

# Conoco Phillips Company

Arapahoe County, Colorado

Sec. 2-T5S-R65W

State Elbert-1H

Plan A

Plan: Rev A0

## Sperry Drilling Services

### Proposal Report

08 November, 2013

Well Coordinates: 1,662,493.96 N, 3,246,724.02 E (39° 38' 56.67" N, 104° 37' 25.66" 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 Elbert-1H

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

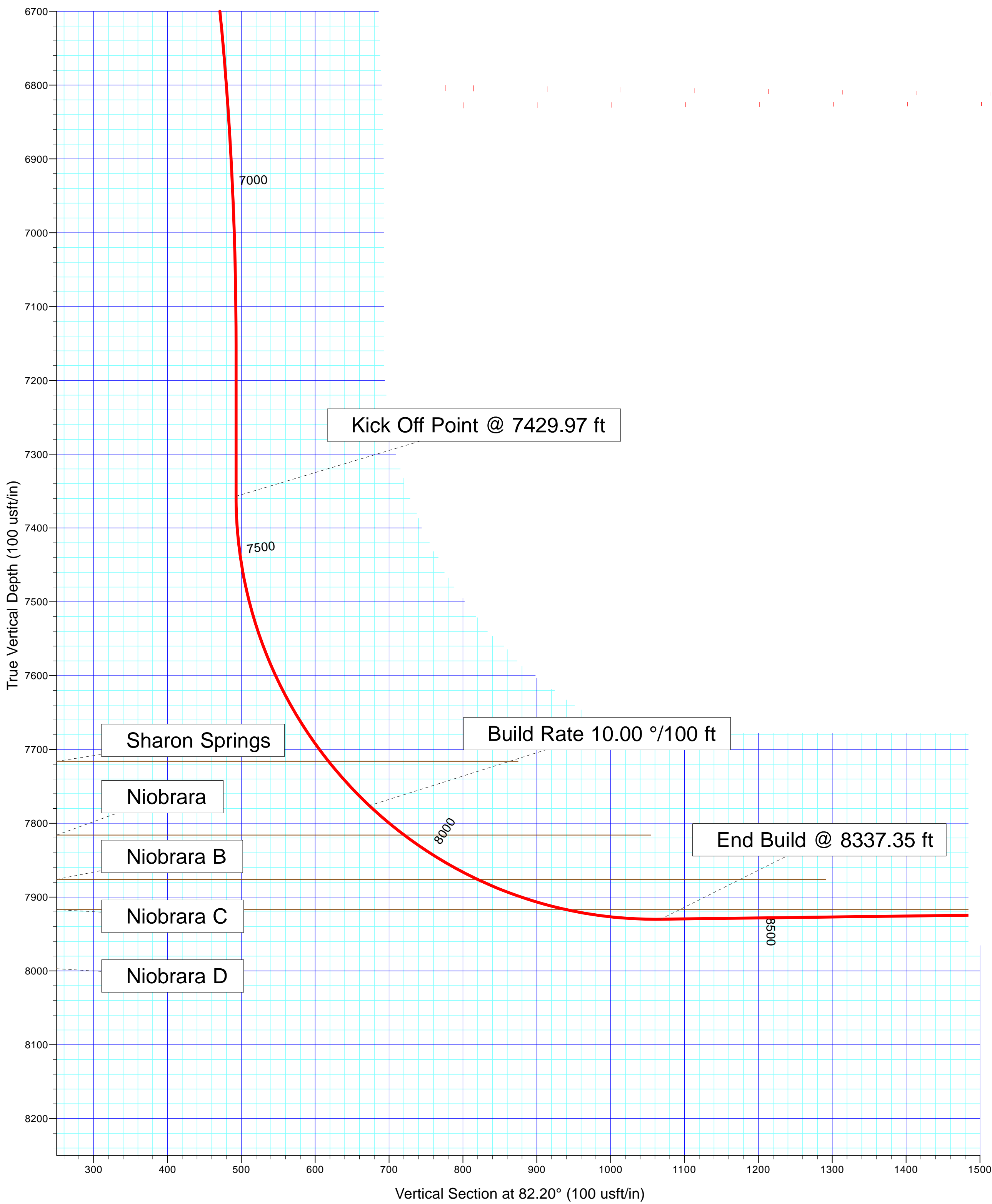
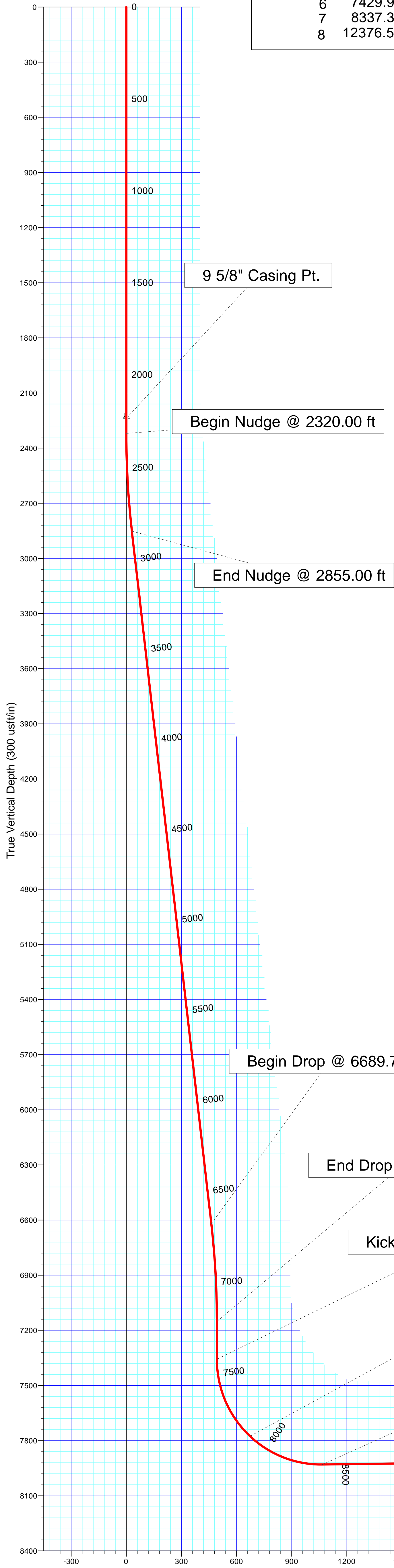
N

True

API - US Survey Feet - Custom

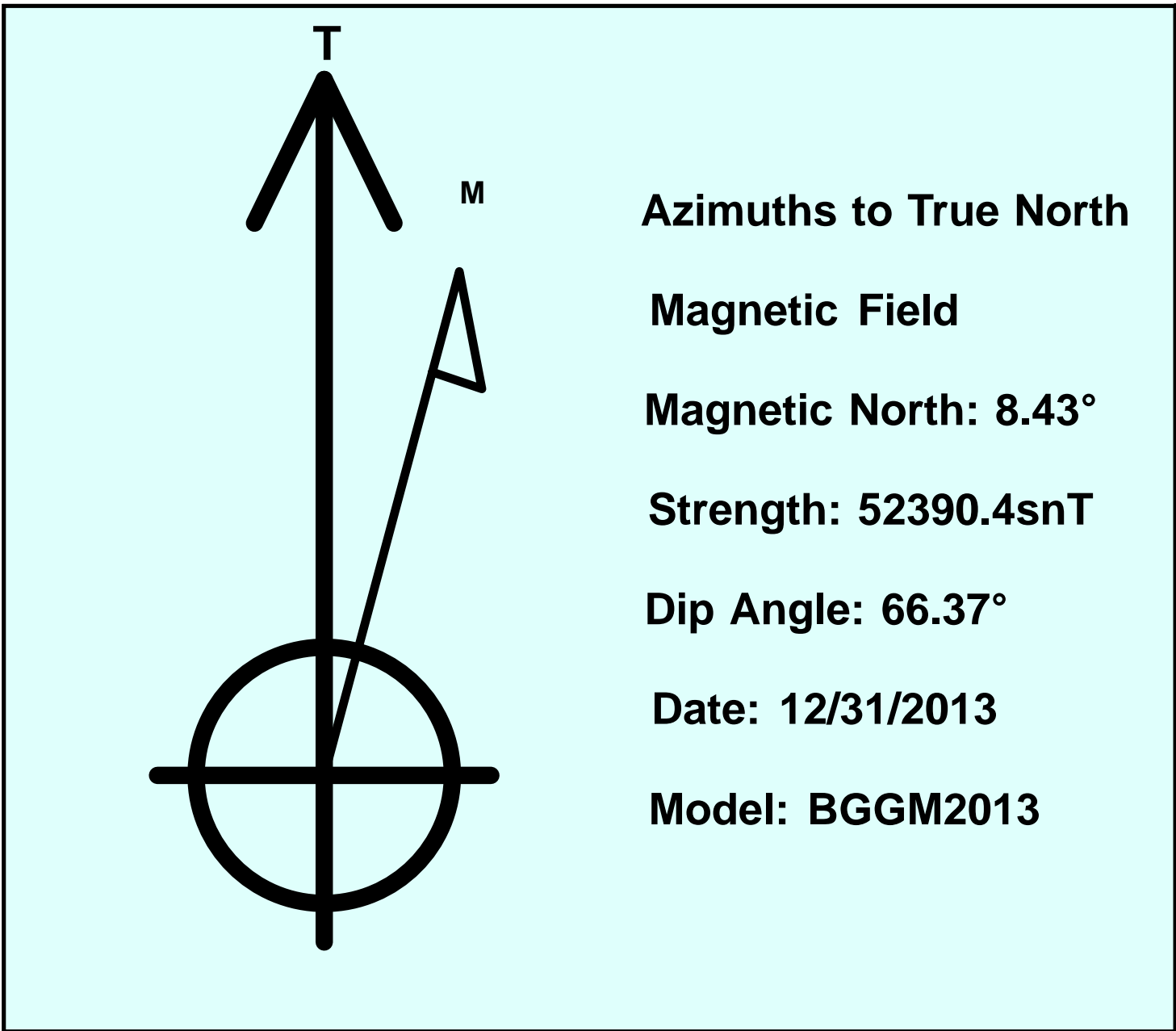
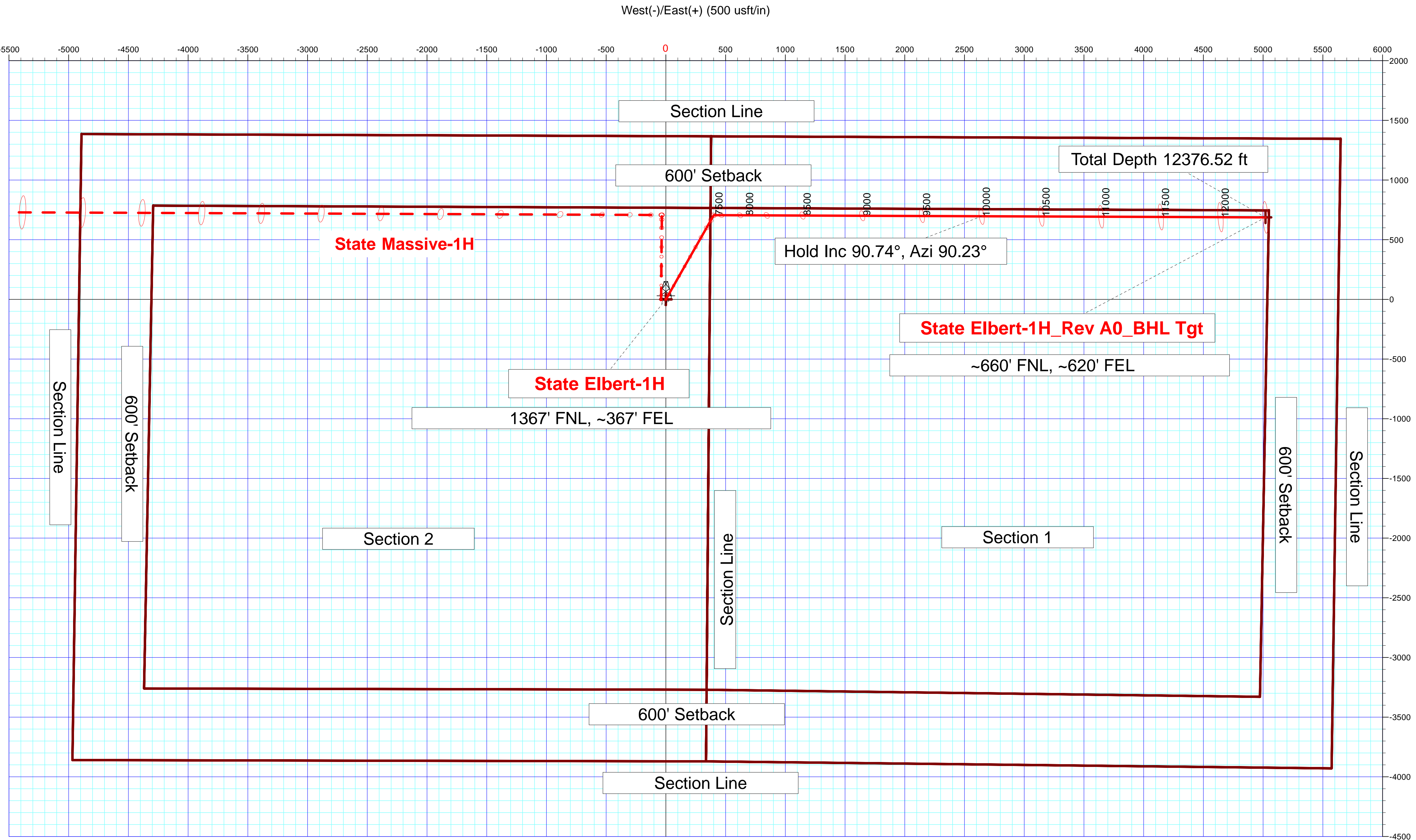
**HALLIBURTON**

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	2320.00	0.00	0.00	2320.00	0.00	0.00	0.00	0.00	0.00	
3	2855.00	10.70	29.60	2851.90	43.31	24.60	2.00	29.60	30.25	
4	6689.78	10.70	29.60	6620.00	662.38	376.29	0.00	0.00	462.69	
5	7224.78	0.00	0.00	7151.90	705.69	400.89	2.00	180.00	492.94	
6	7429.97	0.00	0.00	7357.09	705.69	400.89	0.00	0.00	492.94	
7	8337.35	90.74	90.23	7930.00	703.41	981.22	10.00	90.23	1067.59	
8	12376.52	90.74	90.23	7878.00	687.54	5020.02	0.00	0.00	5066.89	State Elbert-1H_Rev A0_BHL Tgt



Vertical Section at 82.20° (100 usf/in)

Vertical Section at 82.20° (300 usf/in)



Plan: Rev A0 (State Elbert-1H/Plan A)	
Created By: Kansa B. Becker	Date: 14:39, November 08 2013
Checked: _____	Date: _____
Reviewed: _____	Date: _____
Approved: _____	Date: _____

## Plan Report for State Elbert-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	29.60	2,399.99	0.97	0.55	0.68	2.00	2.00	0.00	29.60
2,500.00	3.60	29.60	2,499.88	4.92	2.79	3.43	2.00	2.00	0.00	0.00
2,600.00	5.60	29.60	2,599.55	11.89	6.75	8.30	2.00	2.00	0.00	0.00
2,700.00	7.60	29.60	2,698.89	21.88	12.43	15.28	2.00	2.00	0.00	0.00
2,800.00	9.60	29.60	2,797.76	34.88	19.82	24.37	2.00	2.00	0.00	0.00
2,855.00	10.70	29.60	2,851.90	43.31	24.60	30.25	2.00	2.00	0.00	0.00
<b>End Nudge @ 2855.00 ft</b>										
2,900.00	10.70	29.60	2,896.11	50.57	28.73	35.33	0.00	0.00	0.00	0.00
3,000.00	10.70	29.60	2,994.37	66.72	37.90	46.60	0.00	0.00	0.00	0.00
3,100.00	10.70	29.60	3,092.64	82.86	47.07	57.88	0.00	0.00	0.00	0.00
3,200.00	10.70	29.60	3,190.90	99.01	56.24	69.16	0.00	0.00	0.00	0.00
3,300.00	10.70	29.60	3,289.16	115.15	65.41	80.43	0.00	0.00	0.00	0.00
3,400.00	10.70	29.60	3,387.42	131.29	74.58	91.71	0.00	0.00	0.00	0.00
3,500.00	10.70	29.60	3,485.68	147.44	83.76	102.99	0.00	0.00	0.00	0.00
3,600.00	10.70	29.60	3,583.94	163.58	92.93	114.26	0.00	0.00	0.00	0.00
3,700.00	10.70	29.60	3,682.20	179.72	102.10	125.54	0.00	0.00	0.00	0.00
3,800.00	10.70	29.60	3,780.46	195.87	111.27	136.82	0.00	0.00	0.00	0.00
3,900.00	10.70	29.60	3,878.73	212.01	120.44	148.09	0.00	0.00	0.00	0.00
4,000.00	10.70	29.60	3,976.99	228.15	129.61	159.37	0.00	0.00	0.00	0.00
4,100.00	10.70	29.60	4,075.25	244.30	138.78	170.65	0.00	0.00	0.00	0.00
4,200.00	10.70	29.60	4,173.51	260.44	147.95	181.92	0.00	0.00	0.00	0.00
4,300.00	10.70	29.60	4,271.77	276.59	157.12	193.20	0.00	0.00	0.00	0.00
4,400.00	10.70	29.60	4,370.03	292.73	166.29	204.48	0.00	0.00	0.00	0.00
4,500.00	10.70	29.60	4,468.29	308.87	175.46	215.75	0.00	0.00	0.00	0.00
4,600.00	10.70	29.60	4,566.56	325.02	184.63	227.03	0.00	0.00	0.00	0.00
4,700.00	10.70	29.60	4,664.82	341.16	193.81	238.31	0.00	0.00	0.00	0.00

## Plan Report for State Elbert-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	10.70	29.60	4,763.08	357.30	202.98	249.58	0.00	0.00	0.00	0.00
4,900.00	10.70	29.60	4,861.34	373.45	212.15	260.86	0.00	0.00	0.00	0.00
5,000.00	10.70	29.60	4,959.60	389.59	221.32	272.14	0.00	0.00	0.00	0.00
5,100.00	10.70	29.60	5,057.86	405.73	230.49	283.41	0.00	0.00	0.00	0.00
5,200.00	10.70	29.60	5,156.12	421.88	239.66	294.69	0.00	0.00	0.00	0.00
5,300.00	10.70	29.60	5,254.38	438.02	248.83	305.97	0.00	0.00	0.00	0.00
5,400.00	10.70	29.60	5,352.65	454.17	258.00	317.24	0.00	0.00	0.00	0.00
5,500.00	10.70	29.60	5,450.91	470.31	267.17	328.52	0.00	0.00	0.00	0.00
5,600.00	10.70	29.60	5,549.17	486.45	276.34	339.80	0.00	0.00	0.00	0.00
5,700.00	10.70	29.60	5,647.43	502.60	285.51	351.07	0.00	0.00	0.00	0.00
5,800.00	10.70	29.60	5,745.69	518.74	294.69	362.35	0.00	0.00	0.00	0.00
5,900.00	10.70	29.60	5,843.95	534.88	303.86	373.63	0.00	0.00	0.00	0.00
6,000.00	10.70	29.60	5,942.21	551.03	313.03	384.90	0.00	0.00	0.00	0.00
6,100.00	10.70	29.60	6,040.47	567.17	322.20	396.18	0.00	0.00	0.00	0.00
6,200.00	10.70	29.60	6,138.74	583.31	331.37	407.46	0.00	0.00	0.00	0.00
6,300.00	10.70	29.60	6,237.00	599.46	340.54	418.73	0.00	0.00	0.00	0.00
6,400.00	10.70	29.60	6,335.26	615.60	349.71	430.01	0.00	0.00	0.00	0.00
6,500.00	10.70	29.60	6,433.52	631.75	358.88	441.29	0.00	0.00	0.00	0.00
6,600.00	10.70	29.60	6,531.78	647.89	368.05	452.56	0.00	0.00	0.00	0.00
6,689.78	10.70	29.60	6,620.00	662.38	376.29	462.69	0.00	0.00	0.00	0.00
<b>Begin Drop @ 6689.78 ft</b>										
6,700.00	10.50	29.60	6,630.05	664.02	377.21	463.83	2.00	-2.00	0.00	180.00
6,800.00	8.50	29.60	6,728.67	678.36	385.36	473.85	2.00	-2.00	0.00	180.00
6,900.00	6.50	29.60	6,827.81	689.70	391.81	481.77	2.00	-2.00	0.00	180.00
7,000.00	4.50	29.60	6,927.35	698.03	396.54	487.59	2.00	-2.00	0.00	180.00
7,100.00	2.50	29.60	7,027.15	703.33	399.55	491.29	2.00	-2.00	0.00	180.00
7,200.00	0.50	29.60	7,127.12	705.60	400.84	492.87	2.00	-2.00	0.00	-180.00
7,224.78	0.00	0.00	7,151.90	705.69	400.89	492.94	2.00	-2.00	0.00	-180.00
<b>End Drop @ 7224.78 ft</b>										
7,300.00	0.00	0.00	7,227.12	705.69	400.89	492.94	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,327.12	705.69	400.89	492.94	0.00	0.00	0.00	0.00
7,429.97	0.00	0.00	7,357.09	705.69	400.89	492.94	0.00	0.00	0.00	0.00
<b>Kick Off Point @ 7429.97 ft</b>										
7,500.00	7.00	90.23	7,426.94	705.68	405.16	497.17	10.00	10.00	0.00	90.23
7,600.00	17.00	90.23	7,524.63	705.59	425.93	517.74	10.00	10.00	0.00	0.00
7,700.00	27.00	90.23	7,617.23	705.45	463.35	554.79	10.00	10.00	0.00	0.00
7,800.00	37.00	90.23	7,701.92	705.24	516.28	607.20	10.00	10.00	0.00	0.00
7,817.84	38.79	90.23	7,716.00	705.20	527.23	618.05	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,900.00	47.00	90.23	7,776.14	704.98	583.11	673.38	10.00	10.00	0.00	0.00
<b>Build Rate 10.00 °/100 ft</b>										
7,962.18	53.22	90.23	7,816.00	704.79	630.80	720.60	10.00	10.00	0.00	0.00
<b>Niobrara</b>										
8,000.00	57.00	90.23	7,837.63	704.67	661.81	751.31	10.00	10.00	0.00	0.00
8,079.11	64.91	90.23	7,876.00	704.40	730.92	819.74	10.00	10.00	0.00	0.00
<b>Niobrara B</b>										
8,100.00	67.00	90.23	7,884.51	704.32	750.00	838.63	10.00	10.00	0.00	0.00
8,200.00	77.00	90.23	7,915.37	703.95	844.98	932.69	10.00	10.00	0.00	0.00
8,207.46	77.75	90.23	7,917.00	703.92	852.26	939.90	10.00	10.00	0.00	0.00
<b>Niobrara C</b>										
8,300.00	87.00	90.23	7,929.26	703.56	943.88	1,030.62	10.00	10.00	0.00	0.00
8,337.35	90.74	90.23	7,930.00	703.41	981.22	1,067.59	10.00	10.00	0.00	0.00
<b>End Build @ 8337.35 ft</b>										
8,400.00	90.74	90.23	7,929.19	703.17	1,043.86	1,129.62	0.00	0.00	0.00	0.00
8,500.00	90.74	90.23	7,927.91	702.77	1,143.85	1,228.63	0.00	0.00	0.00	0.00
8,600.00	90.74	90.23	7,926.62	702.38	1,243.84	1,327.65	0.00	0.00	0.00	0.00
8,700.00	90.74	90.23	7,925.33	701.99	1,343.83	1,426.66	0.00	0.00	0.00	0.00
8,800.00	90.74	90.23	7,924.04	701.59	1,443.83	1,525.67	0.00	0.00	0.00	0.00

## Plan Report for State Elbert-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 (°)
8,900.00	90.74	90.23	7,922.76	701.20	1,543.82	1,624.69	0.00	0.00	0.00	0.00
9,000.00	90.74	90.23	7,921.47	700.81	1,643.81	1,723.70	0.00	0.00	0.00	0.00
9,100.00	90.74	90.23	7,920.18	700.42	1,743.80	1,822.71	0.00	0.00	0.00	0.00
9,200.00	90.74	90.23	7,918.89	700.02	1,843.79	1,921.72	0.00	0.00	0.00	0.00
9,300.00	90.74	90.23	7,917.61	699.63	1,943.78	2,020.74	0.00	0.00	0.00	0.00
9,400.00	90.74	90.23	7,916.32	699.24	2,043.77	2,119.75	0.00	0.00	0.00	0.00
9,500.00	90.74	90.23	7,915.03	698.84	2,143.76	2,218.76	0.00	0.00	0.00	0.00
9,600.00	90.74	90.23	7,913.74	698.45	2,243.75	2,317.78	0.00	0.00	0.00	0.00
9,700.00	90.74	90.23	7,912.46	698.06	2,343.74	2,416.79	0.00	0.00	0.00	0.00
9,800.00	90.74	90.23	7,911.17	697.67	2,443.74	2,515.80	0.00	0.00	0.00	0.00
9,900.00	90.74	90.23	7,909.88	697.27	2,543.73	2,614.81	0.00	0.00	0.00	0.00
10,000.00	90.74	90.23	7,908.60	696.88	2,643.72	2,713.83	0.00	0.00	0.00	0.00
Hold Inc 90.74°, Azi 90.23°										
10,100.00	90.74	90.23	7,907.31	696.49	2,743.71	2,812.84	0.00	0.00	0.00	0.00
10,200.00	90.74	90.23	7,906.02	696.09	2,843.70	2,911.85	0.00	0.00	0.00	0.00
10,300.00	90.74	90.23	7,904.73	695.70	2,943.69	3,010.87	0.00	0.00	0.00	0.00
10,400.00	90.74	90.23	7,903.45	695.31	3,043.68	3,109.88	0.00	0.00	0.00	0.00
10,500.00	90.74	90.23	7,902.16	694.92	3,143.67	3,208.89	0.00	0.00	0.00	0.00
10,600.00	90.74	90.23	7,900.87	694.52	3,243.66	3,307.90	0.00	0.00	0.00	0.00
10,700.00	90.74	90.23	7,899.58	694.13	3,343.65	3,406.92	0.00	0.00	0.00	0.00
10,800.00	90.74	90.23	7,898.30	693.74	3,443.64	3,505.93	0.00	0.00	0.00	0.00
10,900.00	90.74	90.23	7,897.01	693.34	3,543.64	3,604.94	0.00	0.00	0.00	0.00
11,000.00	90.74	90.23	7,895.72	692.95	3,643.63	3,703.95	0.00	0.00	0.00	0.00
11,100.00	90.74	90.23	7,894.43	692.56	3,743.62	3,802.97	0.00	0.00	0.00	0.00
11,200.00	90.74	90.23	7,893.15	692.17	3,843.61	3,901.98	0.00	0.00	0.00	0.00
11,300.00	90.74	90.23	7,891.86	691.77	3,943.60	4,000.99	0.00	0.00	0.00	0.00
11,400.00	90.74	90.23	7,890.57	691.38	4,043.59	4,100.01	0.00	0.00	0.00	0.00
11,500.00	90.74	90.23	7,889.28	690.99	4,143.58	4,199.02	0.00	0.00	0.00	0.00
11,600.00	90.74	90.23	7,888.00	690.59	4,243.57	4,298.03	0.00	0.00	0.00	0.00
11,700.00	90.74	90.23	7,886.71	690.20	4,343.56	4,397.04	0.00	0.00	0.00	0.00
11,800.00	90.74	90.23	7,885.42	689.81	4,443.55	4,496.06	0.00	0.00	0.00	0.00
11,900.00	90.74	90.23	7,884.13	689.42	4,543.54	4,595.07	0.00	0.00	0.00	0.00
12,000.00	90.74	90.23	7,882.85	689.02	4,643.54	4,694.08	0.00	0.00	0.00	0.00
12,100.00	90.74	90.23	7,881.56	688.63	4,743.53	4,793.10	0.00	0.00	0.00	0.00
12,200.00	90.74	90.23	7,880.27	688.24	4,843.52	4,892.11	0.00	0.00	0.00	0.00
12,300.00	90.74	90.23	7,878.99	687.84	4,943.51	4,991.12	0.00	0.00	0.00	0.00
12,376.52	90.74	90.23	7,878.00	687.54	5,020.02	5,066.89	0.00	0.00	0.00	0.00
Total Depth 12376.52 ft										

### 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
2,855.00	2,851.90	43.31	24.60	End Nudge @ 2855.00 ft
6,689.78	6,620.00	662.38	376.29	Begin Drop @ 6689.78 ft
7,224.78	7,151.90	705.69	400.89	End Drop @ 7224.78 ft
7,429.97	7,357.09	705.69	400.89	Kick Off Point @ 7429.97 ft
7,900.00	7,776.14	704.98	583.11	Build Rate 10.00 °/100 ft
8,337.35	7,930.00	703.41	981.22	End Build @ 8337.35 ft
10,000.00	7,908.60	696.88	2,643.72	Hold Inc 90.74°, Azi 90.23°
12,376.52	7,878.00	687.54	5,020.02	Total Depth 12376.52 ft

## Plan Report for State Elbert-1H - Rev A0

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	State Elbert-1H_Rev A0_BHL Tgt	82.20	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	12,376.52	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			
7,817.84	7,716.00	Sharon Springs			
7,962.18	7,816.00	Niobrara			
8,079.11	7,876.00	Niobrara B			
8,207.46	7,917.00	Niobrara C			

### Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
State Elbert-1H_SB	0.00	0.00	0.00	Polygon
State Elbert-1H_SL	0.00	0.00	0.00	Polygon
State Elbert-1H_Rev A0_BHL Tgt	7,878.00	687.54	5,020.02	Point

### Directional Difficulty Index

Average Dogleg over Survey:	0.91 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 8,337.35 usft
Net Tortousity applicable to Plans:	0.91 °/100usft	Directional Difficulty Index:	6.143

### Audit Info



**North Reference Sheet for Sec. 2-T5S-R65W - State Elbert-1H - 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 24 ft @ 5878.00usft (H&P 280). Northing and Easting are relative to State Elbert-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: 1,662,493.96 usft N, 3,246,724.02 usft E  
 Geographical Coordinates of Well: 39° 38' 56.67" N, 104° 37' 25.66" W  
 Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,376.52usft  
 the Bottom Hole Displacement is 5,066.89usft in the Direction of 82.20° ( True).  
 Magnetic Convergence at surface is: -7.88° (31 December 2013, , BGGM2013)

