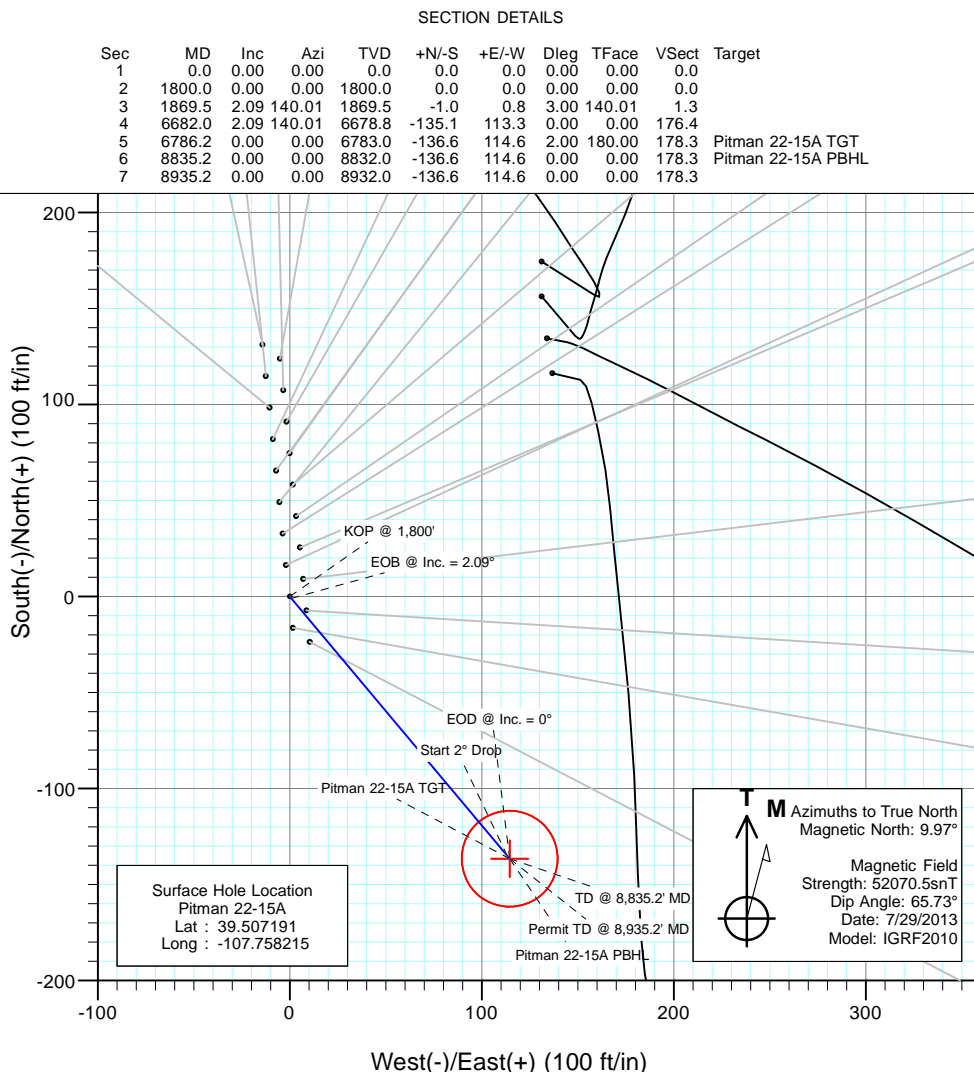
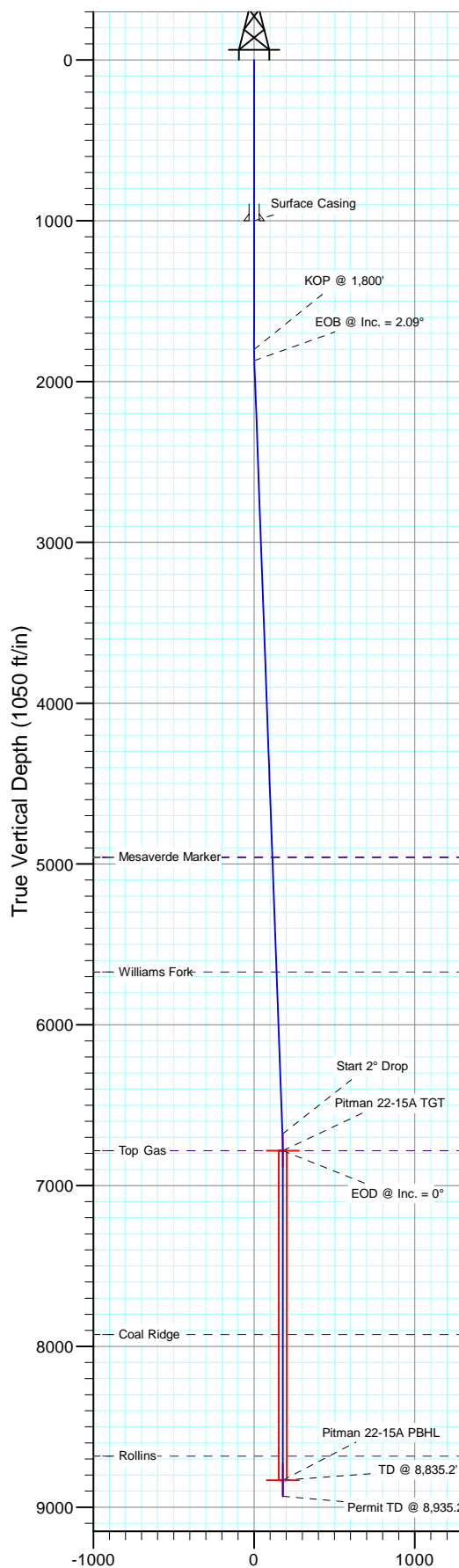




Project: Mamm Creek  
Site: O22NW  
Well: Pitman 22-15A  
Wellbore: OH  
Design: Plan #1



DESIGN TARGET DETAILS						
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Pitman 22-15A TGT	-136.6	114.6	1617405.70	2363013.46	39.506816	-107.757809
Pitman 22-15A PBHL	-136.6	114.6	1617405.70	2363013.46	39.506816	-107.757809

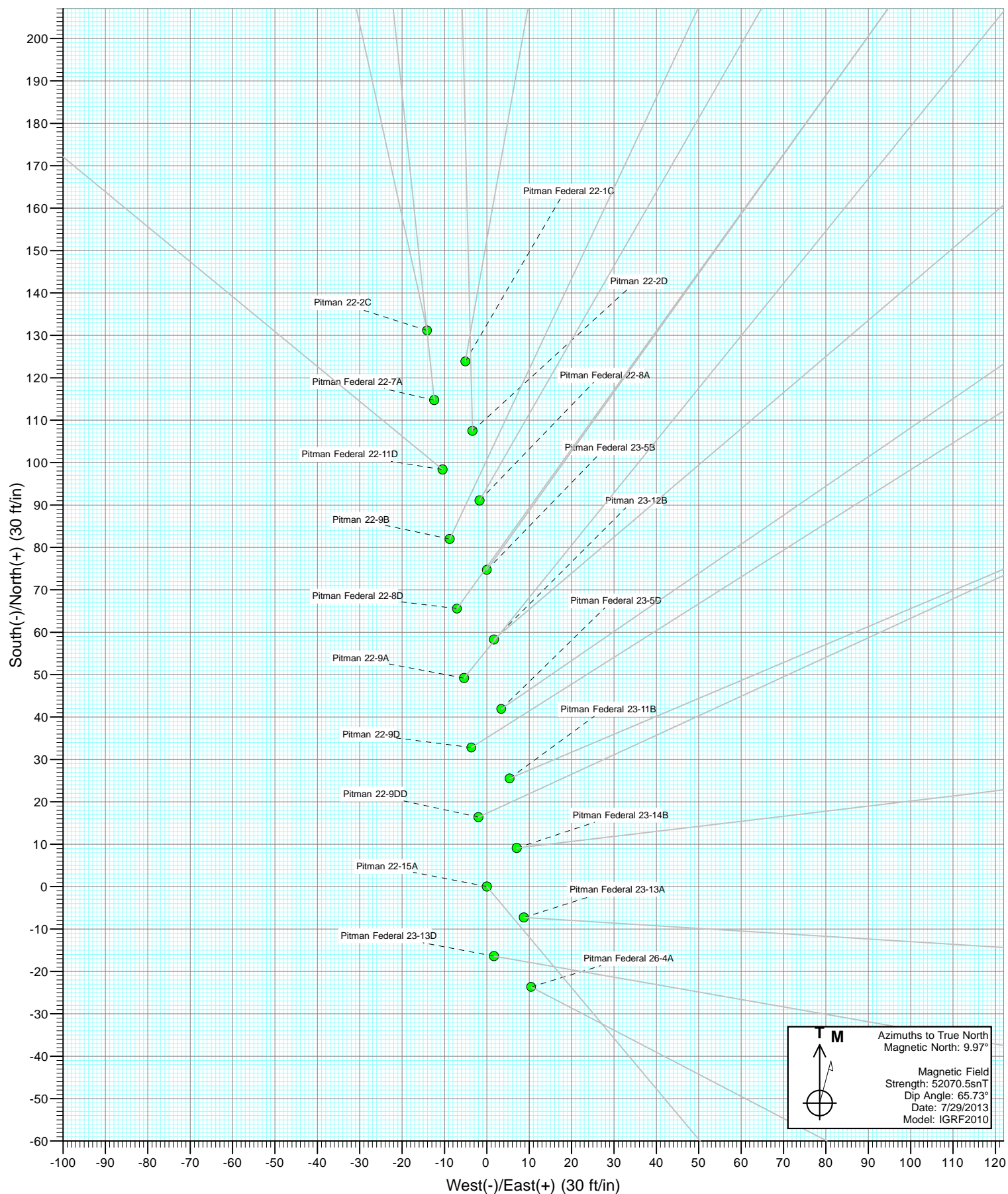
FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4959.0	4961.1	Mesaverde Marker
4959.0	4961.1	Ohio Creek
5672.0	5674.5	Williams Fork
6783.0	6786.2	Top Gas
7926.0	7929.2	Coal Ridge
8682.0	8685.2	Rollins

Plan #1  
Pitman 22-15A  
135XXX; SC  
KB=22' @ 6262.0ft (Patterson 308)  
Ground Elevation @ 6240.0  
North American Datum 1983  
Well Pitman 22-15A, True North

Vertical Section at 140.01° (1050 ft/in)

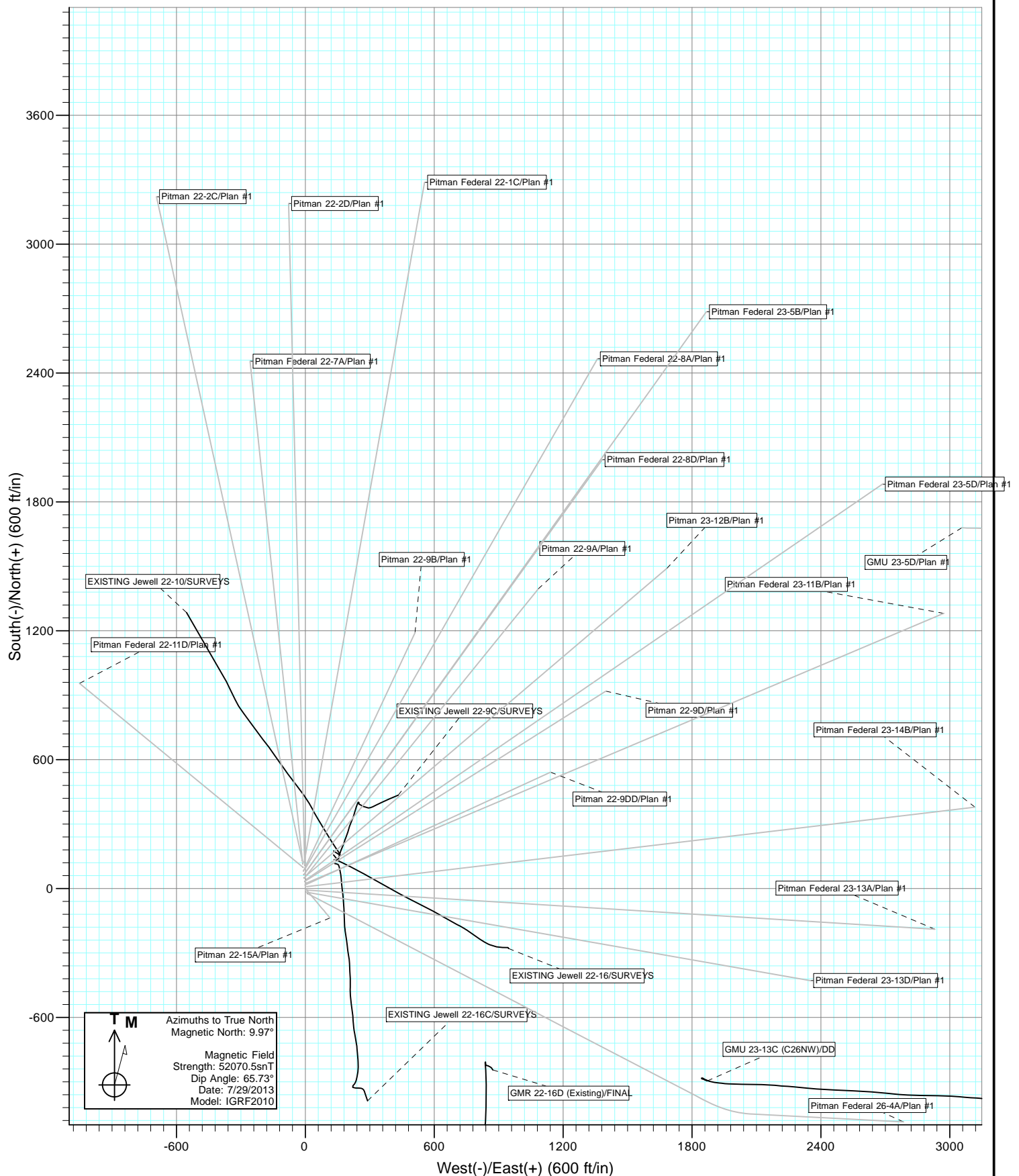


Project: Mamm Creek  
Site: O22NW





Project: Mamm Creek  
Site: O22NW



# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Pitman 22-15A
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	KB=22' @ 6262.0ft (Patterson 308)
<b>Project:</b>	Mamm Creek	<b>MD Reference:</b>	KB=22' @ 6262.0ft (Patterson 308)
<b>Site:</b>	O22NW	<b>North Reference:</b>	True
<b>Well:</b>	Pitman 22-15A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

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

Site		O22NW			
Site Position:		Northing:	1,617,521.17 ft	Latitude:	39.507126
From:	Lat/Long	Easting:	2,362,912.18 ft	Longitude:	-107.758178
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.42 °

Well	Pitman 22-15A					
Well Position	+N/-S	0.0 ft	Northing:	1,617,545.07 ft	Latitude:	39.507191
	+E/-W	0.0 ft	Easting:	2,362,902.33 ft	Longitude:	-107.758215
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,240.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/29/2013	9.97	65.73	52,071

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	140.01

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	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,869.5	2.09	140.01	1,869.5	-1.0	0.8	3.00	3.00	0.00	140.01	
6,682.0	2.09	140.01	6,678.8	-135.1	113.3	0.00	0.00	0.00	0.00	
6,786.2	0.00	0.00	6,783.0	-136.6	114.6	2.00	-2.00	0.00	180.00	Pitman 22-15A TGT
8,835.2	0.00	0.00	8,832.0	-136.6	114.6	0.00	0.00	0.00	0.00	Pitman 22-15A PBHL
8,935.2	0.00	0.00	8,932.0	-136.6	114.6	0.00	0.00	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Pitman 22-15A
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	KB=22' @ 6262.0ft (Patterson 308)
<b>Project:</b>	Mamm Creek	<b>MD Reference:</b>	KB=22' @ 6262.0ft (Patterson 308)
<b>Site:</b>	O22NW	<b>North Reference:</b>	True
<b>Well:</b>	Pitman 22-15A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<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	
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	Surface Casing
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	KOP @ 1,800'
1,869.5	2.09	140.01	1,869.5	-1.0	0.8	1.3	3.00	3.00	EOB @ Inc. = 2.09°
1,900.0	2.09	140.01	1,900.0	-1.8	1.5	2.4	0.00	0.00	
2,000.0	2.09	140.01	1,999.9	-4.6	3.9	6.0	0.00	0.00	
2,100.0	2.09	140.01	2,099.8	-7.4	6.2	9.7	0.00	0.00	
2,200.0	2.09	140.01	2,199.8	-10.2	8.5	13.3	0.00	0.00	
2,300.0	2.09	140.01	2,299.7	-13.0	10.9	16.9	0.00	0.00	
2,400.0	2.09	140.01	2,399.6	-15.8	13.2	20.6	0.00	0.00	
2,500.0	2.09	140.01	2,499.6	-18.5	15.6	24.2	0.00	0.00	
2,600.0	2.09	140.01	2,599.5	-21.3	17.9	27.8	0.00	0.00	
2,700.0	2.09	140.01	2,699.4	-24.1	20.2	31.5	0.00	0.00	
2,800.0	2.09	140.01	2,799.4	-26.9	22.6	35.1	0.00	0.00	
2,900.0	2.09	140.01	2,899.3	-29.7	24.9	38.8	0.00	0.00	
3,000.0	2.09	140.01	2,999.2	-32.5	27.2	42.4	0.00	0.00	
3,100.0	2.09	140.01	3,099.2	-35.3	29.6	46.0	0.00	0.00	
3,200.0	2.09	140.01	3,199.1	-38.1	31.9	49.7	0.00	0.00	
3,300.0	2.09	140.01	3,299.0	-40.8	34.3	53.3	0.00	0.00	
3,400.0	2.09	140.01	3,399.0	-43.6	36.6	56.9	0.00	0.00	
3,500.0	2.09	140.01	3,498.9	-46.4	38.9	60.6	0.00	0.00	
3,600.0	2.09	140.01	3,598.8	-49.2	41.3	64.2	0.00	0.00	
3,700.0	2.09	140.01	3,698.8	-52.0	43.6	67.9	0.00	0.00	
3,800.0	2.09	140.01	3,798.7	-54.8	46.0	71.5	0.00	0.00	
3,900.0	2.09	140.01	3,898.6	-57.6	48.3	75.1	0.00	0.00	
4,000.0	2.09	140.01	3,998.6	-60.4	50.6	78.8	0.00	0.00	
4,100.0	2.09	140.01	4,098.5	-63.1	53.0	82.4	0.00	0.00	
4,200.0	2.09	140.01	4,198.4	-65.9	55.3	86.1	0.00	0.00	
4,300.0	2.09	140.01	4,298.4	-68.7	57.6	89.7	0.00	0.00	
4,400.0	2.09	140.01	4,398.3	-71.5	60.0	93.3	0.00	0.00	
4,500.0	2.09	140.01	4,498.2	-74.3	62.3	97.0	0.00	0.00	
4,600.0	2.09	140.01	4,598.2	-77.1	64.7	100.6	0.00	0.00	
4,700.0	2.09	140.01	4,698.1	-79.9	67.0	104.2	0.00	0.00	
4,800.0	2.09	140.01	4,798.0	-82.7	69.3	107.9	0.00	0.00	
4,900.0	2.09	140.01	4,898.0	-85.4	71.7	111.5	0.00	0.00	
4,961.1	2.09	140.01	4,959.0	-87.1	73.1	113.7	0.00	0.00	Ohio Creek - Mesaverde Marker

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Pitman 22-15A
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	KB=22' @ 6262.0ft (Patterson 308)
<b>Project:</b>	Mamm Creek	<b>MD Reference:</b>	KB=22' @ 6262.0ft (Patterson 308)
<b>Site:</b>	O22NW	<b>North Reference:</b>	True
<b>Well:</b>	Pitman 22-15A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<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
5,000.0	2.09	140.01	4,997.9	-88.2	74.0	115.2	0.00	0.00	
5,100.0	2.09	140.01	5,097.8	-91.0	76.3	118.8	0.00	0.00	
5,200.0	2.09	140.01	5,197.8	-93.8	78.7	122.4	0.00	0.00	
5,300.0	2.09	140.01	5,297.7	-96.6	81.0	126.1	0.00	0.00	
5,400.0	2.09	140.01	5,397.6	-99.4	83.4	129.7	0.00	0.00	
5,500.0	2.09	140.01	5,497.6	-102.2	85.7	133.4	0.00	0.00	
5,600.0	2.09	140.01	5,597.5	-105.0	88.0	137.0	0.00	0.00	
5,674.5	2.09	140.01	5,672.0	-107.0	89.8	139.7	0.00	0.00	Williams Fork
5,700.0	2.09	140.01	5,697.4	-107.7	90.4	140.6	0.00	0.00	
5,800.0	2.09	140.01	5,797.4	-110.5	92.7	144.3	0.00	0.00	
5,900.0	2.09	140.01	5,897.3	-113.3	95.1	147.9	0.00	0.00	
6,000.0	2.09	140.01	5,997.2	-116.1	97.4	151.5	0.00	0.00	
6,100.0	2.09	140.01	6,097.2	-118.9	99.7	155.2	0.00	0.00	
6,200.0	2.09	140.01	6,197.1	-121.7	102.1	158.8	0.00	0.00	
6,300.0	2.09	140.01	6,297.1	-124.5	104.4	162.5	0.00	0.00	
6,400.0	2.09	140.01	6,397.0	-127.3	106.7	166.1	0.00	0.00	
6,500.0	2.09	140.01	6,496.9	-130.0	109.1	169.7	0.00	0.00	
6,600.0	2.09	140.01	6,596.9	-132.8	111.4	173.4	0.00	0.00	
6,682.0	2.09	140.01	6,678.8	-135.1	113.3	176.4	0.00	0.00	Start 2° Drop
6,700.0	1.72	140.01	6,696.8	-135.6	113.7	177.0	2.00	-2.00	
6,786.2	0.00	0.00	6,783.0	-136.6	114.6	178.3	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
6,800.0	0.00	0.00	6,796.8	-136.6	114.6	178.3	0.00	0.00	
6,900.0	0.00	0.00	6,896.8	-136.6	114.6	178.3	0.00	0.00	
7,000.0	0.00	0.00	6,996.8	-136.6	114.6	178.3	0.00	0.00	
7,100.0	0.00	0.00	7,096.8	-136.6	114.6	178.3	0.00	0.00	
7,200.0	0.00	0.00	7,196.8	-136.6	114.6	178.3	0.00	0.00	
7,300.0	0.00	0.00	7,296.8	-136.6	114.6	178.3	0.00	0.00	
7,400.0	0.00	0.00	7,396.8	-136.6	114.6	178.3	0.00	0.00	
7,500.0	0.00	0.00	7,496.8	-136.6	114.6	178.3	0.00	0.00	
7,600.0	0.00	0.00	7,596.8	-136.6	114.6	178.3	0.00	0.00	
7,700.0	0.00	0.00	7,696.8	-136.6	114.6	178.3	0.00	0.00	
7,800.0	0.00	0.00	7,796.8	-136.6	114.6	178.3	0.00	0.00	
7,900.0	0.00	0.00	7,896.8	-136.6	114.6	178.3	0.00	0.00	
7,929.2	0.00	0.00	7,926.0	-136.6	114.6	178.3	0.00	0.00	Coal Ridge
8,000.0	0.00	0.00	7,996.8	-136.6	114.6	178.3	0.00	0.00	
8,100.0	0.00	0.00	8,096.8	-136.6	114.6	178.3	0.00	0.00	
8,200.0	0.00	0.00	8,196.8	-136.6	114.6	178.3	0.00	0.00	
8,300.0	0.00	0.00	8,296.8	-136.6	114.6	178.3	0.00	0.00	
8,400.0	0.00	0.00	8,396.8	-136.6	114.6	178.3	0.00	0.00	
8,500.0	0.00	0.00	8,496.8	-136.6	114.6	178.3	0.00	0.00	
8,600.0	0.00	0.00	8,596.8	-136.6	114.6	178.3	0.00	0.00	
8,685.2	0.00	0.00	8,682.0	-136.6	114.6	178.3	0.00	0.00	Rollins
8,700.0	0.00	0.00	8,696.8	-136.6	114.6	178.3	0.00	0.00	
8,800.0	0.00	0.00	8,796.8	-136.6	114.6	178.3	0.00	0.00	
8,835.2	0.00	0.00	8,832.0	-136.6	114.6	178.3	0.00	0.00	TD @ 8,835.2' MD
8,900.0	0.00	0.00	8,896.8	-136.6	114.6	178.3	0.00	0.00	
8,935.2	0.00	0.00	8,932.0	-136.6	114.6	178.3	0.00	0.00	Permit TD @ 8,935.2' MD

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well Pitman 22-15A
<b>Company:</b>	EnCana Oil & Gas (USA) Inc	<b>TVD Reference:</b>	KB=22' @ 6262.0ft (Patterson 308)
<b>Project:</b>	Mamm Creek	<b>MD Reference:</b>	KB=22' @ 6262.0ft (Patterson 308)
<b>Site:</b>	O22NW	<b>North Reference:</b>	True
<b>Well:</b>	Pitman 22-15A	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Pitman 22-15A PBHL	0.00	0.00	8,832.0	-136.6	114.6	1,617,405.70	2,363,013.46	39.506816	-107.757809
- plan hits target center									
- Circle (radius 25.0)									
Pitman 22-15A TGT	0.00	0.00	6,783.0	-136.6	114.6	1,617,405.70	2,363,013.46	39.506816	-107.757809
- plan hits target center									
- Point									

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

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
4,961.1	4,959.0	Mesaverde Marker			
4,961.1	4,959.0	Ohio Creek			
5,674.5	5,672.0	Williams Fork			
6,786.2	6,783.0	Top Gas			
7,929.2	7,926.0	Coal Ridge			
8,685.2	8,682.0	Rollins			

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W	Comment	
(ft)	(ft)	(ft)	(ft)		
1,800.0	1,800.0	0.0	0.0	KOP @ 1,800'	
1,869.5	1,869.5	-1.0	0.8	EOB @ Inc. = 2.09°	
6,682.0	6,678.8	-135.1	113.3	Start 2° Drop	
6,786.2	6,783.0	-136.6	114.6	EOD @ Inc. = 0°	
8,835.2	8,832.0	-136.6	114.6	TD @ 8,835.2' MD	
8,935.2	8,932.0	-136.6	114.6	Permit TD @ 8,935.2' MD	