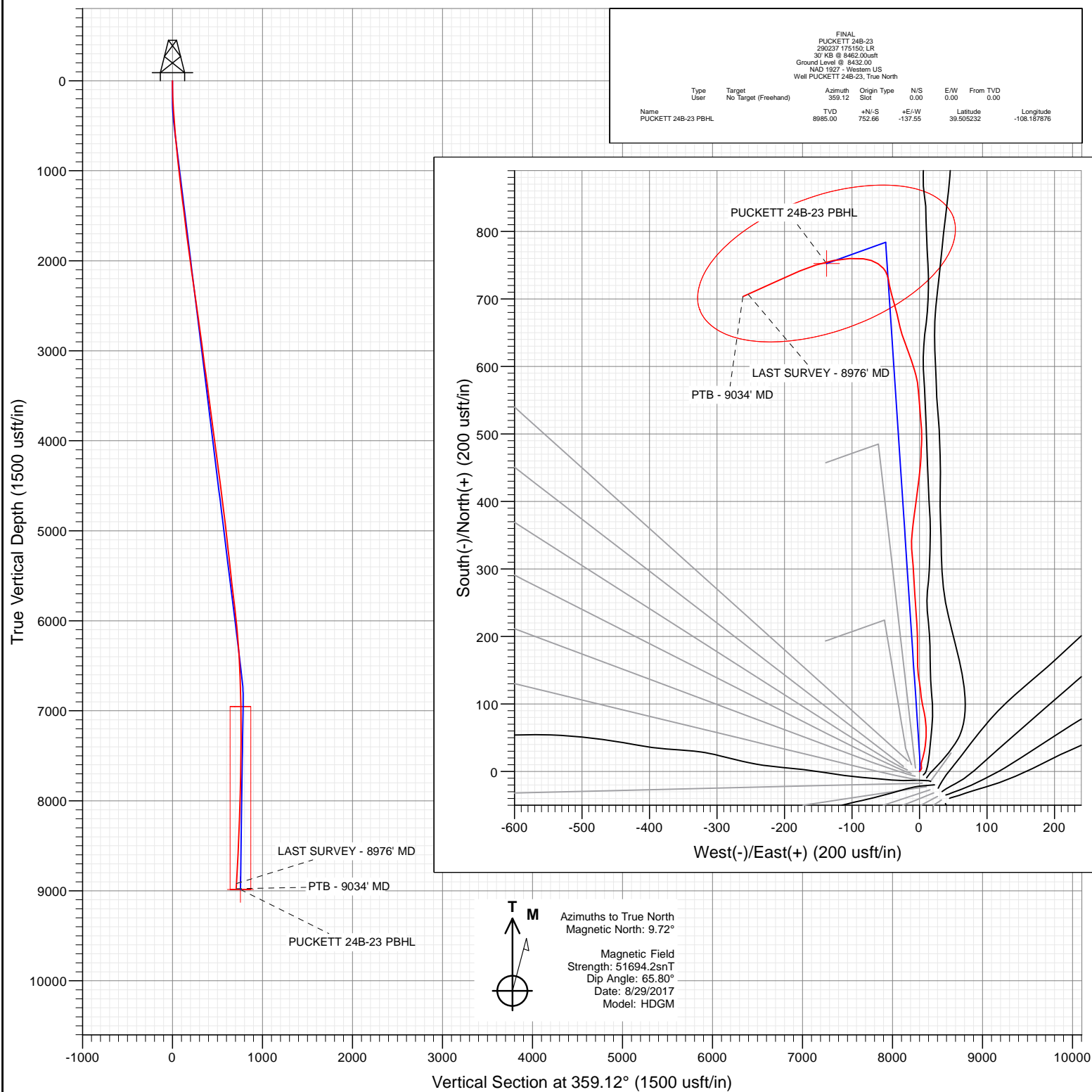


Project: Garfield County, CO (UTM 12N)
Site: S23-T6S-R97W (MESA N23)
Well: PUCKETT 24B-23
Wellbore: OH
Design: FINAL



CATHEDRAL

WELL DETAILS: PUCKETT 24B-23

+N/-S	+E/-W	Northing	Ground Level: Easting	8432.00 Latitude	Longitude
0.00	0.00	14357532.00	2433852.00	39.503167	-108.187389



Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 24B-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 24B-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 24B-23					
Well Position	+N/-S	0.00 usft	Northing:	14,357,532.00 usft	Latitude:	39.503167
	+E/-W	0.00 usft	Easting:	2,433,852.00 usft	Longitude:	-108.187389
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	8/29/2017	9.72	65.80	51,694.20000000

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	359.12	

Survey Program	Date	9/11/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
173.00	9,034.00	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		
173.00	2.29	36.41	172.95	2.78	2.05	2.75	1.32	1.32		
204.00	2.55	32.28	203.93	3.86	2.79	3.82	1.01	0.84		
235.00	2.59	1.96	234.90	5.15	3.18	5.10	4.34	0.13		
265.00	2.90	356.59	264.86	6.58	3.16	6.53	1.34	1.03		
295.00	3.30	343.85	294.82	8.17	2.87	8.12	2.65	1.33		
355.00	3.82	9.69	354.71	11.80	2.73	11.75	2.78	0.87		
386.00	4.31	13.82	385.63	13.95	3.18	13.90	1.84	1.58		
478.00	5.67	16.63	477.28	21.66	5.31	21.57	1.50	1.48		
570.00	5.10	10.48	568.87	30.03	7.35	29.92	0.88	-0.62		
665.00	4.92	6.26	663.51	38.24	8.56	38.10	0.43	-0.19		
759.00	5.10	5.82	757.15	46.40	9.43	46.25	0.20	0.19		
854.00	5.67	1.87	851.73	55.29	10.01	55.13	0.72	0.60		

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 24B-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 24B-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
948.00	6.46	356.77	945.20	65.21	9.86	65.05	1.02	0.84	
1,043.00	6.77	353.96	1,039.57	76.12	8.97	75.97	0.47	0.33	
1,137.00	6.94	347.45	1,132.90	87.17	7.15	87.05	0.85	0.18	
1,232.00	6.99	347.98	1,227.20	98.43	4.70	98.34	0.09	0.05	
1,326.00	7.43	353.17	1,320.46	110.05	2.79	110.00	0.84	0.47	
1,421.00	7.30	354.40	1,414.67	122.16	1.47	122.12	0.22	-0.14	
1,515.00	6.94	350.79	1,507.95	133.71	-0.02	133.69	0.61	-0.38	
1,610.00	7.12	351.67	1,602.24	145.20	-1.79	145.21	0.22	0.19	
1,704.00	7.38	359.76	1,695.49	157.00	-2.66	157.02	1.12	0.28	
1,799.00	6.50	359.67	1,789.79	168.48	-2.72	168.50	0.93	-0.93	
1,893.00	7.25	358.97	1,883.11	179.73	-2.86	179.75	0.80	0.80	
1,988.00	8.39	0.37	1,977.23	192.66	-2.92	192.68	1.22	1.20	
2,082.00	8.04	357.56	2,070.26	206.08	-3.15	206.11	0.57	-0.37	
2,176.00	8.35	356.86	2,163.30	219.46	-3.81	219.50	0.35	0.33	
2,271.00	7.95	354.57	2,257.34	232.89	-4.81	232.94	0.54	-0.42	
2,411.00	7.65	357.47	2,396.05	251.84	-6.14	251.90	0.35	-0.21	
2,506.00	7.95	355.98	2,490.17	264.71	-6.87	264.78	0.38	0.32	
2,600.00	8.22	356.59	2,583.24	277.90	-7.73	277.99	0.30	0.29	
2,695.00	8.57	357.56	2,677.22	291.75	-8.44	291.85	0.40	0.37	
2,789.00	8.17	355.10	2,770.22	305.41	-9.30	305.51	0.57	-0.43	
2,884.00	7.30	354.75	2,864.35	318.14	-10.43	318.26	0.92	-0.92	
2,978.00	7.16	354.31	2,957.60	329.92	-11.56	330.06	0.16	-0.15	
3,073.00	7.69	4.59	3,051.81	342.15	-11.64	342.28	1.50	0.56	
3,167.00	7.03	4.15	3,145.04	354.15	-10.72	354.28	0.70	-0.70	
3,262.00	8.26	8.02	3,239.19	366.71	-9.35	366.81	1.40	1.29	
3,356.00	8.04	6.97	3,332.24	379.92	-7.61	379.99	0.28	-0.23	
3,450.00	8.00	7.32	3,425.32	392.93	-5.98	392.98	0.07	-0.04	
3,545.00	7.43	7.67	3,519.46	405.58	-4.31	405.60	0.60	-0.60	
3,639.00	6.72	8.55	3,612.75	417.04	-2.68	417.03	0.76	-0.76	
3,734.00	7.34	5.30	3,707.03	428.58	-1.30	428.55	0.78	0.65	
3,828.00	8.22	6.53	3,800.17	441.23	0.02	441.18	0.95	0.94	
3,922.00	7.38	6.26	3,893.29	453.91	1.44	453.84	0.89	-0.89	
4,017.00	7.69	1.43	3,987.48	466.33	2.27	466.24	0.74	0.33	
4,112.00	7.34	2.75	4,081.66	478.75	2.72	478.65	0.41	-0.37	
4,206.00	6.86	2.31	4,174.94	490.35	3.23	490.25	0.51	-0.51	
4,300.00	7.69	358.53	4,268.18	502.25	3.30	502.14	1.02	0.88	
4,395.00	6.86	356.33	4,362.42	514.27	2.77	514.16	0.92	-0.87	
4,489.00	7.69	354.13	4,455.66	526.13	1.77	526.04	0.93	0.88	
4,584.00	8.09	355.45	4,549.76	539.11	0.59	539.04	0.46	0.42	
4,678.00	7.95	355.28	4,642.84	552.18	-0.47	552.13	0.15	-0.15	
4,773.00	7.52	354.57	4,736.97	564.92	-1.60	564.88	0.46	-0.45	
4,867.00	6.59	351.50	4,830.26	576.38	-2.98	576.36	1.07	-0.99	
4,962.00	6.46	346.31	4,924.65	586.96	-5.05	586.97	0.64	-0.14	
5,056.00	6.02	342.00	5,018.09	596.79	-7.83	596.84	0.68	-0.47	
5,151.00	6.55	340.25	5,112.52	606.63	-11.20	606.73	0.59	0.56	
5,246.00	7.03	342.00	5,206.85	617.25	-14.82	617.41	0.55	0.51	
5,340.00	6.64	340.51	5,300.19	627.85	-18.41	628.06	0.46	-0.41	
5,435.00	6.20	337.26	5,394.59	637.76	-22.23	638.02	0.60	-0.46	
5,529.00	6.77	342.71	5,487.99	647.73	-25.84	648.05	0.89	0.61	
5,624.00	6.99	346.49	5,582.31	658.70	-28.85	659.06	0.53	0.23	
5,718.00	7.47	348.16	5,675.56	670.24	-31.44	670.64	0.56	0.51	
5,907.00	6.64	342.80	5,863.13	692.70	-37.20	693.19	0.56	-0.44	
6,002.00	5.98	344.38	5,957.55	702.71	-40.15	703.25	0.72	-0.69	

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 24B-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 24B-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
6,096.00	5.67	348.25	6,051.07	711.98	-42.42	712.54	0.53	-0.33	
6,191.00	5.36	348.42	6,145.63	720.92	-44.26	721.51	0.33	-0.33	
6,285.00	4.44	346.75	6,239.28	728.76	-45.98	729.38	0.99	-0.98	
6,379.00	3.82	342.71	6,333.04	735.29	-47.74	735.94	0.73	-0.66	
6,474.00	3.60	331.28	6,427.84	740.93	-50.12	741.61	0.81	-0.23	
6,569.00	3.16	317.75	6,522.68	745.48	-53.31	746.21	0.96	-0.46	
6,947.00	3.52	289.36	6,900.06	757.04	-71.26	758.04	0.44	0.10	
7,136.00	3.82	275.91	7,088.67	759.61	-83.00	760.80	0.48	0.16	
7,412.00	4.75	267.12	7,363.90	759.99	-103.56	761.48	0.41	0.34	
7,696.00	5.19	258.86	7,646.84	756.91	-127.91	758.78	0.30	0.15	
7,980.00	5.32	252.44	7,929.65	750.46	-153.06	752.71	0.21	0.05	
8,263.00	5.27	247.43	8,211.44	741.51	-177.57	744.14	0.16	-0.02	
8,641.00	6.77	244.45	8,587.35	725.24	-213.71	728.43	0.41	0.40	
8,976.00	8.35	246.56	8,919.42	707.05	-253.84	710.85	0.48	0.47	LAST SURVEY - 8976' MD
9,034.00	8.35	246.56	8,976.81	703.70	-261.57	707.62	0.00	0.00	PTB - 9034' MD

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									
PUCKETT 24B-23 PBHL	0.00	0.00	8,985.00	752.66	-137.55	14,358,280.00	2,433,691.00	39.505232	-108.187876
- actual wellpath misses target center by 133.11usft at 9022.75usft MD (8965.68 TVD, 704.35 N, -260.07 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	
8,976.00	8,919.42	707.05	-253.84	LAST SURVEY - 8976' MD	
9,034.00	8,976.81	703.70	-261.57	PTB - 9034' MD	

Checked By: _____ Approved By: _____ Date: _____