

Conoco Phillips Company

Arapahoe County, Colorado

Sec. 2-T5S-R65W

State Massive-1H

Plan A (Pilot)

Plan: Rev A0

Sperry Drilling Services

Proposal Report

08 November, 2013

Well Coordinates: 1,662,490.55 N, 3,246,684.16 E (39° 38' 56.64" N, 104° 37' 26.17" W)

Ground Level: 5,854.00 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 State Massive-1H

KB=24 ft @ 5878.00usft (H&P 280)

N

True

API - US Survey Feet - Custom

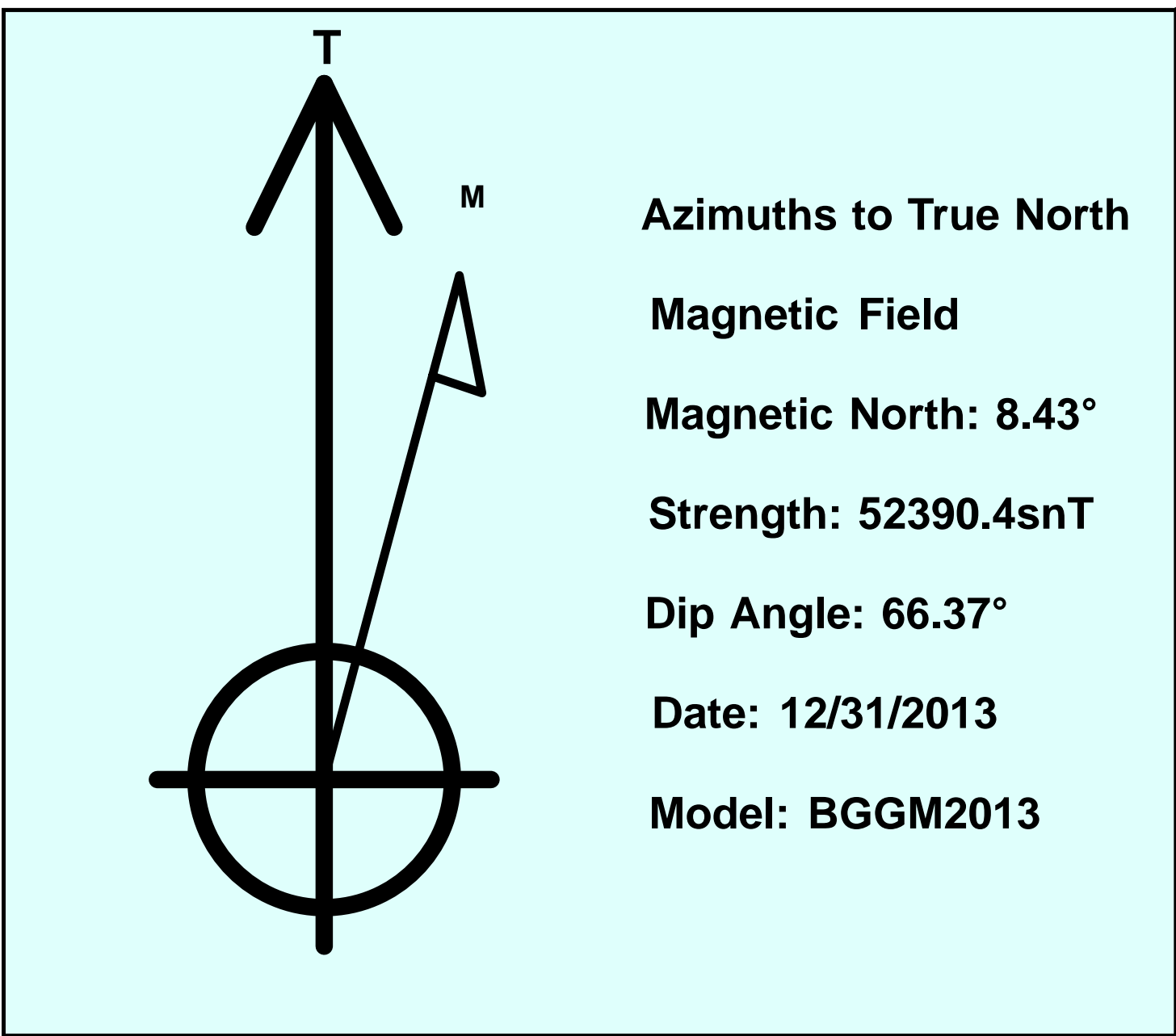
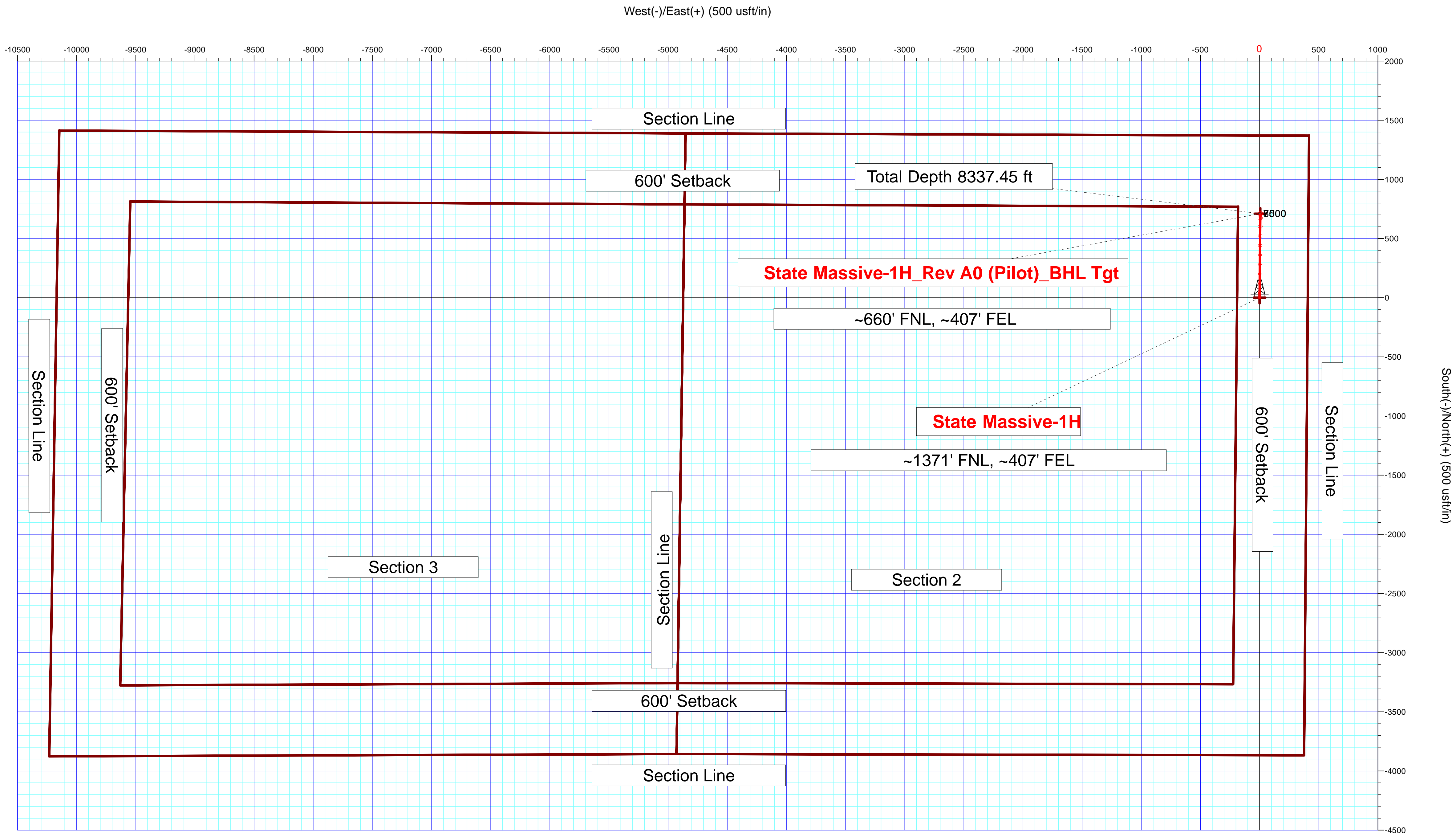
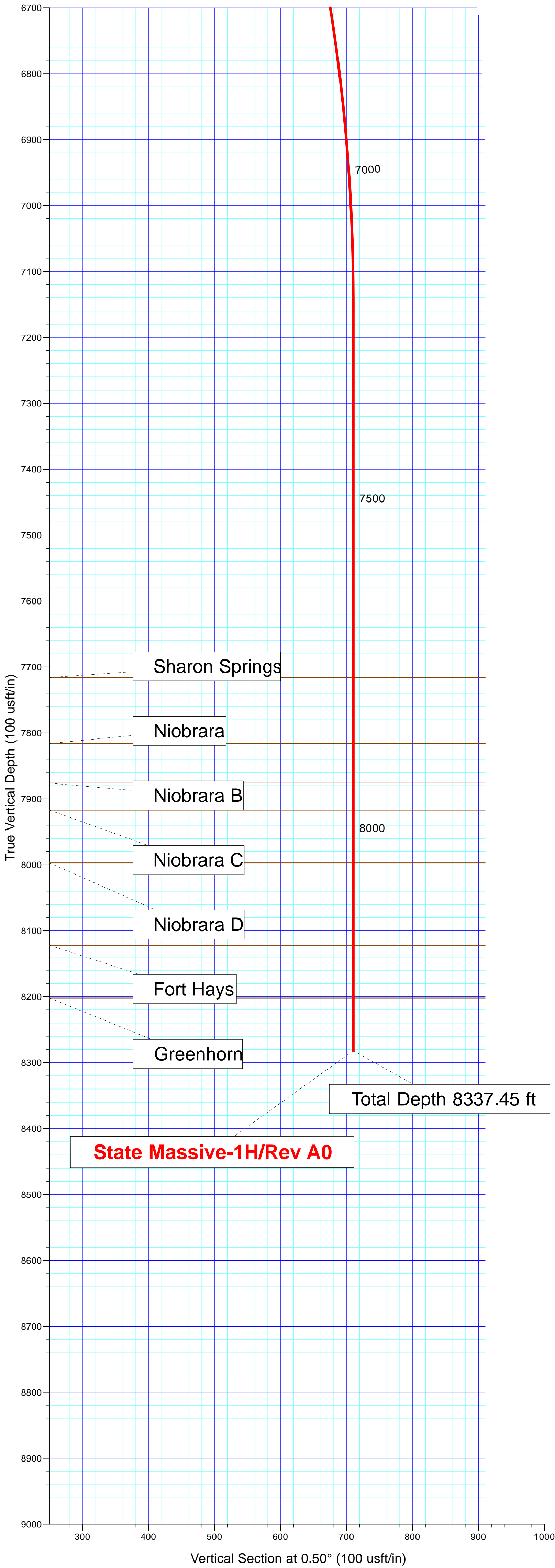
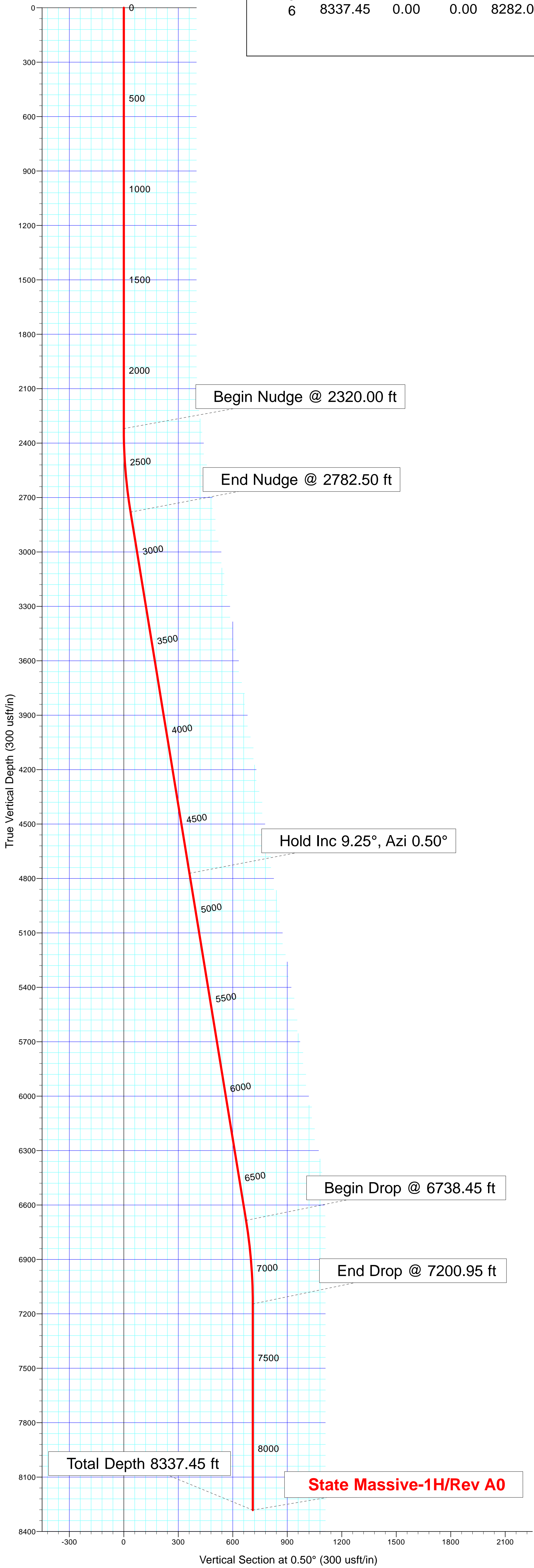
HALLIBURTON

Project: Arapahoe County, Colorado
Site: Sec. 2-T5S-R65W
Well: State Massive-1H
Wellbore: Plan A (Pilot)
Plan: Rev A0

Conoco Phillips Company



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	2320.00	0.00	0.00	2320.00	0.00	0.00	0.00	0.00	0.00	
3	2782.50	9.25	0.50	2780.49	37.25	0.33	2.00	0.50	37.25	
4	6738.45	9.25	0.50	6685.00	673.12	5.87	0.00	0.00	673.14	
5	7200.95	0.00	0.00	7145.49	710.37	6.20	2.00	-180.00	710.39	
6	8337.45	0.00	0.00	8282.00	710.37	6.20	0.00	0.00	710.39	State Massive-1H_Rev A0 (Pilot)_BHL Tgt



Plan: Rev A0 (State Massive-1H/Plan A (Pilot))	
Created By: Kansa B. Becker	Date: 14:28, November 08 2013
Checked: _____	Date: _____
Reviewed: _____	Date: _____
Approved: _____	Date: _____

Plan Report for State Massive-1H - 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
600.00	0.00	0.00	600.00	0.00	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	0.00
800.00	0.00	0.00	800.00	0.00	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	0.00
1,000.00	0.00	0.00	1,000.00	0.00	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	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,888.00	0.00	0.00	1,888.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills										
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,038.00	0.00	0.00	2,038.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierre Shale										
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,238.00	0.00	0.00	2,238.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Casing - 9 5/8" Casing Pt.										
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,320.00	0.00	0.00	2,320.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 2320.00 ft										
2,400.00	1.60	0.50	2,399.99	1.12	0.01	1.12	2.00	2.00	0.00	0.50
2,500.00	3.60	0.50	2,499.88	5.65	0.05	5.65	2.00	2.00	0.00	0.00
2,600.00	5.60	0.50	2,599.55	13.67	0.12	13.67	2.00	2.00	0.00	0.00
2,700.00	7.60	0.50	2,698.89	25.16	0.22	25.17	2.00	2.00	0.00	0.00
2,782.50	9.25	0.50	2,780.49	37.25	0.33	37.25	2.00	2.00	0.00	0.00
End Nudge @ 2782.50 ft										
2,800.00	9.25	0.50	2,797.77	40.06	0.35	40.07	0.00	0.00	0.00	0.00
2,900.00	9.25	0.50	2,896.47	56.14	0.49	56.14	0.00	0.00	0.00	0.00
3,000.00	9.25	0.50	2,995.17	72.21	0.63	72.21	0.00	0.00	0.00	0.00
3,100.00	9.25	0.50	3,093.86	88.29	0.77	88.29	0.00	0.00	0.00	0.00
3,200.00	9.25	0.50	3,192.56	104.36	0.91	104.36	0.00	0.00	0.00	0.00
3,300.00	9.25	0.50	3,291.26	120.43	1.05	120.44	0.00	0.00	0.00	0.00
3,400.00	9.25	0.50	3,389.96	136.51	1.19	136.51	0.00	0.00	0.00	0.00
3,500.00	9.25	0.50	3,488.66	152.58	1.33	152.59	0.00	0.00	0.00	0.00
3,600.00	9.25	0.50	3,587.36	168.65	1.47	168.66	0.00	0.00	0.00	0.00
3,700.00	9.25	0.50	3,686.06	184.73	1.61	184.73	0.00	0.00	0.00	0.00
3,800.00	9.25	0.50	3,784.76	200.80	1.75	200.81	0.00	0.00	0.00	0.00
3,900.00	9.25	0.50	3,883.46	216.87	1.89	216.88	0.00	0.00	0.00	0.00
4,000.00	9.25	0.50	3,982.16	232.95	2.03	232.96	0.00	0.00	0.00	0.00
4,100.00	9.25	0.50	4,080.86	249.02	2.17	249.03	0.00	0.00	0.00	0.00
4,200.00	9.25	0.50	4,179.56	265.10	2.31	265.11	0.00	0.00	0.00	0.00
4,300.00	9.25	0.50	4,278.26	281.17	2.45	281.18	0.00	0.00	0.00	0.00
4,400.00	9.25	0.50	4,376.96	297.24	2.59	297.25	0.00	0.00	0.00	0.00
4,500.00	9.25	0.50	4,475.66	313.32	2.73	313.33	0.00	0.00	0.00	0.00
4,600.00	9.25	0.50	4,574.36	329.39	2.87	329.40	0.00	0.00	0.00	0.00
4,700.00	9.25	0.50	4,673.06	345.46	3.01	345.48	0.00	0.00	0.00	0.00

Plan Report for State Massive-1H - 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 (°)
4,800.00	9.25	0.50	4,771.76	361.54	3.16	361.55	0.00	0.00	0.00	0.00
Hold Inc 9.25°, Azi 0.50°										
4,900.00	9.25	0.50	4,870.46	377.61	3.30	377.63	0.00	0.00	0.00	0.00
5,000.00	9.25	0.50	4,969.16	393.68	3.44	393.70	0.00	0.00	0.00	0.00
5,100.00	9.25	0.50	5,067.86	409.76	3.58	409.77	0.00	0.00	0.00	0.00
5,200.00	9.25	0.50	5,166.56	425.83	3.72	425.85	0.00	0.00	0.00	0.00
5,300.00	9.25	0.50	5,265.26	441.91	3.86	441.92	0.00	0.00	0.00	0.00
5,400.00	9.25	0.50	5,363.96	457.98	4.00	458.00	0.00	0.00	0.00	0.00
5,500.00	9.25	0.50	5,462.66	474.05	4.14	474.07	0.00	0.00	0.00	0.00
5,600.00	9.25	0.50	5,561.36	490.13	4.28	490.14	0.00	0.00	0.00	0.00
5,700.00	9.25	0.50	5,660.06	506.20	4.42	506.22	0.00	0.00	0.00	0.00
5,800.00	9.25	0.50	5,758.76	522.27	4.56	522.29	0.00	0.00	0.00	0.00
5,900.00	9.25	0.50	5,857.45	538.35	4.70	538.37	0.00	0.00	0.00	0.00
6,000.00	9.25	0.50	5,956.15	554.42	4.84	554.44	0.00	0.00	0.00	0.00
6,100.00	9.25	0.50	6,054.85	570.49	4.98	570.52	0.00	0.00	0.00	0.00
6,200.00	9.25	0.50	6,153.55	586.57	5.12	586.59	0.00	0.00	0.00	0.00
6,300.00	9.25	0.50	6,252.25	602.64	5.26	602.66	0.00	0.00	0.00	0.00
6,400.00	9.25	0.50	6,350.95	618.72	5.40	618.74	0.00	0.00	0.00	0.00
6,500.00	9.25	0.50	6,449.65	634.79	5.54	634.81	0.00	0.00	0.00	0.00
6,600.00	9.25	0.50	6,548.35	650.86	5.68	650.89	0.00	0.00	0.00	0.00
6,700.00	9.25	0.50	6,647.05	666.94	5.82	666.96	0.00	0.00	0.00	0.00
6,738.45	9.25	0.50	6,685.00	673.12	5.87	673.14	0.00	0.00	0.00	0.00
Begin Drop @ 6738.45 ft										
6,800.00	8.02	0.50	6,745.85	682.36	5.95	682.38	2.00	-2.00	0.00	-180.00
6,900.00	6.02	0.50	6,845.10	694.58	6.06	694.60	2.00	-2.00	0.00	-180.00
7,000.00	4.02	0.50	6,944.71	703.32	6.14	703.35	2.00	-2.00	0.00	-180.00
7,100.00	2.02	0.50	7,044.57	708.59	6.18	708.62	2.00	-2.00	0.00	-180.00
7,200.00	0.02	0.50	7,144.55	710.37	6.20	710.39	2.00	-2.00	0.00	-180.00
7,200.95	0.00	0.00	7,145.49	710.37	6.20	710.39	2.00	-2.00	-52.73	-180.00
End Drop @ 7200.95 ft										
7,300.00	0.00	0.00	7,244.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,344.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,444.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,544.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,644.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
7,771.45	0.00	0.00	7,716.00	710.37	6.20	710.39	0.00	0.00	0.00	0.00
Sharon Springs										
7,800.00	0.00	0.00	7,744.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
7,871.45	0.00	0.00	7,816.00	710.37	6.20	710.39	0.00	0.00	0.00	0.00
Niobrara										
7,900.00	0.00	0.00	7,844.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
7,931.45	0.00	0.00	7,876.00	710.37	6.20	710.39	0.00	0.00	0.00	0.00
Niobrara B										
7,972.45	0.00	0.00	7,917.00	710.37	6.20	710.39	0.00	0.00	0.00	0.00
Niobrara C										
8,000.00	0.00	0.00	7,944.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
8,052.45	0.00	0.00	7,997.00	710.37	6.20	710.39	0.00	0.00	0.00	0.00
Niobrara D										
8,100.00	0.00	0.00	8,044.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
8,177.45	0.00	0.00	8,122.00	710.37	6.20	710.39	0.00	0.00	0.00	0.00
Fort Hays										
8,200.00	0.00	0.00	8,144.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
8,257.45	0.00	0.00	8,202.00	710.37	6.20	710.39	0.00	0.00	0.00	0.00
Greenhorn										
8,300.00	0.00	0.00	8,244.55	710.37	6.20	710.39	0.00	0.00	0.00	0.00
8,337.45	0.00	0.00	8,282.00	710.37	6.20	710.39	0.00	0.00	0.00	0.00
Total Depth 8337.45 ft										

Plan Report for State Massive-1H - Rev A0

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,320.00	2,320.00	0.00	0.00	Begin Nudge @ 2320.00 ft
2,782.50	2,780.49	37.25	0.33	End Nudge @ 2782.50 ft
4,800.00	4,771.76	361.54	3.16	Hold Inc 9.25°, Azi 0.50°
6,738.45	6,685.00	673.12	5.87	Begin Drop @ 6738.45 ft
7,200.95	7,145.49	710.37	6.20	End Drop @ 7200.95 ft
8,337.45	8,282.00	710.37	6.20	Total Depth 8337.45 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	State Massive-1H_Rev A0 (Pilot)_BHL Tgt	0.50	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	2,238.00	Rev A0	NSG-CT_D/P
2,238.00	8,337.45	Rev A0	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,238.00	2,238.00	9 5/8" Casing Pt.	9-5/8	13-1/2

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,888.00	1,888.00	Fox Hills			
2,038.00	2,038.00	Pierre Shale			
2,238.00	2,238.00	Surface Casing			
7,771.45	7,716.00	Sharon Springs			
7,871.45	7,816.00	Niobrara			
7,931.45	7,876.00	Niobrara B			
7,972.45	7,917.00	Niobrara C			
8,052.45	7,997.00	Niobrara D			
8,177.45	8,122.00	Fort Hays			
8,257.45	8,202.00	Greenhorn			

Plan Report for State Massive-1H - Rev A0

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
State Massive-1H_Rev A0_SL	0.00	0.00	0.00	Polygon
State Massive-1H_Rev A0_SB	0.00	0.00	0.00	Polygon
State Massive-1H_Rev A0 (Pilot)_BHL Tgt	8,282.00	710.37	6.20	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.22 °/100usft	Maximum Dogleg over Survey:	2.00 °/100usft at 2,782.50 usft
Net Tortousity applicable to Plans:	0.22 °/100usft	Directional Difficulty Index:	4.599

Audit Info

North Reference Sheet for Sec. 2-T5S-R65W - State Massive-1H - Plan A (Pilot)

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference .
 Vertical Depths are relative to KB=24 ft @ 5878.00usft (H&P 280). Northing and Easting are relative to State Massive-1H
 Coordinate System is US State Plane 1983, Colorado Central 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:39° 45' 0.000 N°
 False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99998159

Grid Coordinates of Well: 1,662,490.55 usft N, 3,246,684.16 usft E
 Geographical Coordinates of Well: 39° 38' 56.64" N, 104° 37' 26.17" W
 Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,337.45usft
 the Bottom Hole Displacement is 710.39usft in the Direction of 0.50° (True).
 Magnetic Convergence at surface is: -7.88° (31 December 2013, , BGGM2013)

