



## Survey Report

<b>Company:</b>	Caerus Oil & Gas (NAD 27)	<b>Local Co-ordinate Reference:</b>	Well PUCKETT 23A-1
<b>Project:</b>	Garfield County, CO	<b>TVD Reference:</b>	30' KB @ 8359.0usft (H&P 330)
<b>Site:</b>	S1-T7S-R97W (Mesa E1 797)	<b>MD Reference:</b>	30' KB @ 8359.0usft (H&P 330)
<b>Well:</b>	PUCKETT 23A-1	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project</b>	Garfield County, CO		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Colorado Central 502		

Site		S1-T7S-R97W (Mesa E1 797)			
Site Position:		Northing:	609,370.34 usft	Latitude:	39.476064
From:	Lat/Long	Easting:	1,245,650.28 usft	Longitude:	-108.172658
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.69 °

Well	PUCKETT 23A-1					
Well Position	+N/-S	0.0 usft	Northing:	609,352.11 usft	Latitude:	39.476014
	+E/-W	0.0 usft	Easting:	1,245,650.31 usft	Longitude:	-108.172656
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	8,329.0 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 (nT)</b>
	HDGM	10/20/2015	9.83	65.82	51,935

<b>Design</b>	FINAL				
<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	109.13	

<b>Survey Program</b>	<b>Date</b>	10/26/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
265.0	8,897.0	Survey #1 (OH)	MWD+HDGM	OWSG MWD + HDGM	

<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>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usf)</b>	<b>Build Rate (°/100u)</b>	<b>Formations / Comments</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
265.0	1.70	60.50	265.0	1.9	3.4	2.6	0.64	0.64		
314.0	1.90	45.60	313.9	2.9	4.6	3.4	1.03	0.41		
405.0	2.60	42.90	404.9	5.4	7.1	4.9	0.78	0.77		
496.0	3.60	59.60	495.7	8.4	11.0	7.6	1.47	1.10		
541.0	4.00	67.30	540.6	9.7	13.7	9.7	1.44	0.89		
588.0	4.50	89.20	587.5	10.4	17.0	12.7	3.59	1.06		
634.0	4.50	110.00	633.4	9.8	20.5	16.2	3.53	0.00		
683.0	4.60	122.20	682.2	8.1	24.0	20.0	1.98	0.20		
778.0	5.20	134.70	776.9	3.0	30.3	27.6	1.29	0.63		
872.0	5.80	134.30	870.4	-3.3	36.7	35.7	0.64	0.64		
967.0	7.00	134.70	964.8	-10.7	44.2	45.3	1.26	1.26		
1,061.0	8.30	131.20	1,058.0	-19.2	53.4	56.8	1.47	1.38		

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<b>Site:</b>	S1-T7S-R97W (Mesa E1 797)	<b>MD Reference:</b>	30' KB @ 8359.0usft (H&P 330)
<b>Well:</b>	PUCKETT 23A-1	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,156.0	6.90	121.80	1,152.2	-26.7	63.4	68.7	1.97	-1.47	
1,251.0	6.70	110.00	1,246.5	-31.7	73.5	79.8	1.48	-0.21	
1,345.0	7.10	110.50	1,339.8	-35.6	84.1	91.1	0.43	0.43	
1,440.0	7.80	112.40	1,434.0	-40.1	95.5	103.4	0.78	0.74	
1,535.0	8.50	116.50	1,528.1	-45.7	107.8	116.8	0.96	0.74	
1,629.0	9.10	119.30	1,621.0	-52.4	120.5	131.0	0.78	0.64	
1,724.0	7.90	111.70	1,714.9	-58.5	133.1	144.9	1.73	-1.26	
1,818.0	7.50	111.60	1,808.1	-63.1	144.8	157.5	0.43	-0.43	
2,008.0	9.40	110.80	1,996.0	-73.2	170.8	185.4	1.00	1.00	
2,102.0	9.80	115.70	2,088.7	-79.4	185.2	201.0	0.97	0.43	
2,197.0	9.30	112.20	2,182.4	-85.8	199.6	216.7	0.81	-0.53	
2,291.0	8.00	104.70	2,275.3	-90.3	213.0	230.8	1.83	-1.38	
2,386.0	7.40	100.00	2,369.4	-93.1	225.4	243.5	0.92	-0.63	
2,470.0	7.00	100.60	2,452.8	-95.0	235.8	253.9	0.48	-0.48	
2,593.0	7.00	89.70	2,574.9	-96.3	250.6	268.3	1.08	0.00	
2,687.0	6.70	98.40	2,668.2	-97.1	261.8	279.1	1.15	-0.32	
2,782.0	6.40	96.00	2,762.6	-98.4	272.5	289.7	0.43	-0.32	
2,876.0	6.00	106.90	2,856.0	-100.4	282.4	299.7	1.32	-0.43	
2,971.0	5.60	111.30	2,950.5	-103.5	291.5	309.3	0.63	-0.42	
3,066.0	6.50	110.50	3,045.0	-107.1	300.9	319.3	0.95	0.95	
3,160.0	7.80	112.70	3,138.3	-111.4	311.7	331.0	1.41	1.38	
3,255.0	7.50	114.30	3,232.4	-116.5	323.3	343.6	0.39	-0.32	
3,350.0	7.20	114.40	3,326.7	-121.5	334.4	355.7	0.32	-0.32	
3,444.0	7.10	109.90	3,419.9	-125.9	345.2	367.4	0.61	-0.11	
3,539.0	6.40	109.30	3,514.3	-129.6	355.7	378.6	0.74	-0.74	
3,633.0	7.50	110.90	3,607.6	-133.6	366.4	390.0	1.19	1.17	
3,728.0	7.00	108.90	3,701.8	-137.7	377.7	401.9	0.59	-0.53	
3,822.0	6.10	108.20	3,795.2	-141.1	387.9	412.7	0.96	-0.96	
3,917.0	7.70	111.50	3,889.5	-145.0	398.6	424.1	1.73	1.68	
4,011.0	7.40	112.90	3,982.7	-149.6	410.0	436.4	0.37	-0.32	
4,106.0	7.20	112.90	4,076.9	-154.3	421.1	448.4	0.21	-0.21	
4,201.0	8.30	100.00	4,171.1	-157.8	433.4	461.2	2.16	1.16	
4,295.0	7.80	100.60	4,264.1	-160.2	446.3	474.2	0.54	-0.53	
4,390.0	7.70	99.00	4,358.3	-162.4	458.9	486.8	0.25	-0.11	
4,484.0	6.60	98.50	4,451.5	-164.2	470.5	498.3	1.17	-1.17	
4,578.0	6.70	100.40	4,544.9	-166.0	481.2	509.0	0.26	0.11	
4,673.0	5.80	100.10	4,639.3	-167.8	491.4	519.3	0.95	-0.95	
4,767.0	5.80	99.20	4,732.9	-169.4	500.8	528.6	0.10	0.00	
4,862.0	7.40	88.00	4,827.2	-169.9	511.6	539.1	2.15	1.68	
4,956.0	7.70	96.80	4,920.4	-170.5	523.9	550.9	1.27	0.32	
5,051.0	7.20	99.50	5,014.6	-172.2	536.1	563.0	0.64	-0.53	
5,146.0	8.50	112.00	5,108.7	-175.8	548.5	575.8	2.25	1.37	
5,240.0	8.40	114.40	5,201.7	-181.3	561.2	589.6	0.39	-0.11	
5,335.0	7.50	112.60	5,295.8	-186.5	573.2	602.7	0.98	-0.95	
5,429.0	6.80	117.70	5,389.1	-191.5	583.8	614.3	1.00	-0.74	
5,524.0	8.10	112.20	5,483.3	-196.6	595.0	626.6	1.56	1.37	
5,619.0	8.20	109.60	5,577.3	-201.4	607.6	640.0	0.40	0.11	
5,713.0	7.60	110.70	5,670.4	-205.8	619.7	653.0	0.66	-0.64	
5,808.0	9.00	107.60	5,764.4	-210.3	632.7	666.7	1.55	1.47	
5,902.0	8.80	105.40	5,857.3	-214.4	646.6	681.2	0.42	-0.21	
5,997.0	8.20	107.00	5,951.2	-218.4	660.1	695.2	0.68	-0.63	
6,091.0	7.80	105.50	6,044.3	-222.0	672.7	708.3	0.48	-0.43	
6,186.0	7.10	105.70	6,138.5	-225.3	684.5	720.6	0.74	-0.74	

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<b>Well:</b>	PUCKETT 23A-1	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
6,280.0	6.20	105.30	6,231.9	-228.2	695.0	731.4	0.96	-0.96	
6,375.0	5.30	108.30	6,326.4	-231.0	704.1	740.9	1.00	-0.95	
6,470.0	4.60	108.60	6,421.1	-233.6	711.9	749.1	0.74	-0.74	
6,564.0	3.80	110.30	6,514.8	-235.9	718.4	756.0	0.86	-0.85	
6,659.0	3.40	110.60	6,609.6	-237.9	724.0	762.0	0.42	-0.42	
6,753.0	3.20	115.50	6,703.5	-240.0	729.0	767.4	0.37	-0.21	
6,848.0	2.70	118.40	6,798.3	-242.3	733.3	772.2	0.55	-0.53	
6,942.0	2.20	96.70	6,892.3	-243.5	737.1	776.2	1.11	-0.53	
7,037.0	2.80	81.70	6,987.2	-243.4	741.2	780.0	0.93	0.63	
7,132.0	2.00	98.40	7,082.1	-243.3	745.1	783.7	1.11	-0.84	
7,226.0	1.30	104.80	7,176.0	-243.8	747.8	786.4	0.77	-0.74	
7,321.0	1.30	113.40	7,271.0	-244.5	749.8	788.5	0.21	0.00	
7,415.0	1.50	115.70	7,365.0	-245.5	751.9	790.8	0.22	0.21	
7,510.0	1.40	118.00	7,460.0	-246.6	754.0	793.2	0.12	-0.11	
7,604.0	0.90	122.40	7,553.9	-247.5	755.7	795.0	0.54	-0.53	
7,699.0	0.70	148.10	7,648.9	-248.4	756.6	796.2	0.43	-0.21	
7,793.0	1.20	217.70	7,742.9	-249.6	756.3	796.4	1.23	0.53	
7,888.0	1.90	221.80	7,837.9	-251.6	754.6	795.4	0.75	0.74	
7,982.0	2.20	226.50	7,931.8	-254.0	752.3	794.0	0.37	0.32	
8,077.0	2.20	231.50	8,026.8	-256.4	749.5	792.2	0.20	0.00	
8,172.0	2.70	236.70	8,121.7	-258.8	746.3	789.8	0.58	0.53	
8,266.0	3.20	239.50	8,215.5	-261.3	742.1	786.8	0.55	0.53	
8,361.0	2.90	245.70	8,310.4	-263.6	737.7	783.3	0.47	-0.32	
8,456.0	3.10	246.90	8,405.3	-265.6	733.1	779.7	0.22	0.21	
8,550.0	3.00	238.10	8,499.1	-267.9	728.7	776.3	0.51	-0.11	
8,644.0	3.60	242.60	8,593.0	-270.6	724.0	772.7	0.69	0.64	
8,739.0	3.90	241.80	8,687.8	-273.5	718.5	768.4	0.32	0.32	
8,832.0	3.70	239.90	8,780.6	-276.5	713.1	764.3	0.25	-0.22	LAST CES SURVEY @ 8832' MD
8,897.0	3.70	239.90	8,845.4	-278.6	709.5	761.6	0.00	0.00	PTB @ 8897' MD

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<b>Well:</b>	PUCKETT 23A-1	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL	<b>Database:</b>	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
PUCKETT 23A-1 BHL 7.	0.00	0.00	8,329.0	-253.8	731.7	609,076.85	1,246,374.23	39.475317	-108.170064
- actual wellpath misses target center by 11.4usft at 8379.6usft MD (8329.0 TVD, -264.0 N, 736.8 E)									
- Circle (radius 50.0)									
PUCKETT 23A-1 BHL 11	0.00	0.00	8,801.0	-253.8	731.7	609,076.85	1,246,374.23	39.475317	-108.170064
- actual wellpath misses target center by 35.7usft at 8832.0usft MD (8780.6 TVD, -276.5 N, 713.1 E)									
- Circle (radius 50.0)									
PUCKETT 23A-1 BHL	0.00	0.00	8,339.0	-807.5	825.7	608,520.70	1,246,451.92	39.473797	-108.169731
- actual wellpath misses target center by 550.5usft at 8396.8usft MD (8346.1 TVD, -264.4 N, 736.0 E)									
- Circle (radius 50.0)									
PUCKETT 23A-1 TGT	0.00	0.00	6,979.0	-807.5	825.7	608,520.70	1,246,451.92	39.473797	-108.169731
- actual wellpath misses target center by 570.4usft at 7031.8usft MD (6981.9 TVD, -243.4 N, 740.9 E)									
- Point									

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(usft)	(usft)			(°)	(°)
4,349.4	4,318.0	WASATCH_G_ZONE.MBL (SSTVD)			
4,657.6	4,624.0	FORT_UNION.MBL (SSTVD)			
5,902.7	5,858.0	OHIO_CREEK.MBL (SSTVD)			
6,078.6	6,032.0	WILLIAMS_FORK.MBL (SSTVD)			
6,906.7	6,857.0	TOP_GAS.MBL (SSTVD)			
8,702.1	8,651.0	ROLLINS.MBL (SSTVD)			
8,852.5	8,801.0	TD.MBL (SSTVD)			

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
8,832.0	8,780.6	-276.5	713.1	LAST CES SURVEY @ 8832' MD
8,897.0	8,845.4	-278.6	709.5	PTB @ 8897' MD

Checked By: _____	Approved By: _____	Date: _____
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