

# **USA**

**DJ BASIN - COLORADO**

**Black Hollow 8-67-16-3H**

**Black Hollow 8-67-16-3H**

**Original Hole**

**Design: Original Hole**

## **Survey Report - Geographic**

**19 July, 2012**

# Marathon Oil

## Survey Report - Geographic

<b>Company:</b>	USA	<b>Local Co-ordinate Reference:</b>	Well Black Hollow 8-67-16-3H
<b>Project:</b>	DJ BASIN - COLORADO	<b>TVD Reference:</b>	WELL @ 5306.0usft (H&P 321)
<b>Site:</b>	Black Hollow 8-67-16-3H	<b>MD Reference:</b>	WELL @ 5306.0usft (H&P 321)
<b>Well:</b>	Black Hollow 8-67-16-3H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Original Hole	<b>Database:</b>	EDMPROD

<b>Project</b>	DJ BASIN - COLORADO		
<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 Northern Zone		

Site		Black Hollow 8-67-16-3H, Section 16, T8N, R67W			
Site Position:		Northing:	1,486,637.67 usft	Latitude:	40° 40' 3.491 N
From:	Map	Easting:	3,168,191.16 usft	Longitude:	104° 53' 37.342 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.39 °

Well	Black Hollow 8-67-16-3H					
Well Position	+N/-S	0.0 usft	Northing:	1,486,637.67 usft	Latitude:	40° 40' 3.491 N
	+E/-W	0.0 usft	Easting:	3,168,191.16 usft	Longitude:	104° 53' 37.342 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	5,275.0 usft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	5/15/2012	8.79	67.22	53,181

<b>Design</b>	Original Hole				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	180.73	

<b>Survey Program</b>	<b>Date</b>	7/19/2012			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
890.0	11,311.0	Survey #1 (Original Hole)	MWD - ISCWSA	MWD - ISCWSA Mod 2	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
0.0	0.00	0.00	0.0	0.0	0.0	1,486,637.67	3,168,191.16	40° 40' 3.491 N	104° 53' 37.342 W	
890.0	0.00	0.00	890.0	0.0	0.0	1,486,637.67	3,168,191.16	40° 40' 3.491 N	104° 53' 37.342 W	
924.0	1.60	7.90	924.0	0.5	0.1	1,486,638.14	3,168,191.23	40° 40' 3.495 N	104° 53' 37.341 W	
985.0	1.70	5.30	985.0	2.2	0.3	1,486,639.89	3,168,191.43	40° 40' 3.513 N	104° 53' 37.338 W	
1,077.0	1.90	359.20	1,076.9	5.1	0.4	1,486,642.77	3,168,191.53	40° 40' 3.541 N	104° 53' 37.337 W	
1,169.0	2.20	3.90	1,168.9	8.4	0.5	1,486,646.06	3,168,191.63	40° 40' 3.574 N	104° 53' 37.335 W	
1,261.0	1.00	17.30	1,260.8	10.9	0.8	1,486,648.59	3,168,191.99	40° 40' 3.599 N	104° 53' 37.330 W	
1,354.0	1.40	3.00	1,353.8	12.8	1.1	1,486,650.50	3,168,192.29	40° 40' 3.617 N	104° 53' 37.326 W	
1,445.0	1.60	359.20	1,444.8	15.2	1.2	1,486,652.88	3,168,192.33	40° 40' 3.641 N	104° 53' 37.326 W	
1,537.0	1.40	0.40	1,536.7	17.6	1.2	1,486,655.28	3,168,192.32	40° 40' 3.665 N	104° 53' 37.325 W	
1,627.0	1.30	13.10	1,626.7	19.7	1.4	1,486,657.38	3,168,192.56	40° 40' 3.685 N	104° 53' 37.322 W	
1,720.0	1.30	334.80	1,719.7	21.7	1.2	1,486,659.36	3,168,192.35	40° 40' 3.705 N	104° 53' 37.325 W	

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<b>Site:</b>	Black Hollow 8-67-16-3H	<b>MD Reference:</b>	WELL @ 5306.0usft (H&P 321)
<b>Well:</b>	Black Hollow 8-67-16-3H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Original Hole	<b>Database:</b>	EDMPROD

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
1,812.0	1.70	344.10	1,811.7	23.9	0.4	1,486,661.62	3,168,191.53	40° 40' 3.727 N	104° 53' 37.335 W	
1,904.0	1.70	337.00	1,903.6	26.5	-0.5	1,486,664.19	3,168,190.62	40° 40' 3.753 N	104° 53' 37.347 W	
1,994.0	1.60	341.70	1,993.6	28.9	-1.5	1,486,666.61	3,168,189.71	40° 40' 3.777 N	104° 53' 37.358 W	
2,087.0	2.60	331.40	2,086.5	32.0	-2.9	1,486,669.69	3,168,188.29	40° 40' 3.807 N	104° 53' 37.377 W	
2,182.0	1.40	344.80	2,181.5	35.0	-4.2	1,486,672.70	3,168,186.95	40° 40' 3.837 N	104° 53' 37.394 W	
2,278.0	1.60	352.10	2,277.4	37.5	-4.7	1,486,675.16	3,168,186.46	40° 40' 3.862 N	104° 53' 37.400 W	
2,373.0	1.80	4.20	2,372.4	40.3	-4.8	1,486,677.97	3,168,186.39	40° 40' 3.889 N	104° 53' 37.400 W	
2,469.0	1.60	3.20	2,468.4	43.1	-4.6	1,486,680.81	3,168,186.58	40° 40' 3.917 N	104° 53' 37.398 W	
2,565.0	2.10	353.30	2,564.3	46.2	-4.7	1,486,683.89	3,168,186.44	40° 40' 3.948 N	104° 53' 37.399 W	
2,660.0	1.70	309.30	2,659.3	48.8	-6.0	1,486,686.51	3,168,185.15	40° 40' 3.974 N	104° 53' 37.416 W	
2,756.0	1.60	308.60	2,755.2	50.6	-8.2	1,486,688.25	3,168,183.00	40° 40' 3.991 N	104° 53' 37.443 W	
2,852.0	1.60	303.20	2,851.2	52.1	-10.3	1,486,689.82	3,168,180.83	40° 40' 4.007 N	104° 53' 37.471 W	
2,947.0	1.70	288.40	2,946.1	53.3	-12.8	1,486,690.99	3,168,178.39	40° 40' 4.018 N	104° 53' 37.503 W	
3,043.0	2.00	298.80	3,042.1	54.6	-15.6	1,486,692.25	3,168,175.57	40° 40' 4.031 N	104° 53' 37.540 W	
3,139.0	0.70	273.70	3,138.1	55.4	-17.6	1,486,693.09	3,168,173.51	40° 40' 4.040 N	104° 53' 37.566 W	
3,235.0	1.10	294.40	3,234.0	55.8	-19.1	1,486,693.51	3,168,172.09	40° 40' 4.044 N	104° 53' 37.585 W	
3,331.0	1.40	280.20	3,330.0	56.4	-21.1	1,486,694.10	3,168,170.10	40° 40' 4.050 N	104° 53' 37.610 W	
3,427.0	1.50	274.20	3,426.0	56.7	-23.5	1,486,694.40	3,168,167.69	40° 40' 4.053 N	104° 53' 37.642 W	
3,523.0	1.70	268.60	3,522.0	56.8	-26.1	1,486,694.46	3,168,165.01	40° 40' 4.054 N	104° 53' 37.676 W	
3,619.0	0.70	325.00	3,617.9	57.2	-27.9	1,486,694.90	3,168,163.25	40° 40' 4.058 N	104° 53' 37.699 W	
3,714.0	0.70	336.80	3,712.9	58.2	-28.5	1,486,695.91	3,168,162.69	40° 40' 4.068 N	104° 53' 37.706 W	
3,810.0	0.80	343.90	3,808.9	59.4	-28.9	1,486,697.10	3,168,162.27	40° 40' 4.080 N	104° 53' 37.712 W	
3,906.0	0.80	337.00	3,904.9	60.7	-29.3	1,486,698.36	3,168,161.83	40° 40' 4.092 N	104° 53' 37.717 W	
4,003.0	0.60	315.80	4,001.9	61.7	-30.0	1,486,699.34	3,168,161.21	40° 40' 4.102 N	104° 53' 37.725 W	
4,099.0	0.50	312.70	4,097.9	62.3	-30.6	1,486,699.99	3,168,160.55	40° 40' 4.109 N	104° 53' 37.734 W	
4,195.0	0.70	300.80	4,193.9	62.9	-31.4	1,486,700.57	3,168,159.74	40° 40' 4.114 N	104° 53' 37.744 W	
4,291.0	0.70	307.30	4,289.9	63.6	-32.4	1,486,701.23	3,168,158.77	40° 40' 4.121 N	104° 53' 37.757 W	
4,387.0	0.60	306.20	4,385.9	64.2	-33.3	1,486,701.88	3,168,157.89	40° 40' 4.127 N	104° 53' 37.768 W	
4,482.0	0.70	329.60	4,480.9	65.0	-34.0	1,486,702.67	3,168,157.20	40° 40' 4.135 N	104° 53' 37.777 W	
4,578.0	0.70	328.40	4,576.9	66.0	-34.6	1,486,703.68	3,168,156.60	40° 40' 4.145 N	104° 53' 37.785 W	
4,673.0	0.50	331.40	4,671.9	66.9	-35.1	1,486,704.54	3,168,156.09	40° 40' 4.154 N	104° 53' 37.791 W	
4,770.0	0.80	324.20	4,768.9	67.8	-35.7	1,486,705.46	3,168,155.49	40° 40' 4.163 N	104° 53' 37.799 W	
4,866.0	0.80	312.30	4,864.8	68.8	-36.6	1,486,706.45	3,168,154.61	40° 40' 4.173 N	104° 53' 37.810 W	
4,962.0	1.00	304.40	4,960.8	69.7	-37.7	1,486,707.38	3,168,153.42	40° 40' 4.182 N	104° 53' 37.826 W	
5,057.0	1.10	302.60	5,055.8	70.7	-39.2	1,486,708.34	3,168,151.97	40° 40' 4.192 N	104° 53' 37.844 W	
5,153.0	0.50	315.10	5,151.8	71.5	-40.3	1,486,709.13	3,168,150.90	40° 40' 4.200 N	104° 53' 37.858 W	
5,248.0	0.60	279.80	5,246.8	71.8	-41.0	1,486,709.51	3,168,150.11	40° 40' 4.203 N	104° 53' 37.868 W	
5,344.0	0.80	269.00	5,342.8	71.9	-42.2	1,486,709.58	3,168,148.95	40° 40' 4.204 N	104° 53' 37.884 W	
5,440.0	0.80	221.20	5,438.8	71.4	-43.3	1,486,709.07	3,168,147.84	40° 40' 4.199 N	104° 53' 37.898 W	
5,536.0	1.20	243.00	5,534.8	70.4	-44.7	1,486,708.11	3,168,146.50	40° 40' 4.190 N	104° 53' 37.915 W	
5,632.0	0.60	261.30	5,630.8	69.9	-46.1	1,486,707.57	3,168,145.11	40° 40' 4.185 N	104° 53' 37.934 W	
5,728.0	0.10	218.20	5,726.8	69.8	-46.6	1,486,707.43	3,168,144.56	40° 40' 4.183 N	104° 53' 37.941 W	
5,824.0	0.30	346.30	5,822.8	69.9	-46.7	1,486,707.61	3,168,144.45	40° 40' 4.185 N	104° 53' 37.942 W	
5,921.0	0.40	327.90	5,919.8	70.5	-47.0	1,486,708.14	3,168,144.21	40° 40' 4.190 N	104° 53' 37.945 W	
6,017.0	0.50	296.80	6,015.8	70.9	-47.5	1,486,708.62	3,168,143.65	40° 40' 4.195 N	104° 53' 37.952 W	
6,113.0	0.40	278.30	6,111.8	71.2	-48.2	1,486,708.85	3,168,142.95	40° 40' 4.197 N	104° 53' 37.961 W	
6,208.0	0.70	268.60	6,206.7	71.2	-49.1	1,486,708.89	3,168,142.04	40° 40' 4.198 N	104° 53' 37.973 W	
6,303.0	0.90	250.60	6,301.7	71.0	-50.4	1,486,708.63	3,168,140.76	40° 40' 4.195 N	104° 53' 37.990 W	
6,400.0	1.10	246.80	6,398.7	70.3	-52.0	1,486,708.01	3,168,139.18	40° 40' 4.189 N	104° 53' 38.010 W	
6,496.0	1.30	237.90	6,494.7	69.4	-53.7	1,486,707.06	3,168,137.41	40° 40' 4.180 N	104° 53' 38.033 W	
6,593.0	1.10	181.40	6,591.7	67.9	-54.7	1,486,705.55	3,168,136.46	40° 40' 4.165 N	104° 53' 38.046 W	
6,624.0	1.50	158.30	6,622.7	67.2	-54.6	1,486,704.87	3,168,136.60	40° 40' 4.158 N	104° 53' 38.044 W	
6,656.0	3.90	165.20	6,654.6	65.8	-54.1	1,486,703.43	3,168,137.03	40° 40' 4.144 N	104° 53' 38.039 W	
6,688.0	6.50	167.10	6,686.5	62.9	-53.4	1,486,700.61	3,168,137.72	40° 40' 4.116 N	104° 53' 38.030 W	
6,719.0	9.80	165.50	6,717.2	58.7	-52.4	1,486,696.35	3,168,138.77	40° 40' 4.074 N	104° 53' 38.017 W	

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## Survey Report - Geographic

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<b>Project:</b>	DJ BASIN - COLORADO	<b>TVD Reference:</b>	WELL @ 5306.0usft (H&P 321)
<b>Site:</b>	Black Hollow 8-67-16-3H	<b>MD Reference:</b>	WELL @ 5306.0usft (H&P 321)
<b>Well:</b>	Black Hollow 8-67-16-3H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Original Hole	<b>Database:</b>	EDMPROD

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,751.0	12.80	166.20	6,748.6	52.6	-50.9	1,486,690.27	3,168,140.30	40° 40' 4.014 N	104° 53' 37.997 W
6,782.0	15.00	167.20	6,778.7	45.3	-49.2	1,486,683.02	3,168,142.00	40° 40' 3.942 N	104° 53' 37.976 W
6,814.0	17.80	169.10	6,809.4	36.5	-47.3	1,486,674.18	3,168,143.85	40° 40' 3.855 N	104° 53' 37.953 W
6,845.0	20.20	171.60	6,838.7	26.6	-45.6	1,486,664.23	3,168,145.53	40° 40' 3.756 N	104° 53' 37.932 W
6,877.0	22.20	173.70	6,868.5	15.1	-44.2	1,486,652.75	3,168,147.00	40° 40' 3.643 N	104° 53' 37.914 W
6,910.0	24.70	175.10	6,898.8	2.0	-42.9	1,486,639.68	3,168,148.27	40° 40' 3.514 N	104° 53' 37.899 W
6,942.0	27.20	177.30	6,927.5	-12.0	-42.0	1,486,625.71	3,168,149.19	40° 40' 3.375 N	104° 53' 37.888 W
6,974.0	28.70	177.10	6,955.8	-26.9	-41.2	1,486,610.73	3,168,149.92	40° 40' 3.227 N	104° 53' 37.880 W
7,005.0	31.50	177.70	6,982.6	-42.5	-40.5	1,486,595.20	3,168,150.62	40° 40' 3.074 N	104° 53' 37.872 W
7,037.0	34.10	178.30	7,009.5	-59.8	-39.9	1,486,577.88	3,168,151.22	40° 40' 2.903 N	104° 53' 37.866 W
7,070.0	36.50	178.70	7,036.4	-78.9	-39.4	1,486,558.82	3,168,151.72	40° 40' 2.714 N	104° 53' 37.861 W
7,102.0	39.80	179.10	7,061.6	-98.6	-39.1	1,486,539.06	3,168,152.10	40° 40' 2.519 N	104° 53' 37.858 W
7,133.0	42.50	179.00	7,084.9	-119.0	-38.7	1,486,518.67	3,168,152.43	40° 40' 2.317 N	104° 53' 37.855 W
7,165.0	43.10	180.00	7,108.4	-140.7	-38.5	1,486,496.93	3,168,152.62	40° 40' 2.103 N	104° 53' 37.855 W
7,197.0	42.90	181.00	7,131.8	-162.6	-38.7	1,486,475.10	3,168,152.43	40° 40' 1.887 N	104° 53' 37.859 W
7,229.0	44.20	182.40	7,155.0	-184.6	-39.4	1,486,453.07	3,168,151.78	40° 40' 1.669 N	104° 53' 37.870 W
7,261.0	45.50	182.90	7,177.7	-207.1	-40.4	1,486,430.52	3,168,150.73	40° 40' 1.447 N	104° 53' 37.885 W
7,293.0	48.70	183.30	7,199.5	-230.6	-41.7	1,486,407.12	3,168,149.46	40° 40' 1.215 N	104° 53' 37.904 W
7,325.0	51.70	183.20	7,220.0	-255.1	-43.1	1,486,382.58	3,168,148.07	40° 40' 0.973 N	104° 53' 37.924 W
7,357.0	54.50	182.80	7,239.2	-280.6	-44.4	1,486,357.02	3,168,146.73	40° 40' 0.721 N	104° 53' 37.944 W
7,389.0	57.80	182.80	7,257.0	-307.2	-45.7	1,486,330.48	3,168,145.43	40° 40' 0.458 N	104° 53' 37.963 W
7,421.0	59.80	181.50	7,273.6	-334.5	-46.8	1,486,303.13	3,168,144.41	40° 40' 0.188 N	104° 53' 37.978 W
7,453.0	61.90	180.40	7,289.2	-362.5	-47.2	1,486,275.19	3,168,143.95	40° 39' 59.912 N	104° 53' 37.987 W
7,485.0	65.50	179.70	7,303.3	-391.2	-47.2	1,486,246.51	3,168,143.93	40° 39' 59.629 N	104° 53' 37.990 W
7,517.0	69.60	180.30	7,315.6	-420.7	-47.2	1,486,216.94	3,168,143.92	40° 39' 59.337 N	104° 53' 37.992 W
7,548.0	73.30	180.60	7,325.4	-450.1	-47.5	1,486,187.56	3,168,143.69	40° 39' 59.046 N	104° 53' 37.998 W
7,580.0	78.10	181.00	7,333.3	-481.1	-47.9	1,486,156.56	3,168,143.26	40° 39' 58.740 N	104° 53' 38.006 W
7,612.0	82.00	181.60	7,338.9	-512.6	-48.6	1,486,125.06	3,168,142.54	40° 39' 58.429 N	104° 53' 38.018 W
7,644.0	85.90	182.60	7,342.2	-544.4	-49.8	1,486,093.26	3,168,141.38	40° 39' 58.115 N	104° 53' 38.036 W
7,676.0	90.30	183.60	7,343.3	-576.3	-51.5	1,486,061.34	3,168,139.65	40° 39' 57.799 N	104° 53' 38.062 W
7,708.0	91.50	183.70	7,342.8	-608.3	-53.6	1,486,029.41	3,168,137.61	40° 39' 57.484 N	104° 53' 38.091 W
7,739.0	91.30	183.80	7,342.0	-639.2	-55.6	1,485,998.48	3,168,135.58	40° 39' 57.179 N	104° 53' 38.120 W
7,771.0	91.40	183.90	7,341.3	-671.1	-57.7	1,485,966.56	3,168,133.43	40° 39' 56.863 N	104° 53' 38.151 W
7,792.4	91.21	183.62	7,340.8	-692.5	-59.1	1,485,945.19	3,168,132.03	40° 39' 56.652 N	104° 53' 38.171 W
<b>A - Black Hollow 8-67-16-3H Landing Point</b>									
7,817.0	91.00	183.30	7,340.3	-717.0	-60.6	1,485,920.66	3,168,130.55	40° 39' 56.410 N	104° 53' 38.192 W
7,881.0	90.50	183.20	7,339.5	-780.9	-64.2	1,485,856.77	3,168,126.92	40° 39' 55.779 N	104° 53' 38.245 W
7,945.0	89.90	183.30	7,339.2	-844.8	-67.9	1,485,792.88	3,168,123.29	40° 39' 55.148 N	104° 53' 38.298 W
8,040.0	90.60	182.90	7,338.8	-939.7	-73.0	1,485,698.02	3,168,118.15	40° 39' 54.211 N	104° 53' 38.373 W
8,135.0	92.20	183.00	7,336.5	-1,034.5	-77.9	1,485,603.17	3,168,113.27	40° 39' 53.274 N	104° 53' 38.445 W
8,230.0	92.20	182.70	7,332.9	-1,129.3	-82.6	1,485,508.36	3,168,108.55	40° 39' 52.337 N	104° 53' 38.514 W
8,325.0	92.90	182.20	7,328.6	-1,224.1	-86.7	1,485,413.54	3,168,104.49	40° 39' 51.401 N	104° 53' 38.575 W
8,421.0	91.00	180.70	7,325.4	-1,320.0	-89.1	1,485,317.64	3,168,102.06	40° 39' 50.453 N	104° 53' 38.615 W
8,517.0	90.80	180.60	7,323.9	-1,416.0	-90.2	1,485,221.65	3,168,100.97	40° 39' 49.505 N	104° 53' 38.638 W
8,613.0	90.50	179.60	7,322.8	-1,512.0	-90.4	1,485,125.66	3,168,100.81	40° 39' 48.556 N	104° 53' 38.649 W
8,708.0	89.80	179.50	7,322.5	-1,607.0	-89.6	1,485,030.67	3,168,101.55	40° 39' 47.618 N	104° 53' 38.647 W
8,804.0	88.40	180.00	7,324.0	-1,703.0	-89.2	1,484,934.68	3,168,101.97	40° 39' 46.669 N	104° 53' 38.651 W
8,899.0	88.70	180.10	7,326.4	-1,798.0	-89.3	1,484,839.71	3,168,101.89	40° 39' 45.731 N	104° 53' 38.660 W
8,995.0	88.10	180.00	7,329.1	-1,893.9	-89.4	1,484,743.75	3,168,101.80	40° 39' 44.783 N	104° 53' 38.670 W
9,092.0	88.10	182.20	7,332.3	-1,990.8	-91.2	1,484,646.83	3,168,099.94	40° 39' 43.825 N	104° 53' 38.702 W
9,188.0	90.30	181.10	7,333.7	-2,086.8	-94.0	1,484,550.88	3,168,097.18	40° 39' 42.877 N	104° 53' 38.747 W
9,283.0	93.70	181.20	7,330.4	-2,181.7	-95.9	1,484,455.97	3,168,095.27	40° 39' 41.940 N	104° 53' 38.780 W
9,380.0	93.10	180.70	7,324.6	-2,278.5	-97.5	1,484,359.16	3,168,093.67	40° 39' 40.983 N	104° 53' 38.809 W
9,477.0	93.80	180.20	7,318.8	-2,375.3	-98.3	1,484,262.34	3,168,092.91	40° 39' 40.026 N	104° 53' 38.828 W

# Marathon Oil

## Survey Report - Geographic

<b>Company:</b>	USA	<b>Local Co-ordinate Reference:</b>	Well Black Hollow 8-67-16-3H
<b>Project:</b>	DJ BASIN - COLORADO	<b>TVD Reference:</b>	WELL @ 5306.0usft (H&P 321)
<b>Site:</b>	Black Hollow 8-67-16-3H	<b>MD Reference:</b>	WELL @ 5306.0usft (H&P 321)
<b>Well:</b>	Black Hollow 8-67-16-3H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Original Hole	<b>Database:</b>	EDMPROD

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,484.1	93.80	180.16	7,318.3	-2,382.4	-98.3	1,484,255.29	3,168,092.89	40° 39' 39.957 N	104° 53' 38.829 W
<b>B - Black Hollow 8-67-16-3H DB90</b>									
9,575.0	93.80	179.60	7,312.3	-2,473.1	-98.1	1,484,164.56	3,168,093.08	40° 39' 39.060 N	104° 53' 38.834 W
9,670.0	92.90	179.40	7,306.7	-2,568.0	-97.3	1,484,069.72	3,168,093.91	40° 39' 38.123 N	104° 53' 38.832 W
9,765.0	92.30	179.50	7,302.4	-2,662.8	-96.3	1,483,974.82	3,168,094.82	40° 39' 37.185 N	104° 53' 38.828 W
9,861.0	92.10	180.40	7,298.7	-2,758.8	-96.3	1,483,878.90	3,168,094.90	40° 39' 36.237 N	104° 53' 38.836 W
9,957.0	89.80	180.00	7,297.1	-2,854.8	-96.6	1,483,782.92	3,168,094.57	40° 39' 35.289 N	104° 53' 38.849 W
10,053.0	89.20	180.20	7,298.0	-2,950.8	-96.8	1,483,686.92	3,168,094.40	40° 39' 34.340 N	104° 53' 38.859 W
10,148.0	89.00	180.30	7,299.5	-3,045.7	-97.2	1,483,591.93	3,168,093.98	40° 39' 33.402 N	104° 53' 38.873 W
10,245.0	89.00	180.60	7,301.2	-3,142.7	-97.9	1,483,494.95	3,168,093.22	40° 39' 32.444 N	104° 53' 38.892 W
10,342.0	89.70	180.80	7,302.3	-3,239.7	-99.1	1,483,397.97	3,168,092.04	40° 39' 31.485 N	104° 53' 38.916 W
10,437.0	89.10	179.70	7,303.3	-3,334.7	-99.5	1,483,302.97	3,168,091.62	40° 39' 30.547 N	104° 53' 38.929 W
10,534.0	89.00	178.50	7,304.9	-3,431.7	-98.0	1,483,206.00	3,168,093.15	40° 39' 29.589 N	104° 53' 38.918 W
10,629.0	88.00	176.40	7,307.4	-3,526.5	-93.8	1,483,111.13	3,168,097.37	40° 39' 28.651 N	104° 53' 38.872 W
10,725.0	87.20	175.60	7,311.4	-3,622.2	-87.1	1,483,015.45	3,168,104.06	40° 39' 27.705 N	104° 53' 38.794 W
10,822.0	88.20	180.60	7,315.3	-3,719.1	-83.9	1,482,918.62	3,168,107.27	40° 39' 26.748 N	104° 53' 38.760 W
10,918.0	89.30	177.10	7,317.4	-3,815.0	-82.0	1,482,822.68	3,168,109.20	40° 39' 25.800 N	104° 53' 38.744 W
11,013.0	90.40	174.40	7,317.6	-3,909.7	-74.9	1,482,727.95	3,168,116.24	40° 39' 24.863 N	104° 53' 38.661 W
11,109.0	89.80	174.70	7,317.4	-4,005.3	-65.8	1,482,632.38	3,168,125.36	40° 39' 23.918 N	104° 53' 38.551 W
11,205.0	91.20	174.50	7,316.6	-4,100.9	-56.8	1,482,536.81	3,168,134.39	40° 39' 22.973 N	104° 53' 38.442 W
11,244.0	91.00	173.20	7,315.9	-4,139.6	-52.6	1,482,498.05	3,168,138.57	40° 39' 22.590 N	104° 53' 38.392 W
11,311.0	91.00	173.20	7,314.7	-4,206.1	-44.7	1,482,431.53	3,168,146.50	40° 39' 21.932 N	104° 53' 38.295 W
<b>C - Black Hollow 8-67-16-3H BHL</b>									

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_