

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 12C-26
Project:	Garfield County, CO (UTM 12N)	TVD Reference:	30' KB @ 8352.00usft
Site:	S26-T6S-R97W (MESA F26)	MD Reference:	30' KB @ 8352.00usft
Well:	PUCKETT 12C-26	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	S26-T6S-R97W (MESA F26), GRAVITY = 0.9987g		
Site Position:		Northing:	14,354,512.70 usft
From:	Map	Easting:	2,433,169.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	39.494943
		Longitude:	-108.190140
		Grid Convergence:	1.79 °

Well	PUCKETT 12C-26		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	39.495068
		Longitude:	-108.190232
		Ground Level:	8,322.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/21/2017	9.68	65.78	51,667.60000000

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	284.48	

Survey Program	Date	12/27/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
206.00	390.00	Survey #1 (OH)	INC+TREND	Inclinometer + known azi trend	
481.00	8,892.00	Survey #2 (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	
206.00	2.24	235.45	205.95	-2.28	-3.32	2.64	1.09	1.09	
297.00	3.43	259.01	296.84	-3.81	-7.45	6.26	1.80	1.31	
390.00	5.85	279.84	389.53	-3.53	-14.86	13.50	3.13	2.60	
481.00	7.34	294.87	479.93	-0.29	-24.70	23.84	2.49	1.64	
572.00	9.27	297.59	569.98	5.55	-36.47	36.70	2.16	2.12	
666.00	10.28	289.68	662.61	11.88	-51.08	52.43	1.79	1.07	
761.00	11.47	294.25	755.91	18.61	-67.67	70.18	1.55	1.25	
855.00	12.48	296.71	847.86	27.02	-85.27	89.32	1.20	1.07	
950.00	13.32	290.56	940.47	35.47	-104.69	110.23	1.69	0.88	
1,044.00	13.76	289.42	1,031.86	42.99	-125.37	132.14	0.55	0.47	
1,139.00	14.41	293.02	1,124.00	51.37	-146.90	155.08	1.15	0.68	

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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
1,233.00	13.67	290.56	1,215.19	59.85	-168.07	177.70	1.01	-0.79	
1,328.00	13.40	283.18	1,307.56	66.30	-189.30	199.86	1.84	-0.28	
1,422.00	13.27	289.06	1,399.03	72.31	-210.10	221.51	1.45	-0.14	
1,516.00	14.19	293.64	1,490.35	80.45	-230.86	243.64	1.51	0.98	
1,611.00	12.88	291.17	1,582.71	88.94	-251.40	265.65	1.51	-1.38	
1,705.00	12.66	294.51	1,674.38	97.00	-270.54	286.20	0.82	-0.23	
1,800.00	12.17	297.94	1,767.16	106.01	-288.86	306.19	0.93	-0.52	
1,894.00	12.00	290.38	1,859.09	114.06	-306.77	325.55	1.69	-0.18	
1,989.00	11.78	291.26	1,952.05	121.01	-325.07	345.00	0.30	-0.23	
2,083.00	13.32	297.85	2,043.80	129.55	-343.59	365.07	2.23	1.64	
2,178.00	12.88	296.45	2,136.33	139.38	-362.74	386.07	0.57	-0.46	
2,272.00	11.56	290.82	2,228.20	147.40	-380.93	405.68	1.89	-1.40	
2,367.00	10.85	287.22	2,321.39	153.43	-398.37	424.08	1.05	-0.75	
2,461.00	11.91	291.09	2,413.54	159.54	-415.87	442.55	1.39	1.13	
2,599.00	13.23	291.35	2,548.23	170.41	-443.86	472.37	0.96	0.96	
2,693.00	13.18	290.56	2,639.75	178.09	-463.91	493.71	0.20	-0.05	
2,787.00	12.96	289.94	2,731.31	185.45	-483.86	514.86	0.28	-0.23	
2,882.00	12.88	289.15	2,823.91	192.55	-503.87	536.02	0.20	-0.08	
2,976.00	12.44	287.66	2,915.62	199.06	-523.42	556.57	0.58	-0.47	
3,071.00	11.78	288.19	3,008.51	205.19	-542.38	576.46	0.70	-0.69	
3,165.00	11.25	287.75	3,100.62	210.98	-560.23	595.19	0.57	-0.56	
3,259.00	11.60	287.66	3,192.75	216.65	-577.97	613.78	0.37	0.37	
3,354.00	11.87	287.75	3,285.77	222.52	-596.37	633.07	0.28	0.28	
3,448.00	12.22	287.57	3,377.70	228.47	-615.07	652.66	0.37	0.37	
3,543.00	11.73	286.96	3,470.63	234.33	-633.89	672.34	0.53	-0.52	
3,637.00	11.95	295.31	3,562.64	241.27	-651.83	691.45	1.84	0.23	
3,732.00	11.73	296.89	3,655.62	249.85	-669.33	710.54	0.41	-0.23	
3,826.00	11.29	298.21	3,747.73	258.52	-685.96	728.81	0.55	-0.47	
3,921.00	11.78	293.55	3,840.81	266.79	-703.05	747.42	1.11	0.52	
4,015.00	11.51	291.79	3,932.87	274.10	-720.55	766.20	0.47	-0.29	
4,110.00	11.25	292.76	4,026.01	281.21	-737.90	784.77	0.34	-0.27	
4,204.00	11.47	292.58	4,118.16	288.34	-754.98	803.10	0.24	0.23	
4,299.00	12.57	291.53	4,211.08	295.76	-773.32	822.71	1.18	1.16	
4,393.00	12.31	291.44	4,302.87	303.18	-792.16	842.81	0.28	-0.28	
4,488.00	12.39	288.71	4,395.68	310.15	-811.24	863.02	0.62	0.08	
4,582.00	13.67	289.86	4,487.25	317.16	-831.24	884.14	1.39	1.36	
4,676.00	13.45	289.42	4,578.63	324.57	-852.00	906.09	0.26	-0.23	
4,771.00	12.26	284.14	4,671.25	330.71	-872.20	927.19	1.76	-1.25	
4,865.00	11.87	280.28	4,763.18	334.87	-891.39	946.81	0.95	-0.41	
4,960.00	12.35	285.55	4,856.07	339.34	-910.79	966.71	1.27	0.51	
5,054.00	13.05	291.00	4,947.77	345.83	-930.39	987.31	1.48	0.74	
5,149.00	12.92	291.00	5,040.34	353.48	-950.31	1,008.51	0.14	-0.14	
5,243.00	13.01	290.91	5,131.94	361.03	-970.01	1,029.47	0.10	0.10	
5,338.00	13.10	292.14	5,224.49	368.90	-989.97	1,050.76	0.31	0.09	
5,432.00	13.05	292.05	5,316.05	376.90	-1,009.67	1,071.84	0.06	-0.05	
5,527.00	12.88	291.44	5,408.63	384.80	-1,029.47	1,092.98	0.23	-0.18	
5,621.00	13.14	291.00	5,500.22	392.45	-1,049.20	1,114.00	0.30	0.28	
5,716.00	13.54	291.00	5,592.65	400.31	-1,069.66	1,135.78	0.42	0.42	
5,810.00	12.04	290.47	5,684.32	407.68	-1,089.12	1,156.46	1.60	-1.60	
5,904.00	10.94	290.65	5,776.43	414.26	-1,106.65	1,175.08	1.17	-1.17	
5,999.00	10.37	289.94	5,869.80	420.35	-1,123.12	1,192.55	0.62	-0.60	
6,093.00	9.05	291.17	5,962.45	425.91	-1,137.97	1,208.32	1.42	-1.40	
6,188.00	6.77	297.06	6,056.54	431.15	-1,149.93	1,221.21	2.54	-2.40	

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6,282.00	4.70	291.79	6,150.06	435.10	-1,158.44	1,230.44	2.27	-2.20	
6,377.00	5.14	290.38	6,244.71	438.03	-1,166.04	1,238.53	0.48	0.46	
6,471.00	4.61	292.89	6,338.37	440.97	-1,173.47	1,246.45	0.61	-0.56	
6,565.00	3.47	300.14	6,432.14	443.86	-1,179.41	1,252.93	1.33	-1.21	
6,849.00	3.87	276.76	6,715.57	449.31	-1,196.36	1,270.70	0.54	0.14	
7,132.00	4.57	271.40	6,997.80	450.71	-1,217.12	1,291.15	0.28	0.25	
7,415.00	4.09	274.47	7,280.00	451.77	-1,238.45	1,312.07	0.19	-0.17	
7,699.00	4.31	265.95	7,563.24	451.81	-1,259.19	1,332.16	0.23	0.08	LAST SURVEY - 7699' MD
8,892.00	4.31	265.95	8,752.86	445.47	-1,348.62	1,417.17	0.00	0.00	PTB - 8892' 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 12C-26 BHL	0.00	0.00	8,735.00	370.43	-1,434.34	14,354,883.00	2,431,696.70	39.496084	-108.195313
- actual wellpath misses target center by 114.79usft at 8881.01usft MD (8741.91 TVD, 445.53 N, -1347.80 E)									
- Ellipse (radii L200.00 W100.00 on 250.00 azi)									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
7,699.00	7,563.24	451.81	-1,259.19	LAST SURVEY - 7699' MD
8,892.00	8,752.86	445.47	-1,348.62	PTB - 8892' MD

Checked By: _____ Approved By: _____ Date: _____