

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_BARCLAY 13-27 PAD

BARCLAY 4C-27HZ

BARCLAY 4C-27HZ

Plan: BARCLAY 4C-27HZ (wp01)

Standard Planning Report

26 July, 2011





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Azimuths to True North

Magnetic North: 8.84°

Magnetic Field

Strength: 53008.0snT

Dip Angle: 66.88°

Date: 7/25/2011

Model: IGRF2010

Project: COLORADO NORTHERN ZONE - 83
Site: WELD BARCLAY 13-27 PAD
Well: BARCLAY 4C-27HZ
Wellbore: BARCLAY 4C-27HZ
Section:
SHL:
Design: BARCLAY 4C-27HZ (wp01)
Latitude: 40.190764
Longitude: -104.771037
GL: 4964.00
KB: 17' RKB + 4964' GL @ 4981.00ft

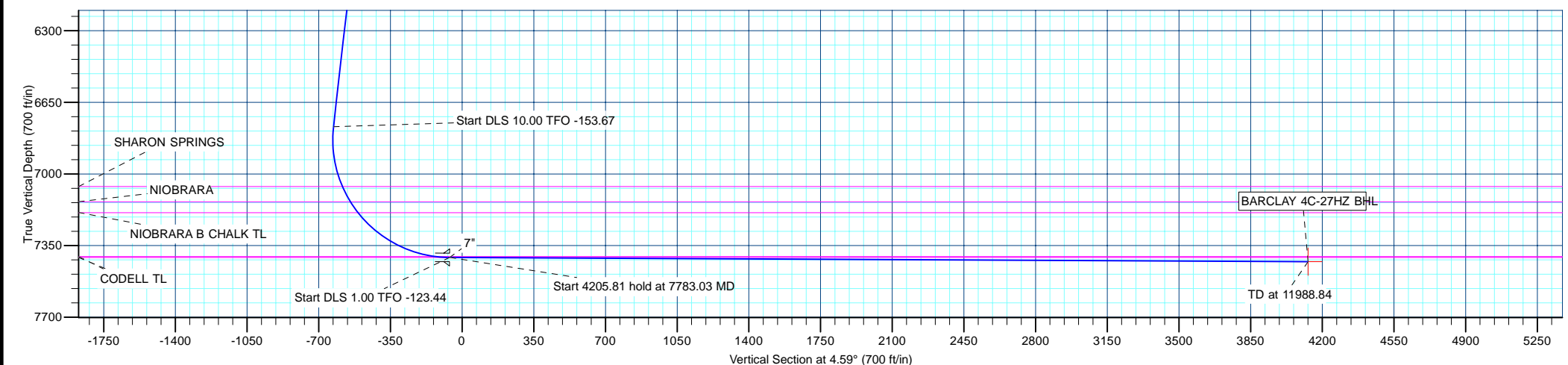
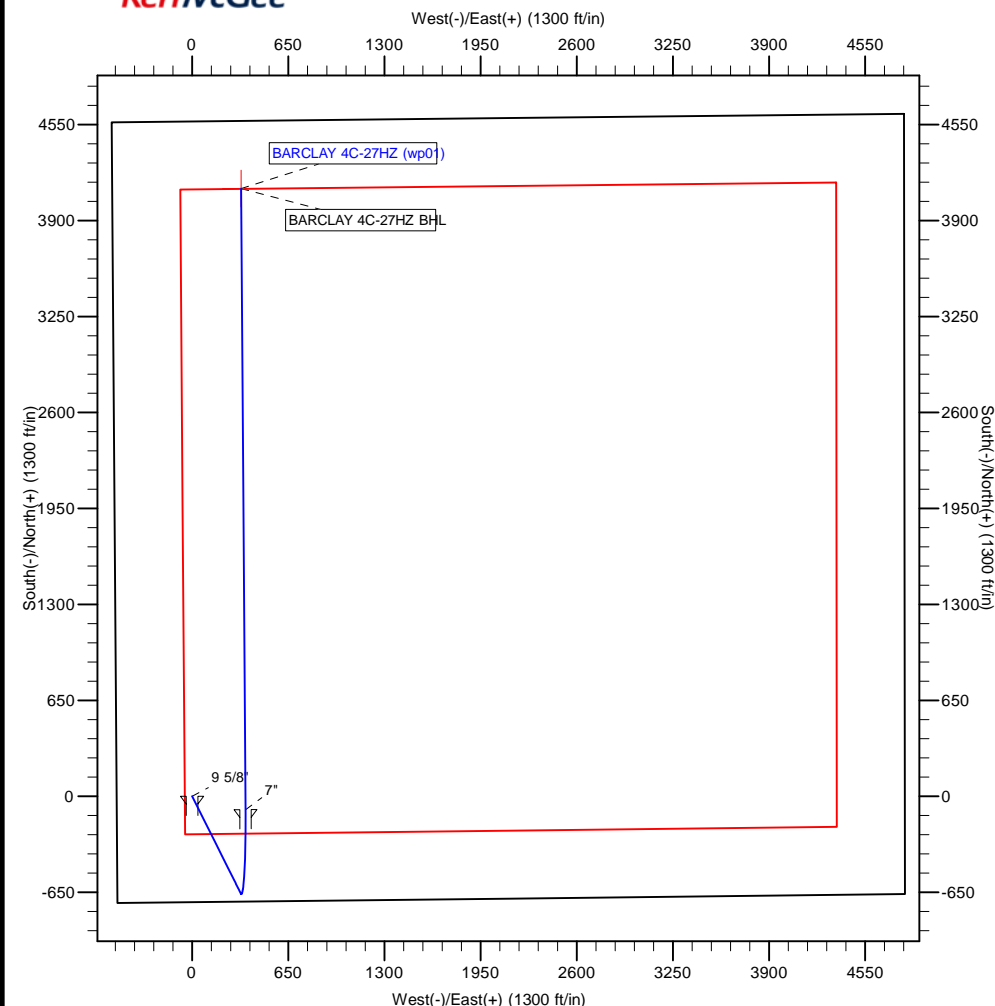
WELL DETAILS: BARCLAY 4C-27HZ						
+N/-S	+E/-W	Northing	Ground Level: Easting	4964.00 Latitude	Longitude	Slot
0.00	0.00	1313174.99	3203648.05	40.190764	-104.771037	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
BARCLAY 4C-27HZ BHL	7428.00	4117.51	330.72	40.202067	-104.769853	Point

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	
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	0.00	
1374.61	7.49	153.45	1373.54	-21.88	10.93	2.00	153.45	-20.93	
6816.58	7.49	153.45	6769.05	-656.64	328.06	0.00	0.00	-628.27	
7781.17	89.74	359.60	7408.00	-90.00	361.00	10.00	-153.67	-60.81	
7783.03	89.73	359.59	7408.01	-88.15	360.99	1.00	-123.44	-58.96	
11988.84	89.73	359.59	7428.00	4117.51	330.72	0.00	0.00	4130.77	BARCLAY 4C-27HZ BHL

CASING DETAILS			
TVD	MD	Name	Size
850.00	850.00	9 5/8"	9-5/8
7408.00	7781.10	7"	7

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3233.00	3250.08	PARKMAN
4411.00	4438.22	SUSSEX
5053.00	5085.75	SHANNON
7061.00	7115.43	SHARON SPRINGS
7136.00	7200.12	NIOBRARA
7189.00	7264.86	NIOBRARA B CHALK TL
7403.00	7707.94	CODELL
7408.00	7781.17	CODELL TL



Database:	edm5000p	Local Co-ordinate Reference:	Well BARCLAY 4C-27HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4964' GL @ 4981.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4964' GL @ 4981.00ft
Site:	WELD_BARCLAY 13-27 PAD	North Reference:	True
Well:	BARCLAY 4C-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 4C-27HZ		
Design:	BARCLAY 4C-27HZ (wp01)		

Project	COLORADO NORTHERN ZONE - 83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site						WELD_BARCLAY 13-27 PAD											
Site Position:			Northing:			1,313,174.88 ft			Latitude:			40.190764					
From:			Lat/Long			Easting:			3,203,632.41 ft			Longitude:			-104.771093		
Position Uncertainty:			0.00 ft			Slot Radius:			0 "			Grid Convergence:			0.47 °		

Well	BARCLAY 4C-27HZ					
Well Position	+N-S	-0.02 ft	Northing:	1,313,174.99 ft	Latitude:	40.190764
	+E-W	15.64 ft	Easting:	3,203,648.05 ft	Longitude:	-104.771037
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,964.00 ft

Wellbore	BARCLAY 4C-27HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/25/2011	8.83	66.88	53,008

Design	BARCLAY 4C-27HZ (wp01)				
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	4.59	

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	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,374.61	7.49	153.45	1,373.54	-21.88	10.93	2.00	2.00	0.00	153.45	
6,816.58	7.49	153.45	6,769.05	-656.64	328.06	0.00	0.00	0.00	0.00	
7,781.17	89.74	359.60	7,408.00	-90.00	361.00	10.00	8.53	-15.95	-153.67	
7,783.03	89.73	359.59	7,408.01	-88.15	360.99	1.00	-0.55	-0.83	-123.44	
11,988.84	89.73	359.59	7,428.00	4,117.51	330.72	0.00	0.00	0.00	0.00	BARCLAY 4C-27HZ

Database:	edm5000p	Local Co-ordinate Reference:	Well BARCLAY 4C-27HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4964' GL @ 4981.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4964' GL @ 4981.00ft
Site:	WELD_BARCLAY 13-27 PAD	North Reference:	True
Well:	BARCLAY 4C-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 4C-27HZ		
Design:	BARCLAY 4C-27HZ (wp01)		

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
850.00	0.00	0.00	850.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
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
Start Build 2.00									
1,100.00	2.00	153.45	1,099.98	-1.56	0.78	-1.49	2.00	2.00	0.00
1,200.00	4.00	153.45	1,199.84	-6.24	3.12	-5.97	2.00	2.00	0.00
1,300.00	6.00	153.45	1,299.45	-14.04	7.01	-13.43	2.00	2.00	0.00
1,374.61	7.49	153.45	1,373.54	-21.88	10.93	-20.93	2.00	2.00	0.00
Start 5441.97 hold at 1374.61 MD									
1,400.00	7.49	153.45	1,398.72	-24.84	12.41	-23.77	0.00	0.00	0.00
1,500.00	7.49	153.45	1,497.86	-36.51	18.24	-34.93	0.00	0.00	0.00
1,600.00	7.49	153.45	1,597.01	-48.17	24.07	-46.09	0.00	0.00	0.00
1,700.00	7.49	153.45	1,696.16	-59.83	29.89	-57.25	0.00	0.00	0.00
1,800.00	7.49	153.45	1,795.30	-71.50	35.72	-68.41	0.00	0.00	0.00
1,900.00	7.49	153.45	1,894.45	-83.16	41.55	-79.57	0.00	0.00	0.00
2,000.00	7.49	153.45	1,993.59	-94.83	47.38	-90.73	0.00	0.00	0.00
2,100.00	7.49	153.45	2,092.74	-106.49	53.20	-101.89	0.00	0.00	0.00
2,200.00	7.49	153.45	2,191.89	-118.15	59.03	-113.05	0.00	0.00	0.00
2,300.00	7.49	153.45	2,291.03	-129.82	64.86	-124.21	0.00	0.00	0.00
2,400.00	7.49	153.45	2,390.18	-141.48	70.69	-135.37	0.00	0.00	0.00
2,500.00	7.49	153.45	2,489.33	-153.15	76.51	-146.53	0.00	0.00	0.00
2,600.00	7.49	153.45	2,588.47	-164.81	82.34	-157.69	0.00	0.00	0.00
2,700.00	7.49	153.45	2,687.62	-176.48	88.17	-168.85	0.00	0.00	0.00
2,800.00	7.49	153.45	2,786.76	-188.14	94.00	-180.01	0.00	0.00	0.00
2,900.00	7.49	153.45	2,885.91	-199.80	99.82	-191.17	0.00	0.00	0.00
3,000.00	7.49	153.45	2,985.06	-211.47	105.65	-202.33	0.00	0.00	0.00
3,100.00	7.49	153.45	3,084.20	-223.13	111.48	-213.49	0.00	0.00	0.00
3,200.00	7.49	153.45	3,183.35	-234.80	117.31	-224.65	0.00	0.00	0.00
3,250.08	7.49	153.45	3,233.00	-240.64	120.22	-230.24	0.00	0.00	0.00
PARKMAN									
3,300.00	7.49	153.45	3,282.50	-246.46	123.13	-235.81	0.00	0.00	0.00
3,400.00	7.49	153.45	3,381.64	-258.13	128.96	-246.97	0.00	0.00	0.00
3,500.00	7.49	153.45	3,480.79	-269.79	134.79	-258.13	0.00	0.00	0.00
3,600.00	7.49	153.45	3,579.93	-281.45	140.62	-269.29	0.00	0.00	0.00
3,700.00	7.49	153.45	3,679.08	-293.12	146.44	-280.45	0.00	0.00	0.00
3,800.00	7.49	153.45	3,778.23	-304.78	152.27	-291.61	0.00	0.00	0.00
3,900.00	7.49	153.45	3,877.37	-316.45	158.10	-302.77	0.00	0.00	0.00
4,000.00	7.49	153.45	3,976.52	-328.11	163.93	-313.93	0.00	0.00	0.00
4,100.00	7.49	153.45	4,075.67	-339.78	169.75	-325.09	0.00	0.00	0.00
4,200.00	7.49	153.45	4,174.81	-351.44	175.58	-336.25	0.00	0.00	0.00
4,300.00	7.49	153.45	4,273.96	-363.10	181.41	-347.42	0.00	0.00	0.00
4,400.00	7.49	153.45	4,373.11	-374.77	187.24	-358.58	0.00	0.00	0.00
4,438.22	7.49	153.45	4,411.00	-379.23	189.46	-362.84	0.00	0.00	0.00
SUSSEX									

Database:	edm5000p	Local Co-ordinate Reference:	Well BARCLAY 4C-27HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4964' GL @ 4981.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4964' GL @ 4981.00ft
Site:	WELD_BARCLAY 13-27 PAD	North Reference:	True
Well:	BARCLAY 4C-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 4C-27HZ		
Design:	BARCLAY 4C-27HZ (wp01)		

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)
4,500.00	7.49	153.45	4,472.25	-386.43	193.06	-369.74	0.00	0.00	0.00
4,600.00	7.49	153.45	4,571.40	-398.10	198.89	-380.90	0.00	0.00	0.00
4,700.00	7.49	153.45	4,670.54	-409.76	204.72	-392.06	0.00	0.00	0.00
4,800.00	7.49	153.45	4,769.69	-421.43	210.54	-403.22	0.00	0.00	0.00
4,900.00	7.49	153.45	4,868.84	-433.09	216.37	-414.38	0.00	0.00	0.00
5,000.00	7.49	153.45	4,967.98	-444.75	222.20	-425.54	0.00	0.00	0.00
5,085.75	7.49	153.45	5,053.00	-454.76	227.20	-435.11	0.00	0.00	0.00
SHANNON									
5,100.00	7.49	153.45	5,067.13	-456.42	228.03	-436.70	0.00	0.00	0.00
5,200.00	7.49	153.45	5,166.28	-468.08	233.85	-447.86	0.00	0.00	0.00
5,300.00	7.49	153.45	5,265.42	-479.75	239.68	-459.02	0.00	0.00	0.00
5,400.00	7.49	153.45	5,364.57	-491.41	245.51	-470.18	0.00	0.00	0.00
5,500.00	7.49	153.45	5,463.71	-503.08	251.34	-481.34	0.00	0.00	0.00
5,600.00	7.49	153.45	5,562.86	-514.74	257.16	-492.50	0.00	0.00	0.00
5,700.00	7.49	153.45	5,662.01	-526.40	262.99	-503.66	0.00	0.00	0.00
5,800.00	7.49	153.45	5,761.15	-538.07	268.82	-514.82	0.00	0.00	0.00
5,900.00	7.49	153.45	5,860.30	-549.73	274.65	-525.98	0.00	0.00	0.00
6,000.00	7.49	153.45	5,959.45	-561.40	280.47	-537.14	0.00	0.00	0.00
6,100.00	7.49	153.45	6,058.59	-573.06	286.30	-548.30	0.00	0.00	0.00
6,200.00	7.49	153.45	6,157.74	-584.73	292.13	-559.46	0.00	0.00	0.00
6,300.00	7.49	153.45	6,256.88	-596.39	297.96	-570.62	0.00	0.00	0.00
6,400.00	7.49	153.45	6,356.03	-608.05	303.78	-581.78	0.00	0.00	0.00
6,500.00	7.49	153.45	6,455.18	-619.72	309.61	-592.94	0.00	0.00	0.00
6,600.00	7.49	153.45	6,554.32	-631.38	315.44	-604.10	0.00	0.00	0.00
6,700.00	7.49	153.45	6,653.47	-643.05	321.27	-615.26	0.00	0.00	0.00
6,800.00	7.49	153.45	6,752.62	-654.71	327.09	-626.42	0.00	0.00	0.00
6,816.58	7.49	153.45	6,769.05	-656.64	328.06	-628.27	0.00	0.00	0.00
Start DLS 10.00 TFO -153.67									
6,900.00	3.69	63.53	6,852.18	-660.32	332.90	-631.55	10.00	-4.56	-107.79
7,000.00	12.08	15.30	6,951.22	-648.77	338.56	-619.58	10.00	8.39	-48.23
7,100.00	21.86	7.89	7,046.76	-620.16	343.89	-590.64	10.00	9.78	-7.41
7,115.43	23.39	7.29	7,061.00	-614.28	344.67	-584.71	10.00	9.89	-3.91
SHARON SPRINGS									
7,200.00	31.78	4.95	7,135.90	-575.37	348.73	-545.61	10.00	9.92	-2.76
7,200.12	31.78	4.95	7,136.00	-575.31	348.73	-545.54	0.00	0.00	0.00
NIOBRARA									
7,264.86	38.23	3.81	7,189.00	-538.30	351.54	-508.42	10.02	9.97	-1.77
NIOBRARA B CHALK TL									
7,300.00	41.73	3.31	7,215.92	-515.77	352.93	-485.85	10.00	9.96	-1.40
7,400.00	51.70	2.21	7,284.40	-443.15	356.38	-413.20	10.00	9.97	-1.10
7,500.00	61.67	1.38	7,339.26	-359.73	358.96	-329.84	10.00	9.98	-0.83
7,600.00	71.65	0.69	7,378.83	-268.05	360.59	-238.31	10.00	9.98	-0.69
7,700.00	81.63	0.08	7,401.90	-170.88	361.23	-141.41	10.00	9.98	-0.61
7,707.94	82.43	0.03	7,403.00	-163.01	361.24	-133.57	10.00	9.98	-0.59
CODELL									
7,781.10	89.73	359.60	7,408.00	-90.07	361.00	-60.88	10.00	9.98	-0.58
7"									
7,781.17	89.74	359.60	7,408.00	-90.00	361.00	-60.81	10.00	9.98	-0.58
Start DLS 1.00 TFO -123.44 - CODELL TL									
7,783.03	89.73	359.59	7,408.01	-88.15	360.99	-58.96	1.00	-0.55	-0.83
Start 4205.81 hold at 7783.03 MD									
7,800.00	89.73	359.59	7,408.09	-71.17	360.86	-42.05	0.00	0.00	0.00
7,900.00	89.73	359.59	7,408.56	28.82	360.15	57.56	0.00	0.00	0.00

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4964' GL @ 4981.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4964' GL @ 4981.00ft
Site:	WELD_BARCLAY 13-27 PAD	North Reference:	True
Well:	BARCLAY 4C-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 4C-27HZ		
Design:	BARCLAY 4C-27HZ (wp01)		

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	89.73	359.59	7,409.04	128.82	359.43	157.18	0.00	0.00	0.00
8,100.00	89.73	359.59	7,409.52	228.81	358.71	256.80	0.00	0.00	0.00
8,200.00	89.73	359.59	7,409.99	328.81	357.99	356.42	0.00	0.00	0.00
8,300.00	89.73	359.59	7,410.47	428.81	357.27	456.03	0.00	0.00	0.00
8,400.00	89.73	359.59	7,410.94	528.80	356.55	555.65	0.00	0.00	0.00
8,500.00	89.73	359.59	7,411.42	628.80	355.83	655.27	0.00	0.00	0.00
8,600.00	89.73	359.59	7,411.89	728.80	355.11	754.89	0.00	0.00	0.00
8,700.00	89.73	359.59	7,412.37	828.79	354.39	854.50	0.00	0.00	0.00
8,800.00	89.73	359.59	7,412.84	928.79	353.67	954.12	0.00	0.00	0.00
8,900.00	89.73	359.59	7,413.32	1,028.78	352.95	1,053.74	0.00	0.00	0.00
9,000.00	89.73	359.59	7,413.79	1,128.78	352.23	1,153.36	0.00	0.00	0.00
9,100.00	89.73	359.59	7,414.27	1,228.78	351.51	1,252.98	0.00	0.00	0.00
9,200.00	89.73	359.59	7,414.74	1,328.77	350.79	1,352.59	0.00	0.00	0.00
9,300.00	89.73	359.59	7,415.22	1,428.77	350.07	1,452.21	0.00	0.00	0.00
9,400.00	89.73	359.59	7,415.69	1,528.77	349.35	1,551.83	0.00	0.00	0.00
9,500.00	89.73	359.59	7,416.17	1,628.76	348.63	1,651.45	0.00	0.00	0.00
9,600.00	89.73	359.59	7,416.65	1,728.76	347.91	1,751.06	0.00	0.00	0.00
9,700.00	89.73	359.59	7,417.12	1,828.76	347.19	1,850.68	0.00	0.00	0.00
9,800.00	89.73	359.59	7,417.60	1,928.75	346.47	1,950.30	0.00	0.00	0.00
9,900.00	89.73	359.59	7,418.07	2,028.75	345.75	2,049.92	0.00	0.00	0.00
10,000.00	89.73	359.59	7,418.55	2,128.74	345.03	2,149.53	0.00	0.00	0.00
10,100.00	89.73	359.59	7,419.02	2,228.74	344.31	2,249.15	0.00	0.00	0.00
10,200.00	89.73	359.59	7,419.50	2,328.74	343.59	2,348.77	0.00	0.00	0.00
10,300.00	89.73	359.59	7,419.97	2,428.73	342.87	2,448.39	0.00	0.00	0.00
10,400.00	89.73	359.59	7,420.45	2,528.73	342.15	2,548.01	0.00	0.00	0.00
10,500.00	89.73	359.59	7,420.92	2,628.73	341.43	2,647.62	0.00	0.00	0.00
10,600.00	89.73	359.59	7,421.40	2,728.72	340.71	2,747.24	0.00	0.00	0.00
10,700.00	89.73	359.59	7,421.87	2,828.72	339.99	2,846.86	0.00	0.00	0.00
10,800.00	89.73	359.59	7,422.35	2,928.71	339.27	2,946.48	0.00	0.00	0.00
10,900.00	89.73	359.59	7,422.82	3,028.71	338.56	3,046.09	0.00	0.00	0.00
11,000.00	89.73	359.59	7,423.30	3,128.71	337.84	3,145.71	0.00	0.00	0.00
11,100.00	89.73	359.59	7,423.78	3,228.70	337.12	3,245.33	0.00	0.00	0.00
11,200.00	89.73	359.59	7,424.25	3,328.70	336.40	3,344.95	0.00	0.00	0.00
11,300.00	89.73	359.59	7,424.73	3,428.70	335.68	3,444.56	0.00	0.00	0.00
11,400.00	89.73	359.59	7,425.20	3,528.69	334.96	3,544.18	0.00	0.00	0.00
11,500.00	89.73	359.59	7,425.68	3,628.69	334.24	3,643.80	0.00	0.00	0.00
11,600.00	89.73	359.59	7,426.15	3,728.68	333.52	3,743.42	0.00	0.00	0.00
11,700.00	89.73	359.59	7,426.63	3,828.68	332.80	3,843.03	0.00	0.00	0.00
11,800.00	89.73	359.59	7,427.10	3,928.68	332.08	3,942.65	0.00	0.00	0.00
11,900.00	89.73	359.59	7,427.58	4,028.67	331.36	4,042.27	0.00	0.00	0.00
11,988.84	89.73	359.59	7,428.00	4,117.51	330.72	4,130.77	0.00	0.00	0.00
TD at 11988.84 - BARCLAY 4C-27HZ BHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
BARCLAY 4C-27HZ E	0.00	0.00	7,428.00	4,117.51	330.72	1,317,295.08	3,203,944.91	40.202067	-104.769853
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

Database:	edm5000p	Local Co-ordinate Reference:	Well BARCLAY 4C-27HZ
Company:	US ROCKIES REGION PLANNING	TVD Reference:	17' RKB + 4964' GL @ 4981.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	17' RKB + 4964' GL @ 4981.00ft
Site:	WELD_BARCLAY 13-27 PAD	North Reference:	True
Well:	BARCLAY 4C-27HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	BARCLAY 4C-27HZ		
Design:	BARCLAY 4C-27HZ (wp01)		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
850.00	850.00	9 5/8"	9-5/8	12-1/4
7,781.10	7,408.00	7"	7	8-3/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,250.08	3,233.00	PARKMAN		0.00	
4,438.22	4,411.00	SUSSEX		0.00	
5,085.75	5,053.00	SHANNON		0.00	
7,115.43	7,061.00	SHARON SPRINGS		0.00	
7,200.12	7,136.00	NIOBRARA		0.00	
7,264.86	7,189.00	NIOBRARA B CHALK TL		0.00	
7,707.94	7,403.00	CODELL		0.00	
7,781.17	7,408.00	CODELL TL		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,000.00	1,000.00	0.00	0.00	Start Build 2.00
1,374.61	1,373.54	-21.88	10.93	Start 5441.97 hold at 1374.61 MD
6,816.58	6,769.05	-656.64	328.06	Start DLS 10.00 TFO -153.67
7,781.17	7,408.00	-90.00	361.00	Start DLS 1.00 TFO -123.44
7,783.03	7,408.01	-88.15	360.99	Start 4205.81 hold at 7783.03 MD
11,988.84	7,428.00	4,117.51	330.72	TD at 11988.84