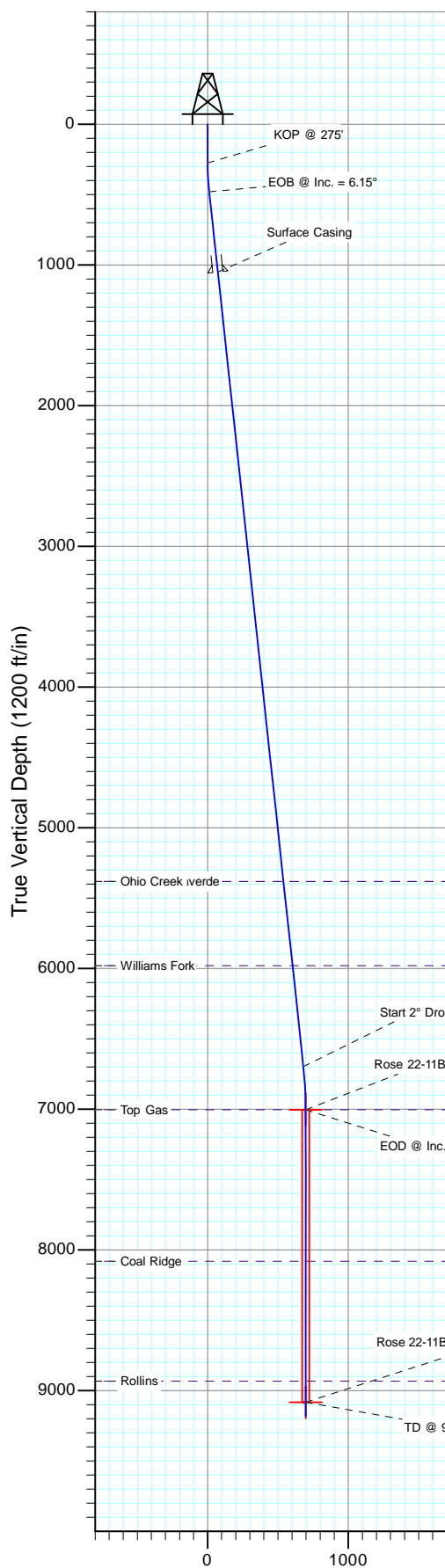
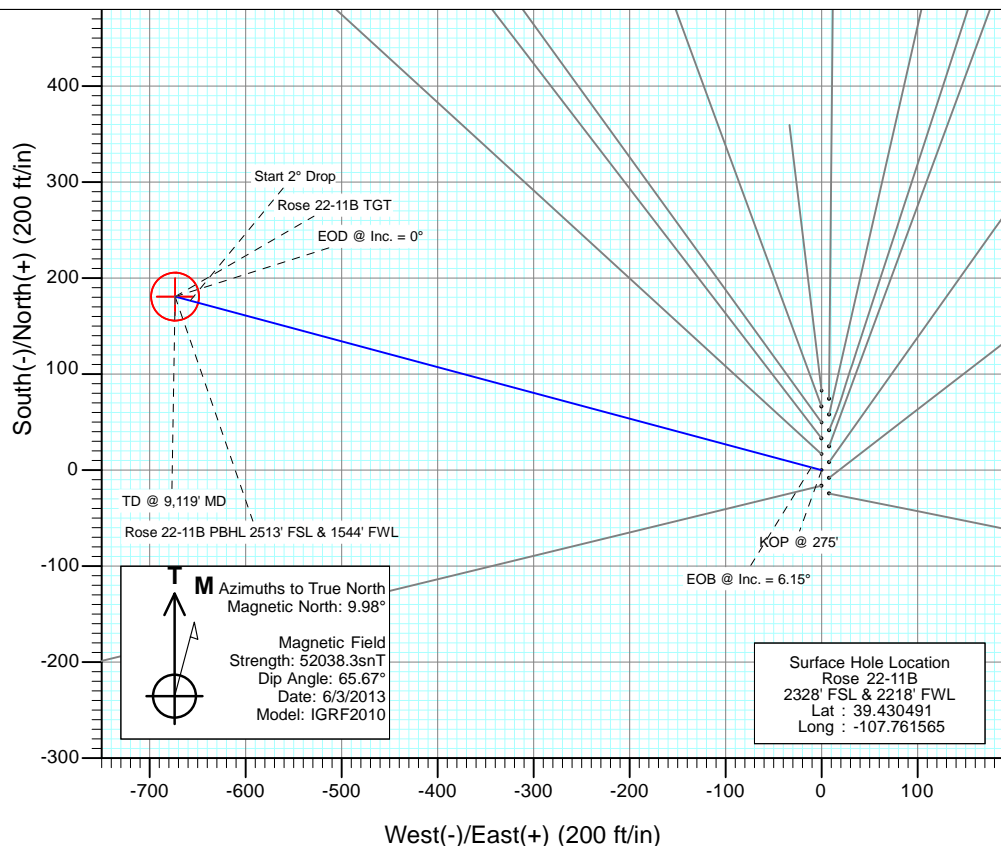




Project: Mamm Creek
Site: K22W Pad
Well: Rose 22-11B
Wellbore: OH
Design: Plan #1



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	275.0	0.00	0.00	275.0	0.0	0.0	0.00	0.00	0.0	
3	479.9	6.15	285.02	479.5	2.8	-10.6	3.00	285.02	11.0	
4	6733.5	6.15	285.02	6697.2	176.4	-657.5	0.00	0.00	680.7	
5	7041.0	0.00	0.00	7004.0	180.7	-673.4	2.00	180.00	697.2	Rose 22-11B TGT
6	9119.0	0.00	0.00	9082.0	180.7	-673.4	0.00	0.00	697.2	Rose 22-11B PBHL 2513' FSL & 1544' FWL
7	9219.0	0.00	0.00	9182.0	180.7	-673.4	0.00	0.00	697.2	

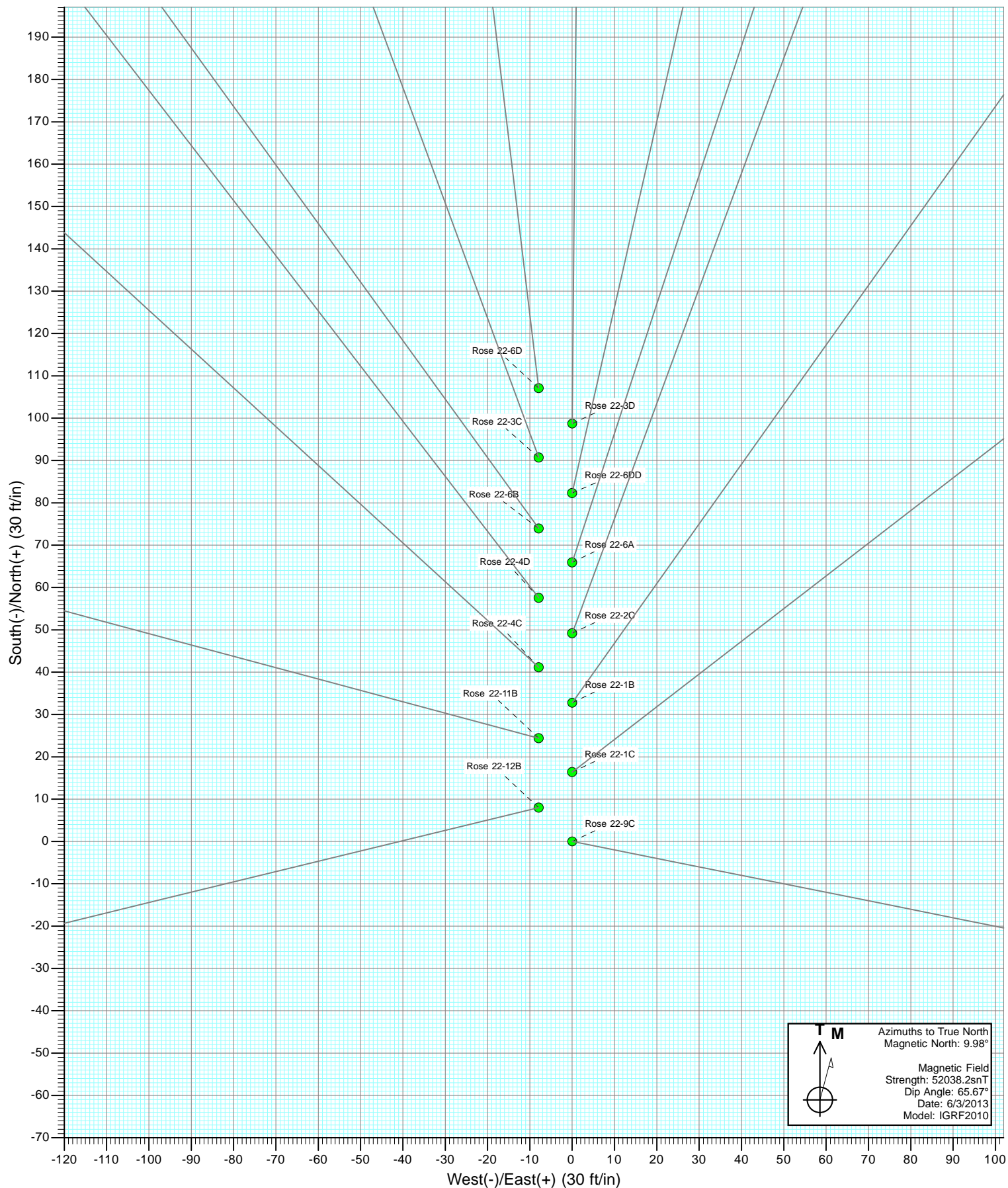


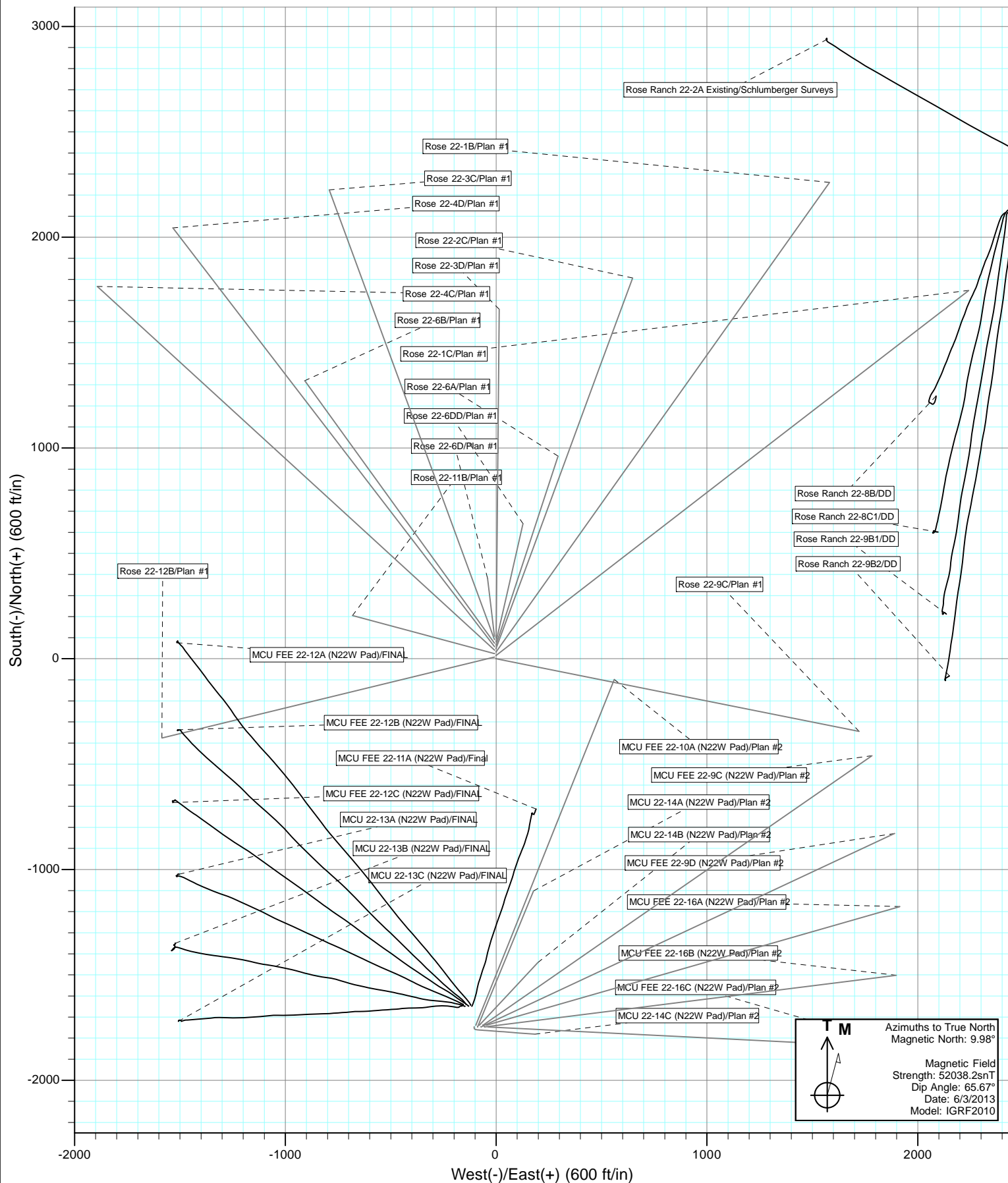
DESIGN TARGET DETAILS						
Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Rose 22-11B TGT	180.7	-673.4	1589837.61	2360593.31	39.430987	-107.763949
Rose 22-11B PBHL 2513' FSL & 1544' FWL	180.7	-673.4	1589837.61	2360593.31	39.430987	-107.763949

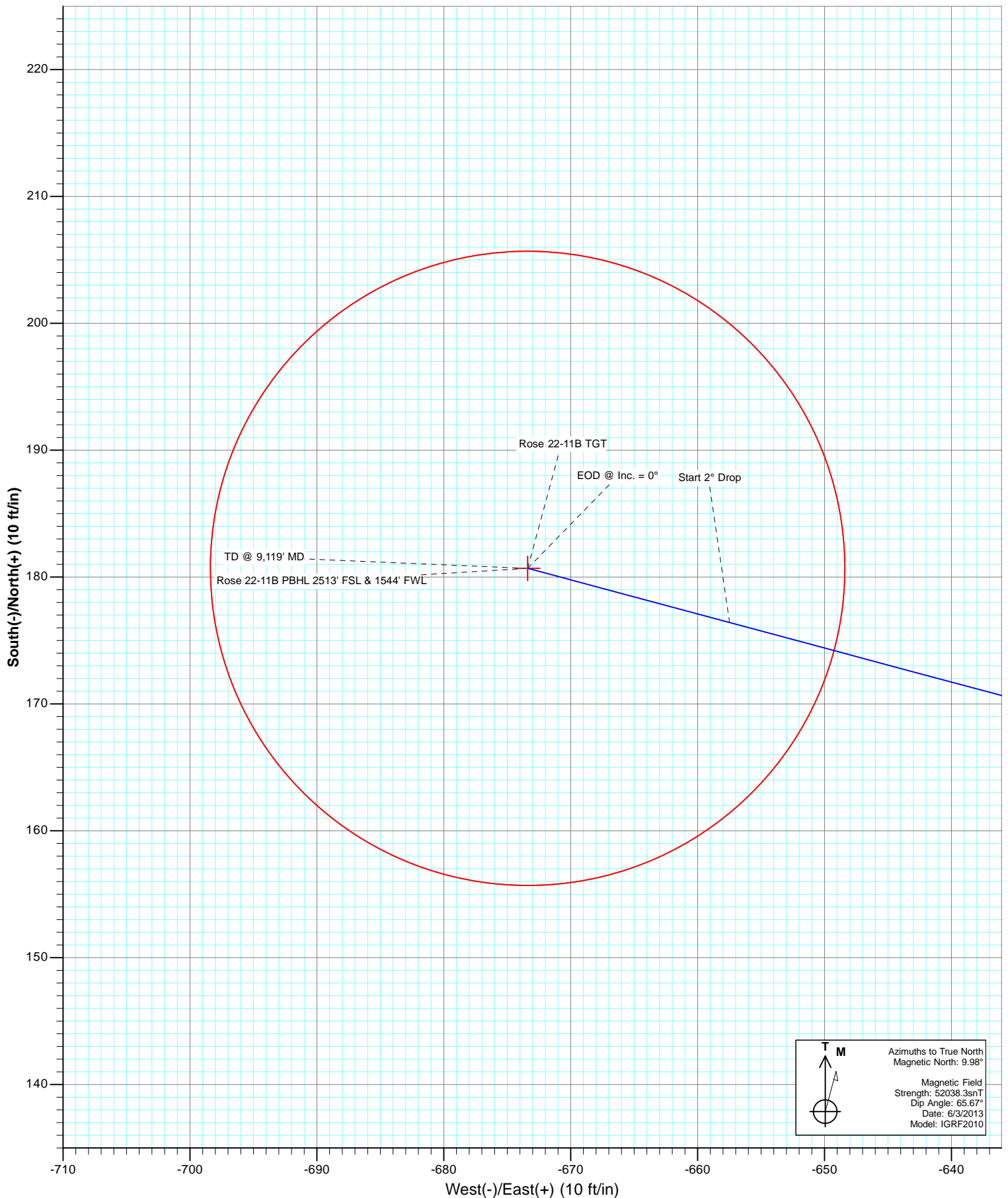
FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
5382.0	5410.8	Ohio Creek
5382.0	5410.8	Top of Mesaverde
5979.0	6011.2	Williams Fork
7004.0	7041.0	Top Gas
8081.0	8118.0	Coal Ridge
8932.0	8969.0	Rollins

Plan #1
Rose 22-11B
135XXX; SC
KB=22' @ 6972.0ft (Patterson #303)
Ground Elevation @ 6950.0
North American Datum 1983
Well Rose 22-11B, True North

Vertical Section at 285.02° (1200 ft/in)







Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Rose 22-11B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 6972.0ft (Patterson #303)
Project:	Mamm Creek	MD Reference:	KB=22' @ 6972.0ft (Patterson #303)
Site:	K22W Pad	North Reference:	True
Well:	Rose 22-11B	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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		K22W Pad			
Site Position:		Northing:		1,589,615.65 ft	
From:		Easting:		2,361,269.29 ft	
Position Uncertainty:		Slot Radius:		Grid Convergence:	
Lat/Long		0.0 ft		39.430424	
				-107.761537	
		13.200 in		-1.43 °	

Well	Rose 22-11B					
Well Position	+N/-S	0.0 ft	Northing:	1,589,640.22 ft	Latitude:	39.430491
	+E/-W	0.0 ft	Easting:	2,361,261.99 ft	Longitude:	-107.761565
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,950.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/3/2013	9.98	65.67	52,038

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	285.02

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	
275.0	0.00	0.00	275.0	0.0	0.0	0.00	0.00	0.00	0.00	
479.9	6.15	285.02	479.5	2.8	-10.6	3.00	3.00	0.00	285.02	
6,733.5	6.15	285.02	6,697.2	176.4	-657.5	0.00	0.00	0.00	0.00	
7,041.0	0.00	0.00	7,004.0	180.7	-673.4	2.00	-2.00	0.00	180.00	Rose 22-11B TGT
9,119.0	0.00	0.00	9,082.0	180.7	-673.4	0.00	0.00	0.00	0.00	Rose 22-11B PBHL 2'
9,219.0	0.00	0.00	9,182.0	180.7	-673.4	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 Rose 22-11B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 6972.0ft (Patterson #303)
Project:	Mamm Creek	MD Reference:	KB=22' @ 6972.0ft (Patterson #303)
Site:	K22W Pad	North Reference:	True
Well:	Rose 22-11B	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
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	
275.0	0.00	0.00	275.0	0.0	0.0	0.0	0.00	0.00	KOP @ 275'
300.0	0.75	285.02	300.0	0.0	-0.2	0.2	3.00	3.00	
400.0	3.75	285.02	399.9	1.1	-3.9	4.1	3.00	3.00	
479.9	6.15	285.02	479.5	2.8	-10.6	11.0	3.00	3.00	EOB @ Inc. = 6.15°
500.0	6.15	285.02	499.5	3.4	-12.7	13.1	0.00	0.00	
600.0	6.15	285.02	598.9	6.2	-23.0	23.8	0.00	0.00	
700.0	6.15	285.02	698.3	9.0	-33.4	34.6	0.00	0.00	
800.0	6.15	285.02	797.8	11.7	-43.7	45.3	0.00	0.00	
900.0	6.15	285.02	897.2	14.5	-54.1	56.0	0.00	0.00	
1,000.0	6.15	285.02	996.6	17.3	-64.4	66.7	0.00	0.00	
1,053.7	6.15	285.02	1,050.0	18.8	-70.0	72.4	0.00	0.00	Surface Casing
1,100.0	6.15	285.02	1,096.0	20.1	-74.7	77.4	0.00	0.00	
1,200.0	6.15	285.02	1,195.5	22.8	-85.1	88.1	0.00	0.00	
1,300.0	6.15	285.02	1,294.9	25.6	-95.4	98.8	0.00	0.00	
1,400.0	6.15	285.02	1,394.3	28.4	-105.8	109.5	0.00	0.00	
1,500.0	6.15	285.02	1,493.7	31.2	-116.1	120.2	0.00	0.00	
1,600.0	6.15	285.02	1,593.2	33.9	-126.5	130.9	0.00	0.00	
1,700.0	6.15	285.02	1,692.6	36.7	-136.8	141.7	0.00	0.00	
1,800.0	6.15	285.02	1,792.0	39.5	-147.2	152.4	0.00	0.00	
1,900.0	6.15	285.02	1,891.4	42.3	-157.5	163.1	0.00	0.00	
2,000.0	6.15	285.02	1,990.9	45.0	-167.8	173.8	0.00	0.00	
2,100.0	6.15	285.02	2,090.3	47.8	-178.2	184.5	0.00	0.00	
2,200.0	6.15	285.02	2,189.7	50.6	-188.5	195.2	0.00	0.00	
2,300.0	6.15	285.02	2,289.1	53.4	-198.9	205.9	0.00	0.00	
2,400.0	6.15	285.02	2,388.6	56.1	-209.2	216.6	0.00	0.00	
2,500.0	6.15	285.02	2,488.0	58.9	-219.6	227.3	0.00	0.00	
2,600.0	6.15	285.02	2,587.4	61.7	-229.9	238.0	0.00	0.00	
2,700.0	6.15	285.02	2,686.8	64.5	-240.2	248.7	0.00	0.00	
2,800.0	6.15	285.02	2,786.3	67.2	-250.6	259.5	0.00	0.00	
2,900.0	6.15	285.02	2,885.7	70.0	-260.9	270.2	0.00	0.00	
3,000.0	6.15	285.02	2,985.1	72.8	-271.3	280.9	0.00	0.00	
3,100.0	6.15	285.02	3,084.5	75.6	-281.6	291.6	0.00	0.00	
3,200.0	6.15	285.02	3,184.0	78.3	-292.0	302.3	0.00	0.00	
3,300.0	6.15	285.02	3,283.4	81.1	-302.3	313.0	0.00	0.00	
3,400.0	6.15	285.02	3,382.8	83.9	-312.7	323.7	0.00	0.00	
3,500.0	6.15	285.02	3,482.2	86.7	-323.0	334.4	0.00	0.00	
3,600.0	6.15	285.02	3,581.7	89.4	-333.3	345.1	0.00	0.00	
3,700.0	6.15	285.02	3,681.1	92.2	-343.7	355.8	0.00	0.00	
3,800.0	6.15	285.02	3,780.5	95.0	-354.0	366.6	0.00	0.00	
3,900.0	6.15	285.02	3,879.9	97.8	-364.4	377.3	0.00	0.00	
4,000.0	6.15	285.02	3,979.4	100.5	-374.7	388.0	0.00	0.00	
4,100.0	6.15	285.02	4,078.8	103.3	-385.1	398.7	0.00	0.00	
4,200.0	6.15	285.02	4,178.2	106.1	-395.4	409.4	0.00	0.00	
4,300.0	6.15	285.02	4,277.6	108.9	-405.8	420.1	0.00	0.00	
4,400.0	6.15	285.02	4,377.1	111.6	-416.1	430.8	0.00	0.00	
4,500.0	6.15	285.02	4,476.5	114.4	-426.4	441.5	0.00	0.00	
4,600.0	6.15	285.02	4,575.9	117.2	-436.8	452.2	0.00	0.00	
4,700.0	6.15	285.02	4,675.3	120.0	-447.1	462.9	0.00	0.00	
4,800.0	6.15	285.02	4,774.8	122.8	-457.5	473.7	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Rose 22-11B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 6972.0ft (Patterson #303)
Project:	Mamm Creek	MD Reference:	KB=22' @ 6972.0ft (Patterson #303)
Site:	K22W Pad	North Reference:	True
Well:	Rose 22-11B	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
4,900.0	6.15	285.02	4,874.2	125.5	-467.8	484.4	0.00	0.00	
5,000.0	6.15	285.02	4,973.6	128.3	-478.2	495.1	0.00	0.00	
5,100.0	6.15	285.02	5,073.0	131.1	-488.5	505.8	0.00	0.00	
5,200.0	6.15	285.02	5,172.5	133.9	-498.8	516.5	0.00	0.00	
5,300.0	6.15	285.02	5,271.9	136.6	-509.2	527.2	0.00	0.00	
5,400.0	6.15	285.02	5,371.3	139.4	-519.5	537.9	0.00	0.00	
5,410.8	6.15	285.02	5,382.0	139.7	-520.6	539.1	0.00	0.00	Top of Mesaverde - Ohio Creek
5,500.0	6.15	285.02	5,470.7	142.2	-529.9	548.6	0.00	0.00	
5,600.0	6.15	285.02	5,570.2	145.0	-540.2	559.3	0.00	0.00	
5,700.0	6.15	285.02	5,669.6	147.7	-550.6	570.0	0.00	0.00	
5,800.0	6.15	285.02	5,769.0	150.5	-560.9	580.8	0.00	0.00	
5,900.0	6.15	285.02	5,868.4	153.3	-571.3	591.5	0.00	0.00	
6,000.0	6.15	285.02	5,967.9	156.1	-581.6	602.2	0.00	0.00	
6,011.2	6.15	285.02	5,979.0	156.4	-582.8	603.4	0.00	0.00	Williams Fork
6,100.0	6.15	285.02	6,067.3	158.8	-591.9	612.9	0.00	0.00	
6,200.0	6.15	285.02	6,166.7	161.6	-602.3	623.6	0.00	0.00	
6,300.0	6.15	285.02	6,266.1	164.4	-612.6	634.3	0.00	0.00	
6,400.0	6.15	285.02	6,365.6	167.2	-623.0	645.0	0.00	0.00	
6,500.0	6.15	285.02	6,465.0	169.9	-633.3	655.7	0.00	0.00	
6,600.0	6.15	285.02	6,564.4	172.7	-643.7	666.4	0.00	0.00	
6,700.0	6.15	285.02	6,663.8	175.5	-654.0	677.1	0.00	0.00	
6,733.5	6.15	285.02	6,697.2	176.4	-657.5	680.7	0.00	0.00	Start 2° Drop
6,800.0	4.82	285.02	6,763.3	178.1	-663.6	687.1	2.00	-2.00	
6,900.0	2.82	285.02	6,863.1	179.8	-670.0	693.7	2.00	-2.00	
7,000.0	0.82	285.02	6,963.1	180.6	-673.1	696.9	2.00	-2.00	
7,041.0	0.00	0.00	7,004.0	180.7	-673.4	697.2	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
7,100.0	0.00	0.00	7,063.0	180.7	-673.4	697.2	0.00	0.00	
7,200.0	0.00	0.00	7,163.0	180.7	-673.4	697.2	0.00	0.00	
7,300.0	0.00	0.00	7,263.0	180.7	-673.4	697.2	0.00	0.00	
7,400.0	0.00	0.00	7,363.0	180.7	-673.4	697.2	0.00	0.00	
7,500.0	0.00	0.00	7,463.0	180.7	-673.4	697.2	0.00	0.00	
7,600.0	0.00	0.00	7,563.0	180.7	-673.4	697.2	0.00	0.00	
7,700.0	0.00	0.00	7,663.0	180.7	-673.4	697.2	0.00	0.00	
7,800.0	0.00	0.00	7,763.0	180.7	-673.4	697.2	0.00	0.00	
7,900.0	0.00	0.00	7,863.0	180.7	-673.4	697.2	0.00	0.00	
8,000.0	0.00	0.00	7,963.0	180.7	-673.4	697.2	0.00	0.00	
8,100.0	0.00	0.00	8,063.0	180.7	-673.4	697.2	0.00	0.00	
8,118.0	0.00	0.00	8,081.0	180.7	-673.4	697.2	0.00	0.00	Coal Ridge
8,200.0	0.00	0.00	8,163.0	180.7	-673.4	697.2	0.00	0.00	
8,300.0	0.00	0.00	8,263.0	180.7	-673.4	697.2	0.00	0.00	
8,400.0	0.00	0.00	8,363.0	180.7	-673.4	697.2	0.00	0.00	
8,500.0	0.00	0.00	8,463.0	180.7	-673.4	697.2	0.00	0.00	
8,600.0	0.00	0.00	8,563.0	180.7	-673.4	697.2	0.00	0.00	
8,700.0	0.00	0.00	8,663.0	180.7	-673.4	697.2	0.00	0.00	
8,800.0	0.00	0.00	8,763.0	180.7	-673.4	697.2	0.00	0.00	
8,900.0	0.00	0.00	8,863.0	180.7	-673.4	697.2	0.00	0.00	
8,969.0	0.00	0.00	8,932.0	180.7	-673.4	697.2	0.00	0.00	Rollins
9,000.0	0.00	0.00	8,963.0	180.7	-673.4	697.2	0.00	0.00	
9,100.0	0.00	0.00	9,063.0	180.7	-673.4	697.2	0.00	0.00	
9,119.0	0.00	0.00	9,082.0	180.7	-673.4	697.2	0.00	0.00	TD @ 9,119' MD
9,200.0	0.00	0.00	9,163.0	180.7	-673.4	697.2	0.00	0.00	
9,219.0	0.00	0.00	9,182.0	180.7	-673.4	697.2	0.00	0.00	Permit TD @ 9,219' MD

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Rose 22-11B
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 6972.0ft (Patterson #303)
Project:	Mamm Creek	MD Reference:	KB=22' @ 6972.0ft (Patterson #303)
Site:	K22W Pad	North Reference:	True
Well:	Rose 22-11B	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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)		
Rose 22-11B TGT	0.00	0.00	7,004.0	180.7	-673.4	1,589,837.61	2,360,593.31	39.430987	-107.763949
- plan hits target center									
- Point									
Rose 22-11B PBHL 251'	0.00	0.00	9,082.0	180.7	-673.4	1,589,837.61	2,360,593.31	39.430987	-107.763949
- plan hits target center									
- Circle (radius 25.0)									

Casing Points				
Measured Depth	Vertical Depth		Casing Diameter	Hole Diameter
(ft)	(ft)	Name	(in)	(in)
1,053.7	1,050.0	Surface Casing		

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
5,410.8	5,382.0	Top of Mesaverde			
5,410.8	5,382.0	Ohio Creek			
6,011.2	5,979.0	Williams Fork			
7,041.0	7,004.0	Top Gas			
8,118.0	8,081.0	Coal Ridge			
8,969.0	8,932.0	Rollins			

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
275.0	275.0	0.0	0.0	KOP @ 275'
479.9	479.5	2.8	-10.6	EOB @ Inc. = 6.15°
6,733.5	6,697.2	176.4	-657.5	Start 2° Drop
7,041.0	7,004.0	180.7	-673.4	EOD @ Inc. = 0°
9,119.0	9,082.0	180.7	-673.4	TD @ 9,119' MD
9,219.0	9,182.0	180.7	-673.4	Permit TD @ 9,219' MD