



Pro Directional
Survey Report

NM OIL CONSERVATION

ARTESIA DISTRICT

JAN 05 2018



Company:	Marathon Oil	Local Coordinate Reference:	RECEIVED
Project:	Eddy County, NM	TVD Reference:	Well @ 3207.50usft (GL: 3181' + KB: 26.5'(H&P480))
Site:	Sterling State 23-27-20	MD Reference:	Well @ 3207.50usft (GL: 3181' + KB: 26.5'(H&P480))
Well:	WA #6H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Project:	Eddy 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						Sterling State 23-27-20					
Site Position:				Northing:		467,254.93 usft		Latitude:		32.284538	
From:		Map		Easting:		538,802.63 usft		Longitude:		-104.207772	
Position Uncertainty:		0.00 usft		Slot Radius:		13-3/16 "		Grid Convergence:		0.07 °	

Well	WA #6H					
Well Position	+N-S	0.00 usft	Northing:	467,254.93 usft	Latitude:	32.284538
	+E-W	0.00 usft	Easting:	538,852.63 usft	Longitude:	-104.207611
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,181.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/27/2017	7.40	60.03	48,024.50

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	359.80

Survey Tool Program		Date	12/27/2017	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	13,789.31	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1

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
[SterlingST#6H]FTP									
100.00	0.00	0.00	100.00	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
300.00	0.00	0.00	300.00	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
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
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

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WA #6H
Project:	Eddy County, NM	TVD Reference:	Well @ 3207.50usft (GL: 3181' + KB: 26.5'(H&P480))
Site:	Sterling State 23-27-20	MD Reference:	Well @ 3207.50usft (GL: 3181' + KB: 26.5'(H&P480))
Well:	WA #6H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	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)
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	0.75	139.91	1,600.00	-0.50	0.42	-0.50	0.75	0.75	0.00
1,700.00	1.50	139.91	1,699.98	-2.00	1.69	-2.01	0.75	0.75	0.00
1,800.00	2.25	139.91	1,799.92	-4.51	3.79	-4.52	0.75	0.75	0.00
1,900.00	3.00	139.91	1,899.82	-8.01	6.74	-8.03	0.75	0.75	0.00
2,000.00	3.75	139.91	1,999.64	-12.51	10.53	-12.55	0.75	0.75	0.00
2,100.00	4.50	139.91	2,099.38	-18.02	15.17	-18.07	0.75	0.75	0.00
2,200.00	5.25	139.91	2,199.02	-24.52	20.64	-24.59	0.75	0.75	0.00
2,300.00	6.00	139.91	2,298.54	-32.01	26.95	-32.11	0.75	0.75	0.00
2,400.00	6.75	139.91	2,397.92	-40.51	34.10	-40.63	0.75	0.75	0.00
2,500.00	7.50	139.91	2,497.15	-50.00	42.09	-50.14	0.75	0.75	0.00
2,600.00	8.25	139.91	2,596.20	-60.48	50.92	-60.66	0.75	0.75	0.00
2,700.00	9.00	139.91	2,695.07	-71.95	60.57	-72.16	0.75	0.75	0.00
2,800.00	9.75	139.91	2,793.73	-84.41	71.07	-84.66	0.75	0.75	0.00
2,833.33	10.00	139.91	2,826.57	-88.78	74.75	-89.05	0.75	0.75	0.00
2,900.00	10.00	139.91	2,892.23	-97.64	82.20	-97.93	0.00	0.00	0.00
3,000.00	10.00	139.91	2,990.71	-110.92	93.39	-111.25	0.00	0.00	0.00
3,100.00	10.00	139.91	3,089.19	-124.21	104.57	-124.57	0.00	0.00	0.00
3,200.00	10.00	139.91	3,187.67	-137.49	115.75	-137.90	0.00	0.00	0.00
3,300.00	10.00	139.91	3,286.15	-150.78	126.94	-151.22	0.00	0.00	0.00
3,400.00	10.00	139.91	3,384.63	-164.06	138.12	-164.54	0.00	0.00	0.00
3,500.00	10.00	139.91	3,483.11	-177.34	149.31	-177.86	0.00	0.00	0.00
3,600.00	10.00	139.91	3,581.59	-190.63	160.49	-191.19	0.00	0.00	0.00
3,700.00	10.00	139.91	3,680.07	-203.91	171.67	-204.51	0.00	0.00	0.00
3,800.00	10.00	139.91	3,778.56	-217.20	182.86	-217.83	0.00	0.00	0.00
3,900.00	10.00	139.91	3,877.04	-230.48	194.04	-231.16	0.00	0.00	0.00
4,000.00	10.00	139.91	3,975.52	-243.76	205.22	-244.48	0.00	0.00	0.00
4,100.00	10.00	139.91	4,074.00	-257.05	216.41	-257.80	0.00	0.00	0.00
4,200.00	10.00	139.91	4,172.48	-270.33	227.59	-271.12	0.00	0.00	0.00
4,300.00	10.00	139.91	4,270.96	-283.62	238.78	-284.45	0.00	0.00	0.00
4,400.00	10.00	139.91	4,369.44	-296.90	249.96	-297.77	0.00	0.00	0.00
4,500.00	10.00	139.91	4,467.92	-310.18	261.14	-311.09	0.00	0.00	0.00
4,600.00	10.00	139.91	4,566.40	-323.47	272.33	-324.42	0.00	0.00	0.00
4,700.00	10.00	139.91	4,664.88	-336.75	283.51	-337.74	0.00	0.00	0.00
4,800.00	10.00	139.91	4,763.36	-350.04	294.69	-351.06	0.00	0.00	0.00

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Well:	WA #6H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	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)	
4,900.00	10.00	139.91	4,861.84	-363.32	305.88	-364.38	0.00	0.00	0.00	
5,000.00	10.00	139.91	4,960.32	-376.60	317.06	-377.71	0.00	0.00	0.00	
5,100.00	10.00	139.91	5,058.81	-389.89	328.24	-391.03	0.00	0.00	0.00	
5,200.00	10.00	139.91	5,157.29	-403.17	339.43	-404.35	0.00	0.00	0.00	
5,300.00	10.00	139.91	5,255.77	-416.45	350.61	-417.68	0.00	0.00	0.00	
5,400.00	10.00	139.91	5,354.25	-429.74	361.80	-431.00	0.00	0.00	0.00	
5,500.00	10.00	139.91	5,452.73	-443.02	372.98	-444.32	0.00	0.00	0.00	
5,600.00	10.00	139.91	5,551.21	-456.31	384.16	-457.64	0.00	0.00	0.00	
5,700.00	10.00	139.91	5,649.69	-469.59	395.35	-470.97	0.00	0.00	0.00	
5,723.45	10.00	139.91	5,672.79	-472.71	397.97	-474.09	0.00	0.00	0.00	
5,800.00	8.47	139.91	5,748.34	-482.10	405.88	-483.52	2.00	-2.00	0.00	
5,900.00	6.47	139.91	5,847.49	-492.05	414.25	-493.49	2.00	-2.00	0.00	
6,000.00	4.47	139.91	5,947.03	-499.34	420.39	-500.80	2.00	-2.00	0.00	
6,100.00	2.47	139.91	6,046.84	-503.97	424.29	-505.44	2.00	-2.00	0.00	
6,200.00	0.47	139.91	6,146.80	-505.93	425.94	-507.41	2.00	-2.00	0.00	
6,223.45	0.00	0.00	6,170.25	-506.00	426.00	-507.48	2.00	-2.00	0.00	
6,300.00	0.00	0.00	6,246.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,346.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,446.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,546.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,646.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,746.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,846.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,946.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,046.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,146.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,246.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,346.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,446.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,546.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,646.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,746.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,846.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,946.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
8,100.00	0.00	0.00	8,046.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,146.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,246.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,346.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,446.80	-506.00	426.00	-507.48	0.00	0.00	0.00	
8,592.20	0.00	0.00	8,539.00	-506.00	426.00	-507.48	0.00	0.00	0.00	
[SterlingST#6H]KOP										
8,600.00	0.78	359.80	8,546.80	-505.95	426.00	-507.43	10.00	10.00	0.00	

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Well:	WA #6H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	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)
8,650.00	5.78	359.80	8,596.70	-503.09	425.99	-504.57	10.00	10.00	0.00
8,700.00	10.78	359.80	8,646.16	-495.89	425.96	-497.37	10.00	10.00	0.00
8,750.00	15.78	359.80	8,694.81	-484.41	425.92	-485.89	10.00	10.00	0.00
8,800.00	20.78	359.80	8,742.27	-468.73	425.87	-470.21	10.00	10.00	0.00
8,850.00	25.78	359.80	8,788.19	-448.97	425.80	-450.46	10.00	10.00	0.00
8,900.00	30.78	359.80	8,832.21	-425.29	425.71	-426.78	10.00	10.00	0.00
8,950.00	35.78	359.80	8,873.99	-397.87	425.62	-399.35	10.00	10.00	0.00
9,000.00	40.78	359.80	8,913.23	-366.90	425.51	-368.38	10.00	10.00	0.00
9,050.00	45.78	359.80	8,949.62	-332.63	425.39	-334.12	10.00	10.00	0.00
9,100.00	50.78	359.80	8,982.88	-295.33	425.25	-296.81	10.00	10.00	0.00
9,150.00	55.78	359.80	9,012.77	-255.26	425.11	-256.74	10.00	10.00	0.00
9,200.00	60.78	359.80	9,039.05	-212.74	424.96	-214.22	10.00	10.00	0.00
9,250.00	65.78	359.80	9,061.52	-168.10	424.80	-169.58	10.00	10.00	0.00
9,300.00	70.78	359.80	9,080.02	-121.66	424.64	-123.14	10.00	10.00	0.00
9,350.00	75.78	359.80	9,094.40	-73.79	424.47	-75.27	10.00	10.00	0.00
9,400.00	80.78	359.80	9,104.56	-24.85	424.30	-26.33	10.00	10.00	0.00
9,450.00	85.78	359.80	9,110.40	24.79	424.12	23.31	10.00	10.00	0.00
9,491.18	89.90	359.80	9,111.96	65.93	423.98	64.45	10.00	10.00	0.00
9,500.00	89.90	359.80	9,111.97	74.75	423.94	73.27	0.00	0.00	0.00
9,600.00	89.90	359.80	9,112.15	174.75	423.59	173.27	0.00	0.00	0.00
9,700.00	89.90	359.80	9,112.33	274.75	423.24	273.27	0.00	0.00	0.00
9,800.00	89.90	359.80	9,112.51	374.75	422.88	373.27	0.00	0.00	0.00
9,900.00	89.90	359.80	9,112.69	474.75	422.53	473.27	0.00	0.00	0.00
10,000.00	89.90	359.80	9,112.86	574.75	422.17	573.27	0.00	0.00	0.00
10,100.00	89.90	359.80	9,113.04	674.75	421.82	673.27	0.00	0.00	0.00
10,200.00	89.90	359.80	9,113.22	774.75	421.47	773.27	0.00	0.00	0.00
10,300.00	89.90	359.80	9,113.40	874.75	421.11	873.27	0.00	0.00	0.00
10,400.00	89.90	359.80	9,113.58	974.75	420.76	973.27	0.00	0.00	0.00
10,500.00	89.90	359.80	9,113.75	1,074.75	420.40	1,073.27	0.00	0.00	0.00
10,600.00	89.90	359.80	9,113.93	1,174.74	420.05	1,173.27	0.00	0.00	0.00
10,700.00	89.90	359.80	9,114.11	1,274.74	419.70	1,273.27	0.00	0.00	0.00
10,800.00	89.90	359.80	9,114.29	1,374.74	419.34	1,373.27	0.00	0.00	0.00
10,900.00	89.90	359.80	9,114.47	1,474.74	418.99	1,473.27	0.00	0.00	0.00
11,000.00	89.90	359.80	9,114.64	1,574.74	418.63	1,573.27	0.00	0.00	0.00
11,100.00	89.90	359.80	9,114.82	1,674.74	418.28	1,673.27	0.00	0.00	0.00
11,200.00	89.90	359.80	9,115.00	1,774.74	417.93	1,773.27	0.00	0.00	0.00
11,300.00	89.90	359.80	9,115.18	1,874.74	417.57	1,873.27	0.00	0.00	0.00
11,400.00	89.90	359.80	9,115.36	1,974.74	417.22	1,973.27	0.00	0.00	0.00
11,500.00	89.90	359.80	9,115.53	2,074.74	416.86	2,073.27	0.00	0.00	0.00
11,600.00	89.90	359.80	9,115.71	2,174.74	416.51	2,173.27	0.00	0.00	0.00
11,700.00	89.90	359.80	9,115.89	2,274.74	416.16	2,273.27	0.00	0.00	0.00
11,800.00	89.90	359.80	9,116.07	2,374.74	415.80	2,373.27	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ord (date Reference):	Well WA #6H
Project:	Eddy County, NM	TVD Reference:	Well @ 3207.50usft (GL: 3181' + KB: 26.5'(H&P480))
Site:	Sterling State 23-27-20	MD Reference:	Well @ 3207.50usft (GL: 3181' + KB: 26.5'(H&P480))
Well:	WA #6H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	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)
11,900.00	89.90	359.80	9,116.25	2,474.73	415.45	2,473.27	0.00	0.00	0.00
12,000.00	89.90	359.80	9,116.42	2,574.73	415.09	2,573.27	0.00	0.00	0.00
12,100.00	89.90	359.80	9,116.60	2,674.73	414.74	2,673.27	0.00	0.00	0.00
12,200.00	89.90	359.80	9,116.78	2,774.73	414.39	2,773.27	0.00	0.00	0.00
12,300.00	89.90	359.80	9,116.96	2,874.73	414.03	2,873.27	0.00	0.00	0.00
12,400.00	89.90	359.80	9,117.14	2,974.73	413.68	2,973.27	0.00	0.00	0.00
12,500.00	89.90	359.80	9,117.31	3,074.73	413.32	3,073.27	0.00	0.00	0.00
12,600.00	89.90	359.80	9,117.49	3,174.73	412.97	3,173.27	0.00	0.00	0.00
12,700.00	89.90	359.80	9,117.67	3,274.73	412.62	3,273.27	0.00	0.00	0.00
12,800.00	89.90	359.80	9,117.85	3,374.73	412.26	3,373.27	0.00	0.00	0.00
12,900.00	89.90	359.80	9,118.03	3,474.73	411.91	3,473.27	0.00	0.00	0.00
13,000.00	89.90	359.80	9,118.20	3,574.73	411.55	3,573.27	0.00	0.00	0.00
13,100.00	89.90	359.80	9,118.38	3,674.72	411.20	3,673.27	0.00	0.00	0.00
13,200.00	89.90	359.80	9,118.56	3,774.72	410.85	3,773.27	0.00	0.00	0.00
13,300.00	89.90	359.80	9,118.74	3,874.72	410.49	3,873.27	0.00	0.00	0.00
13,400.00	89.90	359.80	9,118.92	3,974.72	410.14	3,973.27	0.00	0.00	0.00
13,500.00	89.90	359.80	9,119.09	4,074.72	409.78	4,073.27	0.00	0.00	0.00
13,600.00	89.90	359.80	9,119.27	4,174.72	409.43	4,173.27	0.00	0.00	0.00
13,700.00	89.90	359.80	9,119.45	4,274.72	409.08	4,273.27	0.00	0.00	0.00
13,789.37	89.90	359.80	9,119.61	4,364.09	408.76	4,362.64	0.00	0.00	0.00
[SterlingST#6H]BHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/S (usft)	+E/W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
[SterlingST#6H]FTP - plan misses target center by 507.17usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.01	0.00	-276.32	425.29	466,978.61	539,277.92	32.283777	-104.206236
[SterlingST#6H]KOP - plan hits target center - Point	0.00	0.00	8,539.00	-506.00	426.00	466,748.93	539,278.63	32.283146	-104.206234
[SterlingST#6H]BHL - plan hits target center - Point	0.00	0.00	9,119.61	4,364.09	408.76	471,619.02	539,261.39	32.296533	-104.206271

Checked By: _____ Approved By: _____ Date: _____