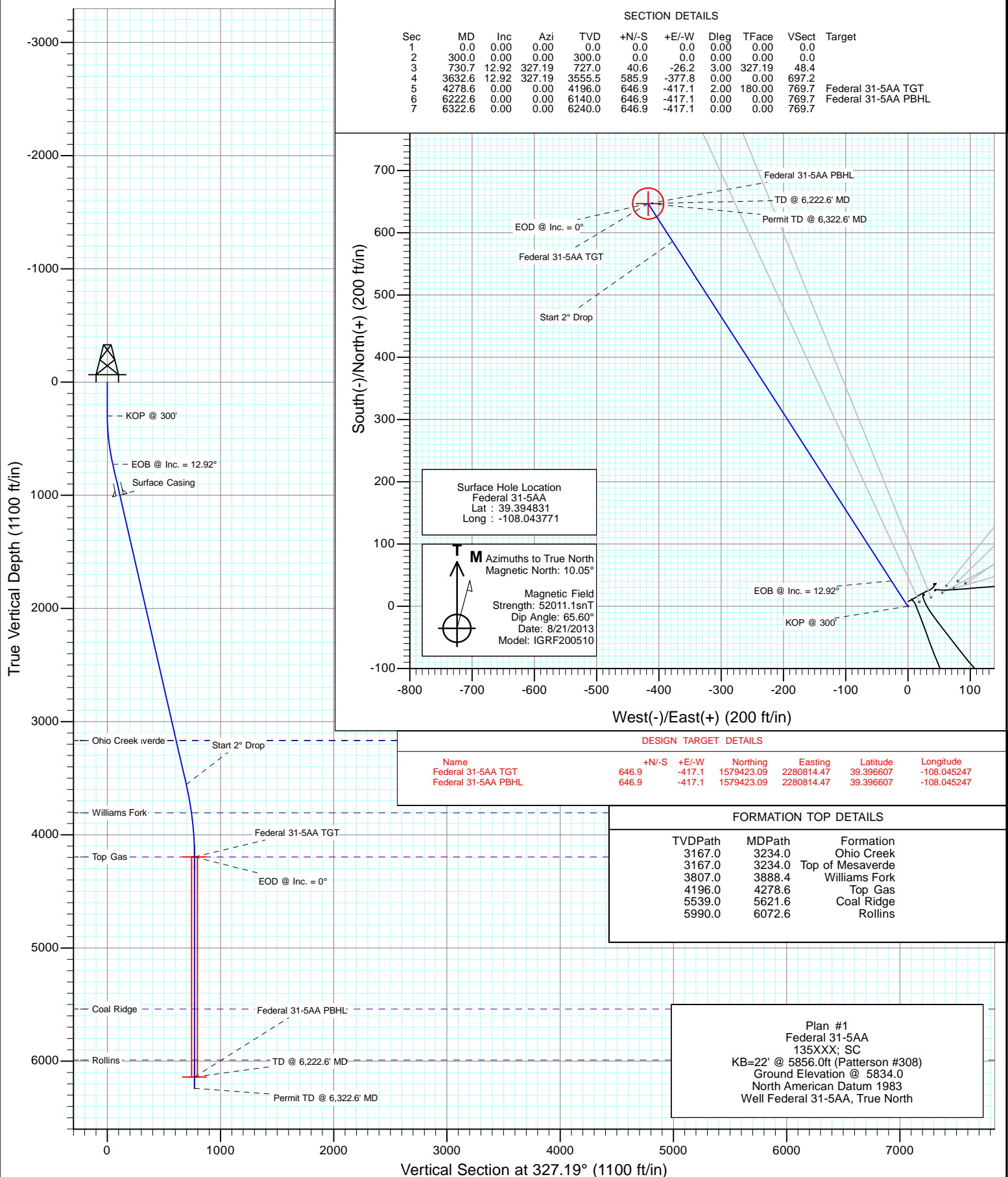


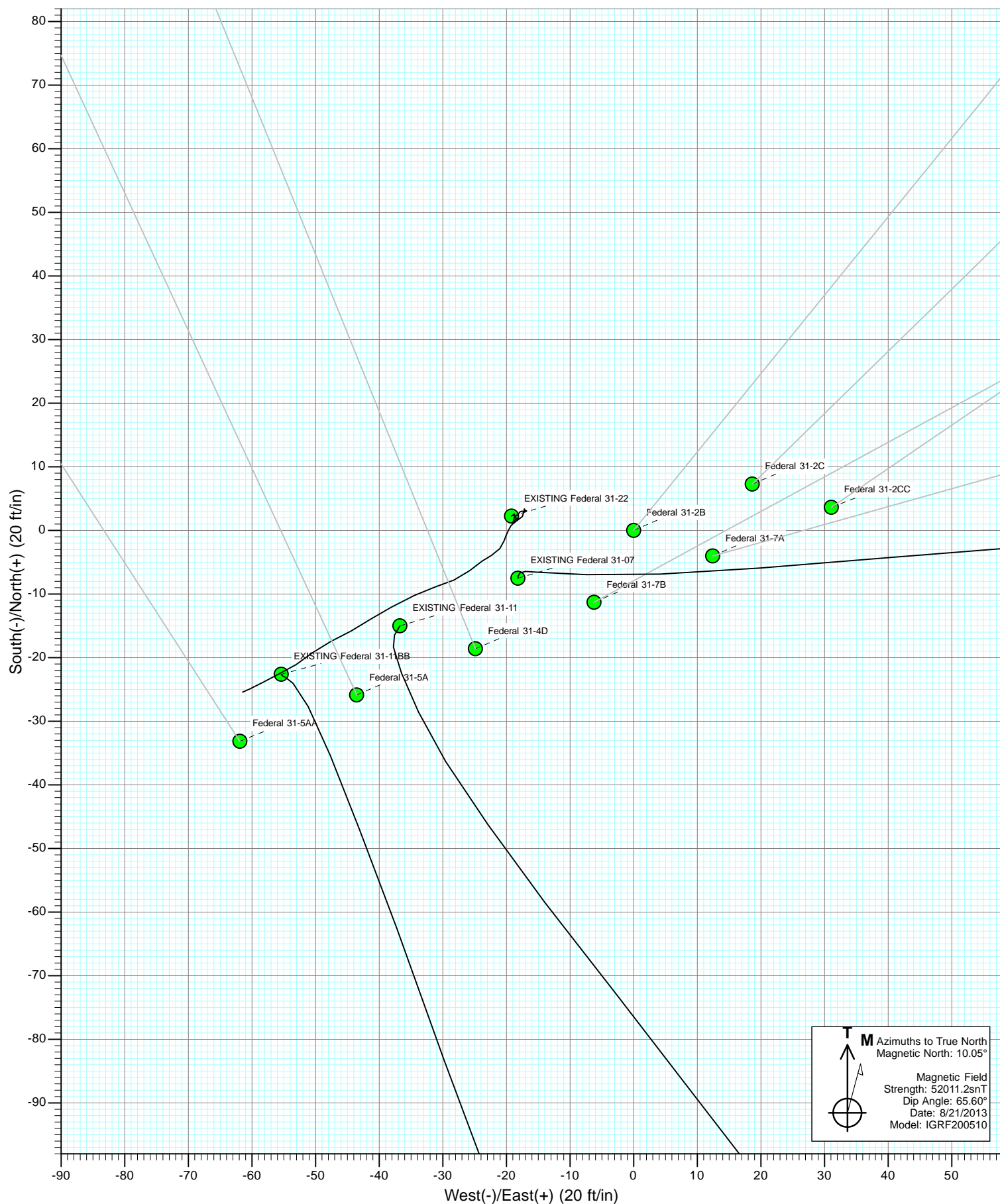


Project: S. Piceance (Parachute)
Site: PF-31 Pad - S31-T7S-R95W
Well: Federal 31-5AA
Wellbore: DD
Design: Plan #1



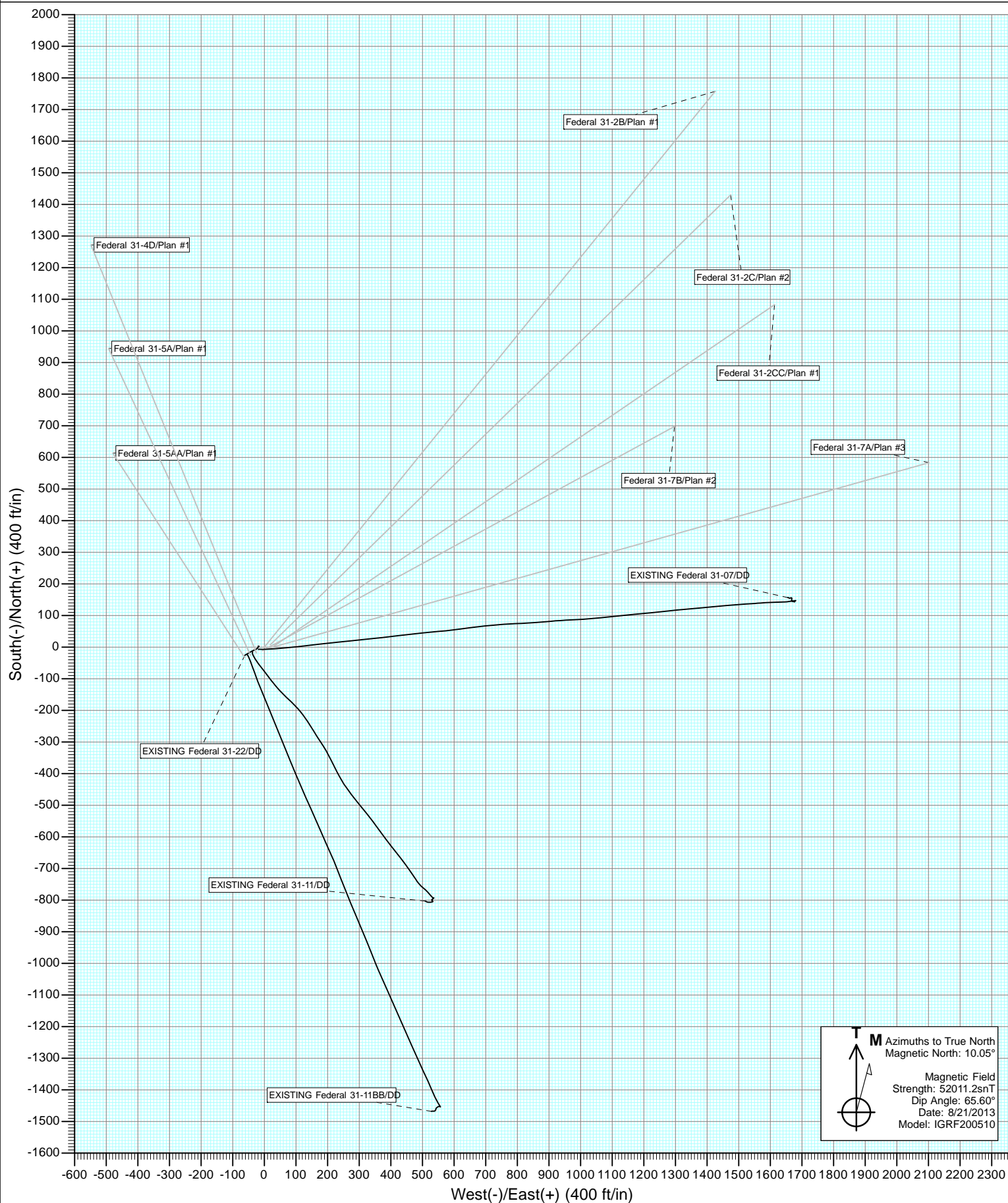


Project: S. Piceance (Parachute)
Site: PF-31 Pad - S31-T7S-R95W



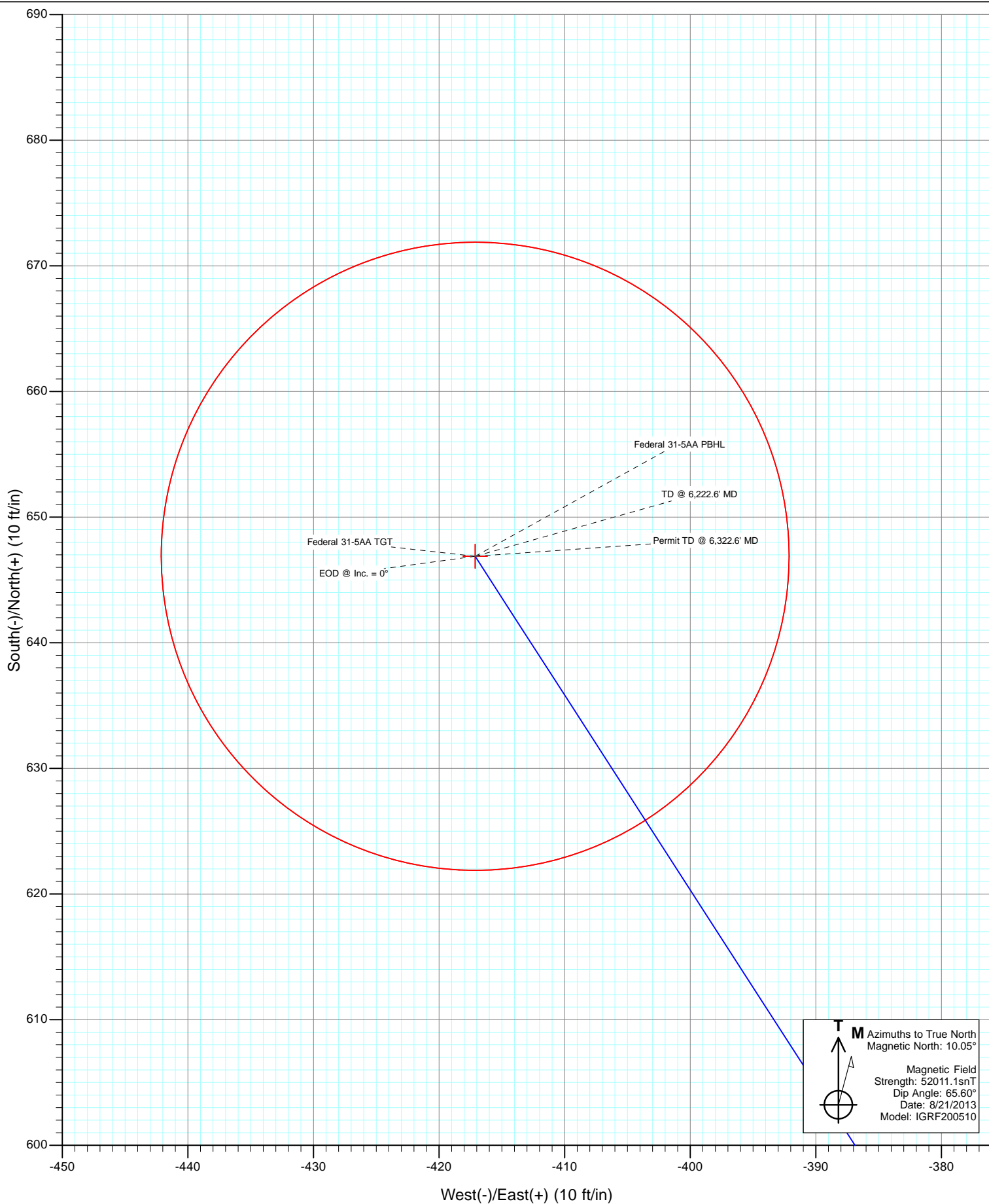


Project: S. Piceance (Parachute)
Site: PF-31 Pad - S31-T7S-R95W





Project: S. Piceance (Parachute)
Site: PF-31 Pad - S31-T7S-R95W
Well: Federal 31-5AA
Wellbore: DD
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Federal 31-5AA
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 5856.0ft (Patterson #308)
Project:	S. Piceance (Parachute)	MD Reference:	KB=22' @ 5856.0ft (Patterson #308)
Site:	PF-31 Pad - S31-T7S-R95W	North Reference:	True
Well:	Federal 31-5AA	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Project	S. Piceance (Parachute), Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		PF-31 Pad - S31-T7S-R95W			
Site Position:		Northing:	1,578,802.25 ft	Latitude:	39.394940
From:	Lat/Long	Easting:	2,281,293.81 ft	Longitude:	-108.043490
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.60 °

Well	Federal 31-5AA					
Well Position	+N/-S	0.0 ft	Northing:	1,578,764.78 ft	Latitude:	39.394831
	+E/-W	0.0 ft	Easting:	2,281,213.31 ft	Longitude:	-108.043771
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,834.0 ft

Wellbore	DD				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	8/21/2013	10.05	65.60	52,011

Design	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	327.19	

Plan Sections										
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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
730.7	12.92	327.19	727.0	40.6	-26.2	3.00	3.00	0.00	327.19	
3,632.6	12.92	327.19	3,555.5	585.9	-377.8	0.00	0.00	0.00	0.00	
4,278.6	0.00	0.00	4,196.0	646.9	-417.1	2.00	-2.00	0.00	180.00	Federal 31-5AA TGT
6,222.6	0.00	0.00	6,140.0	646.9	-417.1	0.00	0.00	0.00	0.00	Federal 31-5AA PBHL
6,322.6	0.00	0.00	6,240.0	646.9	-417.1	0.00	0.00	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Federal 31-5AA
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 5856.0ft (Patterson #308)
Project:	S. Piceance (Parachute)	MD Reference:	KB=22' @ 5856.0ft (Patterson #308)
Site:	PF-31 Pad - S31-T7S-R95W	North Reference:	True
Well:	Federal 31-5AA	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
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
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	KOP @ 300'
400.0	3.00	327.19	400.0	2.2	-1.4	2.6	3.00	3.00	
500.0	6.00	327.19	499.6	8.8	-5.7	10.5	3.00	3.00	
600.0	9.00	327.19	598.8	19.8	-12.7	23.5	3.00	3.00	
700.0	12.00	327.19	697.1	35.1	-22.6	41.7	3.00	3.00	
730.7	12.92	327.19	727.0	40.6	-26.2	48.4	3.00	3.00	EOB @ Inc. = 12.92°
800.0	12.92	327.19	794.6	53.7	-34.6	63.9	0.00	0.00	
900.0	12.92	327.19	892.1	72.5	-46.7	86.2	0.00	0.00	
1,000.0	12.92	327.19	989.5	91.2	-58.8	108.6	0.00	0.00	
1,010.7	12.92	327.19	1,000.0	93.3	-60.1	111.0	0.00	0.00	Surface Casing
1,100.0	12.92	327.19	1,087.0	110.0	-71.0	130.9	0.00	0.00	
1,200.0	12.92	327.19	1,184.5	128.8	-83.1	153.3	0.00	0.00	
1,300.0	12.92	327.19	1,281.9	147.6	-95.2	175.6	0.00	0.00	
1,400.0	12.92	327.19	1,379.4	166.4	-107.3	198.0	0.00	0.00	
1,500.0	12.92	327.19	1,476.9	185.2	-119.4	220.4	0.00	0.00	
1,600.0	12.92	327.19	1,574.4	204.0	-131.5	242.7	0.00	0.00	
1,700.0	12.92	327.19	1,671.8	222.8	-143.7	265.1	0.00	0.00	
1,800.0	12.92	327.19	1,769.3	241.6	-155.8	287.4	0.00	0.00	
1,900.0	12.92	327.19	1,866.8	260.4	-167.9	309.8	0.00	0.00	
2,000.0	12.92	327.19	1,964.2	279.2	-180.0	332.2	0.00	0.00	
2,100.0	12.92	327.19	2,061.7	297.9	-192.1	354.5	0.00	0.00	
2,200.0	12.92	327.19	2,159.2	316.7	-204.2	376.9	0.00	0.00	
2,300.0	12.92	327.19	2,256.6	335.5	-216.4	399.2	0.00	0.00	
2,400.0	12.92	327.19	2,354.1	354.3	-228.5	421.6	0.00	0.00	
2,500.0	12.92	327.19	2,451.6	373.1	-240.6	444.0	0.00	0.00	
2,600.0	12.92	327.19	2,549.0	391.9	-252.7	466.3	0.00	0.00	
2,700.0	12.92	327.19	2,646.5	410.7	-264.8	488.7	0.00	0.00	
2,800.0	12.92	327.19	2,744.0	429.5	-276.9	511.0	0.00	0.00	
2,900.0	12.92	327.19	2,841.4	448.3	-289.1	533.4	0.00	0.00	
3,000.0	12.92	327.19	2,938.9	467.1	-301.2	555.7	0.00	0.00	
3,100.0	12.92	327.19	3,036.4	485.9	-313.3	578.1	0.00	0.00	
3,200.0	12.92	327.19	3,133.8	504.6	-325.4	600.5	0.00	0.00	
3,234.0	12.92	327.19	3,167.0	511.0	-329.5	608.1	0.00	0.00	Top of Mesaverde - Ohio Creek
3,300.0	12.92	327.19	3,231.3	523.4	-337.5	622.8	0.00	0.00	
3,400.0	12.92	327.19	3,328.8	542.2	-349.6	645.2	0.00	0.00	
3,500.0	12.92	327.19	3,426.3	561.0	-361.8	667.5	0.00	0.00	
3,600.0	12.92	327.19	3,523.7	579.8	-373.9	689.9	0.00	0.00	
3,632.6	12.92	327.19	3,555.5	585.9	-377.8	697.2	0.00	0.00	Start 2° Drop
3,700.0	11.57	327.19	3,621.4	598.0	-385.6	711.5	2.00	-2.00	
3,800.0	9.57	327.19	3,719.7	613.4	-395.5	729.8	2.00	-2.00	
3,888.4	7.80	327.19	3,807.0	624.6	-402.7	743.2	2.00	-2.00	Williams Fork
3,900.0	7.57	327.19	3,818.5	625.9	-403.6	744.7	2.00	-2.00	
4,000.0	5.57	327.19	3,917.9	635.5	-409.8	756.2	2.00	-2.00	
4,100.0	3.57	327.19	4,017.5	642.2	-414.1	764.1	2.00	-2.00	
4,200.0	1.57	327.19	4,117.4	646.0	-416.5	768.6	2.00	-2.00	
4,278.6	0.00	0.00	4,196.0	646.9	-417.1	769.7	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
4,300.0	0.00	0.00	4,217.4	646.9	-417.1	769.7	0.00	0.00	
4,400.0	0.00	0.00	4,317.4	646.9	-417.1	769.7	0.00	0.00	
4,500.0	0.00	0.00	4,417.4	646.9	-417.1	769.7	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Federal 31-5AA
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 5856.0ft (Patterson #308)
Project:	S. Piceance (Parachute)	MD Reference:	KB=22' @ 5856.0ft (Patterson #308)
Site:	PF-31 Pad - S31-T7S-R95W	North Reference:	True
Well:	Federal 31-5AA	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
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
4,600.0	0.00	0.00	4,517.4	646.9	-417.1	769.7	0.00	0.00	
4,700.0	0.00	0.00	4,617.4	646.9	-417.1	769.7	0.00	0.00	
4,800.0	0.00	0.00	4,717.4	646.9	-417.1	769.7	0.00	0.00	
4,900.0	0.00	0.00	4,817.4	646.9	-417.1	769.7	0.00	0.00	
5,000.0	0.00	0.00	4,917.4	646.9	-417.1	769.7	0.00	0.00	
5,100.0	0.00	0.00	5,017.4	646.9	-417.1	769.7	0.00	0.00	
5,200.0	0.00	0.00	5,117.4	646.9	-417.1	769.7	0.00	0.00	
5,300.0	0.00	0.00	5,217.4	646.9	-417.1	769.7	0.00	0.00	
5,400.0	0.00	0.00	5,317.4	646.9	-417.1	769.7	0.00	0.00	
5,500.0	0.00	0.00	5,417.4	646.9	-417.1	769.7	0.00	0.00	
5,600.0	0.00	0.00	5,517.4	646.9	-417.1	769.7	0.00	0.00	
5,621.6	0.00	0.00	5,539.0	646.9	-417.1	769.7	0.00	0.00	Coal Ridge
5,700.0	0.00	0.00	5,617.4	646.9	-417.1	769.7	0.00	0.00	
5,800.0	0.00	0.00	5,717.4	646.9	-417.1	769.7	0.00	0.00	
5,900.0	0.00	0.00	5,817.4	646.9	-417.1	769.7	0.00	0.00	
6,000.0	0.00	0.00	5,917.4	646.9	-417.1	769.7	0.00	0.00	
6,072.6	0.00	0.00	5,990.0	646.9	-417.1	769.7	0.00	0.00	Rollins
6,100.0	0.00	0.00	6,017.4	646.9	-417.1	769.7	0.00	0.00	
6,200.0	0.00	0.00	6,117.4	646.9	-417.1	769.7	0.00	0.00	
6,222.6	0.00	0.00	6,140.0	646.9	-417.1	769.7	0.00	0.00	TD @ 6,222.6' MD
6,300.0	0.00	0.00	6,217.4	646.9	-417.1	769.7	0.00	0.00	
6,322.6	0.00	0.00	6,240.0	646.9	-417.1	769.7	0.00	0.00	Permit TD @ 6,322.6' MD

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
Federal 31-5AA TGT - plan hits target center - Point	0.00	0.00	4,196.0	646.9	-417.1	1,579,423.09	2,280,814.47	39.396607	-108.045247
Federal 31-5AA PBHL - plan hits target center - Circle (radius 25.0)	0.00	0.00	6,140.0	646.9	-417.1	1,579,423.09	2,280,814.47	39.396607	-108.045247

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,010.7	1,000.0	Surface Casing		

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Federal 31-5AA
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 5856.0ft (Patterson #308)
Project:	S. Piceance (Parachute)	MD Reference:	KB=22' @ 5856.0ft (Patterson #308)
Site:	PF-31 Pad - S31-T7S-R95W	North Reference:	True
Well:	Federal 31-5AA	Survey Calculation Method:	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,234.0	3,167.0	Top of Mesaverde			
3,234.0	3,167.0	Ohio Creek			
3,888.4	3,807.0	Williams Fork			
4,278.6	4,196.0	Top Gas			
5,621.6	5,539.0	Coal Ridge			
6,072.6	5,990.0	Rollins			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
300.0	300.0	0.0	0.0	KOP @ 300'
730.7	727.0	40.6	-26.2	EOB @ Inc. = 12.92°
3,632.6	3,555.5	585.9	-377.8	Start 2° Drop
4,278.6	4,196.0	646.9	-417.1	EOD @ Inc. = 0°
6,222.6	6,140.0	646.9	-417.1	TD @ 6,222.6' MD
6,322.6	6,240.0	646.9	-417.1	Permit TD @ 6,322.6' MD