

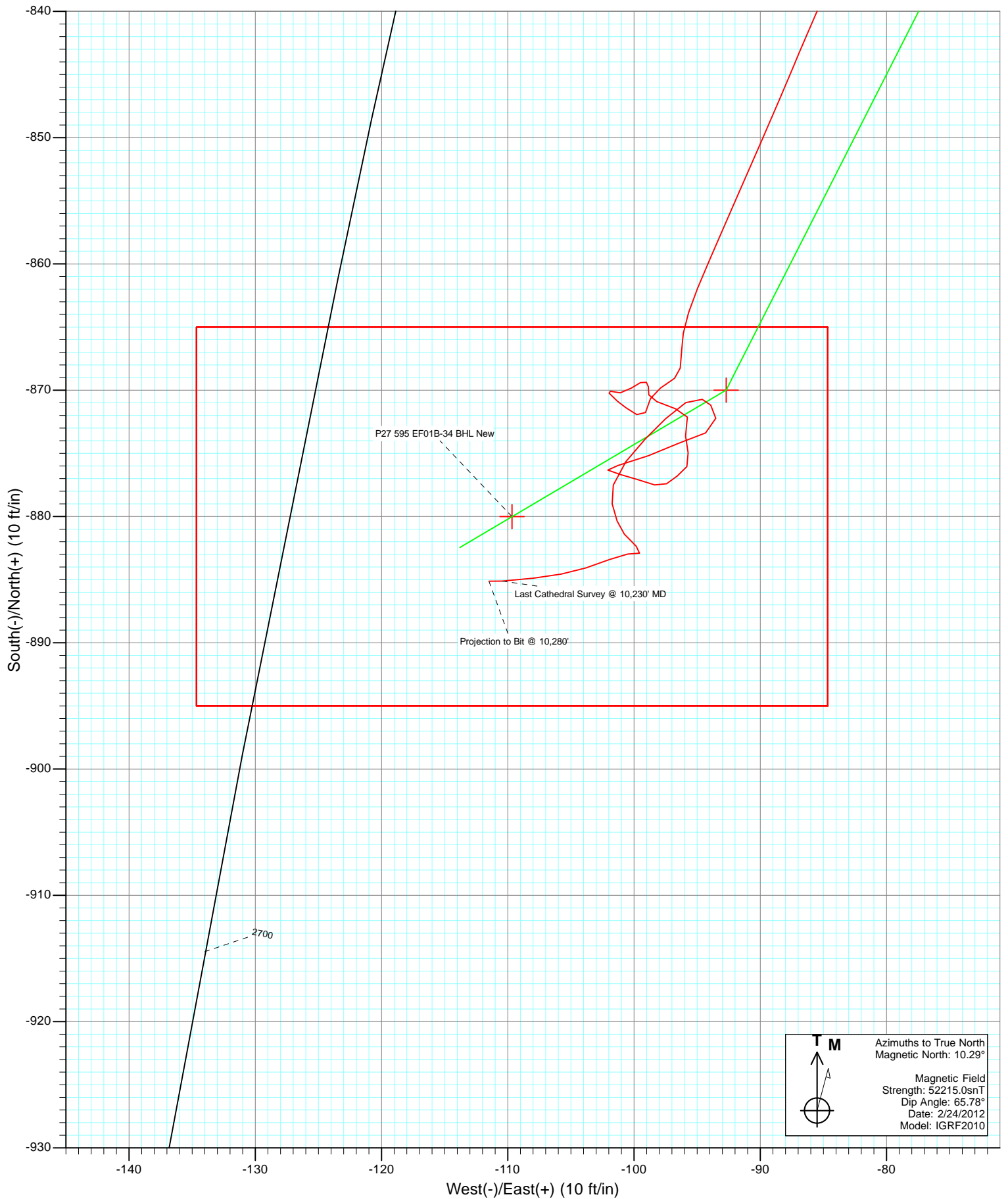
Azimuths to True North
 Magnetic North: 10.29°

Magnetic Field
 Strength: 52215.0snT
 Dip Angle: 65.78°
 Date: 2/24/2012
 Model: IGRF2010

DD NP EF01B-34 P27 595 125117/141955 (SH), 144755 125186; LR EF01B-34 P27 @ 6671.0ft (Patterson 303) North American Datum 1983 Well NP EF01B-34 P27 595, True North							
Type	Target	Azimuth	Origin	Type	N/S	E/W	From TVD
Target	P27 595 EF01B-34 BHL	185.52	Slot		0.0	0.0	0.0
Name	TVD	+N/-S	+E/-W	Latitude	Longitude		
P27 595 EF01B-34 TGT New	5440.0	-870.0	-92.7	39° 34' 36.94 N	108° 2' 0.61 W		
P27 595 EF01B-34 BHL New	10000.0	-880.0	-109.7	39° 34' 36.84 N	108° 2' 0.83 W		



Project: North Piceance
Site: P27 595 (S27-T5S-R95W)
Well: NP EF01B-34 P27 595
Wellbore: DD
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NP EF01B-34 P27 595
Project:	North Piceance	TVD Reference:	EF01B-34 P27 @ 6671.0ft (Patterson 303)
Site:	P27 595 (S27-T5S-R95W)	MD Reference:	EF01B-34 P27 @ 6671.0ft (Patterson 303)
Well:	NP EF01B-34 P27 595	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Project	North Piceance		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		P27 595 (S27-T5S-R95W)			
Site Position:		Northing:	1,645,842.89 ft	Latitude:	39° 34' 45.45 N
From:	Lat/Long	Easting:	2,286,079.88 ft	Longitude:	108° 1' 59.43 W
Position Uncertainty:	0.0 ft	Slot Radius:	0.000 in	Grid Convergence:	-1.60 °

Well	NP EF01B-34 P27 595					
Well Position	+N/-S	0.0 ft	Northing:	1,645,851.77 ft	Latitude:	39° 34' 45.54 N
	+E/-W	0.0 ft	Easting:	2,286,080.22 ft	Longitude:	108° 1' 59.43 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,649.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/24/2012	10.29	65.78	52,215

Design	DD				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	185.52	

Survey Program	Date	3/3/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
50.0	135.0	Survey #1 (DD)	Gyro	Gyro	
173.0	1,775.0	Survey #2 (DD)	MWD	Geolink MWD	
1,890.0	10,280.0	Survey #3 (DD)	MWD	Geolink MWD	

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Formations /
Depth (ft)	(°)	(°)	Depth (ft)	(ft)	(ft)	Section (ft)	Rate (°/100ft)	Rate (°/100ft)	Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
50.0	0.25	55.53	50.0	0.1	0.1	-0.1	0.50	0.50	
100.0	0.38	45.67	100.0	0.2	0.3	-0.3	0.28	0.26	
135.0	0.61	38.81	135.0	0.5	0.5	-0.5	0.68	0.66	Last Gyro Survey @ 135' MD
173.0	1.40	29.50	173.0	1.0	0.9	-1.1	2.12	2.08	
234.0	2.50	37.60	234.0	2.7	2.0	-2.9	1.85	1.80	
265.0	2.40	38.10	264.9	3.8	2.8	-4.0	0.33	-0.32	
295.0	3.10	48.40	294.9	4.8	3.8	-5.2	2.85	2.33	
326.0	3.30	64.70	325.8	5.7	5.3	-6.2	2.99	0.65	
357.0	3.50	72.40	356.8	6.4	7.0	-7.1	1.61	0.65	
388.0	3.50	76.50	387.7	6.9	8.8	-7.7	0.81	0.00	

Cathedral Energy Services

Survey Report

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Project:	North Piceance	TVD Reference:	EF01B-34 P27 @ 6671.0ft (Patterson 303)
Site:	P27 595 (S27-T5S-R95W)	MD Reference:	EF01B-34 P27 @ 6671.0ft (Patterson 303)
Well:	NP EF01B-34 P27 595	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
418.0	3.70	77.20	417.7	7.3	10.6	-8.3	0.68	0.67	
449.0	3.70	83.40	448.6	7.7	12.6	-8.9	1.29	0.00	
479.0	3.80	86.90	478.5	7.9	14.6	-9.2	0.83	0.33	
510.0	3.80	80.50	509.5	8.1	16.6	-9.6	1.37	0.00	
559.0	3.70	87.20	558.4	8.4	19.8	-10.3	0.92	-0.20	
605.0	3.80	89.90	604.3	8.5	22.8	-10.6	0.44	0.22	
650.0	4.00	84.20	649.2	8.7	25.8	-11.1	0.97	0.44	
696.0	4.00	93.80	695.1	8.7	29.0	-11.5	1.45	0.00	
742.0	4.10	93.80	740.9	8.5	32.3	-11.6	0.22	0.22	
788.0	3.80	86.70	786.8	8.5	35.4	-11.8	1.25	-0.65	
833.0	3.50	90.90	831.7	8.5	38.3	-12.2	0.89	-0.67	
879.0	2.80	90.80	877.7	8.5	40.8	-12.4	1.52	-1.52	
925.0	1.90	87.00	923.6	8.5	42.7	-12.6	1.98	-1.96	
971.0	1.50	100.30	969.6	8.5	44.1	-12.7	1.22	-0.87	
1,016.0	1.10	103.70	1,014.6	8.3	45.1	-12.6	0.90	-0.89	
1,062.0	0.80	114.40	1,060.6	8.0	45.8	-12.4	0.75	-0.65	
1,108.0	0.50	138.50	1,106.6	7.7	46.2	-12.1	0.87	-0.65	
1,154.0	1.50	138.30	1,152.6	7.1	46.7	-11.6	2.17	2.17	
1,200.0	2.20	133.50	1,198.6	6.1	47.8	-10.6	1.56	1.52	
1,246.0	3.10	131.90	1,244.5	4.6	49.4	-9.4	1.96	1.96	
1,291.0	4.40	134.20	1,289.4	2.6	51.5	-7.6	2.91	2.89	
1,337.0	5.60	134.60	1,335.2	-0.2	54.4	-5.0	2.61	2.61	
1,429.0	7.40	134.00	1,426.6	-7.5	61.8	1.5	1.96	1.96	
1,521.0	8.00	133.50	1,517.8	-16.0	70.7	9.1	0.66	0.65	
1,612.0	9.10	133.40	1,607.8	-25.3	80.5	17.4	1.21	1.21	
1,704.0	9.30	135.20	1,698.6	-35.6	91.1	26.6	0.38	0.22	
1,775.0	9.30	138.80	1,768.7	-43.9	98.9	34.2	0.82	0.00	
1,890.0	9.30	132.10	1,882.2	-57.2	111.9	46.1	0.94	0.00	
1,981.0	9.30	132.60	1,972.0	-67.1	122.8	54.9	0.09	0.00	
2,073.0	9.90	137.00	2,062.7	-77.9	133.6	64.7	1.03	0.65	
2,165.0	9.50	137.80	2,153.4	-89.3	144.1	75.0	0.46	-0.43	
2,256.0	9.00	136.20	2,243.2	-100.0	154.1	84.7	0.62	-0.55	
2,348.0	8.80	136.90	2,334.1	-110.3	163.9	94.0	0.25	-0.22	
2,439.0	9.10	138.80	2,424.0	-120.8	173.4	103.6	0.46	0.33	
2,531.0	10.30	141.20	2,514.7	-132.7	183.3	114.5	1.38	1.30	
2,622.0	9.80	146.20	2,604.3	-145.5	192.7	126.3	1.10	-0.55	
2,714.0	10.10	154.00	2,694.9	-159.2	200.6	139.2	1.50	0.33	
2,805.0	9.80	163.30	2,784.5	-173.8	206.4	153.2	1.79	-0.33	
2,897.0	10.30	174.00	2,875.1	-189.5	209.5	168.5	2.10	0.54	
2,988.0	10.90	181.30	2,964.6	-206.2	210.1	185.0	1.61	0.66	
3,080.0	12.30	188.10	3,054.7	-224.6	208.6	203.5	2.12	1.52	
3,171.0	14.20	193.20	3,143.3	-245.1	204.6	224.2	2.45	2.09	
3,263.0	14.90	198.00	3,232.3	-267.3	198.4	247.0	1.51	0.76	
3,354.0	16.50	201.60	3,319.9	-290.5	190.0	270.8	2.06	1.76	
3,446.0	18.40	203.10	3,407.7	-316.0	179.5	297.2	2.12	2.07	
3,538.0	20.50	205.40	3,494.4	-343.9	166.9	326.2	2.43	2.28	
3,629.0	22.60	205.20	3,579.1	-374.1	152.6	357.7	2.31	2.31	
3,721.0	22.30	205.90	3,664.1	-405.8	137.5	390.7	0.44	-0.33	
3,812.0	23.30	206.90	3,748.0	-437.4	121.8	423.6	1.18	1.10	
3,904.0	22.90	207.00	3,832.6	-469.5	105.4	457.2	0.44	-0.43	
3,996.0	23.30	207.40	3,917.2	-501.6	88.9	490.8	0.47	0.43	
4,088.0	23.30	208.40	4,001.7	-533.8	71.9	524.4	0.43	0.00	
4,179.0	22.60	209.50	4,085.5	-564.9	54.7	557.0	0.90	-0.77	

Cathedral Energy Services

Survey Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NP EF01B-34 P27 595
Project:	North Piceance	TVD Reference:	EF01B-34 P27 @ 6671.0ft (Patterson 303)
Site:	P27 595 (S27-T5S-R95W)	MD Reference:	EF01B-34 P27 @ 6671.0ft (Patterson 303)
Well:	NP EF01B-34 P27 595	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
4,270.0	23.80	207.90	4,169.2	-596.3	37.5	589.9	1.49	1.32	
4,367.0	23.70	207.50	4,258.0	-630.9	19.4	626.1	0.20	-0.10	
4,454.0	21.90	206.40	4,338.2	-660.9	4.1	657.5	2.13	-2.07	
4,545.0	19.60	206.70	4,423.2	-689.8	-10.3	687.6	2.53	-2.53	
4,637.0	18.00	206.60	4,510.3	-716.3	-23.6	715.2	1.74	-1.74	
4,728.0	15.60	207.50	4,597.4	-739.7	-35.6	739.7	2.65	-2.64	
4,820.0	14.30	207.70	4,686.3	-760.7	-46.6	761.7	1.41	-1.41	
4,911.0	13.60	207.40	4,774.6	-780.2	-56.7	782.0	0.77	-0.77	
5,003.0	12.70	207.20	4,864.2	-798.8	-66.3	801.5	0.98	-0.98	
5,094.0	10.80	205.30	4,953.3	-815.4	-74.5	818.8	2.13	-2.09	
5,186.0	9.70	203.70	5,043.8	-830.3	-81.3	834.3	1.23	-1.20	
5,277.0	8.20	202.80	5,133.7	-843.3	-86.9	847.7	1.66	-1.65	
5,368.0	6.50	203.90	5,224.0	-854.0	-91.5	858.8	1.87	-1.87	
5,460.0	4.30	202.60	5,315.6	-861.9	-95.0	867.1	2.39	-2.39	
5,551.0	2.20	178.30	5,406.4	-866.8	-96.2	872.1	2.71	-2.31	
5,642.0	1.00	232.00	5,497.4	-869.1	-96.8	874.3	1.98	-1.32	
5,733.0	0.70	239.70	5,588.4	-869.8	-97.9	875.2	0.35	-0.33	
5,825.0	0.80	209.70	5,680.4	-870.7	-98.7	876.1	0.43	0.11	
5,916.0	0.70	187.80	5,771.4	-871.8	-99.1	877.3	0.33	-0.11	
6,008.0	0.90	302.00	5,863.4	-871.9	-99.8	877.5	1.46	0.22	
6,099.0	0.40	303.30	5,954.4	-871.4	-100.6	877.0	0.55	-0.55	
6,190.0	0.70	310.80	6,045.4	-870.8	-101.3	876.6	0.34	0.33	
6,282.0	0.40	320.10	6,137.3	-870.2	-102.0	876.0	0.34	-0.33	
6,373.0	0.40	108.10	6,228.3	-870.1	-101.9	875.9	0.85	0.00	
6,464.0	0.60	92.00	6,319.3	-870.2	-101.1	875.9	0.27	0.22	
6,556.0	0.70	46.10	6,411.3	-869.8	-100.2	875.4	0.56	0.11	
6,647.0	0.40	80.90	6,502.3	-869.4	-99.5	874.9	0.48	-0.33	
6,739.0	0.20	100.30	6,594.3	-869.4	-99.0	874.9	0.24	-0.22	
6,830.0	0.40	179.20	6,685.3	-869.7	-98.9	875.2	0.45	0.22	
6,922.0	0.40	175.30	6,777.3	-870.4	-98.8	875.8	0.03	0.00	
7,013.0	0.80	110.10	6,868.3	-870.9	-98.2	876.3	0.80	0.44	
7,104.0	1.20	111.60	6,959.3	-871.5	-96.7	876.7	0.44	0.44	
7,196.0	0.40	170.20	7,051.3	-872.1	-95.8	877.3	1.14	-0.87	
7,292.0	0.30	206.30	7,147.3	-872.7	-95.8	877.9	0.25	-0.10	
7,384.0	0.90	178.40	7,239.3	-873.6	-95.9	878.8	0.71	0.65	
7,475.0	0.80	163.20	7,330.3	-875.0	-95.7	880.1	0.27	-0.11	
7,567.0	0.70	211.00	7,422.3	-876.0	-95.8	881.2	0.67	-0.11	
7,658.0	0.70	240.80	7,513.3	-876.8	-96.6	882.0	0.40	0.00	
7,750.0	0.60	226.00	7,605.3	-877.4	-97.4	882.7	0.21	-0.11	
7,842.0	0.80	292.50	7,697.3	-877.5	-98.4	882.9	0.85	0.22	
7,933.0	1.00	282.80	7,788.3	-877.1	-99.7	882.6	0.28	0.22	
8,024.0	0.80	290.60	7,879.3	-876.7	-101.1	882.3	0.26	-0.22	
8,116.0	0.50	288.40	7,971.2	-876.3	-102.1	882.1	0.33	-0.33	
8,207.0	1.50	78.50	8,062.2	-876.0	-101.3	881.6	2.14	1.10	
8,299.0	1.70	66.80	8,154.2	-875.2	-98.8	880.6	0.42	0.22	
8,390.0	1.50	68.70	8,245.2	-874.2	-96.5	879.4	0.23	-0.22	
8,482.0	1.40	69.20	8,337.1	-873.4	-94.3	878.4	0.11	-0.11	
8,573.0	1.00	342.60	8,428.1	-872.2	-93.5	877.2	1.84	-0.44	
8,665.0	0.40	331.00	8,520.1	-871.2	-93.9	876.2	0.67	-0.65	
8,756.0	0.70	288.70	8,611.1	-870.7	-94.6	875.8	0.53	0.33	
8,848.0	1.10	240.10	8,703.1	-871.0	-95.9	876.2	0.90	0.43	
8,939.0	1.50	225.40	8,794.1	-872.3	-97.5	877.6	0.57	0.44	
9,031.0	1.30	225.10	8,886.0	-873.8	-99.1	879.3	0.22	-0.22	

Cathedral Energy Services

Survey Report

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Project:	North Piceance	TVD Reference:	EF01B-34 P27 @ 6671.0ft (Patterson 303)
Site:	P27 595 (S27-T5S-R95W)	MD Reference:	EF01B-34 P27 @ 6671.0ft (Patterson 303)
Well:	NP EF01B-34 P27 595	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	DD	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
9,122.0	1.70	216.80	8,977.0	-875.6	-100.6	881.3	0.50	0.44	
9,213.0	1.00	193.60	9,068.0	-877.5	-101.6	883.2	0.96	-0.77	
9,305.0	0.90	172.20	9,160.0	-879.0	-101.7	884.7	0.40	-0.11	
9,396.0	0.90	156.00	9,251.0	-880.4	-101.3	886.0	0.28	0.00	
9,487.0	0.60	142.40	9,341.9	-881.4	-100.8	887.0	0.38	-0.33	
9,578.0	1.10	132.10	9,432.9	-882.4	-99.8	887.9	0.57	0.55	
9,671.0	0.50	276.30	9,525.9	-882.9	-99.6	888.4	1.65	-0.65	
9,762.0	0.70	258.50	9,616.9	-883.0	-100.5	888.5	0.30	0.22	
9,853.0	1.20	250.20	9,707.9	-883.4	-101.9	889.1	0.57	0.55	
9,944.0	1.30	250.70	9,798.9	-884.1	-103.8	890.0	0.11	0.11	
10,036.0	1.20	262.00	9,890.9	-884.6	-105.7	890.6	0.29	-0.11	
10,127.0	1.60	260.90	9,981.8	-884.9	-107.9	891.2	0.44	0.44	
10,230.0	1.20	269.60	10,084.8	-885.1	-110.4	891.6	0.44	-0.39	Last Cathedral Survey @ 10,230' MD
10,280.0	1.20	269.60	10,134.8	-885.1	-111.5	891.7	0.00	0.00	Projection to Bit @ 10,280'

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
P27 595 EF01B-34 TGT	0.00	0.00	5,440.0	-870.0	-92.7	1,644,984.70	2,285,963.30	39° 34' 36.94 N	108° 2' 0.61 W
- actual wellpath misses target center by 4.1ft at 5584.6ft MD (5440.0 TVD, -867.9 N, -96.3 E)									
- Point									
P27 595 EF01B-34 BHL	0.00	0.00	10,000.0	-880.0	-109.7	1,644,975.16	2,285,946.07	39° 34' 36.84 N	108° 2' 0.83 W
- actual wellpath misses target center by 5.1ft at 10145.2ft MD (10000.0 TVD, -885.0 N, -108.4 E)									
- Rectangle (sides W30.0 H50.0 D0.0)									
Interp @ 3467.8 (NP EF	0.00	0.00	3,467.8	-277.0	197.7	1,645,569.38	2,286,270.08	39° 34' 42.80 N	108° 1' 56.90 W
- actual wellpath misses target center by 60.1ft at 3488.4ft MD (3447.8 TVD, -328.5 N, 174.0 E)									
- Point									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
135.0	135.0	0.5	0.5	Last Gyro Survey @ 135' MD
10,230.0	10,084.8	-885.1	-110.4	Last Cathedral Survey @ 10,230' MD
10,280.0	10,134.8	-885.1	-111.5	Projection to Bit @ 10,280'

Checked By: _____ Approved By: _____ Date: _____