

HOBBS OCD

JAN 28 2020

Marathon Oil

Cave Lion 5 WXY Federal 9H

HP 480

This survey is correct to the best of my knowledge and is supported by actual field data.



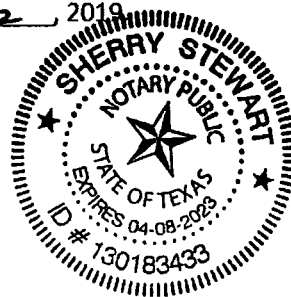
Notarized this data 17th of December, 2019

Sherry Stewart

Notary Signature

County of Midland

State of Texas



Scientific Drilling

The

In Wellbore Placement

Double
Sided

Marathon Oil Permian, LLC

Lea County, NM (NAD27-NME)

Cave Lion Pad

Cave Lion 5 WA Federal #9H

Wellbore #1

Design: Actual

Standard Survey Report

17 June, 2019



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Scientific Drilling, Intl

Survey Report

Company:	Marathon Oil Permian, LLC	Local Co-ordinate Reference:	Well Cave Lion 5 WA Federal #9H
Project:	Lea County, NM (NAD27-NME)	TVD Reference:	KB=26.5 @ 3288.50usft
Site:	Cave Lion Pad	MD Reference:	KB=26.5 @ 3288.50usft
Well:	Cave Lion 5 WA Federal #9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	Midland District

Project	Lea County, NM (NAD27-NME)		
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		Using geodetic scale factor

Site		Cave Lion Pad			
Site Position:		Northing:	388,917.09 usft	Latitude:	32° 3' 56.703 N
From:	Map	Easting:	791,664.75 usft	Longitude:	103° 23' 30.513 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.50 °

Well	Cave Lion 5 WA Federal #9H					
Well Position	+N/-S	0.00 usft	Northing:	388,917.06 usft	Latitude:	32° 3' 56.695 N
	+E/-W	0.00 usft	Easting:	791,754.71 usft	Longitude:	103° 23' 29.468 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,262.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/14/2019	6.60	59.70	47,738

Design	Actual				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (bearing)	
	0.00	0.00	0.00	359.39	

Survey Program	Date 6/17/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
183.00	11,948.00	SDI MWD Surveys (Wellbore #1)	MWD+HDGM	OWSG MWD + HDGM
12,042.00	17,819.00	SDI MWD - Curve/Lateral (Wellbore #1)	MWD+HDGM	OWSG MWD + HDGM

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	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	
183.00	0.48	261.30	183.00	-0.12	-0.76	-0.11	0.26	0.26	0.00	
244.00	0.55	253.21	244.00	-0.24	-1.29	-0.23	0.17	0.11	-13.26	
335.00	0.88	249.23	334.99	-0.61	-2.36	-0.59	0.37	0.36	-4.37	
426.00	0.71	217.97	425.98	-1.31	-3.36	-1.27	0.50	-0.19	-34.35	
518.00	0.47	210.18	517.97	-2.08	-3.90	-2.04	0.27	-0.26	-8.47	
608.00	0.45	249.29	607.97	-2.53	-4.42	-2.48	0.34	-0.02	43.46	
700.00	0.80	270.73	699.97	-2.65	-5.24	-2.59	0.27	0.16	23.30	
792.00	0.41	295.98	791.96	-2.50	-6.02	-2.43	0.31	-0.21	27.45	
884.00	0.66	301.76	883.96	-2.07	-6.76	-2.00	0.28	0.27	6.28	

Scientific Drilling, Intl

Survey Report

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Site:	Cave Lion Pad	MD Reference:	KB=26.5 @ 3288.50usft
Well:	Cave Lion 5 WA Federal #9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	Midland District

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
974.00	0.78	285.97	973.95	-1.63	-7.79	-1.55	0.28	0.13	-17.54
1,174.00	1.07	291.43	1,173.93	-0.58	-10.84	-0.46	0.15	0.15	2.73
1,247.00	0.85	288.71	1,246.92	-0.15	-11.99	-0.02	0.31	-0.30	-3.73
1,341.00	0.26	100.35	1,340.91	0.03	-12.44	0.17	1.18	-0.63	182.60
1,436.00	0.53	115.61	1,435.91	-0.20	-11.83	-0.07	0.30	0.28	16.06
1,530.00	0.36	119.73	1,529.91	-0.53	-11.18	-0.41	0.18	-0.18	4.38
1,624.00	0.21	103.51	1,623.91	-0.72	-10.76	-0.60	0.18	-0.16	-17.26
1,719.00	0.14	43.21	1,718.91	-0.67	-10.51	-0.56	0.20	-0.07	-63.47
1,813.00	0.31	69.01	1,812.91	-0.50	-10.19	-0.39	0.21	0.18	27.45
1,907.00	0.12	50.00	1,906.91	-0.34	-9.88	-0.24	0.21	-0.20	-20.22
2,002.00	1.43	97.94	2,001.90	-0.44	-8.63	-0.35	1.42	1.38	50.46
2,096.00	2.83	104.47	2,095.83	-1.19	-5.22	-1.13	1.51	1.49	6.95
2,190.00	5.15	102.32	2,189.59	-2.67	1.15	-2.68	2.47	2.47	-2.29
2,285.00	6.73	101.91	2,284.08	-4.72	10.76	-4.84	1.66	1.66	-0.43
2,379.00	7.76	104.33	2,377.33	-7.43	22.30	-7.67	1.14	1.10	2.57
2,474.00	9.82	108.72	2,471.21	-11.62	36.19	-12.00	2.28	2.17	4.62
2,568.00	10.76	108.94	2,563.70	-17.04	52.08	-17.59	1.00	1.00	0.23
2,662.00	10.99	107.97	2,656.01	-22.65	68.90	-23.39	0.31	0.24	-1.03
2,757.00	11.35	105.09	2,749.21	-27.88	86.54	-28.80	0.70	0.38	-3.03
2,851.00	11.16	109.46	2,841.40	-33.32	104.05	-34.42	0.93	-0.20	4.65
2,945.00	11.66	112.18	2,933.55	-39.94	121.42	-41.23	0.78	0.53	2.89
3,040.00	11.86	113.02	3,026.55	-47.38	139.30	-48.86	0.28	0.21	0.88
3,134.00	11.56	114.35	3,118.60	-55.04	156.77	-56.70	0.43	-0.32	1.41
3,228.00	11.72	114.37	3,210.66	-62.66	174.05	-64.71	0.17	0.17	0.02
3,323.00	11.76	113.20	3,303.68	-70.66	191.73	-72.69	0.25	0.04	-1.23
3,417.00	10.81	114.46	3,395.86	-78.08	208.56	-80.30	1.04	-1.01	1.34
3,512.00	10.44	114.37	3,489.23	-85.32	224.51	-87.71	0.39	-0.39	-0.09
3,606.00	9.60	114.97	3,581.79	-92.14	239.38	-94.69	0.90	-0.89	0.64
3,701.00	9.01	114.57	3,675.54	-98.58	253.32	-101.27	0.62	-0.62	-0.42
3,795.00	8.83	112.17	3,768.41	-104.36	266.70	-107.20	0.44	-0.19	-2.55
3,890.00	8.04	112.68	3,862.38	-109.68	279.58	-112.65	0.84	-0.83	0.54
3,984.00	7.13	112.72	3,955.56	-114.46	291.03	-117.56	0.97	-0.97	0.04
4,079.00	7.65	110.41	4,049.77	-118.95	302.39	-122.16	0.63	0.55	-2.43
4,173.00	8.90	109.58	4,142.79	-123.57	315.11	-126.91	1.34	1.33	-0.88
4,267.00	8.40	110.25	4,235.72	-128.38	328.40	-131.87	0.54	-0.53	0.71
4,362.00	8.54	112.45	4,329.68	-133.47	341.43	-137.10	0.37	0.15	2.32
4,456.00	8.42	113.88	4,422.65	-138.93	354.17	-142.69	0.28	-0.13	1.52
4,550.00	8.18	113.36	4,515.67	-144.36	366.61	-148.26	0.27	-0.26	-0.55
4,645.00	8.15	108.72	4,609.71	-149.20	379.19	-153.23	0.69	-0.03	-4.88
4,739.00	8.23	111.33	4,702.75	-153.79	391.76	-157.95	0.40	0.09	2.78
4,834.00	7.39	110.75	4,796.87	-158.43	403.81	-162.72	0.89	-0.88	-0.61
4,928.00	5.58	114.36	4,890.26	-162.46	413.63	-166.85	1.97	-1.93	3.84
5,023.00	5.89	116.23	4,984.79	-166.51	422.21	-171.00	0.38	0.33	1.97

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Survey Report

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Well:	Cave Lion 5 WA Federal #9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	Midland District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,117.00	5.17	113.82	5,078.35	-170.38	430.41	-174.93	0.80	-0.77	-2.58
5,212.00	2.66	115.28	5,173.12	-173.03	436.32	-177.66	2.64	-2.64	1.54
5,306.00	1.39	126.57	5,267.06	-174.64	439.21	-179.30	1.41	-1.35	12.01
5,367.00	0.95	144.67	5,328.05	-175.49	440.10	-180.17	0.93	-0.72	29.67
5,490.00	0.77	117.34	5,451.03	-176.70	441.42	-181.39	0.36	-0.15	-22.22
5,585.00	1.17	113.56	5,546.02	-177.38	442.87	-182.09	0.43	0.42	-3.98
5,680.00	1.24	114.57	5,641.00	-178.20	444.70	-182.92	0.08	0.07	1.08
5,774.00	0.94	110.73	5,734.98	-178.89	446.35	-183.64	0.33	-0.32	-4.09
5,868.00	1.04	121.73	5,828.97	-179.62	447.79	-184.37	0.23	0.11	11.70
5,963.00	1.20	107.87	5,923.95	-180.37	449.47	-185.15	0.33	0.17	-14.59
6,057.00	0.99	113.80	6,017.93	-181.00	451.15	-185.80	0.25	-0.22	6.31
6,152.00	0.93	116.77	6,112.92	-181.68	452.59	-186.49	0.08	-0.06	3.13
6,246.00	0.93	124.76	6,206.90	-182.46	453.90	-187.28	0.14	0.00	8.50
6,340.00	0.89	98.17	6,300.89	-183.00	455.25	-187.84	0.45	-0.04	-28.29
6,435.00	0.44	115.38	6,395.89	-183.26	456.31	-188.11	0.51	-0.47	18.12
6,529.00	0.74	94.34	6,489.88	-183.46	457.24	-188.32	0.39	0.32	-22.38
6,624.00	0.78	73.19	6,584.87	-183.32	458.47	-188.19	0.30	0.04	-22.26
6,718.00	0.81	65.53	6,678.86	-182.86	459.69	-187.74	0.12	0.03	-8.15
6,813.00	0.84	67.80	6,773.85	-182.32	460.94	-187.22	0.05	0.03	2.39
6,907.00	0.88	70.60	6,867.84	-181.82	462.26	-186.73	0.06	0.04	2.98
7,002.00	0.64	55.38	6,962.84	-181.28	463.39	-186.20	0.33	-0.25	-16.02
7,096.00	0.84	65.30	7,056.83	-180.69	464.44	-185.62	0.25	0.21	10.55
7,190.00	0.64	35.37	7,150.82	-179.97	465.37	-184.92	0.46	-0.21	-31.84
7,285.00	0.68	55.82	7,245.81	-179.22	466.15	-184.18	0.25	0.04	21.53
7,379.00	0.71	28.11	7,339.81	-178.40	466.88	-183.36	0.36	0.03	-29.48
7,473.00	0.66	18.42	7,433.80	-177.37	467.33	-182.34	0.13	-0.05	-10.31
7,568.00	0.69	41.24	7,528.79	-176.42	467.88	-181.39	0.28	0.03	24.02
7,662.00	0.76	83.32	7,622.79	-175.92	468.87	-180.90	0.56	0.07	44.77
7,757.00	0.87	87.60	7,717.78	-175.82	470.22	-180.82	0.13	0.12	4.51
7,851.00	0.37	63.23	7,811.77	-175.65	471.20	-180.66	0.59	-0.53	-25.93
7,946.00	0.50	118.73	7,906.77	-175.71	471.84	-180.73	0.44	0.14	58.42
8,040.00	0.65	220.37	8,000.77	-176.32	471.85	-181.33	0.95	0.16	108.13
8,134.00	1.23	260.19	8,094.76	-176.90	470.51	-181.89	0.89	0.62	42.36
8,229.00	1.21	261.17	8,189.73	-177.22	468.52	-182.20	0.03	-0.02	1.03
8,323.00	0.88	241.76	8,283.72	-177.72	466.90	-182.68	0.51	-0.35	-20.65
8,418.00	1.61	222.15	8,378.70	-179.05	465.36	-184.00	0.88	0.77	-20.64
8,512.00	1.17	229.38	8,472.67	-180.66	463.75	-185.58	0.50	-0.47	7.69
8,607.00	1.27	249.94	8,567.65	-181.65	462.02	-186.56	0.47	0.11	21.64
8,701.00	0.85	264.54	8,661.63	-182.07	460.35	-186.96	0.53	-0.45	15.53
8,795.00	0.81	239.60	8,755.62	-182.47	459.08	-187.35	0.38	-0.04	-26.53
8,890.00	0.54	246.37	8,850.61	-182.99	458.09	-187.86	0.30	-0.28	7.13
8,984.00	0.51	254.65	8,944.61	-183.28	457.29	-188.14	0.09	-0.03	8.81
9,079.00	0.84	268.68	9,039.60	-183.41	456.18	-188.26	0.39	0.35	14.77

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Survey										
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9,173.00	0.64	238.74	9,133.60	-183.70	455.04	-188.53	0.46	-0.21	-31.85	
9,268.00	0.38	285.99	9,228.59	-183.89	454.29	-188.71	0.50	-0.27	49.74	
9,362.00	0.12	175.81	9,322.59	-183.90	453.99	-188.72	0.46	-0.28	-117.21	
9,456.00	0.50	305.83	9,416.59	-183.76	453.67	-188.58	0.62	0.40	138.32	
9,550.00	0.11	352.68	9,510.59	-183.43	453.33	-188.24	0.46	-0.41	49.84	
9,644.00	0.50	298.94	9,604.59	-183.14	452.96	-187.95	0.47	0.41	-57.17	
9,739.00	0.72	271.59	9,699.58	-182.92	452.00	-187.72	0.38	0.23	-28.79	
9,833.00	0.95	259.08	9,793.57	-183.05	450.64	-187.84	0.31	0.24	-13.31	
9,928.00	1.00	266.43	9,888.56	-183.25	449.04	-188.02	0.14	0.05	7.74	
10,022.00	1.10	257.63	9,982.54	-183.50	447.34	-188.25	0.20	0.11	-9.36	
10,116.00	1.13	238.20	10,076.53	-184.18	445.67	-188.91	0.40	0.03	-20.67	
10,211.00	1.25	216.44	10,171.51	-185.51	444.26	-190.23	0.49	0.13	-22.91	
10,305.00	1.17	229.64	10,265.49	-186.95	442.92	-191.66	0.31	-0.09	14.04	
10,399.00	1.21	248.22	10,359.47	-187.94	441.27	-192.63	0.41	0.04	19.77	
10,494.00	1.70	247.78	10,454.43	-188.85	439.03	-193.51	0.52	0.52	-0.46	
10,588.00	2.09	250.14	10,548.38	-189.96	436.13	-194.59	0.42	0.41	2.51	
10,683.00	1.59	274.56	10,643.33	-190.44	433.18	-195.04	0.97	-0.53	25.71	
10,777.00	1.71	299.26	10,737.30	-189.65	430.66	-194.23	0.76	0.13	26.28	
10,872.00	2.00	307.76	10,832.25	-187.94	428.11	-192.49	0.42	0.31	8.95	
10,966.00	1.68	318.23	10,926.20	-185.91	425.90	-190.44	0.49	-0.34	11.14	
11,061.00	1.03	340.28	11,021.17	-184.07	424.68	-188.58	0.87	-0.68	23.21	
11,155.00	0.51	295.60	11,115.16	-183.09	424.02	-187.60	0.81	-0.55	-47.53	
11,249.00	1.01	245.96	11,209.16	-183.25	422.89	-187.74	0.83	0.53	-52.81	
11,343.00	0.96	221.08	11,303.14	-184.18	421.61	-188.66	0.45	-0.05	-26.47	
11,438.00	1.41	244.92	11,398.12	-185.28	420.03	-189.74	0.69	0.47	25.09	
11,532.00	0.29	152.33	11,492.11	-185.98	419.09	-190.43	1.54	-1.19	-98.50	
11,627.00	0.50	147.47	11,587.11	-186.54	419.43	-191.00	0.22	0.22	-5.12	
11,721.00	1.25	211.88	11,681.10	-187.76	419.11	-192.21	1.20	0.80	68.52	
11,815.00	1.97	227.86	11,775.06	-189.71	417.37	-194.14	0.90	0.77	17.00	
11,910.00	2.07	234.17	11,870.00	-191.81	414.77	-196.22	0.26	0.11	6.64	
11,946.00	2.19	235.74	11,905.98	-192.58	413.67	-196.97	0.37	0.33	4.36	
12,042.00	2.37	244.40	12,001.90	-194.47	410.36	-198.83	0.40	0.19	9.02	
12,105.00	1.58	266.45	12,064.87	-195.09	408.32	-199.42	1.72	-1.25	35.00	
12,183.00	0.88	323.46	12,142.85	-194.67	406.89	-198.99	1.70	-0.90	73.09	
12,200.00	0.69	281.82	12,159.85	-194.55	406.71	-198.87	3.44	-1.12	-244.94	
12,295.00	7.10	7.17	12,254.60	-188.60	406.89	-192.92	7.45	6.75	89.84	
12,389.00	21.16	4.09	12,345.53	-165.80	408.83	-170.14	14.97	14.96	-3.28	
12,483.00	29.03	2.74	12,430.59	-126.03	411.14	-130.40	8.39	8.37	-1.44	
12,577.00	40.01	0.94	12,507.92	-72.87	412.73	-77.26	11.73	11.68	-1.91	
12,658.80	47.62	1.47	12,566.90	-16.29	413.93	-20.70	9.32	9.31	0.64	
FTP[CL#9H]										
12,672.00	48.85	1.54	12,575.70	-6.45	414.19	-10.86	9.32	9.31	0.55	
12,766.00	59.61	1.19	12,630.56	69.69	415.99	65.25	11.45	11.45	-0.37	
12,860.00	66.27	4.51	12,673.31	153.23	420.22	148.74	7.75	7.09	3.53	

Scientific Drilling, Intl

Survey Report

Company:	Marathon Oil Permian, LLC	Local Co-ordinate Reference:	Well Cave Lion 5 WA Federal #9H
Project:	Lea County, NM (NAD27-NME)	TVD Reference:	KB=26.5 @ 3288.50usft
Site:	Cave Lion Pad	MD Reference:	KB=26.5 @ 3288.50usft
Well:	Cave Lion 5 WA Federal #9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	Midland District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,955.00	76.89	2.51	12,703.29	243.06	425.68	238.51	11.36	11.18	-2.11
13,049.00	80.63	1.95	12,721.61	335.17	429.27	330.58	4.02	3.98	-0.60
13,143.00	85.51	0.66	12,732.95	428.43	431.39	423.81	5.37	5.19	-1.37
13,237.00	87.25	359.18	12,738.88	522.23	431.25	517.61	2.43	1.85	-1.57
13,332.00	92.14	0.84	12,739.39	617.20	431.11	612.58	5.37	5.15	1.54
13,426.00	89.36	358.32	12,738.16	711.17	430.25	708.55	3.85	-2.96	-2.47
13,521.00	90.87	359.81	12,737.97	806.16	428.70	801.55	2.23	1.59	1.57
13,615.00	90.71	359.16	12,736.67	900.14	427.86	895.54	0.71	-0.17	-0.69
13,710.00	89.97	358.14	12,736.11	995.11	425.62	990.52	1.33	-0.78	-1.07
13,804.00	91.04	359.86	12,735.28	1,089.09	423.98	1,084.51	2.15	1.14	1.83
13,899.00	89.56	359.18	12,734.78	1,184.08	423.18	1,179.51	1.71	-1.56	-0.72
13,993.00	91.21	0.64	12,734.15	1,278.07	423.03	1,273.50	2.34	1.76	1.55
14,088.00	90.03	357.86	12,733.12	1,373.05	421.79	1,368.48	3.18	-1.24	-2.93
14,182.00	92.49	0.02	12,731.05	1,467.00	420.05	1,462.44	3.48	2.62	2.30
14,276.00	90.10	357.81	12,728.93	1,560.94	418.27	1,556.40	3.46	-2.54	-2.35
14,371.00	92.25	0.80	12,726.98	1,655.90	417.12	1,651.37	3.88	2.26	3.15
14,466.00	92.72	356.36	12,722.86	1,750.76	414.77	1,746.24	4.70	0.49	-4.67
14,560.00	92.18	358.62	12,718.84	1,844.58	410.66	1,840.10	2.47	-0.57	2.40
14,654.00	91.81	2.25	12,715.57	1,938.50	411.37	1,934.01	3.88	-0.39	3.86
14,749.00	91.61	358.96	12,712.73	2,033.44	412.37	2,028.93	3.47	-0.21	-3.46
14,843.00	88.93	356.13	12,712.29	2,127.33	408.35	2,122.87	4.15	-2.85	-3.01
14,937.00	90.17	1.01	12,713.03	2,221.27	406.00	2,216.82	5.36	1.32	5.19
15,032.00	90.60	2.18	12,712.39	2,316.23	408.65	2,311.75	1.31	0.45	1.23
15,126.00	89.66	1.46	12,712.18	2,410.18	411.63	2,405.66	1.26	-1.00	-0.77
15,221.00	90.47	3.15	12,712.07	2,505.10	415.45	2,500.53	1.97	0.85	1.78
15,315.00	90.60	2.52	12,711.19	2,598.98	420.10	2,594.36	0.68	0.14	-0.67
15,410.00	91.98	1.42	12,709.05	2,693.90	423.37	2,689.24	1.86	1.45	-1.16
15,505.00	90.44	0.54	12,707.05	2,788.86	424.99	2,784.17	1.87	-1.62	-0.93
15,599.00	90.60	0.16	12,706.19	2,882.85	425.56	2,878.16	0.44	0.17	-0.40
15,694.00	92.25	359.72	12,703.83	2,977.82	425.46	2,973.12	1.80	1.74	-0.46
15,788.00	92.51	0.01	12,699.93	3,071.74	425.24	3,067.04	0.41	0.28	0.31
15,882.00	90.77	358.24	12,697.24	3,165.68	423.81	3,160.99	2.64	-1.85	-1.88
15,977.00	91.98	359.18	12,694.96	3,260.63	421.67	3,255.95	1.61	1.27	0.99
16,070.00	90.97	359.49	12,692.56	3,353.59	420.59	3,348.92	1.14	-1.09	0.33
16,164.00	89.66	357.59	12,692.05	3,447.55	418.20	3,442.90	2.46	-1.39	-2.02
16,258.00	91.61	0.16	12,691.00	3,541.51	416.35	3,536.88	3.43	2.07	2.73
16,353.00	91.47	358.94	12,688.45	3,636.47	415.60	3,631.84	1.29	-0.15	-1.28
16,448.00	90.94	358.03	12,686.45	3,731.42	413.09	3,726.81	1.11	-0.56	-0.96
16,542.00	90.54	354.83	12,685.24	3,825.22	407.24	3,820.66	3.43	-0.43	-3.40
16,639.00	93.12	355.79	12,681.50	3,941.75	397.68	3,937.30	2.35	2.21	0.82
16,733.00	92.48	358.38	12,676.91	4,035.51	392.91	4,031.10	2.83	-0.68	2.76
16,847.00	88.99	355.10	12,675.70	4,129.32	387.56	4,124.96	5.09	-3.71	-3.49
16,941.00	90.10	358.04	12,676.45	4,223.14	381.94	4,218.84	3.34	1.18	3.13

Scientific Drilling, Intl
Survey Report

Company:	Marathon Oil Permian, LLC	Local Co-ordinate Reference:	Well Cave Lion 5 WA Federal #9H
Project:	Lea County, NM (NAD27-NME)	TVD Reference:	KB=26.5 @ 3288.50usft
Site:	Cave Lion Pad	MD Reference:	KB=26.5 @ 3288.50usft
Well:	Cave Lion 5 WA Federal #9H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	Midland District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
17,036.00	91.31	0.27	12,675.28	4,318.12	380.54	4,313.82	2.67	1.27	2.35
17,130.00	92.92	0.37	12,671.81	4,412.05	381.06	4,407.74	1.72	1.71	0.11
17,224.00	93.25	359.89	12,666.75	4,505.91	381.27	4,501.60	0.62	0.35	-0.51
17,318.00	92.21	359.00	12,662.28	4,599.80	380.37	4,595.49	1.46	-1.11	-0.95
17,412.00	91.84	358.92	12,658.96	4,693.72	378.66	4,689.43	0.40	-0.39	-0.09
17,506.00	89.19	356.90	12,658.11	4,787.64	375.23	4,783.38	3.54	-2.82	-2.15
17,559.00	91.11	359.15	12,657.97	4,840.61	373.41	4,836.36	5.58	3.62	4.25
SDI MWD									
17,619.00	91.11	359.15	12,656.81	4,900.59	372.52	4,896.34	0.00	0.00	0.00
Bit Projection - BHL[CL#9H]									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
17,559.00	12,657.97	4,840.61	373.41	SDI MWD
17,619.00	12,656.81	4,900.59	372.52	Bit Projection

Checked By: _____ Approved By: _____ Date: _____