



MARATHON OIL CORP.

**LEA COUNTY, NM (NAD-27)
COLIBRI FEDERAL 23-32-10
FB #20H**

#20H OH

Design: #20H OH (Actual)

HOBBS OCD

MAY 09 2019

Standard Survey Report

RECEIVED

15 October, 2018



Company:	MARATHON OIL CORP.	Local Co-ordinate Reference:	Site COLIBRI FEDERAL 23-32-10
Project:	LEA COUNTY, NM (NAD-27)	TVD Reference:	GE: 3708'+ KB= 26.5'= 3734.5' MSL @ 3734.50usft (H&P 498 (KB= 26.5'))
Site:	COLIBRI FEDERAL 23-32-10	MD Reference:	GE: 3708'+ KB= 26.5'= 3734.5' MSL @ 3734.50usft (H&P 498 (KB= 26.5'))
Well:	FB #20H	North Reference:	Grid
Wellbore:	#20H OH	Survey Calculation Method:	Minimum Curvature
Design:	#20H OH (Actual)	Database:	EDM 5000.1 Single User Db

Project	LEA COUNTY, NM (NAD-27)		
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	COLIBRI FEDERAL 23-32-10		
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Site Position:		Northing:	482,871.52 usft	Latitude:	32° 19' 32.65301 N
From:	Map	Easting:	707,780.82 usft	Longitude:	103° 39' 38.4442 W
Position Uncertainty:	0.00 usft	Slot Radius:	20 "	Grid Convergence:	0.36 °

Well	FB #20H				
Well Position	+N/-S	0.00 usft	Northing:	482,871.52 usft	Latitude: 32° 19' 32.65301 N
	+E/-W	0.00 usft	Easting:	707,780.82 usft	Longitude: 103° 39' 38.4442 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	3,734.50 usft	Ground Level: 3,708.00 usft

Wellbore	#20H OH				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/10/2018	6.83	60.08	48,063

Design	#20H OH (Actual)				
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Audit Notes:					
Version:	Actual	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	180.00

Survey Program		Date 10/15/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
242.00	14,552.00	LEAM MWD Surveys 242' MD- 14,552' MI	LEAM MWD+HDGM	MWD+HDGM	
14,607.00	14,607.00	Projected to T.D.- 14,607' MD- 9,972.77' T	Project	Projection	

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
242.00	0.31	163.53	242.00	-0.63	0.19	0.63	0.13	0.13	0.00
LEAM MWD Survey - 242' MD/TVD									
333.00	0.26	176.36	333.00	-1.07	0.27	1.07	0.09	-0.05	14.10
424.00	0.48	161.86	424.00	-1.64	0.40	1.64	0.26	0.24	-15.93
515.00	0.66	174.34	514.99	-2.52	0.57	2.52	0.24	0.20	13.71
606.00	0.71	175.20	605.98	-3.61	0.67	3.61	0.06	0.05	0.95
697.00	0.57	180.67	696.98	-4.62	0.71	4.62	0.17	-0.15	6.01

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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Buid Rate (°/100usft)	Turn Rate (°/100usft)
788.00	0.71	195.96	787.97	-5.61	0.55	5.61	0.24	0.15	16.80
879.00	0.75	186.12	878.97	-6.75	0.33	6.75	0.14	0.04	-10.81
971.00	0.62	206.33	970.96	-7.79	0.05	7.79	0.30	-0.14	21.97
1,065.00	0.66	206.07	1,064.95	-8.74	-0.42	8.74	0.04	0.04	-0.28
1,160.00	0.70	189.19	1,159.95	-9.80	-0.75	9.80	0.21	0.04	-17.77
1,177.00	0.62	209.41	1,176.95	-9.98	-0.81	9.98	1.44	-0.47	118.94
1,249.00	0.75	226.99	1,248.94	-10.64	-1.35	10.64	0.34	0.18	24.42
1,250.00	0.75	227.22	1,249.94	-10.65	-1.36	10.65	0.31	0.04	23.18
13-3/8" Csg.- 1250' MD- 1249.94' TVD									
1,343.00	0.84	246.85	1,342.93	-11.33	-2.43	11.33	0.31	0.10	21.11
1,438.00	1.41	229.45	1,437.91	-12.37	-3.96	12.37	0.69	0.60	-18.32
1,532.00	1.32	227.60	1,531.89	-13.85	-5.64	13.85	0.11	-0.10	-1.97
1,626.00	1.36	231.12	1,625.86	-15.28	-7.30	15.28	0.10	0.04	3.74
1,721.00	1.45	232.17	1,720.83	-16.72	-9.13	16.72	0.10	0.09	1.11
1,815.00	1.80	233.32	1,814.79	-18.34	-11.26	18.34	0.37	0.37	1.22
1,909.00	2.02	224.44	1,908.74	-20.40	-13.60	20.40	0.39	0.23	-9.45
2,004.00	1.98	224.88	2,003.68	-22.76	-15.93	22.76	0.05	-0.04	0.46
2,098.00	1.80	212.31	2,097.63	-25.16	-17.86	25.16	0.48	-0.19	-13.37
2,193.00	1.54	207.56	2,192.59	-27.55	-19.25	27.55	0.31	-0.27	-5.00
2,287.00	0.92	177.59	2,286.57	-29.42	-19.81	29.42	0.93	-0.66	-31.88
2,381.00	1.10	169.16	2,380.56	-31.06	-19.60	31.06	0.25	0.19	-8.97
2,476.00	1.36	165.99	2,475.54	-33.05	-19.16	33.05	0.28	0.27	-3.34
2,571.00	1.19	150.87	2,570.51	-35.01	-18.41	35.01	0.40	-0.18	-15.92
2,665.00	1.10	134.97	2,664.49	-36.50	-17.29	36.50	0.35	-0.10	-16.91
2,759.00	1.10	149.21	2,758.48	-37.91	-16.19	37.91	0.29	0.00	15.15
2,854.00	1.32	136.99	2,853.46	-39.50	-14.98	39.50	0.36	0.23	-12.86
2,948.00	1.63	139.89	2,947.42	-41.31	-13.38	41.31	0.34	0.33	3.09
3,043.00	1.89	132.77	3,042.38	-43.41	-11.36	43.41	0.36	0.27	-7.49
3,137.00	1.89	140.42	3,136.33	-45.65	-9.23	45.65	0.27	0.00	8.14
3,231.00	1.41	132.51	3,230.29	-47.63	-7.39	47.63	0.56	-0.51	-8.41
3,326.00	1.19	132.15	3,325.27	-49.08	-5.80	49.08	0.23	-0.23	-0.38
3,420.00	1.67	133.31	3,419.24	-50.68	-4.08	50.68	0.51	0.51	1.23
3,515.00	1.98	137.43	3,514.19	-52.84	-1.96	52.84	0.35	0.33	4.34
3,610.00	1.67	165.90	3,609.14	-55.39	-0.51	55.39	1.00	-0.33	29.97
3,704.00	1.41	170.83	3,703.11	-57.86	0.00	57.86	0.31	-0.28	5.24
3,799.00	1.63	184.10	3,798.07	-60.36	0.09	60.36	0.44	0.23	13.97
3,894.00	1.54	199.04	3,893.04	-62.91	-0.42	62.91	0.44	-0.09	15.73
3,988.00	1.54	189.28	3,987.00	-65.35	-1.04	65.35	0.28	0.00	-10.38
4,083.00	2.64	160.98	4,081.94	-68.68	-0.53	68.68	1.55	1.16	-29.79
4,177.00	4.35	152.90	4,175.76	-73.90	1.80	73.90	1.89	1.82	-8.60
4,271.00	4.22	156.68	4,269.50	-80.25	4.79	80.25	0.33	-0.14	4.02
4,365.00	3.96	150.26	4,363.26	-86.25	7.77	86.25	0.56	-0.28	-6.83

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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)
4,459.00	4.18	146.57	4,457.03	-91.92	11.27	91.92	0.36	0.23	-3.93
4,554.00	4.62	146.66	4,551.75	-98.01	15.28	98.01	0.46	0.46	0.09
4,648.00	3.91	140.15	4,645.48	-103.63	19.42	103.63	0.91	-0.76	-6.93
4,742.00	2.95	143.32	4,739.32	-108.03	22.91	108.03	1.04	-1.02	3.37
4,787.00	2.37	140.06	4,784.27	-109.68	24.20	109.68	1.33	-1.29	-7.24
4,860.00	2.33	126.30	4,857.21	-111.71	26.37	111.71	0.77	-0.06	-18.86
9-5/8" Csg.- 4860' MD- 4857.20' TVD									
4,933.00	2.42	112.82	4,930.14	-113.19	28.98	113.19	0.77	0.13	-18.46
5,028.00	4.00	63.77	5,025.01	-112.50	33.80	112.50	3.19	1.66	-51.63
5,122.00	5.49	60.00	5,118.68	-108.80	40.64	108.80	1.62	1.59	-4.01
5,217.00	7.16	59.73	5,213.10	-103.54	49.69	103.54	1.76	1.76	-0.28
5,311.00	8.57	48.13	5,306.22	-95.92	59.97	95.92	2.25	1.50	-12.34
5,406.00	9.49	38.20	5,400.05	-85.04	70.08	85.04	1.90	0.97	-10.45
5,500.00	9.36	35.47	5,492.78	-72.72	79.31	72.72	0.50	-0.14	-2.90
5,595.00	9.32	35.12	5,586.52	-60.14	88.22	60.14	0.07	-0.04	-0.37
5,689.00	8.62	32.66	5,679.37	-47.98	96.40	47.98	0.85	-0.74	-2.62
5,784.00	9.14	36.53	5,773.23	-35.92	104.73	35.92	0.83	0.55	4.07
5,879.00	10.29	42.59	5,866.87	-23.61	114.96	23.61	1.62	1.21	6.38
5,974.00	10.55	43.38	5,960.30	-11.05	126.68	11.05	0.31	0.27	0.83
6,069.00	9.67	41.80	6,053.83	1.22	137.97	-1.22	0.97	-0.93	-1.66
6,166.00	9.67	41.45	6,149.45	13.40	148.79	-13.40	0.06	0.00	-0.36
6,262.00	9.80	41.71	6,244.07	25.55	159.57	-25.55	0.14	0.14	0.27
6,358.00	9.80	40.75	6,338.67	37.83	170.34	-37.83	0.17	0.00	-1.00
6,454.00	9.49	40.31	6,433.31	50.06	180.79	-50.06	0.33	-0.32	-0.46
6,551.00	8.88	39.52	6,529.07	61.93	190.73	-61.93	0.64	-0.63	-0.81
6,647.00	8.40	38.46	6,623.98	73.14	199.80	-73.14	0.53	-0.50	-1.10
6,744.00	8.18	37.23	6,719.96	84.18	208.39	-84.18	0.29	-0.23	-1.27
6,838.00	7.65	37.93	6,813.07	94.44	216.28	-94.44	0.57	-0.56	0.74
6,933.00	5.93	38.29	6,907.40	103.28	223.21	-103.28	1.81	-1.81	0.38
7,027.00	5.89	38.20	7,000.90	110.88	229.20	-110.88	0.04	-0.04	-0.10
7,122.00	4.84	45.76	7,095.48	117.51	235.08	-117.51	1.33	-1.11	7.96
7,216.00	2.59	54.55	7,189.28	121.51	239.65	-121.51	2.46	-2.39	9.35
7,310.00	0.44	14.64	7,283.24	123.09	241.48	-123.09	2.42	-2.29	-42.46
7,405.00	0.48	340.81	7,378.24	123.82	241.44	-123.82	0.28	0.04	-35.61
7,499.00	0.44	324.99	7,472.24	124.49	241.10	-124.49	0.14	-0.04	-16.83
7,594.00	0.48	294.40	7,567.23	124.95	240.53	-124.95	0.26	0.04	-32.20
7,688.00	0.40	298.97	7,661.23	125.27	239.88	-125.27	0.09	-0.09	4.86
7,782.00	0.31	339.22	7,755.23	125.67	239.51	-125.67	0.27	-0.10	42.82
7,877.00	0.09	325.07	7,850.23	125.97	239.37	-125.97	0.24	-0.23	-14.89
7,971.00	0.18	160.45	7,944.23	125.89	239.38	-125.89	0.28	0.10	-175.13
8,065.00	0.13	153.77	8,038.23	125.65	239.48	-125.65	0.06	-0.05	-7.11
8,160.00	0.13	123.80	8,133.23	125.50	239.61	-125.50	0.07	0.00	-31.55

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8,255.00	0.22	171.00	8,228.23	125.26	239.73	-125.26	0.17	0.09	49.68
8,349.00	0.88	166.69	8,322.22	124.38	239.93	-124.38	0.70	0.70	-4.59
8,436.00	0.22	108.07	8,409.22	123.68	240.24	-123.68	0.91	-0.76	-67.38
8,531.00	0.57	206.51	8,504.22	123.20	240.20	-123.20	0.67	0.37	103.62
8,625.00	0.44	159.84	8,598.21	122.44	240.12	-122.44	0.44	-0.14	-49.65
8,719.00	0.66	197.98	8,692.21	121.58	240.07	-121.58	0.44	0.23	40.57
8,814.00	0.48	150.35	8,787.20	120.72	240.10	-120.72	0.51	-0.19	-50.14
8,908.00	0.44	226.20	8,881.20	120.13	240.04	-120.13	0.60	-0.04	80.69
9,002.00	0.97	180.67	8,975.20	119.08	239.77	-119.08	0.78	0.56	-48.44
9,097.00	1.19	172.67	9,070.18	117.30	239.88	-117.30	0.28	0.23	-8.42
9,191.00	1.05	172.93	9,164.16	115.48	240.11	-115.48	0.15	-0.15	0.28
9,255.00	1.63	178.47	9,228.14	113.98	240.21	-113.98	0.93	0.91	8.66
9,279.00	1.63	168.89	9,252.13	113.31	240.28	-113.31	1.13	0.00	-39.92
9,312.00	1.69	166.43	9,285.12	112.37	240.49	-112.37	0.28	0.17	-7.47
7" Csg.- 9312' MD- 9285.12' TVD									
9,373.00	1.80	162.30	9,346.09	110.59	240.99	-110.59	0.28	0.19	-6.76
9,467.00	11.16	180.23	9,439.39	100.06	241.40	-100.06	10.07	9.96	19.07
9,560.00	20.13	181.55	9,528.85	75.01	240.93	-75.01	9.65	9.65	1.42
9,655.00	28.97	183.22	9,615.18	35.62	239.20	-35.62	9.33	9.31	1.76
9,750.00	37.54	179.44	9,694.56	-16.39	238.19	16.39	9.28	9.02	-3.98
9,843.00	46.37	184.27	9,763.67	-78.43	235.95	78.43	10.10	9.49	5.19
9,938.00	55.21	184.89	9,823.67	-151.72	230.05	151.72	9.32	9.31	0.65
10,032.00	60.88	185.24	9,873.40	-231.13	223.01	231.13	6.04	6.03	0.37
10,127.00	65.27	178.12	9,916.45	-315.71	220.63	315.71	8.12	4.62	-7.49
10,221.00	73.63	176.89	9,949.42	-403.56	224.48	403.56	8.98	8.89	-1.31
10,335.00	81.54	176.19	9,973.91	-514.60	231.21	514.60	6.96	6.94	-0.61
10,431.00	90.59	176.36	9,980.49	-610.07	237.42	610.07	9.43	9.43	0.18
10,525.00	90.81	178.56	9,979.34	-703.97	241.59	703.97	2.35	0.23	2.34
10,619.00	89.98	176.36	9,978.69	-797.87	245.75	797.87	2.50	-0.88	-2.34
10,713.00	88.84	178.74	9,979.66	-891.77	249.77	891.77	2.81	-1.21	2.53
10,807.00	89.19	183.22	9,981.27	-985.72	248.16	985.72	4.78	0.37	4.77
10,901.00	90.15	184.54	9,981.82	-1,079.50	241.80	1,079.50	1.74	1.02	1.40
10,995.00	89.01	181.55	9,982.51	-1,173.35	236.81	1,173.35	3.40	-1.21	-3.18
11,089.00	89.19	180.58	9,983.98	-1,267.32	235.06	1,267.32	1.05	0.19	-1.03
11,183.00	88.84	179.97	9,985.60	-1,361.30	234.61	1,361.30	0.75	-0.37	-0.65
11,277.00	89.71	180.23	9,986.79	-1,455.30	234.45	1,455.30	0.97	0.93	0.28
11,372.00	90.99	181.37	9,986.21	-1,550.28	233.12	1,550.28	1.80	1.35	1.20
11,466.00	91.47	181.99	9,984.19	-1,644.22	230.37	1,644.22	0.83	0.51	0.66
11,560.00	90.81	179.53	9,982.32	-1,738.18	229.12	1,738.18	2.71	-0.70	-2.62
11,655.00	90.81	179.26	9,980.98	-1,833.17	230.12	1,833.17	0.28	0.00	-0.28
11,751.00	89.85	178.82	9,980.42	-1,929.15	231.73	1,929.15	1.10	-1.00	-0.46
11,846.00	91.30	180.41	9,979.47	-2,024.14	232.37	2,024.14	2.27	1.53	1.67

Company: MARATHON OIL CORP.
Project: LEA COUNTY, NM (NAD-27)
Site: COLIBRI FEDERAL 23-32-10
Well: FB #20H
Wellbore: #20H OH
Design: #20H OH (Actual)

Local Co-ordinate Reference: Site COLIBRI FEDERAL 23-32-10
TVD Reference: GE: 3708'+ KB= 26.5'= 3734.5' MSL @ 3734.50usft (H&P 498 (KB= 26.5'))
MD Reference: GE: 3708'+ KB= 26.5'= 3734.5' MSL @ 3734.50usft (H&P 498 (KB= 26.5'))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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)
11,942.00	89.45	180.85	9,978.84	-2,120.13	231.32	2,120.13	1.98	-1.93	0.46
12,037.00	88.79	179.18	9,980.30	-2,215.11	231.29	2,215.11	1.89	-0.69	-1.76
12,133.00	89.10	177.59	9,982.07	-2,311.05	234.00	2,311.05	1.69	0.32	-1.66
12,228.00	87.87	176.71	9,984.58	-2,405.90	238.72	2,405.90	1.59	-1.29	-0.93
12,324.00	87.96	177.24	9,988.07	-2,501.70	243.78	2,501.70	0.56	0.09	0.55
12,419.00	88.57	177.33	9,990.95	-2,596.55	248.28	2,596.55	0.65	0.64	0.09
12,514.00	89.63	177.77	9,992.44	-2,691.45	252.34	2,691.45	1.21	1.12	0.46
12,608.00	90.90	178.21	9,992.01	-2,785.39	255.64	2,785.39	1.43	1.35	0.47
12,703.00	91.91	178.38	9,989.68	-2,880.32	258.46	2,880.32	1.08	1.06	0.18
12,797.00	89.10	179.26	9,988.85	-2,974.29	260.40	2,974.29	3.13	-2.99	0.94
12,892.00	90.68	180.41	9,989.03	-3,069.28	260.67	3,069.28	2.06	1.66	1.21
12,986.00	91.03	180.32	9,987.63	-3,163.27	260.07	3,163.27	0.38	0.37	-0.10
13,080.00	90.73	179.53	9,986.18	-3,257.26	260.19	3,257.26	0.90	-0.32	-0.84
13,175.00	91.65	180.14	9,984.21	-3,352.23	260.47	3,352.23	1.16	0.97	0.64
13,269.00	89.54	178.82	9,983.24	-3,446.22	261.32	3,446.22	2.65	-2.24	-1.40
13,364.00	90.07	178.47	9,983.56	-3,541.19	263.57	3,541.19	0.67	0.56	-0.37
13,523.00	92.40	179.35	9,980.13	-3,700.11	266.59	3,700.11	1.57	1.47	0.55
13,618.00	90.51	179.79	9,977.72	-3,795.07	267.30	3,795.07	2.04	-1.99	0.46
13,712.00	86.81	181.37	9,979.92	-3,889.02	266.35	3,889.02	4.28	-3.94	1.68
13,806.00	86.90	181.81	9,985.07	-3,982.85	263.75	3,982.85	0.48	0.10	0.47
13,901.00	90.55	183.13	9,987.19	-4,077.72	259.66	4,077.72	4.09	3.84	1.39
13,995.00	91.52	182.16	9,985.49	-4,171.60	255.32	4,171.60	1.46	1.03	-1.03
14,090.00	89.71	182.08	9,984.47	-4,266.52	251.81	4,266.52	1.91	-1.91	-0.08
14,185.00	90.37	181.64	9,984.40	-4,361.47	248.72	4,361.47	0.83	0.69	-0.46
14,279.00	90.99	181.55	9,983.29	-4,455.43	246.11	4,455.43	0.67	0.66	-0.10
14,374.00	91.08	181.20	9,981.57	-4,550.39	243.83	4,550.39	0.38	0.09	-0.37
14,468.00	91.38	181.72	9,979.55	-4,644.33	241.43	4,644.33	0.64	0.32	0.55
14,552.00	93.41	183.92	9,976.04	-4,728.15	237.31	4,728.15	3.56	2.42	2.62
LEAM MWD Surveys - 242' MD- 14,552' MD									
14,607.00	93.41	183.92	9,972.77	-4,782.92	233.55	4,782.92	0.00	0.00	0.00
Projected to T.D.- 14,607' MD- 9,972.77' TVD									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,250.00	1,249.94	13-3/8" Csg.- 1250' MD- 1249.94' TVD	13-3/8	17-1/2
4,860.00	4,857.21	9-5/8" Csg.- 4860' MD- 4857.20' TVD	9-5/8	12-1/4
9,312.00	9,285.12	7" Csg.- 9312' MD- 9285.12' TVD	7	8-3/4

Company:	MARATHON OIL CORP.	Local Co-ordinate Reference:	Site COLIBRI FEDERAL 23-32-10
Project:	LEA COUNTY, NM (NAD-27)	TVD Reference:	GE: 3708'+ KB= 26.5'= 3734.5' MSL @ 3734.50usft (H&P 498 (KB= 26.5'))
Site:	COLIBRI FEDERAL 23-32-10	MD Reference:	GE: 3708'+ KB= 26.5'= 3734.5' MSL @ 3734.50usft (H&P 498 (KB= 26.5'))
Well:	FB #20H	North Reference:	Grid
Wellbore:	#20H OH	Survey Calculation Method:	Minimum Curvature
Design:	#20H OH (Actual)	Database:	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
242.00	242.00	-0.63	0.19	LEAM MWD Survey - 242' MD/TVD
14,552.00	9,976.04	-4,728.15	237.31	LEAM MWD Surveys - 242' MD- 14,552' MD
14,607.00	9,972.77	-4,782.92	233.55	Projected to T.D.- 14,607' MD- 9,972.77' TVD

Checked By: _____	Approved By: _____	Date: _____
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MARATHON OIL CORP.

Project: LEA COUNTY, NM (NAD-27)
Site: COLIBRI FEDERAL 23-32-10
Well: FB #20H
Wellbore: #20H OH
Design: #20H Plan #2



DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
C.F. 23-32-10 FB #20H - SHL	0.00	0.00	0.00	482871.52	707780.8232	19° 32.65301' N	103° 39' 38.4442' W
FTP (330° FSL/1983° FEL)	9978.00	-115.65	240.46	482755.87	708021.2882	19° 31.49365' N	103° 39' 35.6504' W
L.P. #2 (90°) (673° FNL/1983° FEL)	9978.00	-458.61	242.72	482412.91	708023.5462	19° 28.09973' N	103° 39' 35.8492' W
LTP #2 (330° FSL/1982° FEL)	9978.00	-4738.88	271.45	478132.64	708052.2322	18° 45.74233' N	103° 39' 35.6279' W
Nudge Pt (100° FNL/1983° FEL)	7235.00	114.34	238.92	482985.86	708019.7422	19° 33.76962' N	103° 39' 35.6515' W
T.D. + 45° #2 (285° FSL/1982° FEL)	9978.00	-4783.90	271.40	478087.62	708052.2282	18° 45.29684' N	103° 39' 35.6317' W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	4850.00	0.00	0.00	4850.00	0.00	0.00	0.00	0.00	0.00	
3	4950.00	0.00	0.00	4950.00	0.00	0.00	0.00	0.00	0.00	
4	5350.08	8.00	64.43	5348.78	12.04	25.16	2.00	64.43	-12.04	
5	6852.14	8.00	64.43	6836.22	102.30	213.76	0.00	0.00	-102.30	
6	7252.22	0.00	0.00	7235.00	114.34	238.92	2.00	180.00	-114.34	
7	9422.26	0.00	0.00	9405.04	114.34	238.92	0.00	0.00	-114.34	
8	810322.26	90.00	179.62	9978.00	-458.61	242.72	10.00	179.62	458.61	LTP #2 (330° FSL/1982° FEL)
9	914602.63	90.00	179.62	9978.00	-4738.88	271.11	0.00	0.00	4738.88	T.D. + 45° #2 (285° FSL/1982° FEL)
10	14647.65	90.00	179.62	9978.00	-4783.90	271.41	0.00	0.00	4783.90	

PROJECT DETAILS: LEA COUNTY, NM (NAD-27)

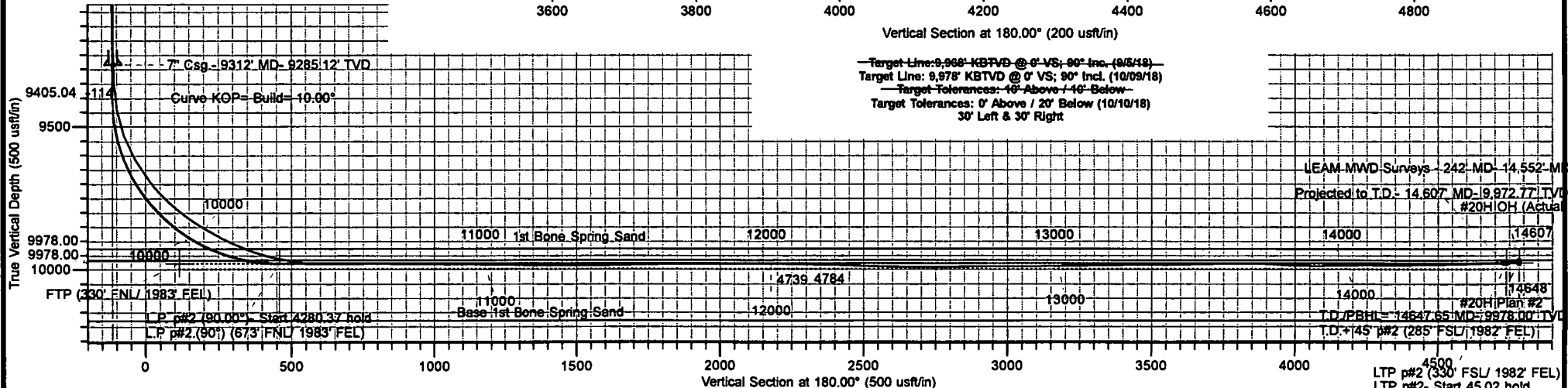
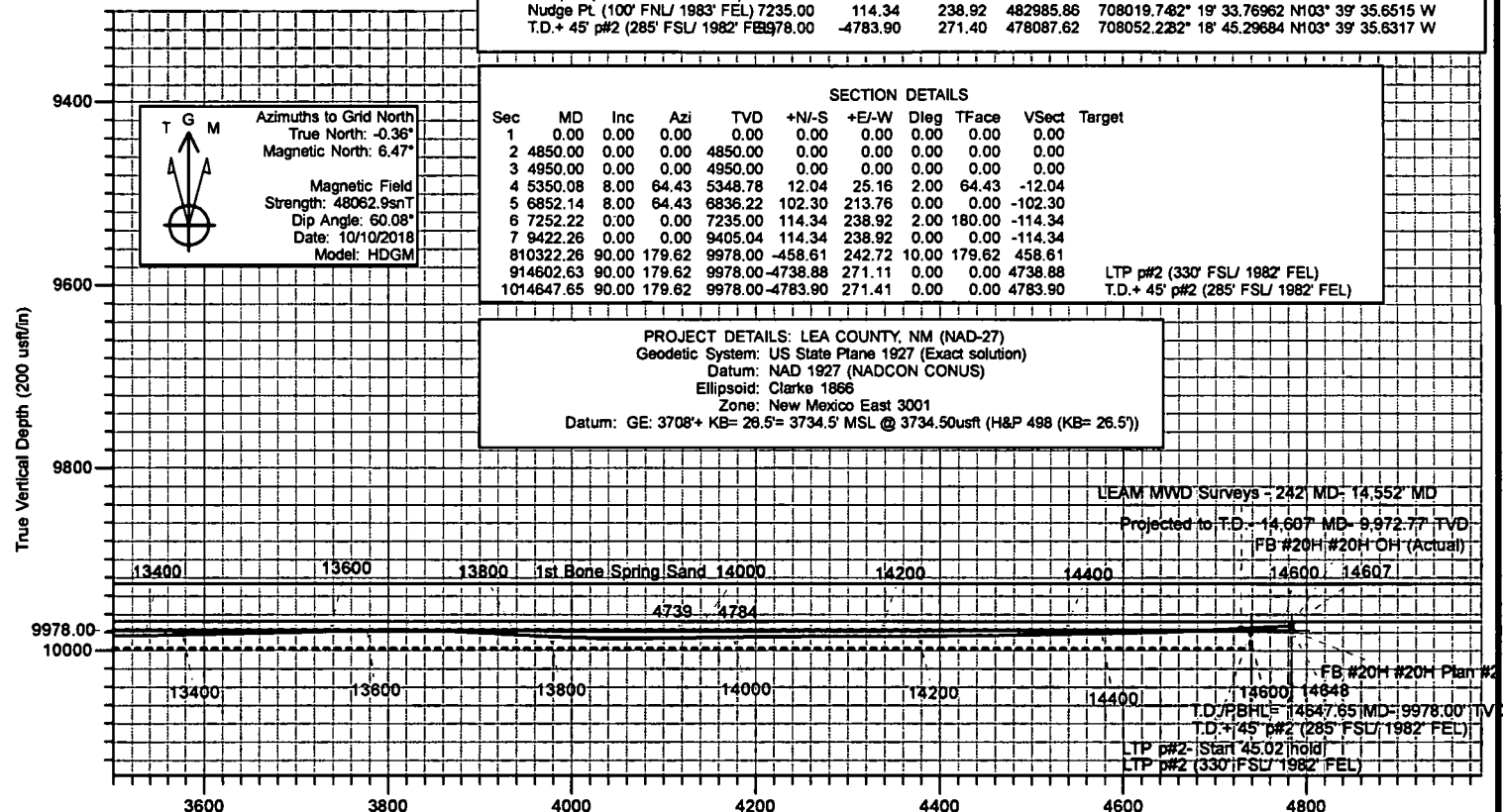
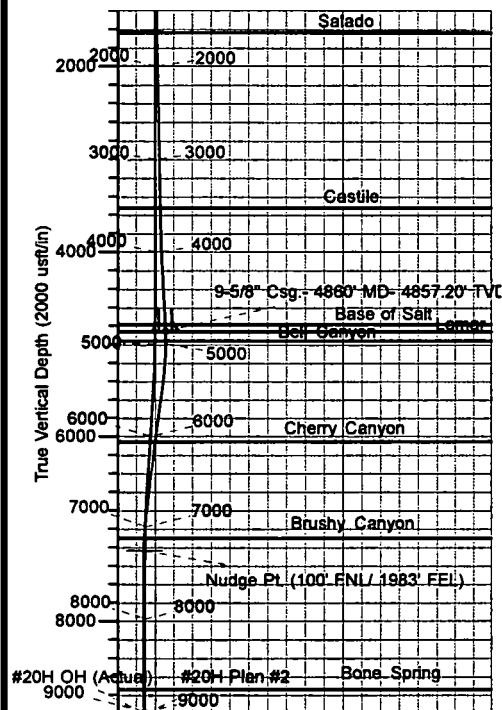
Geodetic System: US State Plane 1927 (Exact solution)

Datum: NAD 1927 (NADCON CONUS)

Ellipsoid: Clarke 1866

Zone: New Mexico East 3001

Datum: GE: 3708' + KB= 26.5' = 3734.5' MSL @ 3734.50usft (H&P 498 (KB= 26.5'))



LEAM DRILLING SERVICES
2010 East Davis, Conroe, Texas 77301
Phone: 936/756-7577, Fax: 936/756-7595

Plan: #20H Plan #2 (FB #20H/20H OH)
COLIBRI FEDERAL 23-32-10
Created By: Lynn Hullin Date: 18:38, October 15 2018
Approved: _____ Date: _____

MARATHON OIL CORP.

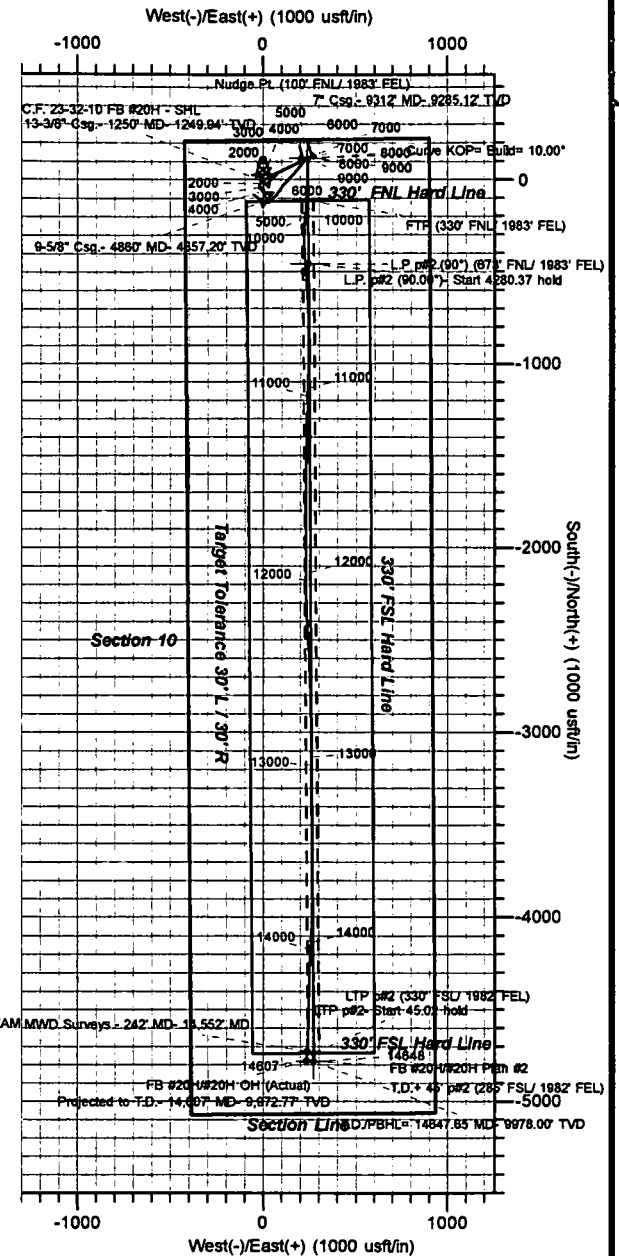
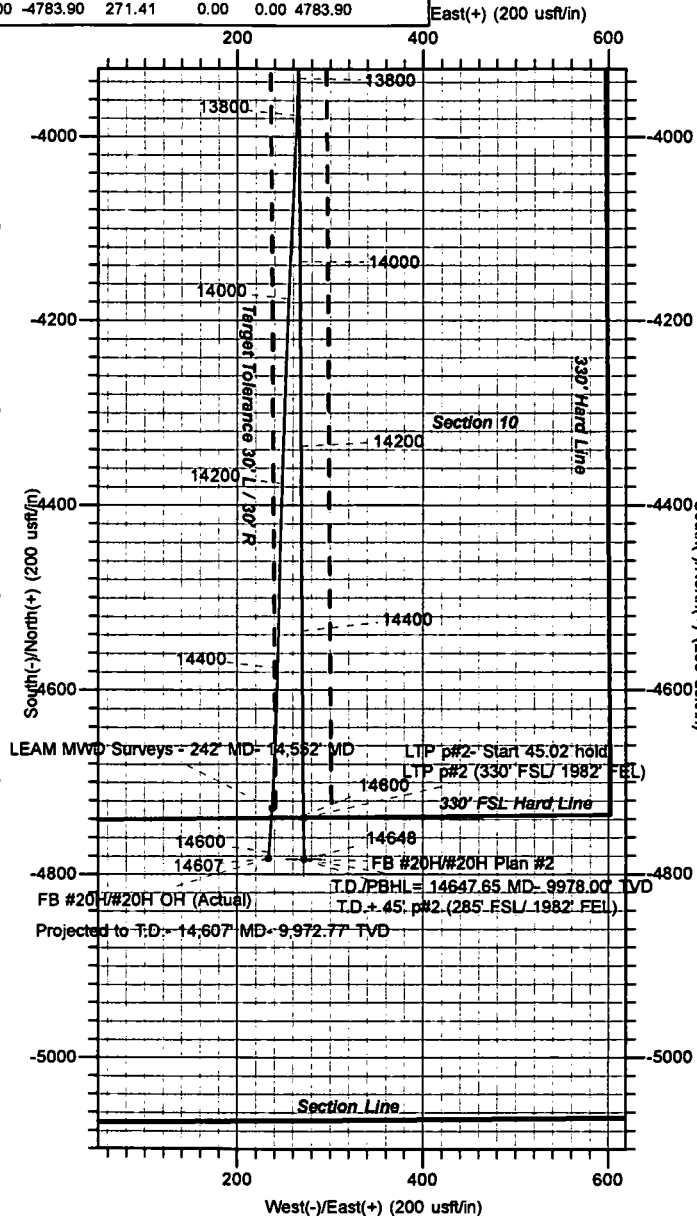
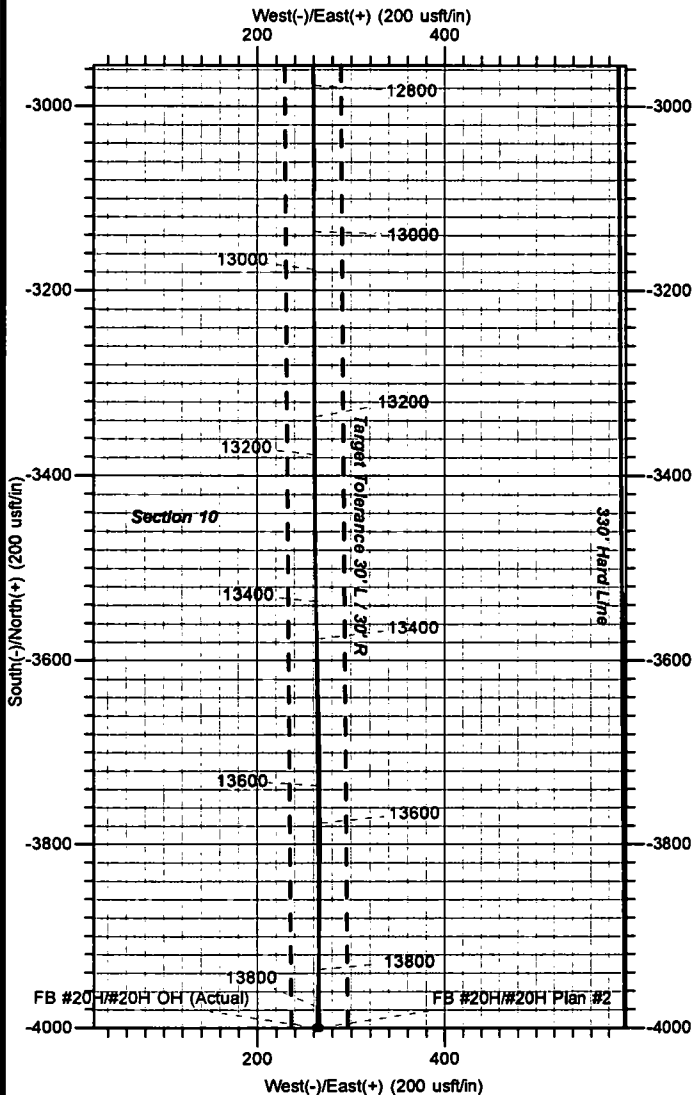
Project: LEA COUNTY, NM (NAD-27)
 Site: COLIBRI FEDERAL 23-32-10
 Well: FB #20H
 Wellbore: #20H OH
 Design: #20H Plan #2



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4850.00	0.00	0.00	4850.00	0.00	0.00	0.00	0.00	0.00
4950.00	0.00	0.00	4950.00	0.00	0.00	0.00	0.00	0.00
5350.08	8.00	64.43	5348.78	12.04	25.16	2.00	64.43	-12.04
6852.14	8.00	64.43	6836.22	102.30	213.76	0.00	0.00	-102.30
7252.22	0.00	0.00	7235.00	114.34	238.92	2.00	180.00	-114.34
9422.26	0.00	0.00	9405.04	114.34	238.92	0.00	0.00	-114.34
10322.26	90.00	179.62	9978.00	-458.61	242.72	10.00	179.62	458.61
14602.63	90.00	179.62	9978.00	-4738.88	271.11	0.00	0.00	4738.88
14647.65	90.00	179.62	9978.00	-4783.90	271.41	0.00	0.00	4783.90

Azimuths to Grid North
 True North: -0.36°
 Magnetic North: 6.47°
 Magnetic Field
 Strength: 48062.9snT
 Dip Angle: 60.08°
 Date: 10/10/2018
 Model: HDGM



PROJECT DETAILS: LEA COUNTY, NM (NAD-27)

Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1886

Zone: New Mexico East 3001
 Datum: GE: 3706+ KB= 26.5= 3734.5' MSL @ 3734.50usft (H&P 498 (KB= 26.5))



LEAM DRILLING SERVICES
 2010 East Davis, Conroe, Texas 77301
 Phone: 936/756-7618, Fax: 936/756-7595

COLIBRI FEDERAL 23-32-10
 Plan: #20H Plan #2 (FB #20H OH)
 Created By: Lynn Hulín
 Date: 18:35, October 15 2018
 Approved: _____ Date: _____