



Marathon Oil

Eddy County, NM

Whistle Pig 1

SB Fee #5H

OH

Design: Gyros/MWD 504'-13235' PTB 13295'

Survey Report

18 February, 2019



Company:	Marathon Oil	Local Co-ordinate Reference:	Well SB Fee #5H
Project:	Eddy County, NM	TVD Reference:	Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
Site:	Whistle Pig 1	MD Reference:	Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
Well:	SB Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyros/MWD 504'-13235' PTB 13295'	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		Whistle Pig 1			
Site Position:		Northing:		424,067.27 usft	
From:	Map	Easting:		592,517.05 usft	
Position Uncertainty:		Slot Radius:		Grid Convergence:	
0.00 usft		13-3/16 "		32.165525 -104.034348 0.16 °	

Well	SB Fee #5H					
Well Position	+N/-S	0.00 usft	Northing:	424,067.27 usft	Latitude:	32.165524
	+E/-W	0.00 usft	Easting:	592,547.05 usft	Longitude:	-104.034251
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	2,912.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/1/2019	7.05	59.90	47,920.40

Design:		Gyros/MWD 504'-13235' PTB 13295'			
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	179.98	

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Well:	SB Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyros/MWD 504'-13235' PTB 13295'	Database:	WellPlanner1

Survey Program		Date	2/18/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
89.00	418.00	Survey #1 (OH)	GYRO-NS-CT	OWSG XYZ Accel with XY Static and Continuous Gyro	
504.00	13,295.00	Survey #2 (OH)	MWD+IFR1	OWSG MWD + IFR1	

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	424,067.27	592,547.05
89.00	0.60	4.83	89.00	-0.46	0.46	0.04	0.47	4.83	424,067.73	592,547.09
215.00	0.40	22.83	214.99	-1.53	1.53	0.27	1.55	9.86	424,068.80	592,547.32
305.00	0.50	36.83	304.99	-2.13	2.13	0.62	2.22	16.29	424,069.40	592,547.67
418.00	0.50	155.83	417.99	-2.08	2.08	1.12	2.36	28.35	424,069.35	592,548.17
504.00	0.20	83.20	503.99	-1.75	1.75	1.42	2.26	39.09	424,069.02	592,548.47
596.00	0.30	21.30	595.99	-1.99	1.99	1.67	2.60	39.93	424,069.26	592,548.72
687.00	0.30	13.40	686.99	-2.45	2.45	1.81	3.05	36.50	424,069.72	592,548.86
777.00	0.50	359.30	776.98	-3.07	3.07	1.86	3.59	31.23	424,070.34	592,548.91
868.00	0.50	1.30	867.98	-3.86	3.86	1.87	4.29	25.77	424,071.13	592,548.92
960.00	0.80	352.00	959.97	-4.90	4.90	1.79	5.22	20.01	424,072.17	592,548.84
1,049.00	0.80	338.40	1,048.96	-6.09	6.09	1.47	6.27	13.56	424,073.36	592,548.52
1,139.00	0.60	351.10	1,138.96	-7.14	7.14	1.17	7.24	9.27	424,074.41	592,548.22
1,228.00	0.50	309.40	1,227.95	-7.85	7.85	0.79	7.89	5.77	424,075.12	592,547.84
1,317.00	0.50	274.00	1,316.95	-8.12	8.12	0.11	8.13	0.75	424,075.39	592,547.16
1,407.00	0.40	264.10	1,406.95	-8.12	8.12	-0.60	8.14	355.79	424,075.39	592,546.45
1,496.00	0.60	288.00	1,495.95	-8.23	8.23	-1.35	8.34	350.68	424,075.50	592,545.70
1,585.00	1.80	283.00	1,584.92	-8.69	8.69	-3.16	9.25	340.04	424,075.96	592,543.89
1,675.00	2.90	289.90	1,674.85	-9.79	9.78	-6.67	11.84	325.70	424,077.05	592,540.38
1,764.00	2.40	292.00	1,763.75	-11.25	11.25	-10.52	15.40	316.92	424,078.52	592,536.53
1,853.00	2.00	288.80	1,852.69	-12.45	12.45	-13.72	18.52	312.22	424,079.72	592,533.33

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Site:	Whistle Pig 1	MD Reference:	Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
Well:	SB Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyros/MWD 504'-13235' PTB 13295'	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)	
1,943.00	2.20	299.50	1,942.63	-13.81	13.80	-16.71	21.67	309.56	424,081.07	592,530.34	
2,032.00	2.00	317.20	2,031.57	-15.79	15.78	-19.25	24.89	309.35	424,083.05	592,527.80	
2,121.00	1.50	329.50	2,120.53	-17.93	17.93	-20.89	27.53	310.63	424,085.20	592,526.16	
2,211.00	3.70	313.80	2,210.43	-20.96	20.95	-23.59	31.55	311.61	424,088.22	592,523.46	
2,300.00	4.50	308.00	2,299.20	-25.10	25.09	-28.41	37.90	311.45	424,092.36	592,518.64	
2,389.00	2.50	319.50	2,388.03	-28.73	28.72	-32.43	43.31	311.53	424,095.99	592,514.62	
2,478.00	1.70	330.10	2,476.97	-31.35	31.34	-34.34	46.49	312.38	424,098.61	592,512.71	
2,577.00	4.60	311.40	2,575.81	-35.25	35.24	-38.05	51.86	312.80	424,102.51	592,509.00	
2,661.00	5.40	309.20	2,659.49	-39.98	39.96	-43.64	59.18	312.48	424,107.23	592,503.41	
2,751.00	5.40	307.70	2,749.09	-45.24	45.23	-50.28	67.63	311.97	424,112.50	592,496.77	
2,840.00	5.70	307.10	2,837.68	-50.47	50.45	-57.12	76.21	311.46	424,117.72	592,489.93	
2,929.00	7.40	315.10	2,926.09	-57.20	57.18	-64.69	86.34	311.48	424,124.45	592,482.36	
3,019.00	9.10	313.40	3,015.16	-66.20	66.18	-73.95	99.24	311.82	424,133.45	592,473.10	
3,109.00	9.20	312.80	3,104.01	-75.98	75.96	-84.40	113.55	311.99	424,143.23	592,462.65	
3,198.00	8.90	311.50	3,191.91	-85.38	85.35	-94.78	127.54	312.00	424,152.62	592,452.27	
3,287.00	10.40	313.80	3,279.64	-95.51	95.47	-105.73	142.46	312.08	424,162.74	592,441.32	
3,376.00	11.70	317.00	3,366.99	-107.68	107.63	-117.68	159.48	312.45	424,174.90	592,429.37	
3,466.00	11.60	315.60	3,455.14	-120.82	120.77	-130.24	177.62	312.84	424,188.04	592,416.81	
3,556.00	11.30	315.00	3,543.35	-133.52	133.47	-142.81	195.47	313.07	424,200.74	592,404.24	
3,645.00	10.70	313.50	3,630.71	-145.38	145.33	-154.96	212.45	313.16	424,212.60	592,392.09	
3,734.00	10.50	312.00	3,718.19	-156.50	156.44	-166.98	228.82	313.13	424,223.71	592,380.07	
3,823.00	10.70	312.00	3,805.68	-167.46	167.39	-179.15	245.19	313.06	424,234.66	592,367.90	
3,913.00	8.80	308.90	3,894.37	-177.38	177.31	-190.72	260.41	312.91	424,244.58	592,356.33	
4,002.00	8.50	307.50	3,982.36	-185.66	185.59	-201.23	273.75	312.68	424,252.86	592,345.82	
4,091.00	7.00	307.00	4,070.54	-192.93	192.86	-210.78	285.70	312.46	424,260.13	592,336.27	
4,181.00	5.10	310.20	4,160.04	-198.82	198.74	-218.22	295.16	312.33	424,266.01	592,328.83	
4,270.00	3.80	315.60	4,248.77	-203.48	203.40	-223.31	302.05	312.33	424,270.67	592,323.74	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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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)	
4,360.00	2.20	324.90	4,338.64	-207.02	206.94	-226.39	306.72	312.43	424,274.21	592,320.66	
4,450.00	1.20	322.10	4,428.60	-209.18	209.10	-227.96	309.34	312.53	424,276.37	592,319.09	
4,539.00	1.40	181.10	4,517.59	-208.83	208.75	-228.55	309.54	312.41	424,276.02	592,318.50	
4,628.00	1.70	180.80	4,606.56	-206.42	206.34	-228.59	307.95	312.07	424,273.61	592,318.46	
4,718.00	1.80	177.10	4,696.52	-203.68	203.60	-228.54	306.07	311.70	424,270.87	592,318.51	
4,807.00	1.80	173.20	4,785.47	-200.89	200.81	-228.30	304.05	311.33	424,268.08	592,318.75	
4,896.00	1.90	176.40	4,874.43	-198.03	197.95	-228.04	301.97	310.96	424,265.22	592,319.01	
4,985.00	1.90	174.30	4,963.38	-195.09	195.01	-227.80	299.87	310.57	424,262.28	592,319.25	
5,074.00	1.90	183.20	5,052.33	-192.15	192.07	-227.74	297.92	310.14	424,259.34	592,319.31	
5,164.00	1.70	186.10	5,142.29	-189.33	189.25	-227.97	296.29	309.70	424,256.52	592,319.08	
5,253.00	1.70	186.90	5,231.25	-186.71	186.63	-228.26	294.85	309.27	424,253.90	592,318.79	
5,342.00	1.70	183.50	5,320.21	-184.08	184.00	-228.50	293.38	308.84	424,251.27	592,318.55	
5,431.00	1.60	181.30	5,409.17	-181.52	181.44	-228.61	291.86	308.44	424,248.71	592,318.44	
5,521.00	0.10	195.70	5,499.16	-180.19	180.11	-228.66	291.08	308.23	424,247.38	592,318.39	
5,610.00	0.30	264.50	5,588.16	-180.09	180.01	-228.91	291.22	308.18	424,247.28	592,318.14	
5,699.00	0.20	171.90	5,677.16	-179.92	179.84	-229.12	291.27	308.13	424,247.11	592,317.93	
5,788.00	0.60	208.90	5,766.15	-179.35	179.27	-229.33	291.09	308.02	424,246.54	592,317.72	
5,877.00	0.60	180.00	5,855.15	-178.48	178.40	-229.55	290.73	307.85	424,245.67	592,317.50	
5,967.00	1.00	28.30	5,945.15	-178.70	178.62	-229.18	290.57	307.93	424,245.89	592,317.87	
6,056.00	1.50	31.90	6,034.13	-180.37	180.29	-228.20	290.83	308.31	424,247.56	592,318.85	
6,145.00	1.40	42.90	6,123.10	-182.16	182.08	-226.84	290.88	308.75	424,249.35	592,320.21	
6,234.00	1.00	35.20	6,212.08	-183.59	183.51	-225.65	290.85	309.12	424,250.78	592,321.40	
6,323.00	0.40	23.50	6,301.07	-184.51	184.43	-225.08	290.99	309.33	424,251.70	592,321.97	
6,413.00	0.20	324.80	6,391.07	-184.92	184.85	-225.05	291.23	309.40	424,252.12	592,322.00	
6,502.00	0.90	222.80	6,480.07	-184.54	184.46	-225.61	291.42	309.27	424,251.73	592,321.44	
6,591.00	1.10	196.00	6,569.05	-183.21	183.13	-226.32	291.13	308.98	424,250.40	592,320.73	
6,681.00	1.00	193.10	6,659.04	-181.61	181.53	-226.74	290.45	308.68	424,248.80	592,320.31	

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Site:	Whistle Pig 1	MD Reference:	Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyros/MWD 504'-13235' PTB 13295'	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)	
6,770.00	0.70	227.30	6,748.03	-180.49	180.41	-227.31	290.20	308.44	424,247.68	592,319.74	
6,859.00	0.30	151.70	6,837.02	-179.91	179.83	-227.60	290.07	308.31	424,247.10	592,319.45	
6,949.00	0.30	131.50	6,927.02	-179.55	179.47	-227.32	289.62	308.29	424,246.74	592,319.73	
7,038.00	0.10	353.80	7,016.02	-179.47	179.39	-227.15	289.44	308.30	424,246.66	592,319.90	
7,128.00	1.10	347.00	7,106.02	-180.39	180.31	-227.35	290.17	308.42	424,247.58	592,319.70	
7,217.00	1.30	349.70	7,195.00	-182.22	182.14	-227.72	291.60	308.65	424,249.41	592,319.33	
7,307.00	1.40	334.10	7,284.97	-184.21	184.13	-228.39	293.37	308.88	424,251.40	592,318.66	
7,396.00	1.60	335.70	7,373.94	-186.32	186.24	-229.37	295.46	309.08	424,253.51	592,317.68	
7,485.00	1.40	349.50	7,462.91	-188.52	188.44	-230.08	297.40	309.32	424,255.71	592,316.97	
7,575.00	1.50	342.50	7,552.88	-190.73	190.65	-230.64	299.23	309.58	424,257.92	592,316.41	
7,664.00	1.90	320.00	7,641.85	-192.97	192.89	-231.94	301.66	309.75	424,260.16	592,315.11	
7,748.00	1.70	288.40	7,725.81	-194.43	194.35	-234.01	304.19	309.71	424,261.62	592,313.04	
7,837.00	1.00	201.10	7,814.79	-194.12	194.04	-235.55	305.18	309.48	424,261.31	592,311.50	
7,848.63	2.52	182.02	7,826.41	-193.77	193.69	-235.59	304.99	309.43	424,260.96	592,311.46	
[WhistleTB#5H]FTP											
7,926.00	13.20	172.50	7,902.95	-183.28	183.20	-234.50	297.57	308.00	424,250.47	592,312.55	
8,015.00	22.90	169.60	7,987.47	-156.11	156.03	-230.03	277.96	304.15	424,223.30	592,317.02	
8,104.00	26.70	170.20	8,068.24	-119.36	119.28	-223.50	253.34	298.09	424,186.55	592,323.55	
8,194.00	34.00	174.30	8,145.87	-74.33	74.25	-217.55	229.87	288.84	424,141.52	592,329.50	
8,284.00	46.80	172.80	8,214.26	-16.50	16.42	-210.91	211.55	274.45	424,083.69	592,336.14	
8,373.00	57.40	172.00	8,268.86	53.01	-53.08	-201.60	208.47	255.25	424,014.19	592,345.45	
8,462.00	63.30	174.80	8,312.87	129.81	-129.88	-192.77	232.44	236.03	423,937.39	592,354.28	
8,551.00	67.20	177.40	8,350.13	210.43	-210.49	-187.31	281.76	221.66	423,856.78	592,359.74	
8,641.00	77.40	178.00	8,377.46	295.99	-296.05	-183.88	348.51	211.85	423,771.22	592,363.17	
8,730.00	86.70	182.10	8,389.76	384.01	-384.08	-184.00	425.88	205.60	423,683.19	592,363.05	
8,820.00	91.40	182.40	8,391.25	473.91	-473.97	-187.53	509.72	201.59	423,593.30	592,359.52	
8,909.00	88.80	183.10	8,391.10	562.79	-562.86	-191.80	594.64	198.82	423,504.41	592,355.25	



Professional Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: Whistle Pig 1
Well: SB Fee #5H
Wellbore: OH
Design: Gyros/MWD 504'-13235' PTB 13295'

Local Co-ordinate Reference:
TVD Reference:
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North Reference:
Survey Calculation Method:
Database:

Well SB Fee #5H
Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
Grid
Minimum Curvature
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)	
8,999.00	88.90	182.90	8,392.90	652.65	-652.72	-196.51	681.66	196.75	423,414.55	592,350.54	
9,088.00	89.20	182.50	8,394.38	741.54	-741.61	-200.70	768.28	195.14	423,325.66	592,346.35	
9,177.00	90.60	182.60	8,394.53	830.45	-830.52	-204.66	855.36	193.84	423,236.75	592,342.39	
9,266.00	91.10	182.50	8,393.21	919.35	-919.42	-208.62	942.79	192.78	423,147.85	592,338.43	
9,355.00	89.30	182.30	8,392.90	1,008.26	-1,008.34	-212.34	1,030.45	191.89	423,058.93	592,334.71	
9,445.00	89.30	182.10	8,394.00	1,098.19	-1,098.26	-215.80	1,119.26	191.12	422,969.01	592,331.25	
9,534.00	87.70	181.20	8,396.33	1,187.12	-1,187.19	-218.36	1,207.11	190.42	422,880.08	592,328.69	
9,624.00	87.70	180.60	8,399.94	1,277.03	-1,277.11	-219.77	1,295.88	189.76	422,790.16	592,327.28	
9,713.00	88.10	180.40	8,403.20	1,365.97	-1,366.05	-220.55	1,383.73	189.17	422,701.22	592,326.50	
9,803.00	88.10	180.40	8,406.19	1,455.92	-1,455.99	-221.18	1,472.70	188.64	422,611.28	592,325.87	
9,892.00	88.10	180.00	8,409.14	1,544.87	-1,544.94	-221.49	1,560.74	188.16	422,522.33	592,325.56	
9,981.00	87.90	179.50	8,412.25	1,633.81	-1,633.89	-221.10	1,648.78	187.71	422,433.38	592,325.95	
10,071.00	89.60	179.90	8,414.21	1,723.79	-1,723.86	-220.63	1,737.92	187.29	422,343.41	592,326.42	
10,160.00	90.90	180.00	8,413.82	1,812.78	-1,812.86	-220.55	1,826.23	186.94	422,254.41	592,326.50	
10,249.00	91.00	179.90	8,412.35	1,901.77	-1,901.85	-220.47	1,914.58	186.61	422,165.42	592,326.58	
10,338.00	91.50	179.90	8,410.40	1,990.75	-1,990.83	-220.32	2,002.98	186.32	422,076.44	592,326.73	
10,428.00	91.60	179.20	8,407.97	2,080.71	-2,080.79	-219.61	2,092.35	186.02	421,986.48	592,327.44	
10,517.00	91.90	179.10	8,405.25	2,169.66	-2,169.74	-218.29	2,180.69	185.75	421,897.53	592,328.76	
10,607.00	90.60	179.80	8,403.29	2,259.63	-2,259.71	-217.43	2,270.15	185.50	421,807.56	592,329.62	
10,696.00	90.50	180.10	8,402.43	2,348.63	-2,348.71	-217.35	2,358.74	185.29	421,718.56	592,329.70	
10,786.00	89.10	180.00	8,402.75	2,438.63	-2,438.70	-217.43	2,448.38	185.09	421,628.57	592,329.62	
10,875.00	89.10	179.40	8,404.15	2,527.61	-2,527.69	-216.96	2,536.98	184.91	421,539.58	592,330.09	
10,964.00	89.30	179.90	8,405.39	2,616.60	-2,616.68	-216.42	2,625.61	184.73	421,450.59	592,330.63	
11,054.00	89.30	179.70	8,406.49	2,706.60	-2,706.67	-216.11	2,715.29	184.56	421,360.60	592,330.94	
11,143.00	89.20	179.30	8,407.65	2,795.59	-2,795.66	-215.33	2,803.94	184.40	421,271.61	592,331.72	
11,232.00	89.40	178.70	8,408.74	2,884.57	-2,884.64	-213.78	2,892.55	184.24	421,182.63	592,333.27	
11,322.00	89.10	178.20	8,409.92	2,974.53	-2,974.60	-211.34	2,982.10	184.06	421,092.67	592,335.71	



Professional Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well SB Fee #5H
Project:	Eddy County, NM	TVD Reference:	Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
Site:	Whistle Pig 1	MD Reference:	Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
Well:	SB Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyros/MWD 504'-13235' PTB 13295'	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)	
11,411.00	89.00	177.60	8,411.39	3,063.45	-3,063.53	-208.08	3,070.59	183.89	421,003.74	592,338.97	
11,501.00	89.30	177.60	8,412.73	3,153.37	-3,153.44	-204.31	3,160.05	183.71	420,913.83	592,342.74	
11,590.00	90.20	178.90	8,413.12	3,242.32	-3,242.39	-201.59	3,248.65	183.56	420,824.88	592,345.46	
11,679.00	91.00	181.10	8,412.19	3,331.31	-3,331.38	-201.59	3,337.48	183.46	420,735.89	592,345.46	
11,768.00	91.50	181.40	8,410.24	3,420.27	-3,420.34	-203.54	3,426.39	183.41	420,646.93	592,343.51	
11,857.00	91.80	181.40	8,407.68	3,509.20	-3,509.28	-205.71	3,515.30	183.35	420,557.99	592,341.34	
11,947.00	92.00	181.20	8,404.70	3,599.13	-3,599.20	-207.75	3,605.19	183.30	420,468.07	592,339.30	
12,036.00	89.00	181.90	8,403.92	3,688.08	-3,688.16	-210.16	3,694.14	183.26	420,379.11	592,336.89	
12,125.00	88.40	181.00	8,405.94	3,777.03	-3,777.10	-212.41	3,783.07	183.22	420,290.17	592,334.64	
12,214.00	89.10	181.40	8,407.88	3,865.99	-3,866.06	-214.27	3,872.00	183.17	420,201.21	592,332.78	
12,304.00	91.70	182.60	8,407.25	3,955.92	-3,956.00	-217.41	3,961.97	183.15	420,111.27	592,329.64	
12,394.00	90.10	182.30	8,405.84	4,045.82	-4,045.90	-221.26	4,051.94	183.13	420,021.37	592,325.79	
12,483.00	89.10	181.20	8,406.46	4,134.77	-4,134.85	-223.98	4,140.91	183.10	419,932.42	592,323.07	
12,572.00	89.10	180.90	8,407.86	4,223.75	-4,223.83	-225.61	4,229.85	183.06	419,843.44	592,321.44	
12,661.00	89.40	180.70	8,409.02	4,312.73	-4,312.81	-226.85	4,318.77	183.01	419,754.46	592,320.20	
12,751.00	89.60	180.80	8,409.81	4,402.72	-4,402.80	-228.03	4,408.70	182.96	419,664.47	592,319.02	
12,840.00	90.10	180.30	8,410.04	4,491.71	-4,491.79	-228.88	4,497.62	182.92	419,575.48	592,318.17	
12,929.00	90.00	180.20	8,409.96	4,580.71	-4,580.79	-229.27	4,586.53	182.87	419,486.48	592,317.78	
13,018.00	90.30	179.90	8,409.73	4,669.71	-4,669.79	-229.35	4,675.42	182.81	419,397.48	592,317.70	
13,108.00	90.20	179.20	8,409.34	4,759.71	-4,759.79	-228.64	4,765.28	182.75	419,307.48	592,318.41	
13,197.00	89.80	178.50	8,409.34	4,848.69	-4,848.77	-226.86	4,854.07	182.68	419,218.50	592,320.19	
13,235.00	89.70	178.10	8,409.50	4,886.67	-4,886.75	-225.73	4,891.96	182.64	419,180.52	592,321.32	
Last Survey: 13235'MD, 8410'TVD - [WhistleTB#5H]LTP/BHL											
13,295.00	89.70	178.10	8,409.82	4,946.64	-4,946.72	-223.74	4,951.78	182.59	419,120.55	592,323.31	
PTB: 13295'MD, 8410'TVD											

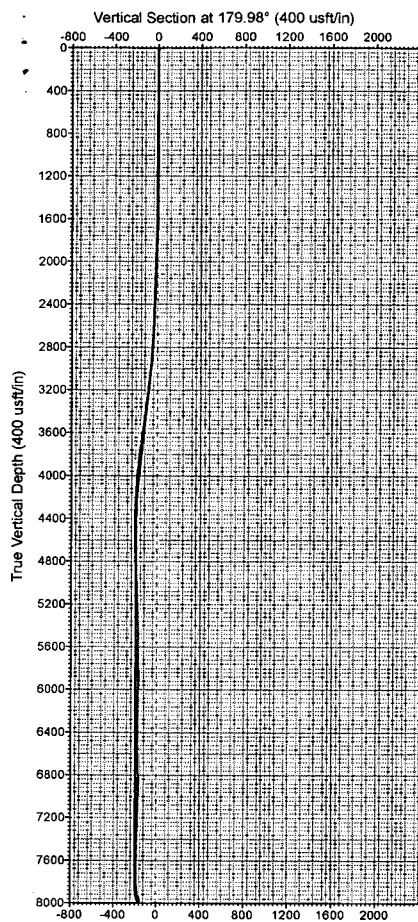


Professional Directional
Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well SB Fee #5H
Project:	Eddy County, NM	TVD Reference:	Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
Site:	Whistle Pig 1	MD Reference:	Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))
Well:	SB Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyros/MWD 504'-13235' PTB 13295'	Database:	WellPlanner1

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
13,235.00	8,409.50	-4,886.75	-225.73	Last Survey: 13235'MD, 8410'TVD
13,295.00 ✓	8,409.82	-4,946.72	-223.74	PTB: 13295'MD, 8410'TVD ✓



Marathon Oil Corporation

Marathon Oil
Eddy County, NM
Whistle Pig 1
SB Fee #5H
Plan #4
GL: 2912' + KB: 25' (PD594)

US State Plane 1927 (Exact solution)
 NAD 1927 (NADCON CONUS)
 Clarke 1866
 New Mexico East: 3001
 Mean Sea Level

RKB Elevation: Well @ 2937.00usft (GL: 2912' + KB: 25' (PD594))

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	424067.27	592547.05	32.165524	-104.034251	

SECTION DETAILS

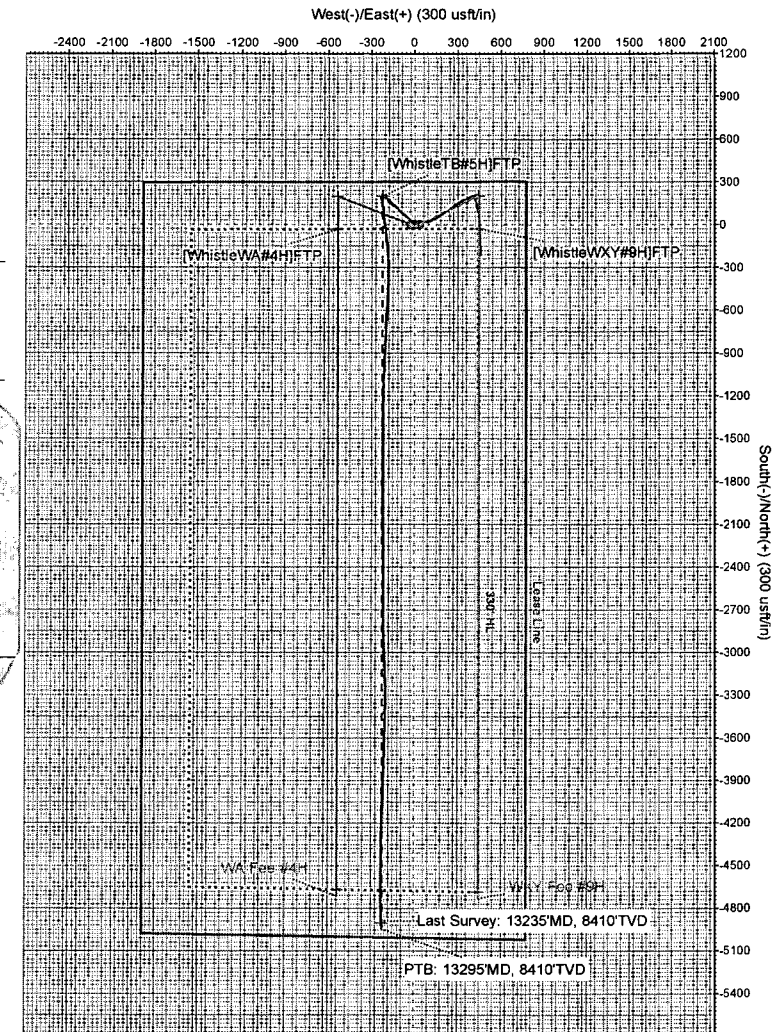
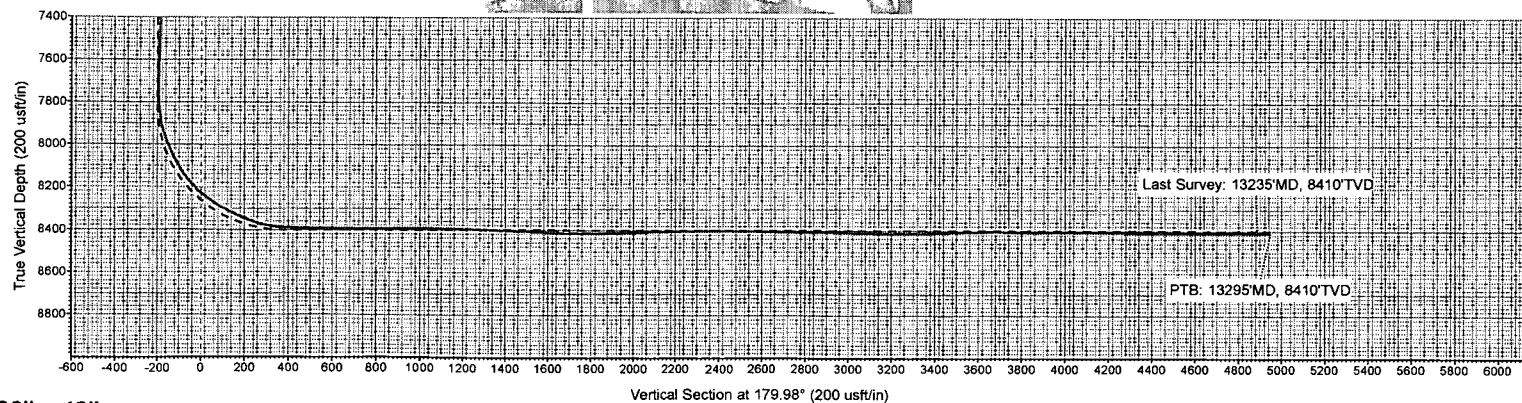
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00
3	1650.00	3.00	311.53	1649.93	0.00	2.60	2.00	-2.60
4	2701.51	3.00	311.53	2700.00	39.09	-44.14	0.00	-39.11
5	3051.36	10.00	311.53	3047.39	65.33	-73.76	2.00	-65.35
6	3984.52	10.00	311.53	3946.68	170.44	-192.42	0.00	-170.51
7	4484.37	0.00	0.00	4444.00	199.28	-224.98	2.00	-199.36
8	7847.37	0.00	0.00	7827.00	199.28	-224.98	0.00	-199.36
9	8747.37	90.00	179.98	8399.96	-373.67	-224.77	10.00	373.59
10	13277.09	90.00	179.98	8400.00	-4903.40	-223.15	0.00	4903.32
11	13322.09	90.00	179.98	8400.00	-4948.40	-223.13	0.00	4948.32

WELLBORE/TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[WhistleTB#5H]FTP	7827.00	199.28	-224.98	424266.55	592322.07
[WhistleTB#5H]LTP/BHL	8400.00	-4903.40	-223.15	419163.87	592323.90



Target Line: 8400' TVD @ 0' VS: 90° INC



Azimuths to Grid North
 True North: -0.16°
 Magnetic North: 6.89°
 Magnetic Field
 Strength: 47920.4nT
 Dip Angle: 59.30°
 Date: 2/12/2019
 Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): 6.89°

Declination (M to T): 7.05° East