

DATE IN 7.14.04	SUSPENSE 8-3-2004	ENGINEER Stogner	LOGGED IN 7.14.04	TYPE NSL	APP NO. DSRM0419649056
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ABOVE THIS LINE FOR DIVISION USE ONLY

**NEW MEXICO OIL CONSERVATION DIVISION**  
**- Engineering Bureau -**  
 1220 South St. Francis Drive, Santa Fe, NM 87505



**ADMINISTRATIVE APPLICATION CHECKLIST**

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

**Application Acronyms:**

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]  
 [DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]  
 [PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]  
 [WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]  
 [SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]  
 [EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication  
☒ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement  
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery  
☐ WFX ☐ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR

[D] Other: Specify \_\_\_\_\_

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or ☐ Does Not Apply

- [A] ☐ Working, Royalty or Overriding Royalty Interest Owners
- [B] ☐ Offset Operators, Leaseholders or Surface Owner
- [C] ☐ Application is One Which Requires Published Legal Notice
- [D] ☐ Notification and/or Concurrent Approval by BLM or SLO  
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office
- [E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,
- [F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

**Note:** Statement must be completed by an Individual with managerial and/or supervisory capacity.

Print or Type Name

Signature

Title

Date

e-mail Address



P.O. Box 3487  
Houston, TX 77253-3487  
Telephone 713/629-6600

July 9, 2004

Mr. Richard Ezeanyim  
Oil Conservation Division  
1220 South Saint Francis Drive  
Santa Fe, New Mexico 87504

***RE: Amendment to Administrative Order NSL-4918 (BHL) (SD)  
Indian Hills Unit Gas Com. Well No. 56 Horizontal Re-Entry  
453' FSL & 350' FWL, Sec. 21, Township 21 South, Range 24 East (SHL),  
176' FNL & 1,185' FEL, Sec. 29, Township 21 South, Range 24 East (BHL)  
Indian Basin Upper Pennsylvanian Associated Pool***

Dear Mr. Ezeanyim,

By means of this application, Marathon respectfully requests to amend the previously approved non-standard location application, NSL-4918 (BHL) (SD) for the Indian Hills Unit Gas Com. Well No. 56 (API No. 30-015-32878). This well has a surface location of 453' FSL & 350' FWL, Section 21, Township 21 South, Range 24 East. Marathon requests this amendment in order to re-enter the existing Indian Hills Unit Gas Com. Well No. 56, and horizontally drill to an orthodox location in the Upper Pennsylvanian formation, with a new final bottom hole location of 700' FNL & 2,600' FEL, Section 29, Township 21 South, Range 24 East, and shall remain dedicated to the standard spacing unit consisting of the east half of Section 29.

Marathon proposes to horizontally sidetrack the Indian Hills Unit Gas Com. Well No. 56 in the "Indian Basin Upper Pennsylvanian Associated Pool", as promulgated by the New Mexico Oil Conservation Division Order Nos. R-9922, R-9922-A, R-9922-B, R-9922-C, R-9922-D, and R-9922-E, and the general rules for the Associated Gas Pools of Southeast New Mexico as promulgated by Division Order No. R-5533. These rules require wells to be located no closer than 660 feet to the outer boundary of the proration/spacing unit and no closer than 330 feet to the governmental quarter/quarter section line. The proposed Indian Hills Unit Gas Com. Well No. 56 horizontal is unorthodox because the well will be within the 660 foot setback from the northern outer boundary of the proposed 320-acre "stand-up" gas proration unit dedicated to the east half of Section 29 from the kick-off point through the end of the anticipated 1,500' lateral. Based on the proposed directional plan, it is expected that the Upper Pennsylvanian formation will be penetrated along the interval from the kick-off point at 176' FNL & 1,185' FEL in Section 29 (at approximate depths of -3,977' SSTVD, 7,870' MD and 7,661' TVD), through to the end of the lateral section at 700' FNL & 2,600' FEL in Section 29 (at approximate depths of -3,944' SSTVD, 9,606' MD and 7,628' TVD) – please see Attachment #1 – Well Location and Acreage Dedication Plat, Attachment #2 – Location Verification Map, Attachment #3 – Vicinity Map, and Attachment #4 – Directional Plat supplied by Baker Inteq, Marathon's proposed

directional drilling company for the well. In summary, this amendment application requests approval to extend the previously approved non-standard producing interval along the northern outer boundary of Section 29.

In support of this application, specific details will be provided for the proposed unorthodox location. These details will include a brief Indian Hills Unit Gas Com. Well No. 56 history, the proration units related to the proposed well work, how the well (and specifically horizontal technology) fits into Marathon's reservoir management plan, and why the proposed location is geologically superior to a standard location in Section 29.

#### **Well History and Directional Plan:**

The Indian Hills Unit Gas Com. Well No. 56 was directionally drilled in September, 2003, to a total depth of 8,310' MD. The well was completed in the Upper Pennsylvanian formation and placed on production. Marathon has evaluated the option to temporarily abandon the well due to very low production rates, but believes that a horizontal sidetrack would help to best deplete the reservoir.

Marathon's proposed plan is to first squeeze off the existing Upper Pennsylvanian formation perforations and to set a whip-stock to kick-off at 7,870' MD. Assuming favorable hole conditions, it is anticipated that the wellbore will be drilled horizontally for approximately 1,500' from the kick-off point.

#### **Proration Unit:**

Currently, the Indian Hills Unit Gas Com. Well No. 56 is dedicated to the existing standard 320 acre spacing consisting of the east half of Section 29, Township 21 South, Range 24 East. The proposed lateral will remain within this same proration unit. Further, there are presently three other wells, the Indian Hills Unit Gas Com. Well No. 27 (API No. 30-015-31406), the Indian Hills Unit Gas Com. Well No. 14 (API No. 30-015-30624), and the Indian Hills Unit Gas Com. Well No. 47 (API No. 30-015-32536), that also produce from this proration unit.

The Indian Hills Unit Gas Com. is operated by Marathon Oil Company. Marathon has a 93.323865% working interest, with the remaining working interest split between Claremont Corporation (1.40937%), Texas Independent Exploration (1.28125%), Devon Energy (1.15313%), Nolan Brunson, Jr. (0.56250%), Nearburg Exploration (0.426135%), Tandem Energy Corporation (1.28125%), Hugh E. Hanagan (0.28125%), and Hanagan Properties (0.28125%).

#### **Geologic Issues:**

The Indian Basin Upper Pennsylvanian Associated Pool is predominantly composed of dolomite and limestone sequences. With current technology, only the fractured, vuggy dolomite sequences have proven productive and economic. The proposed lateral in Indian Hills Unit Gas Com. Well No. 56 is an attempt to better develop the western extent of the oil bearing dolomite horizons within the Indian Hills Unit Gas Com. (please see Attachment #5 - Upper Pennsylvanian Structure map) by connecting the wellbore with more of the productive fractured, vuggy reservoir. Further, based on Formation Micro Imager open hole logs of analogous wells, it is believed that the Indian Hills Unit Gas Com. Well No. 56 vertical wellbore failed to most efficiently connect to a fracture

network in the oil leg of the Upper Pennsylvanian formation. This data is supported by the relatively high current oil production rates in offset wells.

Marathon has two geologic goals in drilling the proposed lateral. The first is to increase connectivity to the fracture network in the oil leg. A horizontal wellbore will provide this by greatly increasing the amount of reservoir exposed to the wellbore. The second goal of the proposed lateral is to expose the wellbore to potentially heterogeneous layers of the oil column. Marathon suspects that there may be oil bearing porosity developments within the dolomite sequences that are poorly connected to the existing vertical and deviated wellbore due to the discontinuous porosity and permeability in some areas of the Upper Pennsylvanian formation. A cross section between Indian Hills Unit Gas Com. Well No. 3 (API No. 30-015-10553), the Indian Hills Unit Well No. 18 (API No. 30-015-70525), the Indian Hills Unit Gas Com. Well No. 56, and the Indian Hills Unit Gas Com. Well No. 27 has been included to help illustrate some of the geologic variability that can exist between relatively closely spaced wells (please see Attachment #6).

#### **Reservoir Management Plan:**

Over the last several years, Marathon has focused on developing the oil potential of the Upper Pennsylvanian formation in the Indian Hills Unit. This has been accomplished primarily by infilling the well density to 80-acres in prospective oil areas. Marathon is now looking at horizontal well technology as a method to improve oil recoveries from poorly drained areas of the reservoir. Recently completed directional wellbores have confirmed strong oil potential in the eastern and western portions of the Indian Hills Unit. The terminus of the proposed lateral is targeted to improve drainage from an area along the northern and western regions of the section that Marathon believes is not being effectively drained by the existing wellbores.

It is Marathon's belief that the proposed unorthodox location represents a superior location in regards to both reservoir drainage and geologic risk. Firstly, the proposed azimuth for the wellbore will maximize the distance between the lateral and the existing wells thereby minimizing potential for well-to-well interference. Secondly, by extending the lateral to the proposed unorthodox terminus location, additional reservoir rock will be exposed to the wellbore; hence, increasing the likelihood to encounter fractures and productive dolomite, and ultimately increasing recovery.

#### **Notifications:**

The mineral ownership of the eastern 320 acre proration unit of Section 29 is not the same as the south half of Section 20, which offsets the proposed unorthodox location in the Upper Pennsylvanian formation and to whom the new location will be non-standard. In Section 20, as well as sections 16, 17, 21, 28 and 33, Marathon Oil Company has a 99.54544% working interest while Nearburg Exploration has a 0.45456% working interest. As mentioned previously, the following is a breakdown of the working interest owners in Section 29:

- Marathon Oil Company --- 93.323865%
- Texas Independent Exploration --- 1.28125%
- Claremont Corporation --- 1.40937%
- Tandem Energy Corporation --- 1.28125%
- Hanagan Properties --- 0.28125%

Hugh E. Hanagan --- 0.28125%

Nolan Brunson, Jr. --- 0.5625%

Devon Energy --- 1.15313%

Nearburg Exploration --- 0.426135%

As the only offsetting interest owner, Nearburg Exploration has been notified in writing of Marathon's intention to sidetrack the Indian Hills Unit Gas Com. Well No. 56 and to produce from the unorthodox Upper Pennsylvanian location. Enclosed is a copy of the letter from Nearburg waiving objection to our proposal (Please see Attachment #7 – Waiver Letter).

Should you have any questions/comments/concerns, please contact me at (713) 296-1921.

Respectfully,



Mark Mick  
Operations Engineer  
Indian Basin Asset Team  
Marathon Oil Company

## DISTRICT I

P.O. Box 1980, Hobbs, NM 88241-1980

## State of New Mexico

Energy, Minerals and Natural Resources Department

Form C-102

Revised February 10, 1984

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

## DISTRICT II

P.O. Drawer ED, Artesia, NM 88211-0710

## OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

## DISTRICT III

1000 Rio Braxos Rd., Artesia, NM 87410

## DISTRICT IV

P.O. Box 2088, Santa Fe, N.M. 87504-2088

## WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code 33685	Pool Name Indian Basin U.P. Assoc.
Property Code	Property Name INDIAN HILLS UNIT GAS COM	Well Number 56
OGED No. 14021	Operator Name MARATHON OIL COMPANY	Elevation 3667'

## Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	21	21-S	24-E		453'	SOUTH	350'	WEST	EDDY

## Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	29	21-S	24-E		913'	NORTH	2633'	EAST	EDDY

Dedicated Acres 320 E/2	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED  
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<p>GEODETTIC COORDINATES NAD 27 NME SURF. Y=530701.2 N X=445521.6 E</p> <p>LAT.=32°27'31.99" N LONG.=104°30'35.85" W</p>				<p>LOT 2 38.26 AC LOT 3</p> <p>LOT 1 38.29 AC LOT 4</p> <p>36.69 AC LOT 6</p> <p>36.72 AC LOT 5</p> <p>36.35 AC LOT 7</p> <p>36.29 AC LOT 8</p> <p>37.74 AC</p> <p>37.68 AC</p>
<p>LOT 3 42.20 AC LOT 4</p> <p>LOT 2 41.76 AC LOT 5</p> <p>LOT 1 41.87 AC LOT 6</p> <p>LOT 10 42.47 AC LOT 9</p> <p>LOT 11 42.78 AC LOT 12</p> <p>LOT 13 43.83 AC</p> <p>LOT 14 43.45 AC</p> <p>43.05 AC</p> <p>42.69 AC</p> <p>42.91 AC</p> <p>42.53 AC</p>	<p>350'</p> <p>20'</p> <p>21'</p> <p>28'</p> <p>29'</p> <p>28'</p> <p>2633'</p> <p>GRAZ=245.11'</p> <p>231.78'</p> <p>B.H.</p> <p>Y=529341.1 N X=442589.9 E</p> <p>SCALE - 1"=2000'</p> <p>STANDARD AREA</p>			

**OPERATOR CERTIFICATION**

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Mike Mick  
Signature

Mike Mick  
Printed Name

Ind. Adv. Eng. Tech  
Title

7-8-04  
Date

**SURVEYOR CERTIFICATION**

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

May 19, 2003

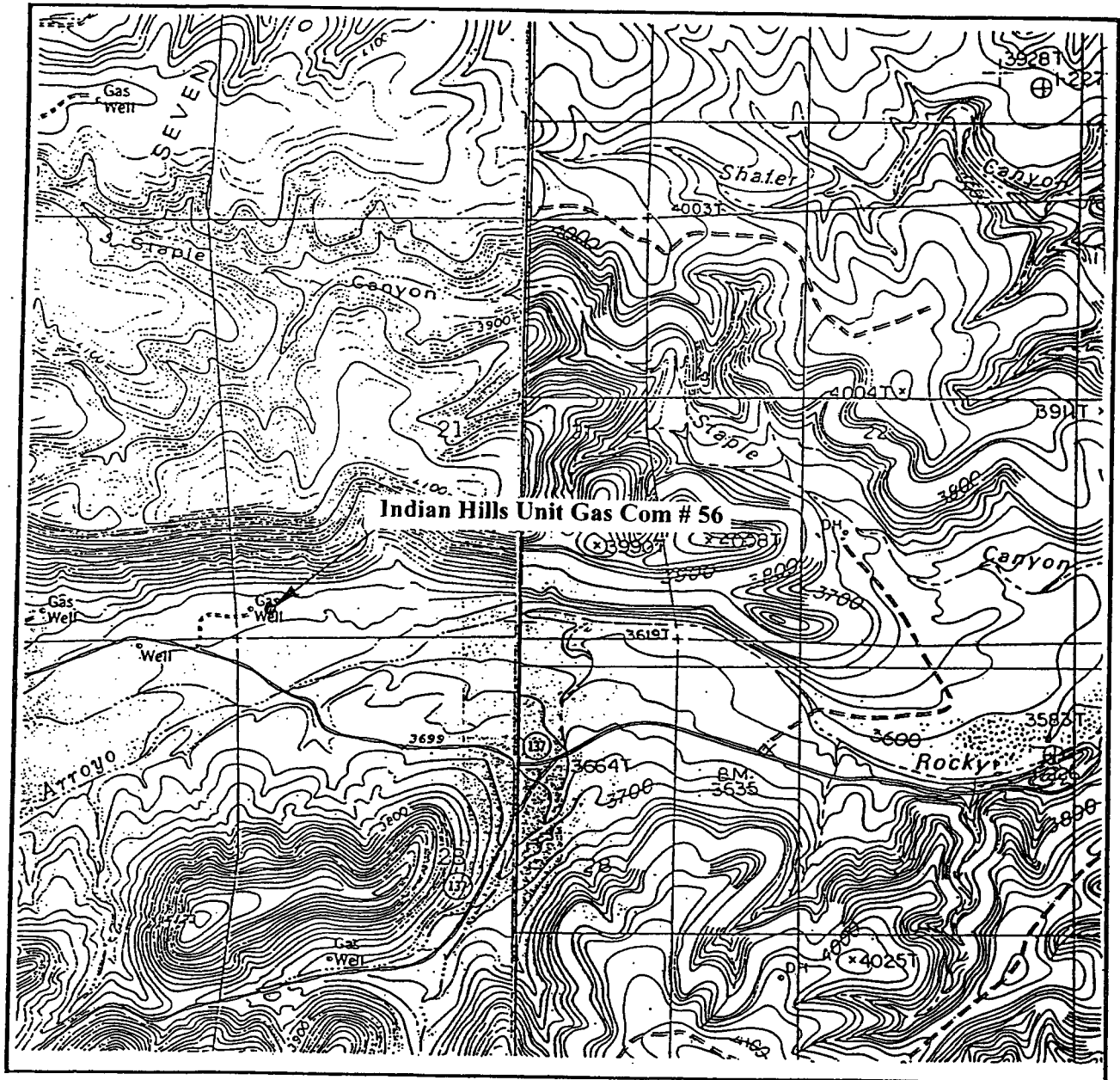
Date Surveyed REV: 07/1/04 JR

Signature & Seal of Professional Surveyor

04.13.0832

Certificate No. GARY EIDSON 19841

# LOCATION VERIFICATION MAP

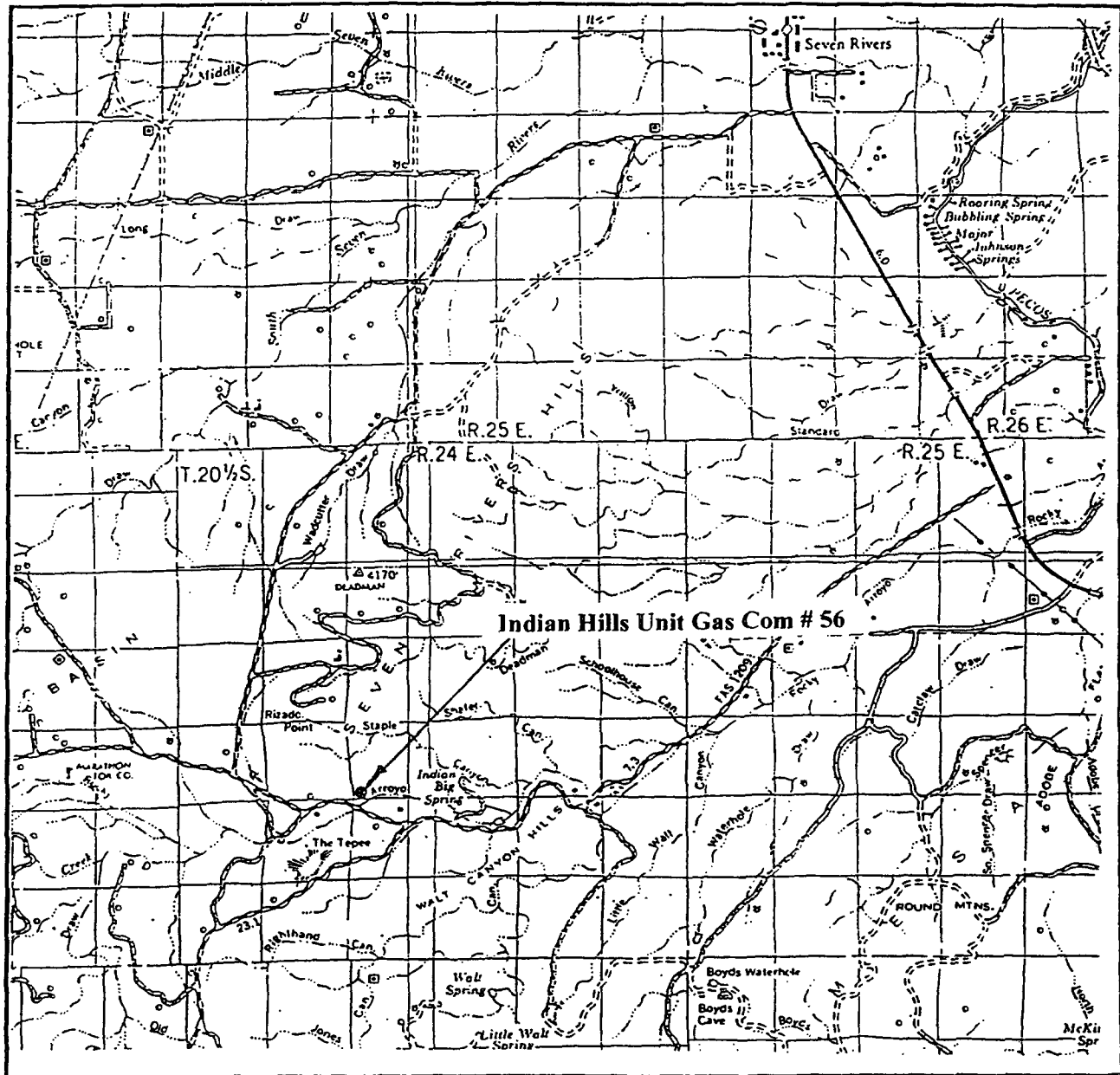


SCALE: 1" = 2000'

 CONTOUR INTERVAL: 20'  
 MARTHA CREEK, N.M.  
 AZOTEA PEAK, N.M.
SEC. 21 TWP. 21-S RGE. 24-ESURVEY N.M.P.M.COUNTY EDDYDESCRIPTION 453' FSL 350' FWLELEVATION 3667'OPERATOR MARATHON OIL COMPANYLEASE INDIAN HILLS UNIT
 U.S.G.S. TOPOGRAPHIC MAP  
 MARTHA CREEK AZOTEA PEAK, N.M.N.M.

 JOHN WEST SURVEYING  
 HOBBS, NEW MEXICO  
 (505) 393-3117

## VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 21 TWP. 21-S RGE. 24-ESURVEY N.M.P.M.COUNTY EDDYDESCRIPTION 453' FSL 350' FWLELEVATION 3667'OPERATOR MARATHON OIL COMPANYLEASE INDIAN HILLS UNIT

JOHN WEST SURVEYING  
 HOBBS, NEW MEXICO  
 (505) 393-3117





# Marathon Oil Company

Structure : INDIAN HILLS UNIT GAS COM #56

Slot : slot #1

Field : INDIAN BASIN

Location : Eddy County New Mexico

Created by: donf

Date plotted : 25-Jun-2004

Plot Reference is ST P1.

Coordinates are in feet reference slot #1.

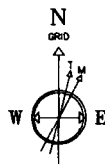
True Vertical Depths are reference rotary table.

55step1

--- Baker Hughes INTEQ ---

## WELL PROFILE DATA

Point	MD	Inc	Dir	TVD	North	East	V. Sect	Deg/100
Tie on	7870.00	14.11	261.58	7660.69	-612.05	-1430.43	1555.16	0.00
KOP	7879.11	14.11	243.50	7669.52	-612.71	-1432.52	1557.34	48.20
Target EOC	8054.24	98.60	243.50	7758.00	-672.02	-1551.49	1690.22	48.24
End of Build/Turn	8856.79	98.60	243.50	7638.00	-1026.08	-2261.65	2483.44	0.00
KOP	8990.29	90.00	243.50	7628.00	-1085.42	-2380.67	2616.38	6.44
T.D. & Target BHL	9605.93	90.00	243.48	7628.00	-1360.20	-2931.60	3231.78	0.00



25-Aug-2003 (source: BGGM)  
 Magnetic North is 8.95 degrees East of True North  
 GRID North is 0.08 degrees West of True North  
 To correct azimuth from True to GRID add 9.08 deg  
 To correct azimuth from Magnetic to GRID add 9.04 deg

### STRUCTURE SET-UP REFERENCE

LAT : 32 27 32.049 N  
 LONG: 104 30 35.617 W  
 X= 445541.6 Y= 530707.2

PROJECTION: MERCATOR

Mercator Zone: New Mexico East  
 Spheroid Used: Clarke - 1866

Data Source: BGGM

Dip Angle: 60.42 deg  
 Field Strength: 49490.94 nT

&lt;-- West (feet)

3000 2800 2600 2400 2200 2000 1800 1600 1400 1200 1000 800

Tie on - 7660.69 Tvd, 612.05 S, 1430.43 W

EOC

South (feet) --&gt;

T.D. &amp; Target - 7628.00 Tvd, 1360.20 S, 2931.60 W

&lt;-- True Vertical Depth (feet)

6800 7000 7200 7400 7600 7800 8000 8200

Tie on - 14.11 Inc, 7870.00 Md, 7660.69 Tvd, 1555.16 Vs

EOC

Target - 98.60 Inc, 8054.24 Md, 7758.00 Tvd, 1690.22 Vs

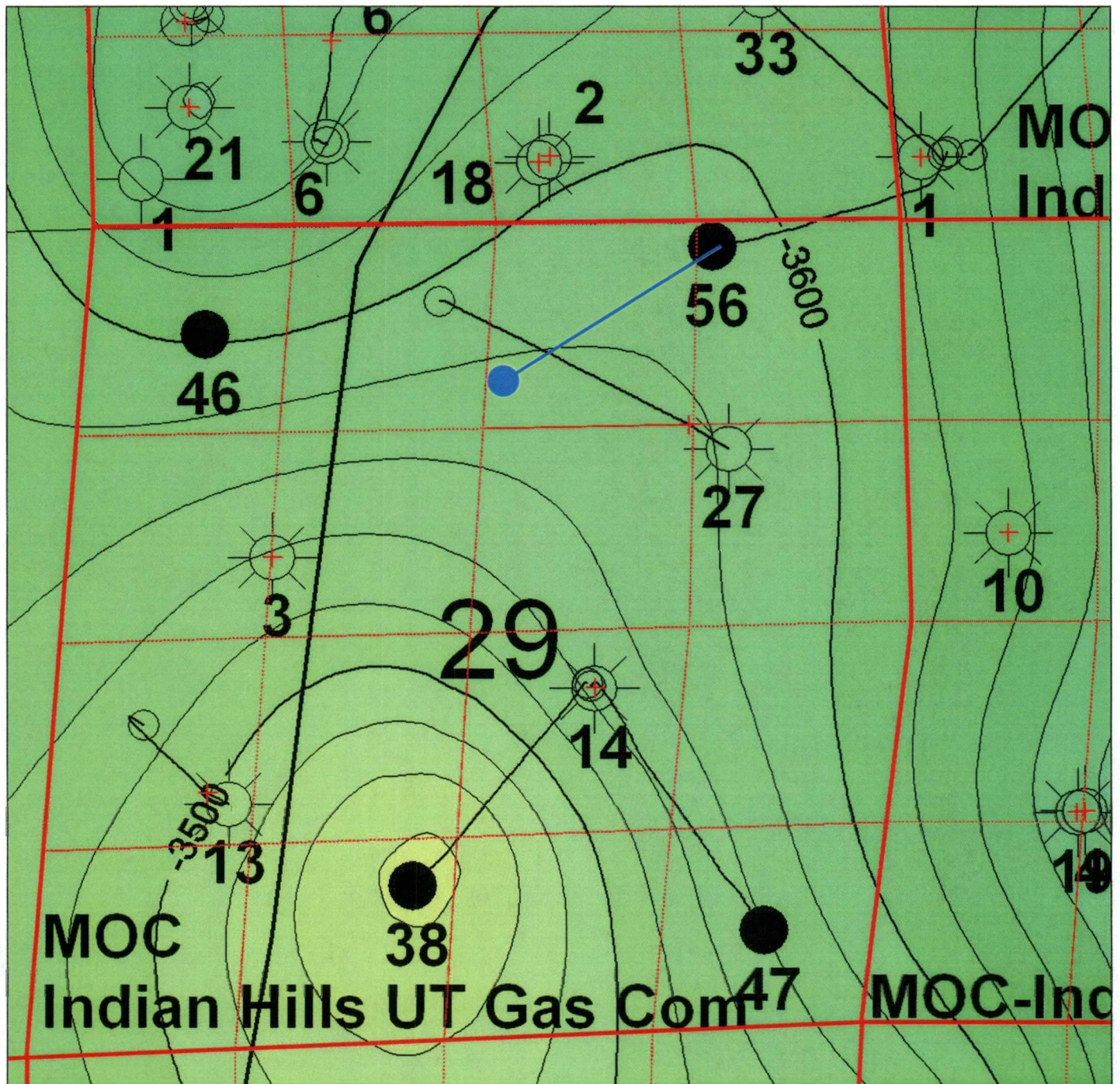
Projection to TD

T.D. &amp; Target - 90.00 Inc, 9605.93 Md, 7628.00 Tvd, 3231.78 Vs

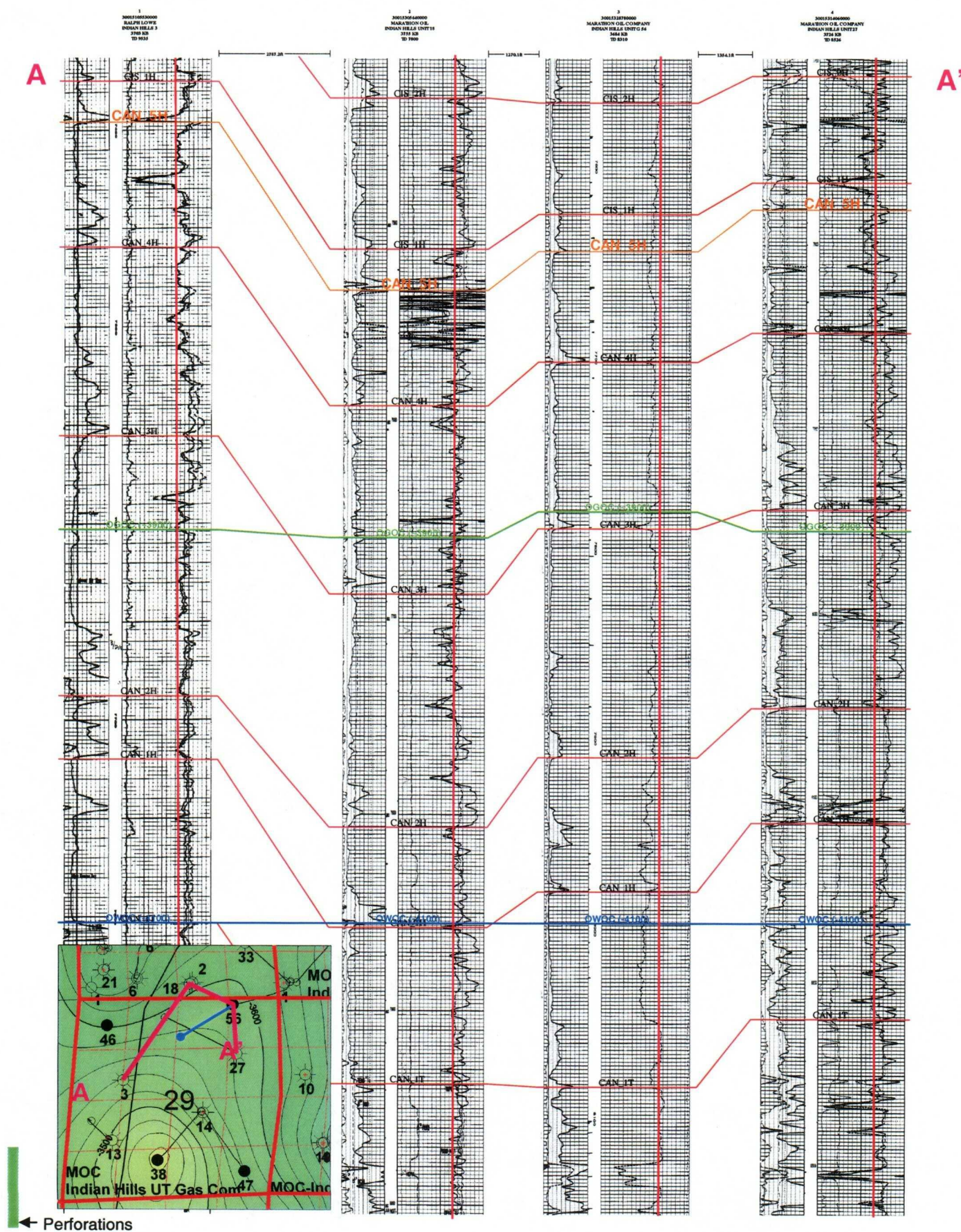
Vertical Section (feet) --&gt;

1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600 3800

Azimuth 245.11 with reference 0.00 N, 0.00 W from slot #1







Southern U.S. Business Unit  
Domestic Production



Marathon  
Oil Company

P.O. Box 3487  
Houston, Texas 77253-3487  
Telephone 713/296-2084

June 30, 2004

Mr. Bob Shelton  
Nearburg Exploration Company, LLC  
3300 North A Street, Building 2, Suite 120  
Midland, Texas 79705

Re: Application for a Horizontal Re-Entry Unorthodox Well Location for the Indian Hills Unit Gas Com No. 56 Location: UL "A", Upper Penn Penetration Point - 99' FNL and 1013' FEL, Section 29, T-21-S, R-24-E, Eddy County, New Mexico

Dear Bob:

Marathon Oil Company proposes to re-enter and horizontally side-track the Indian Hills Unit Gas Com Well No. 56 in the "Indian Basin Upper Pennsylvanian Associated Pool" as promulgated by the New Mexico Oil Conservation Division Order Nos. R-9922, R-9922-A, R-9922-B, R-9922-C, R-9922-D and R-9922-E and the general rules for the Associated Gas Pools of Southeast New Mexico as promulgated by Division Order No. R-5353. These rules require wells to be located no closer than 660 feet to the outer boundary of the proration/spacing unit and no closer than 330 feet to the governmental quarter/quarter section lines. The proposed Indian Hills Unit Gas Com No. 56 location is unorthodox because the producing interval will infringe upon the 660 foot setback from the northern boundary of the 320 acre "stand-up" gas proration unit dedicated to the East half of Section 29. The 80-acre spacing unit for the Indian Hills Unit Gas Com No. 56 will be a "lay-down" in the N/2 of the NE/4 of Section 29.

This letter is to inform you, as an offset operator or interest owner, of Marathon's intention to request administrative approval for this non-standard location. If you have an objection to this application, it must be filed, in writing, with the New Mexico Oil Conservation Division, 1220 S. St. Francis Dr., Santa Fe, New Mexico 87504, within 20 days from the date of this letter. Should you have no objection to this location, please sign below and return an executed copy of this letter to me. The application for administrative approval for this location will be sent to the Oil Conservation Division in Santa Fe as soon as possible. If you have any questions or need more information, please call me at (713) 296-2084.

Sincerely,

A handwritten signature in cursive script that reads 'Wyn Emerson'.

Wyn Emerson  
Landman  
Indian Basin Asset Team

Signature: A handwritten signature in cursive script that reads 'Robert G. Shelton'.

Printed Name: Robert G. Shelton

Title: P-I-F

Company Name: Nearburg Exploration Company LLC

Date: 7/2/04