

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T1N-R67W

NRC 2N-8HZ

Plan B

Plan: Rev B0 Permit

## Sperry Drilling Services

### Proposal Report

05 November, 2013

Well Coordinates: 1,264,984.46 N, 3,164,739.04 E (40° 03' 33.38" N, 104° 54' 41.23" W)

Ground Level: 5,063.00 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 NRC 2N-8HZ

RKB = 17' @ 5080.00usft (Drilling Rig)

N

True

Dec-Deg - API - US Survey Feet - Custom

**HALLIBURTON**

Project: Weld County, CO (NAD 83)  
Site: Sec. 8-T1N-R67W  
Well: NRC 2N-8HZ  
Wellbore: Plan B  
Design: Rev B0 Permit

# Anadarko Petroleum Corp.

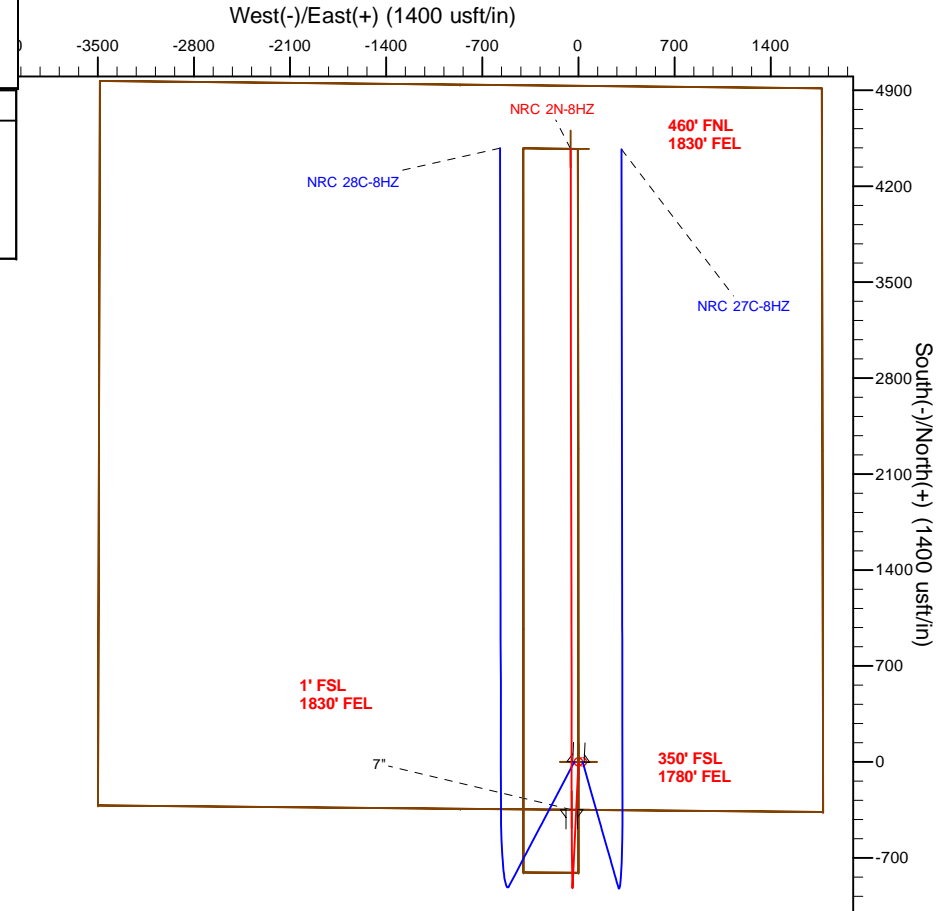
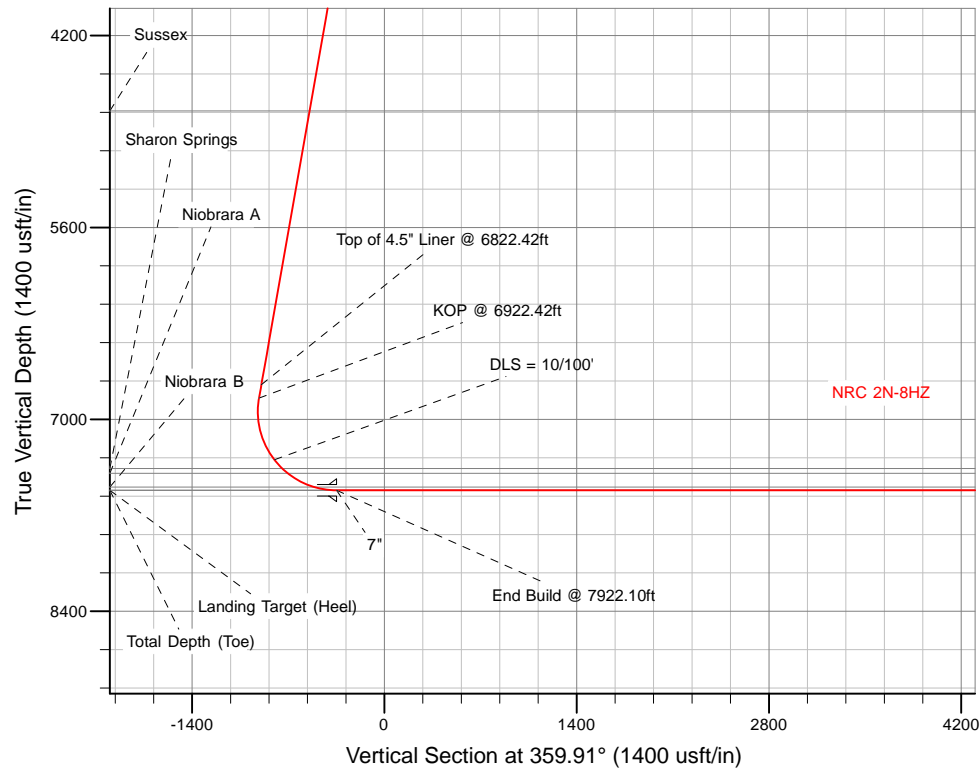
**HALLIBURTON**  
Sperry Drilling

## 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	1400.00	0.00	0.00	1400.00	0.00	0.00	0.00	0.00	0.00	
3	1898.99	9.98	182.69	1896.47	-43.30	-2.04	2.00	182.69	-43.30	
4	6922.42	9.98	182.69	6843.89	-912.91	-42.96	0.00	0.00	-912.84	
5	7922.10	90.00	359.91	7516.00	-348.61	-49.55	10.00	177.18	-348.53	NRC 2N-8HZ_CP
6	12742.39	90.00	359.91	7516.00	4471.68	-56.81	0.00	0.00	4471.76	NRC 2N-8HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
NRC 2N-8HZ_LD	0.00	0.00	0.00	40° 3' 33.375 N	104° 54' 41.231 W	Polygon
NRC 2N-8HZ_SHL	0.00	0.00	0.00	40° 3' 33.375 N	104° 54' 41.231 W	
NRC_SEC	0.00	2298.99	-860.28	40° 3' 56.094 N	104° 54' 52.296 W	Polygon
NRC 2N-8HZ_BHL	7516.00	4471.68	-56.81	40° 4' 17.566 N	104° 54' 41.962 W	
NRC 2N-8HZ_CP	7516.00	-348.61	-49.55	40° 3' 29.930 N	104° 54' 41.868 W	Point



TVD	MD	
6745.40	6822.42	Top of 4.5" Liner @ 6822.42ft
6843.89	6922.42	KOP @ 6922.42ft

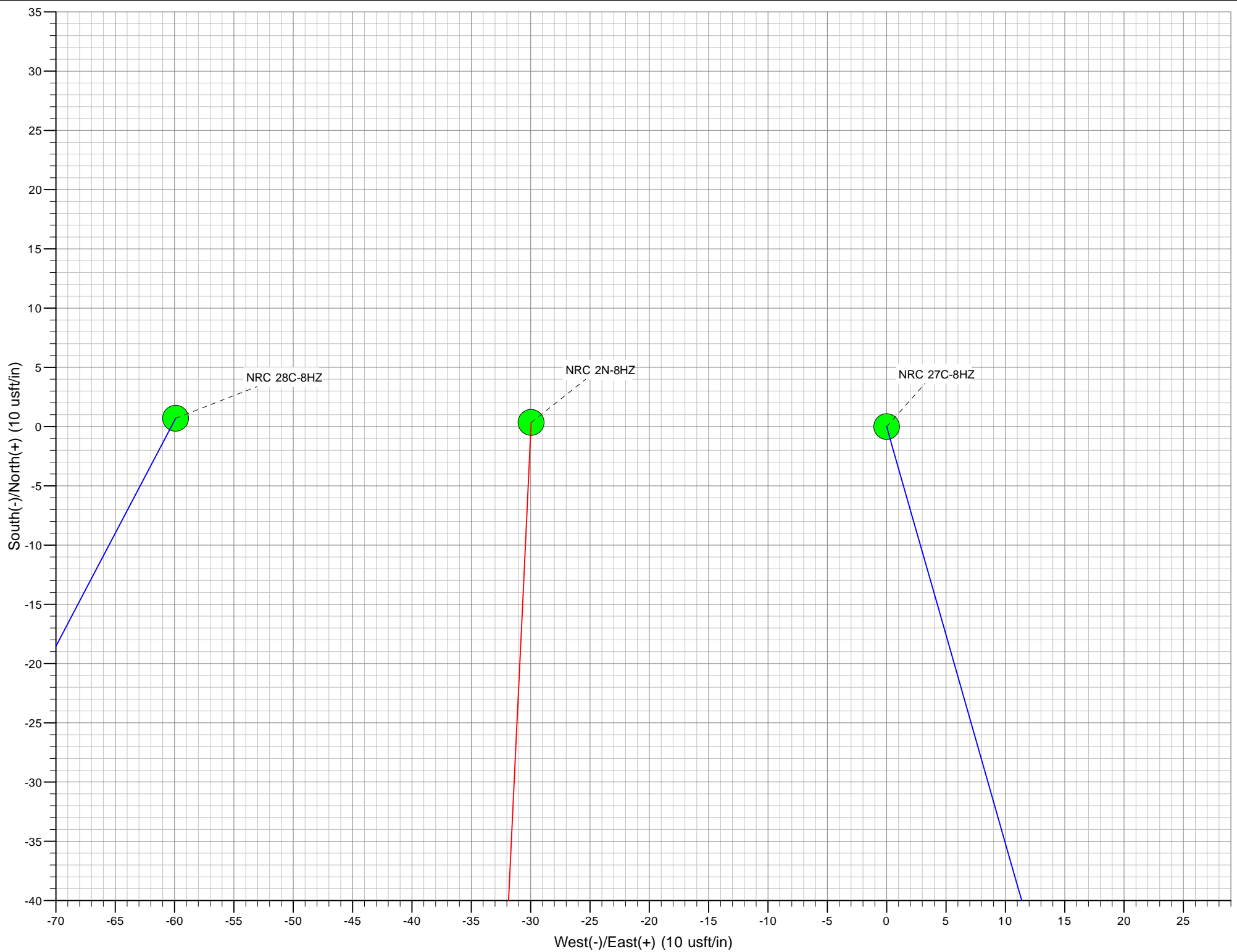
## WELL DETAILS: NRC 2N-8HZ

Ground Level: 5063.00

RKB = 17' @ 5080.00usft (Drilling Rig)

Plan: Rev B0 Permit (NRC 2N-8HZ/Plan B)

Created By: Clint Eshelman Date: 11/04/2013  
Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_



**Plan Report for NRC 2N-8HZ - Rev B0 Permit**

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
<b>NRC 2N-8HZ_SHL - NRC_SEC - NRC 2N-8HZ_LD</b>										
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
730.00	0.00	0.00	730.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
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
<b>Begin Nudge @ 1400.00ft</b>										
1,500.00	2.00	182.69	1,499.98	-1.74	-0.08	-1.74	2.00	2.00	0.00	182.69
1,600.00	4.00	182.69	1,599.84	-6.97	-0.33	-6.97	2.00	2.00	0.00	0.00
1,700.00	6.00	182.69	1,699.45	-15.68	-0.74	-15.68	2.00	2.00	0.00	0.00
1,800.00	8.00	182.69	1,798.70	-27.85	-1.31	-27.85	2.00	2.00	0.00	0.00
1,898.99	9.98	182.69	1,896.47	-43.30	-2.04	-43.30	2.00	2.00	0.00	0.00
<b>End Nudge @ 1898.99ft</b>										
1,900.00	9.98	182.69	1,897.47	-43.47	-2.05	-43.47	0.01	0.01	0.00	0.00
2,000.00	9.98	182.69	1,995.95	-60.79	-2.86	-60.78	0.00	0.00	0.00	0.00
2,100.00	9.98	182.69	2,094.44	-78.10	-3.67	-78.09	0.00	0.00	0.00	0.00
2,200.00	9.98	182.69	2,192.93	-95.41	-4.49	-95.40	0.00	0.00	0.00	0.00
2,300.00	9.98	182.69	2,291.41	-112.72	-5.30	-112.71	0.00	0.00	0.00	0.00
2,400.00	9.98	182.69	2,389.90	-130.03	-6.12	-130.02	0.00	0.00	0.00	0.00
2,500.00	9.98	182.69	2,488.39	-147.34	-6.93	-147.33	0.00	0.00	0.00	0.00
2,600.00	9.98	182.69	2,586.87	-164.65	-7.75	-164.64	0.00	0.00	0.00	0.00
2,700.00	9.98	182.69	2,685.36	-181.96	-8.56	-181.95	0.00	0.00	0.00	0.00
2,800.00	9.98	182.69	2,783.85	-199.27	-9.38	-199.26	0.00	0.00	0.00	0.00
2,900.00	9.98	182.69	2,882.33	-216.58	-10.19	-216.57	0.00	0.00	0.00	0.00
3,000.00	9.98	182.69	2,980.82	-233.90	-11.01	-233.88	0.00	0.00	0.00	0.00
3,100.00	9.98	182.69	3,079.31	-251.21	-11.82	-251.19	0.00	0.00	0.00	0.00
3,200.00	9.98	182.69	3,177.79	-268.52	-12.64	-268.50	0.00	0.00	0.00	0.00
3,300.00	9.98	182.69	3,276.28	-285.83	-13.45	-285.81	0.00	0.00	0.00	0.00
3,400.00	9.98	182.69	3,374.77	-303.14	-14.26	-303.12	0.00	0.00	0.00	0.00
3,500.00	9.98	182.69	3,473.26	-320.45	-15.08	-320.43	0.00	0.00	0.00	0.00
3,600.00	9.98	182.69	3,571.74	-337.76	-15.89	-337.74	0.00	0.00	0.00	0.00
3,700.00	9.98	182.69	3,670.23	-355.07	-16.71	-355.05	0.00	0.00	0.00	0.00
3,800.00	9.98	182.69	3,768.72	-372.38	-17.52	-372.36	0.00	0.00	0.00	0.00
3,900.00	9.98	182.69	3,867.20	-389.70	-18.34	-389.67	0.00	0.00	0.00	0.00
4,000.00	9.98	182.69	3,965.69	-407.01	-19.15	-406.98	0.00	0.00	0.00	0.00
4,100.00	9.98	182.69	4,064.18	-424.32	-19.97	-424.29	0.00	0.00	0.00	0.00
4,200.00	9.98	182.69	4,162.66	-441.63	-20.78	-441.60	0.00	0.00	0.00	0.00
4,300.00	9.98	182.69	4,261.15	-458.94	-21.60	-458.91	0.00	0.00	0.00	0.00
4,400.00	9.98	182.69	4,359.64	-476.25	-22.41	-476.21	0.00	0.00	0.00	0.00
4,500.00	9.98	182.69	4,458.12	-493.56	-23.23	-493.52	0.00	0.00	0.00	0.00
4,600.00	9.98	182.69	4,556.61	-510.87	-24.04	-510.83	0.00	0.00	0.00	0.00
4,700.00	9.98	182.69	4,655.10	-528.18	-24.85	-528.14	0.00	0.00	0.00	0.00
4,796.36	9.98	182.69	4,750.00	-544.86	-25.64	-544.82	0.00	0.00	0.00	0.00
<b>Sussex</b>										
4,800.00	9.98	182.69	4,753.58	-545.49	-25.67	-545.45	0.00	0.00	0.00	0.00
4,900.00	9.98	182.69	4,852.07	-562.81	-26.48	-562.76	0.00	0.00	0.00	0.00

**Plan Report for NRC 2N-8HZ - Rev B0 Permit**

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 (°)
5,000.00	9.98	182.69	4,950.56	-580.12	-27.30	-580.07	0.00	0.00	0.00	0.00
5,100.00	9.98	182.69	5,049.05	-597.43	-28.11	-597.38	0.00	0.00	0.00	0.00
5,200.00	9.98	182.69	5,147.53	-614.74	-28.93	-614.69	0.00	0.00	0.00	0.00
5,300.00	9.98	182.69	5,246.02	-632.05	-29.74	-632.00	0.00	0.00	0.00	0.00
5,400.00	9.98	182.69	5,344.51	-649.36	-30.56	-649.31	0.00	0.00	0.00	0.00
5,500.00	9.98	182.69	5,442.99	-666.67	-31.37	-666.62	0.00	0.00	0.00	0.00
5,600.00	9.98	182.69	5,541.48	-683.98	-32.19	-683.93	0.00	0.00	0.00	0.00
5,700.00	9.98	182.69	5,639.97	-701.29	-33.00	-701.24	0.00	0.00	0.00	0.00
5,800.00	9.98	182.69	5,738.45	-718.61	-33.82	-718.55	0.00	0.00	0.00	0.00
5,900.00	9.98	182.69	5,836.94	-735.92	-34.63	-735.86	0.00	0.00	0.00	0.00
6,000.00	9.98	182.69	5,935.43	-753.23	-35.44	-753.17	0.00	0.00	0.00	0.00
6,100.00	9.98	182.69	6,033.91	-770.54	-36.26	-770.48	0.00	0.00	0.00	0.00
6,200.00	9.98	182.69	6,132.40	-787.85	-37.07	-787.79	0.00	0.00	0.00	0.00
6,300.00	9.98	182.69	6,230.89	-805.16	-37.89	-805.10	0.00	0.00	0.00	0.00
6,400.00	9.98	182.69	6,329.37	-822.47	-38.70	-822.41	0.00	0.00	0.00	0.00
6,500.00	9.98	182.69	6,427.86	-839.78	-39.52	-839.72	0.00	0.00	0.00	0.00
6,600.00	9.98	182.69	6,526.35	-857.09	-40.33	-857.03	0.00	0.00	0.00	0.00
6,700.00	9.98	182.69	6,624.84	-874.40	-41.15	-874.34	0.00	0.00	0.00	0.00
6,800.00	9.98	182.69	6,723.32	-891.72	-41.96	-891.65	0.00	0.00	0.00	0.00
6,822.42	9.98	182.69	6,745.40	-895.60	-42.14	-895.53	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 6822.42ft</b>										
6,900.00	9.98	182.69	6,821.81	-909.03	-42.78	-908.96	0.00	0.00	0.00	0.00
6,922.42	9.98	182.69	6,843.89	-912.91	-42.96	-912.84	0.00	0.00	0.00	0.00
<b>KOP @ 6922.42ft</b>										
7,000.00	2.26	192.39	6,920.97	-921.13	-43.60	-921.06	10.00	-9.95	12.49	177.18
7,100.00	7.81	356.34	7,020.72	-916.27	-44.46	-916.20	10.00	5.54	163.96	167.52
7,200.00	17.80	358.39	7,118.11	-894.16	-45.33	-894.09	10.00	9.99	2.05	3.60
7,300.00	27.79	358.99	7,210.19	-855.48	-46.17	-855.40	10.00	10.00	0.60	1.60
7,400.00	37.79	359.28	7,294.14	-801.39	-46.97	-801.32	10.00	10.00	0.30	1.05
<b>DLS = 10/100'</b>										
7,486.15	46.41	359.45	7,358.00	-743.70	-47.60	-743.62	10.00	10.00	0.19	0.80
<b>Sharon Springs</b>										
7,500.00	47.79	359.47	7,367.43	-733.55	-47.70	-733.47	10.00	10.00	0.16	0.68
7,539.60	51.75	359.53	7,393.00	-703.32	-47.96	-703.25	10.00	10.00	0.15	0.66
<b>Niobrara A</b>										
7,600.00	57.79	359.61	7,427.83	-654.01	-48.33	-653.93	10.00	10.00	0.13	0.62
7,700.00	67.79	359.71	7,473.49	-565.19	-48.86	-565.11	10.00	10.00	0.11	0.58
7,759.20	73.71	359.77	7,493.00	-509.32	-49.11	-509.24	10.00	10.00	0.10	0.53
<b>Niobrara B</b>										
7,800.00	77.79	359.81	7,503.04	-469.79	-49.25	-469.71	10.00	10.00	0.09	0.51
7,900.00	87.79	359.89	7,515.57	-370.70	-49.51	-370.62	10.00	10.00	0.09	0.50
7,922.10	90.00	359.91	7,516.00	-348.61	-49.55	-348.53	10.00	10.00	0.09	0.49
<b>End Build @ 7922.10ft - Landing Target (Heel) - 7" - NRC 2N-8HZ_CP</b>										
8,000.00	90.00	359.91	7,516.00	-270.71	-49.66	-270.63	0.00	0.00	0.00	0.49
8,100.00	90.00	359.91	7,516.00	-170.71	-49.81	-170.63	0.00	0.00	0.00	0.00
8,200.00	90.00	359.91	7,516.00	-70.71	-49.97	-70.63	0.00	0.00	0.00	0.00
8,300.00	90.00	359.91	7,516.00	29.29	-50.12	29.37	0.00	0.00	0.00	0.00
8,400.00	90.00	359.91	7,516.00	129.29	-50.27	129.37	0.00	0.00	0.00	0.00
8,500.00	90.00	359.91	7,516.00	229.29	-50.42	229.37	0.00	0.00	0.00	0.00
8,600.00	90.00	359.91	7,516.00	329.29	-50.57	329.37	0.00	0.00	0.00	0.00
8,700.00	90.00	359.91	7,516.00	429.29	-50.72	429.37	0.00	0.00	0.00	0.00
8,800.00	90.00	359.91	7,516.00	529.29	-50.87	529.37	0.00	0.00	0.00	0.00
8,900.00	90.00	359.91	7,516.00	629.29	-51.02	629.37	0.00	0.00	0.00	0.00
9,000.00	90.00	359.91	7,516.00	729.29	-51.17	729.37	0.00	0.00	0.00	0.00
9,100.00	90.00	359.91	7,516.00	829.29	-51.32	829.37	0.00	0.00	0.00	0.00
9,200.00	90.00	359.91	7,516.00	929.29	-51.47	929.37	0.00	0.00	0.00	0.00
9,300.00	90.00	359.91	7,516.00	1,029.29	-51.62	1,029.37	0.00	0.00	0.00	0.00
9,400.00	90.00	359.91	7,516.00	1,129.29	-51.77	1,129.37	0.00	0.00	0.00	0.00
9,500.00	90.00	359.91	7,516.00	1,229.29	-51.93	1,229.37	0.00	0.00	0.00	0.00

## Plan Report for NRC 2N-8HZ - Rev B0 Permit

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 (°)
9,600.00	90.00	359.91	7,516.00	1,329.29	-52.08	1,329.37	0.00	0.00	0.00	0.00
9,700.00	90.00	359.91	7,516.00	1,429.29	-52.23	1,429.37	0.00	0.00	0.00	0.00
9,800.00	90.00	359.91	7,516.00	1,529.29	-52.38	1,529.37	0.00	0.00	0.00	0.00
9,900.00	90.00	359.91	7,516.00	1,629.29	-52.53	1,629.37	0.00	0.00	0.00	0.00
10,000.00	90.00	359.91	7,516.00	1,729.29	-52.68	1,729.37	0.00	0.00	0.00	0.00
10,100.00	90.00	359.91	7,516.00	1,829.29	-52.83	1,829.37	0.00	0.00	0.00	0.00
10,200.00	90.00	359.91	7,516.00	1,929.29	-52.98	1,929.37	0.00	0.00	0.00	0.00
10,300.00	90.00	359.91	7,516.00	2,029.29	-53.13	2,029.37	0.00	0.00	0.00	0.00
10,400.00	90.00	359.91	7,516.00	2,129.29	-53.28	2,129.37	0.00	0.00	0.00	0.00
10,500.00	90.00	359.91	7,516.00	2,229.29	-53.43	2,229.37	0.00	0.00	0.00	0.00
10,600.00	90.00	359.91	7,516.00	2,329.29	-53.58	2,329.37	0.00	0.00	0.00	0.00
10,700.00	90.00	359.91	7,516.00	2,429.29	-53.73	2,429.37	0.00	0.00	0.00	0.00
10,800.00	90.00	359.91	7,516.00	2,529.29	-53.89	2,529.37	0.00	0.00	0.00	0.00
10,900.00	90.00	359.91	7,516.00	2,629.29	-54.04	2,629.37	0.00	0.00	0.00	0.00
11,000.00	90.00	359.91	7,516.00	2,729.29	-54.19	2,729.37	0.00	0.00	0.00	0.00
11,100.00	90.00	359.91	7,516.00	2,829.29	-54.34	2,829.37	0.00	0.00	0.00	0.00
11,200.00	90.00	359.91	7,516.00	2,929.29	-54.49	2,929.37	0.00	0.00	0.00	0.00
11,300.00	90.00	359.91	7,516.00	3,029.29	-54.64	3,029.37	0.00	0.00	0.00	0.00
11,400.00	90.00	359.91	7,516.00	3,129.29	-54.79	3,129.37	0.00	0.00	0.00	0.00
11,500.00	90.00	359.91	7,516.00	3,229.29	-54.94	3,229.37	0.00	0.00	0.00	0.00
11,600.00	90.00	359.91	7,516.00	3,329.29	-55.09	3,329.37	0.00	0.00	0.00	0.00
11,700.00	90.00	359.91	7,516.00	3,429.29	-55.24	3,429.37	0.00	0.00	0.00	0.00
11,800.00	90.00	359.91	7,516.00	3,529.29	-55.39	3,529.37	0.00	0.00	0.00	0.00
11,900.00	90.00	359.91	7,516.00	3,629.29	-55.54	3,629.37	0.00	0.00	0.00	0.00
12,000.00	90.00	359.91	7,516.00	3,729.29	-55.69	3,729.37	0.00	0.00	0.00	0.00
12,100.00	90.00	359.91	7,516.00	3,829.29	-55.85	3,829.37	0.00	0.00	0.00	0.00
12,200.00	90.00	359.91	7,516.00	3,929.29	-56.00	3,929.37	0.00	0.00	0.00	0.00
12,300.00	90.00	359.91	7,516.00	4,029.29	-56.15	4,029.37	0.00	0.00	0.00	0.00
12,400.00	90.00	359.91	7,516.00	4,129.29	-56.30	4,129.37	0.00	0.00	0.00	0.00
12,500.00	90.00	359.91	7,516.00	4,229.29	-56.45	4,229.37	0.00	0.00	0.00	0.00
12,600.00	90.00	359.91	7,516.00	4,329.29	-56.60	4,329.37	0.00	0.00	0.00	0.00
12,700.00	90.00	359.91	7,516.00	4,429.29	-56.75	4,429.37	0.00	0.00	0.00	0.00
12,742.39	90.00	359.91	7,516.00	4,471.68	-56.81	4,471.76	0.00	0.00	0.00	0.00

TD Well @ 12742.39ft - Total Depth (Toe) - NRC 2N-8HZ\_BHL

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
1,400.00	1,400.00	0.00	0.00	Begin Nudge @ 1400.00ft
1,898.99	1,896.47	-43.30	-2.04	End Nudge @ 1898.99ft
6,822.42	6,745.40	-895.60	-42.14	Top of 4.5" Liner @ 6822.42ft
6,922.42	6,843.89	-912.91	-42.96	KOP @ 6922.42ft
7,400.00	7,294.14	-801.39	-46.97	DLS = 10'/100'
7,922.10	7,516.00	-348.61	-49.55	End Build @ 7922.10ft
12,742.39	7,516.00	4,471.68	-56.81	TD Well @ 12742.39ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	+E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	359.91	Slot	0.00	0.00	0.00

## Plan Report for NRC 2N-8HZ - Rev B0 Permit

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,922.10	Rev B0 Permit	MWD
7,922.10	12,742.39	Rev B0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
730.00	730.00	9 5/8"	9-5/8	13-1/2
7,922.10	7,516.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,796.36	4,750.00	Sussex		0.00	
7,486.15	7,358.00	Sharon Springs		0.00	
7,539.60	7,393.00	Niobrara A		0.00	
7,759.20	7,493.00	Niobrara B		0.00	
7,922.10	7,516.00	Landing Target (Heel)		0.00	
12,742.39	7,516.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
NRC 2N-8HZ_SHL	0.00	0.00	0.00	Point
NRC_SEC	0.00	2,298.99	-860.28	Polygon
NRC 2N-8HZ_LD	0.00	0.00	0.00	Polygon
NRC 2N-8HZ_CP	7,516.00	-348.61	-49.55	Point
NRC 2N-8HZ_BHL	7,516.00	4,471.68	-56.81	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.86 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,922.10 usft
Net Tortousity applicable to Plans:	0.86 °/100usft	Directional Difficulty Index:	6.250

Audit Info

**North Reference Sheet for Sec. 8-T1N-R67W - NRC 2N-8HZ - Plan B**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.  
 Vertical Depths are relative to RKB = 17' @ 5080.00usft (Drilling Rig). Northing and Easting are relative to NRC 2N-8HZ  
 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:0.000000°, Latitude Origin:40.783333°  
 False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996240

Grid Coordinates of Well: 1,264,984.46 usft N, 3,164,739.04 usft E  
 Geographical Coordinates of Well: 40° 03' 33.38" N, 104° 54' 41.23" W  
 Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,742.39usft  
 the Bottom Hole Displacement is 4,472.04usft in the Direction of 359.27° ( True).  
 Magnetic Convergence at surface is: -8.29° (24 June 2013, , BGGM2013)

