

Whiting Oil and Gas Corporation

Weld County, CO

Sec. 2-T10N-R57W

Horsetail #02D-0201

Plan A

Plan: Rev A0

Sperry Drilling Services

Proposal Report

25 February, 2014

Well Coordinates: 1,566,446.36 N, 3,490,702.48 E (40° 52' 29.25" N, 103° 43' 32.06" 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-0201

KB 17' @ 4795.00usft (Frontier 26)

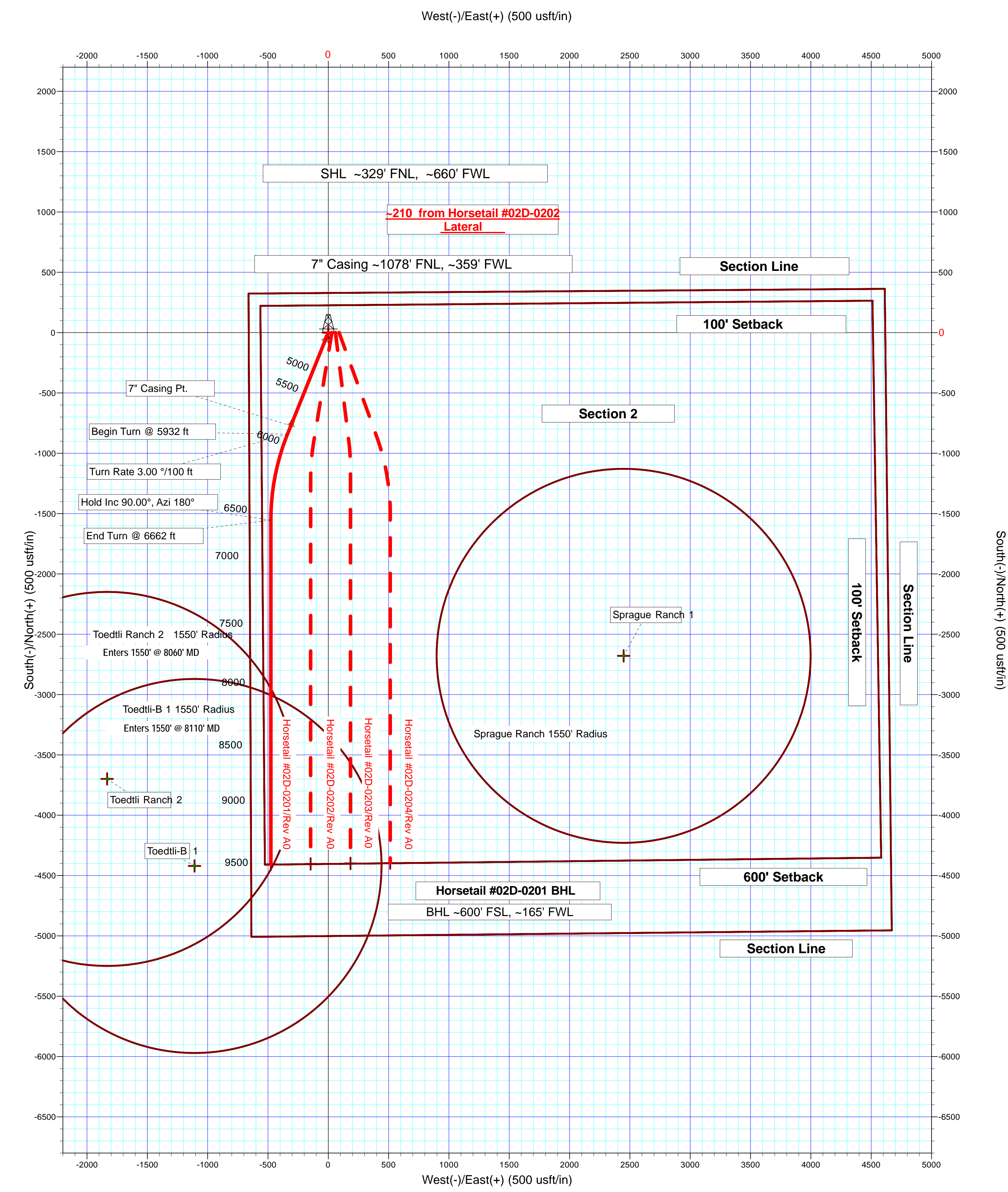
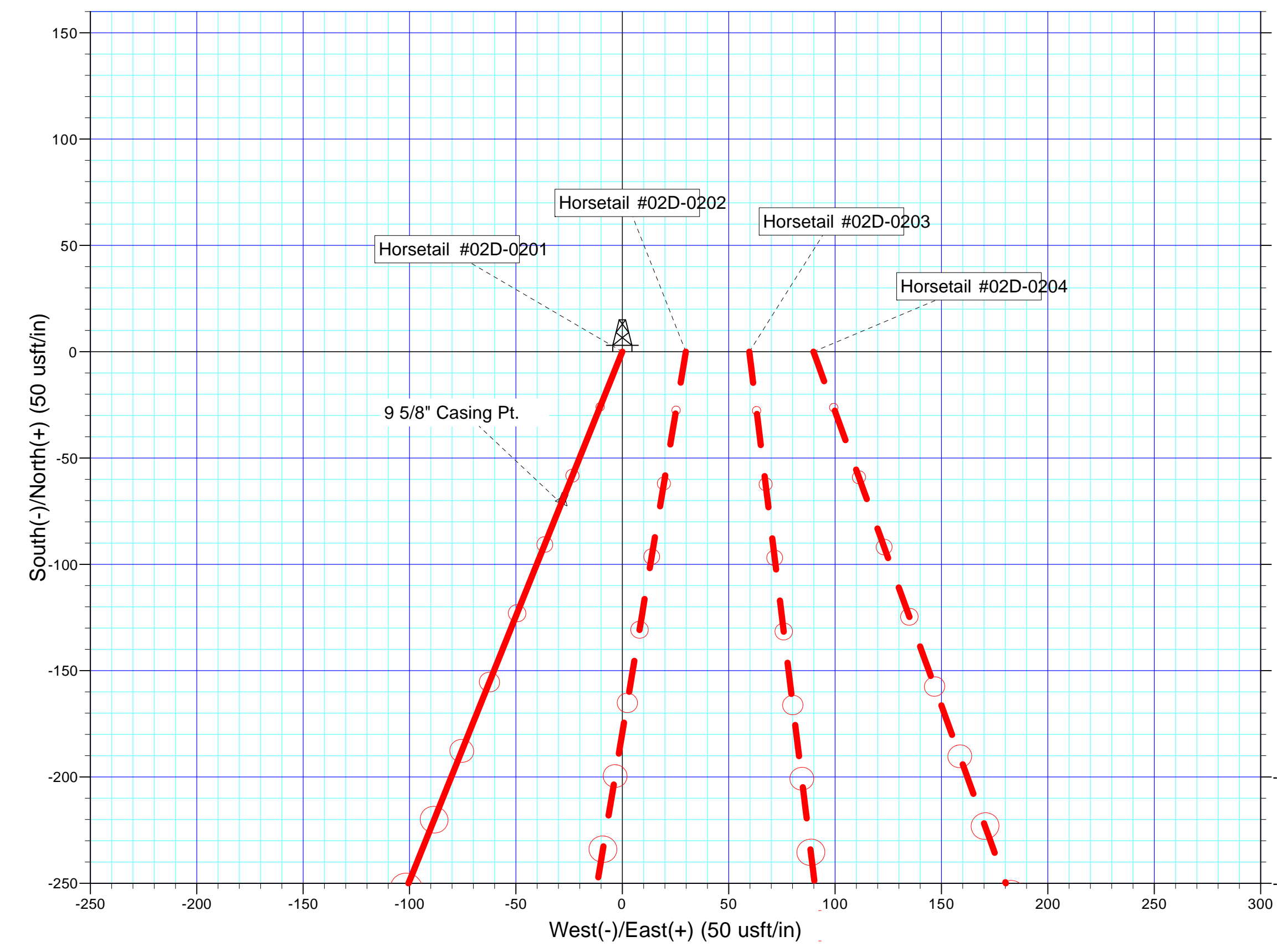
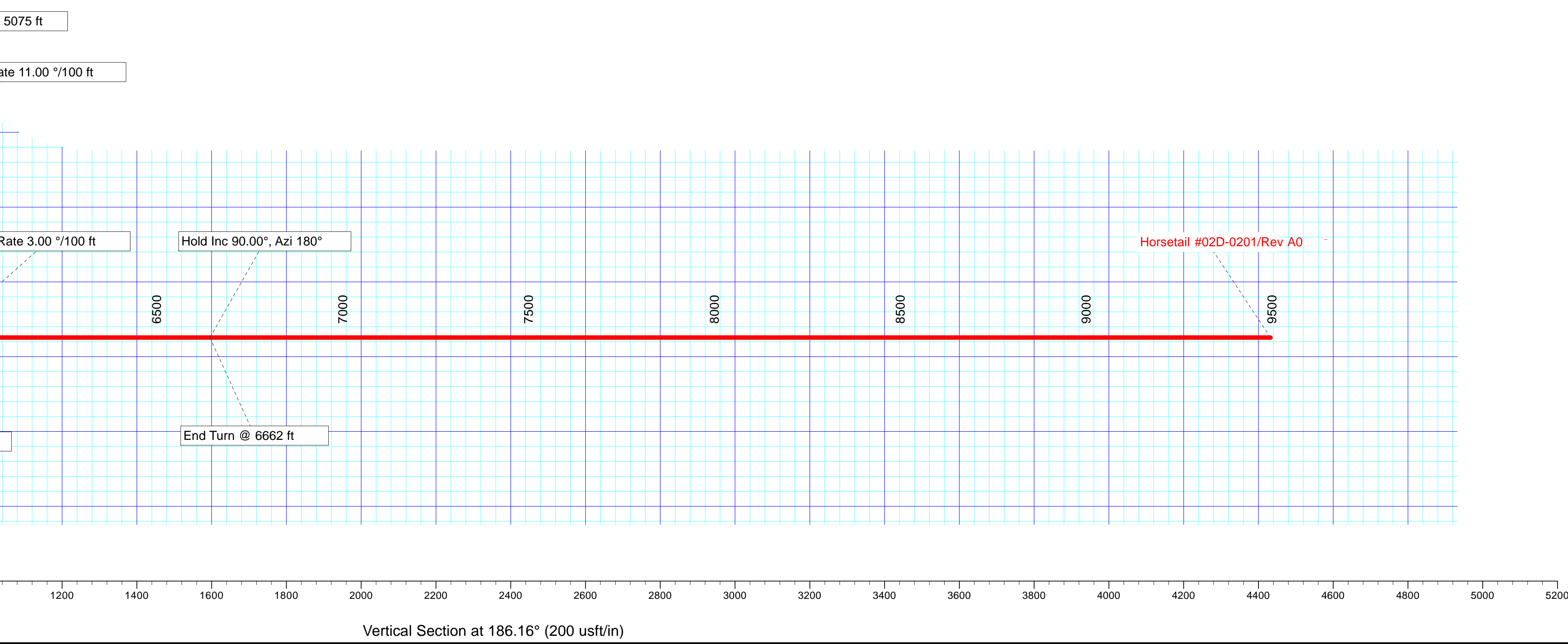
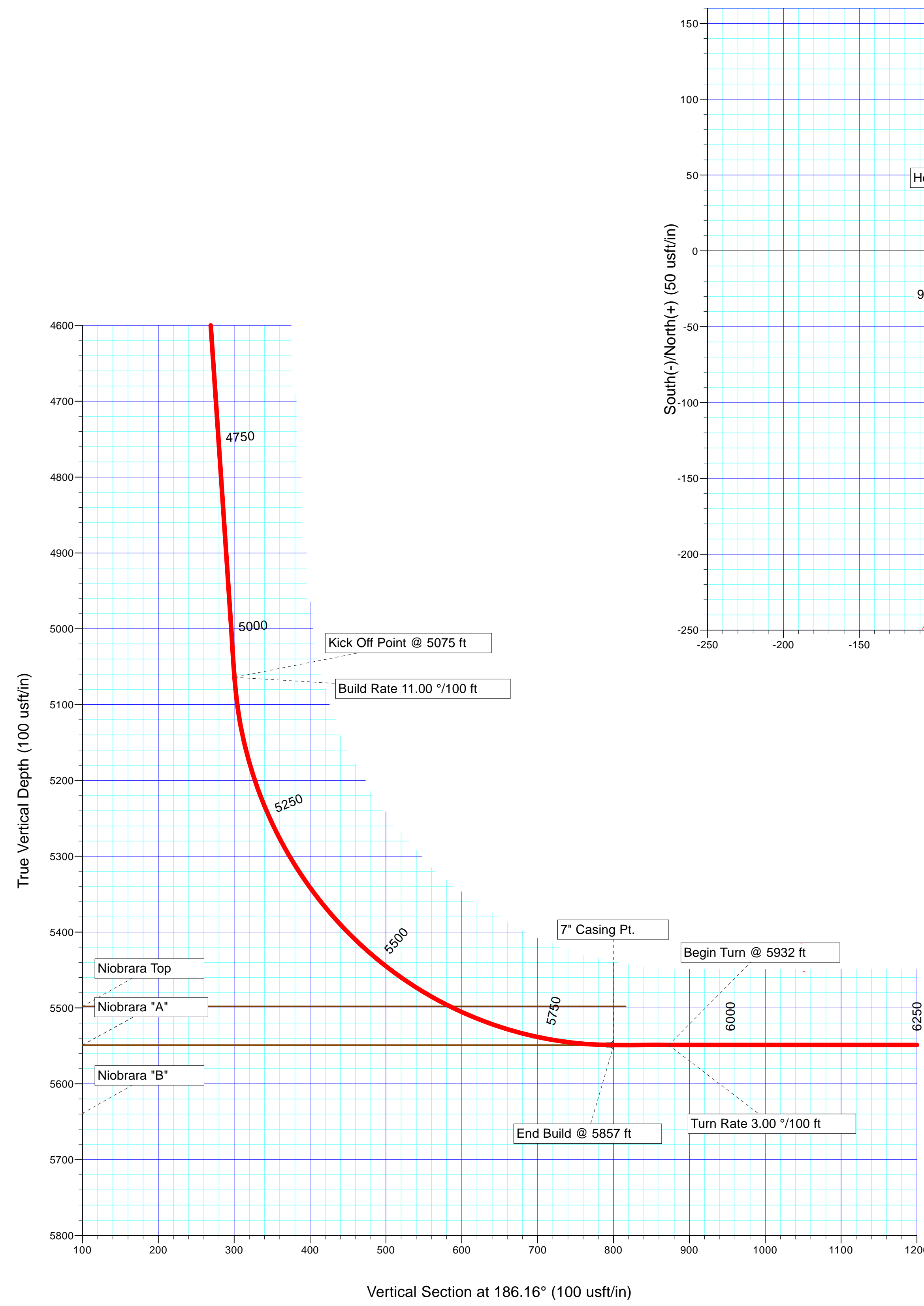
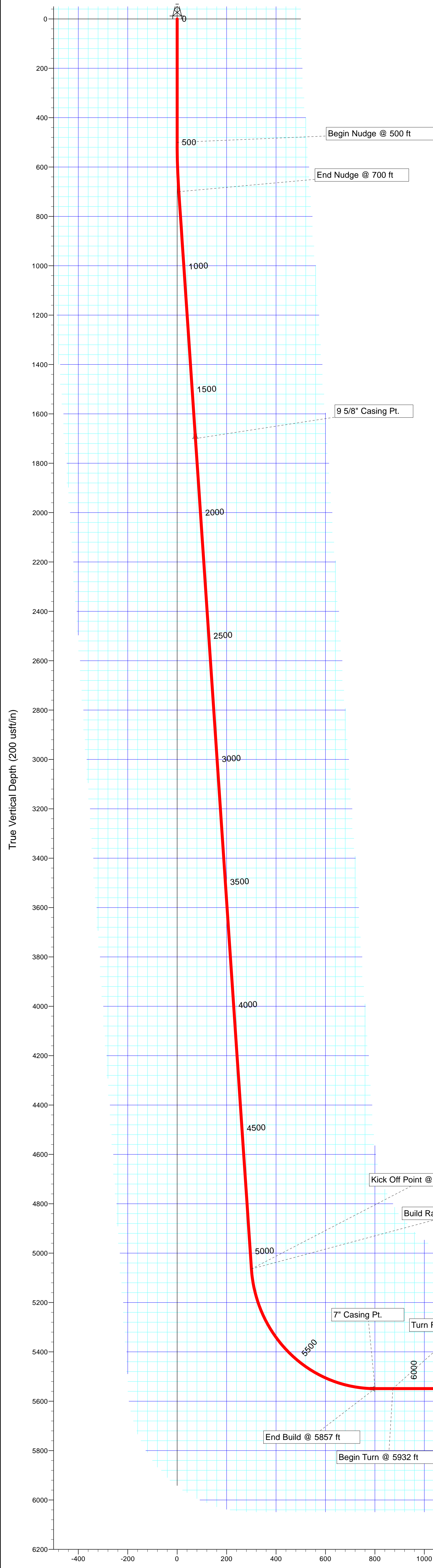
N

True

API - US Survey Feet - Custom

HALLIBURTON

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Target
1	0.00	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	0.00
3	700.00	4.00	201.89	699.84	-6.48	-2.60	2.00	201.89	6.72	
4	5075.28	4.00	201.89	5064.46	-289.67	-116.39	0.00	0.00	300.49	
5	5857.10	90.00	201.89	5549.00	-771.81	-310.11	11.00	0.00	800.64	
6	5932.10	90.00	201.89	5549.00	-841.41	-338.07	0.00	0.00	872.83	
7	6661.77	90.00	180.00	5549.00	-1553.46	-475.77	3.00	-90.00	1595.55	
8	9515.00	90.00	180.00	5549.00	-4406.68	-475.76	0.00	0.00	4432.29	Horsetail #02D-0201 BHL



Azimuths to True North
 Magnetic Field
 Magnetic North: 7.98°
 Strength: 53101.7snT
 Dip Angle: 67.48°
 Date: 4/9/2014
 Model: BGGM2013

Plan: Rev A0 (Horsetail #02D-0201/Plan A)
 Created By: Troy L. Stoute Date: 16:22, February 25 2014
 Checked: _____ Date: _____
 Reviewed: _____ Date: _____
 Approved: _____ Date: _____

Plan Report for Horsetail #02D-0201 - 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	201.89	599.98	-1.62	-0.65	1.68	2.00	2.00	0.00	201.89
700.00	4.00	201.89	699.84	-6.48	-2.60	6.72	2.00	2.00	0.00	0.00
End Nudge @ 700 ft										
800.00	4.00	201.89	799.59	-12.95	-5.20	13.43	0.00	0.00	0.00	0.00
900.00	4.00	201.89	899.35	-19.42	-7.80	20.15	0.00	0.00	0.00	0.00
1,000.00	4.00	201.89	999.11	-25.89	-10.40	26.86	0.00	0.00	0.00	0.00
1,100.00	4.00	201.89	1,098.86	-32.37	-13.00	33.58	0.00	0.00	0.00	0.00
1,200.00	4.00	201.89	1,198.62	-38.84	-15.61	40.29	0.00	0.00	0.00	0.00
1,300.00	4.00	201.89	1,298.38	-45.31	-18.21	47.00	0.00	0.00	0.00	0.00
1,400.00	4.00	201.89	1,398.13	-51.78	-20.81	53.72	0.00	0.00	0.00	0.00
1,500.00	4.00	201.89	1,497.89	-58.26	-23.41	60.43	0.00	0.00	0.00	0.00
1,600.00	4.00	201.89	1,597.65	-64.73	-26.01	67.15	0.00	0.00	0.00	0.00
1,606.37	4.00	201.89	1,604.00	-65.14	-26.17	67.58	0.00	0.00	0.00	0.00
Pierre										
1,700.00	4.00	201.89	1,697.40	-71.20	-28.61	73.86	0.00	0.00	0.00	0.00
1,702.60	4.00	201.89	1,700.00	-71.37	-28.68	74.04	0.00	0.00	0.00	0.00
9 5/8" Casing Pt.										
1,800.00	4.00	201.89	1,797.16	-77.68	-31.21	80.58	0.00	0.00	0.00	0.00
1,900.00	4.00	201.89	1,896.91	-84.15	-33.81	87.29	0.00	0.00	0.00	0.00
2,000.00	4.00	201.89	1,996.67	-90.62	-36.41	94.01	0.00	0.00	0.00	0.00
2,100.00	4.00	201.89	2,096.43	-97.09	-39.01	100.72	0.00	0.00	0.00	0.00
2,200.00	4.00	201.89	2,196.18	-103.57	-41.61	107.43	0.00	0.00	0.00	0.00
2,300.00	4.00	201.89	2,295.94	-110.04	-44.21	114.15	0.00	0.00	0.00	0.00
2,400.00	4.00	201.89	2,395.70	-116.51	-46.81	120.86	0.00	0.00	0.00	0.00
2,500.00	4.00	201.89	2,495.45	-122.98	-49.41	127.58	0.00	0.00	0.00	0.00
2,600.00	4.00	201.89	2,595.21	-129.46	-52.02	134.29	0.00	0.00	0.00	0.00
2,700.00	4.00	201.89	2,694.97	-135.93	-54.62	141.01	0.00	0.00	0.00	0.00
2,800.00	4.00	201.89	2,794.72	-142.40	-57.22	147.72	0.00	0.00	0.00	0.00
2,900.00	4.00	201.89	2,894.48	-148.88	-59.82	154.44	0.00	0.00	0.00	0.00
3,000.00	4.00	201.89	2,994.23	-155.35	-62.42	161.15	0.00	0.00	0.00	0.00
3,100.00	4.00	201.89	3,093.99	-161.82	-65.02	167.86	0.00	0.00	0.00	0.00
3,200.00	4.00	201.89	3,193.75	-168.29	-67.62	174.58	0.00	0.00	0.00	0.00
3,300.00	4.00	201.89	3,293.50	-174.77	-70.22	181.29	0.00	0.00	0.00	0.00
3,400.00	4.00	201.89	3,393.26	-181.24	-72.82	188.01	0.00	0.00	0.00	0.00
3,500.00	4.00	201.89	3,493.02	-187.71	-75.42	194.72	0.00	0.00	0.00	0.00
3,600.00	4.00	201.89	3,592.77	-194.18	-78.02	201.44	0.00	0.00	0.00	0.00
3,700.00	4.00	201.89	3,692.53	-200.66	-80.62	208.15	0.00	0.00	0.00	0.00
3,800.00	4.00	201.89	3,792.29	-207.13	-83.22	214.87	0.00	0.00	0.00	0.00
3,900.00	4.00	201.89	3,892.04	-213.60	-85.82	221.58	0.00	0.00	0.00	0.00
4,000.00	4.00	201.89	3,991.80	-220.07	-88.42	228.29	0.00	0.00	0.00	0.00
4,100.00	4.00	201.89	4,091.56	-226.55	-91.03	235.01	0.00	0.00	0.00	0.00
4,200.00	4.00	201.89	4,191.31	-233.02	-93.63	241.72	0.00	0.00	0.00	0.00
4,300.00	4.00	201.89	4,291.07	-239.49	-96.23	248.44	0.00	0.00	0.00	0.00
4,400.00	4.00	201.89	4,390.82	-245.97	-98.83	255.15	0.00	0.00	0.00	0.00
4,500.00	4.00	201.89	4,490.58	-252.44	-101.43	261.87	0.00	0.00	0.00	0.00
4,600.00	4.00	201.89	4,590.34	-258.91	-104.03	268.58	0.00	0.00	0.00	0.00
4,700.00	4.00	201.89	4,690.09	-265.38	-106.63	275.30	0.00	0.00	0.00	0.00
4,800.00	4.00	201.89	4,789.85	-271.86	-109.23	282.01	0.00	0.00	0.00	0.00
4,900.00	4.00	201.89	4,889.61	-278.33	-111.83	288.73	0.00	0.00	0.00	0.00
5,000.00	4.00	201.89	4,989.36	-284.80	-114.43	295.44	0.00	0.00	0.00	0.00
5,075.00	4.00	201.89	5,064.18	-289.66	-116.38	300.48	0.00	0.00	0.00	0.00

Plan Report for Horsetail #02D-0201 - 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 (°)
Kick Off Point @ 5075 ft - Build Rate 11.00 °/100 ft										
5,075.28	4.00	201.89	5,064.46	-289.67	-116.39	300.49	0.00	0.00	0.00	0.00
5,100.00	6.72	201.89	5,089.07	-291.82	-117.25	302.72	11.00	11.00	0.00	0.00
5,200.00	17.72	201.89	5,186.65	-311.43	-125.13	323.06	11.00	11.00	0.00	0.00
5,300.00	28.72	201.89	5,278.41	-347.95	-139.81	360.95	11.00	11.00	0.00	0.00
5,400.00	39.72	201.89	5,360.98	-400.05	-160.74	415.00	11.00	11.00	0.00	0.00
5,500.00	50.72	201.89	5,431.31	-465.82	-187.16	483.21	11.00	11.00	0.00	0.00
5,600.00	61.72	201.89	5,486.82	-542.82	-218.10	563.10	11.00	11.00	0.00	0.00
5,624.69	64.43	201.89	5,498.00	-563.24	-226.31	584.28	11.00	11.00	0.00	0.00
Niobrara Top										
5,700.00	72.72	201.89	5,525.48	-628.24	-252.42	651.71	11.00	11.00	0.00	0.00
5,800.00	83.72	201.89	5,545.87	-718.94	-288.87	745.79	11.00	11.00	0.00	0.00
5,857.00	89.99	201.89	5,549.00	-771.72	-310.07	800.55	11.00	11.00	0.00	0.00
End Build @ 5857 ft - 7" Casing Pt.										
5,857.10	90.00	201.89	5,549.00	-771.81	-310.11	800.64	11.00	11.00	0.00	0.00
Niobrara "A"										
5,900.00	90.00	201.89	5,549.00	-811.62	-326.11	841.94	0.00	0.00	0.00	0.00
5,932.00	90.00	201.89	5,549.00	-841.32	-338.04	872.74	0.00	0.00	0.00	0.00
Begin Turn @ 5932 ft - Turn Rate 3.00 °/100 ft										
5,932.10	90.00	201.89	5,549.00	-841.41	-338.07	872.83	0.00	0.00	0.00	0.00
6,000.00	90.00	199.85	5,549.00	-904.85	-362.26	938.51	3.00	0.00	-3.00	-90.00
6,100.00	90.00	196.85	5,549.00	-999.75	-393.75	1,036.24	3.00	0.00	-3.00	-90.00
6,200.00	90.00	193.85	5,549.00	-1,096.17	-420.22	1,134.95	3.00	0.00	-3.00	-90.00
6,300.00	90.00	190.85	5,549.00	-1,193.85	-441.61	1,234.35	3.00	0.00	-3.00	-90.00
6,400.00	90.00	187.85	5,549.00	-1,292.51	-457.86	1,334.18	3.00	0.00	-3.00	-90.00
6,500.00	90.00	184.85	5,549.00	-1,391.88	-468.92	1,434.17	3.00	0.00	-3.00	-90.00
6,600.00	90.00	181.85	5,549.00	-1,491.70	-474.77	1,534.04	3.00	0.00	-3.00	-90.00
6,661.77	90.00	180.00	5,549.00	-1,553.46	-475.77	1,595.55	3.00	0.00	-3.00	-90.00
6,662.00	90.00	180.00	5,549.00	-1,553.69	-475.77	1,595.78	0.00	0.00	0.00	0.00
Hold Inc 90.00°, Azi 180° - End Turn @ 6662 ft										
6,700.00	90.00	180.00	5,549.00	-1,591.69	-475.77	1,633.56	0.00	0.00	0.00	0.00
6,800.00	90.00	180.00	5,549.00	-1,691.69	-475.77	1,732.98	0.00	0.00	0.00	0.00
6,900.00	90.00	180.00	5,549.00	-1,791.69	-475.77	1,832.40	0.00	0.00	0.00	0.00
7,000.00	90.00	180.00	5,549.00	-1,891.69	-475.77	1,931.83	0.00	0.00	0.00	0.00
7,100.00	90.00	180.00	5,549.00	-1,991.69	-475.77	2,031.25	0.00	0.00	0.00	0.00
7,200.00	90.00	180.00	5,549.00	-2,091.69	-475.77	2,130.67	0.00	0.00	0.00	0.00
7,300.00	90.00	180.00	5,549.00	-2,191.69	-475.77	2,230.09	0.00	0.00	0.00	0.00
7,400.00	90.00	180.00	5,549.00	-2,291.69	-475.77	2,329.51	0.00	0.00	0.00	0.00
7,500.00	90.00	180.00	5,549.00	-2,391.69	-475.77	2,428.94	0.00	0.00	0.00	0.00
7,600.00	90.00	180.00	5,549.00	-2,491.69	-475.77	2,528.36	0.00	0.00	0.00	0.00
7,700.00	90.00	180.00	5,549.00	-2,591.69	-475.77	2,627.78	0.00	0.00	0.00	0.00
7,800.00	90.00	180.00	5,549.00	-2,691.69	-475.77	2,727.20	0.00	0.00	0.00	0.00
7,900.00	90.00	180.00	5,549.00	-2,791.69	-475.77	2,826.63	0.00	0.00	0.00	0.00
8,000.00	90.00	180.00	5,549.00	-2,891.69	-475.77	2,926.05	0.00	0.00	0.00	0.00
8,100.00	90.00	180.00	5,549.00	-2,991.69	-475.77	3,025.47	0.00	0.00	0.00	0.00
8,200.00	90.00	180.00	5,549.00	-3,091.69	-475.77	3,124.89	0.00	0.00	0.00	0.00
8,300.00	90.00	180.00	5,549.00	-3,191.69	-475.76	3,224.31	0.00	0.00	0.00	0.00
8,400.00	90.00	180.00	5,549.00	-3,291.69	-475.76	3,323.74	0.00	0.00	0.00	0.00
8,500.00	90.00	180.00	5,549.00	-3,391.69	-475.76	3,423.16	0.00	0.00	0.00	0.00
8,600.00	90.00	180.00	5,549.00	-3,491.69	-475.76	3,522.58	0.00	0.00	0.00	0.00
8,700.00	90.00	180.00	5,549.00	-3,591.69	-475.76	3,622.00	0.00	0.00	0.00	0.00
8,800.00	90.00	180.00	5,549.00	-3,691.69	-475.76	3,721.43	0.00	0.00	0.00	0.00
8,900.00	90.00	180.00	5,549.00	-3,791.69	-475.76	3,820.85	0.00	0.00	0.00	0.00
9,000.00	90.00	180.00	5,549.00	-3,891.69	-475.76	3,920.27	0.00	0.00	0.00	0.00
9,100.00	90.00	180.00	5,549.00	-3,991.69	-475.76	4,019.69	0.00	0.00	0.00	0.00
9,200.00	90.00	180.00	5,549.00	-4,091.69	-475.76	4,119.11	0.00	0.00	0.00	0.00
9,300.00	90.00	180.00	5,549.00	-4,191.69	-475.76	4,218.54	0.00	0.00	0.00	0.00
9,400.00	90.00	180.00	5,549.00	-4,291.69	-475.76	4,317.96	0.00	0.00	0.00	0.00
9,500.00	90.00	180.00	5,549.00	-4,391.69	-475.76	4,417.38	0.00	0.00	0.00	0.00

Plan Report for Horsetail #02D-0201 - 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 (°)
9,515.00	90.00	180.00	5,549.00	-4,406.68	-475.76	4,432.29	0.00	0.00	0.00	0.00
Total Depth 9515 ft										

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.00	500.00	0.00	0.00	Begin Nudge @ 500 ft
700.00	699.84	-6.48	-2.60	End Nudge @ 700 ft
5,075.00	5,064.18	-289.66	-116.38	Kick Off Point @ 5075 ft
5,075.00	5,064.18	-289.66	-116.38	Build Rate 11.00 °/100 ft
5,857.00	5,549.00	-771.72	-310.07	End Build @ 5857 ft
5,932.00	5,549.00	-841.32	-338.04	Begin Turn @ 5932 ft
5,932.00	5,549.00	-841.32	-338.04	Turn Rate 3.00 °/100 ft
6,662.00	5,549.00	-1,553.69	-475.77	Hold Inc 90.00°, Azi 180°
6,662.00	5,549.00	-1,553.69	-475.77	End Turn @ 6662 ft
9,515.00	5,549.00	-4,406.68	-475.76	Total Depth 9515 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Horsetail #02D-0201 BHL	186.16	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	5,857.00	Rev A0	MWD+IFR1+MS+sag
5,857.00	9,514.20	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
5,857.00	5,549.00	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	
5,624.69	5,498.00	Niobrara Top		0.00	
5,857.10	5,549.00	Niobrara "A"		0.00	

Plan Report for Horsetail #02D-0201 - 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	0.00	Polygon
Horsetail #02D Section Setback	0.00	0.01	0.00	Polygon
Horsetail #02D-0201 BHL	5,549.00	-4,406.68	-475.76	Point

Directional Difficulty Index

Average Dogleg over Survey:	1.18 °/100usft	Maximum Dogleg over Survey:	11.00 °/100usft at 5,857.10 usft
Net Tortousity applicable to Plans:	1.18 °/100usft	Directional Difficulty Index:	6.065

Audit Info

North Reference Sheet for Sec. 2-T10N-R57W - Horsetail #02D-0201 - 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-0201

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: 1,566,446.36 usft N, 3,490,702.48 usft E

Geographical Coordinates of Well: 40° 52' 29.25" N, 103° 43' 32.06" W

Grid Convergence at Surface is: 1.15°

Based upon Minimum Curvature type calculations, at a Measured Depth of 9,515.00usft the Bottom Hole Displacement is 4,432.29usft in the Direction of 186.16° (True).

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

