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DISTRICT II-ARTESIA O.C.D.

Marathon Oil Permian, LLC

Eddy County, NM (NAD27)

Red Light

27-34 State Com 23 26 27 WA #15H

30-015-44491

OH

**Provide Signature Page for
Directional Survey**

Survey: SDI Survey #1

Standard Survey Report

13 February, 2018

Survey Report

Company:	Marathon Oil Permian, LLC	Local Co-ordinate Reference:	Well 27-34 State Com 23 26 27 WA #15H
Project:	Eddy County, NM (NAD27)	TVD Reference:	KB = 26.5' @ 3311.50usft (H&P 441)
Site:	Red Light	MD Reference:	KB = 26.5' @ 3311.50usft (H&P 441)
Well:	27-34 State Com 23 26 27 WA #15H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Midland District

Project	Eddy County, NM (NAD27)		
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	Red Light		
Site Position:		Northing:	466,229.90 usft
From:	Map	Easting:	518,227.80 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 16' 54.368 N
		Longitude:	104° 16' 27.667 W
		Grid Convergence:	0.03 °

Well	27-34 State Com 23 26 27 WA #15H		
Well Position	+N/-S	0.00 usft	Northing: 466,229.90 usft
	+E/-W	0.00 usft	Easting: 518,227.80 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 16' 54.368 N
		Longitude:	104° 16' 27.667 W
		Ground Level:	3,285.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	10/4/2017	7.45
		Dip Angle (°)	60.00
		Field Strength (nT)	48,031

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
		Direction (bearing)	180.11

Survey Program	Date 2/13/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
170.00	15,967.00	SDI Survey #1 (OH)	MWD+HDGM
			Description
			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
170.00	0.50	204.26	170.00	-0.68	-0.30	0.68	0.29	0.29	0.00
230.00	0.30	161.77	230.00	-1.06	-0.36	1.06	0.57	-0.33	-70.82
320.00	0.17	202.96	320.00	-1.41	-0.34	1.41	0.23	-0.14	45.77
412.00	0.29	198.72	412.00	-1.76	-0.47	1.76	0.13	0.13	-4.61
596.00	0.21	176.41	595.99	-2.53	-0.60	2.54	0.07	-0.04	-12.13
687.00	0.34	122.26	686.99	-2.85	-0.36	2.85	0.30	0.14	-59.51
778.00	0.90	117.22	777.99	-3.32	0.50	3.32	0.62	0.62	-5.54
869.00	0.78	112.75	868.98	-3.88	1.71	3.88	0.15	-0.13	-4.91
959.00	0.22	341.38	958.97	-3.96	2.22	3.95	1.04	-0.62	-145.97

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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)
1,049.00	1.40	296.79	1,048.96	-3.30	1.18	3.29	1.39	1.31	-49.54
1,140.00	2.29	294.75	1,139.92	-2.03	-1.46	2.04	0.98	0.98	-2.24
1,234.00	4.04	297.11	1,233.77	0.26	-6.11	-0.25	1.87	1.86	2.51
1,329.00	5.79	300.68	1,328.42	4.23	-13.21	-4.21	1.87	1.84	3.76
1,424.00	6.47	300.10	1,422.87	9.36	-21.96	-9.32	0.72	0.72	-0.61
1,519.00	5.94	300.60	1,517.32	14.55	-30.83	-14.49	0.56	-0.56	0.53
1,613.00	5.08	297.34	1,610.88	18.93	-38.71	-18.86	0.97	-0.91	-3.47
1,708.00	4.79	295.78	1,705.53	22.59	-46.02	-22.50	0.34	-0.31	-1.64
1,803.00	4.39	295.82	1,800.22	25.90	-52.86	-25.80	0.42	-0.42	0.04
1,893.00	3.87	296.40	1,889.99	28.75	-58.68	-28.64	0.58	-0.58	0.64
1,993.00	3.96	295.45	1,989.76	31.74	-64.82	-31.61	0.11	0.09	-0.95
2,088.00	3.68	292.45	2,084.55	34.31	-70.60	-34.17	0.36	-0.29	-3.16
2,183.00	4.29	300.49	2,179.32	37.28	-76.48	-37.13	0.87	0.64	8.46
2,277.00	4.33	303.05	2,273.05	41.00	-82.49	-40.84	0.21	0.04	2.72
2,372.00	4.34	304.63	2,367.78	44.99	-88.45	-44.82	0.13	0.01	1.66
2,467.00	4.20	302.53	2,462.51	48.91	-94.34	-48.73	0.22	-0.15	-2.21
2,561.00	4.92	293.76	2,556.22	52.38	-100.93	-52.19	1.06	0.77	-9.33
2,656.00	4.75	290.21	2,650.88	55.38	-108.35	-55.17	0.36	-0.18	-3.74
2,751.00	4.82	285.56	2,745.55	57.81	-115.89	-57.59	0.41	0.07	-4.89
2,845.00	5.01	285.02	2,839.20	59.94	-123.66	-59.70	0.21	0.20	-0.57
2,940.00	4.86	285.49	2,933.85	62.09	-131.54	-61.83	0.16	-0.16	0.49
3,035.00	4.43	281.51	3,028.54	63.89	-139.02	-63.63	0.57	-0.45	-4.19
3,130.00	4.87	287.18	3,123.23	65.82	-146.46	-65.53	0.67	0.46	5.97
3,225.00	5.42	290.94	3,217.84	68.61	-154.51	-68.31	0.68	0.58	3.96
3,319.00	5.01	287.62	3,311.45	71.44	-162.57	-71.13	0.54	-0.44	-3.53
3,414.00	5.20	283.99	3,406.08	73.74	-170.70	-73.41	0.39	0.20	-3.82
3,509.00	4.84	294.15	3,500.72	76.42	-178.53	-76.07	1.01	-0.38	10.69
3,604.00	5.14	293.30	3,595.36	79.74	-186.10	-79.38	0.33	0.32	-0.89
3,698.00	4.63	290.28	3,689.01	82.72	-193.52	-82.35	0.61	-0.54	-3.21
3,793.00	4.93	297.22	3,783.68	85.92	-200.75	-85.53	0.69	0.32	7.31
3,888.00	5.45	298.92	3,878.29	89.96	-208.33	-89.56	0.57	0.55	1.79
3,983.00	5.23	295.64	3,972.88	94.02	-216.18	-93.60	0.40	-0.23	-3.45
4,077.00	5.09	294.96	4,066.50	97.63	-223.82	-97.20	0.16	-0.15	-0.72
4,172.00	5.03	289.23	4,161.13	100.78	-231.58	-100.34	0.54	-0.06	-6.03
4,266.00	4.56	292.07	4,254.80	103.54	-238.93	-103.09	0.56	-0.50	3.02
4,361.00	4.49	288.82	4,349.51	106.16	-245.95	-105.69	0.28	-0.07	-3.42
4,455.00	3.95	284.05	4,443.25	108.14	-252.57	-107.65	0.68	-0.57	-5.07
4,550.00	4.28	299.89	4,538.01	110.70	-258.82	-110.20	1.24	0.35	16.67
4,644.00	4.44	304.07	4,631.74	114.48	-264.88	-113.97	0.38	0.17	4.45
4,739.00	4.21	307.53	4,726.47	118.67	-270.69	-118.15	0.37	-0.24	3.64
4,833.00	3.98	304.48	4,820.23	122.62	-276.11	-122.09	0.34	-0.24	-3.24
4,927.00	3.55	303.43	4,914.02	126.07	-281.23	-125.53	0.46	-0.46	-1.12
5,021.00	3.30	302.38	5,007.86	129.12	-285.94	-128.57	0.27	-0.27	-1.12
5,116.00	3.97	306.20	5,102.67	132.53	-290.91	-131.97	0.75	0.71	4.02

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5,210.00	3.83	296.22	5,196.45	135.83	-296.35	-135.26	0.74	-0.15	-10.62
5,304.00	3.30	307.25	5,290.27	138.86	-301.32	-138.28	0.92	-0.56	11.73
5,399.00	3.07	306.21	5,385.12	142.02	-305.55	-141.43	0.25	-0.24	-1.09
5,493.00	3.52	290.76	5,478.97	144.53	-310.28	-143.93	1.05	0.48	-16.44
5,587.00	4.64	289.86	5,572.73	146.84	-316.55	-146.23	1.19	1.19	-0.96
5,682.00	4.34	285.54	5,667.44	149.11	-323.63	-148.49	0.48	-0.32	-4.55
5,776.00	3.77	298.69	5,761.20	151.55	-329.77	-150.91	1.16	-0.61	13.99
5,871.00	4.49	308.12	5,855.96	155.34	-335.43	-154.70	1.04	0.76	9.93
5,965.00	5.92	300.78	5,949.57	160.09	-342.49	-159.44	1.68	1.52	-7.81
6,059.00	5.05	291.21	6,043.14	164.07	-350.51	-163.40	1.34	-0.93	-10.18
6,154.00	4.73	287.75	6,137.79	166.78	-358.14	-166.09	0.46	-0.34	-3.64
6,248.00	5.54	291.26	6,231.41	169.60	-366.06	-168.90	0.92	0.86	3.73
6,342.00	5.49	288.98	6,324.98	172.71	-374.54	-171.99	0.24	-0.05	-2.43
6,436.00	5.33	304.69	6,418.57	176.66	-382.39	-175.93	1.58	-0.17	16.71
6,531.00	4.52	313.83	6,513.22	181.76	-388.71	-181.02	1.18	-0.85	9.62
6,625.00	3.86	312.06	6,606.96	186.45	-393.74	-185.69	0.72	-0.70	-1.88
6,720.00	3.47	309.76	6,701.77	190.43	-398.32	-189.66	0.44	-0.41	-2.42
6,813.00	2.69	305.70	6,794.63	193.50	-402.26	-192.73	0.87	-0.84	-4.37
6,908.00	1.90	336.34	6,889.56	196.25	-404.70	-195.47	1.51	-0.83	32.25
7,003.00	3.15	347.64	6,984.47	200.24	-405.89	-199.46	1.41	1.32	11.89
7,097.00	4.77	319.51	7,078.25	205.73	-408.98	-204.95	2.64	1.72	-29.93
7,192.00	3.61	304.94	7,173.00	210.45	-414.00	-209.66	1.65	-1.22	-15.34
7,287.00	2.88	297.56	7,267.84	213.27	-418.56	-212.47	0.88	-0.77	-7.77
7,381.00	5.02	294.00	7,361.61	216.03	-424.42	-215.22	2.29	2.28	-3.79
7,476.00	4.92	281.85	7,456.26	218.56	-432.20	-217.73	1.11	-0.11	-12.79
7,571.00	6.70	279.30	7,550.77	220.29	-441.66	-219.45	1.89	1.87	-2.68
7,665.00	6.51	268.42	7,644.15	221.03	-452.40	-220.16	1.34	-0.20	-11.57
7,760.00	5.03	271.44	7,738.66	220.99	-461.94	-220.10	1.59	-1.56	3.18
7,854.00	5.77	281.27	7,832.25	222.02	-470.70	-221.11	1.26	0.79	10.46
7,949.00	4.67	280.01	7,926.85	223.62	-479.19	-222.70	1.16	-1.16	-1.33
8,044.00	3.18	275.01	8,021.63	224.52	-485.62	-223.59	1.61	-1.57	-5.26
8,138.00	2.37	274.20	8,115.52	224.89	-490.16	-223.95	0.86	-0.86	-0.86
8,229.00	1.74	242.06	8,206.46	224.39	-493.26	-223.44	1.42	-0.69	-35.32
8,261.00	4.02	191.52	8,238.42	223.06	-493.91	-222.11	10.03	7.13	-157.94
8,292.00	7.19	181.57	8,269.27	220.05	-494.18	-219.10	10.66	10.23	-32.10
8,324.00	10.48	178.58	8,300.89	215.14	-494.16	-214.19	10.38	10.28	-9.34
8,356.00	14.25	178.96	8,332.14	208.29	-494.02	-207.34	11.78	11.78	1.19
8,387.00	17.38	181.39	8,361.96	199.85	-494.06	-198.90	10.32	10.10	7.84
8,418.00	20.76	184.65	8,391.26	189.74	-494.62	-188.79	11.43	10.90	10.52
8,450.00	24.72	183.60	8,420.76	177.40	-495.50	-176.45	12.44	12.38	-3.28
8,482.00	27.92	183.89	8,449.44	163.25	-496.43	-162.29	10.01	10.00	0.91
8,513.00	30.61	182.18	8,476.48	148.12	-497.22	-147.16	9.09	8.68	-5.52
8,544.00	33.77	181.70	8,502.72	131.61	-497.78	-130.66	10.23	10.19	-1.55

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8,576.00	36.64	182.87	8,528.86	113.18	-498.52	-112.22	9.21	8.97	3.66	
8,607.00	40.14	181.74	8,553.15	93.95	-499.29	-92.99	11.51	11.29	-3.65	
8,639.00	43.65	181.23	8,576.97	72.59	-499.84	-71.63	11.02	10.97	-1.59	
8,671.00	46.77	182.24	8,599.51	49.90	-500.53	-48.93	10.00	9.75	3.16	
8,702.00	49.55	185.19	8,620.19	26.86	-502.04	-25.89	11.43	8.97	9.52	
8,734.00	51.46	187.75	8,640.55	2.33	-504.83	-1.36	8.59	5.97	8.00	
8,765.00	53.46	188.83	8,659.43	-22.00	-508.37	22.97	7.02	6.45	3.48	
8,797.00	55.07	189.72	8,678.12	-47.63	-512.56	48.61	5.51	5.03	2.78	
8,828.00	56.64	188.44	8,695.52	-72.96	-516.61	73.95	6.11	5.06	-4.13	
8,860.00	58.91	187.11	8,712.59	-99.78	-520.27	100.78	7.92	7.09	-4.16	
8,864.34	59.38	187.04	8,714.81	-103.48	-520.72	104.48	10.89	10.80	-1.56	
FTP[RL27-34-15H]										
8,891.00	62.26	186.64	8,727.81	-126.59	-523.50	127.59	10.89	10.81	-1.51	
8,923.00	66.46	185.31	8,741.65	-155.27	-526.49	156.28	13.65	13.13	-4.16	
8,954.00	68.30	183.84	8,753.58	-183.80	-528.77	184.81	7.37	5.94	-4.74	
8,986.00	70.38	183.60	8,764.87	-213.67	-530.71	214.69	6.54	6.50	-0.75	
9,017.00	73.69	182.36	8,774.43	-243.12	-532.24	244.14	11.33	10.68	-4.00	
9,049.00	77.64	181.98	8,782.35	-274.09	-533.42	275.12	12.40	12.34	-1.19	
9,080.00	81.23	182.04	8,788.03	-304.54	-534.49	305.57	11.58	11.58	0.19	
9,120.00	85.13	181.49	8,792.78	-344.23	-535.71	345.26	9.85	9.75	-1.38	
9,215.00	87.99	179.46	8,798.48	-439.05	-536.49	440.07	3.69	3.01	-2.14	
9,310.00	88.05	179.08	8,801.76	-533.98	-535.28	535.01	0.40	0.06	-0.40	
9,404.00	89.53	179.19	8,803.75	-627.95	-533.86	628.97	1.58	1.57	0.12	
9,499.00	90.47	180.71	8,803.75	-722.94	-533.78	723.97	1.88	0.99	1.60	
9,594.00	90.81	180.68	8,802.69	-817.93	-534.93	818.95	0.36	0.36	-0.03	
9,688.00	91.58	179.96	8,800.73	-911.91	-535.46	912.93	1.12	0.82	-0.77	
9,784.00	90.44	180.72	8,799.03	-1,007.89	-536.03	1,008.91	1.43	-1.19	0.79	
9,878.00	91.07	179.69	8,797.79	-1,101.88	-536.36	1,102.90	1.28	0.67	-1.10	
9,973.00	92.18	180.79	8,795.10	-1,196.83	-536.76	1,197.86	1.64	1.17	1.16	
10,068.00	92.15	180.78	8,791.51	-1,291.76	-538.06	1,292.79	0.03	-0.03	-0.01	
10,162.00	91.78	180.66	8,788.29	-1,385.70	-539.24	1,386.73	0.41	-0.39	-0.13	
10,256.00	91.72	180.61	8,785.42	-1,479.65	-540.28	1,480.68	0.08	-0.06	-0.05	
10,351.00	90.07	180.64	8,783.93	-1,574.62	-541.32	1,575.66	1.74	-1.74	0.03	
10,445.00	89.83	181.34	8,784.02	-1,668.61	-542.94	1,669.65	0.79	-0.26	0.74	
10,539.00	88.45	180.75	8,785.43	-1,762.58	-544.66	1,763.62	1.60	-1.47	-0.63	
10,634.00	86.97	179.70	8,789.22	-1,857.50	-545.03	1,858.54	1.91	-1.56	-1.11	
10,729.00	87.98	179.02	8,793.41	-1,952.40	-543.97	1,953.44	1.28	1.06	-0.72	
10,823.00	91.08	179.82	8,794.18	-2,046.38	-543.02	2,047.42	3.41	3.30	0.85	
10,918.00	90.37	179.28	8,792.98	-2,141.37	-542.27	2,142.41	0.94	-0.75	-0.57	
11,012.00	90.03	178.95	8,792.65	-2,235.36	-540.82	2,236.39	0.50	-0.36	-0.35	
11,107.00	89.80	178.36	8,792.79	-2,330.33	-538.59	2,331.36	0.67	-0.24	-0.62	
11,202.00	89.29	178.45	8,793.54	-2,425.29	-535.95	2,426.31	0.55	-0.54	0.09	
11,296.00	89.50	177.86	8,794.54	-2,519.24	-532.92	2,520.25	0.67	0.22	-0.63	
11,391.00	92.76	180.58	8,792.66	-2,614.19	-531.63	2,615.20	4.47	3.43	2.86	

Survey Report

Company:	Marathon Oil Permian, LLC	Local Co-ordinate Reference:	Well 27-34 State Com 23 26 27 WA #15H
Project:	Eddy County, NM (NAD27)	TVD Reference:	KB = 26.5' @ 3311.50usft (H&P 441)
Site:	Red Light	MD Reference:	KB = 26.5' @ 3311.50usft (H&P 441)
Well:	27-34 State Com 23 26 27 WA #15H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)
11,486.00	90.90	181.91	8,789.63	-2,709.11	-533.69	2,710.13	2.41	-1.96	1.40
11,580.00	89.56	181.24	8,789.25	-2,803.07	-536.27	2,804.09	1.59	-1.43	-0.71
11,675.00	90.03	181.54	8,789.59	-2,898.04	-538.58	2,899.07	0.59	0.49	0.32
11,768.00	91.85	182.49	8,788.07	-2,990.97	-541.85	2,992.00	2.21	1.96	1.02
11,862.00	92.98	183.19	8,784.11	-3,084.77	-546.50	3,085.81	1.41	1.20	0.74
11,957.00	91.04	183.00	8,780.77	-3,179.56	-551.63	3,180.62	2.05	-2.04	-0.20
12,051.00	89.63	180.84	8,780.22	-3,273.50	-554.78	3,274.56	2.74	-1.50	-2.30
12,145.00	88.62	180.95	8,781.66	-3,367.48	-556.24	3,368.54	1.08	-1.07	0.12
12,240.00	87.75	180.55	8,784.67	-3,462.42	-557.49	3,463.49	1.01	-0.92	-0.42
12,334.00	88.72	181.22	8,787.56	-3,556.36	-558.94	3,557.43	1.25	1.03	0.71
12,429.00	87.88	180.88	8,790.38	-3,651.31	-560.68	3,652.37	0.95	-0.88	-0.36
12,524.00	88.09	181.02	8,793.72	-3,746.23	-562.25	3,747.31	0.27	0.22	0.15
12,618.00	88.52	181.33	8,796.50	-3,840.17	-564.18	3,841.25	0.56	0.46	0.33
12,713.00	86.67	179.69	8,800.49	-3,935.08	-565.02	3,936.15	2.60	-1.95	-1.73
12,808.00	87.34	178.85	8,805.45	-4,029.94	-563.82	4,031.01	1.13	0.71	-0.88
12,902.00	89.40	178.04	8,808.13	-4,123.86	-561.27	4,124.93	2.35	2.19	-0.86
12,997.00	90.84	179.21	8,807.93	-4,218.83	-558.99	4,219.89	1.95	1.52	1.23
13,092.00	91.92	180.30	8,805.64	-4,313.80	-558.58	4,314.86	1.61	1.14	1.15
13,187.00	91.61	179.86	8,802.71	-4,408.75	-558.71	4,409.82	0.57	-0.33	-0.46
13,282.00	91.04	180.30	8,800.52	-4,503.73	-558.85	4,504.79	0.76	-0.60	0.46
13,376.00	88.32	179.59	8,801.04	-4,597.71	-558.76	4,598.78	2.99	-2.89	-0.76
13,471.00	88.66	177.76	8,803.55	-4,692.65	-556.56	4,693.71	1.96	0.36	-1.93
13,566.00	90.47	177.09	8,804.27	-4,787.55	-552.29	4,788.60	2.03	1.91	-0.71
13,661.00	89.90	177.61	8,803.96	-4,882.45	-547.90	4,883.49	0.81	-0.60	0.55
13,756.00	89.26	176.71	8,804.66	-4,977.33	-543.19	4,978.36	1.16	-0.67	-0.95
13,850.00	89.87	176.03	8,805.37	-5,071.13	-537.24	5,072.15	0.97	0.65	-0.72
13,945.00	91.17	177.66	8,804.51	-5,165.98	-532.01	5,166.99	2.19	1.37	1.72
14,039.00	91.98	178.82	8,801.92	-5,259.90	-529.13	5,260.90	1.50	0.86	1.23
14,134.00	93.02	181.13	8,797.78	-5,354.80	-529.08	5,355.81	2.66	1.09	2.43
14,229.00	94.70	182.57	8,791.38	-5,449.53	-532.14	5,450.54	2.33	1.77	1.52
14,323.00	92.05	184.92	8,785.85	-5,543.15	-538.27	5,544.17	3.76	-2.82	2.50
14,417.00	88.82	184.70	8,785.14	-5,636.80	-546.15	5,637.84	3.44	-3.44	-0.23
14,512.00	87.24	182.54	8,788.40	-5,731.55	-552.15	5,732.60	2.82	-1.66	-2.27
14,605.00	86.88	181.09	8,793.17	-5,824.38	-555.09	5,825.43	1.60	-0.39	-1.56
14,700.00	89.23	180.01	8,796.40	-5,919.31	-556.00	5,920.37	2.72	2.47	-1.14
14,794.00	89.80	181.15	8,797.19	-6,013.30	-556.95	6,014.36	1.36	0.61	1.21
14,888.00	89.80	181.31	8,797.52	-6,107.28	-558.97	6,108.34	0.17	0.00	0.17
14,983.00	89.36	180.64	8,798.22	-6,202.26	-560.59	6,203.33	0.84	-0.46	-0.71
15,077.00	89.09	179.98	8,799.49	-6,296.25	-561.10	6,297.32	0.76	-0.29	-0.70
15,172.00	87.82	179.54	8,802.05	-6,391.21	-560.70	6,392.28	1.41	-1.34	-0.46
15,266.00	89.03	179.44	8,804.63	-6,485.17	-559.86	6,486.24	1.29	1.29	-0.11
15,361.00	90.27	179.29	8,805.21	-6,580.16	-558.81	6,581.22	1.31	1.31	-0.16
15,454.00	90.67	179.93	8,804.45	-6,673.16	-558.18	6,674.22	0.81	0.43	0.69

Survey Report

Company: Marathon Oil Permian, LLC
Project: Eddy County, NM (NAD27)
Site: Red Light
Well: 27-34 State Com 23 26 27 WA #15H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 27-34 State Com 23 26 27 WA #15H
TVD Reference: KB = 26.5' @ 3311.50usft (H&P 441)
MD Reference: KB = 26.5' @ 3311.50usft (H&P 441)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland District

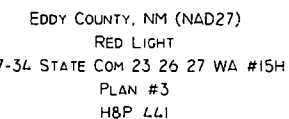
Survey

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)
15,549.00	90.13	179.21	8,803.79	-6,768.15	-557.46	6,769.21	0.95	-0.57	-0.76
15,644.00	90.47	178.50	8,803.29	-6,863.13	-555.57	6,864.18	0.83	0.36	-0.75
15,738.00	89.46	179.34	8,803.35	-6,957.11	-553.79	6,958.16	1.40	-1.07	0.89
15,833.00	90.07	179.78	8,803.74	-7,052.11	-553.06	7,053.16	0.79	0.64	0.46
15,905.00	89.83	180.15	8,803.80	-7,124.11	-553.02	7,125.15	0.61	-0.33	0.51
FINAL MWD Survey (15905.00' MD)									
15,967.00	89.83	180.15	8,803.98	-7,186.11	-553.18	7,187.15	0.00	0.00	0.00
TD Reached 154'VS Before BHL - FINAL Proj. to Bit (15967.00' MD) - BHL[RL27-34-15H]									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
15,905.00	8,803.80	-7,124.11	-553.02	FINAL MWD Survey (15905.00' MD)
15,967.00	8,803.98	-7,186.11	-553.18	TD Reached 154'VS Before BHL
15,967.00	8,803.98	-7,186.11	-553.18	FINAL Proj. to Bit (15967.00' MD)

Checked By: _____ Approved By: _____ Date: _____



		Ground Level:		3285.00	
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	466229.90	518227.80	32° 16' 54.368 N	04° 16' 27.667 W



Magnetic Field
Strength: 48031.2snT
Dip Angle: 60.00°
Date: 10/4/2017
Model: HDGM

To convert Magnetic North to Grid, Add 7.42°
To convert True North to Grid, Subtract 0.03°

DRILLING TARGET: 8788' TVD @ 0VS // 89.9° INC

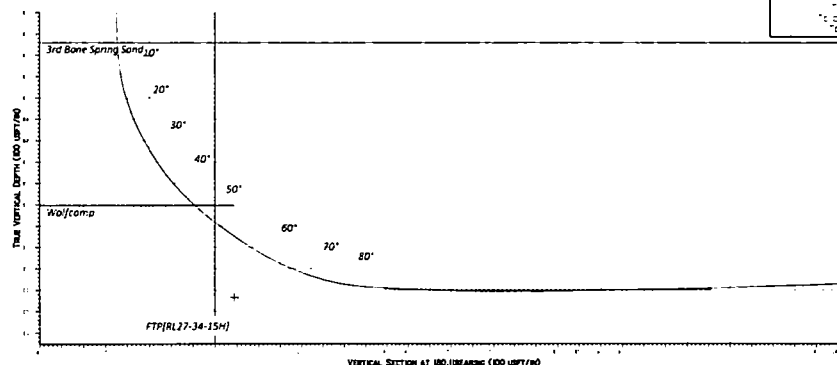
TARGET WINDOW: 10' UP // 10' DOWN

Name	TVD	+N/-S	+E/-W	Northing	Easting
BHL[RL27-34-15H]	8801.00	-7340.32	-552.72	458890.24	517675.13
FTP[RL27-34-15H]	8818.34	-42.49	-538.89	466187.41	517688.96

SITE DETAILS: RED LIGHT
SITE CENTRE NORTHING: 466229.90
EASTING: 518227.80
POSITIONAL UNCERTAINTY: 0.00
CONVERGENCE: 0.03
LOCAL NORTH: GRID

PROJECT DETAILS: EDDY COUNTY, NM (NAD27)
 GEODETIC SYSTEM: US STATE PLANE 1927 (EXACT SOLUTION)
 DATUM: NAD 1927 (NADCON CONUS)
 ELLIPSOID: CLARKE 1866
 ZONE: NEW MEXICO EAST 3001
 SYSTEM DATUM: MEAN SEA LEVEL

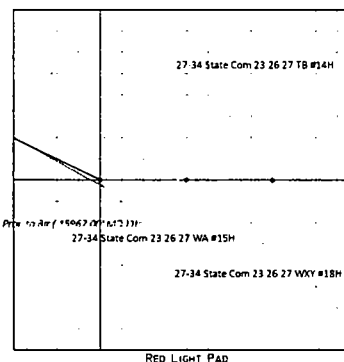
TVDPATH	MDPATH	FORMATION
553.50	555.50	CASCADE
1543.50	1544.70	BASE OF SALT
171.50	171.60	LAMAR
1913.50	1915.81	BELL CANYON
2606.50	2610.89	CHERRY CANYON
3608.50	3615.91	BRUCHY CANYON
5217.50	5229.75	BONE SPRING
6177.50	6192.64	1ST BONE SPRING CANYON
6545.50	6561.75	2ND BONE SPRING CANYON
8220.50	8241.78	3RD BONE SPRING CANYON
8602.50	8602.33	WOLFCAMP

[illegible]

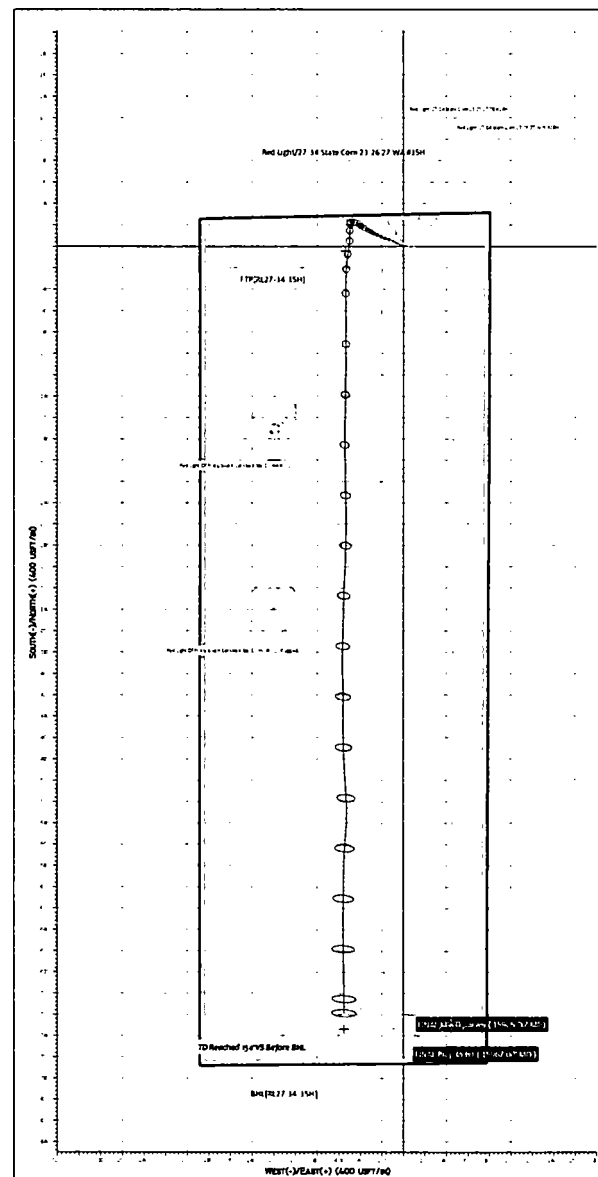
FINAL MIND Survey: 15-05-00 M/DI

FINAL PROJ. 12 P. 1 25967 00 723 / TO Reached 15.4V3 Before 021

BHL/RL27-34-15H/



RED LIGHT PAD



Scientific Drilling