

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 25B-23
Project:	Garfield County, CO (UTM 12N)	TVD Reference:	30' KB @ 8462.00usft
Site:	S23-T6S-R97W (MESA N23)	MD Reference:	30' KB @ 8462.00usft
Well:	PUCKETT 25B-23	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

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

Site	S23-T6S-R97W (MESA N23)		
Site Position:		Northing:	14,357,518.00 usft
From:	Map	Easting:	2,433,869.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	39.503127
		Longitude:	-108.187330
		Grid Convergence:	1.79 °

Well	PUCKETT 25B-23					
Well Position	+N/-S	0.00 usft	Northing:	14,357,486.00 usft	Latitude:	39.503037
	+E/-W	0.00 usft	Easting:	2,433,892.00 usft	Longitude:	-108.187252
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,432.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/1/2017	9.70	65.83	51,718.50000000

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	225.27	

Survey Program	Date	7/11/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
178.00	8,990.00	Survey #1 (OH)	MWD+HDGM	OWSG MWD + HDGM	

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	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
178.00	1.14	155.95	177.99	-1.62	0.72	0.63	0.64	0.64		
209.00	1.41	160.35	208.98	-2.26	0.98	0.90	0.93	0.87		
300.00	1.85	165.18	299.94	-4.73	1.73	2.10	0.51	0.48		
391.00	1.89	166.59	390.90	-7.61	2.45	3.62	0.07	0.04		
483.00	1.54	170.19	482.85	-10.31	3.01	5.11	0.40	-0.38		
575.00	1.49	169.93	574.82	-12.70	3.43	6.50	0.05	-0.05		
670.00	1.19	165.00	669.80	-14.87	3.91	7.69	0.34	-0.32		
764.00	1.19	159.64	763.78	-16.73	4.50	8.58	0.12	0.00		
859.00	0.92	171.86	858.76	-18.41	4.95	9.44	0.37	-0.28		
953.00	1.41	212.20	952.74	-20.13	4.44	11.02	0.98	0.52		
1,048.00	1.89	223.71	1,047.70	-22.26	2.73	13.72	0.61	0.51		
1,142.00	1.85	225.65	1,141.65	-24.44	0.58	16.79	0.08	-0.04		

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Well:	PUCKETT 25B-23	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	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
1,236.00	2.15	218.53	1,235.59	-26.88	-1.61	20.06	0.41	0.32	
1,331.00	3.16	204.73	1,330.49	-30.65	-3.81	24.28	1.25	1.06	
1,425.00	3.43	193.92	1,424.34	-35.73	-5.57	29.11	0.72	0.29	
1,520.00	3.43	187.33	1,519.17	-41.31	-6.62	33.78	0.41	0.00	
1,614.00	3.60	179.24	1,612.99	-47.05	-6.94	38.04	0.56	0.18	
1,709.00	3.43	173.53	1,707.81	-52.86	-6.58	41.87	0.41	-0.18	
1,804.00	3.08	178.45	1,802.66	-58.23	-6.19	45.38	0.47	-0.37	
1,898.00	2.73	168.17	1,896.54	-62.95	-5.66	48.32	0.67	-0.37	
1,992.00	2.86	182.14	1,990.43	-67.48	-5.29	51.25	0.74	0.14	
2,087.00	3.21	193.04	2,085.30	-72.44	-5.98	55.23	0.71	0.37	
2,181.00	3.60	199.37	2,179.13	-77.79	-7.55	60.11	0.58	0.41	
2,276.00	4.00	194.89	2,273.92	-83.80	-9.39	65.65	0.52	0.42	
2,370.00	4.04	193.39	2,367.69	-90.19	-11.00	71.29	0.12	0.04	
2,481.00	4.75	194.18	2,478.36	-98.45	-13.03	78.55	0.64	0.64	
2,601.00	4.88	198.75	2,597.94	-108.10	-15.89	87.37	0.34	0.11	
2,696.00	4.53	205.08	2,692.62	-115.33	-18.78	94.51	0.66	-0.37	
2,790.00	4.88	195.15	2,786.31	-122.55	-21.40	101.45	0.94	0.37	
2,885.00	4.31	196.29	2,881.00	-129.88	-23.46	108.07	0.61	-0.60	
2,979.00	3.69	190.58	2,974.77	-136.24	-25.00	113.65	0.78	-0.66	
3,073.00	3.38	190.58	3,068.59	-141.94	-26.07	118.42	0.33	-0.33	
3,168.00	2.86	191.28	3,163.45	-147.01	-27.04	122.68	0.55	-0.55	
3,262.00	3.38	195.24	3,257.31	-151.99	-28.23	127.03	0.60	0.55	
3,357.00	3.16	191.99	3,352.16	-157.25	-29.51	131.64	0.30	-0.23	
3,451.00	3.03	193.92	3,446.02	-162.20	-30.65	135.93	0.18	-0.14	
3,545.00	2.99	173.44	3,539.89	-167.04	-30.96	139.57	1.14	-0.04	
3,640.00	2.73	171.60	3,634.77	-171.74	-30.35	142.44	0.29	-0.27	
3,734.00	2.59	176.34	3,728.67	-176.08	-29.89	145.16	0.28	-0.15	
3,829.00	2.37	179.59	3,823.58	-180.18	-29.74	147.94	0.27	-0.23	
3,923.00	2.11	183.90	3,917.51	-183.85	-29.84	150.60	0.33	-0.28	
4,018.00	1.98	186.18	4,012.45	-187.23	-30.14	153.18	0.16	-0.14	
4,112.00	1.85	198.67	4,106.40	-190.28	-30.80	155.80	0.46	-0.14	
4,207.00	1.76	203.85	4,201.35	-193.07	-31.88	158.53	0.20	-0.09	
4,301.00	2.42	187.77	4,295.29	-196.36	-32.73	161.45	0.93	0.70	
4,395.00	2.02	188.03	4,389.22	-199.96	-33.23	164.34	0.43	-0.43	
4,490.00	2.24	199.98	4,484.15	-203.37	-34.10	167.36	0.52	0.23	
4,584.00	2.51	177.04	4,578.07	-207.15	-34.62	170.39	1.04	0.29	
4,679.00	2.59	184.69	4,672.98	-211.36	-34.69	173.40	0.37	0.08	
4,773.00	1.85	182.05	4,766.91	-215.00	-34.92	176.12	0.79	-0.79	
4,868.00	1.32	176.96	4,861.87	-217.62	-34.91	177.97	0.58	-0.56	
4,963.00	1.10	153.05	4,956.85	-219.53	-34.44	178.97	0.57	-0.23	
5,057.00	1.23	154.98	5,050.83	-221.25	-33.60	179.59	0.14	0.14	
5,152.00	0.66	73.77	5,145.82	-222.02	-32.65	179.45	1.37	-0.60	
5,246.00	0.75	172.83	5,239.82	-222.48	-32.05	179.35	1.14	0.10	
5,435.00	0.97	223.63	5,428.80	-224.86	-33.00	181.71	0.40	0.12	
5,624.00	1.32	312.13	5,617.77	-224.56	-35.72	183.42	0.86	0.19	
5,813.00	1.06	229.43	5,806.74	-224.24	-38.66	185.29	0.84	-0.14	
6,002.00	1.19	245.51	5,995.71	-226.19	-41.78	188.87	0.18	0.07	
6,191.00	2.20	290.95	6,184.63	-225.70	-46.95	192.21	0.85	0.53	
6,380.00	2.11	276.10	6,373.50	-224.04	-53.80	195.90	0.30	-0.05	
6,569.00	1.89	239.89	6,562.39	-225.23	-59.95	201.11	0.67	-0.12	
6,758.00	2.73	254.83	6,751.24	-227.97	-66.99	208.04	0.54	0.44	
6,947.00	3.56	253.51	6,939.95	-230.82	-76.97	217.13	0.44	0.44	
7,136.00	4.18	256.94	7,128.52	-234.04	-89.30	228.16	0.35	0.33	

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7,326.00	5.23	247.62	7,317.88	-238.90	-104.06	242.06	0.68	0.55	
7,515.00	5.58	251.84	7,506.04	-245.04	-120.75	258.25	0.28	0.19	
7,704.00	6.68	250.52	7,693.96	-251.57	-139.85	276.41	0.59	0.58	
7,893.00	6.46	253.86	7,881.72	-258.19	-160.42	295.68	0.23	-0.12	
8,082.00	7.03	253.16	8,069.41	-264.50	-181.71	315.24	0.30	0.30	
8,271.00	8.09	253.60	8,256.76	-271.61	-205.53	337.17	0.56	0.56	
8,459.00	7.43	254.65	8,443.04	-278.56	-229.95	359.41	0.36	-0.35	
8,648.00	7.73	253.33	8,630.39	-285.44	-253.91	381.27	0.18	0.16	
8,838.00	8.61	254.21	8,818.46	-292.98	-279.83	404.99	0.47	0.46	
8,932.00	8.79	254.21	8,911.38	-296.85	-293.52	417.43	0.19	0.19	LAST SURVEY - 8932' MD
8,990.00	8.79	254.21	8,968.69	-299.26	-302.05	425.19	0.00	0.00	PTB - 8990' MD

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 25B-23 PBHL - actual wellpath misses target center by 123.59usft at 8981.22usft MD (8960.02 TVD, -298.89 N, -300.75 E) - Ellipse (radii L200.00 W100.00 on 250.00 azi)	0.00	0.00	8,978.00	-303.57	-178.57	14,357,177.00	2,433,723.00	39.502204	-108.187885

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
8,932.00	8,911.38	-296.85	-293.52	LAST SURVEY - 8932' MD
8,990.00	8,968.69	-299.26	-302.05	PTB - 8990' MD

Checked By: _____ Approved By: _____ Date: _____