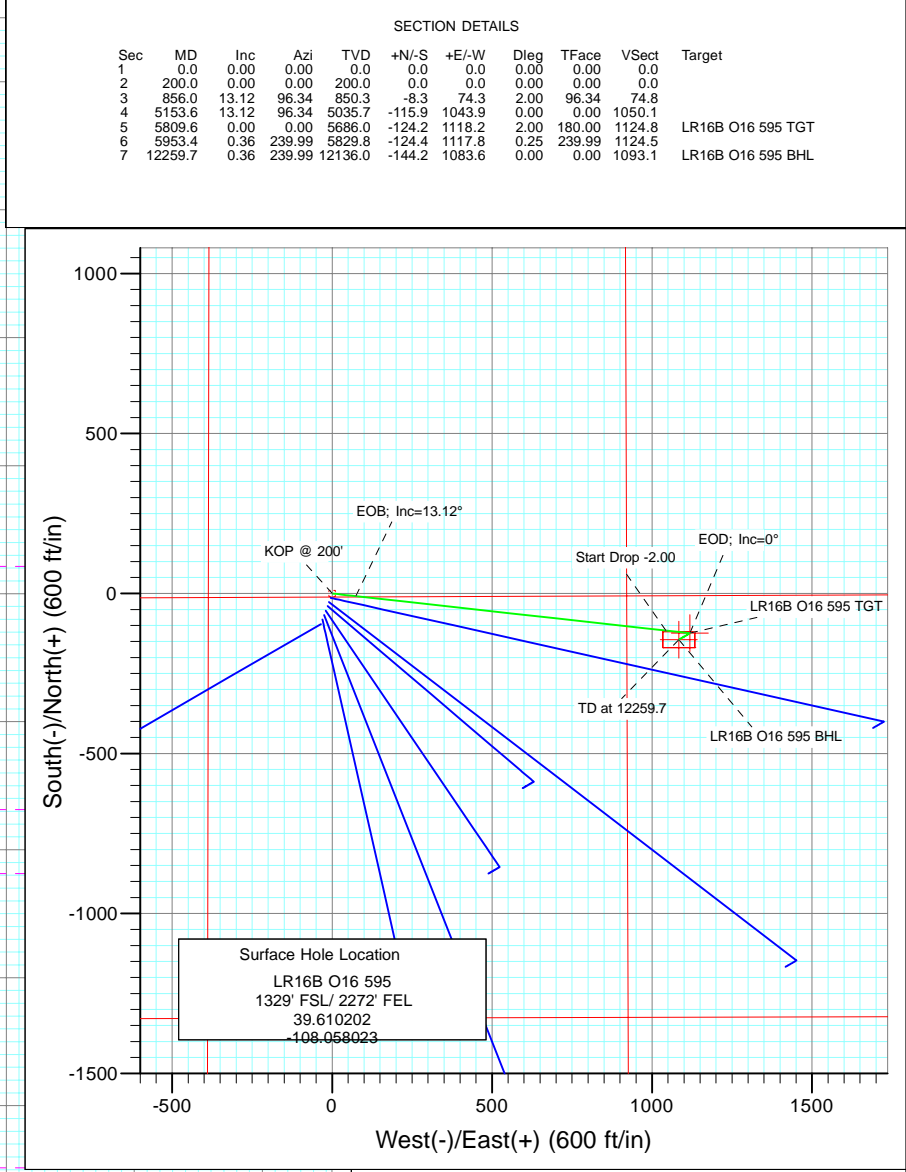
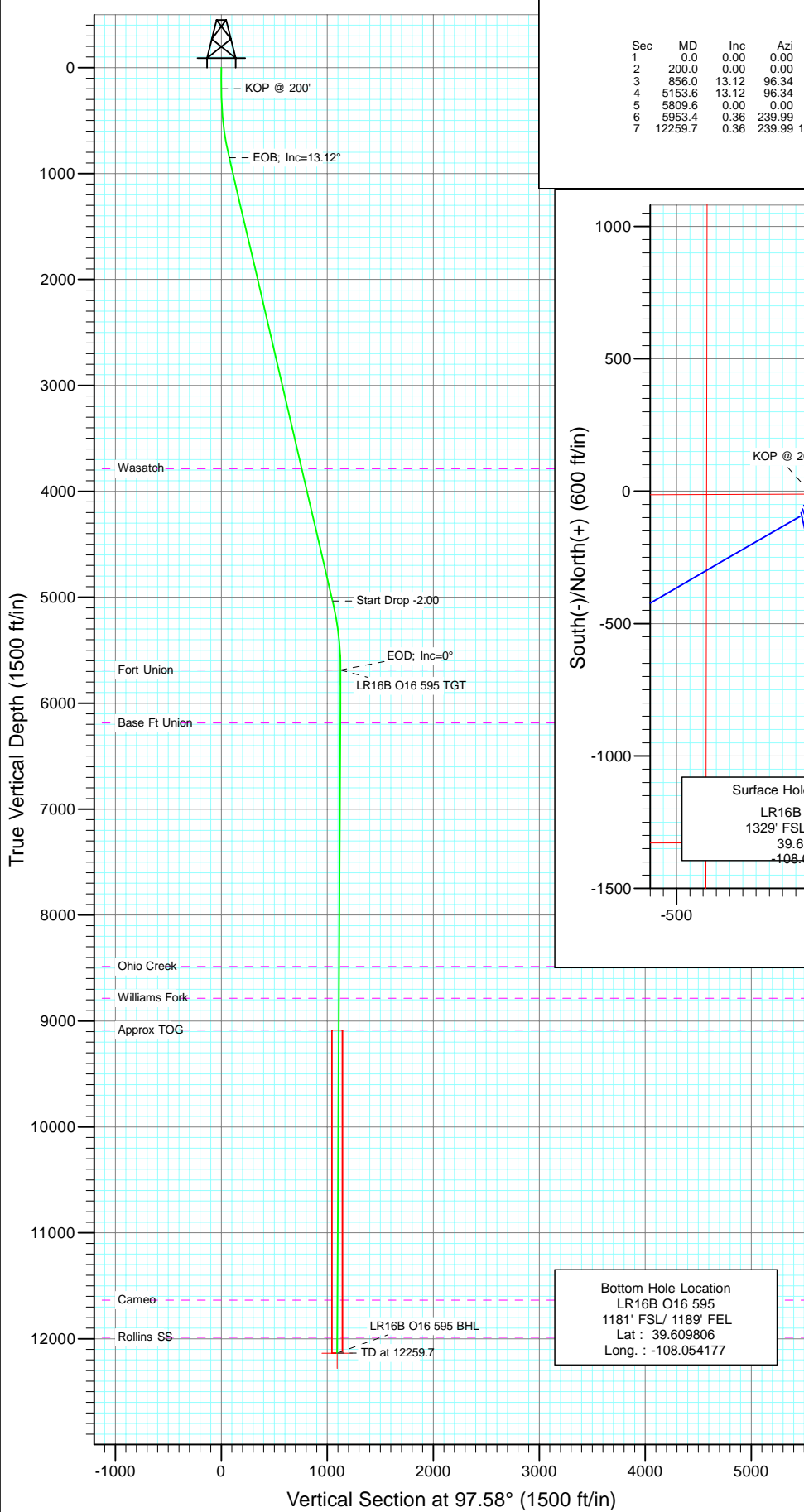




Project: Garfield County  
Site: O16 595 Pad  
Well: LR16B O16 595  
Wellbore: DD  
Design: Plan #1



Compass rose showing True North (T) and Magnetic North (M).

Azimuths to True North  
Magnetic North: 10.46°

Magnetic Field  
Strength: 52388.3snT  
Dip Angle: 65.85°  
Date: 9/27/2010  
Model: IGRF200510

FORMATION TOP DETAILS			
TVDPPath	MDPath	Formation	
3786.0	3870.4	Wasatch	
5686.0	5809.6	Fort Union	
6186.0	6309.6	Base Ft Union	
8486.0	8609.7	Ohio Creek	
8786.0	8909.7	Williams Fork	
9086.0	9209.7	Approx TOG	
11636.0	11759.7	Cameo	
11986.0	12109.7	Rollins SS	

DESIGN DETAILS: Plan #1

105XXX; BH

KBE @ 8318.0ft (Patterson 302)

Target	Azimuth	Origin	N/S	E/W	From TVD
LR16B O16 595 BHL	97.58	Slot	0.0	0.0	0.0

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	EDM 5000.1 US Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Project:</b>	Garfield County	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site:</b>	Long Ridge O16 595 Pad	<b>North Reference:</b>	True
<b>Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

<b>Project</b>	Garfield County		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

Site		Long Ridge O16 595 Pad			
Site Position:		Northing:	1,657,293.80 ft	Latitude:	39.610202
From:	Lat/Long	Easting:	2,279,395.79 ft	Longitude:	-108.058023
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.61 °

Well	LR16B O16 595					
Well Position	+N/-S	0.0 ft	Northing:	1,657,293.78 ft	Latitude:	39.610202
	+E/-W	0.0 ft	Easting:	2,279,395.79 ft	Longitude:	-108.058023
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	8,303.0 ft

<b>Wellbore</b>	DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	9/27/2010	10.46	65.85	52,388

<b>Design</b>	Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	97.58

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
856.0	13.12	96.34	850.3	-8.3	74.3	2.00	2.00	0.00	96.34	
5,153.6	13.12	96.34	5,035.7	-115.9	1,043.9	0.00	0.00	0.00	0.00	
5,809.6	0.00	0.00	5,686.0	-124.2	1,118.2	2.00	-2.00	0.00	180.00	LR16B O16 595 TGT
5,953.4	0.36	239.99	5,829.8	-124.4	1,117.8	0.25	0.25	-83.48	239.99	
12,259.7	0.36	239.99	12,136.0	-144.2	1,083.6	0.00	0.00	0.00	0.00	LR16B O16 595 BHL

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	EDM 5000.1 US Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Project:</b>	Garfield County	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site:</b>	Long Ridge O16 595 Pad	<b>North Reference:</b>	True
<b>Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
30.0	0.00	0.00	30.0	0.0	0.0	0.0	0.00	0.00	
60.0	0.00	0.00	60.0	0.0	0.0	0.0	0.00	0.00	
90.0	0.00	0.00	90.0	0.0	0.0	0.0	0.00	0.00	
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	
150.0	0.00	0.00	150.0	0.0	0.0	0.0	0.00	0.00	
180.0	0.00	0.00	180.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	KOP @ 200'
210.0	0.20	96.34	210.0	0.0	0.0	0.0	2.00	2.00	
240.0	0.80	96.34	240.0	0.0	0.3	0.3	2.00	2.00	
270.0	1.40	96.34	270.0	-0.1	0.8	0.9	2.00	2.00	
300.0	2.00	96.34	300.0	-0.2	1.7	1.7	2.00	2.00	
330.0	2.60	96.34	330.0	-0.3	2.9	2.9	2.00	2.00	
360.0	3.20	96.34	359.9	-0.5	4.4	4.5	2.00	2.00	
390.0	3.80	96.34	389.9	-0.7	6.3	6.3	2.00	2.00	
420.0	4.40	96.34	419.8	-0.9	8.4	8.4	2.00	2.00	
450.0	5.00	96.34	449.7	-1.2	10.8	10.9	2.00	2.00	
480.0	5.60	96.34	479.6	-1.5	13.6	13.7	2.00	2.00	
510.0	6.20	96.34	509.4	-1.8	16.7	16.8	2.00	2.00	
540.0	6.80	96.34	539.2	-2.2	20.0	20.1	2.00	2.00	
570.0	7.40	96.34	569.0	-2.6	23.7	23.9	2.00	2.00	
600.0	8.00	96.34	598.7	-3.1	27.7	27.9	2.00	2.00	
630.0	8.60	96.34	628.4	-3.6	32.0	32.2	2.00	2.00	
660.0	9.20	96.34	658.0	-4.1	36.6	36.8	2.00	2.00	
690.0	9.80	96.34	687.6	-4.6	41.5	41.8	2.00	2.00	
720.0	10.40	96.34	717.1	-5.2	46.8	47.1	2.00	2.00	
750.0	11.00	96.34	746.6	-5.8	52.3	52.6	2.00	2.00	
780.0	11.60	96.34	776.0	-6.5	58.2	58.5	2.00	2.00	
810.0	12.20	96.34	805.4	-7.1	64.3	64.7	2.00	2.00	
840.0	12.80	96.34	834.7	-7.9	70.8	71.2	2.00	2.00	
856.0	13.12	96.34	850.3	-8.3	74.3	74.8	2.00	2.00	EOB; Inc=13.12°
870.0	13.12	96.34	863.9	-8.6	77.5	77.9	0.00	0.00	
900.0	13.12	96.34	893.1	-9.4	84.3	84.7	0.00	0.00	
930.0	13.12	96.34	922.4	-10.1	91.0	91.6	0.00	0.00	
960.0	13.12	96.34	951.6	-10.9	97.8	98.4	0.00	0.00	
990.0	13.12	96.34	980.8	-11.6	104.6	105.2	0.00	0.00	
1,020.0	13.12	96.34	1,010.0	-12.4	111.3	112.0	0.00	0.00	
1,050.0	13.12	96.34	1,039.2	-13.1	118.1	118.8	0.00	0.00	
1,080.0	13.12	96.34	1,068.4	-13.9	124.9	125.6	0.00	0.00	
1,110.0	13.12	96.34	1,097.7	-14.6	131.6	132.4	0.00	0.00	
1,140.0	13.12	96.34	1,126.9	-15.4	138.4	139.2	0.00	0.00	
1,170.0	13.12	96.34	1,156.1	-16.1	145.2	146.0	0.00	0.00	
1,200.0	13.12	96.34	1,185.3	-16.9	151.9	152.8	0.00	0.00	
1,230.0	13.12	96.34	1,214.5	-17.6	158.7	159.6	0.00	0.00	
1,260.0	13.12	96.34	1,243.7	-18.4	165.5	166.4	0.00	0.00	
1,290.0	13.12	96.34	1,273.0	-19.1	172.2	173.3	0.00	0.00	
1,320.0	13.12	96.34	1,302.2	-19.9	179.0	180.1	0.00	0.00	
1,350.0	13.12	96.34	1,331.4	-20.6	185.8	186.9	0.00	0.00	
1,380.0	13.12	96.34	1,360.6	-21.4	192.5	193.7	0.00	0.00	
1,410.0	13.12	96.34	1,389.8	-22.1	199.3	200.5	0.00	0.00	
1,440.0	13.12	96.34	1,419.0	-22.9	206.1	207.3	0.00	0.00	
1,470.0	13.12	96.34	1,448.3	-23.6	212.8	214.1	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	EDM 5000.1 US Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Project:</b>	Garfield County	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site:</b>	Long Ridge O16 595 Pad	<b>North Reference:</b>	True
<b>Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

### Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
1,500.0	13.12	96.34	1,477.5	-24.4	219.6	220.9	0.00	0.00	
1,530.0	13.12	96.34	1,506.7	-25.1	226.4	227.7	0.00	0.00	
1,560.0	13.12	96.34	1,535.9	-25.9	233.2	234.5	0.00	0.00	
1,590.0	13.12	96.34	1,565.1	-26.6	239.9	241.3	0.00	0.00	
1,620.0	13.12	96.34	1,594.3	-27.4	246.7	248.1	0.00	0.00	
1,650.0	13.12	96.34	1,623.6	-28.1	253.5	255.0	0.00	0.00	
1,680.0	13.12	96.34	1,652.8	-28.9	260.2	261.8	0.00	0.00	
1,710.0	13.12	96.34	1,682.0	-29.7	267.0	268.6	0.00	0.00	
1,740.0	13.12	96.34	1,711.2	-30.4	273.8	275.4	0.00	0.00	
1,770.0	13.12	96.34	1,740.4	-31.2	280.5	282.2	0.00	0.00	
1,800.0	13.12	96.34	1,769.6	-31.9	287.3	289.0	0.00	0.00	
1,830.0	13.12	96.34	1,798.9	-32.7	294.1	295.8	0.00	0.00	
1,860.0	13.12	96.34	1,828.1	-33.4	300.8	302.6	0.00	0.00	
1,890.0	13.12	96.34	1,857.3	-34.2	307.6	309.4	0.00	0.00	
1,920.0	13.12	96.34	1,886.5	-34.9	314.4	316.2	0.00	0.00	
1,950.0	13.12	96.34	1,915.7	-35.7	321.1	323.0	0.00	0.00	
1,980.0	13.12	96.34	1,944.9	-36.4	327.9	329.8	0.00	0.00	
2,010.0	13.12	96.34	1,974.2	-37.2	334.7	336.7	0.00	0.00	
2,040.0	13.12	96.34	2,003.4	-37.9	341.4	343.5	0.00	0.00	
2,070.0	13.12	96.34	2,032.6	-38.7	348.2	350.3	0.00	0.00	
2,100.0	13.12	96.34	2,061.8	-39.4	355.0	357.1	0.00	0.00	
2,130.0	13.12	96.34	2,091.0	-40.2	361.8	363.9	0.00	0.00	
2,160.0	13.12	96.34	2,120.2	-40.9	368.5	370.7	0.00	0.00	
2,190.0	13.12	96.34	2,149.5	-41.7	375.3	377.5	0.00	0.00	
2,220.0	13.12	96.34	2,178.7	-42.4	382.1	384.3	0.00	0.00	
2,250.0	13.12	96.34	2,207.9	-43.2	388.8	391.1	0.00	0.00	
2,280.0	13.12	96.34	2,237.1	-43.9	395.6	397.9	0.00	0.00	
2,310.0	13.12	96.34	2,266.3	-44.7	402.4	404.7	0.00	0.00	
2,340.0	13.12	96.34	2,295.5	-45.4	409.1	411.5	0.00	0.00	
2,370.0	13.12	96.34	2,324.8	-46.2	415.9	418.4	0.00	0.00	
2,400.0	13.12	96.34	2,354.0	-46.9	422.7	425.2	0.00	0.00	
2,430.0	13.12	96.34	2,383.2	-47.7	429.4	432.0	0.00	0.00	
2,460.0	13.12	96.34	2,412.4	-48.4	436.2	438.8	0.00	0.00	
2,490.0	13.12	96.34	2,441.6	-49.2	443.0	445.6	0.00	0.00	

### 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									
LR16B O16 595 TGT	0.00	0.00	5,686.0	-124.2	1,118.2	1,657,138.15	2,280,510.09	39.609861	-108.054054
- plan misses target center by 3314.7ft at 2490.0ft MD (2441.6 TVD, -49.2 N, 443.0 E)									
- Point									
LR16B O16 595 BHL	0.00	0.00	12,136.0	-144.2	1,083.6	1,657,119.12	2,280,474.89	39.609806	-108.054177
- plan misses target center by 9716.0ft at 2490.0ft MD (2441.6 TVD, -49.2 N, 443.0 E)									
- Rectangle (sides W50.0 H100.0 D0.0)									

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	EDM 5000.1 US Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Project:</b>	Garfield County	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site:</b>	Long Ridge O16 595 Pad	<b>North Reference:</b>	True
<b>Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

### Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
2,500.0	13.12	96.34	2,451.4	-49.4	445.2	447.9	0.00	0.00	
2,600.0	13.12	96.34	2,548.8	-52.0	467.8	470.6	0.00	0.00	
2,700.0	13.12	96.34	2,646.1	-54.5	490.3	493.2	0.00	0.00	
2,800.0	13.12	96.34	2,743.5	-57.0	512.9	515.9	0.00	0.00	
2,900.0	13.12	96.34	2,840.9	-59.5	535.5	538.6	0.00	0.00	
3,000.0	13.12	96.34	2,938.3	-62.0	558.0	561.3	0.00	0.00	
3,100.0	13.12	96.34	3,035.7	-64.5	580.6	584.0	0.00	0.00	
3,200.0	13.12	96.34	3,133.1	-67.0	603.2	606.7	0.00	0.00	
3,300.0	13.12	96.34	3,230.5	-69.5	625.7	629.4	0.00	0.00	
3,400.0	13.12	96.34	3,327.9	-72.0	648.3	652.1	0.00	0.00	
3,500.0	13.12	96.34	3,425.3	-74.5	670.8	674.8	0.00	0.00	
3,600.0	13.12	96.34	3,522.7	-77.0	693.4	697.5	0.00	0.00	
3,700.0	13.12	96.34	3,620.0	-79.5	716.0	720.2	0.00	0.00	
3,800.0	13.12	96.34	3,717.4	-82.0	738.5	742.9	0.00	0.00	
3,870.4	13.12	96.34	3,786.0	-83.8	754.4	758.9	0.00	0.00	Wasatch
3,900.0	13.12	96.34	3,814.8	-84.5	761.1	765.6	0.00	0.00	
4,000.0	13.12	96.34	3,912.2	-87.0	783.6	788.3	0.00	0.00	
4,100.0	13.12	96.34	4,009.6	-89.5	806.2	811.0	0.00	0.00	
4,200.0	13.12	96.34	4,107.0	-92.0	828.8	833.7	0.00	0.00	
4,300.0	13.12	96.34	4,204.4	-94.6	851.3	856.4	0.00	0.00	
4,400.0	13.12	96.34	4,301.8	-97.1	873.9	879.1	0.00	0.00	
4,500.0	13.12	96.34	4,399.2	-99.6	896.4	901.7	0.00	0.00	
4,600.0	13.12	96.34	4,496.5	-102.1	919.0	924.4	0.00	0.00	
4,700.0	13.12	96.34	4,593.9	-104.6	941.6	947.1	0.00	0.00	
4,800.0	13.12	96.34	4,691.3	-107.1	964.1	969.8	0.00	0.00	
4,900.0	13.12	96.34	4,788.7	-109.6	986.7	992.5	0.00	0.00	
5,000.0	13.12	96.34	4,886.1	-112.1	1,009.3	1,015.2	0.00	0.00	
5,100.0	13.12	96.34	4,983.5	-114.6	1,031.8	1,037.9	0.00	0.00	
5,153.6	13.12	96.34	5,035.7	-115.9	1,043.9	1,050.1	0.00	0.00	Start Drop -2.00
5,200.0	12.19	96.34	5,081.0	-117.1	1,054.0	1,060.2	2.00	-2.00	
5,300.0	10.19	96.34	5,179.1	-119.2	1,073.3	1,079.6	2.00	-2.00	
5,400.0	8.19	96.34	5,277.8	-121.0	1,089.2	1,095.6	2.00	-2.00	
5,500.0	6.19	96.34	5,377.0	-122.3	1,101.6	1,108.1	2.00	-2.00	
5,600.0	4.19	96.34	5,476.6	-123.3	1,110.6	1,117.2	2.00	-2.00	
5,700.0	2.19	96.34	5,576.4	-124.0	1,116.2	1,122.8	2.00	-2.00	
5,800.0	0.19	96.34	5,676.4	-124.2	1,118.2	1,124.8	2.00	-2.00	
5,809.6	0.00	0.00	5,686.0	-124.2	1,118.2	1,124.8	2.00	-2.00	EOD; Inc=0° - Fort Union - LR16B O16 595 TG
5,900.0	0.23	239.99	5,776.4	-124.3	1,118.1	1,124.7	0.25	0.25	
5,953.4	0.36	239.99	5,829.8	-124.4	1,117.8	1,124.5	0.25	0.25	
6,000.0	0.36	239.99	5,876.4	-124.6	1,117.6	1,124.3	0.00	0.00	
6,100.0	0.36	239.99	5,976.4	-124.9	1,117.0	1,123.8	0.00	0.00	
6,200.0	0.36	239.99	6,076.4	-125.2	1,116.5	1,123.3	0.00	0.00	
6,300.0	0.36	239.99	6,176.4	-125.5	1,116.0	1,122.8	0.00	0.00	
6,309.6	0.36	239.99	6,186.0	-125.5	1,115.9	1,122.7	0.00	0.00	Base Ft Union
6,400.0	0.36	239.99	6,276.4	-125.8	1,115.4	1,122.3	0.00	0.00	
6,500.0	0.36	239.99	6,376.4	-126.1	1,114.9	1,121.8	0.00	0.00	
6,600.0	0.36	239.99	6,476.4	-126.4	1,114.3	1,121.3	0.00	0.00	
6,700.0	0.36	239.99	6,576.4	-126.8	1,113.8	1,120.8	0.00	0.00	
6,800.0	0.36	239.99	6,676.4	-127.1	1,113.2	1,120.3	0.00	0.00	
6,900.0	0.36	239.99	6,776.4	-127.4	1,112.7	1,119.8	0.00	0.00	
7,000.0	0.36	239.99	6,876.4	-127.7	1,112.2	1,119.3	0.00	0.00	
7,100.0	0.36	239.99	6,976.4	-128.0	1,111.6	1,118.8	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	EDM 5000.1 US Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Project:</b>	Garfield County	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site:</b>	Long Ridge O16 595 Pad	<b>North Reference:</b>	True
<b>Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
7,200.0	0.36	239.99	7,076.4	-128.3	1,111.1	1,118.3	0.00	0.00	
7,300.0	0.36	239.99	7,176.3	-128.6	1,110.5	1,117.8	0.00	0.00	
7,400.0	0.36	239.99	7,276.3	-129.0	1,110.0	1,117.3	0.00	0.00	
7,500.0	0.36	239.99	7,376.3	-129.3	1,109.4	1,116.8	0.00	0.00	
7,600.0	0.36	239.99	7,476.3	-129.6	1,108.9	1,116.3	0.00	0.00	
7,700.0	0.36	239.99	7,576.3	-129.9	1,108.4	1,115.8	0.00	0.00	
7,800.0	0.36	239.99	7,676.3	-130.2	1,107.8	1,115.3	0.00	0.00	
7,900.0	0.36	239.99	7,776.3	-130.5	1,107.3	1,114.8	0.00	0.00	
8,000.0	0.36	239.99	7,876.3	-130.8	1,106.7	1,114.3	0.00	0.00	
8,100.0	0.36	239.99	7,976.3	-131.2	1,106.2	1,113.8	0.00	0.00	
8,200.0	0.36	239.99	8,076.3	-131.5	1,105.6	1,113.3	0.00	0.00	
8,300.0	0.36	239.99	8,176.3	-131.8	1,105.1	1,112.8	0.00	0.00	
8,400.0	0.36	239.99	8,276.3	-132.1	1,104.6	1,112.3	0.00	0.00	
8,500.0	0.36	239.99	8,376.3	-132.4	1,104.0	1,111.8	0.00	0.00	
8,600.0	0.36	239.99	8,476.3	-132.7	1,103.5	1,111.3	0.00	0.00	
8,609.7	0.36	239.99	8,486.0	-132.8	1,103.4	1,111.3	0.00	0.00	Ohio Creek
8,700.0	0.36	239.99	8,576.3	-133.0	1,102.9	1,110.8	0.00	0.00	
8,800.0	0.36	239.99	8,676.3	-133.3	1,102.4	1,110.3	0.00	0.00	
8,900.0	0.36	239.99	8,776.3	-133.7	1,101.8	1,109.8	0.00	0.00	
8,909.7	0.36	239.99	8,786.0	-133.7	1,101.8	1,109.8	0.00	0.00	Williams Fork
9,000.0	0.36	239.99	8,876.3	-134.0	1,101.3	1,109.3	0.00	0.00	
9,100.0	0.36	239.99	8,976.3	-134.3	1,100.8	1,108.8	0.00	0.00	
9,200.0	0.36	239.99	9,076.3	-134.6	1,100.2	1,108.4	0.00	0.00	
9,209.7	0.36	239.99	9,086.0	-134.6	1,100.2	1,108.3	0.00	0.00	Approx TOG
9,300.0	0.36	239.99	9,176.3	-134.9	1,099.7	1,107.9	0.00	0.00	
9,400.0	0.36	239.99	9,276.3	-135.2	1,099.1	1,107.4	0.00	0.00	
9,500.0	0.36	239.99	9,376.3	-135.5	1,098.6	1,106.9	0.00	0.00	
9,600.0	0.36	239.99	9,476.3	-135.9	1,098.0	1,106.4	0.00	0.00	
9,700.0	0.36	239.99	9,576.3	-136.2	1,097.5	1,105.9	0.00	0.00	
9,800.0	0.36	239.99	9,676.3	-136.5	1,097.0	1,105.4	0.00	0.00	
9,900.0	0.36	239.99	9,776.3	-136.8	1,096.4	1,104.9	0.00	0.00	
10,000.0	0.36	239.99	9,876.3	-137.1	1,095.9	1,104.4	0.00	0.00	
10,100.0	0.36	239.99	9,976.3	-137.4	1,095.3	1,103.9	0.00	0.00	
10,200.0	0.36	239.99	10,076.3	-137.7	1,094.8	1,103.4	0.00	0.00	
10,300.0	0.36	239.99	10,176.3	-138.1	1,094.2	1,102.9	0.00	0.00	
10,400.0	0.36	239.99	10,276.3	-138.4	1,093.7	1,102.4	0.00	0.00	
10,500.0	0.36	239.99	10,376.3	-138.7	1,093.1	1,101.9	0.00	0.00	
10,600.0	0.36	239.99	10,476.3	-139.0	1,092.6	1,101.4	0.00	0.00	
10,700.0	0.36	239.99	10,576.3	-139.3	1,092.1	1,100.9	0.00	0.00	
10,800.0	0.36	239.99	10,676.3	-139.6	1,091.5	1,100.4	0.00	0.00	
10,900.0	0.36	239.99	10,776.3	-139.9	1,091.0	1,099.9	0.00	0.00	
11,000.0	0.36	239.99	10,876.3	-140.3	1,090.4	1,099.4	0.00	0.00	
11,100.0	0.36	239.99	10,976.3	-140.6	1,089.9	1,098.9	0.00	0.00	
11,200.0	0.36	239.99	11,076.3	-140.9	1,089.3	1,098.4	0.00	0.00	
11,300.0	0.36	239.99	11,176.3	-141.2	1,088.8	1,097.9	0.00	0.00	
11,400.0	0.36	239.99	11,276.3	-141.5	1,088.3	1,097.4	0.00	0.00	
11,500.0	0.36	239.99	11,376.3	-141.8	1,087.7	1,096.9	0.00	0.00	
11,600.0	0.36	239.99	11,476.3	-142.1	1,087.2	1,096.4	0.00	0.00	
11,700.0	0.36	239.99	11,576.3	-142.4	1,086.6	1,095.9	0.00	0.00	
11,759.7	0.36	239.99	11,636.0	-142.6	1,086.3	1,095.6	0.00	0.00	Cameo
11,800.0	0.36	239.99	11,676.3	-142.8	1,086.1	1,095.4	0.00	0.00	
11,900.0	0.36	239.99	11,776.3	-143.1	1,085.5	1,094.9	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	EDM 5000.1 US Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Project:</b>	Garfield County	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site:</b>	Long Ridge O16 595 Pad	<b>North Reference:</b>	True
<b>Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	DD		
<b>Design:</b>	Plan #1		

### Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
12,000.0	0.36	239.99	11,876.3	-143.4	1,085.0	1,094.4	0.00	0.00	
12,100.0	0.36	239.99	11,976.3	-143.7	1,084.5	1,093.9	0.00	0.00	
12,109.7	0.36	239.99	11,986.0	-143.7	1,084.4	1,093.9	0.00	0.00	Rollins SS
12,200.0	0.36	239.99	12,076.3	-144.0	1,083.9	1,093.4	0.00	0.00	
12,259.7	0.36	239.99	12,136.0	-144.2	1,083.6	1,093.1	0.00	0.00	TD at 12259.7 - LR16B O16 595 BHL

### Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
LR16B O16 595 TGT - plan hits target center - Point	0.00	0.00	5,686.0	-124.2	1,118.2	1,657,138.15	2,280,510.09	39.609861	-108.054054
LR16B O16 595 BHL - plan hits target center - Rectangle (sides W50.0 H100.0 D0.0)	0.00	0.00	12,136.0	-144.2	1,083.6	1,657,119.12	2,280,474.89	39.609806	-108.054177

### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,870.4	3,786.0	Wasatch		0.00	
5,809.6	5,686.0	Fort Union		0.00	
6,309.6	6,186.0	Base Ft Union		0.00	
8,609.7	8,486.0	Ohio Creek		0.00	
8,909.7	8,786.0	Williams Fork		0.00	
9,209.7	9,086.0	Approx TOG		0.00	
11,759.7	11,636.0	Cameo		0.00	
12,109.7	11,986.0	Rollins SS		0.00	

### Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
200.0	200.0	0.0	0.0	KOP @ 200'
856.0	850.3	-8.3	74.3	EOB; Inc=13.12°
5,153.6	5,035.7	-115.9	1,043.9	Start Drop -2.00
5,809.6	5,686.0	-124.2	1,118.2	EOD; Inc=0°
12,259.7	12,136.0	-124.4	1,117.8	TD at 12259.7

# **Berry Petroleum Company (NAD 83)**

**Garfield County  
Long Ridge O16 595 Pad  
LR16B O16 595  
DD  
Plan #1**

## **Anticollision Report**

**28 September, 2010**



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Project:</b>	Garfield County	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Reference Site:</b>	Long Ridge O16 595 Pad	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	DD	<b>Database:</b>	EDM 5000.1 US Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 100.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	9/28/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	12,259.7	Plan #1 (DD)	MWD	Geolink MWD	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Long Ridge O16 595 Pad						
LR02A O16 595 - DD - Plan #1	200.0	200.0	72.2	71.6	111.857	CC, ES
LR02A O16 595 - DD - Plan #1	600.0	590.7	99.7	97.4	44.053	SF
LR14A O16 595 - DD - Plan #1						Out of range
LR15A O16 595 - DD - Plan #1	200.0	200.0	41.8	41.1	64.694	CC, ES
LR15A O16 595 - DD - Plan #1	700.0	698.6	65.1	62.5	25.523	SF
LR15C O16 595 - DD - Plan #1	200.0	200.0	87.0	86.3	134.685	CC, ES
LR15C O16 595 - DD - Plan #1	400.0	394.7	94.4	93.0	69.170	SF
LR15D O16 595 - DD - Plan #1	200.0	200.0	57.5	56.8	89.030	CC, ES
LR15D O16 595 - DD - Plan #1	700.0	691.7	93.2	90.3	32.358	SF
LR16A O16 595 - DD - Plan #1	200.0	200.0	14.3	13.6	22.136	CC
LR16A O16 595 - DD - Plan #1	300.0	300.1	14.5	13.5	14.452	ES
LR16A O16 595 - DD - Plan #1	3,500.0	3,499.1	97.9	74.0	4.095	SF
LR16C O16 595 - DD - Plan #1	200.0	200.0	28.4	27.7	43.904	CC, ES
LR16C O16 595 - DD - Plan #1	1,100.0	1,094.0	97.6	91.5	16.098	SF

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Project:</b>	Garfield County	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Reference Site:</b>	Long Ridge O16 595 Pad	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	DD	<b>Database:</b>	EDM 5000.1 US Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Long Ridge O16 595 Pad - LR02A O16 595 - DD - Plan #1												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-159.69	-67.7	-25.1	72.2				
100.0	100.0	100.0	100.0	0.1	0.1	-159.69	-67.7	-25.1	72.2	71.9	0.30	243.454	
200.0	200.0	200.0	200.0	0.3	0.3	-159.69	-67.7	-25.1	72.2	71.6	0.65	111.857 CC, ES	
300.0	300.0	298.1	298.1	0.5	0.5	104.36	-69.3	-24.5	73.9	72.9	1.00	74.181	
400.0	399.8	396.1	395.9	0.7	0.7	105.42	-74.0	-22.6	79.1	77.7	1.37	57.671	
500.0	499.5	493.6	493.1	0.9	0.9	106.89	-81.7	-19.6	87.6	85.8	1.79	49.027	
600.0	598.7	590.7	589.4	1.2	1.2	108.49	-92.5	-15.3	99.7	97.4	2.26	44.053 SF	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Project:</b>	Garfield County	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Reference Site:</b>	Long Ridge O16 595 Pad	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	DD	<b>Database:</b>	EDM 5000.1 US Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Long Ridge O16 595 Pad - LR15A O16 595 - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis			
0.0	0.0	0.0	0.0	0.0	0.0	-160.29	-39.3	-14.1	41.8					
100.0	100.0	100.0	100.0	0.1	0.1	-160.29	-39.3	-14.1	41.8	41.5	0.30	140.804		
200.0	200.0	200.0	200.0	0.3	0.3	-160.29	-39.3	-14.1	41.8	41.1	0.65	64.694 CC, ES		
300.0	300.0	300.0	300.0	0.5	0.5	105.66	-39.3	-14.1	42.2	41.2	1.00	42.290		
400.0	399.8	399.8	399.8	0.7	0.7	112.21	-39.3	-14.1	43.9	42.6	1.36	32.189		
500.0	499.5	499.5	499.5	0.9	0.8	121.81	-39.3	-14.1	47.9	46.2	1.75	27.434		
600.0	598.7	598.9	598.9	1.2	1.0	130.72	-40.4	-12.8	55.1	53.0	2.14	25.768		
700.0	697.5	698.6	698.5	1.5	1.2	136.52	-43.8	-8.8	65.1	62.5	2.55	25.523 SF		
800.0	795.6	798.4	797.9	1.9	1.4	139.88	-49.4	-2.3	77.3	74.3	3.00	25.769		
856.0	850.3	854.3	853.4	2.1	1.5	140.98	-53.5	2.6	84.9	81.6	3.27	25.941		
900.0	893.1	898.3	897.0	2.3	1.7	141.49	-57.3	7.0	91.0	87.5	3.50	26.031		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Project:</b>	Garfield County	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Reference Site:</b>	Long Ridge O16 595 Pad	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	DD	<b>Database:</b>	EDM 5000.1 US Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Long Ridge O16 595 Pad - LR15C O16 595 - DD - Plan #1												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-159.72	-81.6	-30.1	87.0				
100.0	100.0	100.0	100.0	0.1	0.1	-159.72	-81.6	-30.1	87.0	86.7	0.30	293.137	
200.0	200.0	200.0	200.0	0.3	0.3	-159.72	-81.6	-30.1	87.0	86.3	0.65	134.685 CC, ES	
300.0	300.0	297.5	297.5	0.5	0.5	104.39	-83.2	-29.8	88.8	87.8	1.00	89.272	
400.0	399.8	394.7	394.6	0.7	0.7	105.62	-88.0	-28.7	94.4	93.0	1.36	69.170 SF	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Project:</b>	Garfield County	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Reference Site:</b>	Long Ridge O16 595 Pad	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	DD	<b>Database:</b>	EDM 5000.1 US Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Long Ridge O16 595 Pad - LR15D O16 595 - DD - Plan #1													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD													<b>Offset Well Error:</b>	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis			
0.0	0.0	0.0	0.0	0.0	0.0	-159.64	-53.9	-20.0	57.5					
100.0	100.0	100.0	100.0	0.1	0.1	-159.64	-53.9	-20.0	57.5	57.2	0.30	193.771		
200.0	200.0	200.0	200.0	0.3	0.3	-159.64	-53.9	-20.0	57.5	56.8	0.65	89.030 CC, ES		
300.0	300.0	298.8	298.8	0.5	0.5	104.27	-55.3	-19.0	58.9	57.9	1.00	58.994		
400.0	399.8	397.5	397.4	0.7	0.7	104.95	-59.5	-16.2	63.2	61.8	1.38	45.842		
500.0	499.5	496.0	495.5	0.9	0.9	105.89	-66.5	-11.4	70.3	68.5	1.81	38.918		
600.0	598.7	594.1	592.8	1.2	1.2	106.89	-76.3	-4.8	80.3	78.0	2.30	34.880		
700.0	697.5	691.7	689.3	1.5	1.5	107.83	-88.7	3.6	93.2	90.3	2.88	32.358 SF		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Project:</b>	Garfield County	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Reference Site:</b>	Long Ridge O16 595 Pad	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	DD	<b>Database:</b>	EDM 5000.1 US Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Long Ridge O16 595 Pad - LR16A O16 595 - DD - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-160.42	-13.5	-4.8	14.3					
100.0	100.0	100.0	100.0	0.1	0.1	-160.42	-13.5	-4.8	14.3	14.0	0.30	48.179		
200.0	200.0	200.0	200.0	0.3	0.3	-160.42	-13.5	-4.8	14.3	13.6	0.65	22.136 CC		
300.0	300.0	300.1	300.0	0.5	0.5	103.10	-13.8	-3.1	14.5	13.5	1.00	14.452 ES		
400.0	399.8	400.1	400.0	0.7	0.7	102.70	-15.0	2.0	15.0	13.7	1.39	10.813		
500.0	499.5	500.2	499.6	0.9	0.9	102.09	-16.9	10.5	16.0	14.1	1.84	8.684		
600.0	598.7	600.2	598.9	1.2	1.2	101.36	-19.6	22.4	17.3	14.9	2.37	7.292		
700.0	697.5	700.3	697.7	1.5	1.5	100.56	-23.0	37.7	19.0	16.0	3.00	6.323		
800.0	795.6	800.3	795.9	1.9	1.9	99.76	-27.1	56.4	21.1	17.3	3.75	5.617		
856.0	850.3	856.3	850.7	2.1	2.1	100.39	-29.7	67.9	22.4	18.2	4.19	5.350		
900.0	893.1	900.2	893.6	2.3	2.3	101.87	-31.7	76.9	23.6	19.0	4.53	5.200		
1,000.0	990.5	1,000.2	991.4	2.7	2.7	104.74	-36.3	97.4	26.2	20.9	5.31	4.938		
1,100.0	1,087.9	1,100.2	1,089.1	3.1	3.1	107.09	-40.9	117.9	28.9	22.8	6.09	4.753		
1,200.0	1,185.3	1,200.1	1,186.8	3.6	3.5	109.02	-45.5	138.4	31.7	24.8	6.86	4.620		
1,300.0	1,282.7	1,300.1	1,284.5	4.0	3.9	110.65	-50.1	159.0	34.5	26.8	7.62	4.520		
1,400.0	1,380.1	1,400.0	1,382.2	4.4	4.3	112.03	-54.7	179.5	37.3	28.9	8.39	4.444		
1,500.0	1,477.5	1,500.0	1,480.0	4.9	4.7	113.22	-59.3	200.0	40.1	30.9	9.14	4.384		
1,600.0	1,574.9	1,599.9	1,577.7	5.3	5.1	114.25	-63.9	220.5	42.9	33.0	9.90	4.337		
1,700.0	1,672.2	1,699.9	1,675.4	5.7	5.5	115.16	-68.4	241.0	45.8	35.1	10.65	4.298		
1,800.0	1,769.6	1,799.9	1,773.1	6.2	5.9	115.95	-73.0	261.6	48.6	37.2	11.40	4.267		
1,900.0	1,867.0	1,899.8	1,870.8	6.6	6.3	116.66	-77.6	282.1	51.5	39.4	12.14	4.241		
2,000.0	1,964.4	1,999.8	1,968.6	7.1	6.7	117.30	-82.2	302.6	54.4	41.5	12.89	4.219		
2,100.0	2,061.8	2,099.7	2,066.3	7.5	7.2	117.87	-86.8	323.1	57.3	43.6	13.63	4.201		
2,200.0	2,159.2	2,199.7	2,164.0	7.9	7.6	118.38	-91.4	343.6	60.1	45.8	14.37	4.185		
2,300.0	2,256.6	2,299.6	2,261.7	8.4	8.0	118.85	-96.0	364.2	63.0	47.9	15.11	4.172		
2,400.0	2,354.0	2,399.6	2,359.4	8.8	8.4	119.28	-100.6	384.7	65.9	50.1	15.85	4.160		
2,500.0	2,451.4	2,499.6	2,457.2	9.3	8.8	119.67	-105.2	405.2	68.8	52.2	16.59	4.150		
2,600.0	2,548.8	2,599.5	2,554.9	9.7	9.2	120.03	-109.7	425.7	71.7	54.4	17.32	4.141		
2,700.0	2,646.1	2,699.5	2,652.6	10.1	9.6	120.36	-114.3	446.3	74.6	56.6	18.06	4.133		
2,800.0	2,743.5	2,799.4	2,750.3	10.6	10.0	120.67	-118.9	466.8	77.5	58.8	18.79	4.127		
2,900.0	2,840.9	2,899.4	2,848.0	11.0	10.5	120.95	-123.5	487.3	80.5	60.9	19.53	4.120		
3,000.0	2,938.3	2,999.3	2,945.8	11.5	10.9	121.22	-128.1	507.8	83.4	63.1	20.26	4.115		
3,100.0	3,035.7	3,099.3	3,043.5	11.9	11.3	121.46	-132.7	528.3	86.3	65.3	20.99	4.110		
3,200.0	3,133.1	3,199.3	3,141.2	12.4	11.7	121.69	-137.3	548.9	89.2	67.5	21.72	4.106		
3,300.0	3,230.5	3,299.2	3,238.9	12.8	12.1	121.91	-141.9	569.4	92.1	69.6	22.45	4.102		
3,400.0	3,327.9	3,399.2	3,336.6	13.2	12.5	122.11	-146.5	589.9	95.0	71.8	23.19	4.098		
3,500.0	3,425.3	3,499.1	3,434.4	13.7	12.9	122.30	-151.0	610.4	97.9	74.0	23.92	4.095 SF		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Project:</b>	Garfield County	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Reference Site:</b>	Long Ridge O16 595 Pad	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	DD	<b>Database:</b>	EDM 5000.1 US Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Long Ridge O16 595 Pad - LR16C O16 595 - DD - Plan #1		Offset Site Error:		0.0 ft
Survey Program:													0-MWD		Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty Axis	Separation Factor					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)							
0.0	0.0	0.0	0.0	0.0	0.0	-159.65	-26.6	-9.9	28.4								
100.0	100.0	100.0	100.0	0.1	0.1	-159.65	-26.6	-9.9	28.4	28.1	0.30	95.555					
200.0	200.0	200.0	200.0	0.3	0.3	-159.65	-26.6	-9.9	28.4	27.7	0.65	43.904	CC, ES				
300.0	300.0	299.7	299.7	0.5	0.5	104.06	-27.6	-8.5	29.3	28.3	1.00	29.252					
400.0	399.8	399.3	399.2	0.7	0.7	104.16	-30.8	-4.4	32.1	30.7	1.39	23.121					
500.0	499.5	498.9	498.4	0.9	0.9	104.29	-36.1	2.5	36.8	34.9	1.83	20.075					
600.0	598.7	598.3	597.0	1.2	1.2	104.41	-43.4	12.1	43.3	40.9	2.35	18.409					
700.0	697.5	697.5	695.0	1.5	1.5	104.50	-52.8	24.3	51.6	48.7	2.96	17.432					
800.0	795.6	796.4	792.1	1.9	1.9	104.54	-64.2	39.2	61.8	58.2	3.68	16.824					
856.0	850.3	851.8	846.2	2.1	2.1	104.58	-71.5	48.7	68.3	64.2	4.11	16.634					
900.0	893.1	895.5	888.8	2.3	2.3	104.86	-77.3	56.3	73.6	69.1	4.45	16.525					
1,000.0	990.5	994.8	985.7	2.7	2.7	105.37	-90.6	73.7	85.6	80.3	5.25	16.295					
1,100.0	1,087.9	1,094.0	1,082.5	3.1	3.1	105.75	-103.9	91.0	97.6	91.5	6.06	16.098	SF				

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Berry Petroleum Company (NAD 83)	<b>Local Co-ordinate Reference:</b>	Well LR16B O16 595
<b>Project:</b>	Garfield County	<b>TVD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Reference Site:</b>	Long Ridge O16 595 Pad	<b>MD Reference:</b>	KBE @ 8318.0ft (Patterson 302)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LR16B O16 595	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	DD	<b>Database:</b>	EDM 5000.1 US Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to KBE @ 8318.0ft (Patterson 302)  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °

Coordinates are relative to: LR16B O16 595  
Coordinate System is US State Plane 1983, Colorado Central Zone  
Grid Convergence at Surface is: -1.61°

