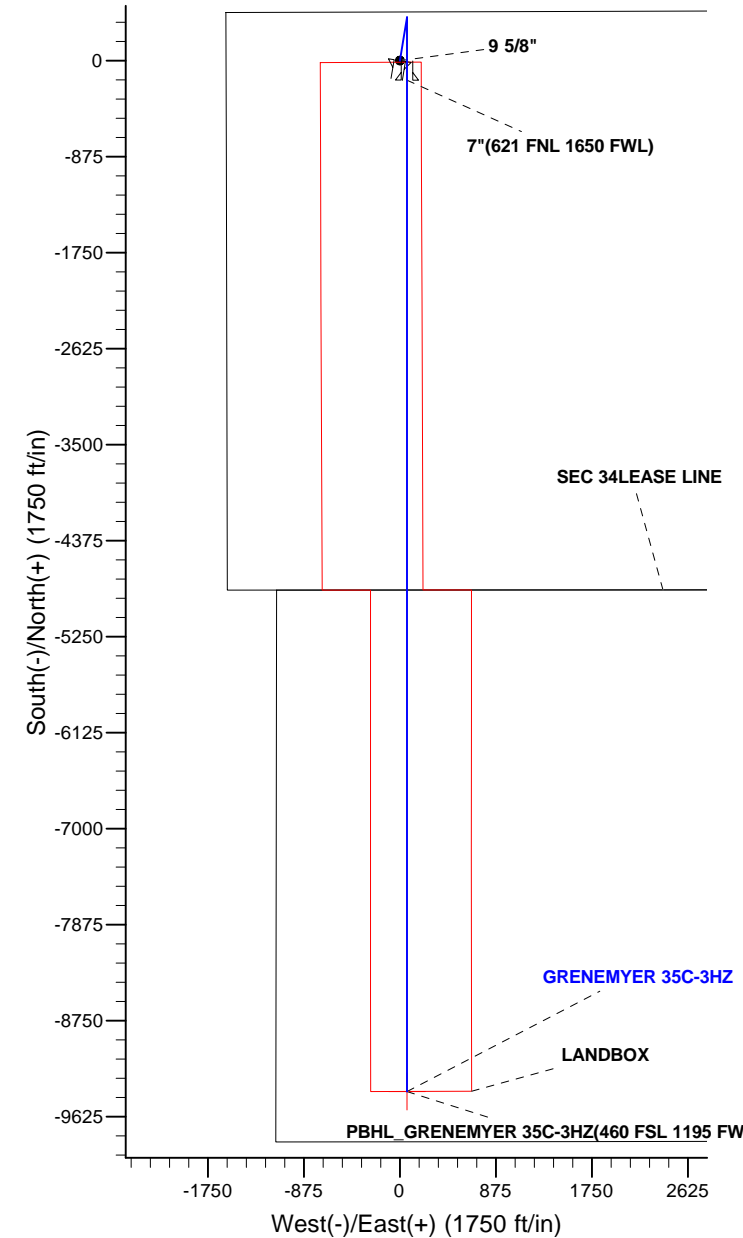
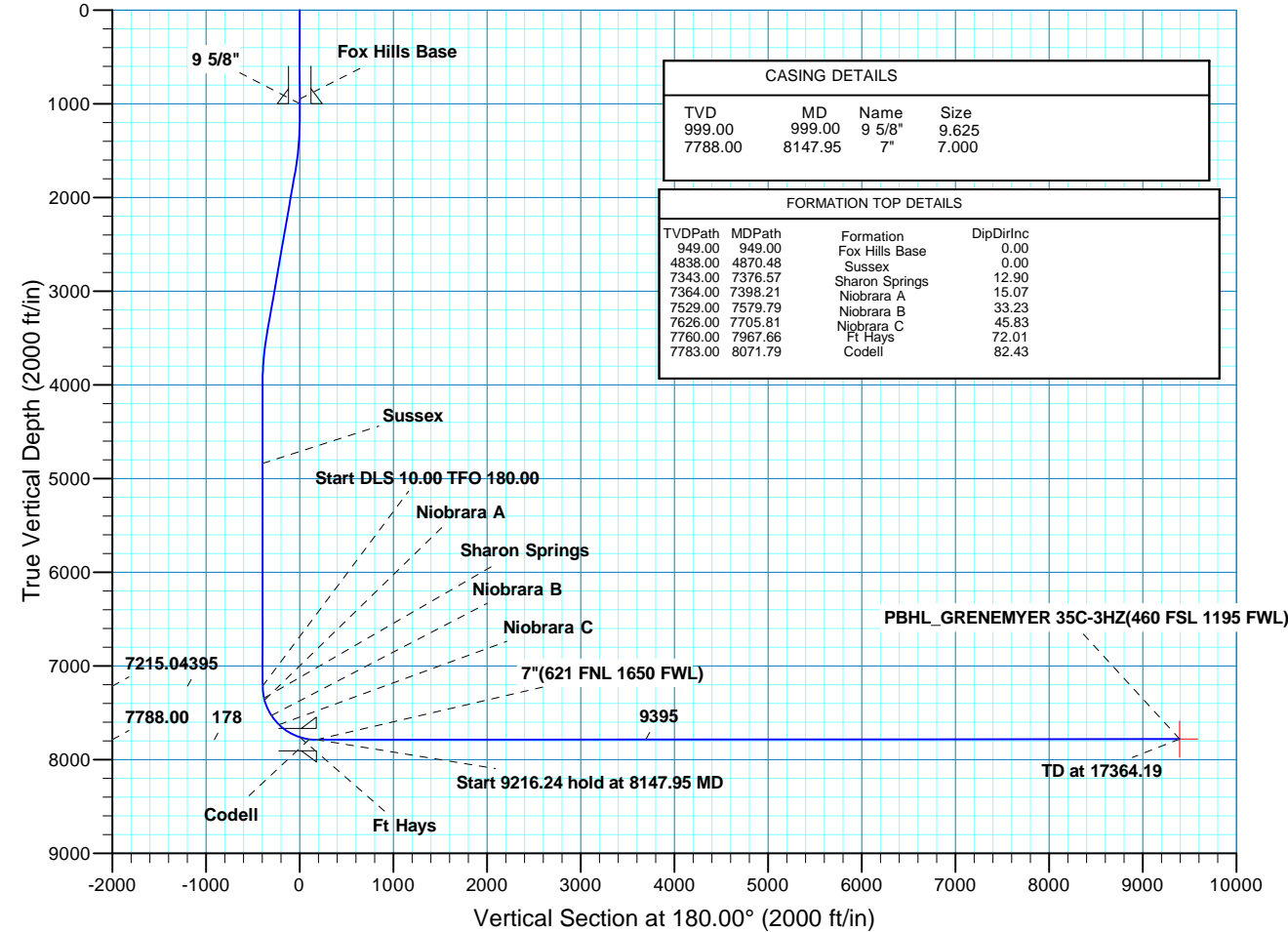


WELL DETAILS: GRENEMYER 35C-3HZ									
GL 5047 & KB 17 @ 5064.00ft (ASSUMED)									
		+N/-S	+E/-W	Northing		Easting		Latitude	Longitude
		0.00	0.00	1248412.77		3173553.54		40.0136149	-104.8803770
SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1199.00	0.00	0.00	1199.00	0.00	0.00	0.00	0.00	0.00	
1699.08	10.00	9.31	1696.55	42.96	7.04	2.00	9.31	-42.96	
3502.39	10.00	9.31	3472.45	352.04	57.69	0.00	0.00	-352.04	
4002.48	0.00	0.00	3970.00	395.00	64.73	2.00	180.00	-395.00	
7247.52	0.00	0.00	7215.04	395.00	64.73	0.00	0.00	-395.00	
8147.95	90.04	180.00	7788.00	-178.39	64.73	10.00	180.00	178.39	
17364.19	90.04	180.00	7781.00	-9394.63	64.73	0.00	0.00	9394.63	PBHL_GRENEMYER 35C-3HZ(460 FSL 1195 FWL)
DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape	
PBHL 7781.00	-9394.63		64.731239018.843173683.91		39.9878250	-104.8801460		Point	
- plan hits target center									





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

GRENNEMYER 35C-3HZ PAD

GRENNEMYER 35C-3HZ

OH

Plan: PLAN #1 PRELIMINARY

Standard Planning Report

10 September, 2013

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENEMYER 35C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENEMYER 35C-3HZ	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	GRENEMYER 35C-3HZ PAD, NENW SEC 34 T1N R67W			
Site Position:		Northing:	1,248,412.57 usft	Latitude: 40.0136150
From:	Lat/Long	Easting:	3,173,523.57 usft	Longitude: -104.8804840
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence: 0.40 °

Well	GRENEMYER 35C-3HZ, 445 FNL 1585 FWL			
Well Position	+N/-S	-0.02 ft	Northing:	1,248,412.77 usft
	+E/-W	29.97 ft	Easting:	3,173,553.54 usft
Position Uncertainty		0.00 ft	Wellhead Elevation:	Ground Level: 5,047.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	08/26/13	8.63	66.63	52,611

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	
1,199.00	0.00	0.00	1,199.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,699.08	10.00	9.31	1,696.55	42.96	7.04	2.00	2.00	0.00	9.31	
3,502.39	10.00	9.31	3,472.45	352.04	57.69	0.00	0.00	0.00	0.00	
4,002.48	0.00	0.00	3,970.00	395.00	64.73	2.00	-2.00	0.00	180.00	
7,247.52	0.00	0.00	7,215.04	395.00	64.73	0.00	0.00	0.00	0.00	
8,147.95	90.04	180.00	7,788.00	-178.39	64.73	10.00	10.00	-19.99	180.00	
17,364.19	90.04	180.00	7,781.00	-9,394.63	64.73	0.00	0.00	0.00	0.00	PBHL_GRENEMYER

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 35C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENNEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENNEMYER 35C-3HZ	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
949.00	0.00	0.00	949.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base									
999.00	0.00	0.00	999.00	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
1,199.00	0.00	0.00	1,199.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,200.00	0.02	9.31	1,200.00	0.00	0.00	0.00	2.00	2.00	0.00
1,300.00	2.02	9.31	1,299.98	1.76	0.29	-1.76	2.00	2.00	0.00
1,400.00	4.02	9.31	1,399.84	6.96	1.14	-6.96	2.00	2.00	0.00
1,500.00	6.02	9.31	1,499.45	15.59	2.55	-15.59	2.00	2.00	0.00
1,600.00	8.02	9.31	1,598.69	27.65	4.53	-27.65	2.00	2.00	0.00
1,699.08	10.00	9.31	1,696.55	42.96	7.04	-42.96	2.00	2.00	0.00
Start 1803.31 hold at 1699.08 MD									
1,700.00	10.00	9.31	1,697.45	43.12	7.07	-43.12	0.00	0.00	0.00
1,800.00	10.00	9.31	1,795.93	60.26	9.87	-60.26	0.00	0.00	0.00
1,900.00	10.00	9.31	1,894.41	77.40	12.68	-77.40	0.00	0.00	0.00
2,000.00	10.00	9.31	1,992.89	94.54	15.49	-94.54	0.00	0.00	0.00
2,100.00	10.00	9.31	2,091.37	111.68	18.30	-111.68	0.00	0.00	0.00
2,200.00	10.00	9.31	2,189.85	128.82	21.11	-128.82	0.00	0.00	0.00
2,300.00	10.00	9.31	2,288.33	145.96	23.92	-145.96	0.00	0.00	0.00
2,400.00	10.00	9.31	2,386.81	163.10	26.73	-163.10	0.00	0.00	0.00
2,500.00	10.00	9.31	2,485.29	180.23	29.53	-180.23	0.00	0.00	0.00
2,600.00	10.00	9.31	2,583.77	197.37	32.34	-197.37	0.00	0.00	0.00
2,700.00	10.00	9.31	2,682.25	214.51	35.15	-214.51	0.00	0.00	0.00
2,800.00	10.00	9.31	2,780.73	231.65	37.96	-231.65	0.00	0.00	0.00
2,900.00	10.00	9.31	2,879.21	248.79	40.77	-248.79	0.00	0.00	0.00
3,000.00	10.00	9.31	2,977.69	265.93	43.58	-265.93	0.00	0.00	0.00
3,100.00	10.00	9.31	3,076.17	283.07	46.39	-283.07	0.00	0.00	0.00
3,200.00	10.00	9.31	3,174.65	300.21	49.19	-300.21	0.00	0.00	0.00
3,300.00	10.00	9.31	3,273.13	317.35	52.00	-317.35	0.00	0.00	0.00
3,400.00	10.00	9.31	3,371.61	334.49	54.81	-334.49	0.00	0.00	0.00
3,500.00	10.00	9.31	3,470.09	351.63	57.62	-351.63	0.00	0.00	0.00
3,502.39	10.00	9.31	3,472.45	352.04	57.69	-352.04	0.00	0.00	0.00
Start Drop -2.00									
3,600.00	8.05	9.31	3,568.85	367.15	60.16	-367.15	2.00	-2.00	0.00
3,700.00	6.05	9.31	3,668.08	379.26	62.15	-379.26	2.00	-2.00	0.00
3,800.00	4.05	9.31	3,767.69	387.94	63.57	-387.94	2.00	-2.00	0.00
3,900.00	2.05	9.31	3,867.54	393.19	64.43	-393.19	2.00	-2.00	0.00
4,000.00	0.05	9.31	3,967.52	395.00	64.73	-395.00	2.00	-2.00	0.00
4,002.48	0.00	0.00	3,970.00	395.00	64.73	-395.00	2.00	-2.00	0.00
Start 3245.04 hold at 4002.48 MD									

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 35C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENNEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENNEMYER 35C-3HZ	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)
4,100.00	0.00	0.00	4,067.52	395.00	64.73	-395.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,167.52	395.00	64.73	-395.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,267.52	395.00	64.73	-395.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,367.52	395.00	64.73	-395.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,467.52	395.00	64.73	-395.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,567.52	395.00	64.73	-395.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,667.52	395.00	64.73	-395.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,767.52	395.00	64.73	-395.00	0.00	0.00	0.00
4,870.48	0.00	0.00	4,838.00	395.00	64.73	-395.00	0.00	0.00	0.00
Sussex									
4,900.00	0.00	0.00	4,867.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,967.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,067.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,167.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,267.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,367.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,467.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,567.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,667.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,767.52	395.00	64.73	-395.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,867.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,967.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,067.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,167.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,267.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,367.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,467.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,567.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,667.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,767.52	395.00	64.73	-395.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,867.52	395.00	64.73	-395.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,967.52	395.00	64.73	-395.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,067.52	395.00	64.73	-395.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,167.52	395.00	64.73	-395.00	0.00	0.00	0.00
7,247.52	0.00	0.00	7,215.04	395.00	64.73	-395.00	0.00	0.00	0.00
Start DLS 10.00 TFO 180.00									
7,300.00	5.25	180.00	7,267.45	392.60	64.73	-392.60	10.00	10.00	0.00
7,376.57	12.90	180.00	7,343.00	380.53	64.73	-380.53	10.00	10.00	0.00
Sharon Springs									
7,398.21	15.07	180.00	7,364.00	375.30	64.73	-375.30	10.00	10.00	0.00
Niobrara A									
7,400.00	15.25	180.00	7,365.73	374.83	64.73	-374.83	10.00	10.00	0.00
7,500.00	25.25	180.00	7,459.43	340.26	64.73	-340.26	10.00	10.00	0.00
7,579.79	33.23	180.00	7,529.00	301.32	64.73	-301.32	10.00	10.00	0.00
Niobrara B									
7,600.00	35.25	180.00	7,545.71	289.95	64.73	-289.95	10.00	10.00	0.00
7,700.00	45.25	180.00	7,621.93	225.43	64.73	-225.43	10.00	10.00	0.00
7,705.81	45.83	180.00	7,626.00	221.28	64.73	-221.28	10.00	10.00	0.00
Niobrara C									
7,800.00	55.25	180.00	7,685.80	148.64	64.73	-148.64	10.00	10.00	0.00
7,900.00	65.25	180.00	7,735.36	61.93	64.73	-61.93	10.00	10.00	0.00
7,967.66	72.01	180.00	7,760.00	-1.04	64.73	1.04	10.00	10.00	0.00
Ft Hays									

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENEMYER 35C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENEMYER 35C-3HZ	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)
8,000.00	75.25	180.00	7,769.11	-32.06	64.73	32.06	10.00	10.00	0.00
8,071.79	82.43	180.00	7,783.00	-102.45	64.73	102.45	10.00	10.00	0.00
Codell									
8,100.00	85.25	180.00	7,786.03	-130.49	64.73	130.49	10.00	10.00	0.00
8,147.95	90.04	180.00	7,788.00	-178.39	64.73	178.39	10.00	10.00	0.00
Start 9216.24 hold at 8147.95 MD - 7"(621 FNL 1650 FWL)									
8,200.00	90.04	180.00	7,787.96	-230.44	64.73	230.44	0.00	0.00	0.00
8,300.00	90.04	180.00	7,787.88	-330.44	64.73	330.44	0.00	0.00	0.00
8,400.00	90.04	180.00	7,787.81	-430.44	64.73	430.44	0.00	0.00	0.00
8,500.00	90.04	180.00	7,787.73	-530.44	64.73	530.44	0.00	0.00	0.00
8,600.00	90.04	180.00	7,787.65	-630.44	64.73	630.44	0.00	0.00	0.00
8,700.00	90.04	180.00	7,787.58	-730.44	64.73	730.44	0.00	0.00	0.00
8,800.00	90.04	180.00	7,787.50	-830.44	64.73	830.44	0.00	0.00	0.00
8,900.00	90.04	180.00	7,787.43	-930.44	64.73	930.44	0.00	0.00	0.00
9,000.00	90.04	180.00	7,787.35	-1,030.44	64.73	1,030.44	0.00	0.00	0.00
9,100.00	90.04	180.00	7,787.27	-1,130.44	64.73	1,130.44	0.00	0.00	0.00
9,200.00	90.04	180.00	7,787.20	-1,230.44	64.73	1,230.44	0.00	0.00	0.00
9,300.00	90.04	180.00	7,787.12	-1,330.44	64.73	1,330.44	0.00	0.00	0.00
9,400.00	90.04	180.00	7,787.05	-1,430.44	64.73	1,430.44	0.00	0.00	0.00
9,500.00	90.04	180.00	7,786.97	-1,530.44	64.73	1,530.44	0.00	0.00	0.00
9,600.00	90.04	180.00	7,786.90	-1,630.44	64.73	1,630.44	0.00	0.00	0.00
9,700.00	90.04	180.00	7,786.82	-1,730.44	64.73	1,730.44	0.00	0.00	0.00
9,800.00	90.04	180.00	7,786.74	-1,830.44	64.73	1,830.44	0.00	0.00	0.00
9,900.00	90.04	180.00	7,786.67	-1,930.44	64.73	1,930.44	0.00	0.00	0.00
10,000.00	90.04	180.00	7,786.59	-2,030.44	64.73	2,030.44	0.00	0.00	0.00
10,100.00	90.04	180.00	7,786.52	-2,130.44	64.73	2,130.44	0.00	0.00	0.00
10,200.00	90.04	180.00	7,786.44	-2,230.44	64.73	2,230.44	0.00	0.00	0.00
10,300.00	90.04	180.00	7,786.36	-2,330.44	64.73	2,330.44	0.00	0.00	0.00
10,400.00	90.04	180.00	7,786.29	-2,430.44	64.73	2,430.44	0.00	0.00	0.00
10,500.00	90.04	180.00	7,786.21	-2,530.44	64.73	2,530.44	0.00	0.00	0.00
10,600.00	90.04	180.00	7,786.14	-2,630.44	64.73	2,630.44	0.00	0.00	0.00
10,700.00	90.04	180.00	7,786.06	-2,730.44	64.73	2,730.44	0.00	0.00	0.00
10,800.00	90.04	180.00	7,785.98	-2,830.44	64.73	2,830.44	0.00	0.00	0.00
10,900.00	90.04	180.00	7,785.91	-2,930.44	64.73	2,930.44	0.00	0.00	0.00
11,000.00	90.04	180.00	7,785.83	-3,030.44	64.73	3,030.44	0.00	0.00	0.00
11,100.00	90.04	180.00	7,785.76	-3,130.44	64.73	3,130.44	0.00	0.00	0.00
11,200.00	90.04	180.00	7,785.68	-3,230.44	64.73	3,230.44	0.00	0.00	0.00
11,300.00	90.04	180.00	7,785.60	-3,330.44	64.73	3,330.44	0.00	0.00	0.00
11,400.00	90.04	180.00	7,785.53	-3,430.44	64.73	3,430.44	0.00	0.00	0.00
11,500.00	90.04	180.00	7,785.45	-3,530.44	64.73	3,530.44	0.00	0.00	0.00
11,600.00	90.04	180.00	7,785.38	-3,630.44	64.73	3,630.44	0.00	0.00	0.00
11,700.00	90.04	180.00	7,785.30	-3,730.44	64.73	3,730.44	0.00	0.00	0.00
11,800.00	90.04	180.00	7,785.22	-3,830.44	64.73	3,830.44	0.00	0.00	0.00
11,900.00	90.04	180.00	7,785.15	-3,930.44	64.73	3,930.44	0.00	0.00	0.00
12,000.00	90.04	180.00	7,785.07	-4,030.44	64.73	4,030.44	0.00	0.00	0.00
12,100.00	90.04	180.00	7,785.00	-4,130.44	64.73	4,130.44	0.00	0.00	0.00
12,200.00	90.04	180.00	7,784.92	-4,230.44	64.73	4,230.44	0.00	0.00	0.00
12,300.00	90.04	180.00	7,784.85	-4,330.44	64.73	4,330.44	0.00	0.00	0.00
12,400.00	90.04	180.00	7,784.77	-4,430.44	64.73	4,430.44	0.00	0.00	0.00
12,500.00	90.04	180.00	7,784.69	-4,530.44	64.73	4,530.44	0.00	0.00	0.00
12,600.00	90.04	180.00	7,784.62	-4,630.44	64.73	4,630.44	0.00	0.00	0.00
12,700.00	90.04	180.00	7,784.54	-4,730.44	64.73	4,730.44	0.00	0.00	0.00
12,800.00	90.04	180.00	7,784.47	-4,830.44	64.73	4,830.44	0.00	0.00	0.00
12,900.00	90.04	180.00	7,784.39	-4,930.44	64.73	4,930.44	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 35C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENNEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENNEMYER 35C-3HZ	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)
13,000.00	90.04	180.00	7,784.31	-5,030.44	64.73	5,030.44	0.00	0.00	0.00
13,100.00	90.04	180.00	7,784.24	-5,130.44	64.73	5,130.44	0.00	0.00	0.00
13,200.00	90.04	180.00	7,784.16	-5,230.44	64.73	5,230.44	0.00	0.00	0.00
13,300.00	90.04	180.00	7,784.09	-5,330.44	64.73	5,330.44	0.00	0.00	0.00
13,400.00	90.04	180.00	7,784.01	-5,430.44	64.73	5,430.44	0.00	0.00	0.00
13,500.00	90.04	180.00	7,783.93	-5,530.44	64.73	5,530.44	0.00	0.00	0.00
13,600.00	90.04	180.00	7,783.86	-5,630.44	64.73	5,630.44	0.00	0.00	0.00
13,700.00	90.04	180.00	7,783.78	-5,730.44	64.73	5,730.44	0.00	0.00	0.00
13,800.00	90.04	180.00	7,783.71	-5,830.44	64.73	5,830.44	0.00	0.00	0.00
13,900.00	90.04	180.00	7,783.63	-5,930.44	64.73	5,930.44	0.00	0.00	0.00
14,000.00	90.04	180.00	7,783.55	-6,030.44	64.73	6,030.44	0.00	0.00	0.00
14,100.00	90.04	180.00	7,783.48	-6,130.44	64.73	6,130.44	0.00	0.00	0.00
14,200.00	90.04	180.00	7,783.40	-6,230.44	64.73	6,230.44	0.00	0.00	0.00
14,300.00	90.04	180.00	7,783.33	-6,330.44	64.73	6,330.44	0.00	0.00	0.00
14,400.00	90.04	180.00	7,783.25	-6,430.44	64.73	6,430.44	0.00	0.00	0.00
14,500.00	90.04	180.00	7,783.17	-6,530.44	64.73	6,530.44	0.00	0.00	0.00
14,600.00	90.04	180.00	7,783.10	-6,630.44	64.73	6,630.44	0.00	0.00	0.00
14,700.00	90.04	180.00	7,783.02	-6,730.44	64.73	6,730.44	0.00	0.00	0.00
14,800.00	90.04	180.00	7,782.95	-6,830.44	64.73	6,830.44	0.00	0.00	0.00
14,900.00	90.04	180.00	7,782.87	-6,930.44	64.73	6,930.44	0.00	0.00	0.00
15,000.00	90.04	180.00	7,782.80	-7,030.44	64.73	7,030.44	0.00	0.00	0.00
15,100.00	90.04	180.00	7,782.72	-7,130.44	64.73	7,130.44	0.00	0.00	0.00
15,200.00	90.04	180.00	7,782.64	-7,230.44	64.73	7,230.44	0.00	0.00	0.00
15,300.00	90.04	180.00	7,782.57	-7,330.44	64.73	7,330.44	0.00	0.00	0.00
15,400.00	90.04	180.00	7,782.49	-7,430.44	64.73	7,430.44	0.00	0.00	0.00
15,500.00	90.04	180.00	7,782.42	-7,530.44	64.73	7,530.44	0.00	0.00	0.00
15,600.00	90.04	180.00	7,782.34	-7,630.44	64.73	7,630.44	0.00	0.00	0.00
15,700.00	90.04	180.00	7,782.26	-7,730.44	64.73	7,730.44	0.00	0.00	0.00
15,800.00	90.04	180.00	7,782.19	-7,830.44	64.73	7,830.44	0.00	0.00	0.00
15,900.00	90.04	180.00	7,782.11	-7,930.44	64.73	7,930.44	0.00	0.00	0.00
16,000.00	90.04	180.00	7,782.04	-8,030.44	64.73	8,030.44	0.00	0.00	0.00
16,100.00	90.04	180.00	7,781.96	-8,130.44	64.73	8,130.44	0.00	0.00	0.00
16,200.00	90.04	180.00	7,781.88	-8,230.44	64.73	8,230.44	0.00	0.00	0.00
16,300.00	90.04	180.00	7,781.81	-8,330.44	64.73	8,330.44	0.00	0.00	0.00
16,400.00	90.04	180.00	7,781.73	-8,430.44	64.73	8,430.44	0.00	0.00	0.00
16,500.00	90.04	180.00	7,781.66	-8,530.44	64.73	8,530.44	0.00	0.00	0.00
16,600.00	90.04	180.00	7,781.58	-8,630.44	64.73	8,630.44	0.00	0.00	0.00
16,700.00	90.04	180.00	7,781.50	-8,730.44	64.73	8,730.44	0.00	0.00	0.00
16,800.00	90.04	180.00	7,781.43	-8,830.44	64.73	8,830.44	0.00	0.00	0.00
16,900.00	90.04	180.00	7,781.35	-8,930.44	64.73	8,930.44	0.00	0.00	0.00
17,000.00	90.04	180.00	7,781.28	-9,030.44	64.73	9,030.44	0.00	0.00	0.00
17,100.00	90.04	180.00	7,781.20	-9,130.44	64.73	9,130.44	0.00	0.00	0.00
17,200.00	90.04	180.00	7,781.12	-9,230.44	64.73	9,230.44	0.00	0.00	0.00
17,300.00	90.04	180.00	7,781.05	-9,330.44	64.73	9,330.44	0.00	0.00	0.00
17,364.19	90.04	180.00	7,781.00	-9,394.63	64.73	9,394.63	0.00	0.00	0.00
TD at 17364.19 - PBHL_GRENNEMYER 35C-3HZ(460 FSL 1195 FWL)									

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 35C-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5047 & KB 17 @ 5064.00ft (ASSUMED)
Site:	GRENNEMYER 35C-3HZ PAD	North Reference:	True
Well:	GRENNEMYER 35C-3HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1 PRELIMINARY		

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_GRENNEMYER 35C-3HZ	0.00	0.00	7,781.00	-9,394.63	64.73	1,239,018.84	3,173,683.91	39.9878250	-104.8801460
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
999.00	999.00	9 5/8"	9.625	12.250	
8,147.95	7,788.00	7"(621 FNL 1650 FWL)	7.000	7.500	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
949.00	821.00	Fox Hills Base		0.00	
4,870.48	4,710.00	Sussex			
7,376.57	7,215.00	Sharon Springs			
7,398.21	7,236.00	Niobrara A			
7,579.79	7,401.00	Niobrara B			
7,705.81	7,498.00	Niobrara C			
7,967.66	7,632.00	Ft Hays			
8,071.79	7,655.00	Codell			

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,199.00	1,199.00	0.00	0.00	Start Build 2.00
1,699.08	1,696.55	42.96	7.04	Start 1803.31 hold at 1699.08 MD
3,502.39	3,472.45	352.04	57.69	Start Drop -2.00
4,002.48	3,970.00	395.00	64.73	Start 3245.04 hold at 4002.48 MD
7,247.52	7,215.04	395.00	64.73	Start DLS 10.00 TFO 180.00
8,147.95	7,788.00	-178.39	64.73	Start 9216.24 hold at 8147.95 MD
17,364.19	7,781.00	-9,394.63	64.73	TD at 17364.19