

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

NMOCD
Hobbs

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

5. Lease Serial No. NMNM13647

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

8. Well Name and No. CAVE LION 5 FEDEAL WC 5H

9. API Well No. 30-025-44102

10. Field and Pool or Exploratory Area HARDEN TANK; WOLFCAMP

11. County or Parish, State LEA COUNTY, NM

SUBMIT IN TRIPLICATE - Other instructions on page 2

DEC 05 2017
RECEIVED

1. Type of Well
 Oil Well Gas Well Other

2. Name of Operator MARATHON OIL PERMIAN, LLC
Contact: JENNIFER E VAN CUREN
E-Mail: jvancuren@marathonoil.com

3a. Address 5555 SAN FELIPE RD HOUSTON, TX 77057

3b. Phone No. (include area code) Ph: 713-296-2500

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 5 T26S R35E Mer NMP SWSW 185FSL 480FWL 32.065600 N Lat, 103.396000 W Lon

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original APD
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

MARATHON OIL PERMIAN LLC HAS UPDATED THE DIRECTIONAL PLAN OR THE CAVE LION 5 FEDERAL WC 5H. PLEASE SEE ATTACHED DIRECTIONAL PLAN.

original COAs still stand.

submit anti-collision report due to Cave Lion 5 Federal BC 1H

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #389542 verified by the BLM Well Information System
For MARATHON OIL PERMIAN, LLC, sent to the Hobbs
Committed to AFMSS for processing by JENNIFER SANCHEZ on 11/06/2017 ()

Name (Printed/Typed) JENNIFER E VAN CUREN Title SR. REGULATORY COMPLIANCE REP

Signature (Electronic Submission) Date 09/25/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By _____ Title _____ Date NOV 6 2017

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office BUREAU OF LAND MANAGEMENT CARLSBAD FIELD OFFICE

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

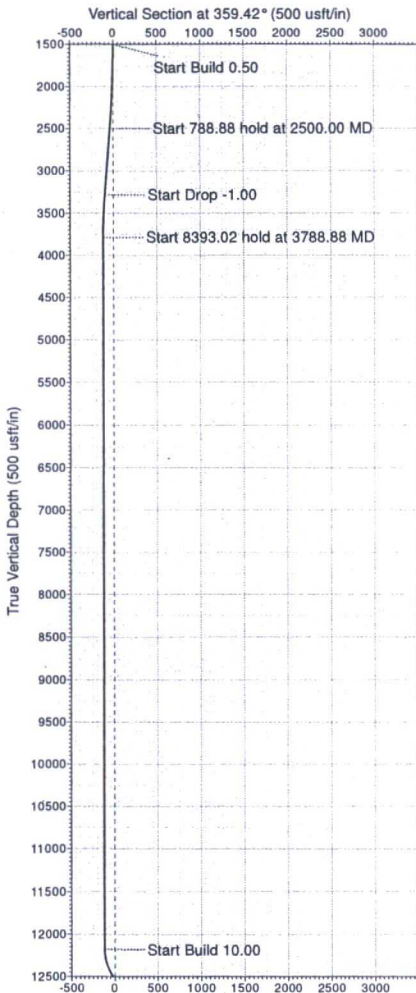
(Instructions on page 2)

** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED **

Handwritten signature



Marathon Oil
Lea County, NM
Cave Lion 5 Federal
WC #5H
Prelim Plan A
GL: 3270' + KB: 26.5' (H&P498)



US State Plane 1927 (Exact solution)
NAD 1927 (NADCON CONUS)
Clarke 1866
New Mexico East 3001
Mean Sea Level

RKB Elevation: Well @ 3296.50usft (GL: 3270' + KB: 26.5' (H&P498))

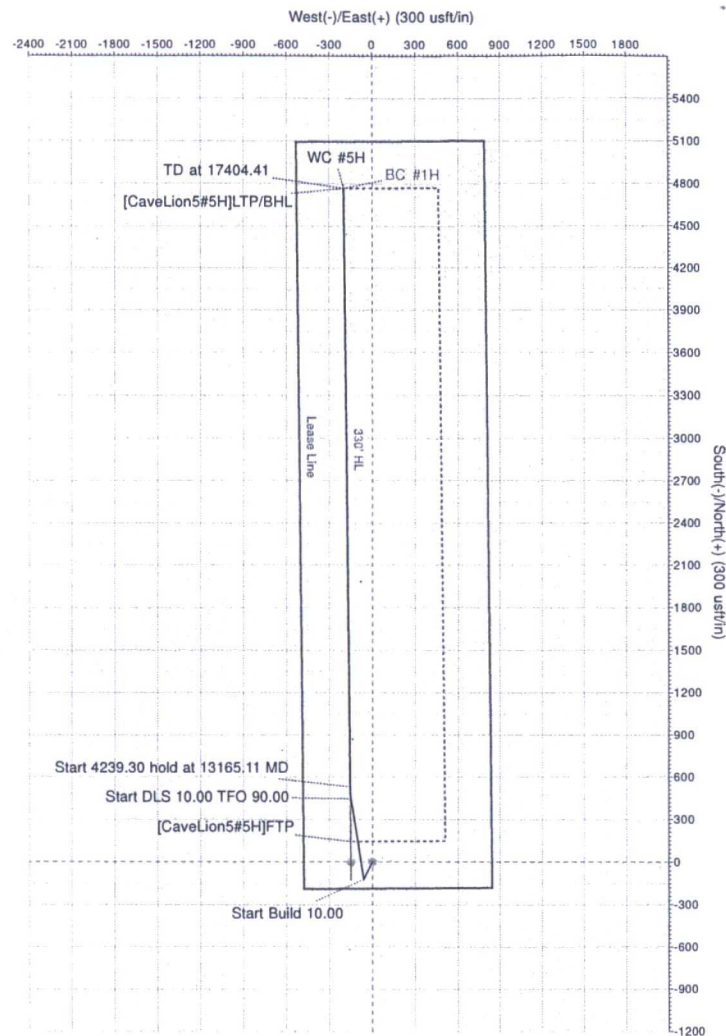
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	388806.12	790365.00	32.0654769	-103.3960077	

SECTION DETAILS

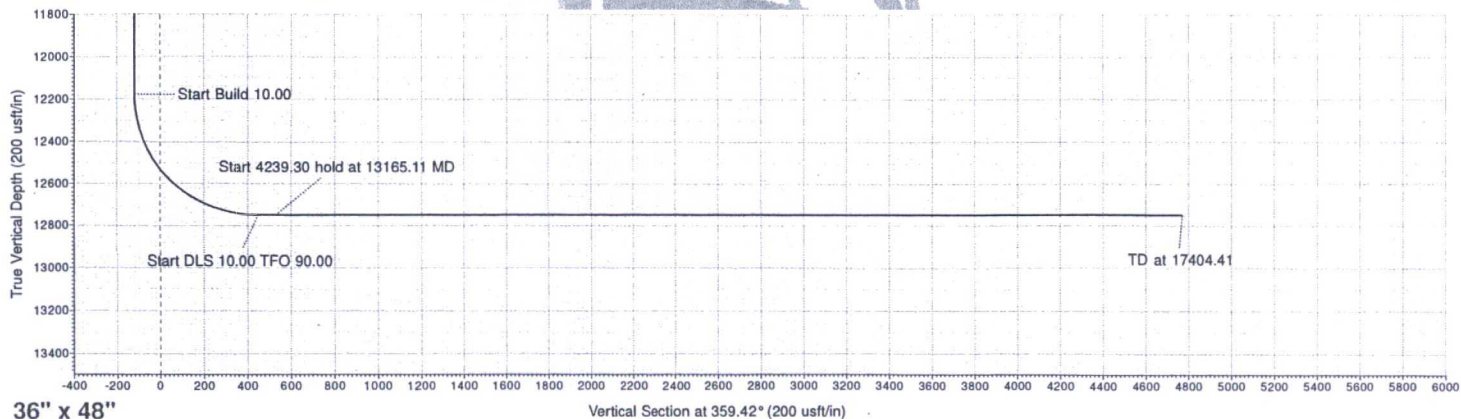
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00
3	2500.00	5.00	206.57	2498.73	-39.00	-19.50	0.50	-38.80
4	3288.88	5.00	206.57	3284.61	-100.50	-50.25	0.00	-99.99
5	3788.88	0.00	0.00	3783.98	-120.00	-60.00	1.00	-119.39
6	12181.91	0.00	0.00	12177.00	-120.00	-60.00	0.00	-119.39
7	13081.91	90.00	351.10	12749.96	446.06	-148.64	10.00	447.54
8	13165.11	90.00	359.42	12749.96	528.91	-155.51	10.00	530.46
9	17404.41	90.00	359.42	12750.00	4767.99	-198.37	0.00	4769.75

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[CaveLion5#5H]FTP	0.00	143.92	-151.41	388950.04	790213.59
[CaveLion5#5H]LTP/BHL	12750.00	4767.99	-198.37	393574.11	790166.63



Target Line: 12750' TVD @ 0° VS, 90° INC



Azimuths to Grid North
True North: -0.50°
Magnetic North: 6.23°

Magnetic Field
Strength: 47900 2snT
Dip Angle: 59.80°
Date: 9/18/2017
Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): 6.24°

Declination (M to T): 6.73° East

36" x 48"

Company: Marathon Oil
Project: Lea County, NM
Site: Cave Lion 5 Federal
Well: WC #5H
Wellbore: OH
Design: Prelim Plan A

Local Co-ordinate Reference: Well WC #5H
TVD Reference: Well @ 3296.50usft (GL: 3270' + KB: 26.5' (H&P498))
MD Reference: Well @ 3296.50usft (GL: 3270' + KB: 26.5' (H&P498))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Cave Lion 5 Federal		
Site Position:		Northing:	388,805.07 usft
From:	Map	Easting:	790,215.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.0654776
		Longitude:	-103.3964918
		Grid Convergence:	0.50 °

Well	WC #5H		
Well Position	+N-S	0.00 usft	Northing: 388,806.12 usft
	+E-W	0.00 usft	Easting: 790,365.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32.0654770
		Longitude:	-103.3960076
		Ground Level:	3,270.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/18/2017	6.73	59.80	47,900.20

Design	Prelim Plan A			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth: 0.00	
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	0.00	0.00	0.00	359.42

Survey Tool Program	Date 9/18/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	5,000.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
5,000.00	10,000.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
10,000.00	17,404.41	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[CaveLion5#5H]FTP										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.50	206.57	1,600.00	-0.39	-0.20	-0.39	0.50	0.50	0.00
1,700.00	1.00	206.57	1,699.99	-1.56	-0.78	-1.55	0.50	0.50	0.00
1,800.00	1.50	206.57	1,799.97	-3.51	-1.76	-3.49	0.50	0.50	0.00
1,900.00	2.00	206.57	1,899.92	-6.24	-3.12	-6.21	0.50	0.50	0.00
2,000.00	2.50	206.57	1,999.84	-9.76	-4.88	-9.71	0.50	0.50	0.00
2,100.00	3.00	206.57	2,099.73	-14.05	-7.02	-13.97	0.50	0.50	0.00
2,200.00	3.50	206.57	2,199.56	-19.12	-9.56	-19.02	0.50	0.50	0.00
2,300.00	4.00	206.57	2,299.35	-24.97	-12.48	-24.84	0.50	0.50	0.00
2,400.00	4.50	206.57	2,399.08	-31.60	-15.80	-31.43	0.50	0.50	0.00
2,500.00	5.00	206.57	2,498.73	-39.00	-19.50	-38.80	0.50	0.50	0.00
2,600.00	5.00	206.57	2,598.35	-46.80	-23.40	-46.56	0.00	0.00	0.00
2,700.00	5.00	206.57	2,697.97	-54.59	-27.30	-54.31	0.00	0.00	0.00
2,800.00	5.00	206.57	2,797.59	-62.39	-31.19	-62.07	0.00	0.00	0.00
2,900.00	5.00	206.57	2,897.21	-70.18	-35.09	-69.82	0.00	0.00	0.00
3,000.00	5.00	206.57	2,996.83	-77.98	-38.99	-77.58	0.00	0.00	0.00
3,100.00	5.00	206.57	3,096.45	-85.77	-42.89	-85.34	0.00	0.00	0.00
3,200.00	5.00	206.57	3,196.07	-93.57	-46.79	-93.09	0.00	0.00	0.00
3,288.88	5.00	206.57	3,284.61	-100.50	-50.25	-99.99	0.00	0.00	0.00
3,300.00	4.89	206.57	3,295.69	-101.36	-50.68	-100.84	1.00	-1.00	0.00
3,400.00	3.89	206.57	3,395.39	-108.20	-54.10	-107.65	1.00	-1.00	0.00
3,500.00	2.89	206.57	3,495.22	-113.49	-56.74	-112.91	1.00	-1.00	0.00
3,600.00	1.89	206.57	3,595.13	-117.22	-58.61	-116.62	1.00	-1.00	0.00
3,700.00	0.89	206.57	3,695.10	-119.38	-59.69	-118.77	1.00	-1.00	0.00
3,788.88	0.00	0.00	3,783.98	-120.00	-60.00	-119.39	1.00	-1.00	0.00
3,800.00	0.00	0.00	3,795.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
3,900.00	0.00	0.00	3,895.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
4,000.00	0.00	0.00	3,995.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
4,100.00	0.00	0.00	4,095.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
4,200.00	0.00	0.00	4,195.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
4,300.00	0.00	0.00	4,295.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
4,400.00	0.00	0.00	4,395.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
4,500.00	0.00	0.00	4,495.10	-120.00	-60.00	-119.39	0.00	0.00	0.00

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Well: WC #5H
Wellbore: OH
Design: Prelim Plan A

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MD Reference: Well @ 3296.50usft (GL: 3270' + KB: 26.5' (H&P498))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,600.00	0.00	0.00	4,595.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
4,700.00	0.00	0.00	4,695.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
4,800.00	0.00	0.00	4,795.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
4,900.00	0.00	0.00	4,895.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,000.00	0.00	0.00	4,995.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,100.00	0.00	0.00	5,095.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,200.00	0.00	0.00	5,195.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,300.00	0.00	0.00	5,295.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,400.00	0.00	0.00	5,395.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,500.00	0.00	0.00	5,495.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,600.00	0.00	0.00	5,595.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,700.00	0.00	0.00	5,695.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,800.00	0.00	0.00	5,795.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
5,900.00	0.00	0.00	5,895.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,000.00	0.00	0.00	5,995.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,100.00	0.00	0.00	6,095.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,200.00	0.00	0.00	6,195.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,300.00	0.00	0.00	6,295.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,400.00	0.00	0.00	6,395.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,500.00	0.00	0.00	6,495.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,600.00	0.00	0.00	6,595.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,700.00	0.00	0.00	6,695.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,800.00	0.00	0.00	6,795.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
6,900.00	0.00	0.00	6,895.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,000.00	0.00	0.00	6,995.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,100.00	0.00	0.00	7,095.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,200.00	0.00	0.00	7,195.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,300.00	0.00	0.00	7,295.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,400.00	0.00	0.00	7,395.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,500.00	0.00	0.00	7,495.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,600.00	0.00	0.00	7,595.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,700.00	0.00	0.00	7,695.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,800.00	0.00	0.00	7,795.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
7,900.00	0.00	0.00	7,895.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
8,000.00	0.00	0.00	7,995.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
8,100.00	0.00	0.00	8,095.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
8,200.00	0.00	0.00	8,195.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
8,300.00	0.00	0.00	8,295.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
8,400.00	0.00	0.00	8,395.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
8,500.00	0.00	0.00	8,495.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
8,600.00	0.00	0.00	8,595.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
8,700.00	0.00	0.00	8,695.10	-120.00	-60.00	-119.39	0.00	0.00	0.00

Company: Marathon Oil
Project: Lea County, NM
Site: Cave Lion 5 Federal
Well: WC #5H
Wellbore: OH
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Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,800.00	0.00	0.00	8,795.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
8,900.00	0.00	0.00	8,895.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,000.00	0.00	0.00	8,995.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,100.00	0.00	0.00	9,095.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,200.00	0.00	0.00	9,195.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,300.00	0.00	0.00	9,295.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,400.00	0.00	0.00	9,395.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,500.00	0.00	0.00	9,495.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,600.00	0.00	0.00	9,595.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,700.00	0.00	0.00	9,695.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,800.00	0.00	0.00	9,795.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
9,900.00	0.00	0.00	9,895.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,000.00	0.00	0.00	9,995.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,100.00	0.00	0.00	10,095.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,200.00	0.00	0.00	10,195.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,300.00	0.00	0.00	10,295.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,400.00	0.00	0.00	10,395.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,500.00	0.00	0.00	10,495.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,600.00	0.00	0.00	10,595.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,700.00	0.00	0.00	10,695.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,800.00	0.00	0.00	10,795.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
10,900.00	0.00	0.00	10,895.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,000.00	0.00	0.00	10,995.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,100.00	0.00	0.00	11,095.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,200.00	0.00	0.00	11,195.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,300.00	0.00	0.00	11,295.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,400.00	0.00	0.00	11,395.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,500.00	0.00	0.00	11,495.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,600.00	0.00	0.00	11,595.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,700.00	0.00	0.00	11,695.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,800.00	0.00	0.00	11,795.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
11,900.00	0.00	0.00	11,895.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
12,000.00	0.00	0.00	11,995.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
12,100.00	0.00	0.00	12,095.10	-120.00	-60.00	-119.39	0.00	0.00	0.00
12,181.91	0.00	0.00	12,177.00	-120.00	-60.00	-119.39	0.00	0.00	0.00
12,200.00	1.81	351.10	12,195.09	-119.72	-60.04	-119.10	10.00	10.00	0.00
12,250.00	6.81	351.10	12,244.94	-116.01	-60.63	-115.39	10.00	10.00	0.00
12,300.00	11.81	351.10	12,294.26	-108.02	-61.88	-107.39	10.00	10.00	0.00
12,350.00	16.81	351.10	12,342.69	-95.81	-63.79	-95.16	10.00	10.00	0.00
12,400.00	21.81	351.10	12,389.87	-79.48	-66.34	-78.81	10.00	10.00	0.00
12,450.00	26.81	351.10	12,435.42	-59.15	-69.53	-58.45	10.00	10.00	0.00
12,500.00	31.81	351.10	12,479.00	-34.98	-73.31	-34.24	10.00	10.00	0.00

Company: Marathon Oil
Project: Lea County, NM
Site: Cave Lion 5 Federal
Well: WC #5H
Wellbore: OH
Design: Prelim Plan A

Local Co-ordinate Reference: Well WC #5H
TVD Reference: Well @ 3296.50usft (GL: 3270' + KB: 26.5' (H&P498))
MD Reference: Well @ 3296.50usft (GL: 3270' + KB: 26.5' (H&P498))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,550.00	36.81	351.10	12,520.29	-7.15	-77.67	-6.36	10.00	10.00	0.00
12,600.00	41.81	351.10	12,558.97	24.14	-82.57	24.97	10.00	10.00	0.00
12,650.00	46.81	351.10	12,594.73	58.63	-87.97	59.52	10.00	10.00	0.00
12,700.00	51.81	351.10	12,627.32	96.08	-93.84	97.02	10.00	10.00	0.00
12,750.00	56.81	351.10	12,656.48	136.18	-100.12	137.19	10.00	10.00	0.00
12,800.00	61.81	351.10	12,681.99	178.65	-106.77	179.72	10.00	10.00	0.00
12,850.00	66.81	351.10	12,703.66	223.15	-113.74	224.29	10.00	10.00	0.00
12,900.00	71.81	351.10	12,721.32	269.35	-120.97	270.56	10.00	10.00	0.00
12,950.00	76.81	351.10	12,734.84	316.89	-128.42	318.17	10.00	10.00	0.00
13,000.00	81.81	351.10	12,744.11	365.42	-136.01	366.77	10.00	10.00	0.00
13,050.00	86.81	351.10	12,749.07	414.55	-143.71	415.99	10.00	10.00	0.00
13,081.91	90.00	351.10	12,749.96	446.06	-148.64	447.54	10.00	10.00	0.00
13,100.00	90.00	352.91	12,749.96	463.98	-151.16	465.48	10.00	0.00	10.00
13,150.00	90.00	357.91	12,749.96	513.80	-155.16	515.35	10.00	0.00	10.00
13,165.11	90.00	359.42	12,749.96	528.91	-155.51	530.46	10.00	0.00	10.00
13,200.00	90.00	359.42	12,749.96	563.80	-155.86	565.34	0.00	0.00	0.00
13,300.00	90.00	359.42	12,749.96	663.79	-156.88	665.34	0.00	0.00	0.00
13,400.00	90.00	359.42	12,749.96	763.78	-157.89	765.34	0.00	0.00	0.00
13,500.00	90.00	359.42	12,749.96	863.78	-158.90	865.34	0.00	0.00	0.00
13,600.00	90.00	359.42	12,749.96	963.77	-159.91	965.34	0.00	0.00	0.00
13,700.00	90.00	359.42	12,749.96	1,063.77	-160.92	1,065.34	0.00	0.00	0.00
13,800.00	90.00	359.42	12,749.96	1,163.76	-161.93	1,165.34	0.00	0.00	0.00
13,900.00	90.00	359.42	12,749.97	1,263.76	-162.94	1,265.34	0.00	0.00	0.00
14,000.00	90.00	359.42	12,749.97	1,363.75	-163.95	1,365.34	0.00	0.00	0.00
14,100.00	90.00	359.42	12,749.97	1,463.75	-164.96	1,465.34	0.00	0.00	0.00
14,200.00	90.00	359.42	12,749.97	1,563.74	-165.97	1,565.34	0.00	0.00	0.00
14,300.00	90.00	359.42	12,749.97	1,663.74	-166.99	1,665.34	0.00	0.00	0.00
14,400.00	90.00	359.42	12,749.97	1,763.73	-168.00	1,765.34	0.00	0.00	0.00
14,500.00	90.00	359.42	12,749.97	1,863.73	-169.01	1,865.34	0.00	0.00	0.00
14,600.00	90.00	359.42	12,749.97	1,963.72	-170.02	1,965.34	0.00	0.00	0.00
14,700.00	90.00	359.42	12,749.97	2,063.72	-171.03	2,065.34	0.00	0.00	0.00
14,800.00	90.00	359.42	12,749.97	2,163.71	-172.04	2,165.34	0.00	0.00	0.00
14,900.00	90.00	359.42	12,749.98	2,263.71	-173.05	2,265.34	0.00	0.00	0.00
15,000.00	90.00	359.42	12,749.98	2,363.70	-174.06	2,365.34	0.00	0.00	0.00
15,100.00	90.00	359.42	12,749.98	2,463.70	-175.07	2,465.34	0.00	0.00	0.00
15,200.00	90.00	359.42	12,749.98	2,563.69	-176.08	2,565.34	0.00	0.00	0.00
15,300.00	90.00	359.42	12,749.98	2,663.69	-177.09	2,665.34	0.00	0.00	0.00
15,400.00	90.00	359.42	12,749.98	2,763.68	-178.11	2,765.34	0.00	0.00	0.00
15,500.00	90.00	359.42	12,749.98	2,863.68	-179.12	2,865.34	0.00	0.00	0.00
15,600.00	90.00	359.42	12,749.98	2,963.67	-180.13	2,965.34	0.00	0.00	0.00
15,700.00	90.00	359.42	12,749.98	3,063.67	-181.14	3,065.34	0.00	0.00	0.00
15,800.00	90.00	359.42	12,749.98	3,163.66	-182.15	3,165.34	0.00	0.00	0.00

Company: Marathon Oil
Project: Lea County, NM
Site: Cave Lion 5 Federal
Well: WC #5H
Wellbore: OH
Design: Prelim Plan A

Local Co-ordinate Reference: Well WC #5H
TVD Reference: Well @ 3296.50usft (GL: 3270' + KB: 26.5' (H&P498))
MD Reference: Well @ 3296.50usft (GL: 3270' + KB: 26.5' (H&P498))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,900.00	90.00	359.42	12,749.99	3,263.66	-183.16	3,265.34	0.00	0.00	0.00
16,000.00	90.00	359.42	12,749.99	3,363.65	-184.17	3,365.34	0.00	0.00	0.00
16,100.00	90.00	359.42	12,749.99	3,463.65	-185.18	3,465.34	0.00	0.00	0.00
16,200.00	90.00	359.42	12,749.99	3,563.64	-186.19	3,565.34	0.00	0.00	0.00
16,300.00	90.00	359.42	12,749.99	3,663.64	-187.20	3,665.34	0.00	0.00	0.00
16,400.00	90.00	359.42	12,749.99	3,763.63	-188.22	3,765.34	0.00	0.00	0.00
16,500.00	90.00	359.42	12,749.99	3,863.63	-189.23	3,865.34	0.00	0.00	0.00
16,600.00	90.00	359.42	12,749.99	3,963.62	-190.24	3,965.34	0.00	0.00	0.00
16,700.00	90.00	359.42	12,749.99	4,063.62	-191.25	4,065.34	0.00	0.00	0.00
16,800.00	90.00	359.42	12,749.99	4,163.61	-192.26	4,165.34	0.00	0.00	0.00
16,900.00	90.00	359.42	12,750.00	4,263.61	-193.27	4,265.34	0.00	0.00	0.00
17,000.00	90.00	359.42	12,750.00	4,363.60	-194.28	4,365.34	0.00	0.00	0.00
17,100.00	90.00	359.42	12,750.00	4,463.60	-195.29	4,465.34	0.00	0.00	0.00
17,200.00	90.00	359.42	12,750.00	4,563.59	-196.30	4,565.34	0.00	0.00	0.00
17,300.00	90.00	359.42	12,750.00	4,663.59	-197.31	4,665.34	0.00	0.00	0.00
17,404.41	90.00	359.42	12,750.00	4,767.99	-198.37	4,769.75	0.00	0.00	0.00

[CaveLion5#5H]LTP/BHL

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
[CaveLion5#5H]FTP	0.00	0.00	0.00	143.92	-151.41	388,950.04	790,213.59	32.0658762	-103.3964923
- hit/miss target									
- Shape									
- plan misses target center by 208.90usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
[CaveLion5#5H]LTP/BHL	0.00	0.00	12,750.0	4,767.99	-198.37	393,574.11	790,166.63	32.0785874	-103.3965143
0									
- plan hits target center									
- Point									

Checked By: _____ Approved By: _____ Date: _____