

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T1N-R67W

NRC 28C-8HZ

## Plan B

Plan: Rev B0 Permit

# Sperry Drilling Services

## Proposal Report

05 November, 2013

Well Coordinates: 1,264,984.61 N, 3,164,709.09 E (40° 03' 33.38" N, 104° 54' 41.62" 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 28C-8HZ

RKB = 17' @ 5080.00usft (Drilling Rig)

N

True

API - US Survey Feet - Custom

**HALLIBURTON**

Project: Weld County, CO (NAD 83)  
Site: Sec. 8-T1N-R67W  
Well: NRC 28C-8HZ  
Wellbore: Plan B  
Design: Rev B0 Permit

# Anadarko Petroleum Corp.

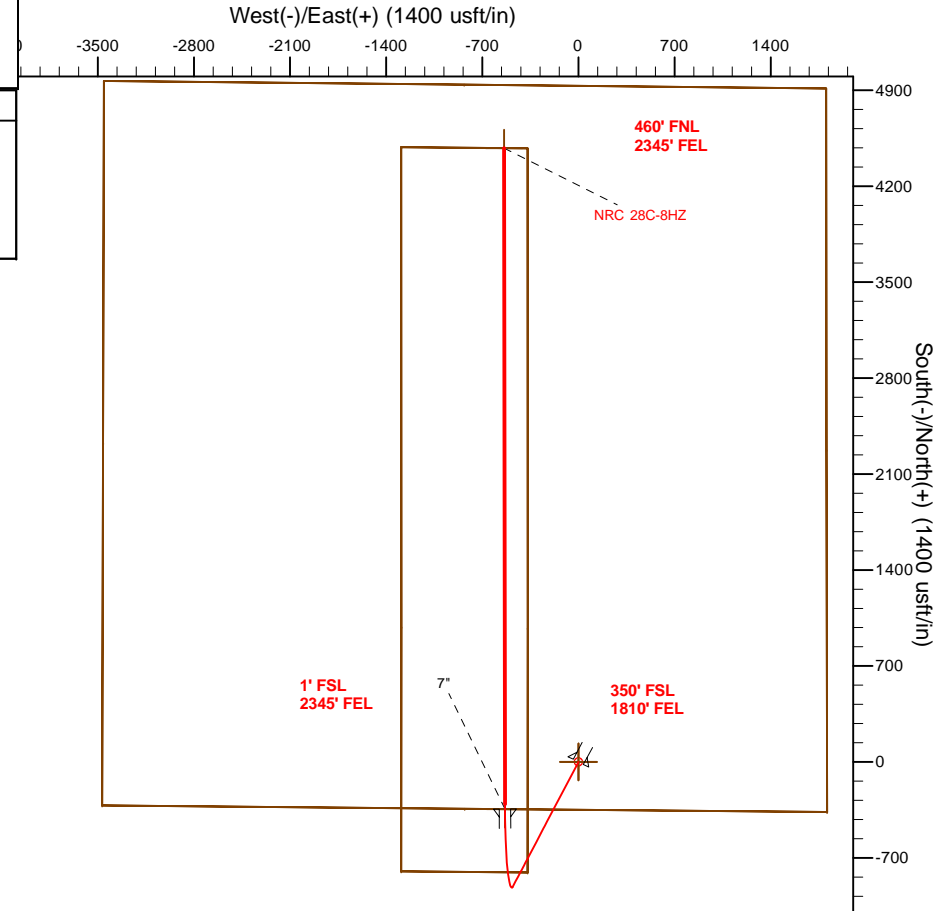
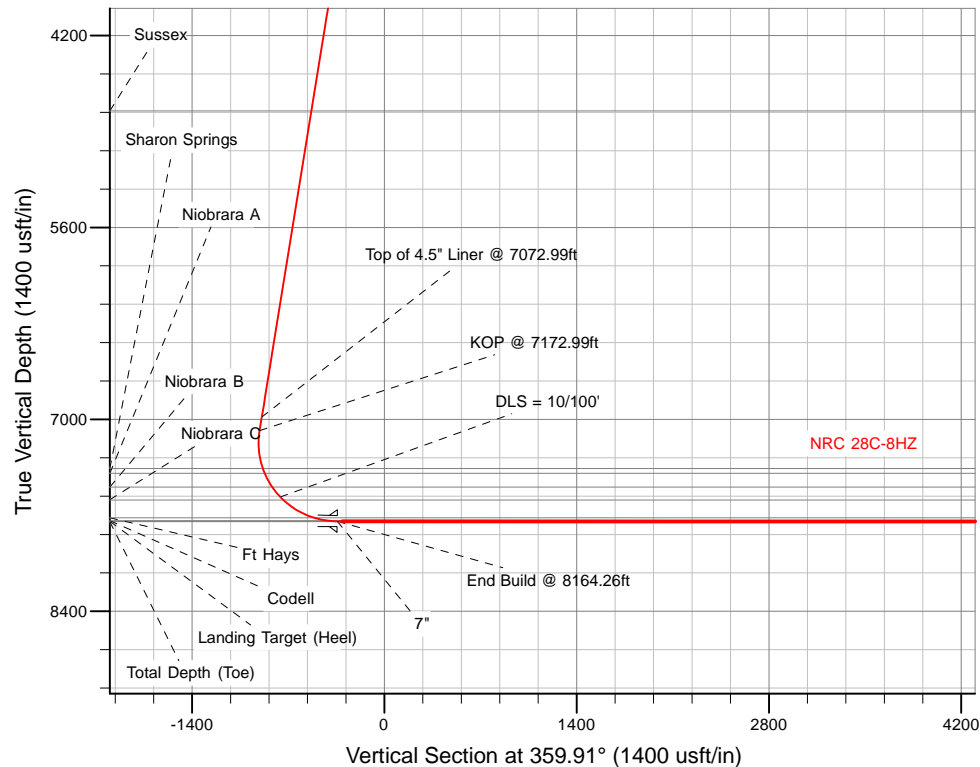
**HALLIBURTON**  
Sperry Drilling

## 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	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	
3	1717.78	10.36	207.70	1714.96	-41.32	-21.69	2.00	207.70	-41.28	
4	7172.99	10.36	207.70	7081.32	-909.56	-477.48	0.00	0.00	-908.81	
5	8164.26	89.98	359.91	7743.00	-344.21	-534.66	10.00	151.83	-343.37	NRC 28C-8HZ_CP
6	12985.28	89.98	359.91	7745.00	4476.80	-541.83	0.00	0.00	4477.65	NRC 28C-8HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
NRC 28C-8HZ_LD	0.00	0.00	0.00	40° 3' 33.379 N	104° 54' 41.616 W	Polygon
NRC 28C-8HZ_SHL	0.00	0.00	0.00	40° 3' 33.379 N	104° 54' 41.616 W	
NRC_SEC	0.00	2298.64	-830.34	40° 3' 56.094 N	104° 54' 52.296 W	Polygon
NRC 28C-8HZ_CP	7743.00	-344.21	-534.66	40° 3' 29.977 N	104° 54' 48.492 W	
NRC 28C-8HZ_BHL	7745.00	4476.80	-541.83	40° 4' 17.620 N	104° 54' 48.586 W	Point



TVD	MD	
6982.95	7072.99	Top of 4.5" Liner @ 7072.99ft
7081.32	7172.99	KOP @ 7172.99ft

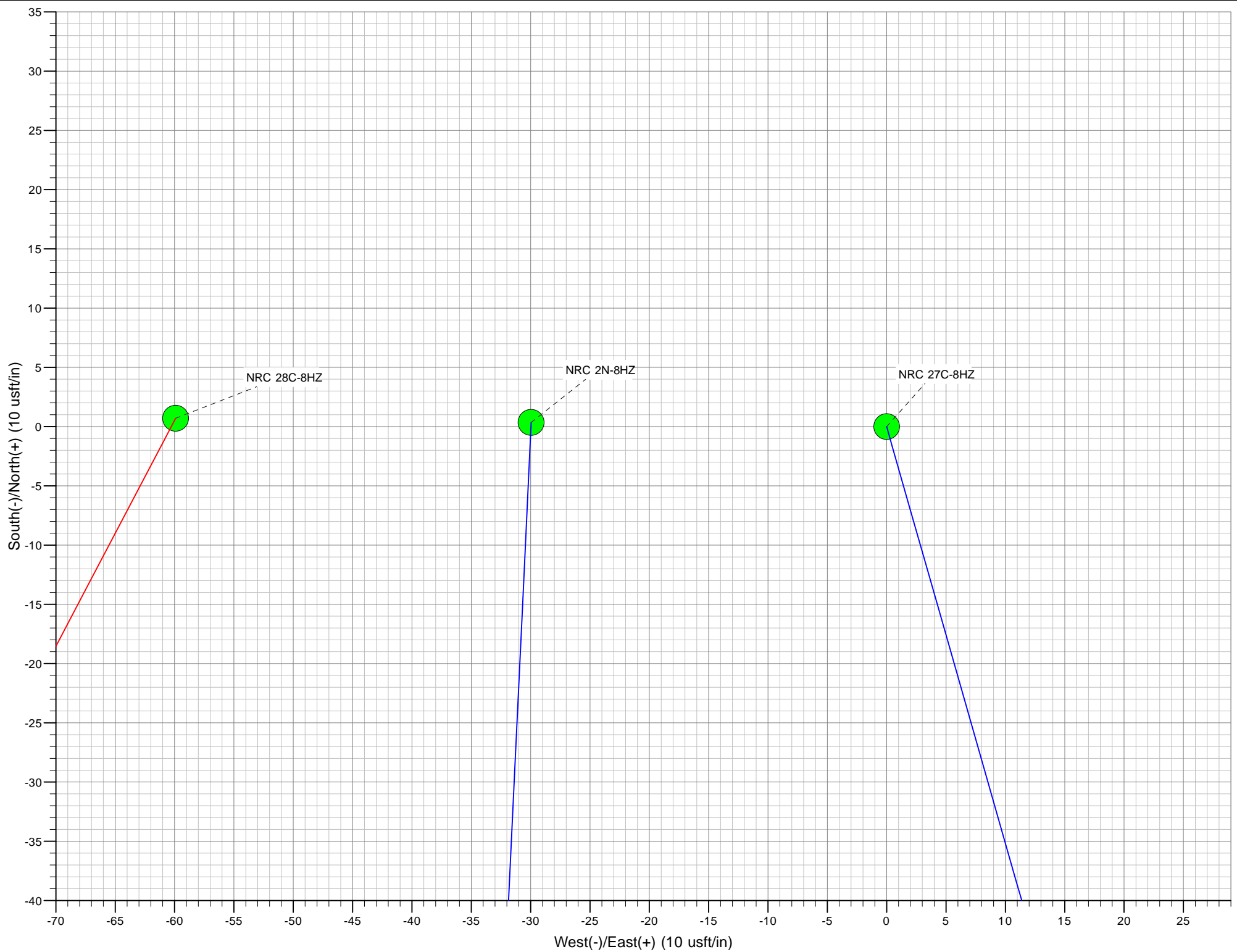
WELL DETAILS: NRC 28C-8HZ

Ground Level: 5063.00

RKB = 17' @ 5080.00usft (Drilling Rig)

Plan: Rev B0 Permit (NRC 28C-8HZ/Plan B)

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



**Plan Report for NRC 28C-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 28C-8HZ_SHL - NRC_SEC - NRC 28C-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
680.00	0.00	0.00	680.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Base</b>										
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
729.03	0.00	0.00	729.03	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
<b>Begin Nudge @ 1200.00ft</b>										
1,300.00	2.00	207.70	1,299.98	-1.55	-0.81	-1.54	2.00	2.00	0.00	207.70
1,400.00	4.00	207.70	1,399.84	-6.18	-3.24	-6.17	2.00	2.00	0.00	0.00
1,500.00	6.00	207.70	1,499.45	-13.90	-7.29	-13.88	2.00	2.00	0.00	0.00
1,600.00	8.00	207.70	1,598.70	-24.69	-12.96	-24.66	2.00	2.00	0.00	0.00
1,700.00	10.00	207.70	1,697.47	-38.54	-20.23	-38.50	2.00	2.00	0.00	0.00
1,717.78	10.36	207.70	1,714.97	-41.32	-21.69	-41.28	2.00	2.00	0.00	0.00
<b>End Nudge @ 1717.78ft</b>										
1,800.00	10.36	207.70	1,795.85	-54.40	-28.56	-54.36	0.00	0.00	0.00	0.00
1,900.00	10.36	207.70	1,894.22	-70.32	-36.91	-70.26	0.00	0.00	0.00	0.00
2,000.00	10.36	207.70	1,992.59	-86.23	-45.27	-86.16	0.00	0.00	0.00	0.00
2,100.00	10.36	207.70	2,090.96	-102.15	-53.62	-102.07	0.00	0.00	0.00	0.00
2,200.00	10.36	207.70	2,189.33	-118.07	-61.98	-117.97	0.00	0.00	0.00	0.00
2,300.00	10.36	207.70	2,287.70	-133.98	-70.33	-133.87	0.00	0.00	0.00	0.00
2,400.00	10.36	207.70	2,386.07	-149.90	-78.69	-149.77	0.00	0.00	0.00	0.00
2,500.00	10.36	207.70	2,484.44	-165.81	-87.05	-165.68	0.00	0.00	0.00	0.00
2,600.00	10.36	207.70	2,582.82	-181.73	-95.40	-181.58	0.00	0.00	0.00	0.00
2,700.00	10.36	207.70	2,681.19	-197.65	-103.76	-197.48	0.00	0.00	0.00	0.00
2,800.00	10.36	207.70	2,779.56	-213.56	-112.11	-213.39	0.00	0.00	0.00	0.00
2,900.00	10.36	207.70	2,877.93	-229.48	-120.47	-229.29	0.00	0.00	0.00	0.00
3,000.00	10.36	207.70	2,976.30	-245.39	-128.82	-245.19	0.00	0.00	0.00	0.00
3,100.00	10.36	207.70	3,074.67	-261.31	-137.18	-261.09	0.00	0.00	0.00	0.00
3,200.00	10.36	207.70	3,173.04	-277.22	-145.53	-277.00	0.00	0.00	0.00	0.00
3,300.00	10.36	207.70	3,271.41	-293.14	-153.89	-292.90	0.00	0.00	0.00	0.00
3,400.00	10.36	207.70	3,369.78	-309.06	-162.24	-308.80	0.00	0.00	0.00	0.00
3,500.00	10.36	207.70	3,468.16	-324.97	-170.60	-324.70	0.00	0.00	0.00	0.00
3,600.00	10.36	207.70	3,566.53	-340.89	-178.95	-340.61	0.00	0.00	0.00	0.00
3,700.00	10.36	207.70	3,664.90	-356.80	-187.31	-356.51	0.00	0.00	0.00	0.00
3,800.00	10.36	207.70	3,763.27	-372.72	-195.66	-372.41	0.00	0.00	0.00	0.00
3,900.00	10.36	207.70	3,861.64	-388.64	-204.02	-388.31	0.00	0.00	0.00	0.00
4,000.00	10.36	207.70	3,960.01	-404.55	-212.37	-404.22	0.00	0.00	0.00	0.00
4,100.00	10.36	207.70	4,058.38	-420.47	-220.73	-420.12	0.00	0.00	0.00	0.00
4,200.00	10.36	207.70	4,156.75	-436.38	-229.08	-436.02	0.00	0.00	0.00	0.00
4,300.00	10.36	207.70	4,255.12	-452.30	-237.44	-451.93	0.00	0.00	0.00	0.00
4,400.00	10.36	207.70	4,353.50	-468.21	-245.79	-467.83	0.00	0.00	0.00	0.00
4,500.00	10.36	207.70	4,451.87	-484.13	-254.15	-483.73	0.00	0.00	0.00	0.00
4,600.00	10.36	207.70	4,550.24	-500.05	-262.50	-499.63	0.00	0.00	0.00	0.00
4,700.00	10.36	207.70	4,648.61	-515.96	-270.86	-515.54	0.00	0.00	0.00	0.00
4,800.00	10.36	207.70	4,746.98	-531.88	-279.21	-531.44	0.00	0.00	0.00	0.00
4,803.07	10.36	207.70	4,750.00	-532.37	-279.47	-531.93	0.00	0.00	0.00	0.00

**Plan Report for NRC 28C-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 (°)
<b>Sussex</b>										
4,900.00	10.36	207.70	4,845.35	-547.79	-287.57	-547.34	0.00	0.00	0.00	0.00
5,000.00	10.36	207.70	4,943.72	-563.71	-295.92	-563.24	0.00	0.00	0.00	0.00
5,100.00	10.36	207.70	5,042.09	-579.63	-304.28	-579.15	0.00	0.00	0.00	0.00
5,200.00	10.36	207.70	5,140.46	-595.54	-312.63	-595.05	0.00	0.00	0.00	0.00
5,300.00	10.36	207.70	5,238.84	-611.46	-320.99	-610.95	0.00	0.00	0.00	0.00
5,400.00	10.36	207.70	5,337.21	-627.37	-329.34	-626.86	0.00	0.00	0.00	0.00
5,500.00	10.36	207.70	5,435.58	-643.29	-337.70	-642.76	0.00	0.00	0.00	0.00
5,600.00	10.36	207.70	5,533.95	-659.20	-346.05	-658.66	0.00	0.00	0.00	0.00
5,700.00	10.36	207.70	5,632.32	-675.12	-354.41	-674.56	0.00	0.00	0.00	0.00
5,800.00	10.36	207.70	5,730.69	-691.04	-362.76	-690.47	0.00	0.00	0.00	0.00
5,900.00	10.36	207.70	5,829.06	-706.95	-371.12	-706.37	0.00	0.00	0.00	0.00
6,000.00	10.36	207.70	5,927.43	-722.87	-379.47	-722.27	0.00	0.00	0.00	0.00
6,100.00	10.36	207.70	6,025.80	-738.78	-387.83	-738.17	0.00	0.00	0.00	0.00
6,200.00	10.36	207.70	6,124.18	-754.70	-396.18	-754.08	0.00	0.00	0.00	0.00
6,300.00	10.36	207.70	6,222.55	-770.62	-404.54	-769.98	0.00	0.00	0.00	0.00
6,400.00	10.36	207.70	6,320.92	-786.53	-412.90	-785.88	0.00	0.00	0.00	0.00
6,500.00	10.36	207.70	6,419.29	-802.45	-421.25	-801.78	0.00	0.00	0.00	0.00
6,600.00	10.36	207.70	6,517.66	-818.36	-429.61	-817.69	0.00	0.00	0.00	0.00
6,700.00	10.36	207.70	6,616.03	-834.28	-437.96	-833.59	0.00	0.00	0.00	0.00
6,800.00	10.36	207.70	6,714.40	-850.19	-446.32	-849.49	0.00	0.00	0.00	0.00
6,900.00	10.36	207.70	6,812.77	-866.11	-454.67	-865.40	0.00	0.00	0.00	0.00
7,000.00	10.36	207.70	6,911.14	-882.03	-463.03	-881.30	0.00	0.00	0.00	0.00
7,072.99	10.36	207.70	6,982.95	-893.64	-469.12	-892.91	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 7072.99ft</b>										
7,100.00	10.36	207.70	7,009.52	-897.94	-471.38	-897.20	0.00	0.00	0.00	0.00
7,172.99	10.36	207.70	7,081.32	-909.56	-477.48	-908.81	0.00	0.00	0.00	0.00
<b>KOP @ 7172.99ft</b>										
7,200.00	8.07	216.81	7,107.98	-913.23	-479.74	-912.47	10.00	-8.44	33.74	151.83
7,300.00	6.02	306.09	7,207.46	-915.77	-488.21	-915.00	10.00	-2.05	89.28	142.83
7,400.00	14.38	340.52	7,305.87	-900.93	-496.62	-900.15	10.00	8.36	34.43	53.98
7,454.53	19.59	346.07	7,358.00	-885.66	-501.08	-884.87	10.00	9.56	10.19	19.98
<b>Sharon Springs</b>										
7,492.13	23.25	348.48	7,393.00	-872.26	-504.08	-871.47	10.00	9.72	6.41	14.66
<b>Niobrara A</b>										
7,500.00	24.02	348.90	7,400.21	-869.17	-504.70	-868.38	10.00	9.77	5.28	12.41
7,600.00	33.86	352.62	7,487.62	-821.45	-512.21	-820.64	10.00	9.84	3.73	12.03
7,606.50	34.50	352.80	7,493.00	-817.83	-512.68	-817.02	10.00	9.89	2.69	8.76
<b>Niobrara B</b>										
7,700.00	43.77	354.82	7,565.45	-759.22	-518.93	-758.40	10.00	9.91	2.16	8.62
<b>DLS = 10/100'</b>										
7,732.10	46.95	355.35	7,588.00	-736.46	-520.88	-735.64	10.00	9.93	1.68	7.05
<b>Niobrara C</b>										
7,800.00	53.70	356.33	7,631.32	-684.37	-524.65	-683.54	10.00	9.94	1.44	6.67
7,900.00	63.65	357.50	7,683.24	-599.17	-529.20	-598.34	10.00	9.95	1.17	6.04
7,990.92	72.71	358.40	7,717.00	-514.91	-532.19	-514.08	10.00	9.96	0.99	5.43
<b>Ft Hays</b>										
8,000.00	73.61	358.48	7,719.63	-506.22	-532.43	-505.38	10.00	9.96	0.93	5.10
8,096.63	83.24	359.34	7,739.00	-411.68	-534.22	-410.84	10.00	9.96	0.89	5.07
<b>Codell</b>										
8,100.00	83.57	359.37	7,739.39	-408.34	-534.25	-407.50	10.00	9.96	0.86	4.90
8,164.26	89.98	359.91	7,743.00	-344.21	-534.66	-343.37	10.00	9.96	0.85	4.90
<b>End Build @ 8164.26ft - Landing Target (Heel) - 7" - NRC 28C-8HZ_CP</b>										
8,200.00	89.98	359.91	7,743.01	-308.48	-534.71	-307.64	0.00	0.00	0.00	4.87
8,300.00	89.98	359.91	7,743.06	-208.48	-534.86	-207.64	0.00	0.00	0.00	0.00
8,400.00	89.98	359.91	7,743.10	-108.48	-535.01	-107.64	0.00	0.00	0.00	0.00
8,500.00	89.98	359.91	7,743.14	-8.48	-535.16	-7.64	0.00	0.00	0.00	0.00
8,600.00	89.98	359.91	7,743.18	91.52	-535.30	92.36	0.00	0.00	0.00	0.00

**Plan Report for NRC 28C-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 (°)
8,700.00	89.98	359.91	7,743.22	191.52	-535.45	192.36	0.00	0.00	0.00	0.00
8,800.00	89.98	359.91	7,743.26	291.52	-535.60	292.36	0.00	0.00	0.00	0.00
8,900.00	89.98	359.91	7,743.31	391.52	-535.75	392.36	0.00	0.00	0.00	0.00
9,000.00	89.98	359.91	7,743.35	491.52	-535.90	492.36	0.00	0.00	0.00	0.00
9,100.00	89.98	359.91	7,743.39	591.52	-536.05	592.36	0.00	0.00	0.00	0.00
9,200.00	89.98	359.91	7,743.43	691.52	-536.20	692.36	0.00	0.00	0.00	0.00
9,300.00	89.98	359.91	7,743.47	791.52	-536.35	792.36	0.00	0.00	0.00	0.00
9,400.00	89.98	359.91	7,743.51	891.52	-536.49	892.36	0.00	0.00	0.00	0.00
9,500.00	89.98	359.91	7,743.55	991.52	-536.64	992.36	0.00	0.00	0.00	0.00
9,600.00	89.98	359.91	7,743.60	1,091.52	-536.79	1,092.36	0.00	0.00	0.00	0.00
9,700.00	89.98	359.91	7,743.64	1,191.52	-536.94	1,192.36	0.00	0.00	0.00	0.00
9,800.00	89.98	359.91	7,743.68	1,291.52	-537.09	1,292.36	0.00	0.00	0.00	0.00
9,900.00	89.98	359.91	7,743.72	1,391.52	-537.24	1,392.36	0.00	0.00	0.00	0.00
10,000.00	89.98	359.91	7,743.76	1,491.52	-537.39	1,492.36	0.00	0.00	0.00	0.00
10,100.00	89.98	359.91	7,743.80	1,591.52	-537.54	1,592.36	0.00	0.00	0.00	0.00
10,200.00	89.98	359.91	7,743.84	1,691.52	-537.68	1,692.36	0.00	0.00	0.00	0.00
10,300.00	89.98	359.91	7,743.89	1,791.52	-537.83	1,792.36	0.00	0.00	0.00	0.00
10,400.00	89.98	359.91	7,743.93	1,891.52	-537.98	1,892.36	0.00	0.00	0.00	0.00
10,500.00	89.98	359.91	7,743.97	1,991.52	-538.13	1,992.36	0.00	0.00	0.00	0.00
10,600.00	89.98	359.91	7,744.01	2,091.52	-538.28	2,092.36	0.00	0.00	0.00	0.00
10,700.00	89.98	359.91	7,744.05	2,191.52	-538.43	2,192.36	0.00	0.00	0.00	0.00
10,800.00	89.98	359.91	7,744.09	2,291.52	-538.58	2,292.36	0.00	0.00	0.00	0.00
10,900.00	89.98	359.91	7,744.13	2,391.52	-538.73	2,392.36	0.00	0.00	0.00	0.00
11,000.00	89.98	359.91	7,744.18	2,491.52	-538.87	2,492.36	0.00	0.00	0.00	0.00
11,100.00	89.98	359.91	7,744.22	2,591.52	-539.02	2,592.36	0.00	0.00	0.00	0.00
11,200.00	89.98	359.91	7,744.26	2,691.52	-539.17	2,692.36	0.00	0.00	0.00	0.00
11,300.00	89.98	359.91	7,744.30	2,791.52	-539.32	2,792.36	0.00	0.00	0.00	0.00
11,400.00	89.98	359.91	7,744.34	2,891.52	-539.47	2,892.36	0.00	0.00	0.00	0.00
11,500.00	89.98	359.91	7,744.38	2,991.52	-539.62	2,992.36	0.00	0.00	0.00	0.00
11,600.00	89.98	359.91	7,744.43	3,091.52	-539.77	3,092.36	0.00	0.00	0.00	0.00
11,700.00	89.98	359.91	7,744.47	3,191.52	-539.92	3,192.36	0.00	0.00	0.00	0.00
11,800.00	89.98	359.91	7,744.51	3,291.52	-540.07	3,292.36	0.00	0.00	0.00	0.00
11,900.00	89.98	359.91	7,744.55	3,391.52	-540.21	3,392.36	0.00	0.00	0.00	0.00
12,000.00	89.98	359.91	7,744.59	3,491.52	-540.36	3,492.36	0.00	0.00	0.00	0.00
12,100.00	89.98	359.91	7,744.63	3,591.52	-540.51	3,592.36	0.00	0.00	0.00	0.00
12,200.00	89.98	359.91	7,744.67	3,691.52	-540.66	3,692.36	0.00	0.00	0.00	0.00
12,300.00	89.98	359.91	7,744.72	3,791.52	-540.81	3,792.36	0.00	0.00	0.00	0.00
12,400.00	89.98	359.91	7,744.76	3,891.52	-540.96	3,892.36	0.00	0.00	0.00	0.00
12,500.00	89.98	359.91	7,744.80	3,991.52	-541.11	3,992.36	0.00	0.00	0.00	0.00
12,600.00	89.98	359.91	7,744.84	4,091.52	-541.26	4,092.36	0.00	0.00	0.00	0.00
12,700.00	89.98	359.91	7,744.88	4,191.52	-541.40	4,192.36	0.00	0.00	0.00	0.00
12,800.00	89.98	359.91	7,744.92	4,291.52	-541.55	4,292.36	0.00	0.00	0.00	0.00
12,900.00	89.98	359.91	7,744.96	4,391.52	-541.70	4,392.36	0.00	0.00	0.00	0.00
12,985.28	89.98	359.91	7,745.00	4,476.80	-541.83	4,477.64	0.00	0.00	0.00	0.00

TD Well @ 12985.28ft - NRC 28C-8HZ\_BHL

**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,200.00	1,200.00	0.00	0.00	Begin Nudge @ 1200.00ft
1,717.78	1,714.97	-41.32	-21.69	End Nudge @ 1717.78ft
7,072.99	6,982.95	-893.64	-469.12	Top of 4.5" Liner @ 7072.99ft
7,172.99	7,081.32	-909.56	-477.48	KOP @ 7172.99ft
7,700.00	7,565.45	-759.22	-518.93	DLS = 10/100'
8,164.26	7,743.00	-344.22	-534.66	End Build @ 8164.26ft
12,985.28	7,745.00	4,476.80	-541.83	TD Well @ 12985.28ft

## Plan Report for NRC 28C-8HZ - Rev B0 Permit

Vertical Section Information

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

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	8,164.26	Rev B0 Permit	MWD
8,164.26	12,985.28	Rev B0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
729.03	729.03	9 5/8"	9-5/8	13-1/2
8,164.26	7,743.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
680.00	680.00	Fox Hills Base			
4,803.07	4,750.00	Sussex			
7,454.53	7,358.00	Sharon Springs			
7,492.13	7,393.00	Niobrara A			
7,606.50	7,493.00	Niobrara B			
7,732.10	7,588.00	Niobrara C			
7,990.92	7,717.00	Ft Hays			
8,096.63	7,739.00	Codell			
8,164.26	7,743.00	Landing Target (Heel)			
12,985.28	7,745.00	Total Depth (Toe)			

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
NRC 28C-8HZ_SHL	0.00	0.00	0.00	Point
NRC_SEC	0.00	2,298.64	-830.34	Polygon
NRC 28C-8HZ_LD	0.00	0.00	0.00	Polygon
NRC 28C-8HZ_CP	7,743.00	-344.21	-534.66	Point
NRC 28C-8HZ_BHL	7,745.00	4,476.80	-541.83	Point

**Plan Report for NRC 28C-8HZ - Rev B0 Permit**

**Directional Difficulty Index**

Average Dogleg over Survey:	0.84 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 8,163.26 usft
Net Tortosity applicable to Plans:	0.84 °/100usft	Directional Difficulty Index:	6.188

**Audit Info**



**North Reference Sheet for Sec. 8-T1N-R67W - NRC 28C-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 28C-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° 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: 0.99996240

Grid Coordinates of Well: 1,264,984.61 usft N, 3,164,709.09 usft E  
 Geographical Coordinates of Well: 40° 03' 33.38" N, 104° 54' 41.62" W  
 Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,985.28usft  
 the Bottom Hole Displacement is 4,509.47usft in the Direction of 353.10° ( True).  
 Magnetic Convergence at surface is: -8.29° (24 June 2013, , BGGM2013)

