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Directional survey indicates the penetration point is 100’ from producing area.



SPERRY-SUN DRILLING SERVICES HORIZONTAL SECTION

LATITUDE
VALUES



DEPARTURE VALUES
 Depths shown on plot are Vertical Depths.
 All measurements are in Feet.

**SPERRY-SUN DRILLING SERVICES
WELL PROFILE DATA**

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	VERTICAL DEPTH	LATITUDE (Ft.)	DEPARTURE (Ft.)	VERTICAL SECTION	DOG LEG	TOOL FACE
0.00	0.000	0.000	0.00	0.00	0.00	20.50		
100.00	0.100	0.000	100.00	0.09 N	0.00	20.49		
200.00	0.200	0.000	200.00	0.35 N	0.00	20.43		
300.00	0.300	0.000	300.00	0.79 N	0.00	20.34		
400.00	0.400	0.000	400.00	1.40 N	0.00	20.22		
500.00	0.500	0.000	499.99	2.18 N	0.00	20.06		
600.00	0.600	0.000	599.99	3.14 N	0.00	19.86		
700.00	0.700	0.000	699.98	4.28 N	0.00	19.63		
800.00	0.800	0.000	799.97	5.58 N	0.00	19.36		
900.00	0.900	0.000	899.96	7.07 N	0.00	19.05		
1000.00	1.000	0.000	999.95	8.73 N	0.00	18.71		
1100.00	1.100	0.000	1099.93	10.56 N	0.00	18.34		
1200.00	1.200	0.000	1199.91	12.57 N	0.00	17.93		
1300.00	1.300	0.000	1299.89	14.75 N	0.00	17.48		
1400.00	1.400	0.000	1399.86	17.10 N	0.00	17.00		
1500.00	1.500	0.000	1499.83	19.63 N	0.00	16.48		
1600.00	1.600	0.000	1599.79	22.34 N	0.00	15.92		
1700.00	1.700	0.000	1699.75	25.22 N	0.00	15.33		
1777.50	1.778	0.000	1777.22	27.57 N	0.00	14.85	0.100	0.000
2000.00	1.778	0.000	1999.61	34.47 N	0.00	13.44		
3000.00	1.778	0.000	2999.13	65.49 N	0.00	7.08		
3223.76	1.778	0.000	3222.78	72.43 N	0.00	5.65	0.000	0.000
3300.00	1.701	0.000	3298.99	74.74 N	0.00 E	5.18		
3400.00	1.601	0.000	3398.94	77.63 N	0.00 E	4.59		
3500.00	1.501	0.000	3498.91	80.33 N	0.00 E	4.03		
3600.00	1.401	0.000	3598.88	82.87 N	0.00 E	3.51		
3700.00	1.301	0.000	3698.85	85.22 N	0.00 E	3.03		
3800.00	1.201	0.000	3798.82	87.41 N	0.00 E	2.58		
3900.00	1.101	0.000	3898.80	89.42 N	0.00 E	2.17		
4000.00	1.001	0.000	3998.79	91.25 N	0.00 E	1.79		
4100.00	0.901	0.000	4098.77	92.91 N	0.00 E	1.45		
4200.00	0.801	0.000	4198.76	94.40 N	0.00 E	1.15		
4300.00	0.701	0.000	4298.75	95.71 N	0.00 E	0.88		
4400.00	0.601	0.000	4398.75	96.85 N	0.00 E	0.65		
4500.00	0.501	0.000	4498.74	97.81 N	0.00 E	0.45		
4600.00	0.401	0.000	4598.74	98.59 N	0.00 E	0.29		
4700.00	0.301	0.000	4698.74	99.21 N	0.00 E	0.16		
4800.00	0.201	0.000	4798.74	99.65 N	0.00 E	0.07		
4900.00	0.101	0.000	4898.74	99.91 N	0.00 E	0.02		
5000.00	0.001	0.000	4998.74	100.00 N	0.00 E	0.00		
5001.26	0.000	0.000	5000.00	100.00 N	0.00	0.00	0.100	180.000
5001.74	0.000	0.000	5000.48	100.00 N	0.00	0.00	0.000	0.000
5025.00	14.888	110.000	5023.48	98.97 N	2.82 E	2.97		
5050.00	30.888	110.000	5046.43	95.66 N	11.93 E	12.57		
5075.00	46.888	110.000	5065.83	90.31 N	26.63 E	28.05		
5100.00	62.888	110.000	5080.16	83.33 N	45.79 E	48.23		
5125.00	78.888	110.000	5088.32	75.28 N	67.91 E	71.54		
5142.36	90.000	110.000	5090.00	69.38 N	84.13 E	88.62	64.000	110.000
5142.36	90.000	110.000	5090.00	69.38 N	84.13 E	88.62	0.000	0.000
5200.00	90.000	107.118	5090.00	51.04 N	138.76 E	145.85		
5300.00	90.000	102.118	5090.00	25.81 N	235.49 E	245.70		
5400.00	90.000	97.118	5090.00	9.11 N	334.06 E	345.60		
5500.00	90.000	92.118	5090.00	1.06 N	433.70 E	444.77		
5542.36	90.000	90.000	5090.00	0.27 N	476.05 E	486.39	5.000	270.000

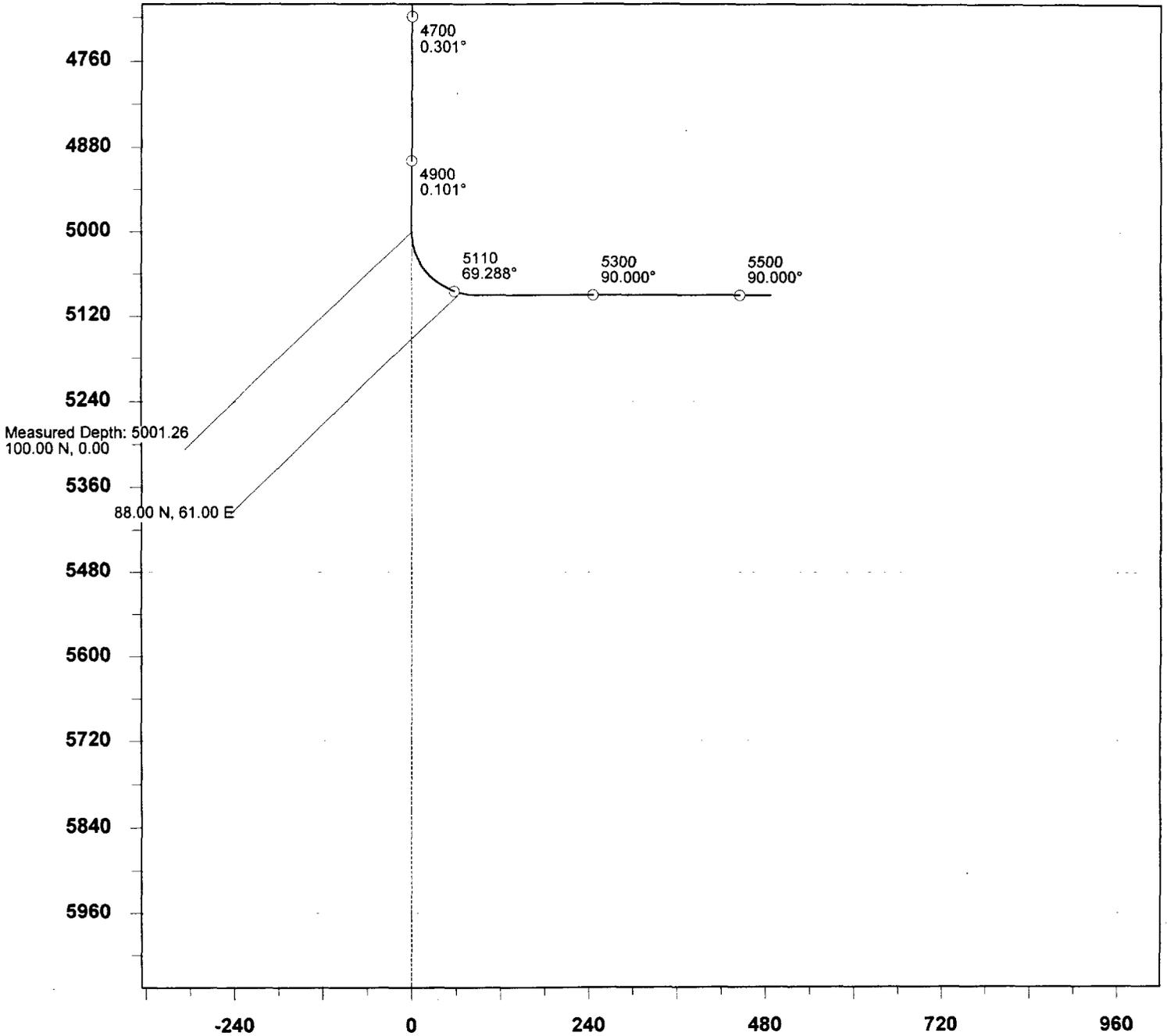
**SPERRY-SUN DRILLING SERVICES
WELL PROFILE DATA**

**The Dogleg Severity is in Degrees per 100.00 Feet
Vertical Section was calculated along an Azimuth of 101.832° (True)**

**Based upon Minimum Curvature type calculations. At a Measured Depth of 5542.36 Feet,
the Bottom Hole Displacement is 486.39 Feet, in the Direction of 101.832° (True)**

SPERRY-SUN DRILLING SERVICES VERTICAL SECTION

VERTICAL
DEPTH



VERTICAL SECTION - Direction: 101.832° (True)
Depths shown on plot are Measured Depths.
All measurements are in Feet.