

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 13-T2N-67W

Kerr 4N-12HZ

Plan B

Plan: Rev B0 Permit

## Sperry Drilling Services

### Proposal Report

17 June, 2014

Well Coordinates: 1,291,306.20 N, 3,182,713.69 E (40° 07' 52.25" N, 104° 50' 47.57" W)

Ground Level: 4,891.00 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 Kerr 4N-12HZ

RKB = 17' @ 4908.00usft (D Rig)

N

True

API - US Survey Feet - Custom

**HALLIBURTON**

Project: Weld County, CO (NAD 83)  
 Site: Sec. 13-T2N-67W  
 Well: Kerr 4N-12HZ  
 Wellbore: Plan B  
 Design: Rev B0 Permit

# Anadarko Petroleum Corp.

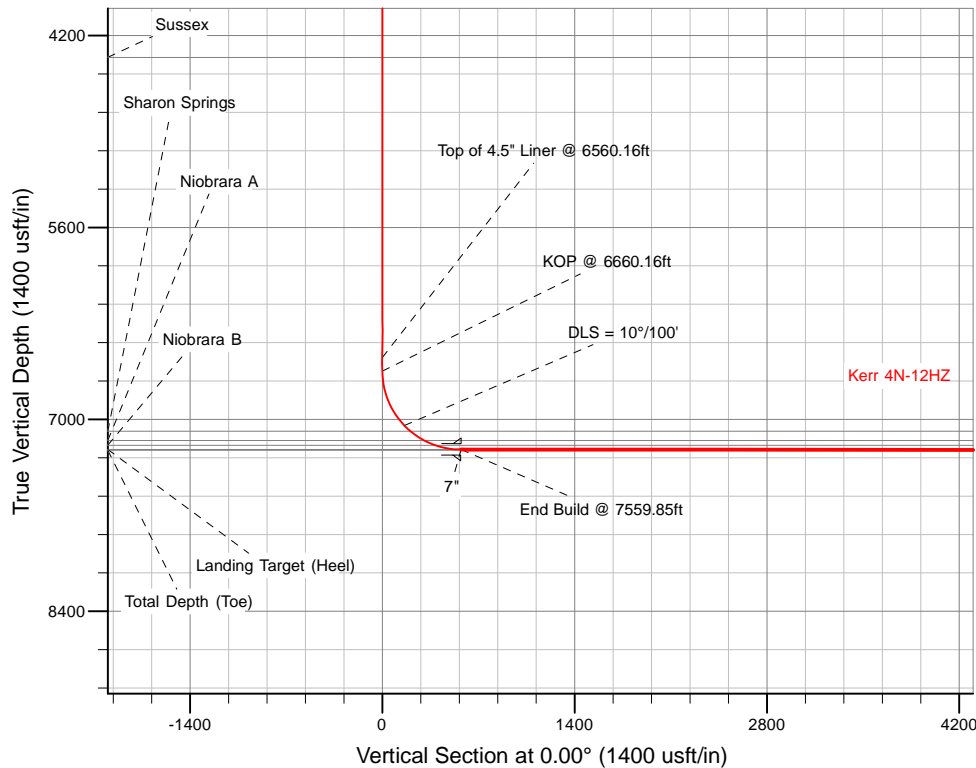
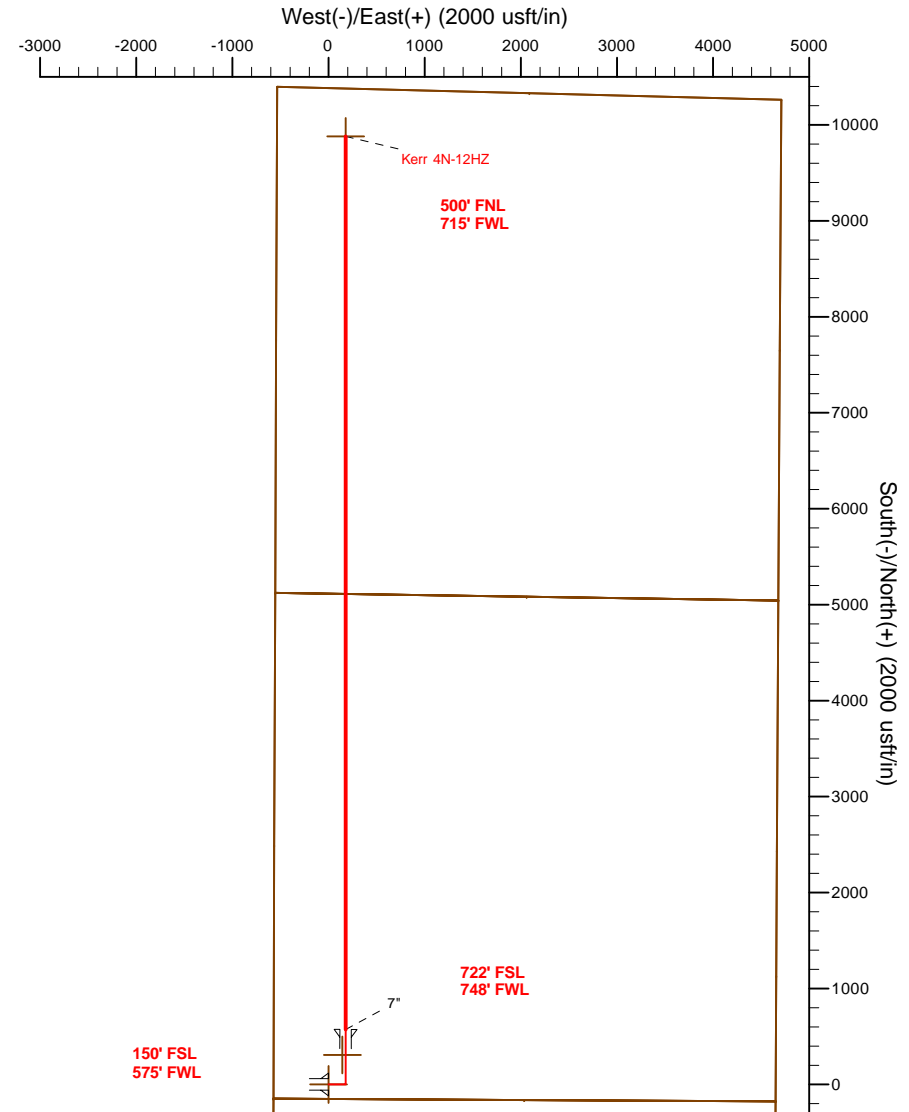


### SECTION DETAILS

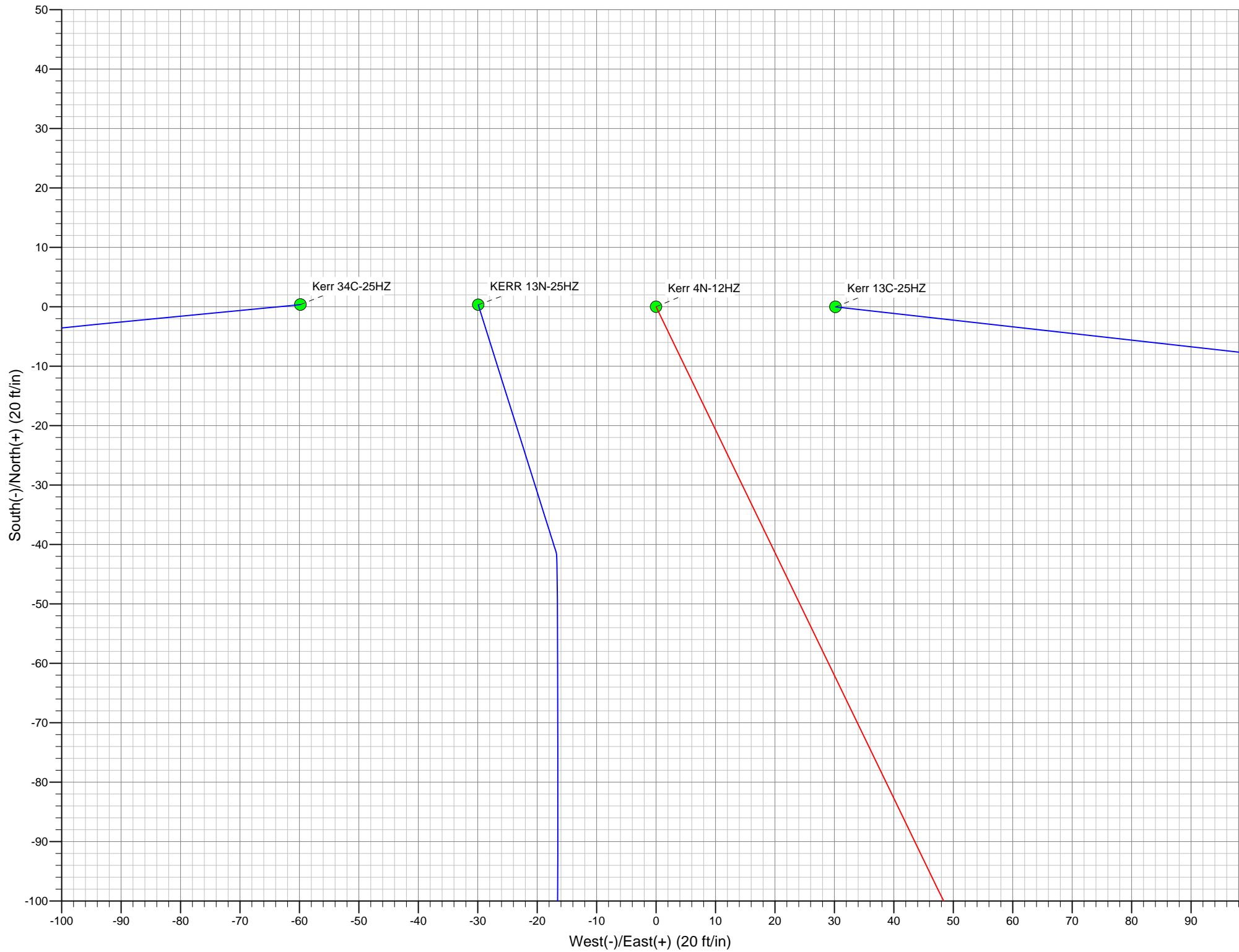
Sec	MD	Inc	Azi	TVD	+N-/S	+E-/W	Dleg	TFace	V Sect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1400.00	0.00	0.00	1400.00	0.00	0.00	0.00	0.00	0.00	
3	1900.00	10.00	90.00	1897.47	0.00	43.52	2.00	90.00	0.00	
4	2430.00	10.00	90.00	2419.41	0.00	135.56	0.00	0.00	0.00	
5	2930.00	0.00	0.00	2916.88	0.00	179.08	2.00	180.00	0.00	
6	6660.16	0.00	0.00	6647.04	0.00	179.08	0.00	0.00	0.00	
7	7559.85	89.97	0.00	7220.00	572.65	179.12	10.00	0.00	572.65	
8	16867.62	89.97	0.00	7225.00	9880.42	179.73	0.00	0.00	9880.42	KERR 4N-12HZ_BHL

### WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N-/S	+E-/W	Latitude	Longitude	
KERR 4N-12HZ_SHL	0.00	0.01	0.00	40° 7' 52.252 N	104° 50' 47.566 W	
Kerr_SEC	0.00	3117.86	2052.10	40° 8' 23.062 N	104° 50' 21.143 W	Polygon
KERR 4N-12HZ_CP	7220.00	308.97	144.29	40° 7' 55.305 N	104° 50' 45.708 W	
KERR 4N-12HZ_BHL	7225.00	9880.42	179.73	40° 9' 29.891 N	104° 50' 45.251 W	Point



WELL DETAILS: Kerr 4N-12HZ	
TVD	MD
6547.04	6560.16
6647.04	6660.16
Top of 4.5" Liner @ 6560.16ft	
KOP @ 6660.16ft	
Ground Level: 4891.00	
RKB = 17' @ 4908.00usft (D Rig)	
Plan: Rev B0 Permit (Kerr 4N-12HZ/Plan B)	
Created By: Clint Eshelman	Date: 6/17/2014
Reviewed: _____	Date: _____



**Plan Report for Kerr 4N-12HZ - 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>KERR 4N-12HZ_SHL - Kerr_SEC</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
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
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Base</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
<b>9 5/8"</b>										
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	90.00	1,499.98	0.00	1.75	0.00	2.00	2.00	0.00	90.00
1,600.00	4.00	90.00	1,599.84	0.00	6.98	0.00	2.00	2.00	0.00	0.00
1,700.00	6.00	90.00	1,699.45	0.00	15.69	0.00	2.00	2.00	0.00	0.00
1,800.00	8.00	90.00	1,798.70	0.00	27.88	0.00	2.00	2.00	0.00	0.00
1,900.00	10.00	90.00	1,897.47	0.00	43.52	0.00	2.00	2.00	0.00	0.00
<b>End Nudge @ 1900.00ft</b>										
2,000.00	10.00	90.00	1,995.95	0.00	60.89	0.00	0.00	0.00	0.00	0.00
2,100.00	10.00	90.00	2,094.43	0.00	78.25	0.00	0.00	0.00	0.00	0.00
2,200.00	10.00	90.00	2,192.91	0.00	95.62	0.00	0.00	0.00	0.00	0.00
2,300.00	10.00	90.00	2,291.39	0.00	112.98	0.00	0.00	0.00	0.00	0.00
2,400.00	10.00	90.00	2,389.87	0.00	130.35	0.00	0.00	0.00	0.00	0.00
2,430.00	10.00	90.00	2,419.41	0.00	135.56	0.00	0.00	0.00	0.00	0.00
<b>Begin Drop @ 2430.00ft</b>										
2,500.00	8.60	90.00	2,488.49	0.00	146.87	0.00	2.00	-2.00	0.00	180.00
2,600.00	6.60	90.00	2,587.61	0.00	160.09	0.00	2.00	-2.00	0.00	180.00
2,700.00	4.60	90.00	2,687.13	0.00	169.85	0.00	2.00	-2.00	0.00	180.00
2,800.00	2.60	90.00	2,786.92	0.00	176.13	0.00	2.00	-2.00	0.00	180.00
2,900.00	0.60	90.00	2,886.88	0.00	178.92	0.00	2.00	-2.00	0.00	180.00
2,930.00	0.00	0.00	2,916.88	0.00	179.08	0.00	2.00	-2.00	0.00	-180.00
<b>End Drop @ 2930.00ft</b>										
3,000.00	0.00	0.00	2,986.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,086.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,186.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,286.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,386.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,486.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,586.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,686.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,786.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,886.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
3,955.12	0.00	0.00	3,942.00	0.00	179.08	0.00	0.00	0.00	0.00	0.00
<b>Parkman</b>										
4,000.00	0.00	0.00	3,986.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,086.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,186.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,286.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
4,372.12	0.00	0.00	4,359.00	0.00	179.08	0.00	0.00	0.00	0.00	0.00
<b>Sussex</b>										

**Plan Report for Kerr 4N-12HZ - 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 (°)
4,400.00	0.00	0.00	4,386.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,486.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,586.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,686.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,786.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,886.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,986.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,086.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,186.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,286.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,386.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,486.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,586.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,686.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,786.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,886.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,986.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,086.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,186.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,286.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,386.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,486.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
6,560.16	0.00	0.00	6,547.04	0.00	179.08	0.00	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 6560.16ft</b>										
6,600.00	0.00	0.00	6,586.88	0.00	179.08	0.00	0.00	0.00	0.00	0.00
6,660.16	0.00	0.00	6,647.04	0.00	179.08	0.00	0.00	0.00	0.00	0.00
<b>KOP @ 6660.16ft</b>										
6,700.00	3.98	0.00	6,686.85	1.38	179.08	1.38	10.00	10.00	0.00	0.00
6,800.00	13.98	0.00	6,785.49	16.98	179.08	16.98	10.00	10.00	0.00	0.00
6,900.00	23.98	0.00	6,879.94	49.47	179.08	49.47	10.00	10.00	0.00	0.00
7,000.00	33.98	0.00	6,967.30	97.86	179.09	97.86	10.00	10.00	0.00	0.00
7,100.00	43.98	0.00	7,044.93	160.70	179.09	160.70	10.00	10.00	0.00	0.00
<b>DLS = 10°/100'</b>										
7,160.24	50.01	0.00	7,086.00	204.73	179.09	204.73	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,200.00	53.98	0.00	7,110.48	236.05	179.09	236.05	10.00	10.00	0.00	0.00
7,282.45	62.23	0.00	7,154.00	305.99	179.10	305.99	10.00	10.00	0.00	0.00
<b>Niobrara A</b>										
7,300.00	63.98	0.00	7,161.94	321.65	179.10	321.65	10.00	10.00	0.00	0.00
7,310.64	65.05	0.00	7,166.52	331.25	179.10	331.25	10.00	10.00	0.00	0.00
<b>KERR 4N-12HZ_CP</b>										
7,367.78	70.76	0.00	7,188.00	384.17	179.10	384.17	10.00	10.00	0.00	0.00
<b>Niobrara B</b>										
7,400.00	73.98	0.00	7,197.76	414.88	179.11	414.88	10.00	10.00	0.00	0.00
7,500.00	83.98	0.00	7,216.84	512.91	179.11	512.91	10.00	10.00	0.00	0.00
7,559.85	89.97	0.00	7,220.00	572.65	179.12	572.65	10.00	10.00	0.00	0.00
<b>End Build @ 7559.85ft - Landing Target (Heel) - 7"</b>										
7,600.00	89.97	0.00	7,220.02	612.80	179.12	612.80	0.00	0.00	0.00	0.00
7,700.00	89.97	0.00	7,220.07	712.80	179.13	712.80	0.00	0.00	0.00	0.00
7,800.00	89.97	0.00	7,220.13	812.80	179.13	812.80	0.00	0.00	0.00	0.00
7,900.00	89.97	0.00	7,220.18	912.80	179.14	912.80	0.00	0.00	0.00	0.00
8,000.00	89.97	0.00	7,220.23	1,012.80	179.15	1,012.80	0.00	0.00	0.00	0.00
8,100.00	89.97	0.00	7,220.29	1,112.80	179.15	1,112.80	0.00	0.00	0.00	0.00
8,200.00	89.97	0.00	7,220.34	1,212.80	179.16	1,212.80	0.00	0.00	0.00	0.00
8,300.00	89.97	0.00	7,220.39	1,312.80	179.16	1,312.80	0.00	0.00	0.00	0.00
8,400.00	89.97	0.00	7,220.45	1,412.80	179.17	1,412.80	0.00	0.00	0.00	0.00
8,500.00	89.97	0.00	7,220.50	1,512.80	179.18	1,512.80	0.00	0.00	0.00	0.00
8,600.00	89.97	0.00	7,220.56	1,612.80	179.18	1,612.80	0.00	0.00	0.00	0.00
8,700.00	89.97	0.00	7,220.61	1,712.80	179.19	1,712.80	0.00	0.00	0.00	0.00

**Plan Report for Kerr 4N-12HZ - 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 (°)
8,800.00	89.97	0.00	7,220.66	1,812.80	179.20	1,812.80	0.00	0.00	0.00	0.00
8,900.00	89.97	0.00	7,220.72	1,912.80	179.20	1,912.80	0.00	0.00	0.00	0.00
9,000.00	89.97	0.00	7,220.77	2,012.80	179.21	2,012.80	0.00	0.00	0.00	0.00
9,100.00	89.97	0.00	7,220.82	2,112.80	179.22	2,112.80	0.00	0.00	0.00	0.00
9,200.00	89.97	0.00	7,220.88	2,212.80	179.22	2,212.80	0.00	0.00	0.00	0.00
9,300.00	89.97	0.00	7,220.93	2,312.80	179.23	2,312.80	0.00	0.00	0.00	0.00
9,400.00	89.97	0.00	7,220.99	2,412.80	179.24	2,412.80	0.00	0.00	0.00	0.00
9,500.00	89.97	0.00	7,221.04	2,512.80	179.24	2,512.80	0.00	0.00	0.00	0.00
9,600.00	89.97	0.00	7,221.09	2,612.80	179.25	2,612.80	0.00	0.00	0.00	0.00
9,700.00	89.97	0.00	7,221.15	2,712.80	179.26	2,712.80	0.00	0.00	0.00	0.00
9,800.00	89.97	0.00	7,221.20	2,812.80	179.26	2,812.80	0.00	0.00	0.00	0.00
9,900.00	89.97	0.00	7,221.25	2,912.80	179.27	2,912.80	0.00	0.00	0.00	0.00
10,000.00	89.97	0.00	7,221.31	3,012.80	179.28	3,012.80	0.00	0.00	0.00	0.00
10,100.00	89.97	0.00	7,221.36	3,112.80	179.28	3,112.80	0.00	0.00	0.00	0.00
10,200.00	89.97	0.00	7,221.42	3,212.80	179.29	3,212.80	0.00	0.00	0.00	0.00
10,300.00	89.97	0.00	7,221.47	3,312.80	179.30	3,312.80	0.00	0.00	0.00	0.00
10,400.00	89.97	0.00	7,221.52	3,412.80	179.30	3,412.80	0.00	0.00	0.00	0.00
10,500.00	89.97	0.00	7,221.58	3,512.80	179.31	3,512.80	0.00	0.00	0.00	0.00
10,600.00	89.97	0.00	7,221.63	3,612.80	179.32	3,612.80	0.00	0.00	0.00	0.00
10,700.00	89.97	0.00	7,221.68	3,712.80	179.32	3,712.80	0.00	0.00	0.00	0.00
10,800.00	89.97	0.00	7,221.74	3,812.80	179.33	3,812.80	0.00	0.00	0.00	0.00
10,900.00	89.97	0.00	7,221.79	3,912.80	179.34	3,912.80	0.00	0.00	0.00	0.00
11,000.00	89.97	0.00	7,221.85	4,012.80	179.34	4,012.80	0.00	0.00	0.00	0.00
11,100.00	89.97	0.00	7,221.90	4,112.80	179.35	4,112.80	0.00	0.00	0.00	0.00
11,200.00	89.97	0.00	7,221.95	4,212.80	179.36	4,212.80	0.00	0.00	0.00	0.00
11,300.00	89.97	0.00	7,222.01	4,312.80	179.36	4,312.80	0.00	0.00	0.00	0.00
11,400.00	89.97	0.00	7,222.06	4,412.80	179.37	4,412.80	0.00	0.00	0.00	0.00
11,500.00	89.97	0.00	7,222.11	4,512.80	179.38	4,512.80	0.00	0.00	0.00	0.00
11,600.00	89.97	0.00	7,222.17	4,612.80	179.38	4,612.80	0.00	0.00	0.00	0.00
11,700.00	89.97	0.00	7,222.22	4,712.80	179.39	4,712.80	0.00	0.00	0.00	0.00
11,800.00	89.97	0.00	7,222.28	4,812.80	179.39	4,812.80	0.00	0.00	0.00	0.00
11,900.00	89.97	0.00	7,222.33	4,912.80	179.40	4,912.80	0.00	0.00	0.00	0.00
12,000.00	89.97	0.00	7,222.38	5,012.80	179.41	5,012.80	0.00	0.00	0.00	0.00
12,100.00	89.97	0.00	7,222.44	5,112.80	179.41	5,112.80	0.00	0.00	0.00	0.00
12,200.00	89.97	0.00	7,222.49	5,212.80	179.42	5,212.80	0.00	0.00	0.00	0.00
12,300.00	89.97	0.00	7,222.54	5,312.80	179.43	5,312.80	0.00	0.00	0.00	0.00
12,400.00	89.97	0.00	7,222.60	5,412.80	179.43	5,412.80	0.00	0.00	0.00	0.00
12,500.00	89.97	0.00	7,222.65	5,512.80	179.44	5,512.80	0.00	0.00	0.00	0.00
12,600.00	89.97	0.00	7,222.71	5,612.80	179.45	5,612.80	0.00	0.00	0.00	0.00
12,700.00	89.97	0.00	7,222.76	5,712.80	179.45	5,712.80	0.00	0.00	0.00	0.00
12,800.00	89.97	0.00	7,222.81	5,812.80	179.46	5,812.80	0.00	0.00	0.00	0.00
12,900.00	89.97	0.00	7,222.87	5,912.80	179.47	5,912.80	0.00	0.00	0.00	0.00
13,000.00	89.97	0.00	7,222.92	6,012.80	179.47	6,012.80	0.00	0.00	0.00	0.00
13,100.00	89.97	0.00	7,222.97	6,112.80	179.48	6,112.80	0.00	0.00	0.00	0.00
13,200.00	89.97	0.00	7,223.03	6,212.80	179.49	6,212.80	0.00	0.00	0.00	0.00
13,300.00	89.97	0.00	7,223.08	6,312.80	179.49	6,312.80	0.00	0.00	0.00	0.00
13,400.00	89.97	0.00	7,223.14	6,412.80	179.50	6,412.80	0.00	0.00	0.00	0.00
13,500.00	89.97	0.00	7,223.19	6,512.80	179.51	6,512.80	0.00	0.00	0.00	0.00
13,600.00	89.97	0.00	7,223.24	6,612.80	179.51	6,612.80	0.00	0.00	0.00	0.00
13,700.00	89.97	0.00	7,223.30	6,712.80	179.52	6,712.80	0.00	0.00	0.00	0.00
13,800.00	89.97	0.00	7,223.35	6,812.80	179.53	6,812.80	0.00	0.00	0.00	0.00
13,900.00	89.97	0.00	7,223.40	6,912.80	179.53	6,912.80	0.00	0.00	0.00	0.00
14,000.00	89.97	0.00	7,223.46	7,012.80	179.54	7,012.80	0.00	0.00	0.00	0.00
14,100.00	89.97	0.00	7,223.51	7,112.80	179.55	7,112.80	0.00	0.00	0.00	0.00
14,200.00	89.97	0.00	7,223.57	7,212.80	179.55	7,212.80	0.00	0.00	0.00	0.00
14,300.00	89.97	0.00	7,223.62	7,312.80	179.56	7,312.80	0.00	0.00	0.00	0.00
14,400.00	89.97	0.00	7,223.67	7,412.80	179.57	7,412.80	0.00	0.00	0.00	0.00
14,500.00	89.97	0.00	7,223.73	7,512.80	179.57	7,512.80	0.00	0.00	0.00	0.00
14,600.00	89.97	0.00	7,223.78	7,612.80	179.58	7,612.80	0.00	0.00	0.00	0.00
14,700.00	89.97	0.00	7,223.83	7,712.80	179.59	7,712.80	0.00	0.00	0.00	0.00

**Plan Report for Kerr 4N-12HZ - 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 (°)
14,800.00	89.97	0.00	7,223.89	7,812.80	179.59	7,812.80	0.00	0.00	0.00	0.00
14,900.00	89.97	0.00	7,223.94	7,912.80	179.60	7,912.80	0.00	0.00	0.00	0.00
15,000.00	89.97	0.00	7,224.00	8,012.80	179.61	8,012.80	0.00	0.00	0.00	0.00
15,100.00	89.97	0.00	7,224.05	8,112.80	179.61	8,112.80	0.00	0.00	0.00	0.00
15,200.00	89.97	0.00	7,224.10	8,212.80	179.62	8,212.80	0.00	0.00	0.00	0.00
15,300.00	89.97	0.00	7,224.16	8,312.80	179.62	8,312.80	0.00	0.00	0.00	0.00
15,400.00	89.97	0.00	7,224.21	8,412.80	179.63	8,412.80	0.00	0.00	0.00	0.00
15,500.00	89.97	0.00	7,224.26	8,512.80	179.64	8,512.80	0.00	0.00	0.00	0.00
15,600.00	89.97	0.00	7,224.32	8,612.80	179.64	8,612.80	0.00	0.00	0.00	0.00
15,700.00	89.97	0.00	7,224.37	8,712.80	179.65	8,712.80	0.00	0.00	0.00	0.00
15,800.00	89.97	0.00	7,224.43	8,812.80	179.66	8,812.80	0.00	0.00	0.00	0.00
15,900.00	89.97	0.00	7,224.48	8,912.80	179.66	8,912.80	0.00	0.00	0.00	0.00
16,000.00	89.97	0.00	7,224.53	9,012.80	179.67	9,012.80	0.00	0.00	0.00	0.00
16,100.00	89.97	0.00	7,224.59	9,112.80	179.68	9,112.80	0.00	0.00	0.00	0.00
16,200.00	89.97	0.00	7,224.64	9,212.80	179.68	9,212.80	0.00	0.00	0.00	0.00
16,300.00	89.97	0.00	7,224.69	9,312.80	179.69	9,312.80	0.00	0.00	0.00	0.00
16,400.00	89.97	0.00	7,224.75	9,412.80	179.70	9,412.80	0.00	0.00	0.00	0.00
16,500.00	89.97	0.00	7,224.80	9,512.80	179.70	9,512.80	0.00	0.00	0.00	0.00
16,600.00	89.97	0.00	7,224.86	9,612.80	179.71	9,612.80	0.00	0.00	0.00	0.00
16,700.00	89.97	0.00	7,224.91	9,712.80	179.72	9,712.80	0.00	0.00	0.00	0.00
16,800.00	89.97	0.00	7,224.96	9,812.80	179.72	9,812.80	0.00	0.00	0.00	0.00
16,867.62	89.97	0.00	7,225.00	9,880.42	179.73	9,880.42	0.00	0.00	0.00	0.00

TD Well @ 16867.62ft - KERR 4N-12HZ\_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
1,900.00	1,897.47	0.00	43.52	End Nudge @ 1900.00ft
2,430.00	2,419.41	0.00	135.56	Begin Drop @ 2430.00ft
2,930.00	2,916.88	0.00	179.08	End Drop @ 2930.00ft
6,560.16	6,547.04	0.00	179.08	Top of 4.5" Liner @ 6560.16ft
6,660.16	6,647.04	0.00	179.08	KOP @ 6660.16ft
7,100.00	7,044.93	160.70	179.09	DLS = 10°/100'
7,559.85	7,220.00	572.65	179.12	End Build @ 7559.85ft
16,867.62	7,225.00	9,880.42	179.73	TD Well @ 16867.62ft

**Vertical Section Information**

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

**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,559.85	Rev B0 Permit	MWD
7,559.85	16,867.62	Rev B0 Permit	MWD

**Plan Report for Kerr 4N-12HZ - Rev B0 Permit****Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,000.00	1,000.00	9 5/8"	9-5/8	13-1/2
7,559.85	7,220.00	7"	7	8-3/4

**Formation Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
950.00	950.00	Fox Hills Base		0.00	
3,955.12	3,942.00	Parkman		0.00	
4,372.12	4,359.00	Sussex		0.00	
7,160.24	7,086.00	Sharon Springs		0.00	
7,282.45	7,154.00	Niobrara A		0.00	
7,367.78	7,188.00	Niobrara B		0.00	
7,559.85	7,220.00	Landing Target (Heel)		0.00	
16,867.62	7,225.00	Total Depth (Toe)		0.00	

***Targets associated with this wellbore***

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
KERR 4N-12HZ_SHL	0.00	0.01	0.00	Point
Kerr_SEC	0.00	3,117.86	2,052.10	Polygon
KERR 4N-12HZ_CP	7,220.00	308.97	144.29	Point
KERR 4N-12HZ_BHL	7,225.00	9,880.42	179.73	Point

**Directional Difficulty Index**

Average Dogleg over Survey:	0.65 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,315.05 usft
Net Tortousity applicable to Plans:	0.65 °/100usft	Directional Difficulty Index:	6.512

**Audit Info**

**North Reference Sheet for Sec. 13-T2N-67W - Kerr 4N-12HZ - 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' @ 4908.00usft (D Rig). Northing and Easting are relative to Kerr 4N-12HZ  
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: 0.99995901

Grid Coordinates of Well: 1,291,306.20 usft N, 3,182,713.69 usft E  
Geographical Coordinates of Well: 40° 07' 52.25" N, 104° 50' 47.57" W  
Grid Convergence at Surface is: 0.42°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,867.62usft  
the Bottom Hole Displacement is 9,882.05usft in the Direction of 1.04° ( True).

Magnetic Convergence at surface is: -8.20° ( 8 August 2013, , BGGM2013)

Magnetic Model: BGGM2013  
Date: 08-Aug-13  
Declination: 8.63°  
Inclination/Dip: 66.74°  
Field Strength: 52685

Grid North is 0.42° East of True North (Grid Convergence)  
Magnetic North is 8.63° East of True North (Magnetic Declination)  
Magnetic North is 8.20° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.42°  
To convert a Magnetic Direction to a True Direction, Add 8.63° East  
To convert a Magnetic Direction to a Grid Direction, Add 8.20°