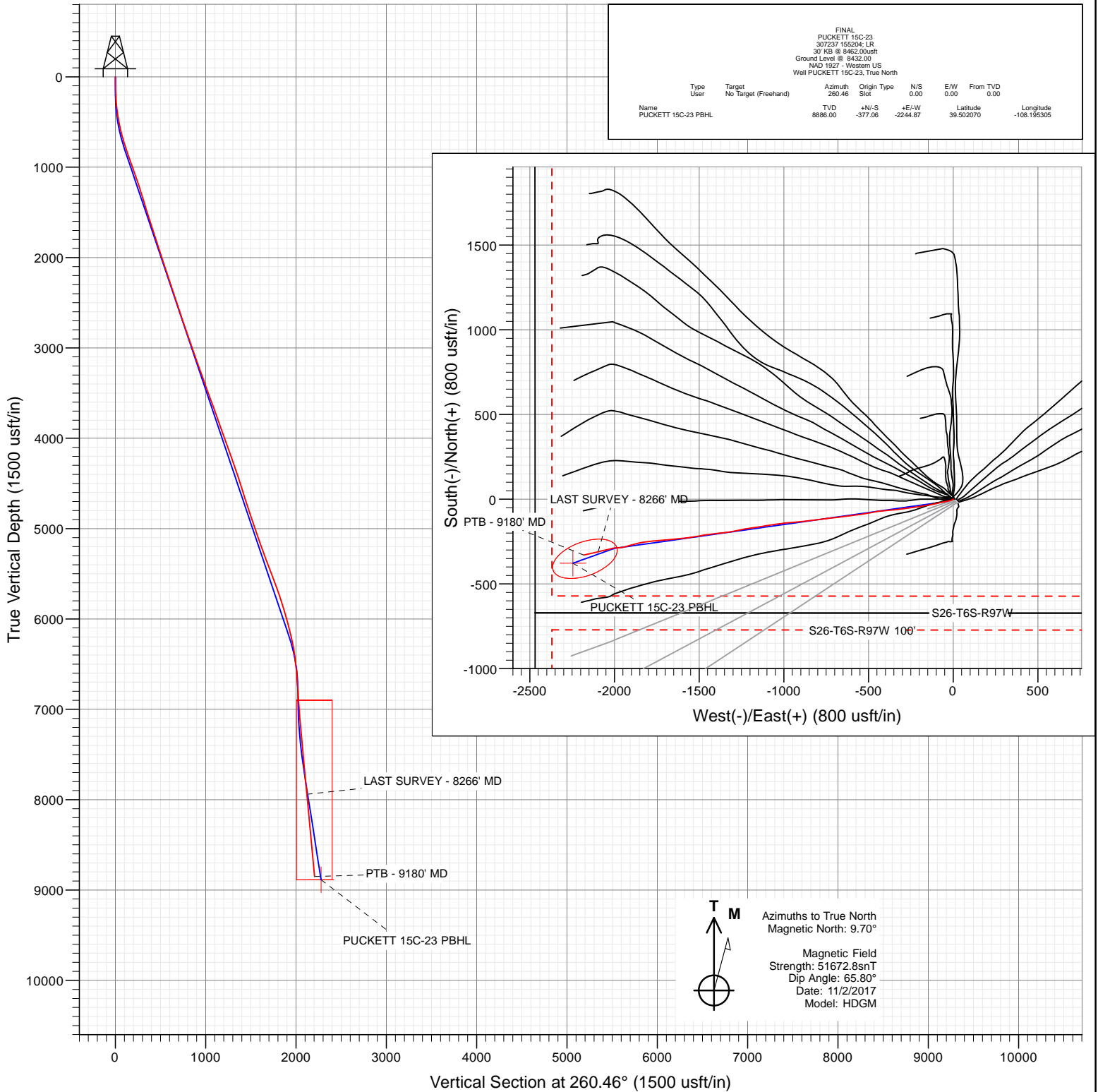




Project: Garfield County, CO (UTM 12N)
Site: S23-T6S-R97W (MESA N23)
Well: PUCKETT 15C-23
Wellbore: OH
Design: FINAL



FINAL PUCKETT 15C-23 307237 155204 LR 30' KB @ 8462.00usft Ground Level @ 8432.00 NAD 1927 - Western US Well PUCKETT 15C-23, True North							
Type	Target	Azimuth	Origin Type	N/S	E/W	From TVD	
User	No Target (Freehand)	260.46	Slot	0.00	0.00	0.00	
Name		TVD	+N/-S	+E/-W	Latitude	Longitude	
PUCKETT 15C-23 PBHL		8886.00	-377.06	-2244.87	39.502070	-108.195305	



WELL DETAILS: PUCKETT 15C-23

+N/-S	+E/-W	Northing	Ground Level:	8432.00	Latitude	Longitude
0.00	0.00	14357510.00	Easting	2433863.00	39.503105	-108.187352



Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 15C-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 15C-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	Latitude:	39.503127
From:	Map	Easting:	2,433,869.00 usft	Longitude:	-108.187330
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	1.79 °

Well	PUCKETT 15C-23					
Well Position	+N/-S	0.00 usft	Northing:	14,357,510.00 usft	Latitude:	39.503105
	+E/-W	0.00 usft	Easting:	2,433,863.00 usft	Longitude:	-108.187352
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	11/2/2017	9.70	65.80	51,672.80000000

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	260.46	

Survey Program	Date	11/13/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
143.00	9,180.00	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	
143.00	1.36	239.33	142.99	-0.87	-1.46	1.58	0.95	0.95	
173.00	2.07	245.31	172.97	-1.27	-2.26	2.44	2.44	2.37	
204.00	2.73	240.47	203.95	-1.87	-3.41	3.67	2.23	2.13	
295.00	5.27	248.82	294.72	-4.45	-9.19	9.80	2.86	2.79	
386.00	7.82	255.50	385.12	-7.51	-19.08	20.07	2.92	2.80	
478.00	10.28	257.52	475.97	-10.85	-33.16	34.50	2.70	2.67	
570.00	12.39	258.75	566.17	-14.55	-50.86	52.57	2.31	2.29	
664.00	15.29	258.14	657.43	-19.07	-72.88	75.04	3.09	3.09	
759.00	17.53	257.17	748.55	-24.82	-99.10	101.84	2.38	2.36	
853.00	19.42	257.70	837.70	-31.29	-128.17	131.58	2.02	2.01	
947.00	19.82	260.42	926.25	-37.27	-159.15	163.13	1.06	0.43	
1,042.00	18.98	262.97	1,015.85	-41.85	-190.37	194.67	1.26	-0.88	

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 15C-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 15C-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
1,136.00	19.07	263.94	1,104.72	-45.34	-220.81	225.27	0.35	0.10	
1,230.00	18.46	259.81	1,193.73	-49.59	-250.73	255.48	1.55	-0.65	
1,325.00	17.80	260.86	1,284.01	-54.56	-279.87	285.04	0.78	-0.69	
1,419.00	16.88	263.23	1,373.74	-58.45	-307.61	313.04	1.23	-0.98	
1,513.00	17.10	265.52	1,463.64	-61.14	-334.94	340.44	0.75	0.23	
1,607.00	17.75	265.34	1,553.32	-63.38	-363.00	368.48	0.69	0.69	
1,702.00	18.33	264.73	1,643.65	-65.93	-392.31	397.81	0.64	0.61	
1,796.00	18.37	263.50	1,732.87	-68.97	-421.74	427.34	0.41	0.04	
1,891.00	18.41	262.71	1,823.02	-72.56	-451.49	457.28	0.27	0.04	
1,985.00	17.18	259.19	1,912.53	-77.05	-479.86	485.99	1.74	-1.31	
2,080.00	17.62	257.52	2,003.18	-82.79	-507.68	514.38	0.70	0.46	
2,174.00	18.11	259.81	2,092.65	-88.45	-535.95	543.19	0.91	0.52	
2,269.00	18.33	264.20	2,182.89	-92.57	-565.34	572.87	1.46	0.23	
2,363.00	19.12	264.29	2,271.91	-95.60	-595.37	602.98	0.84	0.84	
2,458.00	17.97	262.62	2,361.98	-99.03	-625.38	633.15	1.33	-1.21	
2,598.00	17.93	261.30	2,495.16	-105.06	-668.10	676.27	0.29	-0.03	
2,692.00	18.94	264.64	2,584.34	-108.67	-697.59	705.96	1.55	1.07	
2,786.00	19.03	264.11	2,673.23	-111.67	-728.03	736.47	0.21	0.10	
2,881.00	18.63	262.88	2,763.14	-115.14	-758.49	767.08	0.59	-0.42	
2,975.00	19.69	263.15	2,851.94	-118.89	-789.11	797.90	1.13	1.13	
3,070.00	19.16	261.13	2,941.53	-123.20	-820.41	829.48	0.90	-0.56	
3,164.00	19.78	264.73	3,030.16	-127.04	-851.49	860.77	1.44	0.66	
3,259.00	18.37	262.36	3,119.94	-130.51	-882.33	891.76	1.69	-1.48	
3,354.00	20.26	266.05	3,209.59	-133.63	-913.58	923.10	2.37	1.99	
3,447.00	19.73	265.43	3,296.99	-135.99	-945.29	954.76	0.61	-0.57	
3,542.00	19.42	264.82	3,386.50	-138.70	-977.01	986.48	0.39	-0.33	
3,637.00	20.52	261.83	3,475.78	-142.49	-1,009.22	1,018.88	1.58	1.16	
3,731.00	20.44	262.44	3,563.84	-146.99	-1,041.80	1,051.75	0.24	-0.09	
3,826.00	19.42	261.30	3,653.15	-151.56	-1,073.86	1,084.12	1.15	-1.07	
3,920.00	18.98	261.39	3,741.92	-156.22	-1,104.42	1,115.03	0.47	-0.47	
4,014.00	20.26	261.65	3,830.46	-160.87	-1,135.63	1,146.59	1.36	1.36	
4,109.00	19.95	261.39	3,919.68	-165.68	-1,167.93	1,179.24	0.34	-0.33	
4,203.00	19.86	261.04	4,008.06	-170.57	-1,199.56	1,211.24	0.16	-0.10	
4,298.00	19.82	259.98	4,097.42	-175.89	-1,231.36	1,243.48	0.38	-0.04	
4,392.00	19.64	258.49	4,185.90	-181.81	-1,262.53	1,275.21	0.57	-0.19	
4,487.00	19.16	257.43	4,275.51	-188.39	-1,293.39	1,306.73	0.63	-0.51	
4,581.00	18.50	263.23	4,364.49	-193.50	-1,323.26	1,337.03	2.11	-0.70	
4,676.00	18.41	263.67	4,454.60	-196.94	-1,353.14	1,367.06	0.17	-0.09	
4,865.00	16.70	262.62	4,634.79	-203.71	-1,409.74	1,424.00	0.92	-0.90	
4,959.00	18.81	262.97	4,724.31	-207.30	-1,438.17	1,452.64	2.25	2.24	
5,054.00	19.12	263.50	4,814.15	-210.94	-1,468.83	1,483.48	0.37	0.33	
5,148.00	18.68	258.40	4,903.09	-215.71	-1,498.88	1,513.90	1.82	-0.47	
5,243.00	18.24	259.81	4,993.20	-221.40	-1,528.41	1,543.97	0.66	-0.46	
5,337.00	18.68	260.86	5,082.37	-226.39	-1,557.75	1,573.73	0.59	0.47	
5,431.00	20.44	264.64	5,170.94	-230.32	-1,588.96	1,605.16	2.31	1.87	
5,526.00	20.52	265.08	5,259.94	-233.30	-1,622.07	1,638.30	0.18	0.08	
5,620.00	20.48	265.08	5,347.98	-236.12	-1,654.86	1,671.11	0.04	-0.04	
5,715.00	20.70	264.47	5,436.92	-239.16	-1,688.13	1,704.43	0.32	0.23	
5,809.00	20.17	264.47	5,525.00	-242.32	-1,720.80	1,737.17	0.56	-0.56	
5,903.00	21.05	266.14	5,612.98	-245.02	-1,753.78	1,770.13	1.13	0.94	
5,998.00	19.51	263.23	5,702.09	-248.04	-1,786.55	1,802.96	1.94	-1.62	
6,093.00	17.71	260.69	5,792.12	-252.25	-1,816.57	1,833.25	2.08	-1.89	
6,187.00	16.22	260.33	5,882.03	-256.77	-1,843.62	1,860.68	1.59	-1.59	

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas	Local Co-ordinate Reference:	Well PUCKETT 15C-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 15C-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
6,281.00	15.38	258.49	5,972.48	-261.46	-1,868.78	1,886.27	1.04	-0.89	
6,376.00	15.78	252.07	6,064.00	-267.95	-1,893.42	1,911.64	1.86	0.42	
6,470.00	14.06	254.71	6,154.82	-274.90	-1,916.59	1,935.65	1.97	-1.83	
6,565.00	11.78	253.39	6,247.41	-280.71	-1,937.02	1,956.75	2.42	-2.40	
6,659.00	10.24	263.06	6,339.69	-284.47	-1,954.51	1,974.63	2.55	-1.64	
6,754.00	7.56	267.19	6,433.54	-285.79	-1,969.14	1,989.27	2.90	-2.82	
6,848.00	5.41	268.68	6,526.93	-286.20	-1,979.74	1,999.80	2.29	-2.29	
6,943.00	4.96	265.26	6,621.54	-286.64	-1,988.31	2,008.32	0.57	-0.47	
7,038.00	3.82	269.56	6,716.26	-287.01	-1,995.57	2,015.54	1.25	-1.20	
7,132.00	3.16	259.72	6,810.09	-287.49	-2,001.25	2,021.22	0.95	-0.70	
7,416.00	4.83	252.86	7,093.39	-292.41	-2,020.38	2,040.90	0.61	0.59	
7,699.00	5.41	259.98	7,375.26	-298.25	-2,044.90	2,066.05	0.30	0.20	
7,983.00	5.23	255.59	7,658.04	-303.80	-2,070.63	2,092.34	0.16	-0.06	
8,266.00	5.45	257.08	7,939.81	-310.01	-2,096.22	2,118.61	0.09	0.08	LAST SURVEY - 8266' MD
9,180.00	5.45	257.08	8,849.68	-329.42	-2,180.83	2,205.26	0.00	0.00	PTB - 9180' 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 15C-23 PBHI	0.00	0.00	8,886.00	-377.06	-2,244.87	14,357,063.00	2,431,631.00	39.502070	-108.195305
- actual wellpath misses target center by 87.69usft at 9180.00usft MD (8849.68 TVD, -329.42 N, -2180.83 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	
8,266.00	7,939.81	-310.01	-2,096.22	LAST SURVEY - 8266' MD	
9,180.00	8,849.68	-329.42	-2,180.83	PTB - 9180' MD	

Checked By: _____	Approved By: _____	Date: _____
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