

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T2N-R67W

Sater 40N-5HZ

API: 05-123-38324:: Job# 900823966

Plan B0

Plan: Rev B0

## Sperry Drilling Services

### Proposal Report

02 December, 2013

Well Coordinates: 1,299,388.24 N, 3,166,139.79 E (40° 09' 13.27" N, 104° 54' 20.25" W)

Ground Level: 4,946.00 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 Sater 40N-5HZ

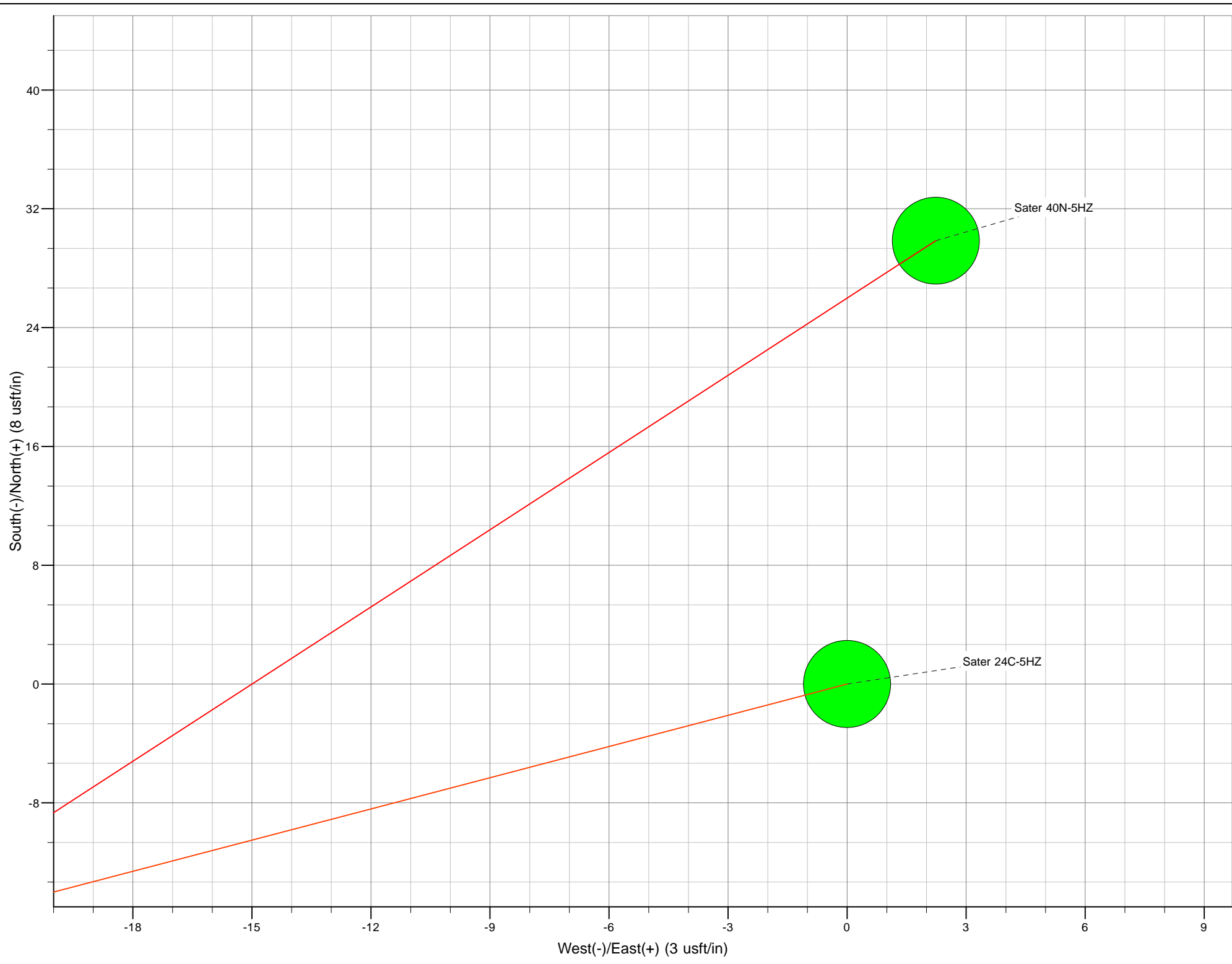
RKB=25' @ 4971.00usft (H&P 308)

N

True

API - US Survey Feet - Custom

**HALLIBURTON**



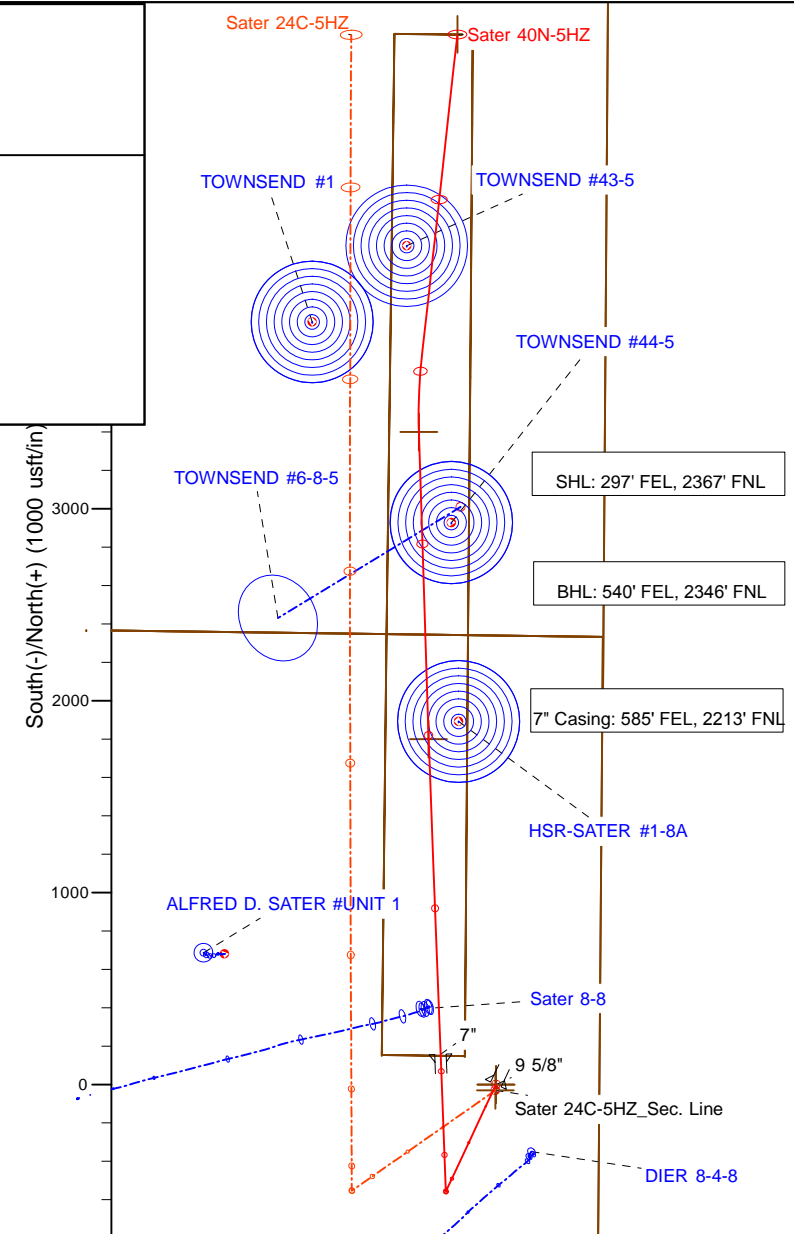
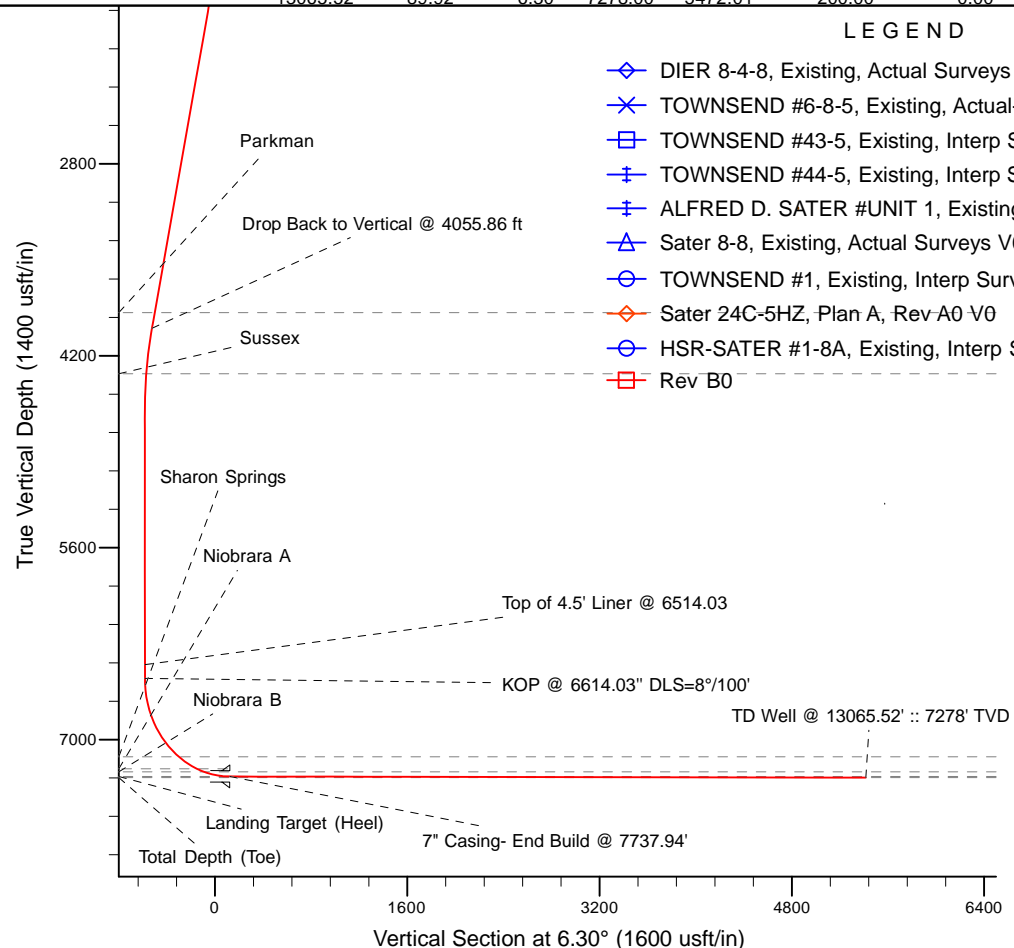
Project: Weld County, CO (NAD 83)  
Site: Sec. 8-T2N-R67W  
Well: Sater 40N-5HZ  
Wellbore: Plan B0  
Design: Rev B0

# Anadarko Petroleum Corp.

**HALLIBURTON**  
Sperry Drilling

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Sater 24C-5HZ_Sec. Line	0.00	-29.86	-2.24	1299358.38	3166137.75	40° 9' 12.978 N	104° 54' 20.279 W
Sater 40N-5HZ_LD	0.00	0.00	0.00	1299388.24	3166139.79	40° 9' 13.273 N	104° 54' 20.250 W
Sater 40N-5HZ_SHL	0.00	0.00	0.00	1299388.24	3166139.79	40° 9' 13.273 N	104° 54' 20.250 W
Sater 40N-5HZ Lateral Target	7272.52	1800.00	-350.00	1301185.78	3165777.75	40° 9' 31.060 N	104° 54' 24.758 W
Sater 40N-5HZ Lateral Target 2	7274.91	3400.00	-400.00	1302785.35	3165717.03	40° 9' 46.872 N	104° 54' 25.402 W
Sater 40N-5HZ_BHL	7278.00	5472.01	-200.00	1304858.56	3165903.13	40° 10' 7.348 N	104° 54' 22.826 W

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSec
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00
1700.00	12.00	205.00	1695.62	-56.74	-26.46	2.00	-59.30
4055.86	12.00	205.00	4000.00	-500.66	-233.46	0.00	-523.25
4655.86	0.00	0.00	4595.62	-557.39	-259.92	2.00	-582.55
6614.03	0.00	0.00	6553.80	-557.39	-259.92	0.00	-582.55
7737.94	89.91	357.81	7270.00	157.18	-287.22	8.00	124.72
9381.95	89.91	357.81	7272.52	1800.00	-350.00	0.00	1750.72
9402.00	89.91	358.21	7272.55	1820.04	-350.70	2.00	1770.56
10982.74	89.91	358.21	7274.91	3400.00	-400.00	0.00	3335.57
11386.96	89.92	6.30	7275.51	3803.57	-384.11	2.00	3738.45
13065.52	89.92	6.30	7278.00	5472.01	-200.00	0.00	5417.02



WELL DETAILS: Sater 40N-5HZ	
Ground Level:	4946.00
RKB=25' @ 4971.00usft (H&P 308)	
Plan: Rev B0 (Sater 40N-5HZ/Plan B0)	
Created By: Pari Amanlou	Date: 11/24/2013

**Plan Report for Sater 40N-5HZ - Rev B0**

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
908.00	0.00	0.00	908.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Base</b>										
958.00	0.00	0.00	958.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
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
<b>Begin Nudge @ 1100.00 ft.</b>										
1,200.00	2.00	205.00	1,199.98	-1.58	-0.74	-1.65	2.00	2.00	0.00	205.00
1,300.00	4.00	205.00	1,299.84	-6.32	-2.95	-6.61	2.00	2.00	0.00	0.00
1,400.00	6.00	205.00	1,399.45	-14.22	-6.63	-14.87	2.00	2.00	0.00	0.00
1,500.00	8.00	205.00	1,498.70	-25.27	-11.78	-26.41	2.00	2.00	0.00	0.00
1,600.00	10.00	205.00	1,597.47	-39.44	-18.39	-41.23	2.00	2.00	0.00	0.00
1,700.00	12.00	205.00	1,695.62	-56.74	-26.46	-59.30	2.00	2.00	0.00	0.00
1,800.00	12.00	205.00	1,793.44	-75.58	-35.24	-78.99	0.00	0.00	0.00	0.00
1,900.00	12.00	205.00	1,891.25	-94.42	-44.03	-98.68	0.00	0.00	0.00	0.00
2,000.00	12.00	205.00	1,989.07	-113.27	-52.82	-118.38	0.00	0.00	0.00	0.00
2,100.00	12.00	205.00	2,086.88	-132.11	-61.60	-138.07	0.00	0.00	0.00	0.00
2,200.00	12.00	205.00	2,184.70	-150.95	-70.39	-157.77	0.00	0.00	0.00	0.00
2,300.00	12.00	205.00	2,282.51	-169.80	-79.18	-177.46	0.00	0.00	0.00	0.00
2,400.00	12.00	205.00	2,380.33	-188.64	-87.96	-197.15	0.00	0.00	0.00	0.00
2,500.00	12.00	205.00	2,478.14	-207.48	-96.75	-216.85	0.00	0.00	0.00	0.00
2,600.00	12.00	205.00	2,575.96	-226.33	-105.54	-236.54	0.00	0.00	0.00	0.00
2,700.00	12.00	205.00	2,673.77	-245.17	-114.32	-256.23	0.00	0.00	0.00	0.00
2,800.00	12.00	205.00	2,771.59	-264.01	-123.11	-275.93	0.00	0.00	0.00	0.00
2,900.00	12.00	205.00	2,869.40	-282.86	-131.90	-295.62	0.00	0.00	0.00	0.00
3,000.00	12.00	205.00	2,967.22	-301.70	-140.68	-315.31	0.00	0.00	0.00	0.00
3,100.00	12.00	205.00	3,065.03	-320.54	-149.47	-335.01	0.00	0.00	0.00	0.00
3,200.00	12.00	205.00	3,162.84	-339.39	-158.26	-354.70	0.00	0.00	0.00	0.00
3,300.00	12.00	205.00	3,260.66	-358.23	-167.04	-374.40	0.00	0.00	0.00	0.00
3,400.00	12.00	205.00	3,358.47	-377.07	-175.83	-394.09	0.00	0.00	0.00	0.00
3,500.00	12.00	205.00	3,456.29	-395.91	-184.62	-413.78	0.00	0.00	0.00	0.00
3,600.00	12.00	205.00	3,554.10	-414.76	-193.40	-433.48	0.00	0.00	0.00	0.00
3,700.00	12.00	205.00	3,651.92	-433.60	-202.19	-453.17	0.00	0.00	0.00	0.00
3,800.00	12.00	205.00	3,749.73	-452.44	-210.98	-472.86	0.00	0.00	0.00	0.00
3,900.00	12.00	205.00	3,847.55	-471.29	-219.76	-492.56	0.00	0.00	0.00	0.00
3,939.31	12.00	205.00	3,886.00	-478.69	-223.22	-500.30	0.00	0.00	0.00	0.00
<b>Parkman</b>										
4,000.00	12.00	205.00	3,945.36	-490.13	-228.55	-512.25	0.00	0.00	0.00	0.00
4,055.86	12.00	205.00	4,000.00	-500.66	-233.46	-523.25	0.00	0.00	0.00	0.00
<b>Drop Back to Vertical @ 4055.86 ft</b>										
4,100.00	11.12	205.00	4,043.25	-508.67	-237.20	-531.63	2.00	-2.00	0.00	180.00
4,200.00	9.12	205.00	4,141.69	-524.59	-244.62	-548.27	2.00	-2.00	0.00	-180.00
4,300.00	7.12	205.00	4,240.68	-537.39	-250.59	-561.64	2.00	-2.00	0.00	180.00
4,391.86	5.28	205.00	4,332.00	-546.38	-254.78	-571.04	2.00	-2.00	0.00	180.00
<b>Sussex</b>										
4,400.00	5.12	205.00	4,340.11	-547.05	-255.09	-571.73	2.00	-2.00	0.00	-180.00
4,500.00	3.12	205.00	4,439.84	-553.55	-258.13	-578.53	2.00	-2.00	0.00	180.00
4,600.00	1.12	205.00	4,539.77	-556.90	-259.69	-582.03	2.00	-2.00	0.00	180.00

## Plan Report for Sater 40N-5HZ - Rev B0

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 (°)
4,655.86	0.00	0.00	4,595.62	-557.39	-259.92	-582.55	2.00	-2.00	0.00	180.00
4,700.00	0.00	0.00	4,639.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,739.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,839.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,939.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,039.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,139.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,239.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,339.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,439.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,539.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,639.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,739.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,839.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,939.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,039.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,139.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,239.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,339.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,439.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
6,514.03	0.00	0.00	6,453.80	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
<b>Top of 4.5' Liner @ 6514.03</b>										
6,600.00	0.00	0.00	6,539.77	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
6,614.03	0.00	0.00	6,553.80	-557.39	-259.92	-582.55	0.00	0.00	0.00	0.00
<b>KOP @ 6614.03" DLS=8"/100'</b>										
6,700.00	6.88	357.81	6,639.56	-552.24	-260.11	-577.45	8.00	8.00	0.00	357.81
6,800.00	14.88	357.81	6,737.68	-533.40	-260.83	-558.80	8.00	8.00	0.00	0.00
6,900.00	22.88	357.81	6,832.23	-501.10	-262.07	-526.83	8.00	8.00	0.00	0.00
7,000.00	30.88	357.81	6,921.35	-455.96	-263.79	-482.15	8.00	8.00	0.00	0.00
7,100.00	38.88	357.81	7,003.32	-398.87	-265.97	-425.64	8.00	8.00	0.00	0.00
7,200.00	46.88	357.81	7,076.55	-330.93	-268.57	-358.40	8.00	8.00	0.00	0.00
7,278.57	53.16	357.81	7,127.00	-270.80	-270.87	-298.89	8.00	8.00	0.00	0.00
<b>Sharon Springs</b>										
7,300.00	54.88	357.81	7,139.59	-253.47	-271.53	-281.73	8.00	8.00	0.00	0.00
7,400.00	62.88	357.81	7,191.24	-167.99	-274.80	-197.13	8.00	8.00	0.00	0.00
7,451.37	66.99	357.81	7,213.00	-121.50	-276.57	-151.12	8.00	8.00	0.00	0.00
<b>Niobrara A</b>										
7,500.00	70.88	357.81	7,230.48	-76.17	-278.31	-106.25	8.00	8.00	0.00	0.00
7,517.48	72.28	357.81	7,236.00	-59.60	-278.94	-89.85	8.00	8.00	0.00	0.00
<b>Niobrara B</b>										
7,600.00	78.88	357.81	7,256.54	20.22	-281.99	-10.85	8.00	8.00	0.00	0.00
7,700.00	86.88	357.81	7,268.93	119.29	-285.78	87.21	8.00	8.00	0.00	0.00
7,737.94	89.91	357.81	7,270.00	157.19	-287.22	124.72	8.00	8.00	0.00	0.00
<b>7" Casing- End Build @ 7737.94' - 7"</b>										
7,740.28	89.91	357.81	7,270.00	159.53	-287.31	127.04	0.00	0.00	0.00	0.00
<b>Landing Target (Heel)</b>										
7,800.00	89.91	357.81	7,270.09	219.20	-289.59	186.10	0.00	0.00	0.00	0.00
7,900.00	89.91	357.81	7,270.25	319.13	-293.41	285.00	0.00	0.00	0.00	0.00
8,000.00	89.91	357.81	7,270.40	419.06	-297.23	383.91	0.00	0.00	0.00	0.00
8,100.00	89.91	357.81	7,270.55	518.98	-301.05	482.81	0.00	0.00	0.00	0.00
8,200.00	89.91	357.81	7,270.71	618.91	-304.87	581.72	0.00	0.00	0.00	0.00
8,300.00	89.91	357.81	7,270.86	718.84	-308.69	680.62	0.00	0.00	0.00	0.00
8,400.00	89.91	357.81	7,271.01	818.76	-312.50	779.53	0.00	0.00	0.00	0.00
8,500.00	89.91	357.81	7,271.17	918.69	-316.32	878.43	0.00	0.00	0.00	0.00
8,600.00	89.91	357.81	7,271.32	1,018.62	-320.14	977.34	0.00	0.00	0.00	0.00
8,700.00	89.91	357.81	7,271.47	1,118.54	-323.96	1,076.24	0.00	0.00	0.00	0.00
8,800.00	89.91	357.81	7,271.63	1,218.47	-327.78	1,175.14	0.00	0.00	0.00	0.00
8,900.00	89.91	357.81	7,271.78	1,318.40	-331.60	1,274.05	0.00	0.00	0.00	0.00
9,000.00	89.91	357.81	7,271.93	1,418.33	-335.42	1,372.95	0.00	0.00	0.00	0.00

**Plan Report for Sater 40N-5HZ - Rev B0**

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 (°)
9,100.00	89.91	357.81	7,272.09	1,518.25	-339.23	1,471.86	0.00	0.00	0.00	0.00
9,200.00	89.91	357.81	7,272.24	1,618.18	-343.05	1,570.76	0.00	0.00	0.00	0.00
9,300.00	89.91	357.81	7,272.39	1,718.11	-346.87	1,669.67	0.00	0.00	0.00	0.00
9,381.95	89.91	357.81	7,272.52	1,800.00	-350.00	1,750.72	0.00	0.00	0.00	0.00
9,400.00	89.91	358.17	7,272.55	1,818.04	-350.63	1,768.58	2.00	0.01	2.00	89.65
9,402.00	89.91	358.21	7,272.55	1,820.04	-350.70	1,770.56	2.00	0.01	2.00	89.65
9,500.00	89.91	358.21	7,272.70	1,917.99	-353.75	1,867.59	0.00	0.00	0.00	0.00
9,600.00	89.91	358.21	7,272.85	2,017.94	-356.87	1,966.59	0.00	0.00	0.00	0.00
9,700.00	89.91	358.21	7,273.00	2,117.89	-359.99	2,065.60	0.00	0.00	0.00	0.00
9,800.00	89.91	358.21	7,273.14	2,217.84	-363.11	2,164.60	0.00	0.00	0.00	0.00
9,900.00	89.91	358.21	7,273.29	2,317.79	-366.23	2,263.61	0.00	0.00	0.00	0.00
10,000.00	89.91	358.21	7,273.44	2,417.74	-369.35	2,362.61	0.00	0.00	0.00	0.00
10,100.00	89.91	358.21	7,273.59	2,517.69	-372.47	2,461.62	0.00	0.00	0.00	0.00
10,200.00	89.91	358.21	7,273.74	2,617.65	-375.59	2,560.62	0.00	0.00	0.00	0.00
10,300.00	89.91	358.21	7,273.89	2,717.60	-378.70	2,659.63	0.00	0.00	0.00	0.00
10,400.00	89.91	358.21	7,274.04	2,817.55	-381.82	2,758.63	0.00	0.00	0.00	0.00
10,500.00	89.91	358.21	7,274.19	2,917.50	-384.94	2,857.64	0.00	0.00	0.00	0.00
10,600.00	89.91	358.21	7,274.34	3,017.45	-388.06	2,956.64	0.00	0.00	0.00	0.00
10,700.00	89.91	358.21	7,274.49	3,117.40	-391.18	3,055.65	0.00	0.00	0.00	0.00
10,800.00	89.91	358.21	7,274.64	3,217.35	-394.30	3,154.65	0.00	0.00	0.00	0.00
10,900.00	89.91	358.21	7,274.79	3,317.30	-397.42	3,253.66	0.00	0.00	0.00	0.00
10,982.74	89.91	358.21	7,274.91	3,400.00	-400.00	3,335.57	0.00	0.00	0.00	0.00
11,000.00	89.91	358.56	7,274.94	3,417.26	-400.49	3,352.67	2.00	0.00	2.00	90.00
11,100.00	89.91	0.56	7,275.09	3,517.25	-401.26	3,451.98	2.00	0.00	2.00	90.00
11,200.00	89.91	2.56	7,275.23	3,617.21	-398.54	3,551.63	2.00	0.00	2.00	90.00
11,300.00	89.91	4.56	7,275.38	3,717.01	-392.33	3,651.51	2.00	0.00	2.00	90.00
11,386.96	89.92	6.30	7,275.51	3,803.57	-384.11	3,738.45	2.00	0.00	2.00	89.99
11,400.00	89.92	6.30	7,275.53	3,816.54	-382.68	3,751.50	0.00	0.00	0.00	0.00
11,500.00	89.92	6.30	7,275.68	3,915.93	-371.71	3,851.50	0.00	0.00	0.00	0.00
11,600.00	89.92	6.30	7,275.83	4,015.33	-360.74	3,951.49	0.00	0.00	0.00	0.00
11,700.00	89.92	6.30	7,275.98	4,114.73	-349.77	4,051.49	0.00	0.00	0.00	0.00
11,800.00	89.92	6.30	7,276.12	4,214.12	-338.81	4,151.49	0.00	0.00	0.00	0.00
11,900.00	89.92	6.30	7,276.27	4,313.52	-327.84	4,251.49	0.00	0.00	0.00	0.00
12,000.00	89.92	6.30	7,276.42	4,412.92	-316.87	4,351.49	0.00	0.00	0.00	0.00
12,100.00	89.92	6.30	7,276.57	4,512.31	-305.90	4,451.49	0.00	0.00	0.00	0.00
12,200.00	89.92	6.30	7,276.72	4,611.71	-294.93	4,551.49	0.00	0.00	0.00	0.00
12,300.00	89.92	6.30	7,276.87	4,711.11	-283.96	4,651.49	0.00	0.00	0.00	0.00
12,400.00	89.92	6.30	7,277.01	4,810.50	-273.00	4,751.49	0.00	0.00	0.00	0.00
12,500.00	89.92	6.30	7,277.16	4,909.90	-262.03	4,851.49	0.00	0.00	0.00	0.00
12,600.00	89.92	6.30	7,277.31	5,009.30	-251.06	4,951.49	0.00	0.00	0.00	0.00
12,700.00	89.92	6.30	7,277.46	5,108.69	-240.09	5,051.49	0.00	0.00	0.00	0.00
12,800.00	89.92	6.30	7,277.61	5,208.09	-229.12	5,151.49	0.00	0.00	0.00	0.00
12,900.00	89.92	6.30	7,277.75	5,307.48	-218.15	5,251.49	0.00	0.00	0.00	0.00
13,000.00	89.92	6.30	7,277.90	5,406.88	-207.19	5,351.49	0.00	0.00	0.00	0.00
13,065.52	89.92	6.30	7,278.00	5,472.01	-200.00	5,417.01	0.00	0.00	0.00	0.00

TD Well @ 13065.52' :: 7278' TVD

**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,100.00	1,100.00	0.00	0.00	Begin Nudge @ 1100.00 ft.
4,055.86	4,000.00	-500.66	-233.46	Drop Back to Vertical @ 4055.86 ft
6,514.03	6,453.80	-557.39	-259.92	Top of 4.5' Liner @ 6514.03
6,614.03	6,553.80	-557.39	-259.92	KOP @ 6614.03" DLS=8°/100'
7,737.94	7,270.00	157.19	-287.22	7" Casing- End Build @ 7737.94'
13,065.52	7,278.00	5,472.01	-200.00	TD Well @ 13065.52' :: 7278' TVD

## Plan Report for Sater 40N-5HZ - Rev B0

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	6.30	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	958.00	Rev B0	NS-GYRO-MS
958.00	7,737.94	Rev B0	MWD+IFR1+SC
7,737.94	13,065.52	Rev B0	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
958.00	958.00	9 5/8"	9-5/8	12-3/4
7,737.94	7,270.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
908.00	908.00	Fox Hills Base			
3,939.31	3,886.00	Parkman			
4,391.86	4,332.00	Sussex			
7,278.57	7,127.00	Sharon Springs			
7,451.37	7,213.00	Niobrara A			
7,517.48	7,236.00	Niobrara B			
7,740.28	7,270.00	Landing Target (Heel)			
13,065.52	7,278.00	Total Depth (Toe)			

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Sater 40N-5HZ SHL	0.00	0.00	0.00	Point
Sater 40N-5HZ LD	0.00	0.00	0.00	Polygon
Sater 40N-5HZ Lateral Target	7,272.52	1,800.00	-350.00	Point
Sater 40N-5HZ Lateral Target 2	7,274.91	3,400.00	-400.00	Point
Sater 40N-5HZ BHL	7,278.00	5,472.01	-200.00	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.94 °/100usft	Maximum Dogleg over Survey:	8.00 °/100usft at 7,737.94 usft
Net Tortousity applicable to Plans:	0.94 °/100usft	Directional Difficulty Index:	6.276

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**Plan Report for Sater 40N-5HZ - Rev B0**

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*Audit Info*



**North Reference Sheet for Sec. 8-T2N-R67W - Sater 40N-5HZ - Plan B0**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference .  
 Vertical Depths are relative to RKB=25' @ 4971.00usft (H&P 308). Northing and Easting are relative to Sater 40N-5HZ  
 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: 0.99995827

Grid Coordinates of Well: 1,299,388.24 usft N, 3,166,139.79 usft E  
 Geographical Coordinates of Well: 40° 09' 13.27" N, 104° 54' 20.25" W  
 Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,065.52usft  
 the Bottom Hole Displacement is 5,475.66usft in the Direction of 357.91° ( True).  
 Magnetic Convergence at surface is: -8.24° (30 November 2013, , BGGM2013)

