

Whiting Oil and Gas Corporation

Weld County, CO

Sec. 2-T10N-R57W

Horsetail #02D-0204

Plan A

Plan: Rev A0

Sperry Drilling Services

Proposal Report

25 February, 2014

Well Coordinates: 1,566,448.17 N, 3,490,792.35 E (40° 52' 29.25" N, 103° 43' 30.89" W)

Ground Level: 4,778.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Horsetail #02D-0204

KB 17' @ 4795.00usft (Frontier 26)

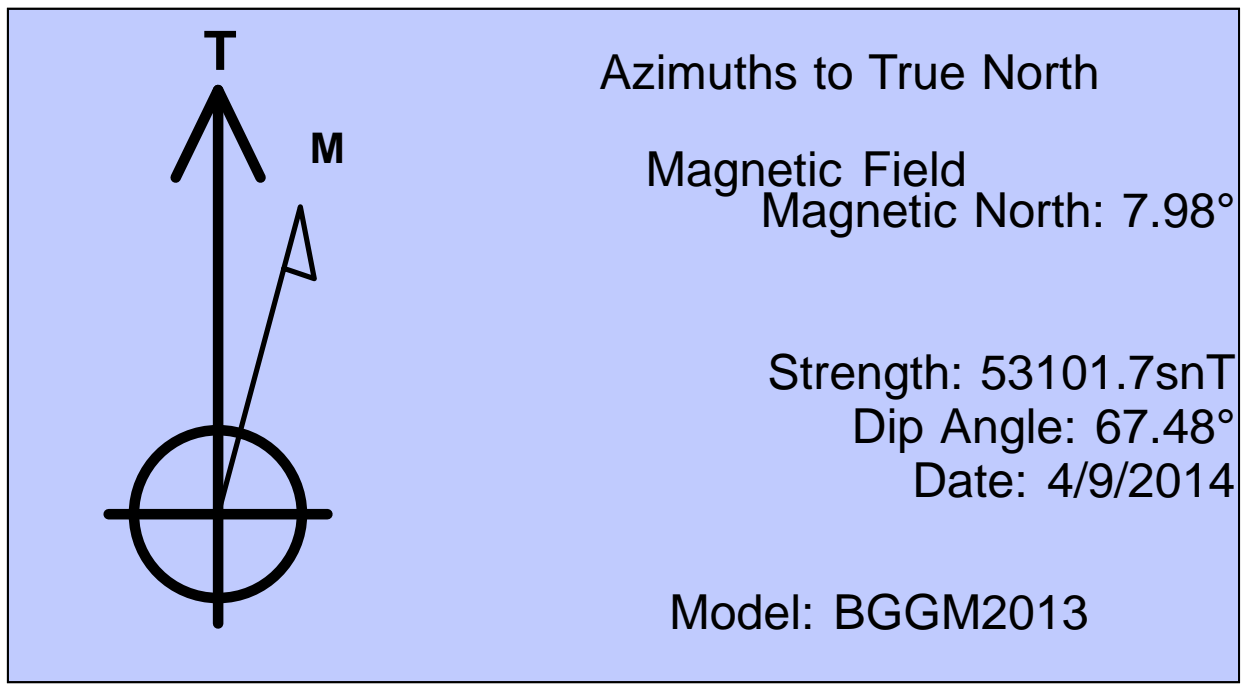
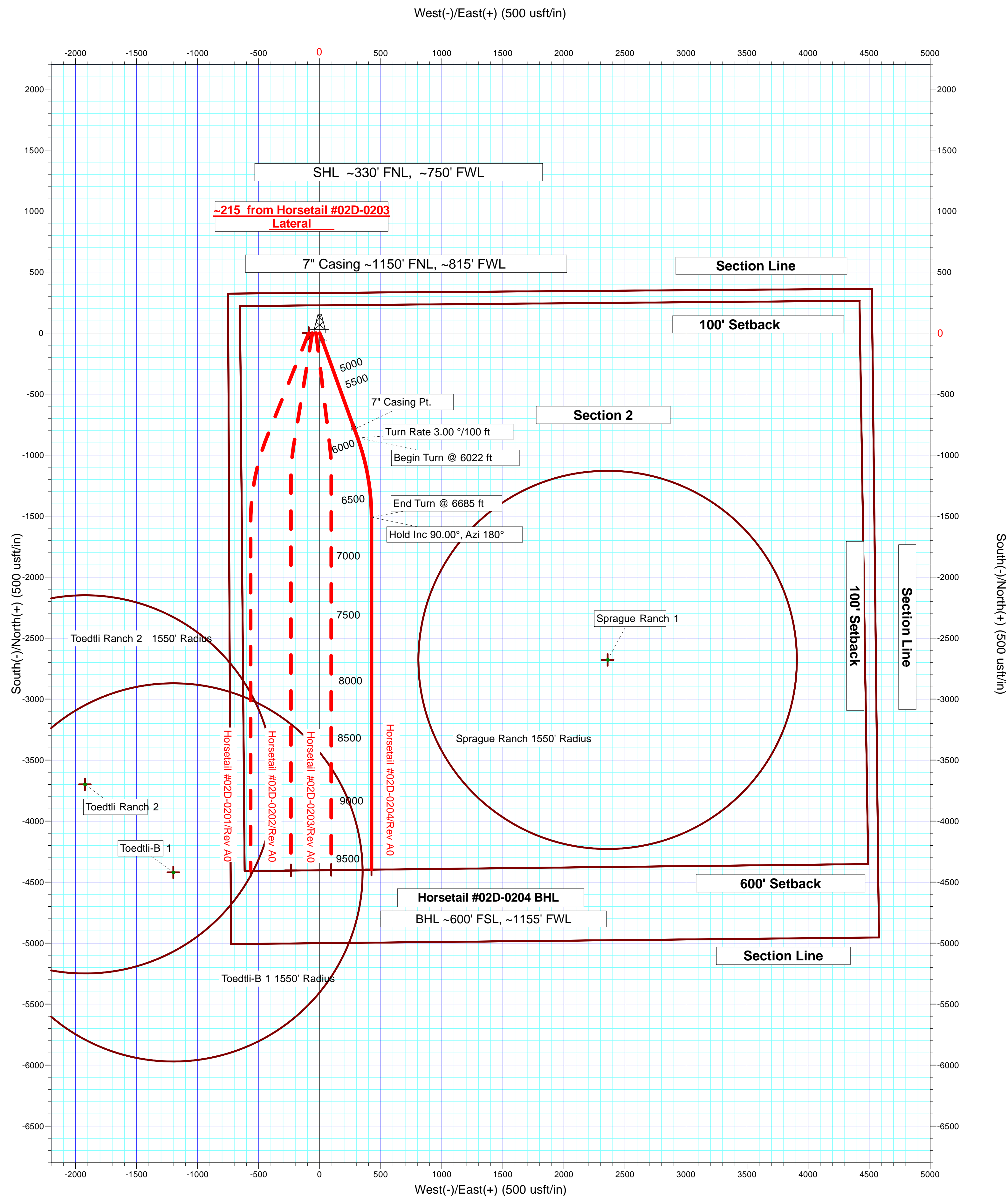
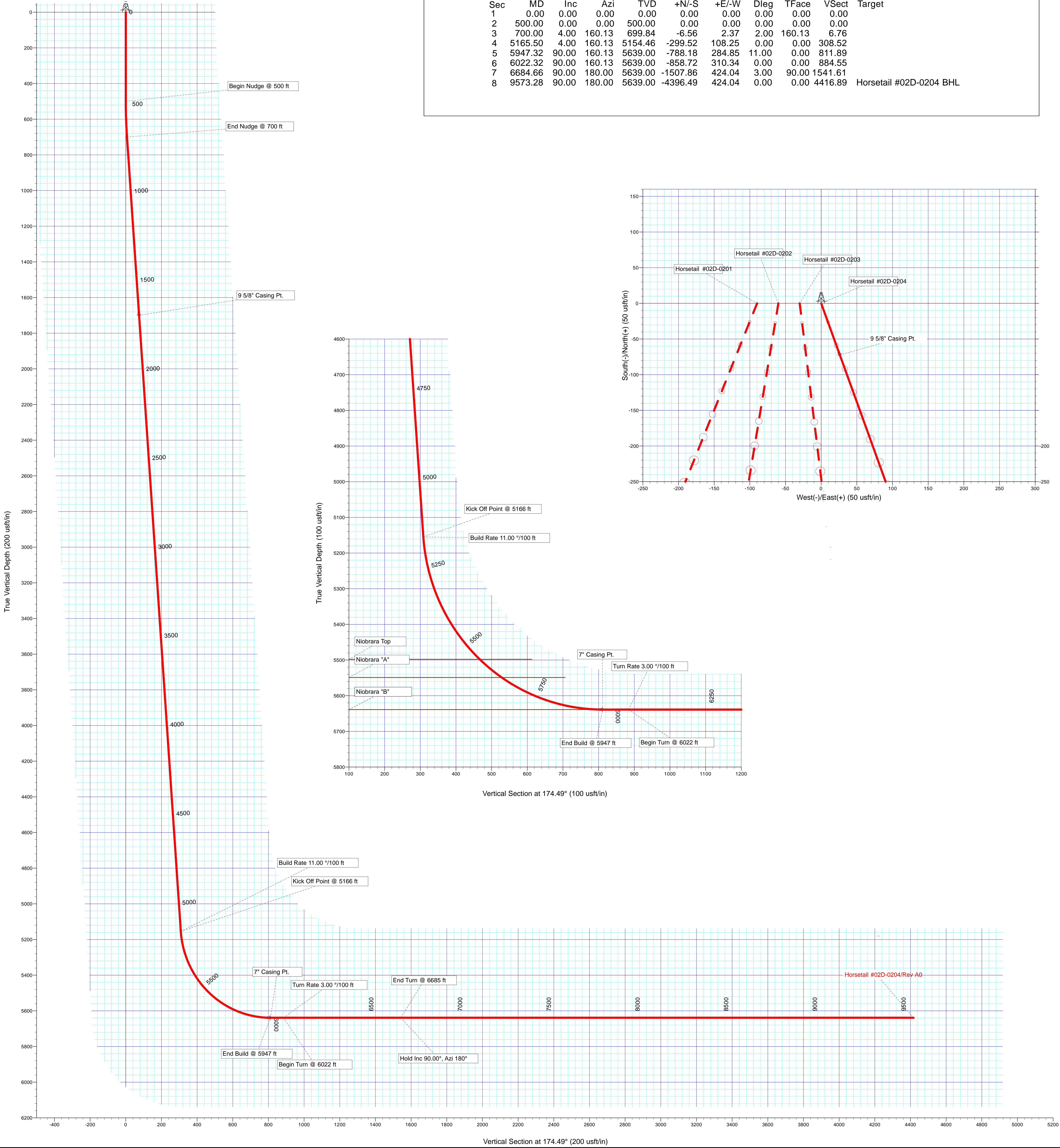
N

True

API - US Survey Feet - Custom

HALLIBURTON

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	
3	700.00	4.00	160.13	699.84	-6.56	2.37	2.00	160.13	6.76	
4	5165.50	4.00	160.13	5154.46	-299.52	108.25	0.00	0.00	308.52	
5	5947.32	90.00	160.13	5639.00	-788.18	284.85	11.00	0.00	811.89	
6	6022.32	90.00	160.13	5639.00	-858.72	310.34	0.00	0.00	884.55	
7	6684.66	90.00	180.00	5639.00	-1507.86	424.04	3.00	90.00	1541.61	
8	9573.28	90.00	180.00	5639.00	-4396.49	424.04	0.00	0.00	4416.89	Horsetail #02D-0204 BHL



Plan: Rev A0 (Horsetail #02D-0204/Plan A)	
Created By: Troy L. Stoute	Date: 17:54, February 25 2014
Checked: _____	Date: _____
Reviewed: _____	Date: _____
Approved: _____	Date: _____

Plan Report for Horsetail #02D-0204 - Rev A0

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
0.00	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	0.00
200.00	0.00	0.00	200.00	0.00	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	0.00
400.00	0.00	0.00	400.00	0.00	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	0.00
Begin Nudge @ 500 ft										
600.00	2.00	160.13	599.98	-1.64	0.59	1.69	2.00	2.00	0.00	160.13
700.00	4.00	160.13	699.84	-6.56	2.37	6.76	2.00	2.00	0.00	0.00
End Nudge @ 700 ft										
800.00	4.00	160.13	799.59	-13.12	4.74	13.52	0.00	0.00	0.00	0.00
900.00	4.00	160.13	899.35	-19.68	7.11	20.28	0.00	0.00	0.00	0.00
1,000.00	4.00	160.13	999.11	-26.24	9.48	27.03	0.00	0.00	0.00	0.00
1,100.00	4.00	160.13	1,098.86	-32.80	11.86	33.79	0.00	0.00	0.00	0.00
1,200.00	4.00	160.13	1,198.62	-39.36	14.23	40.55	0.00	0.00	0.00	0.00
1,300.00	4.00	160.13	1,298.38	-45.93	16.60	47.31	0.00	0.00	0.00	0.00
1,400.00	4.00	160.13	1,398.13	-52.49	18.97	54.06	0.00	0.00	0.00	0.00
1,500.00	4.00	160.13	1,497.89	-59.05	21.34	60.82	0.00	0.00	0.00	0.00
1,600.00	4.00	160.13	1,597.65	-65.61	23.71	67.58	0.00	0.00	0.00	0.00
1,606.37	4.00	160.13	1,604.00	-66.02	23.86	68.01	0.00	0.00	0.00	0.00
Pierre										
1,700.00	4.00	160.13	1,697.40	-72.17	26.08	74.34	0.00	0.00	0.00	0.00
1,702.60	4.00	160.13	1,700.00	-72.34	26.14	74.51	0.00	0.00	0.00	0.00
9 5/8" Casing Pt.										
1,800.00	4.00	160.13	1,797.16	-78.73	28.45	81.09	0.00	0.00	0.00	0.00
1,900.00	4.00	160.13	1,896.91	-85.29	30.82	87.85	0.00	0.00	0.00	0.00
2,000.00	4.00	160.13	1,996.67	-91.85	33.19	94.61	0.00	0.00	0.00	0.00
2,100.00	4.00	160.13	2,096.43	-98.41	35.56	101.37	0.00	0.00	0.00	0.00
2,200.00	4.00	160.13	2,196.18	-104.97	37.94	108.13	0.00	0.00	0.00	0.00
2,300.00	4.00	160.13	2,295.94	-111.53	40.31	114.88	0.00	0.00	0.00	0.00
2,400.00	4.00	160.13	2,395.70	-118.09	42.68	121.64	0.00	0.00	0.00	0.00
2,500.00	4.00	160.13	2,495.45	-124.65	45.05	128.40	0.00	0.00	0.00	0.00
2,600.00	4.00	160.13	2,595.21	-131.21	47.42	135.16	0.00	0.00	0.00	0.00
2,700.00	4.00	160.13	2,694.97	-137.77	49.79	141.91	0.00	0.00	0.00	0.00
2,800.00	4.00	160.13	2,794.72	-144.33	52.16	148.67	0.00	0.00	0.00	0.00
2,900.00	4.00	160.13	2,894.48	-150.89	54.53	155.43	0.00	0.00	0.00	0.00
3,000.00	4.00	160.13	2,994.23	-157.45	56.90	162.19	0.00	0.00	0.00	0.00
3,100.00	4.00	160.13	3,093.99	-164.01	59.27	168.94	0.00	0.00	0.00	0.00
3,200.00	4.00	160.13	3,193.75	-170.57	61.65	175.70	0.00	0.00	0.00	0.00
3,300.00	4.00	160.13	3,293.50	-177.13	64.02	182.46	0.00	0.00	0.00	0.00
3,400.00	4.00	160.13	3,393.26	-183.69	66.39	189.22	0.00	0.00	0.00	0.00
3,500.00	4.00	160.13	3,493.02	-190.25	68.76	195.98	0.00	0.00	0.00	0.00
3,600.00	4.00	160.13	3,592.77	-196.81	71.13	202.73	0.00	0.00	0.00	0.00
3,700.00	4.00	160.13	3,692.53	-203.37	73.50	209.49	0.00	0.00	0.00	0.00
3,800.00	4.00	160.13	3,792.29	-209.93	75.87	216.25	0.00	0.00	0.00	0.00
3,900.00	4.00	160.13	3,892.04	-216.49	78.24	223.01	0.00	0.00	0.00	0.00
4,000.00	4.00	160.13	3,991.80	-223.05	80.61	229.76	0.00	0.00	0.00	0.00
4,100.00	4.00	160.13	4,091.56	-229.62	82.98	236.52	0.00	0.00	0.00	0.00
4,200.00	4.00	160.13	4,191.31	-236.18	85.35	243.28	0.00	0.00	0.00	0.00
4,300.00	4.00	160.13	4,291.07	-242.74	87.73	250.04	0.00	0.00	0.00	0.00
4,400.00	4.00	160.13	4,390.82	-249.30	90.10	256.79	0.00	0.00	0.00	0.00
4,500.00	4.00	160.13	4,490.58	-255.86	92.47	263.55	0.00	0.00	0.00	0.00
4,600.00	4.00	160.13	4,590.34	-262.42	94.84	270.31	0.00	0.00	0.00	0.00
4,700.00	4.00	160.13	4,690.09	-268.98	97.21	277.07	0.00	0.00	0.00	0.00
4,800.00	4.00	160.13	4,789.85	-275.54	99.58	283.83	0.00	0.00	0.00	0.00
4,900.00	4.00	160.13	4,889.61	-282.10	101.95	290.58	0.00	0.00	0.00	0.00
5,000.00	4.00	160.13	4,989.36	-288.66	104.32	297.34	0.00	0.00	0.00	0.00
5,100.00	4.00	160.13	5,089.12	-295.22	106.69	304.10	0.00	0.00	0.00	0.00

Plan Report for Horsetail #02D-0204 - Rev A0

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
5,165.50	4.00	160.13	5,154.46	-299.52	108.25	308.52	0.00	0.00	0.00	0.00
5,166.00	4.06	160.13	5,154.96	-299.55	108.26	308.56	11.00	11.00	0.00	0.00
Kick Off Point @ 5166 ft - Build Rate 11.00 °/100 ft										
5,200.00	7.80	160.13	5,188.77	-302.85	109.45	311.96	11.00	11.00	0.00	0.00
5,300.00	18.80	160.13	5,285.94	-324.44	117.25	334.20	11.00	11.00	0.00	0.00
5,400.00	29.80	160.13	5,376.95	-363.08	131.22	374.00	11.00	11.00	0.00	0.00
5,500.00	40.80	160.13	5,458.44	-417.33	150.83	429.89	11.00	11.00	0.00	0.00
5,554.85	46.83	160.13	5,498.00	-453.03	163.73	466.65	11.00	11.00	0.00	0.00
Niobrara Top										
5,600.00	51.80	160.13	5,527.43	-485.22	175.36	499.81	11.00	11.00	0.00	0.00
5,636.54	55.81	160.13	5,549.00	-512.94	185.38	528.37	11.00	11.00	0.00	0.00
Niobrara "A"										
5,700.00	62.80	160.13	5,581.38	-564.23	203.91	581.20	11.00	11.00	0.00	0.00
5,800.00	73.80	160.13	5,618.30	-651.48	235.45	671.07	11.00	11.00	0.00	0.00
5,900.00	84.80	160.13	5,636.85	-743.74	268.79	766.11	11.00	11.00	0.00	0.00
5,947.00	89.97	160.13	5,639.00	-787.88	284.74	811.58	11.00	11.00	0.00	0.00
End Build @ 5947 ft - 7" Casing Pt.										
5,947.32	90.00	160.13	5,639.00	-788.18	284.85	811.89	11.00	11.00	0.00	0.00
Niobrara "B"										
6,000.00	90.00	160.13	5,639.00	-837.73	302.76	862.93	0.00	0.00	0.00	0.00
6,022.00	90.00	160.13	5,639.00	-858.42	310.24	884.24	0.00	0.00	0.00	0.00
Turn Rate 3.00 °/100 ft - Begin Turn @ 6022 ft										
6,022.32	90.00	160.13	5,639.00	-858.72	310.34	884.55	0.00	0.00	0.00	0.00
6,100.00	90.00	162.46	5,639.00	-932.29	335.25	960.17	3.00	0.00	3.00	90.00
6,200.00	90.00	165.46	5,639.00	-1,028.39	362.88	1,058.48	3.00	0.00	3.00	90.00
6,300.00	90.00	168.46	5,639.00	-1,125.80	385.44	1,157.60	3.00	0.00	3.00	90.00
6,400.00	90.00	171.46	5,639.00	-1,224.26	402.87	1,257.28	3.00	0.00	3.00	90.00
6,500.00	90.00	174.46	5,639.00	-1,323.49	415.13	1,357.23	3.00	0.00	3.00	90.00
6,600.00	90.00	177.46	5,639.00	-1,423.23	422.17	1,457.19	3.00	0.00	3.00	90.00
6,684.66	90.00	180.00	5,639.00	-1,507.86	424.04	1,541.61	3.00	0.00	3.00	90.00
6,685.00	90.00	180.00	5,639.00	-1,508.20	424.04	1,541.95	0.00	0.00	0.00	0.00
End Turn @ 6685 ft - Hold Inc 90.00°, Azi 180°										
6,700.00	90.00	180.00	5,639.00	-1,523.20	424.04	1,556.88	0.00	0.00	0.00	0.00
6,800.00	90.00	180.00	5,639.00	-1,623.20	424.04	1,656.42	0.00	0.00	0.00	0.00
6,900.00	90.00	180.00	5,639.00	-1,723.20	424.04	1,755.95	0.00	0.00	0.00	0.00
7,000.00	90.00	180.00	5,639.00	-1,823.20	424.04	1,855.49	0.00	0.00	0.00	0.00
7,100.00	90.00	180.00	5,639.00	-1,923.20	424.04	1,955.03	0.00	0.00	0.00	0.00
7,200.00	90.00	180.00	5,639.00	-2,023.20	424.04	2,054.57	0.00	0.00	0.00	0.00
7,300.00	90.00	180.00	5,639.00	-2,123.20	424.04	2,154.11	0.00	0.00	0.00	0.00
7,400.00	90.00	180.00	5,639.00	-2,223.20	424.04	2,253.64	0.00	0.00	0.00	0.00
7,500.00	90.00	180.00	5,639.00	-2,323.20	424.04	2,353.18	0.00	0.00	0.00	0.00
7,600.00	90.00	180.00	5,639.00	-2,423.20	424.04	2,452.72	0.00	0.00	0.00	0.00
7,700.00	90.00	180.00	5,639.00	-2,523.20	424.04	2,552.26	0.00	0.00	0.00	0.00
7,800.00	90.00	180.00	5,639.00	-2,623.20	424.04	2,651.80	0.00	0.00	0.00	0.00
7,900.00	90.00	180.00	5,639.00	-2,723.20	424.04	2,751.33	0.00	0.00	0.00	0.00
8,000.00	90.00	180.00	5,639.00	-2,823.20	424.04	2,850.87	0.00	0.00	0.00	0.00
8,100.00	90.00	180.00	5,639.00	-2,923.20	424.04	2,950.41	0.00	0.00	0.00	0.00
8,200.00	90.00	180.00	5,639.00	-3,023.20	424.04	3,049.95	0.00	0.00	0.00	0.00
8,300.00	90.00	180.00	5,639.00	-3,123.20	424.04	3,149.49	0.00	0.00	0.00	0.00
8,400.00	90.00	180.00	5,639.00	-3,223.20	424.04	3,249.03	0.00	0.00	0.00	0.00
8,500.00	90.00	180.00	5,639.00	-3,323.20	424.04	3,348.56	0.00	0.00	0.00	0.00
8,600.00	90.00	180.00	5,639.00	-3,423.20	424.04	3,448.10	0.00	0.00	0.00	0.00
8,700.00	90.00	180.00	5,639.00	-3,523.20	424.04	3,547.64	0.00	0.00	0.00	0.00
8,800.00	90.00	180.00	5,639.00	-3,623.20	424.04	3,647.18	0.00	0.00	0.00	0.00
8,900.00	90.00	180.00	5,639.00	-3,723.20	424.04	3,746.72	0.00	0.00	0.00	0.00
9,000.00	90.00	180.00	5,639.00	-3,823.20	424.04	3,846.25	0.00	0.00	0.00	0.00
9,100.00	90.00	180.00	5,639.00	-3,923.20	424.04	3,945.79	0.00	0.00	0.00	0.00
9,200.00	90.00	180.00	5,639.00	-4,023.20	424.04	4,045.33	0.00	0.00	0.00	0.00

Plan Report for Horsetail #02D-0204 - Rev A0

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
9,300.00	90.00	180.00	5,639.00	-4,123.20	424.04	4,144.87	0.00	0.00	0.00	0.00
9,400.00	90.00	180.00	5,639.00	-4,223.20	424.04	4,244.41	0.00	0.00	0.00	0.00
9,500.00	90.00	180.00	5,639.00	-4,323.20	424.04	4,343.94	0.00	0.00	0.00	0.00
9,573.00	90.00	180.00	5,639.00	-4,396.20	424.04	4,416.61	0.00	0.00	0.00	0.00
Total Depth 9573 ft										
9,573.28	90.00	180.00	5,639.00	-4,396.49	424.04	4,416.89	0.00	0.00	0.00	0.00

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
500.00	500.00	0.00	0.00	Begin Nudge @ 500 ft
700.00	699.84	-6.56	2.37	End Nudge @ 700 ft
5,166.00	5,154.96	-299.55	108.26	Kick Off Point @ 5166 ft
5,166.00	5,154.96	-299.55	108.26	Build Rate 11.00 °/100 ft
5,947.00	5,639.00	-787.88	284.74	End Build @ 5947 ft
6,022.00	5,639.00	-858.42	310.24	Turn Rate 3.00 °/100 ft
6,022.00	5,639.00	-858.42	310.24	Begin Turn @ 6022 ft
6,685.00	5,639.00	-1,508.20	424.04	End Turn @ 6685 ft
6,685.00	5,639.00	-1,508.20	424.04	Hold Inc 90.00°, Azi 180°
9,573.00	5,639.00	-4,396.20	424.04	Total Depth 9573 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	+E/-W (usft)	Start TVD (usft)
Target	Horsetail #02D-0204 BHL	174.49	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	1,700.00	Rev A0	MWD+IFR1+MS+sag
1,700.00	5,947.00	Rev A0	MWD+IFR1+MS+sag
5,947.00	9,572.77	Rev A0	MWD+IFR1+MS+sag

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,702.60	1,700.00	9 5/8" Casing Pt.	9-5/8	13-1/2
5,947.00	5,639.00	7" Casing Pt.	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,606.37	1,604.00	Pierre		0.00	
5,554.85	5,498.00	Niobrara Top		0.00	
5,636.54	5,549.00	Niobrara "A"		0.00	
5,947.32	5,639.00	Niobrara "B"		0.00	

Plan Report for Horsetail #02D-0204 - Rev A0

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Horsetail #02D Section 2 Lines	0.00	0.01	-89.88	Polygon
Horsetail #02D Section Setback	0.00	0.01	-89.88	Polygon
Horsetail #02D-0204 BHL	5,639.00	-4,396.49	424.04	Point

Directional Difficulty Index

Average Dogleg over Survey:	1.15 °/100usft	Maximum Dogleg over Survey:	11.00 °/100usft at 5,947.32 usft
Net Tortousity applicable to Plans:	1.15 °/100usft	Directional Difficulty Index:	6.010

Audit Info

North Reference Sheet for Sec. 2-T10N-R57W - Horsetail #02D-0204 - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to KB 17' @ 4795.00usft (Frontier 26). Northing and Easting are relative to Horsetail #02D-0204

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 1.00001612

Grid Coordinates of Well: 1,566,448.17 usft N, 3,490,792.35 usft E

Geographical Coordinates of Well: 40° 52' 29.25" N, 103° 43' 30.89" W

Grid Convergence at Surface is: 1.15°

Based upon Minimum Curvature type calculations, at a Measured Depth of 9,573.28usft
the Bottom Hole Displacement is 4,416.89usft in the Direction of 174.49° (True).

Magnetic Convergence at surface is: -6.83° (9 April 2014, , BGGM2013)

