





Cathedral Energy Services

Survey Report

Company:	Coachman Energy Operating Company, LLC	Local Co-ordinate Reference:	Well Coachman Energy Federal 14/15-6-21
Project:	Garfield County, CO	TVD Reference:	KB=23' @ 6955.0usft (Frontier # 28)
Site:	S21 T6S R91W (21B Pad)	MD Reference:	KB=23' @ 6955.0usft (Frontier # 28)
Well:	Coachman Energy Federal 14/15-6-21	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S21 T6S R91W (21B Pad)			
Site Position:		Northing:	1,072,631.30 usft	Latitude:	39.514322
From:	Lat/Long	Easting:	2,420,925.95 usft	Longitude:	-107.552555
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.33 °

Well	Coachman Energy Federal 14/15-6-21					
Well Position	+N/-S	0.0 usft	Northing:	1,072,662.47 usft	Latitude:	39.514410
	+E/-W	0.0 usft	Easting:	2,420,963.64 usft	Longitude:	-107.552424
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	6,932.0 usft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/1/2014	9.70	65.74	51,959

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	4.83	

Survey Program	Date	12/10/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
149.0	8,025.0	Survey #1 (DD)	ISCWSA MWD	MWD - ISCWSA	

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	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
149.0	0.80	165.20	149.0	-1.0	0.3	-1.0	0.54	0.54		
209.0	0.80	158.10	209.0	-1.8	0.5	-1.7	0.17	0.00		
274.0	0.40	187.20	274.0	-2.4	0.7	-2.4	0.75	-0.62		
337.0	0.10	127.00	337.0	-2.7	0.7	-2.6	0.57	-0.48		
432.0	0.40	340.50	432.0	-2.4	0.6	-2.4	0.51	0.32		
526.0	0.50	2.10	526.0	-1.7	0.5	-1.7	0.21	0.11		
620.0	2.20	10.70	620.0	0.5	0.9	0.5	1.82	1.81		
715.0	3.90	358.70	714.8	5.5	1.2	5.6	1.90	1.79		
809.0	6.40	12.40	808.4	13.8	2.2	13.9	2.95	2.66		
903.0	9.40	5.20	901.5	26.6	4.0	26.8	3.35	3.19		
997.0	11.10	3.90	994.0	43.2	5.3	43.5	1.83	1.81		
1,091.0	11.90	1.00	1,086.1	62.0	6.1	62.3	1.05	0.85		

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Well:	Coachman Energy Federal 14/15-6-21	North Reference:	True
Wellbore:	DD	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
1,184.0	12.40	0.50	1,177.1	81.5	6.4	81.8	0.55	0.54	
1,276.0	12.30	1.20	1,266.9	101.2	6.7	101.4	0.20	-0.11	
1,370.0	11.80	3.40	1,358.9	120.8	7.5	121.0	0.72	-0.53	
1,464.0	11.10	9.50	1,451.0	139.3	9.5	139.6	1.49	-0.74	
1,485.0	11.10	8.00	1,471.6	143.3	10.1	143.7	1.38	0.00	
1,572.0	11.80	8.50	1,556.9	160.4	12.6	160.9	0.81	0.80	
1,667.0	12.40	7.50	1,649.8	180.1	15.4	180.8	0.67	0.63	
1,761.0	11.50	5.10	1,741.7	199.5	17.5	200.2	1.09	-0.96	
1,855.0	10.70	4.60	1,834.0	217.5	19.1	218.3	0.86	-0.85	
1,950.0	11.30	5.00	1,927.2	235.6	20.6	236.5	0.64	0.63	
2,044.0	10.10	4.30	2,019.6	253.0	22.0	253.9	1.28	-1.28	
2,137.0	10.00	2.70	2,111.1	269.2	23.0	270.1	0.32	-0.11	
2,198.0	10.10	1.00	2,171.2	279.8	23.3	280.8	0.51	0.16	
2,292.0	11.10	6.30	2,263.6	297.0	24.5	298.0	1.48	1.06	
2,354.0	11.10	5.10	2,324.4	308.9	25.7	310.0	0.37	0.00	
2,449.0	11.30	3.80	2,417.6	327.3	27.1	328.4	0.34	0.21	
2,543.0	11.00	0.90	2,509.9	345.5	27.8	346.6	0.68	-0.32	
2,638.0	10.80	5.90	2,603.2	363.4	28.9	364.5	1.02	-0.21	
2,732.0	10.70	4.80	2,695.5	380.8	30.5	382.1	0.24	-0.11	
2,795.0	10.30	4.40	2,757.5	392.3	31.5	393.5	0.65	-0.63	
2,890.0	10.30	1.80	2,850.9	409.2	32.4	410.5	0.49	0.00	
2,952.0	10.20	4.20	2,911.9	420.3	33.0	421.5	0.71	-0.16	
3,046.0	10.20	9.10	3,004.4	436.8	34.9	438.2	0.92	0.00	
3,140.0	10.20	8.70	3,097.0	453.2	37.5	454.8	0.08	0.00	
3,234.0	10.60	9.30	3,189.4	470.0	40.1	471.7	0.44	0.43	
3,329.0	10.90	8.80	3,282.7	487.5	42.9	489.4	0.33	0.32	
3,423.0	9.00	1.90	3,375.3	503.6	44.5	505.6	2.38	-2.02	
3,486.0	8.60	3.80	3,437.6	513.2	45.0	515.2	0.78	-0.63	
3,550.0	7.10	7.00	3,501.0	521.9	45.8	523.9	2.44	-2.34	
3,644.0	4.20	14.20	3,594.5	531.0	47.3	533.1	3.17	-3.09	
3,738.0	2.90	14.10	3,688.3	536.7	48.8	538.9	1.38	-1.38	
3,833.0	1.10	342.40	3,783.3	539.9	49.1	542.1	2.16	-1.89	
3,928.0	1.00	321.00	3,878.3	541.4	48.3	543.5	0.42	-0.11	
4,022.0	0.30	359.40	3,972.3	542.3	47.7	544.4	0.84	-0.74	
4,118.0	0.20	50.40	4,068.3	542.6	47.9	544.7	0.24	-0.10	
4,212.0	0.30	216.50	4,162.3	542.5	47.9	544.7	0.53	0.11	
4,307.0	0.30	274.90	4,257.3	542.4	47.5	544.4	0.31	0.00	
4,402.0	0.10	320.40	4,352.3	542.5	47.2	544.5	0.25	-0.21	
4,497.0	0.70	12.30	4,447.3	543.1	47.2	545.1	0.68	0.63	
4,591.0	1.10	5.10	4,541.2	544.5	47.4	546.6	0.44	0.43	
4,686.0	1.30	0.10	4,636.2	546.5	47.5	548.6	0.24	0.21	
4,782.0	0.30	250.40	4,732.2	547.5	47.3	549.6	1.49	-1.04	
4,845.0	0.50	201.10	4,795.2	547.2	47.0	549.2	0.60	0.32	
4,908.0	0.90	204.20	4,858.2	546.5	46.7	548.5	0.64	0.63	
4,971.0	0.80	216.00	4,921.2	545.7	46.3	547.7	0.32	-0.16	
5,034.0	0.80	246.20	4,984.2	545.2	45.6	547.1	0.66	0.00	
5,129.0	0.70	254.30	5,079.2	544.8	44.4	546.6	0.15	-0.11	
5,224.0	0.50	283.70	5,174.2	544.7	43.5	546.4	0.38	-0.21	
5,319.0	0.40	275.70	5,269.2	544.8	42.7	546.5	0.12	-0.11	
5,383.0	0.20	225.10	5,333.2	544.8	42.4	546.4	0.49	-0.31	
5,478.0	0.40	160.80	5,428.2	544.3	42.4	546.0	0.38	0.21	
5,573.0	0.80	119.70	5,523.2	543.7	43.1	545.4	0.59	0.42	
5,636.0	0.80	124.00	5,586.2	543.2	43.9	545.0	0.10	0.00	

Cathedral Energy Services

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Site:	S21 T6S R91W (21B Pad)	MD Reference:	KB=23' @ 6955.0usft (Frontier # 28)
Well:	Coachman Energy Federal 14/15-6-21	North Reference:	True
Wellbore:	DD	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
5,731.0	1.10	148.20	5,681.2	542.1	44.9	543.9	0.52	0.32	
5,794.0	0.90	158.20	5,744.1	541.1	45.4	543.0	0.42	-0.32	
5,888.0	0.30	136.80	5,838.1	540.2	45.8	542.2	0.67	-0.64	
5,950.0	0.70	120.40	5,900.1	539.9	46.3	541.9	0.68	0.65	
6,045.0	1.20	105.60	5,995.1	539.4	47.7	541.5	0.58	0.53	
6,108.0	0.90	116.90	6,058.1	539.0	48.8	541.2	0.58	-0.48	
6,203.0	0.40	127.40	6,153.1	538.4	49.7	540.7	0.54	-0.53	
6,297.0	0.10	10.20	6,247.1	538.3	50.0	540.6	0.48	-0.32	
6,392.0	0.40	17.90	6,342.1	538.7	50.1	541.0	0.32	0.32	
6,485.0	0.60	295.20	6,435.1	539.2	49.8	541.5	0.73	0.22	
6,547.0	0.70	283.40	6,497.1	539.5	49.1	541.7	0.27	0.16	
6,641.0	1.60	285.30	6,591.1	539.9	47.3	542.0	0.96	0.96	
6,735.0	2.50	290.80	6,685.0	541.0	44.1	542.8	0.98	0.96	
6,830.0	2.00	306.20	6,779.9	542.7	40.8	544.2	0.82	-0.53	
6,892.0	2.10	319.40	6,841.9	544.2	39.2	545.6	0.78	0.16	
6,986.0	2.60	328.80	6,935.8	547.4	37.0	548.5	0.67	0.53	
7,030.0	2.90	334.20	6,979.8	549.2	36.0	550.3	0.90	0.68	
7,145.0	2.90	357.40	7,094.6	554.7	34.6	555.7	1.01	0.00	
7,238.0	3.00	359.30	7,187.5	559.5	34.5	560.4	0.15	0.11	
7,333.0	3.00	354.30	7,282.4	564.5	34.2	565.4	0.28	0.00	
7,427.0	2.90	346.20	7,376.3	569.2	33.4	570.0	0.46	-0.11	
7,522.0	3.00	347.20	7,471.1	574.0	32.3	574.7	0.12	0.11	
7,615.0	2.50	340.80	7,564.0	578.3	31.1	578.8	0.63	-0.54	
7,708.0	2.70	327.40	7,656.9	582.0	29.2	582.4	0.69	0.22	
7,801.0	2.40	314.30	7,749.8	585.3	26.6	585.4	0.70	-0.32	
7,895.0	2.40	317.90	7,843.8	588.1	23.9	588.0	0.16	0.00	
7,970.0	2.20	327.70	7,918.7	590.5	22.1	590.2	0.59	-0.27	Last CES Survey @ 7,970' MD
8,025.0	2.20	327.70	7,973.7	592.3	21.0	591.9	0.00	0.00	PTB @ 8,025'

Cathedral Energy Services

Survey Report

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Project:	Garfield County, CO	TVD Reference:	KB=23' @ 6955.0usft (Frontier # 28)
Site:	S21 T6S R91W (21B Pad)	MD Reference:	KB=23' @ 6955.0usft (Frontier # 28)
Well:	Coachman Energy Federal 14/15-6-21	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
Coachman Federal 14/1	0.00	0.00	7,512.0	537.7	45.4	1,073,198.96	2,421,021.50	39.515886	-107.552263
- actual wellpath misses target center by 40.6usft at 7561.0usft MD (7510.1 TVD, 575.9 N, 31.8 E)									
- Circle (radius 100.0)									
Dejour Federal 14/15-6-	0.00	0.00	13,003.0	537.7	45.4	1,073,198.96	2,421,021.50	39.515886	-107.552263
- actual wellpath misses target center by 5029.7usft at 8025.0usft MD (7973.7 TVD, 592.3 N, 21.0 E)									
- Circle (radius 100.0)									
Coachman Federal 14/1	0.00	0.00	7,900.0	537.7	45.4	1,073,198.96	2,421,021.50	39.515886	-107.552263
- actual wellpath misses target center by 57.0usft at 7949.1usft MD (7897.8 TVD, 589.8 N, 22.5 E)									
- Circle (radius 100.0)									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
7,970.0	7,918.7	590.5	22.1	Last CES Survey @ 7,970' MD	
8,025.0	7,973.7	592.3	21.0	PTB @ 8,025'	

Checked By: _____ Approved By: _____ Date: _____

Coachman Energy Operating Company, LLC

Garfield County, CO

S21 T6S R91W (21B Pad)

Coachman Energy Federal 14/15-6-21

DD

Design: FINAL

Survey Report - Geographic

10 December, 2014

Cathedral Energy Services

Survey Report - Geographic

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Project	Garfield County, CO		
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Geo Datum:	North American Datum 1983		
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From:	Lat/Long	Easting:	2,420,925.95 usft	Longitude:	-107.552555
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.33 °

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Well Position	+N/-S	0.0 usft	Northing:	1,072,662.47 usft	Latitude:	39.514410
	+E/-W	0.0 usft	Easting:	2,420,963.65 usft	Longitude:	-107.552424
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	6,932.0 usft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/1/2014	9.70	65.74	51,959

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	4.83	

Survey Program	Date	12/10/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
149.0	8,025.0	Survey #1 (DD)	ISCWSA MWD	MWD - ISCWSA	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,072,662.47	2,420,963.65	39.514410	-107.552424
149.0	0.80	165.20	149.0	-1.0	0.3	1,072,661.46	2,420,963.89	39.514407	-107.552423
209.0	0.80	158.10	209.0	-1.8	0.5	1,072,660.66	2,420,964.13	39.514405	-107.552422
274.0	0.40	187.20	274.0	-2.4	0.7	1,072,660.01	2,420,964.26	39.514403	-107.552422
337.0	0.10	127.00	337.0	-2.7	0.7	1,072,659.76	2,420,964.27	39.514403	-107.552422
432.0	0.40	340.50	432.0	-2.4	0.6	1,072,660.03	2,420,964.23	39.514403	-107.552422
526.0	0.50	2.10	526.0	-1.7	0.5	1,072,660.75	2,420,964.15	39.514405	-107.552422
620.0	2.20	10.70	620.0	0.5	0.9	1,072,662.92	2,420,964.55	39.514411	-107.552421
715.0	3.90	358.70	714.8	5.5	1.2	1,072,667.94	2,420,964.93	39.514425	-107.552420
809.0	6.40	12.40	808.4	13.8	2.2	1,072,676.22	2,420,966.18	39.514448	-107.552416
903.0	9.40	5.20	901.5	26.6	4.0	1,072,688.94	2,420,968.30	39.514483	-107.552410
997.0	11.10	3.90	994.0	43.2	5.3	1,072,705.58	2,420,969.99	39.514529	-107.552405

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Survey Report - Geographic

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Project:	Garfield County, CO	TVD Reference:	KB=23' @ 6955.0usft (Frontier # 28)
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Wellbore:	DD	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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,091.0	11.90	1.00	1,086.1	62.0	6.1	1,072,724.28	2,420,971.21	39.514580	-107.552403
1,184.0	12.40	0.50	1,177.1	81.5	6.4	1,072,743.84	2,420,971.92	39.514634	-107.552402
1,276.0	12.30	1.20	1,266.9	101.2	6.7	1,072,763.50	2,420,972.66	39.514688	-107.552401
1,370.0	11.80	3.40	1,358.9	120.8	7.5	1,072,783.08	2,420,973.90	39.514742	-107.552398
1,464.0	11.10	9.50	1,451.0	139.3	9.5	1,072,801.55	2,420,976.39	39.514793	-107.552391
1,485.0	11.10	8.00	1,471.6	143.3	10.1	1,072,805.53	2,420,977.10	39.514803	-107.552388
1,572.0	11.80	8.50	1,556.9	160.4	12.6	1,072,822.56	2,420,979.97	39.514850	-107.552380
1,667.0	12.40	7.50	1,649.8	180.1	15.4	1,072,842.21	2,420,983.19	39.514905	-107.552370
1,761.0	11.50	5.10	1,741.7	199.5	17.5	1,072,861.49	2,420,985.79	39.514958	-107.552362
1,855.0	10.70	4.60	1,834.0	217.5	19.1	1,072,879.48	2,420,987.74	39.515007	-107.552357
1,950.0	11.30	5.00	1,927.2	235.6	20.6	1,072,897.51	2,420,989.68	39.515057	-107.552351
2,044.0	10.10	4.30	2,019.6	253.0	22.0	1,072,914.86	2,420,991.50	39.515104	-107.552346
2,137.0	10.00	2.70	2,111.1	269.2	23.0	1,072,931.03	2,420,992.87	39.515149	-107.552343
2,198.0	10.10	1.00	2,171.2	279.8	23.3	1,072,941.66	2,420,993.46	39.515178	-107.552342
2,292.0	11.10	6.30	2,263.6	297.0	24.5	1,072,958.87	2,420,994.99	39.515225	-107.552338
2,354.0	11.10	5.10	2,324.4	308.9	25.7	1,072,970.71	2,420,996.45	39.515258	-107.552333
2,449.0	11.30	3.80	2,417.6	327.3	27.1	1,072,989.07	2,420,998.31	39.515309	-107.552328
2,543.0	11.00	0.90	2,509.9	345.5	27.8	1,073,007.20	2,420,999.48	39.515358	-107.552326
2,638.0	10.80	5.90	2,603.2	363.4	28.9	1,073,025.09	2,421,000.95	39.515408	-107.552322
2,732.0	10.70	4.80	2,695.5	380.8	30.5	1,073,042.50	2,421,002.99	39.515456	-107.552316
2,795.0	10.30	4.40	2,757.5	392.3	31.5	1,073,053.92	2,421,004.17	39.515487	-107.552313
2,890.0	10.30	1.80	2,850.9	409.2	32.4	1,073,070.86	2,421,005.49	39.515533	-107.552310
2,952.0	10.20	4.20	2,911.9	420.3	33.0	1,073,081.85	2,421,006.32	39.515564	-107.552307
3,046.0	10.20	9.10	3,004.4	436.8	34.9	1,073,098.32	2,421,008.62	39.515609	-107.552301
3,140.0	10.20	8.70	3,097.0	453.2	37.5	1,073,114.71	2,421,011.58	39.515654	-107.552292
3,234.0	10.60	9.30	3,189.4	470.0	40.1	1,073,131.40	2,421,014.62	39.515700	-107.552282
3,329.0	10.90	8.80	3,282.7	487.5	42.9	1,073,148.83	2,421,017.81	39.515748	-107.552272
3,423.0	9.00	1.90	3,375.3	503.6	44.5	1,073,164.92	2,421,019.79	39.515793	-107.552267
3,486.0	8.60	3.80	3,437.6	513.2	45.0	1,073,174.53	2,421,020.49	39.515819	-107.552265
3,550.0	7.10	7.00	3,501.0	521.9	45.8	1,073,183.21	2,421,021.49	39.515843	-107.552262
3,644.0	4.20	14.20	3,594.5	531.0	47.3	1,073,192.28	2,421,023.25	39.515868	-107.552257
3,738.0	2.90	14.10	3,688.3	536.7	48.8	1,073,197.89	2,421,024.80	39.515883	-107.552251
3,833.0	1.10	342.40	3,783.3	539.9	49.1	1,073,201.08	2,421,025.19	39.515892	-107.552250
3,928.0	1.00	321.00	3,878.3	541.4	48.3	1,073,202.61	2,421,024.43	39.515896	-107.552253
4,022.0	0.30	359.40	3,972.3	542.3	47.7	1,073,203.51	2,421,023.93	39.515899	-107.552255
4,118.0	0.20	50.40	4,068.3	542.6	47.9	1,073,203.86	2,421,024.06	39.515900	-107.552255
4,212.0	0.30	216.50	4,162.3	542.5	47.9	1,073,203.77	2,421,024.04	39.515899	-107.552255
4,307.0	0.30	274.90	4,257.3	542.4	47.5	1,073,203.60	2,421,023.64	39.515899	-107.552256
4,402.0	0.10	320.40	4,352.3	542.5	47.2	1,073,203.69	2,421,023.34	39.515899	-107.552257
4,497.0	0.70	12.30	4,447.3	543.1	47.2	1,073,204.32	2,421,023.43	39.515901	-107.552257
4,591.0	1.10	5.10	4,541.2	544.5	47.4	1,073,205.78	2,421,023.66	39.515905	-107.552256
4,686.0	1.30	0.10	4,636.2	546.5	47.5	1,073,207.76	2,421,023.79	39.515910	-107.552256
4,782.0	0.30	250.40	4,732.2	547.5	47.3	1,073,208.77	2,421,023.58	39.515913	-107.552257
4,845.0	0.50	201.10	4,795.2	547.2	47.0	1,073,208.46	2,421,023.32	39.515912	-107.552258
4,908.0	0.90	204.20	4,858.2	546.5	46.7	1,073,207.76	2,421,023.00	39.515910	-107.552259
4,971.0	0.80	216.00	4,921.2	545.7	46.3	1,073,206.97	2,421,022.52	39.515908	-107.552260
5,034.0	0.80	246.20	4,984.2	545.2	45.6	1,073,206.45	2,421,021.85	39.515907	-107.552263
5,129.0	0.70	254.30	5,079.2	544.8	44.4	1,073,206.05	2,421,020.67	39.515905	-107.552267
5,224.0	0.50	283.70	5,174.2	544.7	43.5	1,073,206.01	2,421,019.71	39.515905	-107.552270
5,319.0	0.40	275.70	5,269.2	544.8	42.7	1,073,206.16	2,421,018.98	39.515906	-107.552273
5,383.0	0.20	225.10	5,333.2	544.8	42.4	1,073,206.11	2,421,018.68	39.515906	-107.552274
5,478.0	0.40	160.80	5,428.2	544.3	42.4	1,073,205.68	2,421,018.66	39.515904	-107.552274
5,573.0	0.80	119.70	5,523.2	543.7	43.1	1,073,205.03	2,421,019.33	39.515903	-107.552271
5,636.0	0.80	124.00	5,586.2	543.2	43.9	1,073,204.54	2,421,020.07	39.515901	-107.552269
5,731.0	1.10	148.20	5,681.2	542.1	44.9	1,073,203.38	2,421,021.07	39.515898	-107.552265

Cathedral Energy Services

Survey Report - Geographic

Company:	Coachman Energy Operating Company, LLC	Local Co-ordinate Reference:	Well Coachman Energy Federal 14/15-6-21
Project:	Garfield County, CO	TVD Reference:	KB=23' @ 6955.0usft (Frontier # 28)
Site:	S21 T6S R91W (21B Pad)	MD Reference:	KB=23' @ 6955.0usft (Frontier # 28)
Well:	Coachman Energy Federal 14/15-6-21	North Reference:	True
Wellbore:	DD	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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,794.0	0.90	158.20	5,744.1	541.1	45.4	1,073,202.39	2,421,021.55	39.515895	-107.552263
5,888.0	0.30	136.80	5,838.1	540.2	45.8	1,073,201.52	2,421,021.97	39.515893	-107.552262
5,950.0	0.70	120.40	5,900.1	539.9	46.3	1,073,201.20	2,421,022.40	39.515892	-107.552260
6,045.0	1.20	105.60	5,995.1	539.4	47.7	1,073,200.60	2,421,023.85	39.515891	-107.552255
6,108.0	0.90	116.90	6,058.1	539.0	48.8	1,073,200.17	2,421,024.92	39.515890	-107.552251
6,203.0	0.40	127.40	6,153.1	538.4	49.7	1,073,199.61	2,421,025.83	39.515888	-107.552248
6,297.0	0.10	10.20	6,247.1	538.3	50.0	1,073,199.49	2,421,026.10	39.515888	-107.552247
6,392.0	0.40	17.90	6,342.1	538.7	50.1	1,073,199.88	2,421,026.23	39.515889	-107.552247
6,485.0	0.60	295.20	6,435.1	539.2	49.8	1,073,200.41	2,421,025.90	39.515890	-107.552248
6,547.0	0.70	283.40	6,497.1	539.5	49.1	1,073,200.65	2,421,025.24	39.515891	-107.552250
6,641.0	1.60	285.30	6,591.1	539.9	47.3	1,073,201.17	2,421,023.43	39.515892	-107.552257
6,735.0	2.50	290.80	6,685.0	541.0	44.1	1,073,202.32	2,421,020.27	39.515895	-107.552268
6,830.0	2.00	306.20	6,779.9	542.7	40.8	1,073,204.11	2,421,017.04	39.515900	-107.552280
6,892.0	2.10	319.40	6,841.9	544.2	39.2	1,073,205.65	2,421,015.46	39.515904	-107.552285
6,986.0	2.60	328.80	6,935.8	547.4	37.0	1,073,208.83	2,421,013.31	39.515913	-107.552293
7,030.0	2.90	334.20	6,979.8	549.2	36.0	1,073,210.71	2,421,012.35	39.515918	-107.552297
7,145.0	2.90	357.40	7,094.6	554.7	34.6	1,073,216.26	2,421,011.08	39.515933	-107.552302
7,238.0	3.00	359.30	7,187.5	559.5	34.5	1,073,221.05	2,421,011.06	39.515946	-107.552302
7,333.0	3.00	354.30	7,282.4	564.5	34.2	1,073,226.01	2,421,010.89	39.515960	-107.552303
7,427.0	2.90	346.20	7,376.3	569.2	33.4	1,073,230.79	2,421,010.19	39.515973	-107.552306
7,522.0	3.00	347.20	7,471.1	574.0	32.3	1,073,235.57	2,421,009.18	39.515986	-107.552310
7,615.0	2.50	340.80	7,564.0	578.3	31.1	1,073,239.89	2,421,008.07	39.515998	-107.552314
7,708.0	2.70	327.40	7,656.9	582.0	29.2	1,073,243.69	2,421,006.31	39.516008	-107.552321
7,801.0	2.40	314.30	7,749.8	585.3	26.6	1,073,246.95	2,421,003.81	39.516017	-107.552330
7,895.0	2.40	317.90	7,843.8	588.1	23.9	1,073,249.85	2,421,001.15	39.516024	-107.552340
7,970.0	2.20	327.70	7,918.7	590.5	22.1	1,073,252.27	2,420,999.39	39.516031	-107.552346
Last CES Survey @ 7,970' MD									
8,025.0	2.20	327.70	7,973.7	592.3	21.0	1,073,254.08	2,420,998.30	39.516036	-107.552350
PTB @ 8,025'									

Design 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									
Coachman Federal 14/1	0.00	0.00	7,900.0	537.7	45.4	1,073,198.96	2,421,021.50	39.515886	-107.552263
- actual wellpath misses target center by 57.0usft at 7949.1usft MD (7897.8 TVD, 589.8 N, 22.5 E)									
- Circle (radius 100.0)									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
7,970.0	7,918.7	590.5	22.1	Last CES Survey @ 7,970' MD	
8,025.0	7,973.7	592.3	21.0	PTB @ 8,025'	

Checked By: _____ Approved By: _____ Date: _____