

PRO DIRECTIONAL

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Marathon Oil Corporation

Will Kane 15 WXY Fee No. 10H
Lea County, NM

October 31, 2019

Job No. LNM1519619
API No. 30-025-46000

Survey Completion Report

Double Sided



Marathon Oil

Marathon Oil

Lea County, NM

Will Kane 15 WXY Fee

No. 10H

OH

Survey: ProDirectional

Survey Report

31 October, 2019



Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Will Kane 15 WXY Fee
Well: No. 10H
Wellbore: OH
Design: Gyro-MWD-100'-17280', PTB: 17336'

Local Co-ordinate Reference: Well No. 10H
TVD Reference: Well @ 3532.00usft
MD Reference: Well @ 3532.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey Program		Date	10/31/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,261.00	Survey #1 (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3	
1,434.00	17,336.00	Survey #2 (OH)	MWD+IFR1	OWSG MWD + IFR1	

MD (usft)	Inc (")	Azi (azimuth) (")	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (")	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	441,865.19	813,427.33
100.00	0.03	82.14	100.00	0.00	0.00	0.03	0.03	82.14	441,865.19	813,427.36
125.00	0.11	227.90	125.00	-0.01	-0.01	0.01	0.02	128.48	441,865.18	813,427.34
150.00	0.26	176.49	150.00	-0.08	-0.08	0.00	0.08	179.81	441,865.11	813,427.33
175.00	0.25	173.99	175.00	-0.20	-0.20	0.01	0.20	177.22	441,864.99	813,427.34
200.00	0.18	135.65	200.00	-0.28	-0.28	0.04	0.28	171.27	441,864.91	813,427.37
225.00	0.15	123.11	225.00	-0.32	-0.32	0.10	0.34	163.23	441,864.87	813,427.43
250.00	0.13	131.90	250.00	-0.36	-0.36	0.15	0.39	157.94	441,864.83	813,427.48
275.00	0.06	212.38	275.00	-0.39	-0.39	0.16	0.42	157.69	441,864.80	813,427.49
300.00	0.05	175.09	300.00	-0.41	-0.41	0.15	0.44	159.51	441,864.78	813,427.48
325.00	0.13	233.83	325.00	-0.44	-0.44	0.13	0.46	163.29	441,864.75	813,427.46
350.00	0.16	210.38	350.00	-0.49	-0.49	0.09	0.50	169.35	441,864.70	813,427.42
375.00	0.14	174.62	375.00	-0.55	-0.55	0.08	0.55	172.02	441,864.64	813,427.41
400.00	0.13	87.37	400.00	-0.58	-0.58	0.11	0.59	169.39	441,864.61	813,427.44
425.00	0.11	89.14	425.00	-0.58	-0.57	0.16	0.60	164.42	441,864.62	813,427.49
450.00	0.12	15.78	450.00	-0.55	-0.55	0.19	0.58	160.78	441,864.64	813,427.52
475.00	0.17	13.05	475.00	-0.49	-0.49	0.21	0.53	157.02	441,864.70	813,427.54
500.00	0.21	2.11	500.00	-0.41	-0.41	0.22	0.46	151.87	441,864.78	813,427.55
525.00	0.10	319.52	525.00	-0.35	-0.34	0.20	0.40	149.24	441,864.85	813,427.53
550.00	0.05	304.41	550.00	-0.32	-0.32	0.18	0.37	150.52	441,864.87	813,427.51
575.00	0.10	83.43	575.00	-0.31	-0.31	0.19	0.37	148.13	441,864.88	813,427.52

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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
1,261.00	0.09	356.27	1,261.00	-0.69	-0.68	1.08	1.28	122.37	441,864.51	813,428.41
1,434.00	1.01	312.19	1,433.99	0.48	0.48	-0.06	0.48	352.65	441,865.67	813,427.27
Pro MWD First Survey: 1434' MD										
1,524.00	2.15	173.05	1,523.97	-0.66	-0.67	-0.45	0.80	213.73	441,864.52	813,426.88
1,613.00	4.04	159.78	1,612.83	-5.27	-5.27	0.84	5.33	170.93	441,859.92	813,428.17
1,703.00	4.04	161.72	1,702.61	-11.28	-11.25	2.93	11.63	165.40	441,853.94	813,430.26
1,792.00	4.13	158.11	1,791.38	-17.24	-17.20	5.11	17.94	163.46	441,847.99	813,432.44
1,881.00	3.96	155.92	1,880.16	-23.04	-22.98	7.56	24.19	161.80	441,842.21	813,434.89
1,970.00	3.60	155.65	1,968.97	-28.42	-28.33	9.96	30.03	160.62	441,836.86	813,437.29
2,060.00	3.69	140.10	2,058.79	-33.24	-33.13	12.99	35.58	158.59	441,832.06	813,440.32
2,150.00	3.82	131.48	2,148.60	-37.48	-37.34	17.09	41.06	155.40	441,827.85	813,444.42
2,239.00	4.18	132.36	2,237.38	-41.67	-41.49	21.71	46.82	152.38	441,823.70	813,449.04
2,328.00	3.87	132.27	2,326.16	-45.91	-45.69	26.33	52.73	150.05	441,819.50	813,453.66
2,418.00	3.78	131.04	2,415.96	-49.94	-49.68	30.81	58.46	148.19	441,815.51	813,458.14
2,507.00	3.78	128.32	2,504.77	-53.72	-53.43	35.33	64.05	146.53	441,811.76	813,462.66
2,596.00	3.60	129.90	2,593.58	-57.37	-57.04	39.77	69.54	145.11	441,808.15	813,467.10
2,686.00	3.60	123.13	2,683.40	-60.76	-60.40	44.31	74.90	143.74	441,804.79	813,471.64
2,775.00	4.40	135.35	2,772.19	-64.76	-64.35	49.05	80.91	142.69	441,800.84	813,476.38
2,864.00	5.85	143.17	2,860.83	-70.86	-70.41	54.16	88.83	142.43	441,794.78	813,481.49
2,953.00	5.93	140.53	2,949.36	-78.09	-77.59	59.81	97.96	142.38	441,787.60	813,487.14
3,043.00	5.76	136.93	3,038.89	-85.03	-84.48	65.84	107.11	142.07	441,780.71	813,493.17
3,132.00	5.71	137.46	3,127.45	-91.60	-91.00	71.89	115.97	141.69	441,774.19	813,499.22
3,221.00	5.76	139.22	3,216.00	-98.30	-97.65	77.80	124.85	141.45	441,767.54	813,505.13
3,310.00	6.11	136.05	3,304.53	-105.14	-104.44	84.00	134.03	141.19	441,760.75	813,511.33
3,400.00	5.93	135.35	3,394.03	-111.95	-111.20	90.59	143.43	140.83	441,753.99	813,517.92
3,489.00	6.15	131.75	3,482.54	-118.45	-117.64	97.38	152.72	140.38	441,747.55	813,524.71
3,579.00	5.32	131.66	3,572.09	-124.49	-123.62	104.10	161.61	139.90	441,741.57	813,531.43



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6,081.00	4.09	124.98	6,065.28	-278.18	-276.18	239.97	365.87	139.01	441,589.01	813,667.30
6,170.00	4.09	134.12	6,154.05	-282.25	-280.21	244.85	372.11	138.85	441,584.98	813,672.18
6,260.00	4.48	149.15	6,243.80	-287.54	-285.46	248.95	378.77	138.91	441,579.73	813,676.28
6,349.00	4.04	147.74	6,332.56	-293.20	-291.09	252.41	385.29	139.07	441,574.10	813,679.74
6,439.00	3.87	148.53	6,422.34	-298.50	-296.37	255.69	391.42	139.21	441,568.82	813,683.02
6,528.00	3.47	145.19	6,511.16	-303.30	-301.14	258.79	397.06	139.33	441,564.05	813,686.12
6,617.00	4.75	145.28	6,599.93	-308.57	-306.38	262.43	403.41	139.42	441,558.81	813,689.76
6,706.00	5.23	144.14	6,688.59	-314.92	-312.70	266.90	411.12	139.52	441,552.49	813,694.23
6,795.00	5.23	143.35	6,777.22	-321.50	-319.24	271.70	419.21	139.60	441,545.95	813,699.03
6,884.00	5.01	144.05	6,865.86	-327.94	-325.64	276.40	427.13	139.68	441,539.55	813,703.73
6,973.00	5.01	143.70	6,954.52	-334.26	-331.92	280.99	434.88	139.75	441,533.27	813,708.32
7,063.00	4.84	143.00	7,044.19	-340.50	-338.12	285.60	442.59	139.81	441,527.07	813,712.93
7,152.00	4.57	138.60	7,132.89	-346.19	-343.77	290.20	449.89	139.83	441,521.42	813,717.53
7,242.00	4.35	141.24	7,222.62	-351.58	-349.13	294.71	456.88	139.83	441,516.06	813,722.04
7,331.00	4.18	143.52	7,311.37	-356.86	-354.37	298.75	463.49	139.87	441,510.82	813,726.08
7,420.00	4.00	140.18	7,400.15	-361.88	-359.36	302.67	469.84	139.89	441,505.83	813,730.00
7,510.00	3.78	142.38	7,489.94	-366.67	-364.12	306.49	475.94	139.91	441,501.07	813,733.82
7,599.00	3.87	140.18	7,578.74	-371.33	-368.75	310.20	481.87	139.93	441,496.44	813,737.53
7,688.00	3.74	144.31	7,667.55	-376.03	-373.41	313.82	487.77	139.96	441,491.78	813,741.15
7,778.00	3.74	145.37	7,757.35	-380.86	-378.21	317.20	493.62	140.01	441,486.98	813,744.53
7,868.00	3.56	146.34	7,847.17	-385.62	-382.95	320.42	499.32	140.08	441,482.24	813,747.75
7,957.00	2.55	148.71	7,936.04	-389.64	-386.95	322.98	504.02	140.15	441,478.24	813,750.31
8,047.00	1.80	158.20	8,025.98	-392.67	-389.97	324.54	507.35	140.23	441,475.22	813,751.87
8,136.00	1.89	157.23	8,114.93	-395.33	-392.62	325.63	510.08	140.33	441,472.57	813,752.96
8,225.00	1.85	163.39	8,203.88	-398.07	-395.35	326.61	512.81	140.44	441,469.84	813,753.94
8,314.00	1.71	165.58	8,292.84	-400.74	-398.01	327.35	515.34	140.56	441,467.18	813,754.68
8,404.00	1.58	173.23	8,382.80	-403.28	-400.55	327.83	517.60	140.70	441,464.64	813,755.16



ProDirectional Survey Report



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10,906.00	1.36	177.89	10,884.45	-414.53	-411.90	315.88	519.08	142.52	441,453.29	813,743.21
10,995.00	1.49	124.27	10,973.42	-416.24	-413.60	316.87	521.04	142.54	441,451.59	813,744.20
11,085.00	0.79	162.86	11,063.40	-417.51	-414.86	318.02	522.73	142.53	441,450.33	813,745.35
11,174.00	0.97	250.13	11,152.40	-418.34	-415.70	317.50	523.08	142.63	441,449.49	813,744.83
11,264.00	0.26	345.67	11,242.39	-418.40	-415.76	316.73	522.66	142.70	441,449.43	813,744.06
11,354.00	0.31	328.53	11,332.39	-417.99	-415.35	316.55	522.23	142.69	441,449.84	813,743.88
11,444.00	0.70	284.06	11,422.39	-417.64	-415.01	315.89	521.56	142.72	441,450.18	813,743.22
11,533.00	0.92	236.60	11,511.38	-417.90	-415.27	314.77	521.09	142.84	441,449.92	813,742.10
11,622.00	1.76	246.18	11,600.36	-418.83	-416.22	312.92	520.73	143.06	441,448.97	813,740.25
11,711.00	1.10	236.07	11,689.33	-419.84	-417.25	310.96	520.38	143.30	441,447.94	813,738.29
11,719.00	1.14	242.31	11,697.33	-419.92	-417.33	310.83	520.36	143.32	441,447.86	813,738.16
11,833.00	1.76	256.46	11,811.29	-420.83	-418.27	308.12	519.50	143.62	441,446.92	813,735.45
11,900.00	0.79	285.82	11,878.27	-420.93	-418.38	306.68	518.74	143.76	441,446.81	813,734.01
11,990.00	8.22	6.50	11,967.96	-414.36	-411.81	306.81	513.53	143.31	441,453.38	813,734.14
12,079.00	17.76	354.55	12,054.59	-394.48	-391.92	306.24	497.38	142.00	441,473.27	813,733.57
12,169.00	27.12	356.57	12,137.69	-360.24	-357.71	303.70	469.24	139.67	441,507.48	813,731.03
12,259.00	36.92	355.60	12,213.90	-312.67	-310.16	300.39	431.78	135.92	441,555.03	813,727.72
12,344.00	46.37	356.39	12,277.35	-256.35	-253.88	296.49	390.33	130.57	441,611.31	813,723.82
12,434.00	56.48	4.48	12,333.45	-186.20	-183.72	297.37	349.54	121.71	441,681.47	813,724.70
12,524.00	73.58	5.62	12,371.30	-105.30	-102.75	304.58	321.45	108.64	441,762.44	813,731.91
12,614.00	85.32	0.96	12,387.76	-17.19	-14.60	309.58	309.92	92.70	441,850.59	813,736.91
12,704.00	91.43	359.65	12,390.31	72.72	75.32	310.06	319.07	76.35	441,940.51	813,737.39
12,794.00	89.89	359.56	12,389.28	162.71	165.31	309.44	350.83	61.89	442,030.50	813,736.77
12,884.00	94.11	5.36	12,386.13	252.48	255.11	313.29	404.02	50.84	442,120.30	813,740.62
12,973.00	94.24	4.22	12,379.65	340.87	343.57	320.70	469.99	43.03	442,208.76	813,748.03
13,062.00	92.40	1.32	12,374.50	429.56	432.30	324.99	540.84	36.94	442,297.49	813,752.32
13,152.00	93.45	1.49	12,369.91	519.39	522.15	327.20	616.20	32.07	442,387.34	813,754.53



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15,659.00	88.97	0.09	12,364.32	3,025.35	3,027.91	293.20	3,042.07	5.53	444,893.10	813,720.53
15,749.00	88.66	359.73	12,366.18	3,115.33	3,117.89	293.06	3,131.64	5.37	444,983.08	813,720.39
15,838.00	88.84	358.77	12,368.13	3,204.31	3,206.86	291.89	3,220.12	5.20	445,072.05	813,719.22
15,928.00	90.07	0.35	12,368.98	3,294.30	3,296.85	291.20	3,309.69	5.05	445,162.04	813,718.53
16,018.00	90.15	1.05	12,368.81	3,384.28	3,386.84	292.30	3,399.43	4.93	445,252.03	813,719.63
16,108.00	89.93	1.05	12,368.75	3,474.24	3,476.83	293.95	3,489.23	4.83	445,342.02	813,721.28
16,198.00	89.10	0.61	12,369.51	3,564.22	3,566.82	295.26	3,579.01	4.73	445,432.01	813,722.59
16,287.00	91.52	0.61	12,369.03	3,653.19	3,655.80	296.20	3,667.78	4.63	445,520.99	813,723.53
16,376.00	90.86	0.52	12,367.18	3,742.16	3,744.78	297.08	3,756.54	4.54	445,609.97	813,724.41
16,465.00	91.08	0.79	12,365.67	3,831.13	3,833.76	298.10	3,845.33	4.45	445,698.95	813,725.43
16,555.00	90.64	0.26	12,364.32	3,921.10	3,923.75	298.92	3,935.12	4.36	445,788.94	813,726.25
16,645.00	90.55	359.56	12,363.39	4,011.10	4,013.74	298.78	4,024.84	4.26	445,878.93	813,726.11
16,734.00	90.64	358.94	12,362.46	4,100.09	4,102.73	297.62	4,113.51	4.15	445,967.92	813,724.95
16,824.00	91.34	358.33	12,360.91	4,190.06	4,192.69	295.47	4,203.09	4.03	446,057.88	813,722.80
16,914.00	88.35	359.82	12,361.15	4,280.05	4,282.66	294.02	4,292.74	3.93	446,147.85	813,721.35
17,004.00	88.48	359.38	12,363.64	4,370.01	4,372.63	293.39	4,382.46	3.84	446,237.82	813,720.72
17,094.00	88.31	359.65	12,366.16	4,459.98	4,462.59	292.63	4,472.17	3.75	446,327.78	813,719.96
17,183.00	88.00	359.12	12,369.03	4,548.93	4,551.53	291.68	4,560.87	3.67	446,416.72	813,719.01
17,273.00	87.16	358.33	12,372.83	4,638.84	4,641.43	289.67	4,650.46	3.57	446,506.62	813,717.00
17,280.00	87.30	358.59	12,373.16	4,645.83	4,648.42	289.49	4,657.43	3.56	446,513.61	813,716.82
Last Survey: 17280' MD										
17,336.00	87.30	358.59	12,375.80	4,701.76	4,704.34	288.11	4,713.15	3.50	446,569.53	813,715.44
PTB: 17336' MD										

Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Will Kane 15 WXY Fee
Well: No. 10H
Wellbore: OH
Design: Gyro-MWD-100'-17280', PTB: 17336'

Local Co-ordinate Reference: Well No. 10H
TVD Reference: Well @ 3532.00usft
MD Reference: Well @ 3532.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,434.00	1,433.99	0.48	-0.06	Pro MWD First Survey: 1434' MD
17,280.00	12,373.16	4,648.42	289.49	Last Survey: 17280' MD
17,336.00	12,375.80	4,704.34	288.11	PTB: 17336' MD

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Company: Marathon Oil
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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
13,242.00	89.85	1.14	12,367.32	609.30	612.08	329.26	695.02	28.28	442,477.27	813,756.59
13,330.00	89.36	0.79	12,367.92	697.27	700.06	330.74	774.26	25.29	442,565.25	813,758.07
13,420.00	88.75	0.35	12,369.41	787.24	790.05	331.64	856.83	22.77	442,655.24	813,758.97
13,509.00	88.18	359.73	12,371.79	876.20	879.01	331.70	939.51	20.67	442,744.20	813,759.03
13,599.00	90.95	358.94	12,372.47	966.19	968.99	330.66	1,023.86	18.84	442,834.18	813,757.99
13,689.00	90.64	358.50	12,371.22	1,056.17	1,058.96	328.65	1,108.79	17.24	442,924.15	813,755.98
13,778.00	89.36	357.89	12,371.22	1,145.15	1,147.92	325.84	1,193.27	15.85	443,013.11	813,753.17
13,867.00	88.48	357.36	12,372.90	1,234.08	1,236.82	322.15	1,278.09	14.60	443,102.01	813,749.48
13,957.00	88.26	358.86	12,375.46	1,324.01	1,326.73	319.19	1,364.59	13.53	443,191.92	813,746.52
14,046.00	88.97	0.17	12,377.61	1,412.99	1,415.70	318.43	1,451.07	12.68	443,280.89	813,745.76
14,136.00	89.58	0.26	12,378.75	1,502.97	1,505.69	318.77	1,539.07	11.95	443,370.88	813,746.10
14,225.00	91.65	358.42	12,377.80	1,591.96	1,594.68	317.75	1,626.02	11.27	443,459.87	813,745.08
14,315.00	91.16	0.35	12,375.59	1,681.93	1,684.64	316.78	1,714.16	10.65	443,549.83	813,744.11
14,405.00	91.38	0.61	12,373.60	1,771.89	1,774.61	317.54	1,802.80	10.14	443,639.80	813,744.87
14,494.00	88.97	359.38	12,373.32	1,860.88	1,863.60	317.53	1,890.46	9.67	443,728.79	813,744.86
14,583.00	90.77	358.50	12,373.53	1,949.87	1,952.58	315.88	1,977.97	9.19	443,817.77	813,743.21
14,673.00	89.67	357.89	12,373.18	2,039.84	2,042.54	313.05	2,066.39	8.71	443,907.73	813,740.38
14,762.00	90.11	356.39	12,373.35	2,128.76	2,131.42	308.61	2,153.65	8.24	443,996.61	813,735.94
14,851.00	92.26	357.10	12,371.51	2,217.63	2,220.26	303.55	2,240.91	7.79	444,085.45	813,730.88
14,941.00	92.13	359.82	12,368.06	2,307.54	2,310.15	301.14	2,329.69	7.43	444,175.34	813,728.47
15,030.00	91.78	359.65	12,365.03	2,396.49	2,399.10	300.73	2,417.87	7.14	444,264.29	813,728.06
15,120.00	91.38	359.65	12,362.55	2,486.46	2,489.06	300.18	2,507.09	6.88	444,354.25	813,727.51
15,210.00	90.86	359.56	12,360.79	2,576.44	2,579.04	299.56	2,596.38	6.63	444,444.23	813,726.89
15,299.00	90.37	359.03	12,359.83	2,665.43	2,668.03	298.46	2,684.67	6.38	444,533.22	813,725.79
15,389.00	89.49	358.68	12,359.94	2,755.43	2,758.01	296.66	2,773.92	6.14	444,623.20	813,723.99
15,479.00	88.84	357.89	12,361.25	2,845.39	2,847.96	293.97	2,863.09	5.89	444,713.15	813,721.30
15,569.00	89.14	0.52	12,362.84	2,935.37	2,937.93	292.72	2,952.47	5.69	444,803.12	813,720.05

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Site: Will Kane 15 WXY Fee
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Local Co-ordinate Reference: Well No. 10H
TVD Reference: Well @ 3532.00usft
MD Reference: Well @ 3532.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
8,493.00	1.19	139.92	8,471.78	-405.21	-402.47	328.57	519.56	140.77	441,462.72	813,755.90
8,583.00	1.45	132.45	8,561.76	-406.70	-403.95	330.01	521.62	140.75	441,461.24	813,757.34
8,672.00	1.10	151.61	8,650.73	-408.23	-405.47	331.25	523.57	140.75	441,459.72	813,758.58
8,762.00	0.88	140.45	8,740.72	-409.53	-406.76	332.10	525.11	140.77	441,458.43	813,759.43
8,851.00	0.79	170.68	8,829.71	-410.66	-407.89	332.63	526.33	140.80	441,457.30	813,759.96
8,940.00	0.75	165.32	8,918.70	-411.83	-409.06	332.88	527.39	140.86	441,456.13	813,760.21
9,029.00	0.48	156.62	9,007.70	-412.74	-409.97	333.18	528.28	140.90	441,455.22	813,760.51
9,119.00	0.75	181.23	9,097.69	-413.68	-410.90	333.31	529.09	140.95	441,454.29	813,760.64
9,208.00	0.70	202.85	9,186.69	-414.76	-411.98	333.09	529.79	141.04	441,453.21	813,760.42
9,297.00	0.70	239.50	9,275.68	-415.53	-412.76	332.41	529.97	141.15	441,452.43	813,759.74
9,387.00	1.14	266.57	9,365.67	-415.85	-413.09	331.04	529.37	141.29	441,452.10	813,758.37
9,476.00	1.49	286.87	9,454.65	-415.55	-412.81	329.05	527.91	141.44	441,452.38	813,756.38
9,566.00	1.45	298.83	9,544.62	-414.65	-411.92	326.93	525.90	141.56	441,453.27	813,754.26
9,655.00	1.80	290.12	9,633.58	-413.60	-410.90	324.64	523.67	141.69	441,454.29	813,751.97
9,745.00	1.14	253.74	9,723.55	-413.35	-410.66	322.45	522.13	141.86	441,454.53	813,749.78
9,834.00	1.32	264.20	9,812.53	-413.69	-411.01	320.58	521.25	142.05	441,454.18	813,747.91
9,921.00	0.22	89.65	9,899.53	-413.78	-411.11	319.75	520.82	142.13	441,454.08	813,747.08
10,010.00	1.01	79.63	9,988.52	-413.64	-410.97	320.69	521.29	142.03	441,454.22	813,748.02
10,100.00	0.48	52.12	10,078.51	-413.28	-410.60	321.77	521.66	141.92	441,454.59	813,749.10
10,189.00	0.40	111.88	10,167.51	-413.17	-410.48	322.35	521.93	141.86	441,454.71	813,749.68
10,279.00	0.31	252.16	10,257.51	-413.36	-410.68	322.41	522.12	141.87	441,454.51	813,749.74
10,368.00	0.70	217.61	10,346.51	-413.86	-411.18	321.85	522.17	141.95	441,454.01	813,749.18
10,457.00	0.57	274.83	10,435.50	-414.25	-411.57	321.08	522.00	142.04	441,453.62	813,748.41
10,547.00	0.44	297.33	10,525.50	-414.05	-411.38	320.32	521.38	142.09	441,453.81	813,747.65
10,637.00	0.66	300.14	10,615.49	-413.62	-410.96	319.57	520.59	142.13	441,454.23	813,746.90
10,726.00	1.14	299.09	10,704.48	-412.92	-410.27	318.35	519.30	142.19	441,454.92	813,745.68
10,816.00	1.27	240.11	10,794.46	-412.97	-410.33	316.70	518.34	142.34	441,454.86	813,744.03

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MD Reference: Well @ 3532.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
3,668.00	4.92	126.82	3,660.73	-129.57	-128.65	110.23	169.42	139.41	441,736.54	813,537.56
3,757.00	5.23	127.97	3,749.38	-134.41	-133.44	116.49	177.13	138.88	441,731.75	813,543.82
3,846.00	4.84	137.81	3,838.04	-139.73	-138.71	122.21	184.87	138.62	441,726.48	813,549.54
3,936.00	5.05	143.35	3,927.70	-145.77	-144.71	127.12	192.61	138.70	441,720.48	813,554.45
4,025.00	4.92	143.17	4,016.37	-152.00	-150.90	131.75	200.32	138.88	441,714.29	813,559.08
4,115.00	5.10	138.43	4,106.02	-158.13	-156.99	136.71	208.17	138.95	441,708.20	813,564.04
4,204.00	5.19	140.10	4,194.67	-164.22	-163.03	141.92	216.15	138.96	441,702.16	813,569.25
4,293.00	5.27	144.93	4,283.30	-170.69	-169.47	146.85	224.24	139.09	441,695.72	813,574.18
4,383.00	5.36	143.44	4,372.91	-177.49	-176.23	151.73	232.55	139.27	441,688.96	813,579.06
4,472.00	4.40	158.73	4,461.59	-184.04	-182.75	155.45	239.92	139.62	441,682.44	813,582.78
4,561.00	4.75	166.64	4,550.31	-190.83	-189.51	157.54	246.44	140.26	441,675.68	813,584.87
4,651.00	5.01	143.70	4,639.99	-197.65	-196.31	160.72	253.71	140.69	441,668.88	813,588.05
4,740.00	6.24	136.76	4,728.56	-204.35	-202.96	166.34	262.42	140.66	441,662.23	813,593.67
4,829.00	5.58	137.11	4,817.09	-211.10	-209.66	172.60	271.56	140.54	441,655.53	813,599.93
4,919.00	5.32	136.49	4,906.68	-217.38	-215.89	178.45	280.09	140.42	441,649.30	813,605.78
5,008.00	6.15	133.06	4,995.23	-223.68	-222.14	184.77	288.94	140.25	441,643.05	813,612.10
5,097.00	5.63	133.15	5,083.76	-229.97	-228.38	191.44	298.00	140.03	441,636.81	813,618.77
5,187.00	5.85	128.49	5,173.31	-235.90	-234.25	198.25	306.88	139.76	441,630.94	813,625.58
5,276.00	3.82	136.67	5,261.99	-240.93	-239.23	203.84	314.29	139.57	441,625.96	813,631.17
5,365.00	3.21	139.39	5,350.82	-245.01	-243.28	207.49	319.75	139.54	441,621.91	813,634.82
5,455.00	2.95	142.64	5,440.69	-248.79	-247.03	210.54	324.58	139.56	441,618.16	813,637.87
5,544.00	2.59	151.08	5,529.59	-252.39	-250.61	212.90	328.84	139.65	441,614.58	813,640.23
5,634.00	3.69	133.50	5,619.46	-256.19	-254.39	215.98	333.71	139.67	441,610.80	813,643.31
5,723.00	4.48	134.65	5,708.23	-260.64	-258.80	220.53	340.02	139.56	441,606.39	813,647.86
5,813.00	4.22	133.06	5,797.97	-265.41	-263.53	225.45	346.81	139.45	441,601.66	813,652.78
5,902.00	4.13	133.86	5,886.73	-269.91	-267.99	230.16	353.26	139.34	441,597.20	813,657.49
5,992.00	4.09	130.25	5,976.50	-274.27	-272.31	234.94	359.65	139.21	441,592.88	813,662.27



ProDirectional
Survey Report



Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Will Kane 15 WXY Fee
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Wellbore: OH
Design: Gyro-MWD-100'-17280', PTB: 17336'

Local Co-ordinate Reference: Well No. 10H
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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
600.00	0.25	90.14	600.00	-0.31	-0.31	0.27	0.41	138.90	441,864.88	813,427.60
625.00	0.34	93.45	625.00	-0.32	-0.31	0.40	0.51	128.24	441,864.88	813,427.73
650.00	0.32	65.03	650.00	-0.29	-0.29	0.54	0.61	118.35	441,864.90	813,427.87
675.00	0.27	54.53	675.00	-0.23	-0.23	0.65	0.69	109.21	441,864.96	813,427.98
700.00	0.20	39.14	700.00	-0.16	-0.16	0.72	0.74	102.30	441,865.03	813,428.05
725.00	0.14	19.52	725.00	-0.10	-0.09	0.76	0.77	97.12	441,865.10	813,428.09
750.00	0.15	20.49	750.00	-0.04	-0.04	0.78	0.78	92.60	441,865.15	813,428.11
775.00	0.18	17.50	775.00	0.03	0.03	0.81	0.81	87.68	441,865.22	813,428.14
800.00	0.07	359.80	800.00	0.08	0.09	0.82	0.82	84.04	441,865.28	813,428.15
825.00	0.05	18.88	825.00	0.10	0.11	0.82	0.83	82.30	441,865.30	813,428.15
850.00	0.03	286.33	850.00	0.12	0.12	0.82	0.83	81.44	441,865.31	813,428.15
875.00	0.05	190.72	875.00	0.11	0.11	0.81	0.82	81.97	441,865.30	813,428.14
900.00	0.09	131.97	900.00	0.08	0.09	0.82	0.83	83.73	441,865.28	813,428.15
925.00	0.12	128.33	925.00	0.05	0.06	0.86	0.86	85.93	441,865.25	813,428.19
950.00	0.20	162.24	950.00	0.00	0.00	0.89	0.89	89.79	441,865.19	813,428.22
975.00	0.25	173.53	975.00	-0.10	-0.09	0.91	0.92	95.80	441,865.10	813,428.24
1,000.00	0.11	196.31	1,000.00	-0.18	-0.17	0.91	0.93	100.57	441,865.02	813,428.24
1,025.00	0.24	192.02	1,025.00	-0.25	-0.24	0.89	0.93	105.29	441,864.95	813,428.22
1,050.00	0.22	180.27	1,050.00	-0.35	-0.34	0.88	0.95	111.28	441,864.85	813,428.21
1,075.00	0.06	134.50	1,075.00	-0.41	-0.40	0.89	0.98	114.21	441,864.79	813,428.22
1,100.00	0.07	120.33	1,100.00	-0.42	-0.42	0.91	1.00	114.56	441,864.77	813,428.24
1,125.00	0.07	141.61	1,125.00	-0.44	-0.44	0.94	1.03	115.03	441,864.75	813,428.27
1,150.00	0.05	74.15	1,150.00	-0.45	-0.45	0.96	1.05	115.02	441,864.74	813,428.29
1,175.00	0.07	98.46	1,175.00	-0.45	-0.45	0.98	1.08	114.41	441,864.74	813,428.31
1,200.00	0.14	115.52	1,200.00	-0.47	-0.46	1.02	1.12	114.22	441,864.73	813,428.35
1,225.00	0.14	126.98	1,225.00	-0.50	-0.49	1.08	1.18	114.58	441,864.70	813,428.41
1,250.00	0.58	187.14	1,250.00	-0.65	-0.64	1.08	1.26	120.39	441,864.55	813,428.41

Company:	Marathon Oil	Local Co-ordinate Reference:	Well No. 10H
Project:	Lea County, NM(NAD 83)	TVD Reference:	Well @ 3532.00usft
Site:	Will Kane 15 WXY Fee	MD Reference:	Well @ 3532.00usft
Well:	No. 10H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyro-MWD-100'-17280', PTB: 17336'	Database:	WellPlanner1

Project	Lea County, NM(NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Will Kane 15 WXY Fee		
Site Position:		Northing:	441,865.26 usft
From:	Map	Easting:	813,367.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.211705
		Longitude:	-103.453772
		Grid Convergence:	0.47 °

Well	No. 10H, LNM1519619		
Well Position	+N/-S	0.00 usft	Northing: 441,865.19 usft
	+E/-W	0.00 usft	Easting: 813,427.33 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32.211703
		Longitude:	-103.453578
		Ground Level:	3,507.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/7/2019	6.62	59.87	47,878.00

Design	Gyro-MWD-100'-17280', PTB: 17336'			
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 (°)
	0.00	0.00	0.00	359.52



PRODIRECTIONAL

Survey Certification Letter

October 31, 2019



Marathon Oil[®]
Corporation

Operator Name: Marathon Oil
Well Name: Will Kane 15 WXY Fee No. 10H
County/Parish: Lea County,
State: NM
Rig Name: Precision 594
Job Number: LNM1519619

This is to certify the surveys performed on the referenced well by Professional Directional Ent., Inc. are true and correct MWD Surveys, data provided as follows:

<u>Surveyor</u>	<u>Surveyed Depths</u>	<u>Projection to Bit</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
ProDirectional	1,434' MD – 17,280' MD	17,336' MD	08/13/19 – 10/05/19	MWD

Sincerely,

Mike Coats
Regulatory Specialist
Professional Directional

850 Conroe Park West Drive | Conroe, TX 77303 | Phone: 936.441.7266

prodirectional.com