

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



Marathon
Oil Company

P.O. Box 3487
Houston, Texas 77253-3487

September 14, 2004

Mr. Richard Ezeanyim
Oil Conservation Division
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

**RE: *Indian Hills Unit Well No. 59 Unorthodox Location
1,117' FNL & 641' FEL, Sec. 20, Township 21 South, Range 24 East (SHL),
2,199' FSL & 864' FWL, Sec. 21, Township 21 South, Range 24 East (BHL)
Indian Basin Upper Pennsylvanian Associated Pool***

Dear Mr. Ezeanyim,

By means of this application, Marathon Oil Company respectfully requests administrative approval to drill the proposed Indian Hills Unit Well No. 59 to a non-standard location in the Upper Pennsylvanian formation. The well is designed to be directionally drilled from a surface location of 1,117' FNL & 641' FEL, Section 20, Township 21 South, Range 24 East, to a bottom hole location of 2,199' FSL & 864' FWL, Section 21, Township 21 South, Range 24 East. The well will to be dedicated to the standard 320-acre spacing unit consisting of the West half of Section 21.

Marathon proposes to drill the Indian Hills Unit Well No. 59 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. These rules further establish the well spacing guidelines and require that in the Indian Basin Upper Pennsylvanian Associated Pool there may be only one well drilled per 80 acres. Therefore, the Indian Hills Unit Well No. 59 would be classified as unorthodox for two (2) reasons:

1. The proposed producing interval will infringe upon the 660 foot setback from the western boundary of the 320 acre "stand-up" gas proration unit dedicated to the West half of Section 21 (please see Attachment #1 - Well Location and Acreage Dedication Plat)

2. The proposed well would be the second Upper Pennsylvanian production well in the 80 acre drilling unit, and also within the 40 acre quarter-quarter section (unit letter 'E') of section 21. This is because Marathon's Indian Hills Unit Well No. 31 (API No. 30-015-31534) *just barely* penetrates the Upper Pennsylvanian formation 36' to the west of the boundary between unit letters 'E' and 'F'.

Each of these issues will be discussed in further detail to demonstrate Marathon's strong interest in pursuing this opportunity and the uniqueness it provides.

Based on the proposed directional plan, it is expected that the top of the Upper Pennsylvanian formation will be penetrated at 2,199' FSL & 864' FWL in Section 21, at approximate depths of -3,615' SSTVD, 8,006' MD and 7,790' TVD. (please see Attachment #2 – Directional Plat supplied by Baker Inteq, Marathon's proposed directional drilling company for the well).

In summary, this amendment application requests approval to produce from the non-standard location within the 660 foot setback from the Western outer boundary of Section 21, and as the 2nd well in the 80 acre drilling unit. In support of this application, specific details will be provided. These details will include the proration units related to the proposed well work and how the existing Indian Hills Unit Well No. 31 presents an additional unorthodox characteristic of this proposed Indian Hills Unit Well No. 59, why the proposed location is geologically superior to a standard location in Section 21, and how the well fits into Marathon's reservoir management plan.

Directional Wellbore:

The Indian Hills Unit Well No. 59 is proposed to be directionally drilled to the Upper Pennsylvanian reservoir. This drilling approach has been common to Marathon's development of the East Indian Basin area due to the topographical constraints of the Seven Rivers Hills and the Azotea Mesa Plateaus (please see Attachment #3 – Location Verification Map). Therefore, the only available surface location to drill a development well for the northwest quarter of Section 21 is located on the Indian Hills Unit Well No. 31 pad location, which is actually located in Section 20.

The geologic target of this well is not limited to the Upper Pennsylvanian reservoir. In addition, this well is being permitted for a potential completion in the deeper Morrow formation. By directionally drilling, Marathon is able to design the well path such that the Morrow formation is penetrated in the southern half of section 21 – a specific requirement to satisfy the well spacing rules for this reservoir.

Proration Unit:

Currently, the Indian Hills Unit Well No. 59 is proposed to be dedicated to the proration unit consisting of the West half of Section 21, Township 21 South, Range 24 East. There are presently three other wells, the Indian Hills Unit Well No. 1 (API No. 30-015-10066), the Indian Hills Unit Well No. 36 (API No. 30-015-32140), and the Indian Hills Unit Well No. 31 (API No. 30-015-31534), that also produce from this proration unit in the Upper Pennsylvanian formation. For your information, the Indian Hills Unit Well No. 1 is producing from a non-standard location as per Administrative Order NSL-4649 (BHL). Further, there is an additional well in the western half of Section 21, the Indian Hills Unit

Well No. 26 (API No. 30-015-31274), but this well produces from the deeper Morrow formation (please see Attachment #4 – Indian Basin Map covering Section 21, Township 21 South, Range 24 East).

The Indian Hills Unit is operated by Marathon Oil Company. Marathon has a 99.54544% working interest and Nearburg Exploration has a 0.45456% working interest. The ownership of this proration unit is identical to Section 20, which offsets to the west of the proposed unorthodox location in the Upper Pennsylvanian formation and is the section to which the proposed well is non-standard.

Non-Standard Well Spacing Request:

The proposed Indian Hills Unit Well No. 59 is targeted to penetrate both the top and base of the Upper Pennsylvanian formation in the southwest corner of unit letter 'E' of Section 21, Township 21 South, Range 24 East (again, please refer to Attachment #4). Noting the stand-up 80-acre drilling units of the northwest quarter section of Section 21, and the terminus of Indian Hills Unit Well No. 31 in the northwest corner of unit letter 'F', Marathon is confident that the Indian Hills Unit Well No. 59 design, targeting its terminus in the southwest corner of unit letter 'E', will maximize hydrocarbon recovery while minimizing well-to-well production interference.

However, upon close examination of the Indian Hills Unit Well No. 31, and in imposing the due diligence to fully understand the technical, economic, and regulatory issues, it was determined that this well actually penetrates the top of the Upper Pennsylvanian reservoir about 36' (in the lateral direction) into unit letter 'E'. Attachment #5 is a "zoomed-in" examination of the unit letters 'E' and 'F' in Section 21, to visually demonstrate the Indian Hills Unit Well No. 31 well path, and its presence in both unit letters.

The total thickness of the Upper Pennsylvanian formation from Indian Hills Unit Well No. 31's open hole log is about 516' MD. With a wellbore inclination of about 19 degrees, this 36' lateral distance west of the boundary between unit letters 'E' and 'F' translates into only about 111' MD (less than 25%) of the total MD actually being in unit letter 'E'. Therefore, while the clear majority of the well and its production (405' MD or 132' in the lateral direction) come from the unit letter 'F', there is a portion which produces from unit letter 'E' such that, technically, if the Indian Hills Unit Well No. 59 is drilled as planned, it would be the second Upper Pennsylvanian producer in this 40-acre area of Section 21.

Geologic Issues:

It is Marathon's belief that the proposed unorthodox location represents a superior location in regards to both reservoir drainage and geologic risk. The Indian Basin Upper Pennsylvanian Associated Pool is predominantly composed of dolomite and limestone sequences. Based on geologic interpretations, rock quality is predicted to be at least equivalent between the proposed location and a standard location. The proposed azimuth for the wellbore will maximize the distance between the existing wells thereby minimizing potential for well-to-well interference. Therefore, the geologic superiority of this well is found in the ability to increase reserves recovery, when compared to a standard location in the same area.

Reservoir Management Plan:

Over the last two 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. Recently completed directional wellbores have confirmed strong oil potential in the eastern portion of the Indian Hills Unit.

Further, with current technology, only the fractured, vuggy dolomite sequences have proven productive and economic. The proposed Indian Hills Unit Well No. 59 is an attempt to further develop the eastern extent of these oil and gas bearing dolomite sequences within the Indian Hills Unit (please see Attachment #6 – Indian Hills Unit and Upper Pennsylvanian Participating Area).

Finally, Marathon's reservoir management strategy has progressed to the point of testing the application of horizontal wells in the Upper Pennsylvanian reservoir as a method of improving the ultimate reserves recovery. Briefly, this strategy encompasses re-entering existing wellbores and side-tracking them horizontally, targeting interpreted undrained areas, to increase connectivity to the fracture network in the oil leg by greatly increasing the amount of reservoir exposed by the wellbore. Because of the extended lateral reach in these wells, and given the Upper Pennsylvanian Associated Gas Pool wellbore spacing rules, the positioning of any new wells could impose limitations on Marathon's future ability to select horizontal well candidates. A horizontal well program, similar to the one currently being pursued in the southeastern area of East Indian Basin, is being strongly considered to target the oil potential in the northeastern area of East Indian Basin. This area, which could include Section 21, would likely involve the wells surrounding the proposed Indian Hills Unit Well No. 59, or potentially even this well itself. Therefore, the positioning of this proposed well is very deliberate and is placed to allow future horizontal drilling options, again for either this well or those surrounding it, should Marathon's application of horizontal well technology prove successful.

Notifications:

It is Marathon's understanding that because the gas spacing unit to which the Indian Hills Unit Well No. 59 would be unorthodox is identical in ownership to that of the proposed, standard, 320-acre gas spacing unit, no waivers or notifications are required.

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

1000 N. FRANKLIN BL., ALBUQUERQUE, NM 87102

DISTRICT II

1901 N. GARDEN AVENUE, ALBUQUERQUE, NM 87102

DISTRICT III

1000 Rio Grande Blvd., Alamo, NM 87410

DISTRICT IV

1000 N. ST. FRANCIS BL., SANTA FE, NM 87505

State of New Mexico

Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102

Revised JUNE 10, 2003

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name
		Miss. / Morrow / U. Penn Assoc.
Property Code	Property Name	Well Number
	INDIAN HILLS UNIT	59
OGED No.	Operator Name	Elevation
014021	MARATHON OIL COMPANY	4149'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	20	21-S	24-E		1117'	NORTH	641'	EAST	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
L	21	21-S	24-E		2199'	SOUTH	864'	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
320 / 640 320 E/2			

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

GEODETIC COORDINATES
NAD 27 NME
SURF.

Y=534264.9 N
X=444189.7 E
LAT.=32°28'07.23" N
LONG.=104°30'51.47" W

B.H.

Y=532451.3 N
X=445873.2 E

OPERATOR CERTIFICATION

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

Mike Mick
Signature

Mike Mick
Printed Name

Adv. Engr. Tech
Title

7-27-04
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.

JUNE 8, 2004

Date Surveyed REV: 07/23/04 JR

Signature & Seal of Professional Surveyor

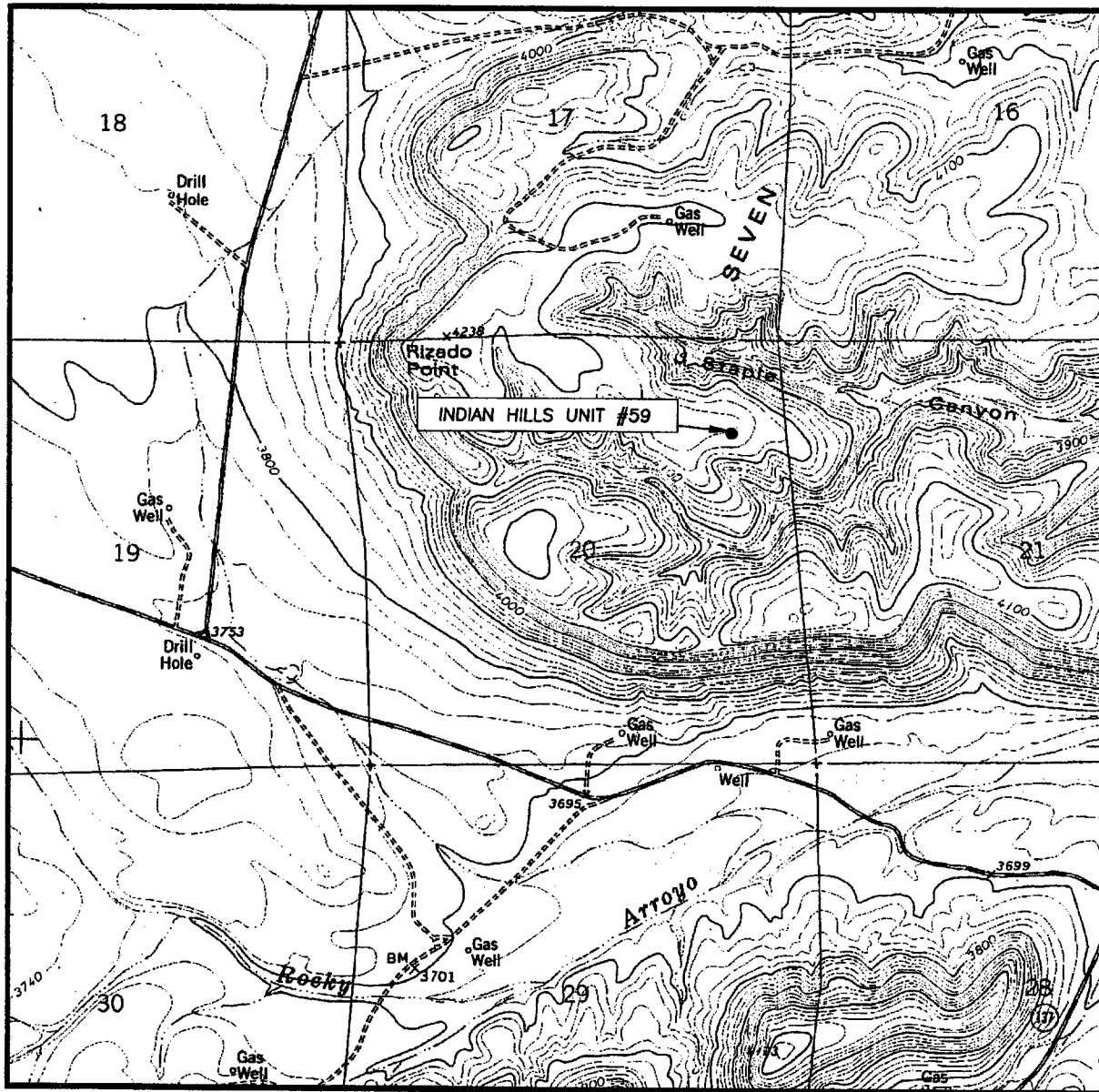
04.13.0940

Certificate No. GARY HEDSON

12041



LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:
MARTHA CREEK, N.M. - 20'SEC. 20 TWP. 21-S RGE. 24-ESURVEY N.M.P.M.COUNTY EDDYDESCRIPTION 1117' FNL & 641' FELELEVATION 4149'OPERATOR MARATHON
OIL COMPANYLEASE INDIAN HILLS UNITU.S.G.S. TOPOGRAPHIC MAP
MARTHA CREEK, N.M.