



Scientific Drilling

EIVED

OCT 09 2018

DISTRICT II-ARTESIA O.C.D.

Marathon Oil Permian, LLC

Eddy County, NM (NAD27)

Gravel Grinder Fee 23-28-18

WXY #3H

30-015-44627

OH

Survey: SDI Survey #1

Standard Survey Report

29 May, 2018



Scientific Drilling



Scientific Drilling, Intl

Survey Report



Company: Marathon Oil Permian, LLC
Project: Eddy County, NM (NAD27)
Site: Gravel Grinder Fee 23-28-18
Well: WXY #3H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well WXY #3H
TVD Reference: KB = 26.5' @ 3106.50usft (H&P 441)
MD Reference: KB = 26.5' @ 3106.50usft (H&P 441)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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	Gravel Grinder Fee 23-28-18		
Site Position:		Northing:	472,497.59 usft
From:	Map	Easting:	562,658.22 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 17' 55.858 N
		Longitude:	104° 7' 49.967 W
		Grid Convergence:	0.11 °

Well	WXY #3H		
Well Position	+N/-S	0.00 usft	Northing: 472,497.59 usft
	+E/-W	0.00 usft	Easting: 562,628.19 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 17' 55.859 N
		Longitude:	104° 7' 50.317 W
		Ground Level:	3,080.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	4/2/2018	7.30
		Dip Angle (°)	60.07
		Field Strength (nT)	48,019

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

Survey Program	Date 5/29/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
75.10	398.00	Gyro Survey (OH)	Gyrodata Gyro
398.00	14,150.00	SDI Survey #1 (OH)	MWD+HDGM
			Description
			Gyrocompass Gyro
			OWSG MWD + HDGM

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)
398.00	0.44	83.26	398.00	0.06	1.12	0.06	0.00	0.00	0.00
502.00	0.18	74.56	502.00	0.15	1.67	0.15	0.25	-0.25	-8.37
593.00	0.37	57.42	593.00	0.35	2.06	0.35	0.23	0.21	-18.84
683.00	0.34	57.35	682.99	0.65	2.52	0.65	0.03	-0.03	-0.08
774.00	0.48	54.76	773.99	1.02	3.06	1.02	0.16	0.15	-2.85
865.00	0.41	47.56	864.99	1.46	3.61	1.46	0.10	-0.08	-7.91
957.00	0.39	44.37	956.99	1.90	4.08	1.90	0.03	-0.02	-3.47
1,047.00	0.66	213.37	1,046.98	1.69	4.01	1.69	1.16	0.30	187.78
1,138.00	1.33	208.32	1,137.97	0.32	3.22	0.32	0.74	0.74	-5.55
1,233.00	1.38	206.44	1,232.94	-1.67	2.18	-1.67	0.07	0.05	-1.98



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1,327.00	1.38	196.55	1,326.92	-3.77	1.36	-3.77	0.25	0.00	-10.52
1,422.00	1.52	201.19	1,421.89	-8.04	0.58	-6.04	0.19	0.15	4.88
1,516.00	1.35	201.63	1,515.86	-8.24	-0.28	-8.24	0.18	-0.18	0.47
1,611.00	1.54	186.19	1,610.83	-10.54	-0.83	-10.54	0.45	0.20	-16.25
1,706.00	2.38	162.90	1,705.77	-13.70	-0.39	-13.70	1.20	0.88	-24.52
1,801.00	3.28	155.38	1,800.66	-18.06	1.32	-18.06	1.02	0.95	-7.92
1,895.00	2.60	169.62	1,894.53	-22.60	2.83	-22.60	1.06	-0.72	15.15
1,989.00	2.86	183.62	1,988.43	-27.03	3.06	-27.03	0.76	0.28	14.89
2,084.00	3.09	199.72	2,083.30	-31.81	2.05	-31.81	0.91	0.24	16.95
2,178.00	2.57	219.04	2,177.19	-35.83	-0.13	-35.83	1.15	-0.55	20.55
2,273.00	1.81	225.38	2,272.12	-38.54	-2.54	-38.54	0.84	-0.80	6.67
2,367.00	1.69	218.83	2,366.07	-40.66	-4.47	-40.66	0.25	-0.13	-6.97
2,462.00	1.73	216.33	2,461.03	-42.91	-6.20	-42.91	0.09	0.04	-2.63
2,559.00	1.42	221.05	2,557.99	-45.00	-7.85	-45.00	0.35	-0.32	4.87
2,653.00	2.20	250.66	2,651.95	-46.47	-10.32	-46.47	1.27	0.83	31.50
2,748.00	4.02	259.55	2,746.81	-47.68	-15.32	-47.68	1.98	1.92	9.36
2,843.00	4.22	254.66	2,841.56	-49.21	-21.96	-49.21	0.43	0.21	-5.15
2,937.00	5.18	263.76	2,935.24	-50.58	-29.52	-50.58	1.29	1.02	9.68
3,032.00	5.57	265.39	3,029.83	-51.42	-38.37	-51.42	0.44	0.41	1.72
3,126.00	5.42	263.62	3,123.39	-52.28	-47.33	-52.28	0.24	-0.16	-1.88
3,220.00	4.93	264.44	3,217.01	-53.17	-55.77	-53.17	0.53	-0.52	0.87
3,315.00	6.06	264.26	3,311.57	-54.06	-64.82	-54.06	1.19	1.19	-0.19
3,409.00	7.54	266.27	3,404.91	-54.96	-75.91	-54.96	1.59	1.57	2.14
3,504.00	9.43	265.90	3,498.87	-55.92	-89.89	-55.92	1.99	1.99	-0.39
3,598.00	10.69	265.22	3,591.42	-57.20	-106.26	-57.20	1.35	1.34	-0.72
3,693.00	11.88	264.82	3,684.58	-58.82	-124.78	-58.82	1.26	1.25	-0.42
3,787.00	11.97	263.55	3,776.55	-60.79	-144.10	-60.79	0.30	0.10	-1.35
3,882.00	11.55	262.44	3,869.56	-63.14	-163.32	-63.14	0.50	-0.44	-1.17
3,976.00	11.56	262.86	3,961.65	-65.55	-182.00	-65.55	0.09	0.01	0.45
4,071.00	11.54	262.50	4,054.73	-67.98	-200.86	-67.98	0.08	-0.02	-0.38
4,165.00	11.85	262.01	4,146.78	-70.54	-219.74	-70.54	0.35	0.33	-0.52
4,259.00	11.92	262.20	4,238.76	-73.20	-238.92	-73.20	0.09	0.07	0.20
4,354.00	11.74	261.55	4,331.74	-75.95	-258.20	-75.95	0.24	-0.19	-0.68
4,449.00	10.41	258.82	4,424.97	-79.04	-276.18	-79.04	1.50	-1.40	-2.87
4,543.00	10.79	256.93	4,517.37	-82.68	-293.08	-82.68	0.55	0.40	-2.01
4,638.00	10.68	255.18	4,610.71	-86.94	-310.25	-86.94	0.36	-0.12	-1.84
4,732.00	10.07	254.94	4,703.17	-91.30	-326.61	-91.30	0.65	-0.65	-0.26
4,827.00	10.98	252.25	4,796.57	-96.22	-343.25	-96.22	1.09	0.96	-2.83
4,922.00	11.61	254.34	4,889.73	-101.56	-361.07	-101.56	0.79	0.66	2.20
5,016.00	12.85	255.60	4,981.60	-106.71	-380.30	-106.71	1.35	1.32	1.34
5,111.00	12.78	255.45	5,074.23	-111.98	-400.70	-111.98	0.08	-0.07	-0.16
5,206.00	13.02	254.59	5,166.83	-117.46	-421.19	-117.46	0.32	0.25	-0.91
5,300.00	12.64	254.33	5,258.49	-123.05	-441.30	-123.05	0.41	-0.40	-0.28



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5,395.00	14.29	255.26	5,350.87	-128.84	-462.65	-128.84	1.75	1.74	0.98
5,489.00	14.91	255.72	5,441.84	-134.78	-485.59	-134.78	0.67	0.66	0.49
5,584.00	13.64	255.28	5,533.90	-140.64	-508.27	-140.64	1.34	-1.34	-0.46
5,679.00	13.68	253.11	5,626.21	-146.75	-529.85	-146.75	0.54	0.04	-2.28
5,773.00	16.61	254.15	5,716.94	-153.65	-553.42	-153.65	3.13	3.12	1.11
5,868.00	16.24	253.46	5,808.06	-161.14	-579.21	-161.14	0.44	-0.39	-0.73
5,963.00	15.32	251.85	5,899.48	-168.83	-603.87	-168.83	1.07	-0.97	-1.69
6,058.00	13.95	251.17	5,991.40	-176.44	-626.64	-176.44	1.45	-1.44	-0.72
6,152.00	13.07	257.91	6,082.80	-182.32	-647.76	-182.32	1.92	-0.94	7.17
6,247.00	11.62	259.74	6,175.60	-186.27	-667.67	-186.27	1.58	-1.53	1.93
6,342.00	11.73	260.08	6,268.64	-189.64	-686.60	-189.64	0.14	0.12	0.36
6,436.00	10.81	259.48	6,360.82	-192.90	-704.68	-192.90	0.99	-0.98	-0.64
6,530.00	11.25	258.64	6,453.09	-196.31	-722.34	-196.31	0.50	0.47	-0.89
6,625.00	11.61	256.38	6,546.20	-200.39	-740.71	-200.39	0.60	0.38	-2.38
6,719.00	13.25	254.08	6,638.00	-205.57	-760.27	-205.57	1.82	1.74	-2.45
6,814.00	13.37	254.41	6,730.44	-211.51	-781.32	-211.51	0.15	0.13	0.35
6,908.00	12.18	258.03	6,822.12	-216.49	-801.49	-216.49	1.53	-1.27	3.85
7,003.00	10.77	258.51	6,915.22	-220.33	-819.99	-220.33	1.49	-1.48	0.51
7,097.00	9.59	259.94	7,007.74	-223.45	-836.31	-223.45	1.28	-1.26	1.52
7,192.00	7.31	259.98	7,101.70	-225.89	-850.05	-225.89	2.40	-2.40	0.04
7,286.00	6.25	265.02	7,195.04	-227.37	-861.04	-227.37	1.29	-1.13	5.36
7,381.00	6.62	270.57	7,289.44	-227.76	-871.67	-227.76	0.76	0.39	5.84
7,475.00	6.02	274.02	7,382.87	-227.37	-882.00	-227.37	0.76	-0.64	3.67
7,570.00	5.54	273.70	7,477.39	-226.72	-891.55	-226.72	0.51	-0.51	-0.34
7,664.00	3.65	274.01	7,571.08	-226.22	-899.06	-226.22	2.01	-2.01	0.33
7,759.00	2.58	272.23	7,665.94	-225.92	-904.21	-225.92	1.13	-1.13	-1.87
7,853.00	2.73	271.11	7,759.84	-225.80	-908.56	-225.80	0.17	0.16	-1.19
7,948.00	1.45	249.19	7,854.77	-226.18	-911.95	-226.18	1.57	-1.35	-23.07
8,042.00	1.24	249.52	7,948.75	-226.96	-914.02	-226.96	0.22	-0.22	0.35
8,137.00	1.54	254.74	8,043.72	-227.65	-916.21	-227.65	0.34	0.32	5.49
8,231.00	1.88	262.40	8,137.68	-228.19	-918.96	-228.19	0.44	0.36	8.15
8,326.00	1.14	237.43	8,232.65	-228.91	-921.30	-228.91	1.02	-0.78	-26.28
8,421.00	0.99	213.24	8,327.63	-230.10	-922.54	-230.10	0.49	-0.16	-25.46
8,515.00	1.08	260.99	8,421.62	-230.92	-923.86	-230.92	0.90	0.10	50.80
8,610.00	1.14	260.27	8,516.60	-231.22	-925.68	-231.22	0.06	0.06	-0.76
8,705.00	0.80	276.31	8,611.59	-231.31	-927.27	-231.31	0.45	-0.36	16.88
8,799.00	1.10	283.83	8,705.57	-231.02	-928.80	-231.02	0.34	0.32	8.00
8,896.00	1.44	290.05	8,802.55	-230.38	-930.85	-230.38	0.38	0.35	6.41
8,990.00	3.79	336.31	8,896.45	-227.13	-933.21	-227.13	3.17	2.50	49.21
9,085.00	16.79	346.96	8,989.73	-210.81	-937.58	-210.81	13.77	13.68	11.21
9,179.00	31.96	349.42	9,075.10	-172.91	-945.26	-172.91	16.17	16.14	2.62
9,274.00	40.97	356.63	9,151.46	-116.96	-951.72	-116.96	10.49	9.48	7.59
9,368.00	49.11	0.81	9,217.84	-50.55	-953.03	-50.55	9.21	8.66	4.45

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9,463.00	55.55	1.88	9,275.87	24.59	-951.24	24.59	6.84	6.78	1.13
9,474.38	56.50	1.90	9,282.21	34.00	-950.93	34.00	8.33	8.33	0.22
FTP[GGF/WXY#3H]									
9,558.00	63.46	2.07	9,324.04	106.33	-948.41	106.33	8.33	8.33	0.20
9,652.00	69.88	359.96	9,361.25	192.58	-946.93	192.58	7.13	6.83	-2.24
9,732.00	79.29	1.98	9,382.49	269.60	-945.59	269.60	12.01	11.76	2.53
9,869.00	92.05	5.22	9,392.82	405.64	-937.00	405.64	9.61	9.31	2.36
9,964.00	91.95	2.49	9,389.50	500.36	-930.62	500.36	2.87	-0.11	-2.87
10,059.00	89.97	1.56	9,387.91	595.28	-927.26	595.28	2.30	-2.08	-0.98
10,153.00	90.80	1.98	9,387.28	689.23	-924.36	689.23	0.99	0.88	0.45
10,247.00	90.64	359.66	9,386.09	783.21	-923.01	783.21	2.47	-0.17	-2.47
10,342.00	90.50	359.14	9,385.15	878.20	-924.01	878.20	0.57	-0.15	-0.55
10,436.00	90.30	358.44	9,384.49	972.17	-925.99	972.17	0.77	-0.21	-0.74
10,531.00	89.06	356.99	9,385.02	1,067.09	-929.78	1,067.09	2.01	-1.31	-1.53
10,625.00	90.00	359.75	9,385.79	1,161.04	-932.45	1,161.04	3.10	1.00	2.94
10,720.00	90.70	1.30	9,385.21	1,256.03	-931.58	1,256.03	1.79	0.74	1.63
10,815.00	88.83	0.14	9,385.60	1,351.02	-930.39	1,351.02	2.32	-1.97	-1.22
10,910.00	90.00	1.62	9,386.57	1,446.00	-928.93	1,446.00	1.99	1.23	1.56
11,005.00	89.03	1.05	9,387.38	1,540.97	-926.72	1,540.97	1.18	-1.02	-0.60
11,100.00	90.47	1.88	9,387.79	1,635.93	-924.29	1,635.93	1.75	1.52	0.87
11,194.00	89.33	0.59	9,387.96	1,729.91	-922.26	1,729.91	1.83	-1.21	-1.37
11,289.00	93.32	2.50	9,385.76	1,824.82	-919.70	1,824.82	4.66	4.20	2.01
11,383.00	91.38	1.78	9,381.91	1,918.67	-916.20	1,918.67	2.20	-2.06	-0.77
11,478.00	89.83	2.11	9,380.90	2,013.61	-912.97	2,013.61	1.67	-1.63	0.35
11,573.00	88.83	0.69	9,382.01	2,108.57	-910.65	2,108.57	1.83	-1.05	-1.49
11,666.00	89.93	0.82	9,383.02	2,201.56	-909.43	2,201.56	1.19	1.18	0.14
11,761.00	88.69	359.02	9,384.16	2,296.54	-909.56	2,296.54	2.30	-1.31	-1.89
11,856.00	89.93	359.07	9,385.31	2,391.52	-911.14	2,391.52	1.31	1.31	0.05
11,950.00	88.39	358.94	9,386.69	2,485.49	-912.77	2,485.49	1.64	-1.64	-0.14
12,045.00	87.85	358.90	9,389.80	2,580.43	-914.56	2,580.43	0.57	-0.57	-0.04
12,139.00	88.56	358.86	9,392.75	2,674.36	-916.40	2,674.36	0.76	0.76	-0.04
12,234.00	90.44	1.20	9,393.58	2,769.35	-916.35	2,769.35	3.16	1.98	2.46
12,328.00	91.11	0.84	9,392.31	2,863.32	-914.68	2,863.32	0.81	0.71	-0.38
12,423.00	89.06	2.59	9,392.16	2,958.27	-911.83	2,958.27	2.84	-2.16	1.84
12,517.00	90.10	1.51	9,392.85	3,052.21	-908.47	3,052.21	1.60	1.11	-1.15
12,612.00	90.27	3.48	9,392.55	3,147.11	-904.34	3,147.11	2.08	0.18	2.07
12,707.00	87.69	4.20	9,394.24	3,241.87	-897.98	3,241.87	2.82	-2.72	0.76
12,802.00	90.23	5.65	9,395.96	3,336.50	-889.82	3,336.50	3.08	2.67	1.53
12,896.00	90.13	2.10	9,395.67	3,430.27	-883.47	3,430.27	3.78	-0.11	-3.78
12,991.00	88.62	2.48	9,396.70	3,525.18	-879.67	3,525.18	1.64	-1.59	0.40
13,085.00	88.39	2.47	9,399.16	3,619.06	-875.62	3,619.06	0.24	-0.24	-0.01
13,180.00	89.87	3.57	9,400.60	3,713.92	-870.61	3,713.92	1.94	1.56	1.16
13,274.00	89.93	2.88	9,400.76	3,807.77	-865.32	3,807.77	0.74	0.06	-0.73
13,368.00	90.47	1.49	9,400.43	3,901.69	-861.74	3,901.69	1.59	0.57	-1.48



Scientific Drilling, Intl
Survey Report



Company: Marathon Oil Permian, LLC
Project: Eddy County, NM (NAD27)
Site: Gravel Grinder Fee 23-28-18
Well: WXY #3H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well WXY #3H
TVD Reference: KB = 26.5' @ 3106.50usft (H&P 441)
MD Reference: KB = 26.5' @ 3106.50usft (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)
13,463.00	89.40	0.47	9,400.54	3,996.68	-860.12	3,996.68	1.56	-1.13	-1.07
13,558.00	86.24	0.97	9,404.15	4,091.59	-858.92	4,091.59	3.37	-3.33	0.53
13,652.00	90.07	1.67	9,407.18	4,185.50	-856.76	4,185.50	4.14	4.07	0.74
13,747.00	90.00	0.42	9,407.12	4,280.48	-855.03	4,280.48	1.32	-0.07	-1.32
13,842.00	90.24	0.79	9,406.92	4,375.47	-854.02	4,375.47	0.46	0.25	0.39
13,936.00	88.59	359.48	9,407.88	4,469.46	-853.80	4,469.46	2.24	-1.76	-1.39
14,031.00	88.49	359.32	9,410.30	4,564.43	-854.80	4,564.43	0.20	-0.11	-0.17
14,098.00	88.66	359.49	9,411.97	4,631.40	-855.49	4,631.40	0.36	0.25	0.25
FINAL MWD Survey (14098.00' MD) - BHL[GGF/WXY#3H]									
14,150.00	88.66	359.49	9,413.19	4,683.39	-855.95	4,683.39	0.00	0.00	0.00
FINAL Proj. to Bit (14160.00' MD)									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
14,098.00	9,411.97	4,631.40	-855.49	FINAL MWD Survey (14098.00' MD)
14,150.00	9,413.19	4,683.39	-855.95	FINAL Proj. to Bit (14150.00' MD)

Checked By: _____ Approved By: _____ Date: _____

