



# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well UWF05C-03H H04 596
<b>Company:</b>	Caerus Oil & Gas	<b>TVD Reference:</b>	30' KB @ 8300.00usft
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 8300.00usft
<b>Site:</b>	S4-T5S-R96W (H04)	<b>North Reference:</b>	True
<b>Well:</b>	UWF05C-03H H04 596	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

<b>Project</b>	Garfield County, CO (UTM 12N)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 - Western US		
<b>Map Zone:</b>	Zone 12N (114 W to 108 W)		

<b>Site</b>	S4-T5S-R96W (H04)		
<b>Site Position:</b>		<b>Northing:</b>	14,409,713.20 usft
<b>From:</b>	Map	<b>Easting:</b>	2,438,700.39 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16"
		<b>Latitude:</b>	39.645887
		<b>Longitude:</b>	-108.164391
		<b>Grid Convergence:</b>	1.81 °

<b>Well</b>	UWF05C-03H H04 596		
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	usft
		<b>Latitude:</b>	39.646125
		<b>Longitude:</b>	-108.164304
		<b>Ground Level:</b>	8,270.00 usft

<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</b>
			(°)	(°)	(nT)
	HDGM	8/31/2017	9.72	65.93	51,509.40000000

<b>Design</b>	PLAN #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	90.32

<b>Plan Sections</b>										
<b>Measured Depth</b>	<b>Inclination</b>	<b>Azimuth</b>	<b>Vertical Depth</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Dogleg Rate</b>	<b>Build Rate</b>	<b>Turn Rate</b>	<b>TFO</b>	<b>Target</b>
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)	(°)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
718.22	12.55	88.01	714.88	1.58	45.58	3.00	3.00	0.00	88.01	
7,446.11	12.55	88.01	7,282.12	52.28	1,506.22	0.00	0.00	0.00	0.00	
7,864.33	0.00	0.00	7,697.00	53.86	1,551.80	3.00	-3.00	0.00	180.00	
8,174.21	3.10	250.00	8,006.73	50.99	1,543.93	1.00	1.00	-35.50	250.00	
11,353.13	3.10	250.00	11,181.00	-7.78	1,382.44	0.00	0.00	0.00	0.00	UWF05C PBHL

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<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 8300.00usft
<b>Site:</b>	S4-T5S-R96W (H04)	<b>North Reference:</b>	True
<b>Well:</b>	UWF05C-03H H04 596	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	
400.00	3.00	88.01	399.95	0.09	2.62	2.62	3.00	3.00	
500.00	6.00	88.01	499.63	0.36	10.46	10.45	3.00	3.00	
600.00	9.00	88.01	598.77	0.82	23.50	23.49	3.00	3.00	
700.00	12.00	88.01	697.08	1.45	41.71	41.70	3.00	3.00	
718.22	12.55	88.01	714.88	1.58	45.58	45.57	3.00	3.00	
800.00	12.55	88.01	794.71	2.20	63.34	63.32	0.00	0.00	
900.00	12.55	88.01	892.32	2.95	85.05	85.03	0.00	0.00	
1,000.00	12.55	88.01	989.94	3.71	106.76	106.73	0.00	0.00	
1,100.00	12.55	88.01	1,087.55	4.46	128.47	128.44	0.00	0.00	
1,200.00	12.55	88.01	1,185.16	5.21	150.18	150.14	0.00	0.00	
1,300.00	12.55	88.01	1,282.77	5.97	171.89	171.85	0.00	0.00	
1,400.00	12.55	88.01	1,380.38	6.72	193.60	193.56	0.00	0.00	
1,500.00	12.55	88.01	1,478.00	7.47	215.31	215.26	0.00	0.00	
1,600.00	12.55	88.01	1,575.61	8.23	237.02	236.97	0.00	0.00	
1,700.00	12.55	88.01	1,673.22	8.98	258.73	258.67	0.00	0.00	
1,800.00	12.55	88.01	1,770.83	9.73	280.44	280.38	0.00	0.00	
1,900.00	12.55	88.01	1,868.44	10.49	302.15	302.08	0.00	0.00	
2,000.00	12.55	88.01	1,966.06	11.24	323.86	323.79	0.00	0.00	
2,100.00	12.55	88.01	2,063.67	11.99	345.57	345.49	0.00	0.00	
2,200.00	12.55	88.01	2,161.28	12.75	367.28	367.20	0.00	0.00	
2,300.00	12.55	88.01	2,258.89	13.50	388.99	388.91	0.00	0.00	
2,400.00	12.55	88.01	2,356.50	14.25	410.70	410.61	0.00	0.00	
2,500.00	12.55	88.01	2,454.12	15.01	432.41	432.32	0.00	0.00	
2,600.00	12.55	88.01	2,551.73	15.76	454.12	454.02	0.00	0.00	
2,700.00	12.55	88.01	2,649.34	16.52	475.83	475.73	0.00	0.00	
2,800.00	12.55	88.01	2,746.95	17.27	497.54	497.43	0.00	0.00	
2,900.00	12.55	88.01	2,844.56	18.02	519.25	519.14	0.00	0.00	
3,000.00	12.55	88.01	2,942.18	18.78	540.96	540.85	0.00	0.00	
3,100.00	12.55	88.01	3,039.79	19.53	562.67	562.55	0.00	0.00	
3,200.00	12.55	88.01	3,137.40	20.28	584.38	584.26	0.00	0.00	
3,300.00	12.55	88.01	3,235.01	21.04	606.09	605.96	0.00	0.00	
3,400.00	12.55	88.01	3,332.62	21.79	627.80	627.67	0.00	0.00	
3,500.00	12.55	88.01	3,430.24	22.54	649.51	649.37	0.00	0.00	
3,600.00	12.55	88.01	3,527.85	23.30	671.22	671.08	0.00	0.00	
3,700.00	12.55	88.01	3,625.46	24.05	692.93	692.78	0.00	0.00	
3,800.00	12.55	88.01	3,723.07	24.80	714.64	714.49	0.00	0.00	
3,900.00	12.55	88.01	3,820.68	25.56	736.35	736.20	0.00	0.00	
4,000.00	12.55	88.01	3,918.30	26.31	758.06	757.90	0.00	0.00	
4,100.00	12.55	88.01	4,015.91	27.06	779.77	779.61	0.00	0.00	
4,200.00	12.55	88.01	4,113.52	27.82	801.48	801.31	0.00	0.00	
4,300.00	12.55	88.01	4,211.13	28.57	823.19	823.02	0.00	0.00	
4,400.00	12.55	88.01	4,308.74	29.32	844.90	844.72	0.00	0.00	
4,500.00	12.55	88.01	4,406.36	30.08	866.61	866.43	0.00	0.00	
4,600.00	12.55	88.01	4,503.97	30.83	888.32	888.14	0.00	0.00	
4,700.00	12.55	88.01	4,601.58	31.59	910.03	909.84	0.00	0.00	
4,800.00	12.55	88.01	4,699.19	32.34	931.74	931.55	0.00	0.00	
4,900.00	12.55	88.01	4,796.80	33.09	953.45	953.25	0.00	0.00	
5,000.00	12.55	88.01	4,894.42	33.85	975.16	974.96	0.00	0.00	

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<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 8300.00usft
<b>Site:</b>	S4-T5S-R96W (H04)	<b>North Reference:</b>	True
<b>Well:</b>	UWF05C-03H H04 596	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
5,100.00	12.55	88.01	4,992.03	34.60	996.87	996.66	0.00	0.00	
5,200.00	12.55	88.01	5,089.64	35.35	1,018.58	1,018.37	0.00	0.00	
5,300.00	12.55	88.01	5,187.25	36.11	1,040.29	1,040.07	0.00	0.00	
5,378.63	12.55	88.01	5,264.00	36.70	1,057.36	1,057.14	0.00	0.00	WASATCH_G_ZONE.MBL (TVD)
5,400.00	12.55	88.01	5,284.86	36.86	1,062.00	1,061.78	0.00	0.00	
5,454.44	12.55	88.01	5,338.00	37.27	1,073.82	1,073.60	0.00	0.00	WASATCH.MBL (TVD)
5,500.00	12.55	88.01	5,382.48	37.61	1,083.71	1,083.49	0.00	0.00	
5,600.00	12.55	88.01	5,480.09	38.37	1,105.42	1,105.19	0.00	0.00	
5,700.00	12.55	88.01	5,577.70	39.12	1,127.13	1,126.90	0.00	0.00	
5,737.19	12.55	88.01	5,614.00	39.40	1,135.21	1,134.97	0.00	0.00	FORT_UNION.MBL (TVD)
5,800.00	12.55	88.01	5,675.31	39.87	1,148.85	1,148.60	0.00	0.00	
5,900.00	12.55	88.01	5,772.92	40.63	1,170.56	1,170.31	0.00	0.00	
6,000.00	12.55	88.01	5,870.54	41.38	1,192.27	1,192.01	0.00	0.00	
6,100.00	12.55	88.01	5,968.15	42.13	1,213.98	1,213.72	0.00	0.00	
6,200.00	12.55	88.01	6,065.76	42.89	1,235.69	1,235.43	0.00	0.00	
6,300.00	12.55	88.01	6,163.37	43.64	1,257.40	1,257.13	0.00	0.00	
6,400.00	12.55	88.01	6,260.98	44.40	1,279.11	1,278.84	0.00	0.00	
6,500.00	12.55	88.01	6,358.60	45.15	1,300.82	1,300.54	0.00	0.00	
6,600.00	12.55	88.01	6,456.21	45.90	1,322.53	1,322.25	0.00	0.00	
6,700.00	12.55	88.01	6,553.82	46.66	1,344.24	1,343.95	0.00	0.00	
6,800.00	12.55	88.01	6,651.43	47.41	1,365.95	1,365.66	0.00	0.00	
6,900.00	12.55	88.01	6,749.04	48.16	1,387.66	1,387.36	0.00	0.00	
7,000.00	12.55	88.01	6,846.66	48.92	1,409.37	1,409.07	0.00	0.00	
7,100.00	12.55	88.01	6,944.27	49.67	1,431.08	1,430.78	0.00	0.00	
7,200.00	12.55	88.01	7,041.88	50.42	1,452.79	1,452.48	0.00	0.00	
7,300.00	12.55	88.01	7,139.49	51.18	1,474.50	1,474.19	0.00	0.00	
7,400.00	12.55	88.01	7,237.10	51.93	1,496.21	1,495.89	0.00	0.00	
7,446.11	12.55	88.01	7,282.12	52.28	1,506.22	1,505.90	0.00	0.00	
7,500.00	10.93	88.01	7,334.87	52.66	1,517.18	1,516.86	3.00	-3.00	
7,600.00	7.93	88.01	7,433.51	53.23	1,533.55	1,533.22	3.00	-3.00	
7,676.03	5.65	88.01	7,509.00	53.54	1,542.53	1,542.20	3.00	-3.00	OHIO_CREEK.MBL (TVD)
7,700.00	4.93	88.01	7,532.87	53.61	1,544.74	1,544.41	3.00	-3.00	
7,800.00	1.93	88.01	7,632.68	53.82	1,550.72	1,550.39	3.00	-3.00	
7,864.33	0.00	0.00	7,697.00	53.86	1,551.80	1,551.47	3.00	-3.00	
7,900.00	0.36	250.00	7,732.67	53.82	1,551.70	1,551.37	1.00	1.00	
7,914.33	0.50	250.00	7,747.00	53.79	1,551.59	1,551.27	1.00	1.00	WILLIAMS_FORK.MBL (TVD)
7,964.34	1.00	250.00	7,797.00	53.56	1,550.98	1,550.65	1.00	1.00	TOP_GAS.MBL (TVD)
8,000.00	1.36	250.00	7,832.66	53.31	1,550.29	1,549.97	1.00	1.00	
8,100.00	2.36	250.00	7,932.60	52.20	1,547.25	1,546.93	1.00	1.00	
8,174.21	3.10	250.00	8,006.73	50.99	1,543.93	1,543.62	1.00	1.00	
8,200.00	3.10	250.00	8,032.48	50.52	1,542.62	1,542.31	0.00	0.00	
8,300.00	3.10	250.00	8,132.33	48.67	1,537.54	1,537.24	0.00	0.00	
8,400.00	3.10	250.00	8,232.19	46.82	1,532.46	1,532.17	0.00	0.00	
8,500.00	3.10	250.00	8,332.04	44.97	1,527.38	1,527.10	0.00	0.00	
8,600.00	3.10	250.00	8,431.89	43.12	1,522.30	1,522.03	0.00	0.00	
8,700.00	3.10	250.00	8,531.75	41.27	1,517.22	1,516.96	0.00	0.00	
8,800.00	3.10	250.00	8,631.60	39.43	1,512.14	1,511.89	0.00	0.00	
8,900.00	3.10	250.00	8,731.46	37.58	1,507.06	1,506.82	0.00	0.00	
9,000.00	3.10	250.00	8,831.31	35.73	1,501.98	1,501.75	0.00	0.00	
9,100.00	3.10	250.00	8,931.16	33.88	1,496.90	1,496.68	0.00	0.00	
9,200.00	3.10	250.00	9,031.02	32.03	1,491.82	1,491.62	0.00	0.00	
9,300.00	3.10	250.00	9,130.87	30.18	1,486.74	1,486.55	0.00	0.00	

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<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

### Planned Survey

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9,400.00	3.10	250.00	9,230.72	28.33	1,481.66	1,481.48	0.00	0.00	
9,500.00	3.10	250.00	9,330.58	26.48	1,476.58	1,476.41	0.00	0.00	
9,600.00	3.10	250.00	9,430.43	24.64	1,471.50	1,471.34	0.00	0.00	
9,700.00	3.10	250.00	9,530.29	22.79	1,466.42	1,466.27	0.00	0.00	
9,800.00	3.10	250.00	9,630.14	20.94	1,461.34	1,461.20	0.00	0.00	
9,900.00	3.10	250.00	9,729.99	19.09	1,456.26	1,456.13	0.00	0.00	
10,000.00	3.10	250.00	9,829.85	17.24	1,451.18	1,451.06	0.00	0.00	
10,100.00	3.10	250.00	9,929.70	15.39	1,446.10	1,445.99	0.00	0.00	
10,200.00	3.10	250.00	10,029.55	13.54	1,441.02	1,440.92	0.00	0.00	
10,300.00	3.10	250.00	10,129.41	11.69	1,435.94	1,435.85	0.00	0.00	
10,400.00	3.10	250.00	10,229.26	9.85	1,430.86	1,430.78	0.00	0.00	
10,500.00	3.10	250.00	10,329.12	8.00	1,425.78	1,425.71	0.00	0.00	
10,556.97	3.10	250.00	10,386.00	6.94	1,422.89	1,422.83	0.00	0.00	CAMEO.MBL (TVD)
10,600.00	3.10	250.00	10,428.97	6.15	1,420.70	1,420.64	0.00	0.00	
10,700.00	3.10	250.00	10,528.82	4.30	1,415.62	1,415.58	0.00	0.00	
10,800.00	3.10	250.00	10,628.68	2.45	1,410.54	1,410.51	0.00	0.00	
10,900.00	3.10	250.00	10,728.53	0.60	1,405.46	1,405.44	0.00	0.00	
11,000.00	3.10	250.00	10,828.39	-1.25	1,400.38	1,400.37	0.00	0.00	
11,100.00	3.10	250.00	10,928.24	-3.10	1,395.30	1,395.30	0.00	0.00	
11,177.87	3.10	250.00	11,006.00	-4.54	1,391.35	1,391.35	0.00	0.00	ROLLINS.MBL (TVD)
11,200.00	3.10	250.00	11,028.09	-4.94	1,390.22	1,390.23	0.00	0.00	
11,300.00	3.10	250.00	11,127.95	-6.79	1,385.14	1,385.16	0.00	0.00	
11,353.13	3.10	250.00	11,181.00	-7.78	1,382.44	1,382.47	0.00	0.00	TD.MBL (TVD)

### Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
UWF05C PBHL	0.00	0.00	11,181.00	-7.78	1,382.44	14,409,836.40	2,440,104.10	39.646103	-108.159397
- plan hits target center									
- Ellipse (radii L200.00 W100.00 on 250.00 azi)									

### Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,378.63	5,264.00	WASATCH_G_ZONE.MBL (TVD)			
5,454.44	5,338.00	WASATCH.MBL (TVD)			
5,737.19	5,614.00	FORT_UNION.MBL (TVD)			
7,676.03	7,509.00	OHIO_CREEK.MBL (TVD)			
7,914.33	7,747.00	WILLIAMS_FORK.MBL (TVD)			
7,964.34	7,797.00	TOP_GAS.MBL (TVD)			
10,556.97	10,386.00	CAMEO.MBL (TVD)			
11,177.87	11,006.00	ROLLINS.MBL (TVD)			
11,353.13	11,181.00	TD.MBL (TVD)			