

# Conoco Phillips Company

Arapahoe County, Colorado

Sec. 2-T5S-R65W

State Massive-1H

Plan A (Lateral)

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

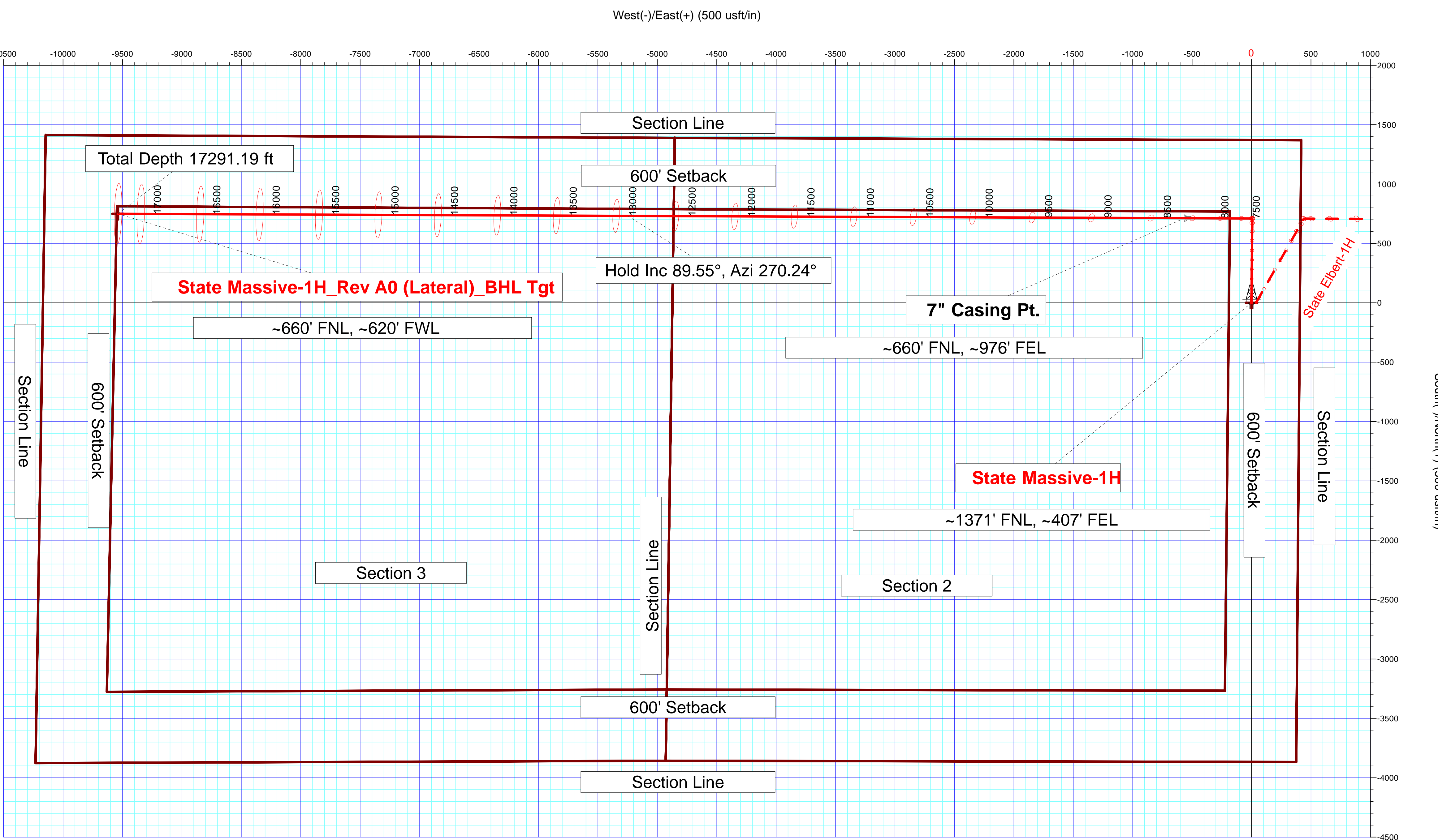
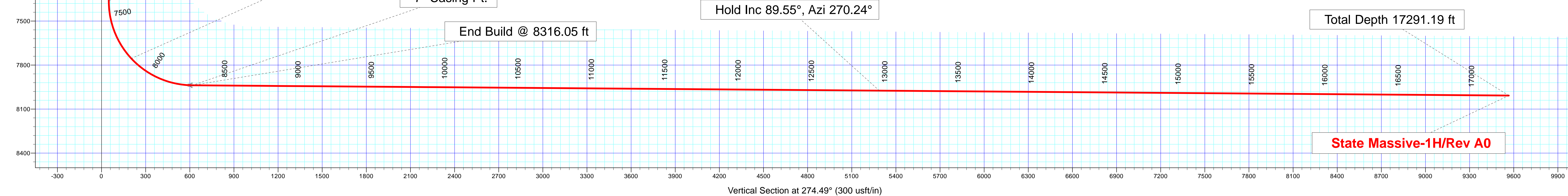
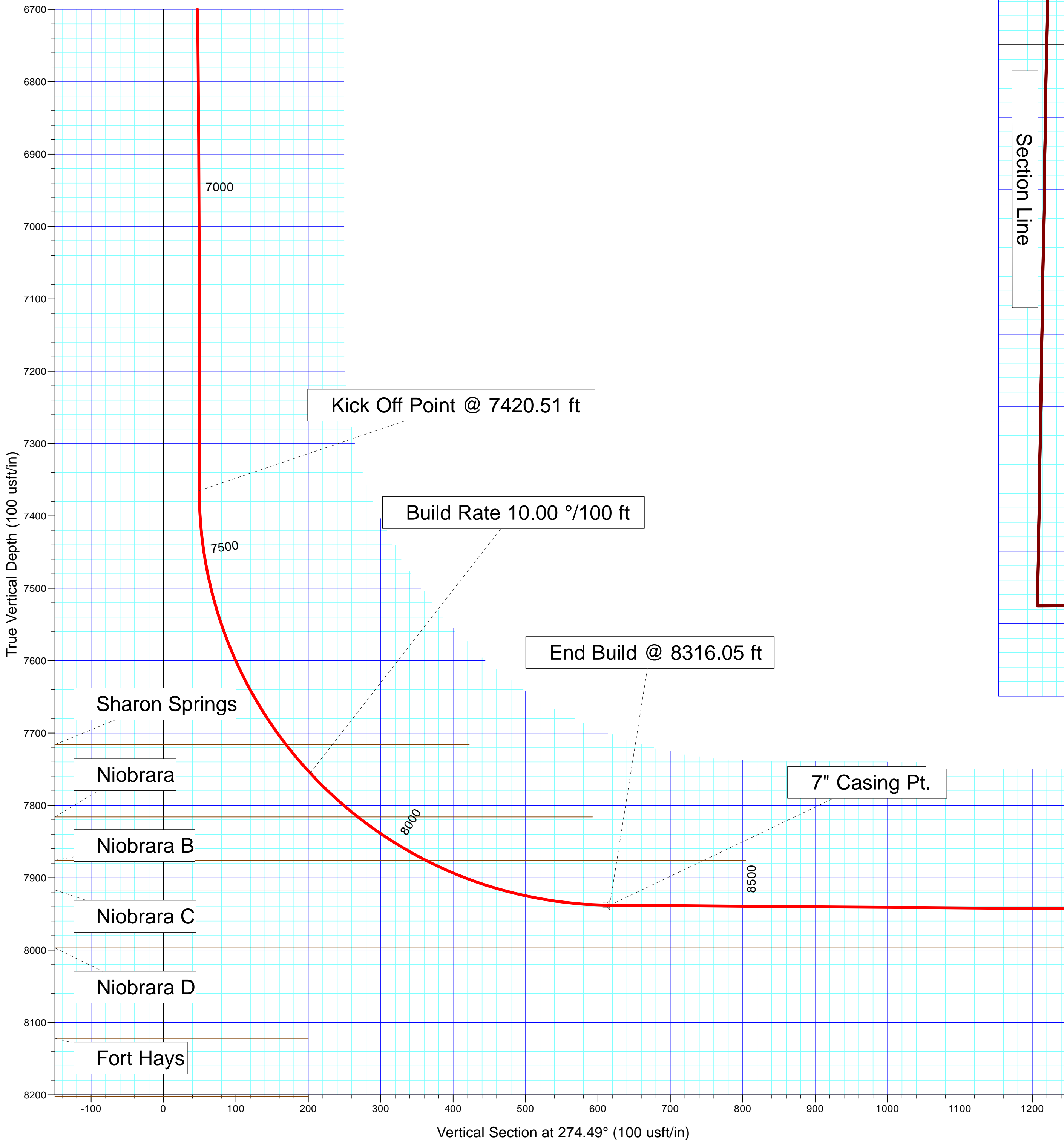
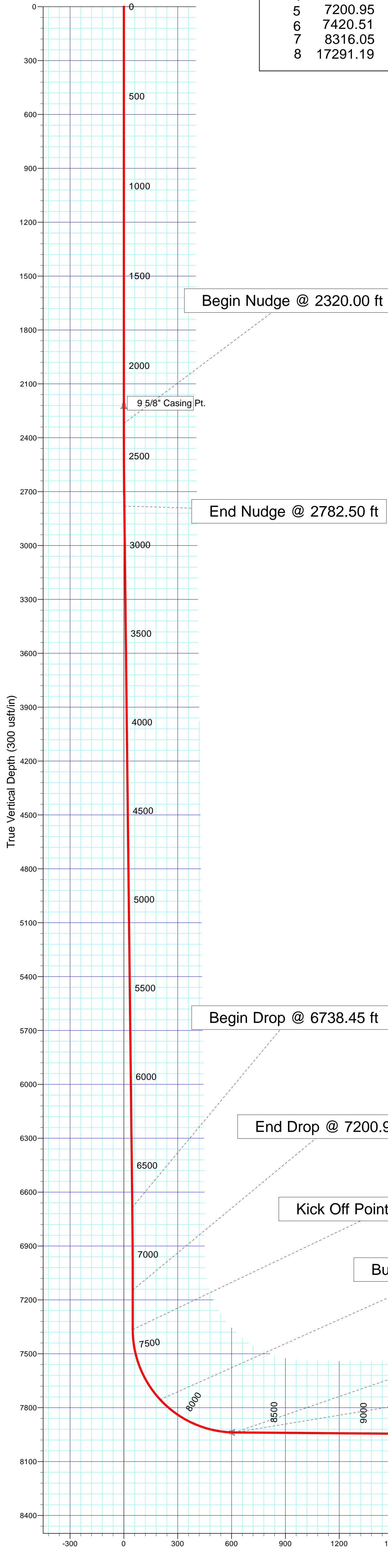
API - US Survey Feet - Custom

**HALLIBURTON**

Project: Arapahoe County, Colorado  
Site: Sec. 2-T5S-R65W  
Well: State Massive-1H  
Wellbore: Plan A (Lateral)  
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	2.59	
4	6738.45	9.25	0.50	6685.00	673.12	5.87	0.00	0.00	46.88	
5	7200.95	0.00	0.00	7145.49	710.37	6.20	2.00	-180.00	49.48	
6	7420.51	0.00	0.00	7365.06	710.37	6.20	0.00	0.00	49.48	
7	8316.05	89.55	270.24	7938.00	712.70	-562.29	10.00	270.24	616.40	
8	17291.19	89.55	270.24	8008.00	749.54	-9537.08	0.00	0.00	9566.49	State Massive-1H_Rev A0 (Lateral)_BHL Tgt



Plan: Rev A0 (State Massive-1H/Plan A (Lateral))

Created By: Kansa B. Becker      Date: 15:01, November 08 2013

Checked: \_\_\_\_\_      Date: \_\_\_\_\_

Reviewed: \_\_\_\_\_      Date: \_\_\_\_\_

Approved: \_\_\_\_\_      Date: \_\_\_\_\_

T  
M

Azimuths to True North

Magnetic Field

Magnetic North: 8.43°

Strength: 52390.4snT

Dip Angle: 66.37°

Date: 12/31/2013

Model: BGGM2013

## 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
<b>Fox Hills</b>										
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
<b>Pierre Shale</b>										
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
<b>Surface Casing - 9 5/8" Casing Pt.</b>										
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
<b>Begin Nudge @ 2320.00 ft</b>										
2,400.00	1.60	0.50	2,399.99	1.12	0.01	0.08	2.00	2.00	0.00	0.50
2,500.00	3.60	0.50	2,499.88	5.65	0.05	0.39	2.00	2.00	0.00	0.00
2,600.00	5.60	0.50	2,599.55	13.67	0.12	0.95	2.00	2.00	0.00	0.00
2,700.00	7.60	0.50	2,698.89	25.16	0.22	1.75	2.00	2.00	0.00	0.00
2,782.50	9.25	0.50	2,780.49	37.25	0.33	2.59	2.00	2.00	0.00	0.00
<b>End Nudge @ 2782.50 ft</b>										
2,800.00	9.25	0.50	2,797.77	40.06	0.35	2.79	0.00	0.00	0.00	0.00
2,900.00	9.25	0.50	2,896.47	56.14	0.49	3.91	0.00	0.00	0.00	0.00
3,000.00	9.25	0.50	2,995.17	72.21	0.63	5.03	0.00	0.00	0.00	0.00
3,100.00	9.25	0.50	3,093.86	88.29	0.77	6.15	0.00	0.00	0.00	0.00
3,200.00	9.25	0.50	3,192.56	104.36	0.91	7.27	0.00	0.00	0.00	0.00
3,300.00	9.25	0.50	3,291.26	120.43	1.05	8.39	0.00	0.00	0.00	0.00
3,400.00	9.25	0.50	3,389.96	136.51	1.19	9.51	0.00	0.00	0.00	0.00
3,500.00	9.25	0.50	3,488.66	152.58	1.33	10.63	0.00	0.00	0.00	0.00
3,600.00	9.25	0.50	3,587.36	168.65	1.47	11.75	0.00	0.00	0.00	0.00
3,700.00	9.25	0.50	3,686.06	184.73	1.61	12.87	0.00	0.00	0.00	0.00
3,800.00	9.25	0.50	3,784.76	200.80	1.75	13.99	0.00	0.00	0.00	0.00
3,900.00	9.25	0.50	3,883.46	216.87	1.89	15.11	0.00	0.00	0.00	0.00
4,000.00	9.25	0.50	3,982.16	232.95	2.03	16.22	0.00	0.00	0.00	0.00
4,100.00	9.25	0.50	4,080.86	249.02	2.17	17.34	0.00	0.00	0.00	0.00
4,200.00	9.25	0.50	4,179.56	265.10	2.31	18.46	0.00	0.00	0.00	0.00
4,300.00	9.25	0.50	4,278.26	281.17	2.45	19.58	0.00	0.00	0.00	0.00
4,400.00	9.25	0.50	4,376.96	297.24	2.59	20.70	0.00	0.00	0.00	0.00
4,500.00	9.25	0.50	4,475.66	313.32	2.73	21.82	0.00	0.00	0.00	0.00
4,600.00	9.25	0.50	4,574.36	329.39	2.87	22.94	0.00	0.00	0.00	0.00
4,700.00	9.25	0.50	4,673.06	345.46	3.01	24.06	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	25.18	0.00	0.00	0.00	0.00
4,900.00	9.25	0.50	4,870.46	377.61	3.30	26.30	0.00	0.00	0.00	0.00
5,000.00	9.25	0.50	4,969.16	393.68	3.44	27.42	0.00	0.00	0.00	0.00
5,100.00	9.25	0.50	5,067.86	409.76	3.58	28.54	0.00	0.00	0.00	0.00
5,200.00	9.25	0.50	5,166.56	425.83	3.72	29.66	0.00	0.00	0.00	0.00
5,300.00	9.25	0.50	5,265.26	441.91	3.86	30.78	0.00	0.00	0.00	0.00
5,400.00	9.25	0.50	5,363.96	457.98	4.00	31.90	0.00	0.00	0.00	0.00
5,500.00	9.25	0.50	5,462.66	474.05	4.14	33.02	0.00	0.00	0.00	0.00
5,600.00	9.25	0.50	5,561.36	490.13	4.28	34.14	0.00	0.00	0.00	0.00
5,700.00	9.25	0.50	5,660.06	506.20	4.42	35.26	0.00	0.00	0.00	0.00
5,800.00	9.25	0.50	5,758.76	522.27	4.56	36.38	0.00	0.00	0.00	0.00
5,900.00	9.25	0.50	5,857.45	538.35	4.70	37.50	0.00	0.00	0.00	0.00
6,000.00	9.25	0.50	5,956.15	554.42	4.84	38.62	0.00	0.00	0.00	0.00
6,100.00	9.25	0.50	6,054.85	570.49	4.98	39.73	0.00	0.00	0.00	0.00
6,200.00	9.25	0.50	6,153.55	586.57	5.12	40.85	0.00	0.00	0.00	0.00
6,300.00	9.25	0.50	6,252.25	602.64	5.26	41.97	0.00	0.00	0.00	0.00
6,400.00	9.25	0.50	6,350.95	618.72	5.40	43.09	0.00	0.00	0.00	0.00
6,500.00	9.25	0.50	6,449.65	634.79	5.54	44.21	0.00	0.00	0.00	0.00
6,600.00	9.25	0.50	6,548.35	650.86	5.68	45.33	0.00	0.00	0.00	0.00
6,700.00	9.25	0.50	6,647.05	666.94	5.82	46.45	0.00	0.00	0.00	0.00
6,738.45	9.25	0.50	6,685.00	673.12	5.87	46.88	0.00	0.00	0.00	0.00
<b>Begin Drop @ 6738.45 ft</b>										
6,800.00	8.02	0.50	6,745.85	682.36	5.95	47.53	2.00	-2.00	0.00	-180.00
6,900.00	6.02	0.50	6,845.10	694.58	6.06	48.38	2.00	-2.00	0.00	-180.00
7,000.00	4.02	0.50	6,944.71	703.32	6.14	48.99	2.00	-2.00	0.00	-180.00
7,100.00	2.02	0.50	7,044.57	708.59	6.18	49.35	2.00	-2.00	0.00	-180.00
7,200.00	0.02	0.50	7,144.55	710.37	6.20	49.48	2.00	-2.00	0.00	-180.00
7,200.95	0.00	0.00	7,145.49	710.37	6.20	49.48	2.00	-2.00	-52.73	-180.00
<b>End Drop @ 7200.95 ft</b>										
7,300.00	0.00	0.00	7,244.55	710.37	6.20	49.48	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,344.55	710.37	6.20	49.48	0.00	0.00	0.00	0.00
7,420.51	0.00	0.00	7,365.06	710.37	6.20	49.48	0.00	0.00	0.00	0.00
<b>Kick Off Point @ 7420.51 ft</b>										
7,500.00	7.95	270.24	7,444.29	710.39	0.69	54.97	10.00	10.00	-112.93	-89.76
7,600.00	17.95	270.24	7,541.62	710.48	-21.68	77.28	10.00	10.00	0.00	0.00
7,700.00	27.95	270.24	7,633.59	710.64	-60.62	116.12	10.00	10.00	0.00	0.00
7,798.22	37.77	270.24	7,716.00	710.86	-113.85	169.20	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,800.00	37.95	270.24	7,717.40	710.86	-114.94	170.29	10.00	10.00	0.00	0.00
7,850.00	42.95	270.24	7,755.44	711.00	-147.37	202.63	10.00	10.00	0.00	0.00
<b>Build Rate 10.00 °/100 ft</b>										
7,900.00	47.95	270.24	7,790.51	711.14	-182.99	238.15	10.00	10.00	0.00	0.00
7,939.61	51.91	270.24	7,816.00	711.27	-213.30	268.37	10.00	10.00	0.00	0.00
<b>Niobrara</b>										
8,000.00	57.95	270.24	7,850.68	711.47	-262.70	317.63	10.00	10.00	0.00	0.00
8,051.47	63.10	270.24	7,876.00	711.65	-307.49	362.30	10.00	10.00	0.00	0.00
<b>Niobrara B</b>										
8,100.00	67.95	270.24	7,896.10	711.84	-351.64	406.34	10.00	10.00	0.00	0.00
8,164.84	74.43	270.24	7,917.00	712.09	-412.99	467.52	10.00	10.00	0.00	0.00
<b>Niobrara C</b>										
8,200.00	77.95	270.24	7,925.39	712.23	-447.13	501.56	10.00	10.00	0.00	0.00
8,300.00	87.95	270.24	7,937.65	712.63	-546.24	600.40	10.00	10.00	0.00	0.00
8,316.05	89.55	270.24	7,938.00	712.70	-562.29	616.40	10.00	10.00	0.00	0.00
<b>End Build @ 8316.05 ft - 7" Casing Pt.</b>										
8,400.00	89.55	270.24	7,938.66	713.05	-646.24	700.12	0.00	0.00	0.00	0.00
8,500.00	89.55	270.24	7,939.44	713.46	-746.23	799.84	0.00	0.00	0.00	0.00
8,600.00	89.55	270.24	7,940.22	713.87	-846.23	899.56	0.00	0.00	0.00	0.00
8,700.00	89.55	270.24	7,940.99	714.28	-946.22	999.28	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 (°)
8,800.00	89.55	270.24	7,941.77	714.69	-1,046.22	1,099.00	0.00	0.00	0.00	0.00
8,900.00	89.55	270.24	7,942.55	715.10	-1,146.22	1,198.72	0.00	0.00	0.00	0.00
9,000.00	89.55	270.24	7,943.33	715.51	-1,246.21	1,298.44	0.00	0.00	0.00	0.00
9,100.00	89.55	270.24	7,944.11	715.92	-1,346.21	1,398.16	0.00	0.00	0.00	0.00
9,200.00	89.55	270.24	7,944.89	716.33	-1,446.20	1,497.88	0.00	0.00	0.00	0.00
9,300.00	89.55	270.24	7,945.67	716.74	-1,546.20	1,597.60	0.00	0.00	0.00	0.00
9,400.00	89.55	270.24	7,946.45	717.15	-1,646.20	1,697.33	0.00	0.00	0.00	0.00
9,500.00	89.55	270.24	7,947.23	717.56	-1,746.19	1,797.05	0.00	0.00	0.00	0.00
9,600.00	89.55	270.24	7,948.01	717.97	-1,846.19	1,896.77	0.00	0.00	0.00	0.00
9,700.00	89.55	270.24	7,948.79	718.38	-1,946.19	1,996.49	0.00	0.00	0.00	0.00
9,800.00	89.55	270.24	7,949.57	718.79	-2,046.18	2,096.21	0.00	0.00	0.00	0.00
9,900.00	89.55	270.24	7,950.35	719.20	-2,146.18	2,195.93	0.00	0.00	0.00	0.00
10,000.00	89.55	270.24	7,951.13	719.61	-2,246.17	2,295.65	0.00	0.00	0.00	0.00
10,100.00	89.55	270.24	7,951.91	720.02	-2,346.17	2,395.37	0.00	0.00	0.00	0.00
10,200.00	89.55	270.24	7,952.69	720.43	-2,446.17	2,495.09	0.00	0.00	0.00	0.00
10,300.00	89.55	270.24	7,953.47	720.84	-2,546.16	2,594.81	0.00	0.00	0.00	0.00
10,400.00	89.55	270.24	7,954.25	721.25	-2,646.16	2,694.53	0.00	0.00	0.00	0.00
10,500.00	89.55	270.24	7,955.03	721.66	-2,746.15	2,794.25	0.00	0.00	0.00	0.00
10,600.00	89.55	270.24	7,955.81	722.07	-2,846.15	2,893.98	0.00	0.00	0.00	0.00
10,700.00	89.55	270.24	7,956.59	722.48	-2,946.15	2,993.70	0.00	0.00	0.00	0.00
10,800.00	89.55	270.24	7,957.37	722.90	-3,046.14	3,093.42	0.00	0.00	0.00	0.00
10,900.00	89.55	270.24	7,958.15	723.31	-3,146.14	3,193.14	0.00	0.00	0.00	0.00
11,000.00	89.55	270.24	7,958.93	723.72	-3,246.13	3,292.86	0.00	0.00	0.00	0.00
11,100.00	89.55	270.24	7,959.71	724.13	-3,346.13	3,392.58	0.00	0.00	0.00	0.00
11,200.00	89.55	270.24	7,960.49	724.54	-3,446.13	3,492.30	0.00	0.00	0.00	0.00
11,300.00	89.55	270.24	7,961.27	724.95	-3,546.12	3,592.02	0.00	0.00	0.00	0.00
11,400.00	89.55	270.24	7,962.05	725.36	-3,646.12	3,691.74	0.00	0.00	0.00	0.00
11,500.00	89.55	270.24	7,962.83	725.77	-3,746.12	3,791.46	0.00	0.00	0.00	0.00
11,600.00	89.55	270.24	7,963.61	726.18	-3,846.11	3,891.18	0.00	0.00	0.00	0.00
11,700.00	89.55	270.24	7,964.39	726.59	-3,946.11	3,990.91	0.00	0.00	0.00	0.00
11,800.00	89.55	270.24	7,965.17	727.00	-4,046.10	4,090.63	0.00	0.00	0.00	0.00
11,900.00	89.55	270.24	7,965.95	727.41	-4,146.10	4,190.35	0.00	0.00	0.00	0.00
12,000.00	89.55	270.24	7,966.73	727.82	-4,246.10	4,290.07	0.00	0.00	0.00	0.00
12,100.00	89.55	270.24	7,967.51	728.23	-4,346.09	4,389.79	0.00	0.00	0.00	0.00
12,200.00	89.55	270.24	7,968.29	728.64	-4,446.09	4,489.51	0.00	0.00	0.00	0.00
12,300.00	89.55	270.24	7,969.07	729.05	-4,546.08	4,589.23	0.00	0.00	0.00	0.00
12,400.00	89.55	270.24	7,969.85	729.46	-4,646.08	4,688.95	0.00	0.00	0.00	0.00
12,500.00	89.55	270.24	7,970.63	729.87	-4,746.08	4,788.67	0.00	0.00	0.00	0.00
12,600.00	89.55	270.24	7,971.41	730.28	-4,846.07	4,888.39	0.00	0.00	0.00	0.00
12,700.00	89.55	270.24	7,972.19	730.69	-4,946.07	4,988.11	0.00	0.00	0.00	0.00
12,800.00	89.55	270.24	7,972.97	731.10	-5,046.06	5,087.83	0.00	0.00	0.00	0.00
12,900.00	89.55	270.24	7,973.75	731.51	-5,146.06	5,187.56	0.00	0.00	0.00	0.00
13,000.00	89.55	270.24	7,974.53	731.92	-5,246.06	5,287.28	0.00	0.00	0.00	0.00
Hold Inc 89.55°, Azi 270.24°										
13,100.00	89.55	270.24	7,975.31	732.33	-5,346.05	5,387.00	0.00	0.00	0.00	0.00
13,200.00	89.55	270.24	7,976.09	732.74	-5,446.05	5,486.72	0.00	0.00	0.00	0.00
13,300.00	89.55	270.24	7,976.87	733.16	-5,546.05	5,586.44	0.00	0.00	0.00	0.00
13,400.00	89.55	270.24	7,977.65	733.57	-5,646.04	5,686.16	0.00	0.00	0.00	0.00
13,500.00	89.55	270.24	7,978.43	733.98	-5,746.04	5,785.88	0.00	0.00	0.00	0.00
13,600.00	89.55	270.24	7,979.21	734.39	-5,846.03	5,885.60	0.00	0.00	0.00	0.00
13,700.00	89.55	270.24	7,979.99	734.80	-5,946.03	5,985.32	0.00	0.00	0.00	0.00
13,800.00	89.55	270.24	7,980.77	735.21	-6,046.03	6,085.04	0.00	0.00	0.00	0.00
13,900.00	89.55	270.24	7,981.55	735.62	-6,146.02	6,184.76	0.00	0.00	0.00	0.00
14,000.00	89.55	270.24	7,982.33	736.03	-6,246.02	6,284.49	0.00	0.00	0.00	0.00
14,100.00	89.55	270.24	7,983.11	736.44	-6,346.01	6,384.21	0.00	0.00	0.00	0.00
14,200.00	89.55	270.24	7,983.89	736.85	-6,446.01	6,483.93	0.00	0.00	0.00	0.00
14,300.00	89.55	270.24	7,984.67	737.26	-6,546.01	6,583.65	0.00	0.00	0.00	0.00
14,400.00	89.55	270.24	7,985.45	737.67	-6,646.00	6,683.37	0.00	0.00	0.00	0.00
14,500.00	89.55	270.24	7,986.23	738.08	-6,746.00	6,783.09	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 (°)
14,600.00	89.55	270.24	7,987.01	738.49	-6,846.00	6,882.81	0.00	0.00	0.00	0.00
14,700.00	89.55	270.24	7,987.79	738.90	-6,945.99	6,982.53	0.00	0.00	0.00	0.00
14,800.00	89.55	270.24	7,988.57	739.31	-7,045.99	7,082.25	0.00	0.00	0.00	0.00
14,900.00	89.55	270.24	7,989.35	739.72	-7,145.98	7,181.97	0.00	0.00	0.00	0.00
15,000.00	89.55	270.24	7,990.13	740.13	-7,245.98	7,281.69	0.00	0.00	0.00	0.00
15,100.00	89.55	270.24	7,990.91	740.54	-7,345.98	7,381.42	0.00	0.00	0.00	0.00
15,200.00	89.55	270.24	7,991.69	740.95	-7,445.97	7,481.14	0.00	0.00	0.00	0.00
15,300.00	89.55	270.24	7,992.47	741.36	-7,545.97	7,580.86	0.00	0.00	0.00	0.00
15,400.00	89.55	270.24	7,993.25	741.77	-7,645.96	7,680.58	0.00	0.00	0.00	0.00
15,500.00	89.55	270.24	7,994.03	742.18	-7,745.96	7,780.30	0.00	0.00	0.00	0.00
15,600.00	89.55	270.24	7,994.81	742.59	-7,845.96	7,880.02	0.00	0.00	0.00	0.00
15,700.00	89.55	270.24	7,995.59	743.01	-7,945.95	7,979.74	0.00	0.00	0.00	0.00
15,800.00	89.55	270.24	7,996.37	743.42	-8,045.95	8,079.46	0.00	0.00	0.00	0.00
15,880.81	89.55	270.24	7,997.00	743.75	-8,126.75	8,160.04	0.00	0.00	0.00	0.00
<b>Niobrara D</b>										
15,900.00	89.55	270.24	7,997.15	743.83	-8,145.94	8,179.18	0.00	0.00	0.00	0.00
16,000.00	89.55	270.24	7,997.93	744.24	-8,245.94	8,278.90	0.00	0.00	0.00	0.00
16,100.00	89.55	270.24	7,998.71	744.65	-8,345.94	8,378.62	0.00	0.00	0.00	0.00
16,200.00	89.55	270.24	7,999.49	745.06	-8,445.93	8,478.34	0.00	0.00	0.00	0.00
16,300.00	89.55	270.24	8,000.27	745.47	-8,545.93	8,578.07	0.00	0.00	0.00	0.00
16,400.00	89.55	270.24	8,001.05	745.88	-8,645.93	8,677.79	0.00	0.00	0.00	0.00
16,500.00	89.55	270.24	8,001.83	746.29	-8,745.92	8,777.51	0.00	0.00	0.00	0.00
16,600.00	89.55	270.24	8,002.61	746.70	-8,845.92	8,877.23	0.00	0.00	0.00	0.00
16,700.00	89.55	270.24	8,003.39	747.11	-8,945.91	8,976.95	0.00	0.00	0.00	0.00
16,800.00	89.55	270.24	8,004.17	747.52	-9,045.91	9,076.67	0.00	0.00	0.00	0.00
16,900.00	89.55	270.24	8,004.95	747.93	-9,145.91	9,176.39	0.00	0.00	0.00	0.00
17,000.00	89.55	270.24	8,005.73	748.34	-9,245.90	9,276.11	0.00	0.00	0.00	0.00
17,100.00	89.55	270.24	8,006.51	748.75	-9,345.90	9,375.83	0.00	0.00	0.00	0.00
17,200.00	89.55	270.24	8,007.29	749.16	-9,445.89	9,475.55	0.00	0.00	0.00	0.00
17,291.19	89.55	270.24	8,008.00	749.54	-9,537.08	9,566.49	0.00	0.00	0.00	0.00
<b>Total Depth 17291.19 ft</b>										

### Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
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
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
7,420.51	7,365.06	710.37	6.20	Kick Off Point @ 7420.51 ft
7,850.00	7,755.44	711.00	-147.37	Build Rate 10.00 °/100 ft
8,316.05	7,938.00	712.70	-562.29	End Build @ 8316.05 ft
13,000.00	7,974.53	731.92	-5,246.06	Hold Inc 89.55°, Azi 270.24°
17,291.19	8,008.00	749.54	-9,537.08	Total Depth 17291.19 ft

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	State Massive-1H_Rev A0 (Lateral)_BHL Tgt	274.49	Slot	0.00	0.00	0.00

### Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
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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	8,316.05	Rev A0	MWD
8,316.05	17,291.19	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
8,316.05	7,938.00	7" Casing Pt.	7	8-3/4

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			
7,798.22	7,716.00	Sharon Springs			
7,939.61	7,816.00	Niobrara			
8,051.47	7,876.00	Niobrara B			
8,164.84	7,917.00	Niobrara C			
15,880.81	7,997.00	Niobrara D			

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 (Lateral)_BHL Tgt	8,008.00	749.54	-9,537.08	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.00 °/100usft	Maximum Dogleg over Survey:	0.00 °/100usft at 0.00 usft
Net Tortousity applicable to Plans:	0.00 °/100usft	Directional Difficulty Index:	6.613

Audit Info

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

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 17,291.19usft  
the Bottom Hole Displacement is 9,566.49usft in the Direction of 274.49° ( True).

Magnetic Convergence at surface is: -7.88° (31 December 2013, , BGGM2013)

