



FORMATION TOP DETAILS				Plan: Plan #5 (596-32C-16/OH)						
TVDPath	MDPath	Formation		Created By: Rex Hall    Date: 2009-07-26						
4732.00	4888.23	Wasatch G		PROJECT DETAILS: Garfield County, CO NAD 83  Geodetic System: US State Plane 1983 Datum: North American Datum 1983 Ellipsoid: GRS 1980 Zone: Colorado Central Zone  System Datum: Mean Sea Level Local North: True						
5134.00	5305.82	Ft. Union								
6444.00	6664.35	Mesaverde								
9078.00	9301.90	Cameo								
9569.00	9792.90	Rollins								
SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	139.22	0.39	259.00	139.22	0.31	-0.28	0.00	0.00	0.21	
2	200.00	0.39	259.00	200.00	0.23	-0.68	0.00	0.00	0.62	
3	430.50	5.00	258.38	430.18	-1.95	-11.30	2.00	-0.67	11.46	596-32C-16
4	965.74	15.70	258.38	955.94	-21.29	-105.37	2.00	0.00	107.50	
5	6438.67	15.70	258.38	6224.56	-319.66	-1556.42	0.00	0.00	1588.91	
6	7223.90	0.00	0.00	7000.00	-341.20	-1661.17	2.00	180.00	1695.85	
7	9857.90	0.00	0.00	9634.00	-341.20	-1661.17	0.00	0.00	1695.85	596-32C-16



# **Marathon Oil Co.**

**Garfield County, CO NAD 83**

**596-32C Pad**

**596-32C-16 - Slot B**

**OH**

**Plan: Plan #5**

## **Standard Planning Report**

**26 July, 2009**

<b>Database:</b>	EDM 2003.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well 596-32C-16 - Slot B
<b>Company:</b>	Marathon Oil Co.	<b>TVD Reference:</b>	GL 8333' & RKB 24' @ 8357.00ft (H&P 324)
<b>Project:</b>	Garfield County, CO NAD 83	<b>MD Reference:</b>	GL 8333' & RKB 24' @ 8357.00ft (H&P 324)
<b>Site:</b>	596-32C Pad	<b>North Reference:</b>	True
<b>Well:</b>	596-32C-16	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #5		

<b>Project</b>	Garfield County, CO NAD 83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

Site		596-32C Pad, Sec 32 T5S R96W			
Site Position:		Northing:	1,642,959.78 ft	Latitude:	39° 34' 4.057 N
From:	Map	Easting:	2,240,668.00 ft	Longitude:	108° 11' 38.083 W
Position Uncertainty:	0.00 ft	Slot Radius:	in	Grid Convergence:	-1.70 °

Well	596-32C-16 - Slot B, 1188' FSL 2323' FWL					
Well Position	+N/-S	0.00 ft	Northing:	1,642,893.17 ft	Latitude:	39° 34' 3.394 N
	+E/-W	0.00 ft	Easting:	2,240,653.18 ft	Longitude:	108° 11' 38.247 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	8,333.00 ft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2005-10	11/7/2007	10.90	65.87	52,628

<b>Design</b>	Plan #5				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	139.22	
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	258.39	

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
139.22	0.39	259.00	139.22	0.31	-0.28	0.00	0.00	0.00	0.00	
200.00	0.39	259.00	200.00	0.23	-0.68	0.00	0.00	0.00	0.00	
430.50	5.00	258.38	430.18	-1.95	-11.30	2.00	2.00	-0.27	-0.67	596-32C-16
965.74	15.70	258.38	955.94	-21.29	-105.37	2.00	2.00	0.00	0.00	
6,438.67	15.70	258.38	6,224.56	-319.66	-1,556.42	0.00	0.00	0.00	0.00	
7,223.90	0.00	0.00	7,000.00	-341.20	-1,661.17	2.00	-2.00	0.00	180.00	
9,857.90	0.00	0.00	9,634.00	-341.20	-1,661.17	0.00	0.00	0.00	0.00	596-32C-16

**Database:** EDM 2003.16 Single User Db  
**Company:** Marathon Oil Co.  
**Project:** Garfield County, CO NAD 83  
**Site:** 596-32C Pad  
**Well:** 596-32C-16  
**Wellbore:** OH  
**Design:** Plan #5

**Local Co-ordinate Reference:** Well 596-32C-16 - Slot B  
**TVD Reference:** GL 8333' & RKB 24' @ 8357.00ft (H&P 324)  
**MD Reference:** GL 8333' & RKB 24' @ 8357.00ft (H&P 324)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

**Planned Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.20	354.18	100.00	0.23	-0.13	0.08	0.20	0.20	0.00
139.22	0.39	259.00	139.22	0.31	-0.28	0.21	1.16	0.48	-242.69
<b>Start 60.78 hold at 139.22 MD</b>									
200.00	0.39	259.00	200.00	0.23	-0.68	0.62	0.00	0.00	0.00
<b>Start DLS 2.00 TFO -0.67</b>									
300.00	2.39	258.44	299.96	-0.26	-3.06	3.05	2.00	2.00	-0.56
400.00	4.39	258.39	399.78	-1.45	-8.85	8.96	2.00	2.00	-0.05
430.50	5.00	258.38	430.18	-1.95	-11.30	11.46	2.00	2.00	-0.02
<b>Start Build 2.00</b>									
500.00	6.39	258.38	499.34	-3.34	-18.05	18.35	2.00	2.00	0.00
600.00	8.39	258.38	598.50	-5.93	-30.65	31.21	2.00	2.00	0.00
700.00	10.39	258.38	697.16	-9.21	-46.63	47.53	2.00	2.00	0.00
800.00	12.39	258.38	795.18	-13.19	-65.97	67.28	2.00	2.00	0.00
900.00	14.39	258.38	892.46	-17.85	-88.65	90.43	2.00	2.00	0.00
965.74	15.70	258.38	955.94	-21.29	-105.37	107.50	2.00	2.00	0.00
<b>Start 15.70° Hold At 965.74' MD</b>									
1,000.00	15.70	258.38	988.92	-23.16	-114.45	116.77	0.00	0.00	0.00
1,100.00	15.70	258.38	1,085.19	-28.61	-140.97	143.84	0.00	0.00	0.00
1,200.00	15.70	258.38	1,181.46	-34.06	-167.48	170.91	0.00	0.00	0.00
1,300.00	15.70	258.38	1,277.72	-39.52	-193.99	197.98	0.00	0.00	0.00
1,400.00	15.70	258.38	1,373.99	-44.97	-220.51	225.05	0.00	0.00	0.00
1,500.00	15.70	258.38	1,470.26	-50.42	-247.02	252.11	0.00	0.00	0.00
1,600.00	15.70	258.38	1,566.52	-55.87	-273.53	279.18	0.00	0.00	0.00
1,700.00	15.70	258.38	1,662.79	-61.32	-300.05	306.25	0.00	0.00	0.00
1,800.00	15.70	258.38	1,759.06	-66.77	-326.56	333.32	0.00	0.00	0.00
1,900.00	15.70	258.38	1,855.33	-72.23	-353.07	360.39	0.00	0.00	0.00
2,000.00	15.70	258.38	1,951.59	-77.68	-379.59	387.45	0.00	0.00	0.00
2,100.00	15.70	258.38	2,047.86	-83.13	-406.10	414.52	0.00	0.00	0.00
2,200.00	15.70	258.38	2,144.13	-88.58	-432.61	441.59	0.00	0.00	0.00
2,300.00	15.70	258.38	2,240.39	-94.03	-459.13	468.66	0.00	0.00	0.00
2,400.00	15.70	258.38	2,336.66	-99.48	-485.64	495.72	0.00	0.00	0.00
2,500.00	15.70	258.38	2,432.93	-104.94	-512.15	522.79	0.00	0.00	0.00
2,600.00	15.70	258.38	2,529.19	-110.39	-538.67	549.86	0.00	0.00	0.00
2,700.00	15.70	258.38	2,625.46	-115.84	-565.18	576.93	0.00	0.00	0.00
2,800.00	15.70	258.38	2,721.73	-121.29	-591.69	604.00	0.00	0.00	0.00
2,900.00	15.70	258.38	2,818.00	-126.74	-618.21	631.06	0.00	0.00	0.00
3,000.00	15.70	258.38	2,914.26	-132.20	-644.72	658.13	0.00	0.00	0.00
3,100.00	15.70	258.38	3,010.53	-137.65	-671.23	685.20	0.00	0.00	0.00
3,200.00	15.70	258.38	3,106.80	-143.10	-697.75	712.27	0.00	0.00	0.00
3,300.00	15.70	258.38	3,203.06	-148.55	-724.26	739.34	0.00	0.00	0.00
3,400.00	15.70	258.38	3,299.33	-154.00	-750.77	766.40	0.00	0.00	0.00
3,500.00	15.70	258.38	3,395.60	-159.45	-777.29	793.47	0.00	0.00	0.00
3,600.00	15.70	258.38	3,491.86	-164.91	-803.80	820.54	0.00	0.00	0.00
3,700.00	15.70	258.38	3,588.13	-170.36	-830.31	847.61	0.00	0.00	0.00
3,800.00	15.70	258.38	3,684.40	-175.81	-856.83	874.68	0.00	0.00	0.00
3,900.00	15.70	258.38	3,780.66	-181.26	-883.34	901.74	0.00	0.00	0.00
4,000.00	15.70	258.38	3,876.93	-186.71	-909.85	928.81	0.00	0.00	0.00
4,100.00	15.70	258.38	3,973.20	-192.16	-936.37	955.88	0.00	0.00	0.00
4,200.00	15.70	258.38	4,069.47	-197.62	-962.88	982.95	0.00	0.00	0.00
4,300.00	15.70	258.38	4,165.73	-203.07	-989.39	1,010.02	0.00	0.00	0.00
4,400.00	15.70	258.38	4,262.00	-208.52	-1,015.90	1,037.08	0.00	0.00	0.00
4,500.00	15.70	258.38	4,358.27	-213.97	-1,042.42	1,064.15	0.00	0.00	0.00

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**Well:** 596-32C-16  
**Wellbore:** OH  
**Design:** Plan #5

**Local Co-ordinate Reference:** Well 596-32C-16 - Slot B  
**TVD Reference:** GL 8333' & RKB 24' @ 8357.00ft (H&P 324)  
**MD Reference:** GL 8333' & RKB 24' @ 8357.00ft (H&P 324)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

**Planned Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,600.00	15.70	258.38	4,454.53	-219.42	-1,068.93	1,091.22	0.00	0.00	0.00
4,700.00	15.70	258.38	4,550.80	-224.88	-1,095.44	1,118.29	0.00	0.00	0.00
4,800.00	15.70	258.38	4,647.07	-230.33	-1,121.96	1,145.36	0.00	0.00	0.00
4,888.23	15.70	258.38	4,732.00	-235.14	-1,145.35	1,169.24	0.00	0.00	0.00
<b>Wasatch G</b>									
4,900.00	15.70	258.38	4,743.33	-235.78	-1,148.47	1,172.42	0.00	0.00	0.00
5,000.00	15.70	258.38	4,839.60	-241.23	-1,174.98	1,199.49	0.00	0.00	0.00
5,100.00	15.70	258.38	4,935.87	-246.68	-1,201.50	1,226.56	0.00	0.00	0.00
5,200.00	15.70	258.38	5,032.13	-252.13	-1,228.01	1,253.63	0.00	0.00	0.00
5,300.00	15.70	258.38	5,128.40	-257.59	-1,254.52	1,280.70	0.00	0.00	0.00
5,305.82	15.70	258.38	5,134.00	-257.90	-1,256.07	1,282.27	0.00	0.00	0.00
<b>Ft. Union</b>									
5,400.00	15.70	258.38	5,224.67	-263.04	-1,281.04	1,307.76	0.00	0.00	0.00
5,500.00	15.70	258.38	5,320.94	-268.49	-1,307.55	1,334.83	0.00	0.00	0.00
5,600.00	15.70	258.38	5,417.20	-273.94	-1,334.06	1,361.90	0.00	0.00	0.00
5,700.00	15.70	258.38	5,513.47	-279.39	-1,360.58	1,388.97	0.00	0.00	0.00
5,800.00	15.70	258.38	5,609.74	-284.85	-1,387.09	1,416.04	0.00	0.00	0.00
5,900.00	15.70	258.38	5,706.00	-290.30	-1,413.60	1,443.10	0.00	0.00	0.00
6,000.00	15.70	258.38	5,802.27	-295.75	-1,440.12	1,470.17	0.00	0.00	0.00
6,100.00	15.70	258.38	5,898.54	-301.20	-1,466.63	1,497.24	0.00	0.00	0.00
6,200.00	15.70	258.38	5,994.80	-306.65	-1,493.14	1,524.31	0.00	0.00	0.00
6,300.00	15.70	258.38	6,091.07	-312.10	-1,519.66	1,551.38	0.00	0.00	0.00
6,400.00	15.70	258.38	6,187.34	-317.56	-1,546.17	1,578.44	0.00	0.00	0.00
6,438.67	15.70	258.38	6,224.56	-319.66	-1,556.42	1,588.91	0.00	0.00	0.00
<b>Start Drop -2.00</b>									
6,500.00	14.48	258.38	6,283.78	-322.88	-1,572.06	1,604.88	2.00	-2.00	0.00
6,600.00	12.48	258.38	6,381.02	-327.57	-1,594.89	1,628.18	2.00	-2.00	0.00
6,664.35	11.19	258.38	6,444.00	-330.23	-1,607.82	1,641.38	2.00	-2.00	0.00
<b>Mesaverde</b>									
6,700.00	10.48	258.38	6,479.01	-331.58	-1,614.38	1,648.08	2.00	-2.00	0.00
6,800.00	8.48	258.38	6,577.64	-334.90	-1,630.51	1,664.55	2.00	-2.00	0.00
6,900.00	6.48	258.38	6,676.79	-337.52	-1,643.26	1,677.56	2.00	-2.00	0.00
7,000.00	4.48	258.38	6,776.33	-339.44	-1,652.61	1,687.11	2.00	-2.00	0.00
7,100.00	2.48	258.38	6,876.14	-340.66	-1,658.55	1,693.17	2.00	-2.00	0.00
7,200.00	0.48	258.38	6,976.10	-341.18	-1,661.08	1,695.75	2.00	-2.00	0.00
7,223.90	0.00	0.00	7,000.00	-341.20	-1,661.17	1,695.85	2.00	-2.00	0.00
<b>Start 0.00° Hold At 7223.90' MD</b>									
7,300.00	0.00	0.00	7,076.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
7,400.00	0.00	0.00	7,176.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
7,500.00	0.00	0.00	7,276.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
7,600.00	0.00	0.00	7,376.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
7,700.00	0.00	0.00	7,476.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
7,800.00	0.00	0.00	7,576.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
7,900.00	0.00	0.00	7,676.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
8,000.00	0.00	0.00	7,776.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
8,100.00	0.00	0.00	7,876.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
8,200.00	0.00	0.00	7,976.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
8,300.00	0.00	0.00	8,076.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
8,400.00	0.00	0.00	8,176.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
8,500.00	0.00	0.00	8,276.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
8,600.00	0.00	0.00	8,376.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
8,700.00	0.00	0.00	8,476.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
8,800.00	0.00	0.00	8,576.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00

**Database:** EDM 2003.16 Single User Db  
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**Project:** Garfield County, CO NAD 83  
**Site:** 596-32C Pad  
**Well:** 596-32C-16  
**Wellbore:** OH  
**Design:** Plan #5

**Local Co-ordinate Reference:** Well 596-32C-16 - Slot B  
**TVD Reference:** GL 8333' & RKB 24' @ 8357.00ft (H&P 324)  
**MD Reference:** GL 8333' & RKB 24' @ 8357.00ft (H&P 324)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

**Planned Survey**

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,900.00	0.00	0.00	8,676.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,000.00	0.00	0.00	8,776.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,100.00	0.00	0.00	8,876.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,200.00	0.00	0.00	8,976.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,300.00	0.00	0.00	9,076.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,301.90	0.00	0.00	9,078.00	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
<b>Cameo</b>									
9,400.00	0.00	0.00	9,176.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,500.00	0.00	0.00	9,276.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,600.00	0.00	0.00	9,376.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,700.00	0.00	0.00	9,476.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,792.90	0.00	0.00	9,569.00	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
<b>Rollins</b>									
9,800.00	0.00	0.00	9,576.10	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
9,857.90	0.00	0.00	9,634.00	-341.20	-1,661.17	1,695.85	0.00	0.00	0.00
<b>PBHL = 1642601.37, 2238982.62 - 596-32C-16 - 596-32C-16</b>									

**Targets**

**Target Name**

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
596-32C-16	0.00	0.00	9,634.00	-341.20	-1,661.17	1,642,601.37	2,238,982.62	39° 34' 0.021 N	108° 11' 59.460 W
- plan hits target center									
- Rectangle (sides W100.00 H200.00 D0.00)									
596-32C-16 Drilling Target	0.00	0.00	7,000.00	-301.20	-1,571.18	1,642,638.69	2,239,073.76	39° 34' 0.417 N	108° 11' 58.311 W
- plan misses target center by 98.49ft at 7223.50ft MD (6999.60 TVD, -341.20 N, -1661.17 E)									
- Point									

**Formations**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,664.35	6,444.00	Mesaverde		0.00	
9,301.90	9,078.00	Cameo		0.00	
9,792.90	9,569.00	Rollins		0.00	
4,888.23	4,732.00	Wasatch G		0.00	
5,305.82	5,134.00	Ft. Union		0.00	

<b>Database:</b>	EDM 2003.16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well 596-32C-16 - Slot B
<b>Company:</b>	Marathon Oil Co.	<b>TVD Reference:</b>	GL 8333' & RKB 24' @ 8357.00ft (H&P 324)
<b>Project:</b>	Garfield County, CO NAD 83	<b>MD Reference:</b>	GL 8333' & RKB 24' @ 8357.00ft (H&P 324)
<b>Site:</b>	596-32C Pad	<b>North Reference:</b>	True
<b>Well:</b>	596-32C-16	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #5		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
139.22	139.22	0.31	-0.28	Start 60.78 hold at 139.22 MD	
200.00	200.00	0.23	-0.68	Start DLS 2.00 TFO -0.67	
430.50	430.18	-1.95	-11.30	Start Build 2.00	
965.74	955.94	-21.29	-105.37	Start 15.70° Hold At 965.74' MD	
6,438.67	6,224.56	-319.66	-1,556.42	Start Drop -2.00	
7,223.90	7,000.00	-341.20	-1,661.17	Start 0.00° Hold At 7223.90' MD	
9,857.90	9,634.00	-341.20	-1,661.17	PBHL = 1642601.37, 2238982.62	