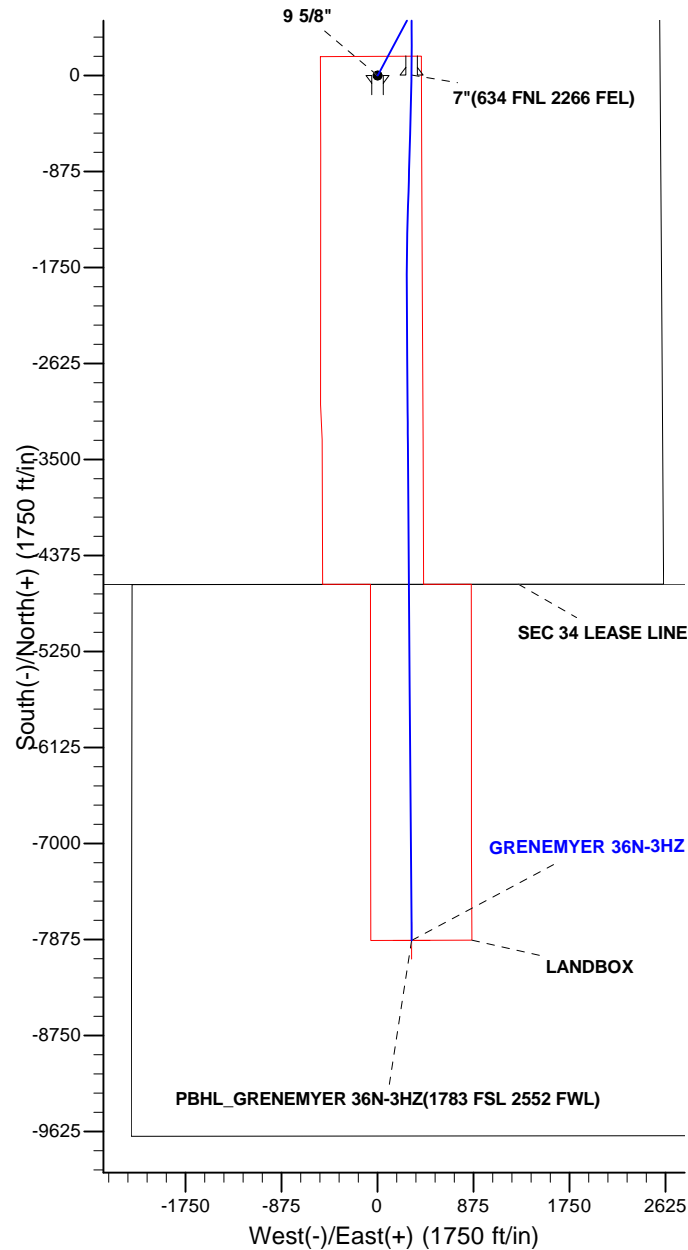
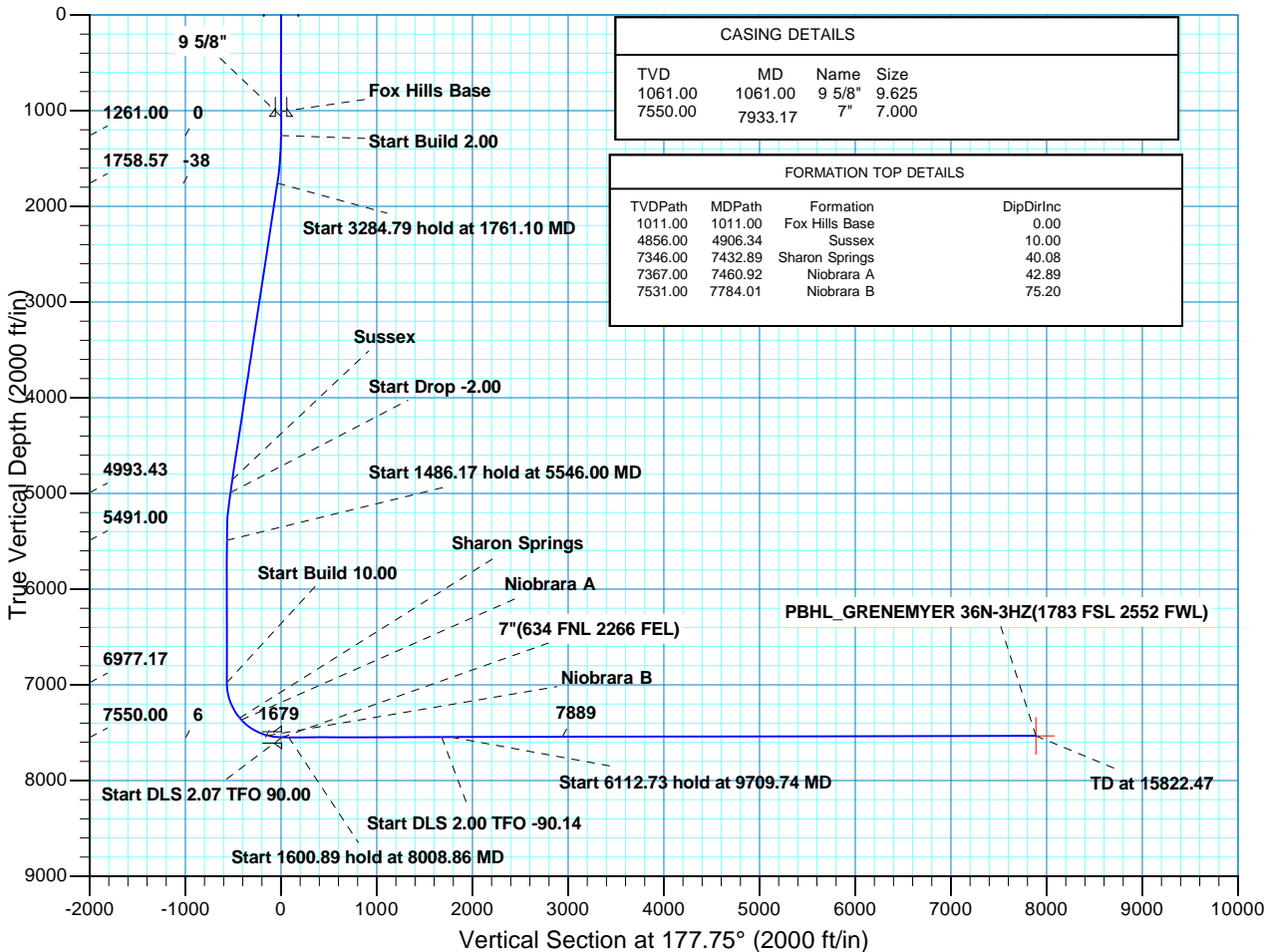




Project: COLORADO NORTHERN ZONE - 83
Site: GRENNEMYER 28-34HZ PAD
Well: GRENNEMYER 36N-3HZ
Wellbore: OH
Design: PLAN #1 PRELIMINARY



WELL DETAILS: GRENNEMYER 36N-3HZ											
GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)											
+N/-S		+E/-W		Northing		Easting		Latitude		Longitude	
0.00		0.00		1248232.98		3174668.22		40.0130999		-104.8764020	
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			
1261.00	0.00	0.00	1261.00	0.00	0.00	0.00	0.00	0.00			
1761.10	10.00	28.12	1758.57	38.40	20.52	2.00	28.12	-37.57			
5045.89	10.00	28.12	4993.43	541.60	289.37	0.00	0.00	-529.81			
5546.00	0.00	0.00	5491.00	580.00	309.89	2.00	180.00	-567.38			
7032.17	0.00	0.00	6977.17	580.00	309.89	0.00	0.00	-567.38			
7933.17	90.12	180.00	7550.00	5.97	309.89	10.00	180.00	6.21			
8008.86	90.12	181.57	7549.84	-69.71	308.85	2.07	90.00	81.79			
9609.75	90.12	181.57	7546.49	-1670.00	265.00	0.00	0.00	1679.12			
9709.74	90.12	179.57	7546.28	-1769.98	264.01	2.00	-90.14	1778.98			
15822.47	90.12	179.57	7534.00	-7882.52	309.89	0.00	0.00	7888.61	PBHL_GRENNEMYER 36N-3HZ(1783 FSL 2552 FWL)		
DESIGN TARGET DETAILS											
Name	TVD	+N/-S		+E/-W	Northing	Easting	Latitude	Longitude	Shape		
PBHL	7534.00	-7882.52		309.89	1240352.85	3175033.53	39.9914610	-104.8752960	Point		
- plan hits target center											





Scientific Drilling

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

GRENNEMYER 28-34HZ PAD

GRENNEMYER 36N-3HZ

OH

Plan: PLAN #1 PRELIMINARY

Standard Planning Report

26 August, 2013

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 36N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Site:	GRENNEMYER 28-34HZ PAD	North Reference:	True
Well:	GRENNEMYER 36N-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	GRENNEMYER 28-34HZ PAD, NWNE SEC 34 T1N R67W		
Site Position:		Northing:	1,248,232.78 usft
From:	Lat/Long	Easting:	3,174,638.25 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	40.0131000
		Longitude:	-104.8765090
		Grid Convergence:	0.40 °

Well	GRENNEMYER 36N-3HZ, 636 FNL 2575 FEL		
Well Position	+N/-S	-0.02 ft	Northing: 1,248,232.97 usft
	+E/-W	29.97 ft	Easting: 3,174,668.22 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	5,049.00 ft
		Latitude:	40.0131000
		Longitude:	-104.8764020
		Ground Level:	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	2013/08/22	8.63	66.64	52,613

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	177.75

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	
1,261.00	0.00	0.00	1,261.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,761.10	10.00	28.12	1,758.57	38.40	20.52	2.00	2.00	0.00	28.12	
5,045.89	10.00	28.12	4,993.43	541.60	289.37	0.00	0.00	0.00	0.00	
5,546.00	0.00	0.00	5,491.00	580.00	309.89	2.00	-2.00	0.00	180.00	
7,032.17	0.00	0.00	6,977.17	580.00	309.89	0.00	0.00	0.00	0.00	
7,933.17	90.12	180.00	7,550.00	5.97	309.89	10.00	10.00	0.00	180.00	
8,008.86	90.12	181.57	7,549.84	-69.71	308.85	2.07	0.00	2.07	90.00	
9,609.75	90.12	181.57	7,546.49	-1,670.00	265.00	0.00	0.00	0.00	0.00	
9,709.74	90.12	179.57	7,546.28	-1,769.98	264.01	2.00	0.00	-2.00	-90.14	
15,822.47	90.12	179.57	7,534.00	-7,882.52	309.89	0.00	0.00	0.00	0.00	PBHL_GRENNEMYER

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 36N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Site:	GRENNEMYER 28-34HZ PAD	North Reference:	True
Well:	GRENNEMYER 36N-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
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,011.00	0.00	0.00	1,011.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base									
1,061.00	0.00	0.00	1,061.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,261.00	0.00	0.00	1,261.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,300.00	0.78	28.12	1,300.00	0.23	0.13	-0.23	2.00	2.00	0.00
1,400.00	2.78	28.12	1,399.95	2.97	1.59	-2.91	2.00	2.00	0.00
1,500.00	4.78	28.12	1,499.72	8.79	4.70	-8.60	2.00	2.00	0.00
1,600.00	6.78	28.12	1,599.21	17.67	9.44	-17.29	2.00	2.00	0.00
1,700.00	8.78	28.12	1,698.28	29.61	15.82	-28.96	2.00	2.00	0.00
1,761.10	10.00	28.12	1,758.57	38.40	20.52	-37.57	2.00	2.00	0.00
Start 3284.79 hold at 1761.10 MD									
1,800.00	10.00	28.12	1,796.87	44.36	23.70	-43.40	0.00	0.00	0.00
1,900.00	10.00	28.12	1,895.35	59.68	31.89	-58.38	0.00	0.00	0.00
2,000.00	10.00	28.12	1,993.83	75.00	40.07	-73.37	0.00	0.00	0.00
2,100.00	10.00	28.12	2,092.31	90.32	48.26	-88.35	0.00	0.00	0.00
2,200.00	10.00	28.12	2,190.79	105.64	56.44	-103.34	0.00	0.00	0.00
2,300.00	10.00	28.12	2,289.27	120.96	64.63	-118.32	0.00	0.00	0.00
2,400.00	10.00	28.12	2,387.75	136.27	72.81	-133.31	0.00	0.00	0.00
2,500.00	10.00	28.12	2,486.23	151.59	81.00	-148.30	0.00	0.00	0.00
2,600.00	10.00	28.12	2,584.71	166.91	89.18	-163.28	0.00	0.00	0.00
2,700.00	10.00	28.12	2,683.19	182.23	97.36	-178.27	0.00	0.00	0.00
2,800.00	10.00	28.12	2,781.67	197.55	105.55	-193.25	0.00	0.00	0.00
2,900.00	10.00	28.12	2,880.15	212.87	113.73	-208.24	0.00	0.00	0.00
3,000.00	10.00	28.12	2,978.63	228.19	121.92	-223.22	0.00	0.00	0.00
3,100.00	10.00	28.12	3,077.11	243.51	130.10	-238.21	0.00	0.00	0.00
3,200.00	10.00	28.12	3,175.59	258.83	138.29	-253.19	0.00	0.00	0.00
3,300.00	10.00	28.12	3,274.07	274.15	146.47	-268.18	0.00	0.00	0.00
3,400.00	10.00	28.12	3,372.56	289.46	154.66	-283.17	0.00	0.00	0.00
3,500.00	10.00	28.12	3,471.04	304.78	162.84	-298.15	0.00	0.00	0.00
3,600.00	10.00	28.12	3,569.52	320.10	171.03	-313.14	0.00	0.00	0.00
3,700.00	10.00	28.12	3,668.00	335.42	179.21	-328.12	0.00	0.00	0.00
3,800.00	10.00	28.12	3,766.48	350.74	187.40	-343.11	0.00	0.00	0.00
3,900.00	10.00	28.12	3,864.96	366.06	195.58	-358.09	0.00	0.00	0.00
4,000.00	10.00	28.12	3,963.44	381.38	203.77	-373.08	0.00	0.00	0.00
4,100.00	10.00	28.12	4,061.92	396.70	211.95	-388.06	0.00	0.00	0.00
4,200.00	10.00	28.12	4,160.40	412.02	220.14	-403.05	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNYER 36N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Site:	GRENNYER 28-34HZ PAD	North Reference:	True
Well:	GRENNYER 36N-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)	
4,300.00	10.00	28.12	4,258.88	427.33	228.32	-418.04	0.00	0.00	0.00	
4,400.00	10.00	28.12	4,357.36	442.65	236.51	-433.02	0.00	0.00	0.00	
4,500.00	10.00	28.12	4,455.84	457.97	244.69	-448.01	0.00	0.00	0.00	
4,600.00	10.00	28.12	4,554.32	473.29	252.88	-462.99	0.00	0.00	0.00	
4,700.00	10.00	28.12	4,652.80	488.61	261.06	-477.98	0.00	0.00	0.00	
4,800.00	10.00	28.12	4,751.28	503.93	269.25	-492.96	0.00	0.00	0.00	
4,900.00	10.00	28.12	4,849.76	519.25	277.43	-507.95	0.00	0.00	0.00	
4,906.34	10.00	28.12	4,856.00	520.22	277.95	-508.90	0.00	0.00	0.00	
Sussex										
5,000.00	10.00	28.12	4,948.24	534.57	285.61	-522.93	0.00	0.00	0.00	
5,045.89	10.00	28.12	4,993.43	541.60	289.37	-529.81	0.00	0.00	0.00	
Start Drop -2.00										
5,100.00	8.92	28.12	5,046.80	549.44	293.56	-537.49	2.00	-2.00	0.00	
5,200.00	6.92	28.12	5,145.84	561.59	300.06	-549.37	2.00	-2.00	0.00	
5,300.00	4.92	28.12	5,245.31	570.69	304.92	-558.27	2.00	-2.00	0.00	
5,400.00	2.92	28.12	5,345.07	576.72	308.14	-564.17	2.00	-2.00	0.00	
5,500.00	0.92	28.12	5,445.01	579.67	309.72	-567.06	2.00	-2.00	0.00	
5,546.00	0.00	0.00	5,491.00	580.00	309.89	-567.38	2.00	-2.00	0.00	
Start 1486.17 hold at 5546.00 MD										
5,600.00	0.00	0.00	5,545.00	580.00	309.89	-567.38	0.00	0.00	0.00	
5,700.00	0.00	0.00	5,645.00	580.00	309.89	-567.38	0.00	0.00	0.00	
5,800.00	0.00	0.00	5,745.00	580.00	309.89	-567.38	0.00	0.00	0.00	
5,900.00	0.00	0.00	5,845.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,945.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,045.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,145.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,245.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,345.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,445.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,545.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,645.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,745.00	580.00	309.89	-567.38	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,845.00	580.00	309.89	-567.38	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,945.00	580.00	309.89	-567.38	0.00	0.00	0.00	
7,032.17	0.00	0.00	6,977.17	580.00	309.89	-567.38	0.00	0.00	0.00	
Start Build 10.00										
7,100.00	6.78	180.00	7,044.85	575.99	309.89	-563.37	10.00	10.00	0.00	
7,200.00	16.79	180.00	7,142.61	555.59	309.89	-542.99	10.00	10.00	0.00	
7,300.00	26.79	180.00	7,235.35	518.52	309.89	-505.94	10.00	10.00	0.00	
7,400.00	36.79	180.00	7,320.24	465.90	309.89	-453.37	10.00	10.00	0.00	
7,432.89	40.08	180.00	7,346.00	445.46	309.89	-432.94	10.00	10.00	0.00	
Sharon Springs										
7,460.92	42.89	180.00	7,367.00	426.89	309.89	-414.39	10.00	10.00	0.00	
Niobrara A										
7,500.00	46.79	180.00	7,394.70	399.35	309.89	-386.86	10.00	10.00	0.00	
7,600.00	56.80	180.00	7,456.47	320.86	309.89	-308.44	10.00	10.00	0.00	
7,700.00	66.80	180.00	7,503.67	232.85	309.89	-220.50	10.00	10.00	0.00	
7,784.01	75.20	180.00	7,531.00	153.49	309.89	-141.20	10.00	10.00	0.00	
Niobrara B										
7,800.00	76.80	180.00	7,534.87	137.97	309.89	-125.69	10.00	10.00	0.00	
7,900.00	86.80	180.00	7,549.11	39.12	309.89	-26.92	10.00	10.00	0.00	

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENNEMYER 36N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Site:	GRENNEMYER 28-34HZ PAD	North Reference:	True
Well:	GRENNEMYER 36N-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)
7,933.17	90.12	180.00	7,550.00	5.97	309.89	6.21	10.00	10.00	0.00
Start DLS 2.07 TFO 90.00 - 7"(634 FNL 2266 FEL)									
8,000.00	90.12	181.39	7,549.86	-60.86	309.08	72.95	2.07	0.00	2.07
8,008.86	90.12	181.57	7,549.84	-69.71	308.85	81.79	2.07	0.00	2.07
Start 1600.89 hold at 8008.86 MD									
8,100.00	90.12	181.57	7,549.65	-160.82	306.36	172.73	0.00	0.00	0.00
8,200.00	90.12	181.57	7,549.44	-260.78	303.62	272.51	0.00	0.00	0.00
8,300.00	90.12	181.57	7,549.23	-360.74	300.88	372.28	0.00	0.00	0.00
8,400.00	90.12	181.57	7,549.02	-460.71	298.14	472.06	0.00	0.00	0.00
8,500.00	90.12	181.57	7,548.81	-560.67	295.40	571.84	0.00	0.00	0.00
8,600.00	90.12	181.57	7,548.61	-660.63	292.66	671.62	0.00	0.00	0.00
8,700.00	90.12	181.57	7,548.40	-760.59	289.92	771.39	0.00	0.00	0.00
8,800.00	90.12	181.57	7,548.19	-860.55	287.18	871.17	0.00	0.00	0.00
8,900.00	90.12	181.57	7,547.98	-960.52	284.44	970.95	0.00	0.00	0.00
9,000.00	90.12	181.57	7,547.77	-1,060.48	281.70	1,070.73	0.00	0.00	0.00
9,100.00	90.12	181.57	7,547.56	-1,160.44	278.96	1,170.50	0.00	0.00	0.00
9,200.00	90.12	181.57	7,547.35	-1,260.40	276.22	1,270.28	0.00	0.00	0.00
9,300.00	90.12	181.57	7,547.14	-1,360.37	273.48	1,370.06	0.00	0.00	0.00
9,400.00	90.12	181.57	7,546.93	-1,460.33	270.75	1,469.84	0.00	0.00	0.00
9,500.00	90.12	181.57	7,546.72	-1,560.29	268.01	1,569.61	0.00	0.00	0.00
9,600.00	90.12	181.57	7,546.51	-1,660.25	265.27	1,669.39	0.00	0.00	0.00
9,609.75	90.12	181.57	7,546.49	-1,670.00	265.00	1,679.12	0.00	0.00	0.00
Start DLS 2.00 TFO -90.14									
9,700.00	90.12	179.76	7,546.30	-1,760.24	263.95	1,769.25	2.00	0.00	-2.00
9,709.74	90.12	179.57	7,546.28	-1,769.98	264.01	1,778.98	2.00	0.00	-2.00
Start 6112.73 hold at 9709.74 MD									
9,800.00	90.12	179.57	7,546.10	-1,860.24	264.68	1,869.20	0.00	0.00	0.00
9,900.00	90.12	179.57	7,545.90	-1,960.23	265.43	1,969.15	0.00	0.00	0.00
10,000.00	90.12	179.57	7,545.70	-2,060.23	266.18	2,069.10	0.00	0.00	0.00
10,100.00	90.12	179.57	7,545.50	-2,160.23	266.94	2,169.05	0.00	0.00	0.00
10,200.00	90.12	179.57	7,545.30	-2,260.22	267.69	2,268.99	0.00	0.00	0.00
10,300.00	90.12	179.57	7,545.10	-2,360.22	268.44	2,368.94	0.00	0.00	0.00
10,400.00	90.12	179.57	7,544.90	-2,460.22	269.19	2,468.89	0.00	0.00	0.00
10,500.00	90.12	179.57	7,544.70	-2,560.21	269.94	2,568.84	0.00	0.00	0.00
10,600.00	90.12	179.57	7,544.50	-2,660.21	270.69	2,668.79	0.00	0.00	0.00
10,700.00	90.12	179.57	7,544.29	-2,760.21	271.44	2,768.74	0.00	0.00	0.00
10,800.00	90.12	179.57	7,544.09	-2,860.21	272.19	2,868.69	0.00	0.00	0.00
10,900.00	90.12	179.57	7,543.89	-2,960.20	272.94	2,968.64	0.00	0.00	0.00
11,000.00	90.12	179.57	7,543.69	-3,060.20	273.69	3,068.59	0.00	0.00	0.00
11,100.00	90.12	179.57	7,543.49	-3,160.20	274.44	3,168.54	0.00	0.00	0.00
11,200.00	90.12	179.57	7,543.29	-3,260.19	275.19	3,268.49	0.00	0.00	0.00
11,300.00	90.12	179.57	7,543.09	-3,360.19	275.94	3,368.44	0.00	0.00	0.00
11,400.00	90.12	179.57	7,542.89	-3,460.19	276.69	3,468.39	0.00	0.00	0.00
11,500.00	90.12	179.57	7,542.69	-3,560.18	277.44	3,568.34	0.00	0.00	0.00
11,600.00	90.12	179.57	7,542.49	-3,660.18	278.19	3,668.28	0.00	0.00	0.00
11,700.00	90.12	179.57	7,542.29	-3,760.18	278.95	3,768.23	0.00	0.00	0.00
11,800.00	90.12	179.57	7,542.08	-3,860.18	279.70	3,868.18	0.00	0.00	0.00
11,900.00	90.12	179.57	7,541.88	-3,960.17	280.45	3,968.13	0.00	0.00	0.00
12,000.00	90.12	179.57	7,541.68	-4,060.17	281.20	4,068.08	0.00	0.00	0.00
12,100.00	90.12	179.57	7,541.48	-4,160.17	281.95	4,168.03	0.00	0.00	0.00
12,200.00	90.12	179.57	7,541.28	-4,260.16	282.70	4,267.98	0.00	0.00	0.00
12,300.00	90.12	179.57	7,541.08	-4,360.16	283.45	4,367.93	0.00	0.00	0.00

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENEMYER 36N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Site:	GRENEMYER 28-34HZ PAD	North Reference:	True
Well:	GRENEMYER 36N-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)
12,400.00	90.12	179.57	7,540.88	-4,460.16	284.20	4,467.88	0.00	0.00	0.00
12,500.00	90.12	179.57	7,540.68	-4,560.15	284.95	4,567.83	0.00	0.00	0.00
12,600.00	90.12	179.57	7,540.48	-4,660.15	285.70	4,667.78	0.00	0.00	0.00
12,700.00	90.12	179.57	7,540.28	-4,760.15	286.45	4,767.73	0.00	0.00	0.00
12,800.00	90.12	179.57	7,540.07	-4,860.15	287.20	4,867.68	0.00	0.00	0.00
12,900.00	90.12	179.57	7,539.87	-4,960.14	287.95	4,967.63	0.00	0.00	0.00
13,000.00	90.12	179.57	7,539.67	-5,060.14	288.70	5,067.57	0.00	0.00	0.00
13,100.00	90.12	179.57	7,539.47	-5,160.14	289.45	5,167.52	0.00	0.00	0.00
13,200.00	90.12	179.57	7,539.27	-5,260.13	290.20	5,267.47	0.00	0.00	0.00
13,300.00	90.12	179.57	7,539.07	-5,360.13	290.96	5,367.42	0.00	0.00	0.00
13,400.00	90.12	179.57	7,538.87	-5,460.13	291.71	5,467.37	0.00	0.00	0.00
13,500.00	90.12	179.57	7,538.67	-5,560.12	292.46	5,567.32	0.00	0.00	0.00
13,600.00	90.12	179.57	7,538.47	-5,660.12	293.21	5,667.27	0.00	0.00	0.00
13,700.00	90.12	179.57	7,538.27	-5,760.12	293.96	5,767.22	0.00	0.00	0.00
13,800.00	90.12	179.57	7,538.06	-5,860.12	294.71	5,867.17	0.00	0.00	0.00
13,900.00	90.12	179.57	7,537.86	-5,960.11	295.46	5,967.12	0.00	0.00	0.00
14,000.00	90.12	179.57	7,537.66	-6,060.11	296.21	6,067.07	0.00	0.00	0.00
14,100.00	90.12	179.57	7,537.46	-6,160.11	296.96	6,167.02	0.00	0.00	0.00
14,200.00	90.12	179.57	7,537.26	-6,260.10	297.71	6,266.97	0.00	0.00	0.00
14,300.00	90.12	179.57	7,537.06	-6,360.10	298.46	6,366.92	0.00	0.00	0.00
14,400.00	90.12	179.57	7,536.86	-6,460.10	299.21	6,466.86	0.00	0.00	0.00
14,500.00	90.12	179.57	7,536.66	-6,560.09	299.96	6,566.81	0.00	0.00	0.00
14,600.00	90.12	179.57	7,536.46	-6,660.09	300.71	6,666.76	0.00	0.00	0.00
14,700.00	90.12	179.57	7,536.26	-6,760.09	301.46	6,766.71	0.00	0.00	0.00
14,800.00	90.12	179.57	7,536.06	-6,860.09	302.21	6,866.66	0.00	0.00	0.00
14,900.00	90.12	179.57	7,535.85	-6,960.08	302.97	6,966.61	0.00	0.00	0.00
15,000.00	90.12	179.57	7,535.65	-7,060.08	303.72	7,066.56	0.00	0.00	0.00
15,100.00	90.12	179.57	7,535.45	-7,160.08	304.47	7,166.51	0.00	0.00	0.00
15,200.00	90.12	179.57	7,535.25	-7,260.07	305.22	7,266.46	0.00	0.00	0.00
15,300.00	90.12	179.57	7,535.05	-7,360.07	305.97	7,366.41	0.00	0.00	0.00
15,400.00	90.12	179.57	7,534.85	-7,460.07	306.72	7,466.36	0.00	0.00	0.00
15,500.00	90.12	179.57	7,534.65	-7,560.06	307.47	7,566.31	0.00	0.00	0.00
15,600.00	90.12	179.57	7,534.45	-7,660.06	308.22	7,666.26	0.00	0.00	0.00
15,700.00	90.12	179.57	7,534.25	-7,760.06	308.97	7,766.21	0.00	0.00	0.00
15,800.00	90.12	179.57	7,534.05	-7,860.05	309.72	7,866.15	0.00	0.00	0.00
15,822.47	90.12	179.57	7,534.00	-7,882.52	309.89	7,888.61	0.00	0.00	0.00
TD at 15822.47 - PBHL_GRENEMYER 36N-3HZ(1783 FSL 2552 FWL)									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL_GRENEMYER 36N-3HZ	0.00	0.00	7,534.00	-7,882.52	309.89	1,240,352.84	3,175,033.54	39.9914610	-104.8752960
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

Database:	EDM5000-RobertS-Local	Local Co-ordinate Reference:	Well GRENEMYER 36N-3HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	GL 5049 & KB 17 @ 5066.00ft (Original Well Elev)
Site:	GRENEMYER 28-34HZ PAD	North Reference:	True
Well:	GRENEMYER 36N-3HZ	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)	
1,061.00	1,061.00	9 5/8"	9.625	12.250	
7,933.17	7,550.00	7"(634 FNL 2266 FEL)	7.000	7.500	

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,011.00	1,011.00	Fox Hills Base		0.00	
4,906.34	4,856.00	Sussex			
7,432.89	7,346.00	Sharon Springs			
7,460.92	7,367.00	Niobrara A			
7,784.01	7,531.00	Niobrara B			

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,261.00	1,261.00	0.00	0.00	Start Build 2.00	
1,761.10	1,758.57	38.40	20.52	Start 3284.79 hold at 1761.10 MD	
5,045.89	4,993.43	541.60	289.37	Start Drop -2.00	
5,546.00	5,491.00	580.00	309.89	Start 1486.17 hold at 5546.00 MD	
7,032.17	6,977.17	580.00	309.89	Start Build 10.00	
7,933.17	7,550.00	5.97	309.89	Start DLS 2.07 TFO 90.00	
8,008.86	7,549.84	-69.71	308.85	Start 1600.89 hold at 8008.86 MD	
9,609.75	7,546.49	-1,670.00	265.00	Start DLS 2.00 TFO -90.14	
9,709.74	7,546.28	-1,769.98	264.01	Start 6112.73 hold at 9709.74 MD	
15,822.47	7,534.00	-7,882.52	309.89	TD at 15822.47	