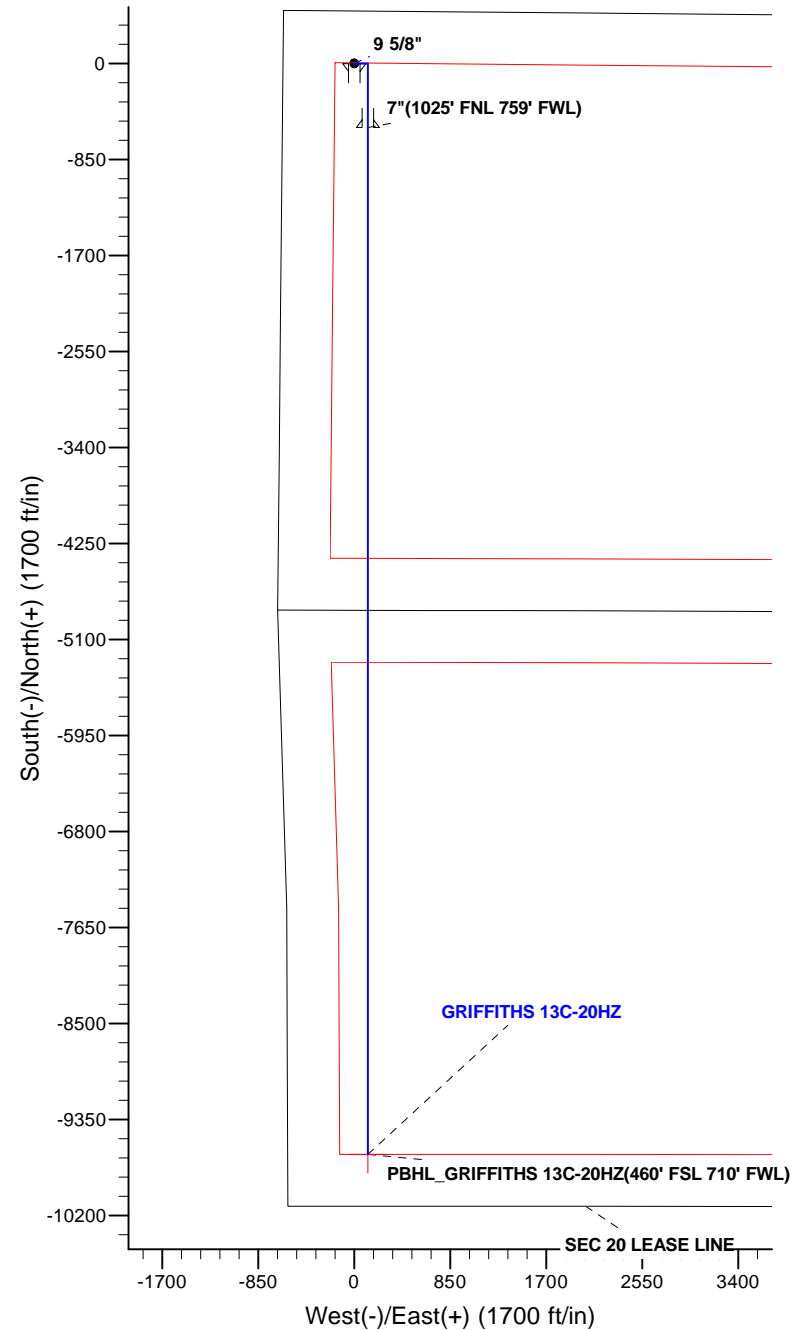
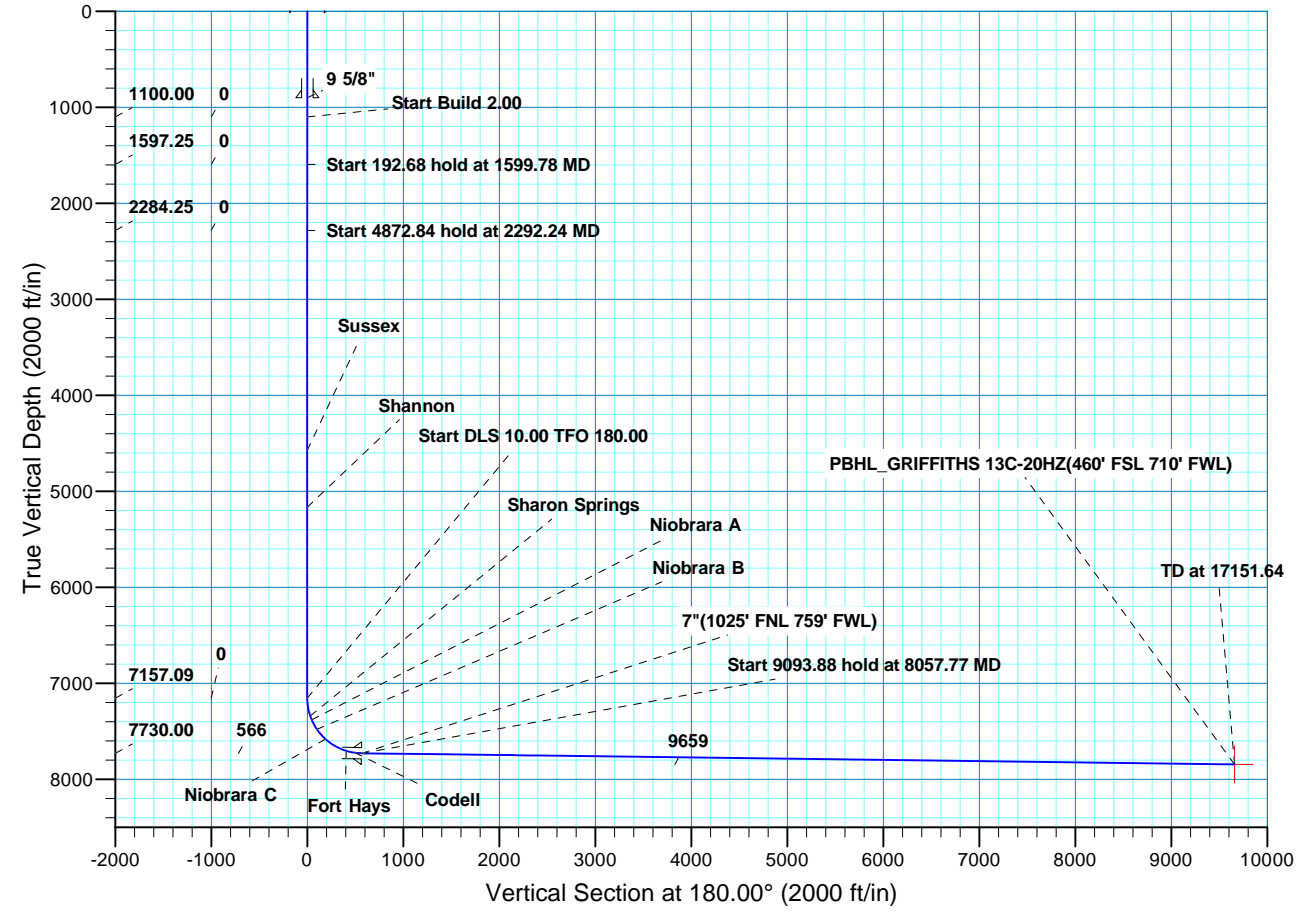




WELL DETAILS: GRIFFITHS 13C-20HZ											
GL 5095 & KB 25 @ 5095.00ft (ASSUMED)											
+N/-S		+E/-W		Northing		Easting		Latitude		Longitude	
0.00		0.00		1264176.57		3161871.81		40.0571050		-104.9217150	
SECTION DETAILS											
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	0.00		
1599.78	10.00	90.00	1597.25	0.00	43.48	2.00	90.00	0.00	0.00		
1792.46	10.00	90.00	1787.00	0.00	76.93	0.00	0.00	0.00	0.00		
2292.24	0.00	0.00	2284.25	0.00	120.41	2.00	180.00	0.00	0.00		
7165.08	0.00	0.00	7157.09	0.00	120.41	0.00	0.00	0.00	0.00		
8057.77	89.27	180.00	7730.00	-565.65	120.41	10.00	180.00	565.65	0.00		
17151.64	89.27	180.00	7846.00	-9658.78	120.41	0.00	0.009658.78	PBHL_GRIFFITHS 13C-20HZ(460' FSL 710' FWL)			
FORMATION TOP DETAILS								CASING DETAILS			
TVDPath	MDPath	Formation		Inc				TVD	MD	Name	Size
4577.00	4584.99	Sussex		0.00				900.00	900.00	9 5/8"	9.625
5168.00	5175.99	Shannon		0.00				7730.00	8057.77	7"	7.000
7341.00	7352.30	Sharon Springs		18.72							
7381.00	7395.12	Niobrara A		23.00							
7480.00	7508.12	Niobrara B		34.30							
7583.00	7645.26	Niobrara C		48.02							
7705.00	7895.04	Fort Hays		73.00							
7725.00	7988.97	Codell		82.39							





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

GRIFFITHS 4-17HZ PAD

GRIFFITHS 13C-20HZ

OH

Plan: PLAN #1 PRELIMINARY

Standard Planning Report

06 May, 2013

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 13C-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Site:	GRIFFITHS 4-17HZ PAD	North Reference:	True
Well:	GRIFFITHS 13C-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Project	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	GRIFFITHS 4-17HZ PAD, SECTION 17 T1N R67W			
Site Position:		Northing:	1,264,176.57 usft	Latitude: 40.0571050
From:	Lat/Long	Easting:	3,161,871.82 usft	Longitude: -104.9217150
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.37 °

Well	GRIFFITHS 13C-20HZ, 465' FNL 630' FWL			
Well Position	+N/-S	0.00 ft	Northing:	1,264,176.57 usft
	+E/-W	0.00 ft	Easting:	3,161,871.82 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:		Ground Level: 5,070.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2012	2013/05/06	8.72	66.66	52,635

Design	PLAN #1 PRELIMINARY			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	180.00

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,599.78	10.00	90.00	1,597.25	0.00	43.48	2.00	2.00	0.00	90.00	
1,792.46	10.00	90.00	1,787.00	0.00	76.93	0.00	0.00	0.00	0.00	
2,292.24	0.00	0.00	2,284.25	0.00	120.41	2.00	-2.00	0.00	180.00	
7,165.08	0.00	0.00	7,157.09	0.00	120.41	0.00	0.00	0.00	0.00	
8,057.77	89.27	180.00	7,730.00	-565.65	120.41	10.00	10.00	20.16	180.00	
17,151.64	89.27	180.00	7,846.00	-9,658.79	120.41	0.00	0.00	0.00	0.00	PBHL_GRIFFITHS 13

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 13C-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Site:	GRIFFITHS 4-17HZ PAD	North Reference:	True
Well:	GRIFFITHS 13C-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

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)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,200.00	2.00	90.00	1,199.98	0.00	1.75	0.00	2.00	2.00	0.00
1,300.00	4.00	90.00	1,299.84	0.00	6.98	0.00	2.00	2.00	0.00
1,400.00	6.00	90.00	1,399.45	0.00	15.69	0.00	2.00	2.00	0.00
1,500.00	8.00	90.00	1,498.70	0.00	27.88	0.00	2.00	2.00	0.00
1,599.78	10.00	90.00	1,597.25	0.00	43.48	0.00	2.00	2.00	0.00
Start 192.68 hold at 1599.78 MD									
1,600.00	10.00	90.00	1,597.47	0.00	43.52	0.00	0.00	0.00	0.00
1,700.00	10.00	90.00	1,695.95	0.00	60.88	0.00	0.00	0.00	0.00
1,792.46	10.00	90.00	1,787.00	0.00	76.93	0.00	0.00	0.00	0.00
Start Drop -2.00									
1,800.00	9.84	90.00	1,794.43	0.00	78.23	0.00	2.00	-2.00	0.00
1,900.00	7.84	90.00	1,893.24	0.00	93.60	0.00	2.00	-2.00	0.00
2,000.00	5.84	90.00	1,992.52	0.00	105.52	0.00	2.00	-2.00	0.00
2,100.00	3.84	90.00	2,092.16	0.00	113.96	0.00	2.00	-2.00	0.00
2,200.00	1.84	90.00	2,192.03	0.00	118.93	0.00	2.00	-2.00	0.00
2,292.24	0.00	0.00	2,284.25	0.00	120.41	0.00	2.00	-2.00	0.00
Start 4872.84 hold at 2292.24 MD									
2,300.00	0.00	0.00	2,292.01	0.00	120.41	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,392.01	0.00	120.41	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,492.01	0.00	120.41	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,592.01	0.00	120.41	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,692.01	0.00	120.41	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,792.01	0.00	120.41	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,892.01	0.00	120.41	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	2,992.01	0.00	120.41	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,092.01	0.00	120.41	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,192.01	0.00	120.41	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,292.01	0.00	120.41	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,392.01	0.00	120.41	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,492.01	0.00	120.41	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,592.01	0.00	120.41	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,692.01	0.00	120.41	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,792.01	0.00	120.41	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,892.01	0.00	120.41	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	3,992.01	0.00	120.41	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,092.01	0.00	120.41	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,192.01	0.00	120.41	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,292.01	0.00	120.41	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,392.01	0.00	120.41	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,492.01	0.00	120.41	0.00	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 13C-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Site:	GRIFFITHS 4-17HZ PAD	North Reference:	True
Well:	GRIFFITHS 13C-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

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)	Turn Rate (°/100ft)
4,584.99	0.00	0.00	4,577.00	0.00	120.41	0.00	0.00	0.00	0.00
Sussex									
4,600.00	0.00	0.00	4,592.01	0.00	120.41	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,692.01	0.00	120.41	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,792.01	0.00	120.41	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,892.01	0.00	120.41	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,992.01	0.00	120.41	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,092.01	0.00	120.41	0.00	0.00	0.00	0.00
5,175.99	0.00	0.00	5,168.00	0.00	120.41	0.00	0.00	0.00	0.00
Shannon									
5,200.00	0.00	0.00	5,192.01	0.00	120.41	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,292.01	0.00	120.41	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,392.01	0.00	120.41	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,492.01	0.00	120.41	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,592.01	0.00	120.41	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,692.01	0.00	120.41	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,792.01	0.00	120.41	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,892.01	0.00	120.41	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,992.01	0.00	120.41	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,092.01	0.00	120.41	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,192.01	0.00	120.41	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,292.01	0.00	120.41	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,392.01	0.00	120.41	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,492.01	0.00	120.41	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,592.01	0.00	120.41	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,692.01	0.00	120.41	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,792.01	0.00	120.41	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,892.01	0.00	120.41	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,992.01	0.00	120.41	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,092.01	0.00	120.41	0.00	0.00	0.00	0.00
7,165.08	0.00	0.00	7,157.09	0.00	120.41	0.00	0.00	0.00	0.00
Start DLS 10.00 TFO 180.00									
7,200.00	3.49	180.00	7,191.99	-1.06	120.41	1.06	10.00	10.00	0.00
7,300.00	13.49	180.00	7,290.77	-15.81	120.41	15.81	10.00	10.00	0.00
7,352.30	18.72	180.00	7,341.00	-30.32	120.41	30.32	10.00	10.00	0.00
Sharon Springs									
7,395.12	23.00	180.00	7,381.00	-45.56	120.41	45.56	10.00	10.00	0.00
Niobrara A									
7,400.00	23.49	180.00	7,385.49	-47.49	120.41	47.49	10.00	10.00	0.00
7,500.00	33.49	180.00	7,473.26	-95.13	120.41	95.13	10.00	10.00	0.00
7,508.12	34.30	180.00	7,480.00	-99.66	120.41	99.66	10.00	10.00	0.00
Niobrara B									
7,600.00	43.49	180.00	7,551.43	-157.30	120.41	157.30	10.00	10.00	0.00
7,645.26	48.02	180.00	7,583.00	-189.71	120.41	189.71	10.00	10.00	0.00
Niobrara C									
7,700.00	53.49	180.00	7,617.62	-232.09	120.41	232.09	10.00	10.00	0.00
7,800.00	63.49	180.00	7,669.82	-317.24	120.41	317.24	10.00	10.00	0.00
7,895.04	73.00	180.00	7,705.00	-405.40	120.41	405.40	10.00	10.00	0.00
Fort Hays									
7,900.00	73.49	180.00	7,706.43	-410.15	120.41	410.15	10.00	10.00	0.00
7,988.97	82.39	180.00	7,725.00	-497.07	120.41	497.07	10.00	10.00	0.00
Codell									
8,000.00	83.49	180.00	7,726.36	-508.02	120.41	508.02	10.00	10.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 13C-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Site:	GRIFFITHS 4-17HZ PAD	North Reference:	True
Well:	GRIFFITHS 13C-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

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)	Turn Rate (°/100ft)
8,057.77	89.27	180.00	7,730.00	-565.65	120.41	565.65	10.00	10.00	0.00
Start 9093.88 hold at 8057.77 MD - 7" (1025' FNL 759' FWL)									
8,100.00	89.27	180.00	7,730.54	-607.88	120.41	607.88	0.00	0.00	0.00
8,200.00	89.27	180.00	7,731.82	-707.87	120.41	707.87	0.00	0.00	0.00
8,300.00	89.27	180.00	7,733.09	-807.86	120.41	807.86	0.00	0.00	0.00
8,400.00	89.27	180.00	7,734.37	-907.85	120.41	907.85	0.00	0.00	0.00
8,500.00	89.27	180.00	7,735.64	-1,007.84	120.41	1,007.84	0.00	0.00	0.00
8,600.00	89.27	180.00	7,736.92	-1,107.84	120.41	1,107.84	0.00	0.00	0.00
8,700.00	89.27	180.00	7,738.19	-1,207.83	120.41	1,207.83	0.00	0.00	0.00
8,800.00	89.27	180.00	7,739.47	-1,307.82	120.41	1,307.82	0.00	0.00	0.00
8,900.00	89.27	180.00	7,740.74	-1,407.81	120.41	1,407.81	0.00	0.00	0.00
9,000.00	89.27	180.00	7,742.02	-1,507.80	120.41	1,507.80	0.00	0.00	0.00
9,100.00	89.27	180.00	7,743.30	-1,607.80	120.41	1,607.80	0.00	0.00	0.00
9,200.00	89.27	180.00	7,744.57	-1,707.79	120.41	1,707.79	0.00	0.00	0.00
9,300.00	89.27	180.00	7,745.85	-1,807.78	120.41	1,807.78	0.00	0.00	0.00
9,400.00	89.27	180.00	7,747.12	-1,907.77	120.41	1,907.77	0.00	0.00	0.00
9,500.00	89.27	180.00	7,748.40	-2,007.76	120.41	2,007.76	0.00	0.00	0.00
9,600.00	89.27	180.00	7,749.67	-2,107.76	120.41	2,107.76	0.00	0.00	0.00
9,700.00	89.27	180.00	7,750.95	-2,207.75	120.41	2,207.75	0.00	0.00	0.00
9,800.00	89.27	180.00	7,752.22	-2,307.74	120.41	2,307.74	0.00	0.00	0.00
9,900.00	89.27	180.00	7,753.50	-2,407.73	120.41	2,407.73	0.00	0.00	0.00
10,000.00	89.27	180.00	7,754.78	-2,507.72	120.41	2,507.72	0.00	0.00	0.00
10,100.00	89.27	180.00	7,756.05	-2,607.71	120.41	2,607.71	0.00	0.00	0.00
10,200.00	89.27	180.00	7,757.33	-2,707.71	120.41	2,707.71	0.00	0.00	0.00
10,300.00	89.27	180.00	7,758.60	-2,807.70	120.41	2,807.70	0.00	0.00	0.00
10,400.00	89.27	180.00	7,759.88	-2,907.69	120.41	2,907.69	0.00	0.00	0.00
10,500.00	89.27	180.00	7,761.15	-3,007.68	120.41	3,007.68	0.00	0.00	0.00
10,600.00	89.27	180.00	7,762.43	-3,107.67	120.41	3,107.67	0.00	0.00	0.00
10,700.00	89.27	180.00	7,763.70	-3,207.67	120.41	3,207.67	0.00	0.00	0.00
10,800.00	89.27	180.00	7,764.98	-3,307.66	120.41	3,307.66	0.00	0.00	0.00
10,900.00	89.27	180.00	7,766.26	-3,407.65	120.41	3,407.65	0.00	0.00	0.00
11,000.00	89.27	180.00	7,767.53	-3,507.64	120.41	3,507.64	0.00	0.00	0.00
11,100.00	89.27	180.00	7,768.81	-3,607.63	120.41	3,607.63	0.00	0.00	0.00
11,200.00	89.27	180.00	7,770.08	-3,707.63	120.41	3,707.63	0.00	0.00	0.00
11,300.00	89.27	180.00	7,771.36	-3,807.62	120.41	3,807.62	0.00	0.00	0.00
11,400.00	89.27	180.00	7,772.63	-3,907.61	120.41	3,907.61	0.00	0.00	0.00
11,500.00	89.27	180.00	7,773.91	-4,007.60	120.41	4,007.60	0.00	0.00	0.00
11,600.00	89.27	180.00	7,775.19	-4,107.59	120.41	4,107.59	0.00	0.00	0.00
11,700.00	89.27	180.00	7,776.46	-4,207.58	120.41	4,207.58	0.00	0.00	0.00
11,800.00	89.27	180.00	7,777.74	-4,307.58	120.41	4,307.58	0.00	0.00	0.00
11,900.00	89.27	180.00	7,779.01	-4,407.57	120.41	4,407.57	0.00	0.00	0.00
12,000.00	89.27	180.00	7,780.29	-4,507.56	120.41	4,507.56	0.00	0.00	0.00
12,100.00	89.27	180.00	7,781.56	-4,607.55	120.41	4,607.55	0.00	0.00	0.00
12,200.00	89.27	180.00	7,782.84	-4,707.54	120.41	4,707.54	0.00	0.00	0.00
12,300.00	89.27	180.00	7,784.11	-4,807.54	120.41	4,807.54	0.00	0.00	0.00
12,400.00	89.27	180.00	7,785.39	-4,907.53	120.41	4,907.53	0.00	0.00	0.00
12,500.00	89.27	180.00	7,786.67	-5,007.52	120.41	5,007.52	0.00	0.00	0.00
12,600.00	89.27	180.00	7,787.94	-5,107.51	120.41	5,107.51	0.00	0.00	0.00
12,700.00	89.27	180.00	7,789.22	-5,207.50	120.41	5,207.50	0.00	0.00	0.00
12,800.00	89.27	180.00	7,790.49	-5,307.50	120.41	5,307.50	0.00	0.00	0.00
12,900.00	89.27	180.00	7,791.77	-5,407.49	120.41	5,407.49	0.00	0.00	0.00
13,000.00	89.27	180.00	7,793.04	-5,507.48	120.41	5,507.48	0.00	0.00	0.00
13,100.00	89.27	180.00	7,794.32	-5,607.47	120.41	5,607.47	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 13C-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Site:	GRIFFITHS 4-17HZ PAD	North Reference:	True
Well:	GRIFFITHS 13C-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

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)	Turn Rate (°/100ft)
13,200.00	89.27	180.00	7,795.59	-5,707.46	120.41	5,707.46	0.00	0.00	0.00
13,300.00	89.27	180.00	7,796.87	-5,807.45	120.41	5,807.45	0.00	0.00	0.00
13,400.00	89.27	180.00	7,798.15	-5,907.45	120.41	5,907.45	0.00	0.00	0.00
13,500.00	89.27	180.00	7,799.42	-6,007.44	120.41	6,007.44	0.00	0.00	0.00
13,600.00	89.27	180.00	7,800.70	-6,107.43	120.41	6,107.43	0.00	0.00	0.00
13,700.00	89.27	180.00	7,801.97	-6,207.42	120.41	6,207.42	0.00	0.00	0.00
13,800.00	89.27	180.00	7,803.25	-6,307.41	120.41	6,307.41	0.00	0.00	0.00
13,900.00	89.27	180.00	7,804.52	-6,407.41	120.41	6,407.41	0.00	0.00	0.00
14,000.00	89.27	180.00	7,805.80	-6,507.40	120.41	6,507.40	0.00	0.00	0.00
14,100.00	89.27	180.00	7,807.07	-6,607.39	120.41	6,607.39	0.00	0.00	0.00
14,200.00	89.27	180.00	7,808.35	-6,707.38	120.41	6,707.38	0.00	0.00	0.00
14,300.00	89.27	180.00	7,809.63	-6,807.37	120.41	6,807.37	0.00	0.00	0.00
14,400.00	89.27	180.00	7,810.90	-6,907.36	120.41	6,907.36	0.00	0.00	0.00
14,500.00	89.27	180.00	7,812.18	-7,007.36	120.41	7,007.36	0.00	0.00	0.00
14,600.00	89.27	180.00	7,813.45	-7,107.35	120.41	7,107.35	0.00	0.00	0.00
14,700.00	89.27	180.00	7,814.73	-7,207.34	120.41	7,207.34	0.00	0.00	0.00
14,800.00	89.27	180.00	7,816.00	-7,307.33	120.41	7,307.33	0.00	0.00	0.00
14,900.00	89.27	180.00	7,817.28	-7,407.32	120.41	7,407.32	0.00	0.00	0.00
15,000.00	89.27	180.00	7,818.55	-7,507.32	120.41	7,507.32	0.00	0.00	0.00
15,100.00	89.27	180.00	7,819.83	-7,607.31	120.41	7,607.31	0.00	0.00	0.00
15,200.00	89.27	180.00	7,821.11	-7,707.30	120.41	7,707.30	0.00	0.00	0.00
15,300.00	89.27	180.00	7,822.38	-7,807.29	120.41	7,807.29	0.00	0.00	0.00
15,400.00	89.27	180.00	7,823.66	-7,907.28	120.41	7,907.28	0.00	0.00	0.00
15,500.00	89.27	180.00	7,824.93	-8,007.28	120.41	8,007.28	0.00	0.00	0.00
15,600.00	89.27	180.00	7,826.21	-8,107.27	120.41	8,107.27	0.00	0.00	0.00
15,700.00	89.27	180.00	7,827.48	-8,207.26	120.41	8,207.26	0.00	0.00	0.00
15,800.00	89.27	180.00	7,828.76	-8,307.25	120.41	8,307.25	0.00	0.00	0.00
15,900.00	89.27	180.00	7,830.03	-8,407.24	120.41	8,407.24	0.00	0.00	0.00
16,000.00	89.27	180.00	7,831.31	-8,507.23	120.41	8,507.23	0.00	0.00	0.00
16,100.00	89.27	180.00	7,832.59	-8,607.23	120.41	8,607.23	0.00	0.00	0.00
16,200.00	89.27	180.00	7,833.86	-8,707.22	120.41	8,707.22	0.00	0.00	0.00
16,300.00	89.27	180.00	7,835.14	-8,807.21	120.41	8,807.21	0.00	0.00	0.00
16,400.00	89.27	180.00	7,836.41	-8,907.20	120.41	8,907.20	0.00	0.00	0.00
16,500.00	89.27	180.00	7,837.69	-9,007.19	120.41	9,007.19	0.00	0.00	0.00
16,600.00	89.27	180.00	7,838.96	-9,107.19	120.41	9,107.19	0.00	0.00	0.00
16,700.00	89.27	180.00	7,840.24	-9,207.18	120.41	9,207.18	0.00	0.00	0.00
16,800.00	89.27	180.00	7,841.51	-9,307.17	120.41	9,307.17	0.00	0.00	0.00
16,900.00	89.27	180.00	7,842.79	-9,407.16	120.41	9,407.16	0.00	0.00	0.00
17,000.00	89.27	180.00	7,844.07	-9,507.15	120.41	9,507.15	0.00	0.00	0.00
17,100.00	89.27	180.00	7,845.34	-9,607.15	120.41	9,607.15	0.00	0.00	0.00
17,151.64	89.27	180.00	7,846.00	-9,658.79	120.41	9,658.79	0.00	0.00	0.00
TD at 17151.64 - PBHL_GRIFFITHS 13C-20HZ(460' FSL 710' FWL)									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL_GRIFFITHS 13C-	0.00	0.00	7,846.00	-9,658.79	120.41	1,254,518.79	3,162,055.21	40.0305900	-104.9212850
- plan hits target center									
- Point									

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRIFFITHS 13C-20HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5095 & KB 25 @ 5095.00ft (ASSUMED)
Site:	GRIFFITHS 4-17HZ PAD	North Reference:	True
Well:	GRIFFITHS 13C-20HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
900.00	900.00	9 5/8"	9.625	12.250	
8,057.77	7,730.00	7"(1025' FNL 759' FWL)	7.000	7.500	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,584.99	4,577.00	Sussex				
5,175.99	5,168.00	Shannon				
7,352.30	7,341.00	Sharon Springs				
7,395.12	7,381.00	Niobrara A				
7,508.12	7,480.00	Niobrara B				
7,645.26	7,583.00	Niobrara C				
7,895.04	7,705.00	Fort Hays				
7,988.97	7,725.00	Codell				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,100.00	1,100.00	0.00	0.00	Start Build 2.00	
1,599.78	1,597.25	0.00	43.48	Start 192.68 hold at 1599.78 MD	
1,792.46	1,787.00	0.00	76.93	Start Drop -2.00	
2,292.24	2,284.25	0.00	120.41	Start 4872.84 hold at 2292.24 MD	
7,165.08	7,157.09	0.00	120.41	Start DLS 10.00 TFO 180.00	
8,057.77	7,730.00	-565.65	120.41	Start 9093.88 hold at 8057.77 MD	
17,151.64	7,846.00	-9,658.79	120.41	TD at 17151.64	