



## Survey Report

<b>Company:</b>	Caerus Oil & Gas (NAD 27)	<b>Local Co-ordinate Reference:</b>	Well PUCKETT 23B-1
<b>Project:</b>	Garfield County, CO	<b>TVD Reference:</b>	KB @ 8359.0usft (H&P 303)
<b>Site:</b>	S1-T7S-R97W (Mesa E1 797)	<b>MD Reference:</b>	KB @ 8359.0usft (H&P 303)
<b>Well:</b>	PUCKETT 23B-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 23B-1					
Well Position	+N/-S	0.0 usft	Northing:	609,350.29 usft	Latitude:	39.476008
	+E/-W	0.0 usft	Easting:	1,245,637.83 usft	Longitude:	-108.172700
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	7/14/2015	9.87	65.82	51,966

<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	217.03	

<b>Survey Program</b>	<b>Date</b>	8/3/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
153.0	8,867.0	Survey #1 (OH)	ISCWSA MWD	MWD - Standard	

<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		
153.0	1.70	269.30	153.0	0.0	-2.3	1.4	1.11	1.11		
183.0	2.20	261.80	183.0	-0.1	-3.3	2.1	1.87	1.67		
214.0	2.90	249.20	213.9	-0.5	-4.6	3.2	2.88	2.26		
244.0	3.40	240.80	243.9	-1.2	-6.1	4.6	2.26	1.67		
275.0	4.00	230.10	274.8	-2.3	-7.7	6.5	2.94	1.94		
305.0	4.70	217.60	304.7	-4.0	-9.3	8.8	3.92	2.33		
336.0	5.10	216.40	335.6	-6.1	-10.9	11.4	1.33	1.29		
366.0	5.40	211.80	365.5	-8.4	-12.4	14.1	1.72	1.00		
396.0	5.60	207.60	395.4	-10.9	-13.8	17.0	1.50	0.67		
488.0	6.30	203.60	486.9	-19.5	-17.9	26.3	0.88	0.76		
579.0	6.30	210.20	577.3	-28.3	-22.4	36.1	0.80	0.00		
674.0	6.80	210.70	671.7	-37.7	-27.9	46.9	0.53	0.53		

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<b>Site:</b>	S1-T7S-R97W (Mesa E1 797)	<b>MD Reference:</b>	KB @ 8359.0usft (H&P 303)
<b>Well:</b>	PUCKETT 23B-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
768.0	7.50	213.40	765.0	-47.6	-34.1	58.6	0.83	0.74	
863.0	8.20	210.20	859.1	-58.6	-41.0	71.5	0.87	0.74	
957.0	8.20	218.40	952.1	-69.7	-48.5	84.8	1.24	0.00	
1,052.0	8.70	219.00	1,046.1	-80.6	-57.2	98.8	0.53	0.53	
1,146.0	9.10	215.80	1,138.9	-92.1	-66.1	113.3	0.68	0.43	
1,241.0	9.60	212.10	1,232.7	-104.9	-74.7	128.7	0.82	0.53	
1,335.0	8.90	212.00	1,325.5	-117.7	-82.7	143.8	0.74	-0.74	
1,430.0	8.80	211.10	1,419.3	-130.2	-90.3	158.3	0.18	-0.11	
1,524.0	9.60	212.70	1,512.1	-142.9	-98.3	173.3	0.89	0.85	
1,619.0	10.60	210.70	1,605.7	-157.1	-107.0	189.9	1.12	1.05	
1,714.0	10.60	216.00	1,699.0	-171.7	-116.6	207.3	1.03	0.00	
1,808.0	11.80	219.60	1,791.2	-186.1	-127.8	225.5	1.48	1.28	
1,903.0	12.90	218.90	1,884.0	-201.8	-140.7	245.9	1.17	1.16	
1,998.0	14.00	218.80	1,976.4	-219.1	-154.5	267.9	1.16	1.16	
2,092.0	14.90	220.00	2,067.5	-237.2	-169.4	291.4	1.01	0.96	
2,187.0	15.30	220.70	2,159.2	-256.0	-185.5	316.1	0.46	0.42	
2,281.0	15.60	222.60	2,249.8	-274.7	-202.1	341.0	0.63	0.32	
2,376.0	15.50	221.90	2,341.3	-293.6	-219.2	366.4	0.22	-0.11	
2,470.0	16.00	220.40	2,431.8	-312.8	-236.0	391.8	0.69	0.53	
2,536.0	16.10	223.10	2,495.2	-326.4	-248.2	410.0	1.14	0.15	
2,631.0	15.50	220.30	2,586.6	-345.7	-265.4	435.8	1.02	-0.63	
2,725.0	15.60	219.50	2,677.2	-365.0	-281.5	461.0	0.25	0.11	
2,820.0	15.00	208.80	2,768.8	-385.7	-295.6	485.9	3.03	-0.63	
2,914.0	14.80	208.20	2,859.7	-406.9	-307.1	509.8	0.27	-0.21	
3,009.0	13.70	206.30	2,951.7	-427.7	-317.8	532.8	1.26	-1.16	
3,103.0	12.00	210.10	3,043.4	-446.1	-327.7	553.5	2.02	-1.81	
3,198.0	12.60	213.80	3,136.2	-463.3	-338.4	573.6	1.04	0.63	
3,291.0	12.50	210.50	3,227.0	-480.4	-349.1	593.8	0.78	-0.11	
3,387.0	12.00	221.10	3,320.8	-496.9	-361.0	614.0	2.40	-0.52	
3,481.0	11.50	221.90	3,412.8	-511.2	-373.6	633.1	0.56	-0.53	
3,576.0	11.10	225.30	3,506.0	-524.7	-386.5	651.6	0.82	-0.42	
3,670.0	11.20	222.60	3,598.2	-537.8	-399.1	669.7	0.57	0.11	
3,765.0	10.30	221.80	3,691.6	-550.9	-411.0	687.3	0.96	-0.95	
3,859.0	12.30	213.70	3,783.7	-565.5	-422.1	705.7	2.71	2.13	
3,953.0	12.00	217.30	3,875.6	-581.6	-433.6	725.4	0.87	-0.32	
4,048.0	11.30	218.00	3,968.7	-596.8	-445.3	744.6	0.75	-0.74	
4,142.0	11.30	218.90	4,060.9	-611.2	-456.8	763.0	0.19	0.00	
4,237.0	11.10	219.30	4,154.0	-625.5	-468.4	781.5	0.23	-0.21	
4,332.0	11.40	209.40	4,247.2	-640.8	-478.8	799.9	2.05	0.32	
4,426.0	11.70	207.80	4,339.3	-657.3	-487.8	818.5	0.47	0.32	
4,520.0	11.40	207.90	4,431.4	-673.9	-496.6	837.1	0.32	-0.32	
4,615.0	11.00	214.00	4,524.6	-689.8	-506.1	855.4	1.32	-0.42	
4,709.0	10.40	214.50	4,617.0	-704.2	-515.9	872.9	0.65	-0.64	
4,804.0	9.70	213.10	4,710.5	-718.0	-525.1	889.4	0.78	-0.74	
4,898.0	8.80	210.10	4,803.3	-730.8	-533.1	904.5	1.09	-0.96	
4,993.0	10.60	217.80	4,896.9	-744.0	-542.1	920.4	2.33	1.89	
5,088.0	12.60	214.80	4,990.0	-759.4	-553.3	939.5	2.20	2.11	
5,182.0	13.10	216.00	5,081.6	-776.5	-565.5	960.4	0.60	0.53	
5,277.0	12.40	216.00	5,174.3	-793.4	-577.8	981.4	0.74	-0.74	
5,371.0	11.80	215.80	5,266.2	-809.4	-589.3	1,001.1	0.64	-0.64	
5,466.0	11.10	216.40	5,359.3	-824.6	-600.4	1,019.9	0.75	-0.74	
5,560.0	12.10	212.40	5,451.4	-840.2	-611.1	1,038.8	1.36	1.06	
5,655.0	11.30	211.60	5,544.4	-856.6	-621.3	1,058.0	0.86	-0.84	

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<b>Site:</b>	S1-T7S-R97W (Mesa E1 797)	<b>MD Reference:</b>	KB @ 8359.0usft (H&P 303)
<b>Well:</b>	PUCKETT 23B-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
5,749.0	11.00	208.10	5,636.7	-872.3	-630.4	1,076.0	0.79	-0.32	
5,844.0	10.50	213.10	5,730.0	-887.6	-639.4	1,093.6	1.11	-0.53	
5,939.0	9.90	207.30	5,823.5	-902.1	-647.8	1,110.3	1.25	-0.63	
6,033.0	9.00	206.30	5,916.2	-915.8	-654.8	1,125.5	0.97	-0.96	
6,128.0	8.60	207.30	6,010.1	-928.8	-661.3	1,139.8	0.45	-0.42	
6,222.0	7.50	212.10	6,103.2	-940.3	-667.8	1,152.8	1.37	-1.17	
6,317.0	6.30	201.20	6,197.5	-950.4	-673.0	1,164.0	1.86	-1.26	
6,411.0	4.80	200.10	6,291.0	-958.9	-676.2	1,172.7	1.60	-1.60	
6,506.0	4.20	190.10	6,385.7	-966.0	-678.2	1,179.6	1.04	-0.63	
6,601.0	4.00	195.50	6,480.5	-972.6	-679.7	1,185.8	0.46	-0.21	
6,695.0	3.40	193.20	6,574.3	-978.5	-681.2	1,191.4	0.66	-0.64	
6,790.0	3.40	187.90	6,669.1	-984.1	-682.2	1,196.4	0.33	0.00	
6,884.0	2.90	185.10	6,763.0	-989.2	-682.8	1,200.9	0.56	-0.53	
6,979.0	0.50	147.40	6,858.0	-991.9	-682.8	1,203.1	2.66	-2.53	
7,073.0	0.30	6.40	6,951.9	-992.0	-682.6	1,203.0	0.81	-0.21	
7,168.0	0.50	248.20	7,046.9	-991.9	-682.9	1,203.2	0.73	0.21	
7,263.0	0.70	115.30	7,141.9	-992.3	-682.8	1,203.4	1.16	0.21	
7,357.0	1.10	103.80	7,235.9	-992.8	-681.4	1,202.9	0.46	0.43	
7,452.0	0.40	194.00	7,330.9	-993.3	-680.6	1,202.9	1.23	-0.74	
7,546.0	0.40	269.40	7,424.9	-993.7	-681.0	1,203.4	0.52	0.00	
7,641.0	0.80	236.60	7,519.9	-994.0	-681.9	1,204.2	0.54	0.42	
7,830.0	1.30	247.90	7,708.9	-995.6	-685.0	1,207.3	0.29	0.26	
8,019.0	1.90	246.60	7,897.8	-997.6	-689.8	1,211.8	0.32	0.32	
8,114.0	1.80	247.40	7,992.8	-998.8	-692.7	1,214.5	0.11	-0.11	
8,303.0	2.70	254.60	8,181.6	-1,001.1	-699.7	1,220.6	0.50	0.48	
8,397.0	2.80	267.80	8,275.5	-1,001.8	-704.1	1,223.8	0.68	0.11	
8,492.0	2.70	259.10	8,370.4	-1,002.3	-708.6	1,226.9	0.45	-0.11	
8,681.0	3.30	265.30	8,559.1	-1,003.6	-718.4	1,233.9	0.36	0.32	
8,805.0	3.40	272.80	8,682.9	-1,003.7	-725.7	1,238.3	0.36	0.08	LAST CES SURVEY @ 8805' MD
8,867.0	3.40	272.80	8,744.8	-1,003.5	-729.3	1,240.4	0.00	0.00	PTB @ 8867' MD

## Survey Report

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<b>Project:</b>	Garfield County, CO	<b>TVD Reference:</b>	KB @ 8359.0usft (H&P 303)
<b>Site:</b>	S1-T7S-R97W (Mesa E1 797)	<b>MD Reference:</b>	KB @ 8359.0usft (H&P 303)
<b>Well:</b>	PUCKETT 23B-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 - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PUCKETT 23B-1 TGT - actual wellpath misses target center by 1737.4usft at 7158.4usft MD (7037.3 TVD, -991.9 N, -682.9 E) - Point	0.00	0.00	7,044.0	-1,161.5	1,046.2	608,158.52	1,246,649.42	39.472819	-108.168994
PUCKETT 23B-1 BHL - actual wellpath misses target center by 1781.0usft at 8789.8usft MD (8667.7 TVD, -1003.8 N, -724.7 E) - Circle (radius 50.0)	0.00	0.00	8,771.0	-1,161.5	1,046.2	608,158.52	1,246,649.42	39.472819	-108.168994
PUCKETT 23B-1 BHL 7. - actual wellpath misses target center by 21.6usft at 8867.0usft MD (8744.8 TVD, -1003.5 N, -729.3 E) - Circle (radius 50.0)	0.00	0.00	8,761.0	-1,008.5	-715.9	608,363.26	1,244,892.57	39.473239	-108.175236

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
8,805.0	8,682.9	-1,003.7	-725.7	LAST CES SURVEY @ 8805' MD	
8,867.0	8,744.8	-1,003.5	-729.3	PTB @ 8867' MD	

Checked By: _____	Approved By: _____	Date: _____
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