

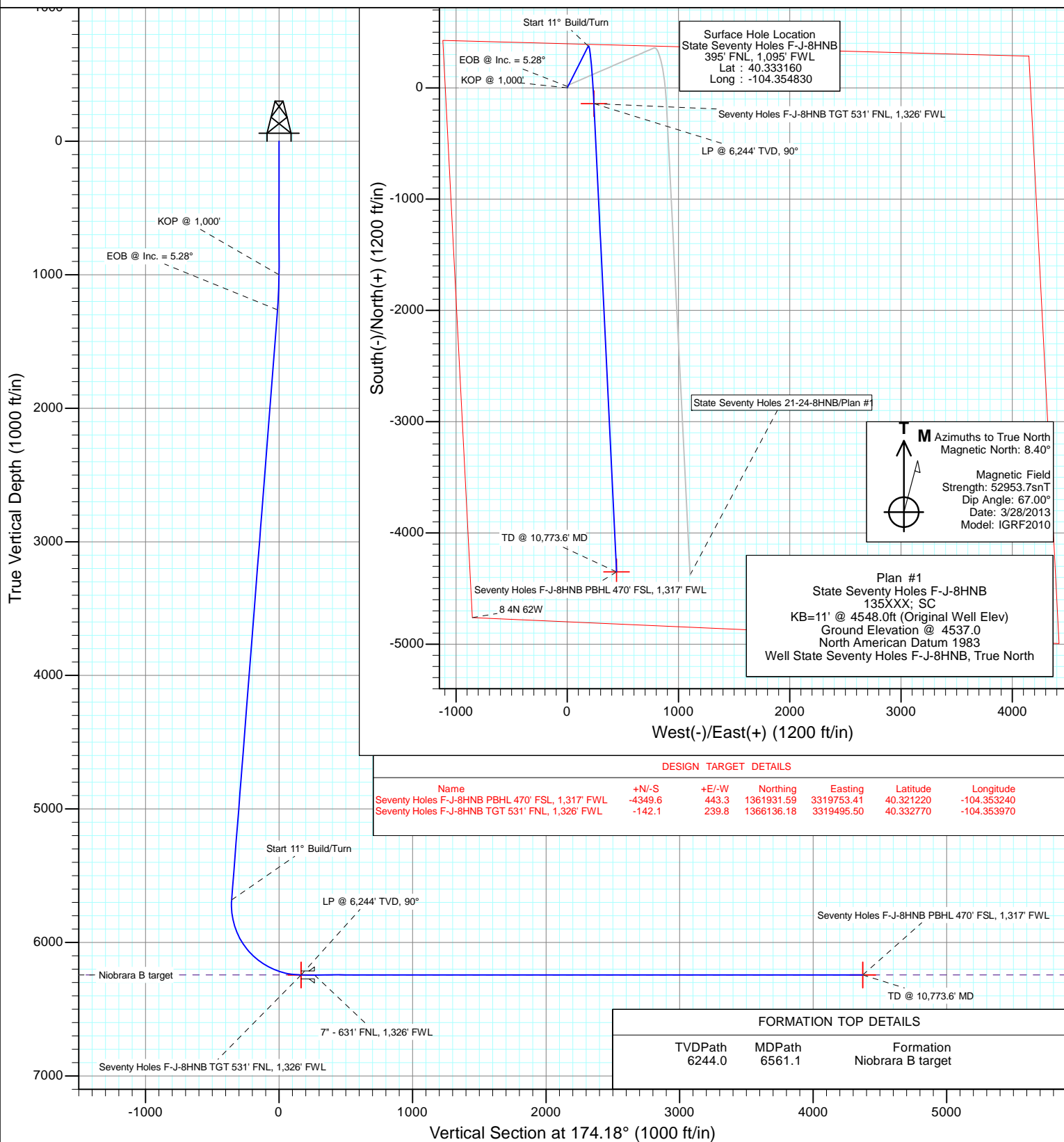


Project: Weld County
Site: State Seventy Holes F-8 Pad
Well: State Seventy Holes F-J-8HNB
Wellbore: OH
Design: Plan #1



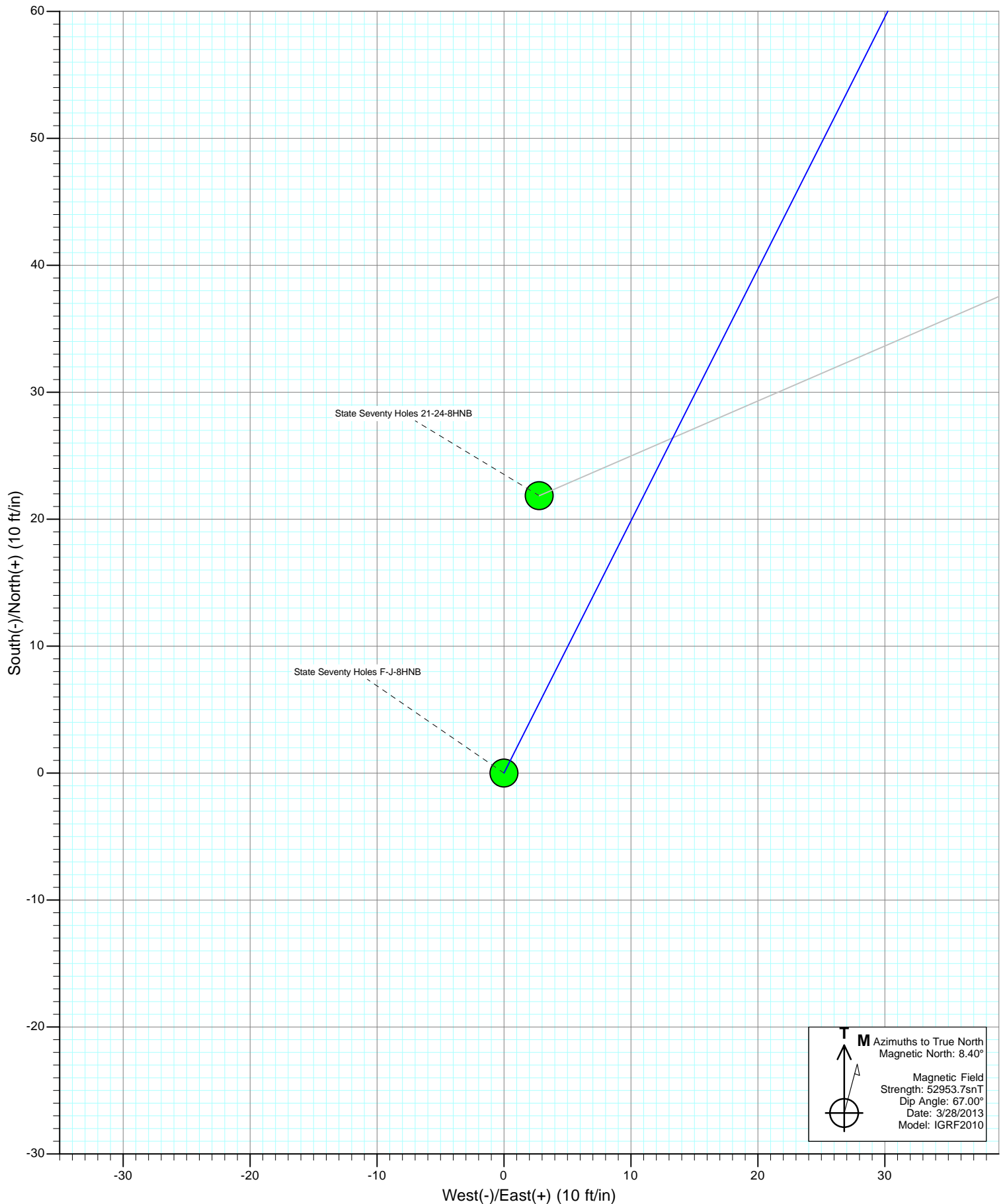
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSEct	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.00	0.0	
3	1263.8	5.28	26.75	1263.5	10.8	5.5	2.00	26.75	-10.2	
4	5701.2	5.28	26.75	5682.0	375.3	189.1	0.00	0.00	-354.2	
5	6561.1	90.00	177.23	6244.0	-142.1	239.8	11.00	150.38	165.6	Seventy Holes F-J-8HNB TGT 531' FNL, 1,326' FWL
6	10773.6	90.00	177.23	6244.0	-4349.6	443.3	0.00	0.00	4372.2	Seventy Holes F-J-8HNB PBHL 470' FSL, 1,317' FWL





Project: Weld County
Site: State Seventy Holes F-8 Pad
Well: State Seventy Holes F-J-8HNB
Wellbore: OH
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well State Seventy Holes F-J-8HNB
Company:	Bonanza Creek Energy Operating Company, LLC	TVD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Project:	Weld County	MD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Site:	State Seventy Holes F-8 Pad	North Reference:	True
Well:	State Seventy Holes F-J-8HNB	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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

Site		State Seventy Holes F-8 Pad			
Site Position:		Northing:	1,366,275.14 ft	Latitude:	40.333160
From:	Lat/Long	Easting:	3,319,253.92 ft	Longitude:	-104.354830
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.74 °

Well	State Seventy Holes F-J-8HNB					
Well Position	+N/-S	0.0 ft	Northing:	1,366,275.14 ft	Latitude:	40.333160
	+E/-W	0.0 ft	Easting:	3,319,253.92 ft	Longitude:	-104.354830
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,537.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	3/28/2013	8.40	67.00	52,954

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	174.18

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)	(°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,263.8	5.28	26.75	1,263.5	10.8	5.5	2.00	2.00	0.00	26.75	
5,701.2	5.28	26.75	5,682.0	375.3	189.1	0.00	0.00	0.00	0.00	
6,561.1	90.00	177.23	6,244.0	-142.1	239.8	11.00	9.85	17.50	150.38	Seventy Holes F-J-8H
10,773.6	90.00	177.23	6,244.0	-4,349.6	443.3	0.00	0.00	0.00	0.00	Seventy Holes F-J-8H

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: Bonanza Creek Energy Operating Company, LLC
Project: Weld County
Site: State Seventy Holes F-8 Pad
Well: State Seventy Holes F-J-8HNB
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well State Seventy Holes F-J-8HNB
TVD Reference: KB=11' @ 4548.0ft (Original Well Elev)
MD Reference: KB=11' @ 4548.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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	
100.0	0.00	0.00	100.0	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	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	KOP @ 1,000'
1,100.0	2.00	26.75	1,100.0	1.6	0.8	-1.5	2.00	2.00	
1,200.0	4.00	26.75	1,199.8	6.2	3.1	-5.9	2.00	2.00	
1,263.8	5.28	26.75	1,263.5	10.8	5.5	-10.2	2.00	2.00	EOB @ Inc. = 5.28°
1,300.0	5.28	26.75	1,299.5	13.8	7.0	-13.0	0.00	0.00	
1,400.0	5.28	26.75	1,399.1	22.0	11.1	-20.8	0.00	0.00	
1,500.0	5.28	26.75	1,498.6	30.2	15.2	-28.5	0.00	0.00	
1,600.0	5.28	26.75	1,598.2	38.5	19.4	-36.3	0.00	0.00	
1,700.0	5.28	26.75	1,697.8	46.7	23.5	-44.0	0.00	0.00	
1,800.0	5.28	26.75	1,797.4	54.9	27.7	-51.8	0.00	0.00	
1,900.0	5.28	26.75	1,896.9	63.1	31.8	-59.5	0.00	0.00	
2,000.0	5.28	26.75	1,996.5	71.3	35.9	-67.3	0.00	0.00	
2,100.0	5.28	26.75	2,096.1	79.5	40.1	-75.0	0.00	0.00	
2,200.0	5.28	26.75	2,195.7	87.7	44.2	-82.8	0.00	0.00	
2,300.0	5.28	26.75	2,295.2	95.9	48.3	-90.5	0.00	0.00	
2,400.0	5.28	26.75	2,394.8	104.2	52.5	-98.3	0.00	0.00	
2,500.0	5.28	26.75	2,494.4	112.4	56.6	-106.0	0.00	0.00	
2,600.0	5.28	26.75	2,594.0	120.6	60.8	-113.8	0.00	0.00	
2,700.0	5.28	26.75	2,693.5	128.8	64.9	-121.6	0.00	0.00	
2,800.0	5.28	26.75	2,793.1	137.0	69.0	-129.3	0.00	0.00	
2,900.0	5.28	26.75	2,892.7	145.2	73.2	-137.1	0.00	0.00	
3,000.0	5.28	26.75	2,992.3	153.4	77.3	-144.8	0.00	0.00	
3,100.0	5.28	26.75	3,091.8	161.6	81.5	-152.6	0.00	0.00	
3,200.0	5.28	26.75	3,191.4	169.9	85.6	-160.3	0.00	0.00	
3,300.0	5.28	26.75	3,291.0	178.1	89.7	-168.1	0.00	0.00	
3,400.0	5.28	26.75	3,390.6	186.3	93.9	-175.8	0.00	0.00	
3,500.0	5.28	26.75	3,490.1	194.5	98.0	-183.6	0.00	0.00	
3,600.0	5.28	26.75	3,589.7	202.7	102.2	-191.3	0.00	0.00	
3,700.0	5.28	26.75	3,689.3	210.9	106.3	-199.1	0.00	0.00	
3,800.0	5.28	26.75	3,788.9	219.1	110.4	-206.8	0.00	0.00	
3,900.0	5.28	26.75	3,888.5	227.4	114.6	-214.6	0.00	0.00	
4,000.0	5.28	26.75	3,988.0	235.6	118.7	-222.3	0.00	0.00	
4,100.0	5.28	26.75	4,087.6	243.8	122.8	-230.1	0.00	0.00	
4,200.0	5.28	26.75	4,187.2	252.0	127.0	-237.8	0.00	0.00	
4,300.0	5.28	26.75	4,286.8	260.2	131.1	-245.6	0.00	0.00	
4,400.0	5.28	26.75	4,386.3	268.4	135.3	-253.3	0.00	0.00	
4,500.0	5.28	26.75	4,485.9	276.6	139.4	-261.1	0.00	0.00	
4,600.0	5.28	26.75	4,585.5	284.8	143.5	-268.8	0.00	0.00	
4,700.0	5.28	26.75	4,685.1	293.1	147.7	-276.6	0.00	0.00	
4,800.0	5.28	26.75	4,784.6	301.3	151.8	-284.3	0.00	0.00	
4,900.0	5.28	26.75	4,884.2	309.5	156.0	-292.1	0.00	0.00	
5,000.0	5.28	26.75	4,983.8	317.7	160.1	-299.8	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well State Seventy Holes F-J-8HNB
Company:	Bonanza Creek Energy Operating Company, LLC	TVD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Project:	Weld County	MD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Site:	State Seventy Holes F-8 Pad	North Reference:	True
Well:	State Seventy Holes F-J-8HNB	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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
5,100.0	5.28	26.75	5,083.4	325.9	164.2	-307.6	0.00	0.00	
5,200.0	5.28	26.75	5,182.9	334.1	168.4	-315.3	0.00	0.00	
5,300.0	5.28	26.75	5,282.5	342.3	172.5	-323.1	0.00	0.00	
5,400.0	5.28	26.75	5,382.1	350.6	176.7	-330.8	0.00	0.00	
5,500.0	5.28	26.75	5,481.7	358.8	180.8	-338.6	0.00	0.00	
5,600.0	5.28	26.75	5,581.2	367.0	184.9	-346.3	0.00	0.00	
5,701.2	5.28	26.75	5,682.0	375.3	189.1	-354.2	0.00	0.00	Start 11° Build/Turn
5,750.0	2.72	103.85	5,730.7	377.0	191.3	-355.7	11.00	-5.24	
5,800.0	6.79	154.78	5,780.6	374.1	193.7	-352.5	11.00	8.15	
5,850.0	12.06	164.93	5,829.9	366.3	196.3	-344.5	11.00	10.53	
5,900.0	17.47	168.92	5,878.2	353.9	199.1	-331.9	11.00	10.82	
5,950.0	22.92	171.05	5,925.1	336.9	202.1	-314.7	11.00	10.90	
6,000.0	28.39	172.40	5,970.2	315.5	205.1	-293.1	11.00	10.94	
6,050.0	33.87	173.34	6,013.0	289.9	208.3	-267.2	11.00	10.96	
6,100.0	39.35	174.05	6,053.1	260.2	211.6	-237.4	11.00	10.97	
6,150.0	44.84	174.61	6,090.2	226.9	214.9	-203.9	11.00	10.97	
6,200.0	50.33	175.07	6,123.9	190.2	218.2	-167.0	11.00	10.98	
6,250.0	55.82	175.46	6,153.9	150.3	221.5	-127.1	11.00	10.98	
6,300.0	61.31	175.80	6,180.0	107.8	224.7	-84.5	11.00	10.98	
6,350.0	66.80	176.11	6,201.8	63.0	227.9	-39.5	11.00	10.99	
6,400.0	72.30	176.40	6,219.3	16.3	231.0	7.3	11.00	10.99	
6,450.0	77.79	176.67	6,232.2	-31.9	233.9	55.5	11.00	10.99	
6,500.0	83.28	176.92	6,240.4	-81.2	236.6	104.7	11.00	10.99	
6,550.0	88.78	177.17	6,243.9	-131.0	239.2	154.5	11.00	10.99	
6,561.1	90.00	177.23	6,244.0	-142.1	239.8	165.6	11.00	10.99	LP @ 6,244' TVD, 90° - Niobrara B target
6,600.0	90.00	177.23	6,244.0	-180.9	241.6	204.5	0.00	0.00	
6,661.1	90.00	177.23	6,244.0	-241.9	244.6	265.5	0.00	0.00	7" - 631' FNL, 1,326' FWL
6,700.0	90.00	177.23	6,244.0	-280.8	246.5	304.3	0.00	0.00	
6,800.0	90.00	177.23	6,244.0	-380.7	251.3	404.2	0.00	0.00	
6,900.0	90.00	177.23	6,244.0	-480.6	256.1	504.1	0.00	0.00	
7,000.0	90.00	177.23	6,244.0	-580.4	261.0	603.9	0.00	0.00	
7,100.0	90.00	177.23	6,244.0	-680.3	265.8	703.8	0.00	0.00	
7,200.0	90.00	177.23	6,244.0	-780.2	270.6	803.6	0.00	0.00	
7,300.0	90.00	177.23	6,244.0	-880.1	275.5	903.5	0.00	0.00	
7,400.0	90.00	177.23	6,244.0	-980.0	280.3	1,003.3	0.00	0.00	
7,500.0	90.00	177.23	6,244.0	-1,079.9	285.1	1,103.2	0.00	0.00	
7,600.0	90.00	177.23	6,244.0	-1,179.7	290.0	1,203.1	0.00	0.00	
7,700.0	90.00	177.23	6,244.0	-1,279.6	294.8	1,302.9	0.00	0.00	
7,800.0	90.00	177.23	6,244.0	-1,379.5	299.6	1,402.8	0.00	0.00	
7,900.0	90.00	177.23	6,244.0	-1,479.4	304.5	1,502.6	0.00	0.00	
8,000.0	90.00	177.23	6,244.0	-1,579.3	309.3	1,602.5	0.00	0.00	
8,100.0	90.00	177.23	6,244.0	-1,679.2	314.1	1,702.4	0.00	0.00	
8,200.0	90.00	177.23	6,244.0	-1,779.0	319.0	1,802.2	0.00	0.00	
8,300.0	90.00	177.23	6,244.0	-1,878.9	323.8	1,902.1	0.00	0.00	
8,400.0	90.00	177.23	6,244.0	-1,978.8	328.6	2,001.9	0.00	0.00	
8,500.0	90.00	177.23	6,244.0	-2,078.7	333.5	2,101.8	0.00	0.00	
8,600.0	90.00	177.23	6,244.0	-2,178.6	338.3	2,201.6	0.00	0.00	
8,700.0	90.00	177.23	6,244.0	-2,278.5	343.1	2,301.5	0.00	0.00	
8,800.0	90.00	177.23	6,244.0	-2,378.3	348.0	2,401.4	0.00	0.00	
8,900.0	90.00	177.23	6,244.0	-2,478.2	352.8	2,501.2	0.00	0.00	
9,000.0	90.00	177.23	6,244.0	-2,578.1	357.6	2,601.1	0.00	0.00	
9,100.0	90.00	177.23	6,244.0	-2,678.0	362.5	2,700.9	0.00	0.00	

Cathedral Energy Services

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Project:	Weld County	MD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Site:	State Seventy Holes F-8 Pad	North Reference:	True
Well:	State Seventy Holes F-J-8HNB	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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
9,200.0	90.00	177.23	6,244.0	-2,777.9	367.3	2,800.8	0.00	0.00	
9,300.0	90.00	177.23	6,244.0	-2,877.8	372.1	2,900.7	0.00	0.00	
9,400.0	90.00	177.23	6,244.0	-2,977.6	377.0	3,000.5	0.00	0.00	
9,500.0	90.00	177.23	6,244.0	-3,077.5	381.8	3,100.4	0.00	0.00	
9,600.0	90.00	177.23	6,244.0	-3,177.4	386.6	3,200.2	0.00	0.00	
9,700.0	90.00	177.23	6,244.0	-3,277.3	391.5	3,300.1	0.00	0.00	
9,800.0	90.00	177.23	6,244.0	-3,377.2	396.3	3,399.9	0.00	0.00	
9,900.0	90.00	177.23	6,244.0	-3,477.1	401.1	3,499.8	0.00	0.00	
10,000.0	90.00	177.23	6,244.0	-3,576.9	406.0	3,599.7	0.00	0.00	
10,100.0	90.00	177.23	6,244.0	-3,676.8	410.8	3,699.5	0.00	0.00	
10,200.0	90.00	177.23	6,244.0	-3,776.7	415.6	3,799.4	0.00	0.00	
10,300.0	90.00	177.23	6,244.0	-3,876.6	420.5	3,899.2	0.00	0.00	
10,400.0	90.00	177.23	6,244.0	-3,976.5	425.3	3,999.1	0.00	0.00	
10,500.0	90.00	177.23	6,244.0	-4,076.3	430.1	4,099.0	0.00	0.00	
10,600.0	90.00	177.23	6,244.0	-4,176.2	435.0	4,198.8	0.00	0.00	
10,700.0	90.00	177.23	6,244.0	-4,276.1	439.8	4,298.7	0.00	0.00	
10,773.6	90.00	177.23	6,244.0	-4,349.6	443.3	4,372.2	0.00	0.00	TD @ 10,773.6' MD

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									
Seventy Holes F-J-8HNB - plan hits target center - Point	0.00	0.00	6,244.0	-4,349.6	443.3	1,361,931.59	3,319,753.41	40.321220	-104.353240
Seventy Holes F-J-8HNB - plan hits target center - Point	0.00	0.00	6,244.0	-142.1	239.8	1,366,136.18	3,319,495.50	40.332770	-104.353970

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
6,661.1	6,244.0	7" - 631' FNL, 1,326' FWL			

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,561.1	6,244.0	Niobrara B target		0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well State Seventy Holes F-J-8HNB
Company:	Bonanza Creek Energy Operating Company, LLC	TVD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Project:	Weld County	MD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Site:	State Seventy Holes F-8 Pad	North Reference:	True
Well:	State Seventy Holes F-J-8HNB	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,000.0	1,000.0	0.0	0.0	KOP @ 1,000'
1,263.8	1,263.5	10.8	5.5	EOB @ Inc. = 5.28°
5,701.2	5,682.0	375.3	189.1	Start 11° Build/Turn
6,561.1	6,244.0	-142.1	239.8	LP @ 6,244' TVD, 90°
10,773.6	6,244.0	-4,349.6	443.3	TD @ 10,773.6' MD

Bonanza Creek Energy Operating Company, LLC

Weld County

State Seventy Holes F-8 Pad

State Seventy Holes F-J-8HNB

OH

Plan #1

Anticollision Report

28 March, 2013

Cathedral Energy Services

Anticollision Report

Company:	Bonanza Creek Energy Operating Company, LLC	Local Co-ordinate Reference:	Well State Seventy Holes F-J-8HNB
Project:	Weld County	TVD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Reference Site:	State Seventy Holes F-8 Pad	MD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	State Seventy Holes F-J-8HNB	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 500.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	3/28/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	10,773.6	Plan #1 (OH)	MWD	Geolink MWD	

Summary							
		Reference Measured	Offset Measured	Distance			
Site Name		Depth	Depth	Between Centres	Between Ellipses	Separation Factor	Warning
Offset Well - Wellbore - Design		(ft)	(ft)	(ft)	(ft)		
Seventy Holes 24-5 Pad							
Seventy Holes 14-5 - OH - OH							Out of range
State Seventy Holes F-8 Pad							
State Seventy Holes 21-24-8HNB - OH - Plan #1		0.0	0.0	22.0			
State Seventy Holes 21-24-8HNB - OH - Plan #1		500.0	500.0	22.0	22.0	10,000.000	CC, ES

Cathedral Energy Services

Anticollision Report

Company:	Bonanza Creek Energy Operating Company, LLC	Local Co-ordinate Reference:	Well State Seventy Holes F-J-8HNB
Project:	Weld County	TVD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Reference Site:	State Seventy Holes F-8 Pad	MD Reference:	KB=11' @ 4548.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	State Seventy Holes F-J-8HNB	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design State Seventy Holes F-8 Pad - State Seventy Holes 21-24-8HNB - OH - 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	7.27	21.9	2.8	22.0						
100.0	100.0	100.0	100.0	0.2	0.2	7.27	21.9	2.8	22.0	22.0	0.00	N/A			
200.0	200.0	200.0	200.0	0.3	0.3	7.27	21.9	2.8	22.0	22.0	0.00	N/A			
300.0	300.0	300.0	300.0	0.5	0.5	7.27	21.9	2.8	22.0	22.0	0.00	N/A			
400.0	400.0	400.0	400.0	0.7	0.7	7.27	21.9	2.8	22.0	22.0	0.00	N/A			
500.0	500.0	500.0	500.0	0.9	0.9	7.27	21.9	2.8	22.0	22.0	0.00	N/A CC, ES			
600.0	600.0	599.6	599.5	1.0	1.0	10.98	22.5	4.4	23.0	23.0	0.00	N/A			
700.0	700.0	698.9	698.7	1.2	1.2	20.34	24.6	9.1	26.3	26.3	0.00	N/A			
800.0	800.0	797.8	797.2	1.4	1.4	31.22	28.0	17.0	32.9	32.9	0.00	N/A			
900.0	900.0	895.9	894.6	1.6	1.7	40.41	32.7	27.8	43.3	43.3	0.00	N/A			
1,000.0	1,000.0	993.3	990.9	1.7	1.9	47.11	38.7	41.6	57.6	57.6	0.00	N/A			
1,100.0	1,100.0	1,092.1	1,088.3	1.9	2.2	25.18	45.3	56.9	72.1	72.1	0.00	N/A			
1,200.0	1,199.8	1,191.2	1,186.0	2.1	2.5	29.48	51.9	72.1	83.9	83.9	0.00	N/A			
1,300.0	1,299.5	1,290.5	1,283.9	2.3	2.8	33.81	58.5	87.4	93.4	93.4	0.00	N/A			
1,400.0	1,399.1	1,389.9	1,381.8	2.5	3.2	37.62	65.2	102.7	102.7	102.7	0.00	N/A			
1,500.0	1,498.6	1,489.2	1,479.8	2.7	3.5	40.78	71.8	118.0	112.5	112.5	0.00	N/A			
1,600.0	1,598.2	1,588.6	1,577.7	2.9	3.8	43.43	78.4	133.3	122.5	122.5	0.00	N/A			
1,700.0	1,697.8	1,687.9	1,675.6	3.1	4.2	45.68	85.0	148.6	132.7	132.7	0.00	N/A			
1,800.0	1,797.4	1,787.3	1,773.6	3.3	4.5	47.61	91.7	163.9	143.1	143.1	0.00	N/A			
1,900.0	1,896.9	1,886.6	1,871.5	3.5	4.8	49.27	98.3	179.2	153.7	153.7	0.00	N/A			
2,000.0	1,996.5	1,986.0	1,969.5	3.8	5.2	50.72	104.9	194.5	164.4	164.4	0.00	N/A			
2,100.0	2,096.1	2,085.3	2,067.4	4.0	5.5	51.99	111.6	209.8	175.1	175.1	0.00	N/A			
2,200.0	2,195.7	2,184.7	2,165.3	4.2	5.8	53.11	118.2	225.1	186.0	186.0	0.00	N/A			
2,300.0	2,295.2	2,284.0	2,263.3	4.4	6.2	54.11	124.8	240.4	196.9	196.9	0.00	N/A			
2,400.0	2,394.8	2,383.4	2,361.2	4.7	6.5	55.01	131.5	255.7	207.8	207.8	0.00	N/A			
2,500.0	2,494.4	2,482.7	2,459.1	4.9	6.8	55.81	138.1	271.0	218.8	218.8	0.00	N/A			
2,600.0	2,594.0	2,582.1	2,557.1	5.1	7.2	56.54	144.7	286.3	229.8	229.8	0.00	N/A			
2,700.0	2,693.5	2,681.4	2,655.0	5.4	7.5	57.20	151.4	301.6	240.9	240.9	0.00	N/A			
2,800.0	2,793.1	2,780.8	2,753.0	5.6	7.8	57.81	158.0	316.9	252.0	252.0	0.00	N/A			
2,900.0	2,892.7	2,880.1	2,850.9	5.8	8.2	58.36	164.6	332.2	263.1	263.1	0.00	N/A			
3,000.0	2,992.3	2,979.5	2,948.8	6.1	8.5	58.87	171.2	347.6	274.3	274.3	0.00	N/A			
3,100.0	3,091.8	3,078.8	3,046.8	6.3	8.9	59.33	177.9	362.9	285.4	285.4	0.00	N/A			
3,200.0	3,191.4	3,178.2	3,144.7	6.5	9.2	59.77	184.5	378.2	296.6	296.6	0.00	N/A			
3,300.0	3,291.0	3,277.5	3,242.7	6.8	9.5	60.17	191.1	393.5	307.8	307.8	0.00	N/A			
3,400.0	3,390.6	3,376.9	3,340.6	7.0	9.9	60.54	197.8	408.8	319.0	319.0	0.00	N/A			
3,500.0	3,490.1	3,476.2	3,438.5	7.2	10.2	60.89	204.4	424.1	330.3	330.3	0.00	N/A			
3,600.0	3,589.7	3,575.5	3,536.5	7.5	10.6	61.21	211.0	439.4	341.5	341.5	0.00	N/A			
3,700.0	3,689.3	3,674.9	3,634.4	7.7	10.9	61.52	217.7	454.7	352.7	352.7	0.00	N/A			
3,800.0	3,788.9	3,774.2	3,732.4	7.9	11.2	61.80	224.3	470.0	364.0	364.0	0.00	N/A			
3,900.0	3,888.5	3,873.6	3,830.3	8.2	11.6	62.07	230.9	485.3	375.2	375.2	0.00	N/A			
4,000.0	3,988.0	3,972.9	3,928.2	8.4	11.9	62.32	237.5	500.6	386.5	386.5	0.00	N/A			
4,100.0	4,087.6	4,072.3	4,026.2	8.6	12.3	62.56	244.2	515.9	397.8	397.8	0.00	N/A			
4,200.0	4,187.2	4,171.6	4,124.1	8.9	12.6	62.79	250.8	531.2	409.1	409.1	0.00	N/A			
4,300.0	4,286.8	4,271.0	4,222.1	9.1	12.9	63.00	257.4	546.5	420.4	420.4	0.00	N/A			
4,400.0	4,386.3	4,370.3	4,320.0	9.3	13.3	63.20	264.1	561.8	431.7	431.7	0.00	N/A			
4,500.0	4,485.9	4,469.7	4,417.9	9.6	13.6	63.39	270.7	577.1	443.0	443.0	0.00	N/A			
4,600.0	4,585.5	4,569.0	4,515.9	9.8	14.0	63.58	277.3	592.4	454.3	454.3	0.00	N/A			
4,700.0	4,685.1	4,668.4	4,613.8	10.0	14.3	63.75	284.0	607.7	465.6	465.6	0.00	N/A			
4,800.0	4,784.6	4,767.7	4,711.8	10.3	14.7	63.91	290.6	623.0	476.9	476.9	0.00	N/A			
4,900.0	4,884.2	4,867.1	4,809.7	10.5	15.0	64.07	297.2	638.3	488.2	488.2	0.00	N/A			
5,000.0	4,983.8	4,966.4	4,907.6	10.7	15.3	64.22	303.9	653.6	499.5	499.5	0.00	N/A			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

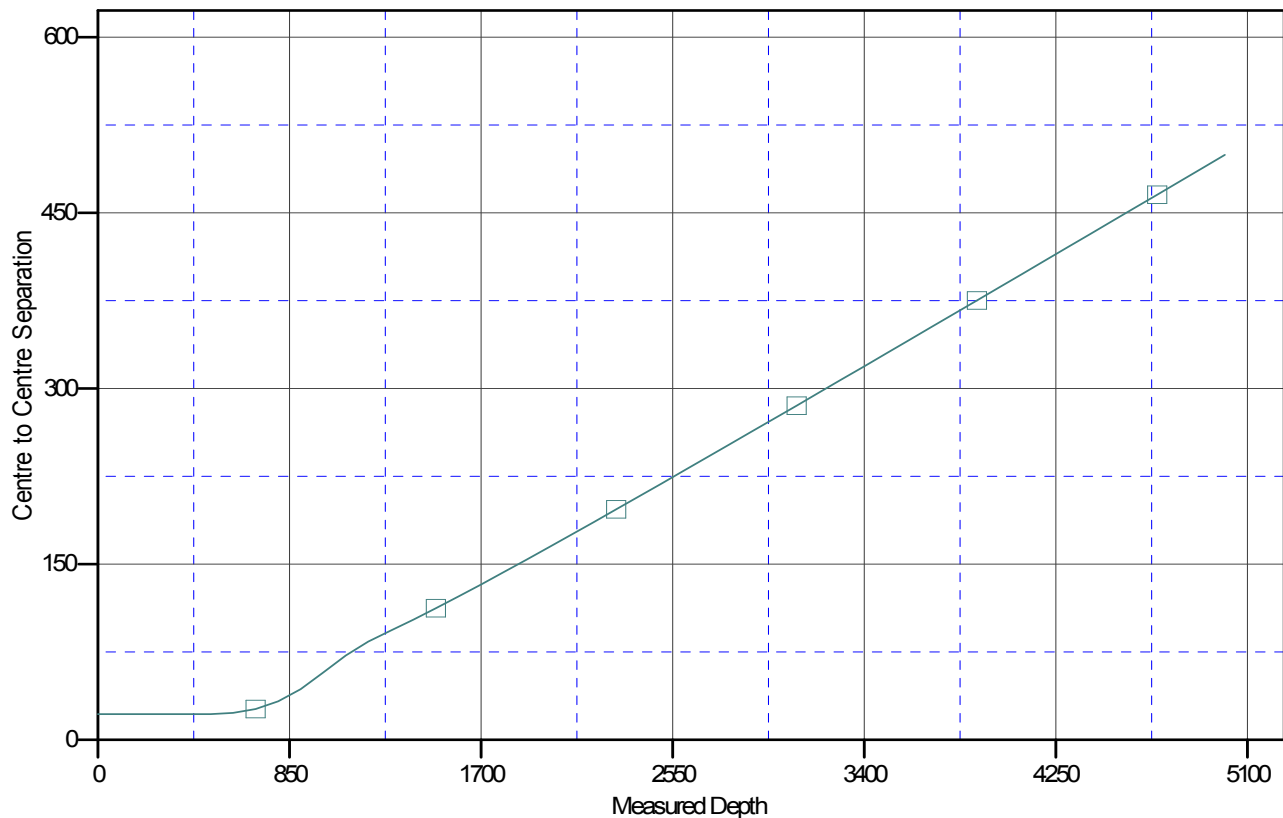
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Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB= 11' @ 4548.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: State Seventy Holes F-J-8HNB
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.74°

Ladder Plot



LEGEND

State SeventyHoles21-24-8HNB, OH, Plan #1 V0