



Marathon Oil

Marathon Oil

Eddy County, NM

Whistle Pig 1

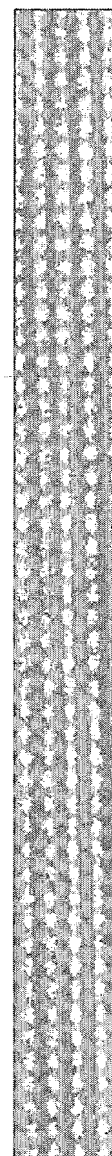
WA Fee #4H

OH

Design: Gyro/MWD 505'-14537' PTB 14593'

Survey Report

28 February, 2019



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WA Fee #4H
Project:	Eddy County, NM	TVD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Site:	Whistle Pig 1	MD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Well:	WA Fee #4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyro/MWD 505'-14537' PTB 14593'	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	Latitude:	32.165525
From:	Map	Easting:	592,517.05	usft	Longitude:	-104.034348
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16	"	Grid Convergence:	0.16 °

Well	WA Fee #4H					
Well Position	+N/-S	0.00 usft	Northing:	424,067.27 usft	Latitude:	32.165525
	+E/-W	0.00 usft	Easting:	592,517.05 usft	Longitude:	-104.034348
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	2,913.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/1/2019	7.05	59.90	47,920.30

Design		Gyro/MWD 505'-14537' PTB 14593'			
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	179.99	

Company: Marathon Oil
Project: Eddy County, NM
Site: Whistle Pig 1
Well: WA Fee #4H
Wellbore: OH
Design: Gyro/MWD 505'-1453' PTB 14593'

Local Co-ordinate Reference: Well WA Fee #4H
TVD Reference: Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
MD Reference: Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey Program Date 2/28/2019

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
145.00	415.00	Survey #1 (OH)	GYRO-NS-CT	OWSG XYZ Accel with XY Static and Continuous Gyro
505.00	14,593.00	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	424,067.27	592,517.05
[WhistleWA#4H]FTP										
145.00	0.90	28.83	144.99	-1.00	1.00	0.55	1.14	28.83	424,068.27	592,517.60
240.00	0.20	95.83	239.99	-1.63	1.63	1.07	1.96	33.31	424,068.90	592,518.12
334.00	0.80	32.83	333.99	-2.17	2.17	1.59	2.69	36.29	424,069.44	592,518.64
415.00	0.70	54.83	414.98	-2.93	2.93	2.30	3.73	38.18	424,070.20	592,519.35
505.00	0.40	53.80	504.97	-3.43	3.43	3.01	4.56	41.23	424,070.70	592,520.06
597.00	0.80	17.50	596.97	-4.23	4.23	3.46	5.47	39.25	424,071.50	592,520.51
688.00	0.90	0.00	687.96	-5.55	5.55	3.65	6.65	33.31	424,072.82	592,520.70
778.00	0.80	10.60	777.95	-6.88	6.88	3.77	7.84	28.70	424,074.15	592,520.82
869.00	1.20	359.20	868.94	-8.46	8.46	3.87	9.30	24.59	424,075.73	592,520.92
961.00	1.30	337.60	960.91	-10.38	10.38	3.46	10.94	18.42	424,077.65	592,520.51
1,050.00	2.00	314.20	1,049.88	-12.40	12.40	1.96	12.55	8.98	424,079.67	592,519.01
1,139.00	2.90	301.50	1,138.80	-14.66	14.66	-1.07	14.70	355.81	424,081.93	592,515.98
1,229.00	2.90	308.40	1,228.68	-17.26	17.26	-4.80	17.92	344.47	424,084.53	592,512.25
1,318.00	2.60	300.90	1,317.58	-19.70	19.70	-8.30	21.37	337.16	424,086.97	592,508.75
1,407.00	2.40	291.30	1,406.50	-21.41	21.41	-11.76	24.43	331.22	424,088.68	592,505.29
1,496.00	2.20	297.30	1,495.42	-22.87	22.87	-15.02	27.36	326.71	424,090.14	592,502.03
1,586.00	2.70	288.70	1,585.34	-24.35	24.34	-18.56	30.61	322.68	424,091.61	592,498.49
1,675.00	3.30	281.60	1,674.22	-25.54	25.53	-23.06	34.40	317.92	424,092.80	592,493.99
1,765.00	3.20	288.20	1,764.07	-26.84	26.84	-27.98	38.77	313.81	424,094.11	592,489.07

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WA Fee #4H
Project:	Eddy County, NM	TVD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Site:	Whistle Pig 1	MD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Well:	WA Fee #4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyro/MWD 505'-14537' PTB 14593'	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)	
1,854.00	2.70	293.80	1,852.96	-28.46	28.46	-32.26	43.02	311.42	424,095.73	592,484.79	
1,943.00	2.30	286.70	1,941.87	-29.82	29.82	-35.89	46.66	309.72	424,097.09	592,481.16	
2,033.00	1.20	242.40	2,031.83	-29.91	29.90	-38.45	48.71	307.87	424,097.17	592,478.60	
2,122.00	1.40	225.30	2,120.81	-28.71	28.70	-40.05	49.27	305.63	424,095.97	592,477.00	
2,211.00	2.00	257.20	2,209.77	-27.60	27.59	-42.34	50.54	303.10	424,094.86	592,474.71	
2,300.00	2.00	244.70	2,298.72	-26.59	26.59	-45.26	52.49	300.43	424,093.86	592,471.79	
2,390.00	2.20	237.30	2,388.66	-24.99	24.98	-48.13	54.23	297.43	424,092.25	592,468.92	
2,479.00	1.60	208.30	2,477.61	-22.97	22.97	-50.16	55.16	294.60	424,090.24	592,466.89	
2,568.00	1.70	250.40	2,566.58	-21.44	21.43	-51.99	56.23	292.40	424,088.70	592,465.06	
2,596.00	2.00	258.40	2,594.56	-21.20	21.19	-52.86	56.95	291.85	424,088.46	592,464.19	
2,750.00	2.20	267.30	2,748.46	-20.52	20.51	-58.44	61.94	289.34	424,087.78	592,458.61	
2,840.00	3.70	281.30	2,838.34	-21.01	21.00	-63.02	66.42	288.43	424,088.27	592,454.03	
2,930.00	5.90	289.50	2,928.02	-23.12	23.11	-70.23	73.93	288.22	424,090.38	592,446.82	
3,019.00	8.20	295.30	3,016.34	-27.37	27.35	-80.28	84.81	288.82	424,094.62	592,436.77	
3,109.00	10.60	298.60	3,105.13	-34.08	34.06	-93.35	99.37	290.04	424,101.33	592,423.70	
3,198.00	11.20	298.40	3,192.52	-42.11	42.09	-108.14	116.04	291.27	424,109.36	592,408.91	
3,287.00	11.30	298.30	3,279.81	-50.36	50.33	-123.42	133.29	292.19	424,117.60	592,393.63	
3,377.00	11.60	296.80	3,368.02	-58.62	58.59	-139.26	151.09	292.82	424,125.86	592,377.79	
3,466.00	11.90	296.30	3,455.15	-66.72	66.69	-155.47	169.17	293.22	424,133.96	592,361.58	
3,555.00	11.50	295.60	3,542.30	-74.62	74.59	-171.70	187.20	293.48	424,141.86	592,345.35	
3,645.00	10.90	294.60	3,630.59	-82.04	82.01	-187.53	204.68	293.62	424,149.28	592,329.52	
3,734.00	11.00	294.00	3,717.97	-89.00	88.97	-202.94	221.58	293.67	424,156.24	592,314.11	
3,823.00	11.40	294.80	3,805.27	-96.15	96.11	-218.68	238.87	293.73	424,163.38	592,298.37	
3,913.00	11.90	293.40	3,893.42	-103.57	103.53	-235.27	257.04	293.75	424,170.80	592,281.78	
4,002.00	12.50	291.80	3,980.41	-110.79	110.75	-252.63	275.84	293.67	424,178.02	592,264.42	
4,092.00	12.40	291.70	4,068.29	-117.99	117.94	-270.65	295.23	293.55	424,185.21	592,246.40	
4,181.00	12.40	291.70	4,155.22	-125.06	125.00	-288.41	314.34	293.43	424,192.27	592,228.64	

Company: Marathon Oil
Project: Eddy County, NM
Site: Whistle Pig 1
Well: WA Fee #4H
Wellbore: OH
Design: Gyro/MWD 505'-14537' PTB 14593'

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

Well WA Fee #4H
 Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
 Well @ 2938.00usft (GL: 2913' + 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)	
4,271.00	12.40	290.30	4,243.12	-131.98	131.93	-306.45	333.65	293.29	424,199.20	592,210.60	
4,360.00	12.50	289.20	4,330.03	-138.47	138.41	-324.51	352.80	293.10	424,205.68	592,192.54	
4,450.00	12.70	288.80	4,417.86	-144.86	144.80	-343.07	372.38	292.88	424,212.07	592,173.98	
4,539.00	13.10	287.90	4,504.61	-151.12	151.06	-361.93	392.19	292.65	424,218.33	592,155.12	
4,628.00	11.50	284.10	4,591.57	-156.39	156.32	-380.14	411.02	292.35	424,223.59	592,136.91	
4,718.00	10.20	280.60	4,679.96	-160.04	159.97	-396.67	427.71	291.96	424,227.24	592,120.38	
4,807.00	8.90	272.10	4,767.73	-161.74	161.67	-411.30	441.93	291.46	424,228.94	592,105.75	
4,896.00	8.00	264.40	4,855.76	-161.39	161.32	-424.34	453.97	290.82	424,228.59	592,092.71	
4,985.00	6.70	275.10	4,944.03	-161.25	161.18	-435.68	464.54	290.30	424,228.45	592,081.37	
5,074.00	5.70	295.30	5,032.52	-163.61	163.53	-444.85	473.95	290.18	424,230.80	592,072.20	
5,164.00	5.60	308.40	5,122.09	-168.25	168.17	-452.33	482.58	290.39	424,235.44	592,064.72	
5,253.00	5.30	305.60	5,210.69	-173.34	173.26	-459.08	490.68	290.68	424,240.53	592,057.97	
5,342.00	5.00	305.30	5,299.33	-177.97	177.89	-465.58	498.41	290.91	424,245.16	592,051.47	
5,432.00	5.30	305.40	5,388.96	-182.65	182.56	-472.17	506.24	291.14	424,249.83	592,044.88	
5,521.00	5.20	291.80	5,477.59	-186.53	186.44	-479.27	514.26	291.26	424,253.71	592,037.78	
5,610.00	5.40	288.90	5,566.21	-189.38	189.30	-486.98	522.47	291.24	424,256.57	592,030.07	
5,699.00	5.30	287.30	5,654.83	-191.96	191.88	-494.86	530.76	291.19	424,259.15	592,022.19	
5,788.00	4.00	291.00	5,743.53	-194.30	194.21	-501.68	537.96	291.16	424,261.48	592,015.37	
5,877.00	1.90	293.10	5,832.41	-195.99	195.90	-505.94	542.54	291.17	424,263.17	592,011.11	
5,967.00	0.90	297.30	5,922.38	-196.90	196.81	-507.94	544.74	291.18	424,264.08	592,009.11	
6,056.00	1.00	298.40	6,011.37	-197.59	197.50	-509.25	546.20	291.20	424,264.77	592,007.80	
6,145.00	0.60	24.80	6,100.36	-198.38	198.30	-509.73	546.94	291.26	424,265.57	592,007.32	
6,234.00	0.70	54.00	6,189.36	-199.13	199.04	-509.10	546.62	291.35	424,266.31	592,007.95	
6,324.00	0.50	50.20	6,279.35	-199.70	199.61	-508.35	546.14	291.44	424,266.88	592,008.70	
6,413.00	0.50	38.40	6,368.35	-200.25	200.17	-507.81	545.84	291.51	424,267.44	592,009.24	
6,502.00	1.00	50.80	6,457.34	-201.05	200.96	-506.97	545.35	291.62	424,268.23	592,010.08	
6,591.00	1.40	50.20	6,546.32	-202.24	202.15	-505.53	544.45	291.80	424,269.42	592,011.52	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WA Fee #4H
Project:	Eddy County, NM	TVD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Site:	Whistle Pig 1	MD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Well:	WA Fee #4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyro/MWD 505'-14537' PTB 14593'	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)	
6,681.00	1.50	50.00	6,636.29	-203.70	203.61	-503.78	543.37	292.01	424,270.88	592,013.27	
6,770.00	1.60	58.10	6,725.26	-205.10	205.01	-501.84	542.10	292.22	424,272.28	592,015.21	
6,859.00	1.80	75.90	6,814.22	-206.10	206.01	-499.43	540.25	292.42	424,273.28	592,017.62	
6,949.00	2.60	63.10	6,904.15	-207.36	207.28	-496.23	537.79	292.67	424,274.55	592,020.82	
7,038.00	2.00	45.20	6,993.08	-209.37	209.29	-493.33	535.89	292.99	424,276.56	592,023.72	
7,128.00	1.50	6.10	7,083.04	-211.65	211.56	-492.09	535.64	293.26	424,278.83	592,024.96	
7,217.00	1.10	356.60	7,172.02	-213.66	213.58	-492.02	536.37	293.46	424,280.85	592,025.03	
7,307.00	2.10	11.90	7,261.99	-216.14	216.05	-491.73	537.10	293.72	424,283.32	592,025.32	
7,396.00	0.70	14.10	7,350.96	-218.26	218.17	-491.26	537.53	293.95	424,285.44	592,025.79	
7,486.00	0.80	168.00	7,440.95	-218.18	218.09	-491.00	537.26	293.95	424,285.36	592,026.05	
7,575.00	0.40	212.30	7,529.95	-217.31	217.22	-491.03	536.94	293.86	424,284.49	592,026.02	
7,664.00	0.60	9.60	7,618.95	-217.50	217.42	-491.12	537.10	293.88	424,284.69	592,025.93	
7,753.00	0.50	215.10	7,707.95	-217.65	217.56	-491.27	537.29	293.89	424,284.83	592,025.78	
7,843.00	0.20	118.80	7,797.94	-217.25	217.16	-491.36	537.21	293.84	424,284.43	592,025.69	
7,932.00	0.80	160.90	7,886.94	-216.59	216.50	-491.02	536.63	293.79	424,283.77	592,026.03	
8,021.00	0.90	201.30	7,975.93	-215.35	215.26	-491.07	536.18	293.67	424,282.53	592,025.98	
8,110.00	1.30	192.90	8,064.92	-213.71	213.63	-491.55	535.96	293.49	424,280.90	592,025.50	
8,200.00	2.50	171.80	8,154.87	-210.78	210.69	-491.50	534.75	293.20	424,277.96	592,025.55	
8,290.00	2.40	202.90	8,244.79	-207.10	207.01	-491.95	533.73	292.82	424,274.28	592,025.10	
8,379.00	2.50	222.20	8,333.71	-203.94	203.86	-493.98	534.39	292.43	424,271.13	592,023.07	
8,468.00	1.50	241.20	8,422.65	-201.94	201.86	-496.30	535.78	292.13	424,269.13	592,020.75	
8,557.00	2.10	251.60	8,511.61	-200.87	200.78	-498.87	537.76	291.92	424,268.05	592,018.18	
8,647.00	2.80	254.60	8,601.53	-199.77	199.68	-502.55	540.77	291.67	424,266.95	592,014.50	
8,736.00	2.90	240.20	8,690.42	-198.07	197.98	-506.60	543.92	291.35	424,265.25	592,010.45	
8,826.00	2.70	238.60	8,780.31	-195.83	195.75	-510.39	546.64	290.98	424,263.02	592,006.66	
8,915.00	2.50	237.70	8,869.22	-193.71	193.62	-513.82	549.09	290.65	424,260.89	592,003.23	
9,005.00	2.10	262.30	8,959.15	-192.44	192.35	-517.11	551.73	290.40	424,259.62	591,999.94	



Professional Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WA Fee #4H
Project:	Eddy County, NM	TVD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Site:	Whistle Pig 1	MD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Well:	WA Fee #4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyro/MWD 505'-14537' PTB 14593'	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)	
9,094.00	1.90	271.50	9,048.09	-192.26	192.17	-520.20	554.56	290.27	424,259.44	591,996.85	
9,183.00	1.90	272.20	9,137.04	-192.35	192.26	-523.15	557.36	290.18	424,259.53	591,993.90	
9,272.00	1.90	270.60	9,226.00	-192.43	192.33	-526.10	560.16	290.08	424,259.60	591,990.95	
9,356.00	0.50	158.00	9,309.98	-192.10	192.01	-527.36	561.22	290.01	424,259.28	591,989.69	
9,445.00	6.50	167.90	9,398.77	-186.81	186.72	-526.15	558.30	289.54	424,253.99	591,990.90	
9,451.67	7.52	168.55	9,405.39	-186.01	185.92	-525.99	557.88	289.47	424,253.19	591,991.06	
[WhistleWA#4H]KOP											
9,535.00	20.30	171.20	9,486.11	-166.30	166.21	-522.68	548.47	287.64	424,233.48	591,994.37	
9,624.00	28.90	177.30	9,566.97	-129.49	129.40	-519.30	535.18	283.99	424,196.67	591,997.75	
9,714.00	36.10	175.20	9,642.83	-81.28	81.19	-516.05	522.40	278.94	424,148.46	592,001.00	
9,803.00	42.80	177.80	9,711.52	-24.87	24.78	-512.69	513.29	272.77	424,092.05	592,004.36	
9,892.00	51.70	180.30	9,771.88	40.41	-40.49	-511.71	513.31	265.48	424,026.78	592,005.34	
9,982.00	60.70	182.40	9,821.90	115.09	-115.18	-513.55	526.30	257.36	423,952.09	592,003.50	
10,072.00	73.40	177.80	9,856.93	197.77	-197.85	-513.53	550.33	248.93	423,869.42	592,003.52	
10,163.00	85.10	178.40	9,873.88	286.96	-287.05	-510.58	585.74	240.66	423,780.22	592,006.47	
10,257.00	87.10	180.20	9,880.27	380.73	-380.82	-509.44	636.04	233.22	423,686.45	592,007.61	
10,351.00	88.80	179.00	9,883.63	474.66	-474.75	-508.78	695.88	226.98	423,592.52	592,008.27	
10,445.00	88.10	179.10	9,886.18	568.62	-568.70	-507.23	762.04	221.73	423,498.57	592,009.82	
10,539.00	88.20	179.70	9,889.21	662.56	-662.65	-506.24	833.90	217.38	423,404.62	592,010.81	
10,633.00	88.60	180.00	9,891.84	756.52	-756.61	-506.00	910.22	213.77	423,310.66	592,011.05	
10,726.00	90.20	178.60	9,892.81	849.51	-849.60	-504.86	988.28	210.72	423,217.67	592,012.19	
10,821.00	92.00	177.80	9,890.99	944.44	-944.53	-501.88	1,069.58	207.98	423,122.74	592,015.17	
10,915.00	90.90	177.70	9,888.61	1,038.34	-1,038.42	-498.19	1,151.74	205.63	423,028.85	592,018.86	
11,009.00	90.00	177.60	9,887.87	1,132.25	-1,132.34	-494.33	1,235.54	203.58	422,934.93	592,022.72	
11,103.00	90.50	178.60	9,887.46	1,226.20	-1,226.29	-491.22	1,321.01	201.83	422,840.98	592,025.83	
11,197.00	90.30	178.50	9,886.80	1,320.17	-1,320.25	-488.84	1,407.85	200.32	422,747.02	592,028.21	
11,290.00	92.30	179.20	9,884.69	1,413.12	-1,413.20	-486.97	1,494.75	199.01	422,654.07	592,030.08	



Professional Directional Survey Report



Company:	Marathon Oil	Local Co-ordinate Reference:	Well WA Fee #4H
Project:	Eddy County, NM	TVD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Site:	Whistle Pig 1	MD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Well:	WA Fee #4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyro/MWD 505'-14537' PTB 14593'	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)	
11,384.00	91.70	180.30	9,881.41	1,507.06	-1,507.14	-486.56	1,583.74	197.89	422,560.13	592,030.49	
11,479.00	91.70	181.20	9,878.59	1,602.01	-1,602.09	-487.80	1,674.71	196.93	422,465.18	592,029.25	
11,573.00	88.40	181.30	9,878.51	1,695.97	-1,696.06	-489.86	1,765.38	196.11	422,371.21	592,027.19	
11,667.00	88.00	181.60	9,881.47	1,789.90	-1,789.98	-492.23	1,856.43	195.38	422,277.29	592,024.82	
11,761.00	87.30	181.90	9,885.32	1,883.77	-1,883.86	-495.10	1,947.83	194.73	422,183.41	592,021.95	
11,855.00	89.30	179.90	9,888.11	1,977.71	-1,977.80	-496.58	2,039.18	194.09	422,089.47	592,020.47	
11,950.00	88.80	179.60	9,889.68	2,072.69	-2,072.78	-496.16	2,131.34	193.46	421,994.49	592,020.89	
12,043.00	88.70	180.50	9,891.71	2,165.67	-2,165.76	-496.24	2,221.88	192.91	421,901.51	592,020.81	
12,137.00	88.90	179.20	9,893.68	2,259.65	-2,259.74	-496.00	2,313.53	192.38	421,807.53	592,021.05	
12,232.00	89.40	179.70	9,895.09	2,354.63	-2,354.72	-495.08	2,406.20	191.87	421,712.55	592,021.97	
12,326.00	93.10	180.10	9,893.04	2,448.59	-2,448.68	-494.92	2,498.20	191.43	421,618.59	592,022.13	
12,419.00	91.00	179.40	9,889.71	2,541.53	-2,541.61	-494.51	2,589.28	191.01	421,525.66	592,022.54	
12,513.00	90.00	179.20	9,888.89	2,635.52	-2,635.60	-493.37	2,681.38	190.60	421,431.67	592,023.68	
12,608.00	89.60	179.90	9,889.22	2,730.51	-2,730.60	-492.62	2,774.68	190.23	421,336.67	592,024.43	
12,702.00	90.80	180.60	9,888.90	2,824.51	-2,824.59	-493.03	2,867.30	189.90	421,242.68	592,024.02	
12,796.00	91.50	181.30	9,887.01	2,918.48	-2,918.56	-494.59	2,960.17	189.62	421,148.71	592,022.46	
12,890.00	90.90	181.50	9,885.04	3,012.43	-3,012.51	-496.88	3,053.22	189.37	421,054.76	592,020.17	
12,983.00	92.80	182.50	9,882.04	3,105.31	-3,105.40	-500.13	3,145.42	189.15	420,961.87	592,016.92	
13,077.00	91.10	181.00	9,878.84	3,199.21	-3,199.30	-503.00	3,238.60	188.93	420,867.97	592,014.05	
13,171.00	87.70	180.60	9,879.82	3,293.18	-3,293.27	-504.31	3,331.66	188.71	420,774.00	592,012.74	
13,265.00	88.20	181.70	9,883.19	3,387.10	-3,387.19	-506.19	3,424.80	188.50	420,680.08	592,010.86	
13,360.00	89.30	182.30	9,885.26	3,482.02	-3,482.11	-509.51	3,519.18	188.32	420,585.16	592,007.54	
13,454.00	89.60	182.60	9,886.16	3,575.93	-3,576.02	-513.53	3,612.70	188.17	420,491.25	592,003.52	
13,549.00	88.60	182.90	9,887.65	3,670.80	-3,670.89	-518.08	3,707.27	188.03	420,396.38	591,998.97	
13,643.00	85.70	181.30	9,892.33	3,764.61	-3,764.70	-521.52	3,800.65	187.89	420,302.57	591,995.53	
13,737.00	86.90	179.50	9,898.39	3,858.41	-3,858.50	-522.18	3,893.67	187.71	420,208.77	591,994.87	
13,831.00	90.20	180.10	9,900.77	3,952.36	-3,952.45	-521.85	3,986.75	187.52	420,114.82	591,995.20	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WA Fee #4H
Project:	Eddy County, NM	TVD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Site:	Whistle Pig 1	MD Reference:	Well @ 2938.00usft (GL: 2913' + KB: 25' (PD594))
Well:	WA Fee #4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Gyro/MWD 505'-14537' PTB 14593'	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)
13,925.00	90.30	177.90	9,900.36	4,046.34	-4,046.43	-520.21	4,079.73	187.33	420,020.84	591,996.84
14,020.00	90.50	178.60	9,899.70	4,141.29	-4,141.38	-517.31	4,173.57	187.12	419,925.89	591,999.74
14,114.00	90.70	179.60	9,898.71	4,235.28	-4,235.37	-515.83	4,266.66	186.94	419,831.90	592,001.22
14,208.00	88.90	178.90	9,899.04	4,329.26	-4,329.35	-514.60	4,359.83	186.78	419,737.92	592,002.45
14,303.00	90.30	176.10	9,899.71	4,424.16	-4,424.25	-510.46	4,453.60	186.58	419,643.02	592,006.59
14,397.00	91.10	175.20	9,898.56	4,517.88	-4,517.97	-503.33	4,545.92	186.36	419,549.30	592,013.72
14,491.00	89.30	175.40	9,898.23	4,611.56	-4,611.65	-495.63	4,638.21	186.13	419,455.62	592,021.42
14,537.00	93.70	177.80	9,897.03	4,657.45	-4,657.54	-492.90	4,683.55	186.04	419,409.73	592,024.15
Last Survey: 14537'MD, 9897'TVD - [WhistleWA#4H]LTP/BHL										
14,593.00✓	93.70	177.80	9,893.41 ✓	4,713.29	-4,713.38	-490.76	4,738.86	185.94	419,353.89	592,026.29
PTB: 14593'MD, 9893'TVD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
14,537.00	9,897.03	-4,657.54	-492.90	Last Survey: 14537'MD, 9897'TVD	
14,593.00	9,893.41	-4,713.38	-490.76	PTB: 14593'MD, 9893'TVD	

Marathon Oil Corporation

Marathon Oil
Eddy County, NM
Whistle Pig 1
WA Fee #4H
Plan #2
GL: 2913' + 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 @ 2938.00usft (GL: 2913' + KB: 25' (PD594))

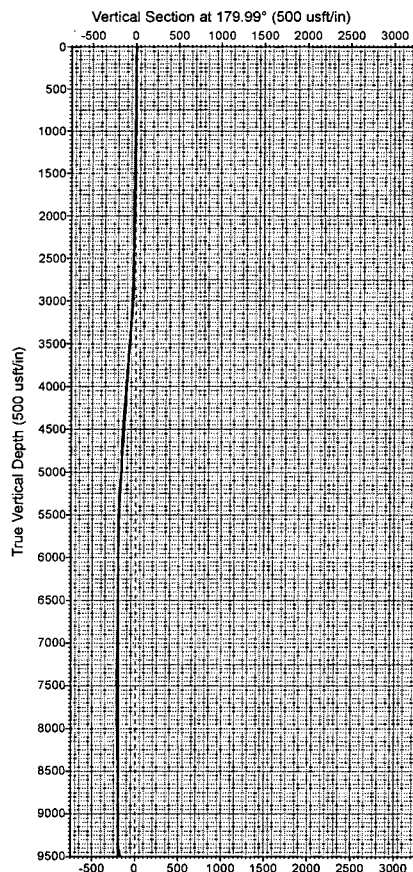
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Spot
0.00	0.00	424067.27	592517.05	32.165525	-104.034348	

SECTION DETAILS

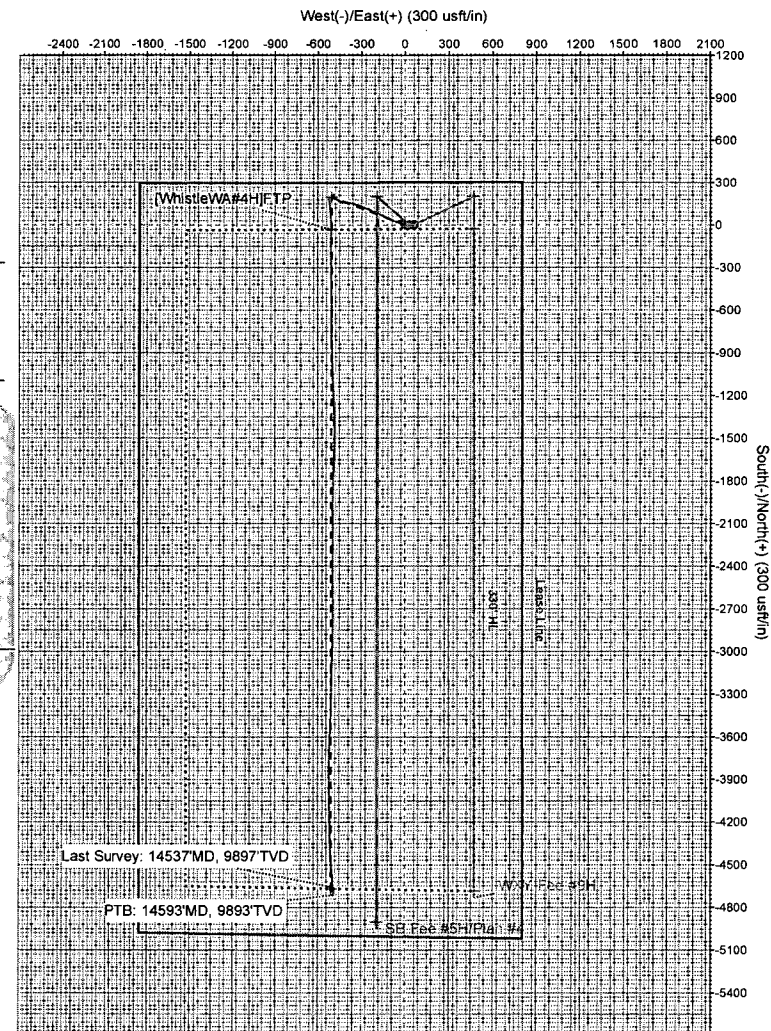
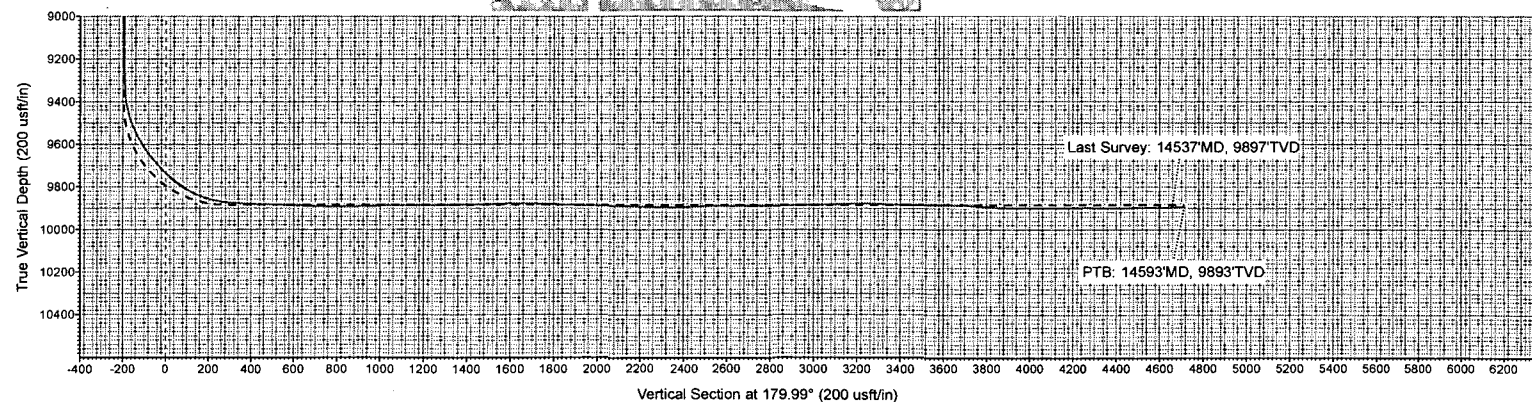
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00
3	1350.00	3.00	291.33	1349.93	1.43	-3.66	2.00	-1.43
4	2701.92	3.00	291.33	2700.00	27.16	-69.56	0.00	-27.18
5	3051.79	10.00	291.33	3047.40	41.56	-106.43	2.00	-41.58
6	5278.36	10.00	291.33	5240.17	182.18	-466.48	0.00	-182.26
7	5778.23	0.00	0.00	5737.50	198.00	-507.00	2.00	-198.09
8	9448.23	0.00	0.00	9407.50	198.00	-507.00	0.00	-198.09
9	10198.22	90.00	179.99	9884.96	-279.46	-506.90	12.00	279.37
10	14587.08	90.00	179.99	9885.00	-4668.32	-506.01	0.00	4668.23
11	14632.08	90.00	179.99	9885.00	-4713.32	-506.00	0.00	4713.23

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[WhistleWA#4H]FTP	0.00	-31.87	-506.53	424035.40	592010.52
[WhistleWA#4H]KOP	9407.50	198.00	-507.00	424265.27	592010.05
[WhistleWA#4H]LTP/BHL	9885.00	-4668.32	-506.01	419398.95	592011.04



Target Line: 9885' TVD @ 0° VS: 90° INC



Azimuths to Grid North
True North: -0.16°
Magnetic North: 6.89°

Magnetic Field
Strength: 47920.3nT
Dip Angle: 59.50°
Date: 2/1/2019
Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): 6.89°

Declination (M to T): 7.05° East