

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 22-T3N-R66W

Morning Fresh 36N-22HZR

Plan C

Plan: Rev C0

## Sperry Drilling Services

### Proposal Report

22 July, 2014

Well Coordinates: 1,322,468.29 N, 3,204,985.90 E (40° 12' 58.48" N, 104° 45' 57.50" W)

Ground Level: 4,886.00 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 Morning Fresh 36N-22HZR

RKB = 13' @ 4899.00usft (Ensign 132)

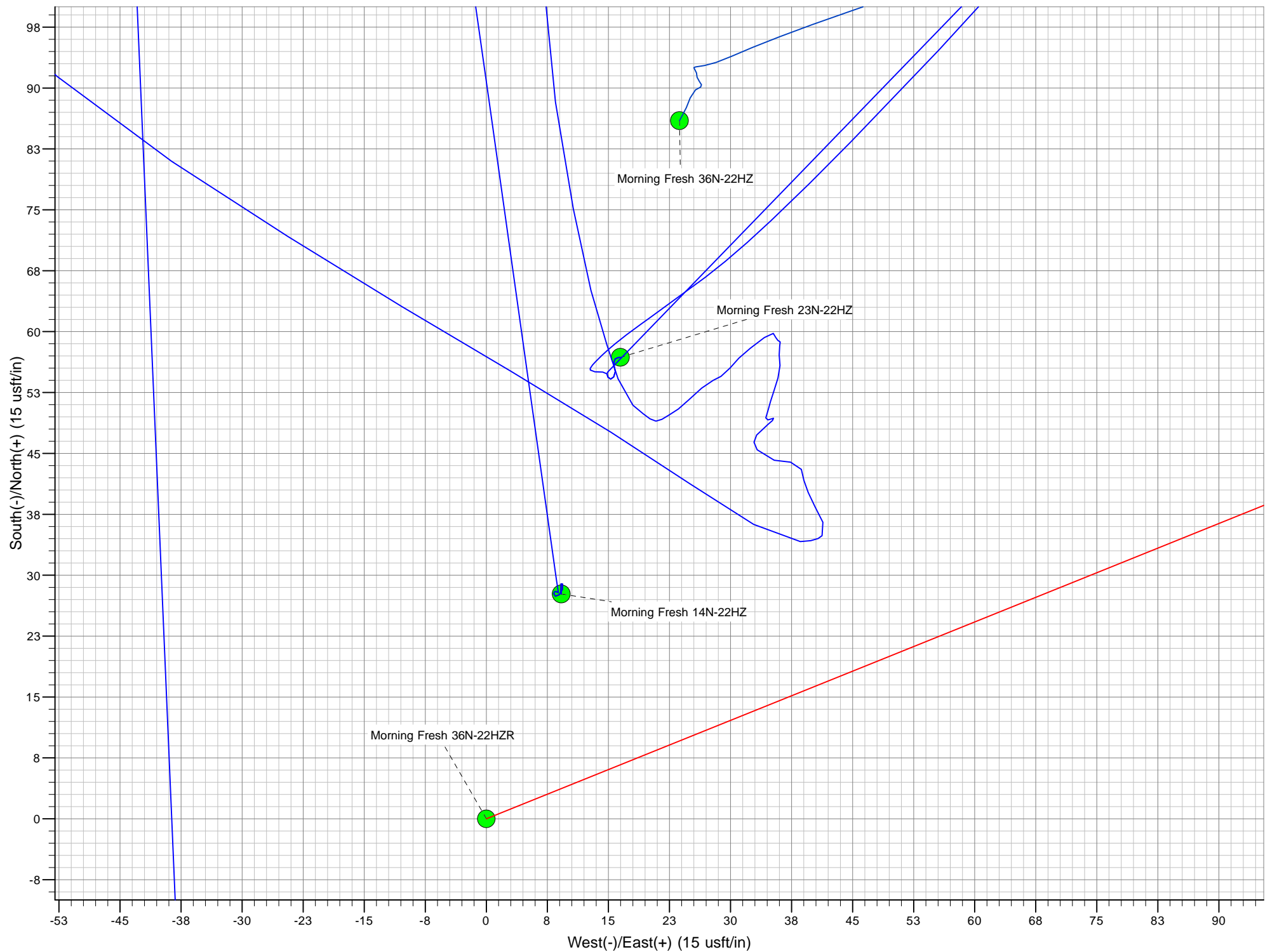
N

True

Dec-Deg - API - US Survey Feet - Custom

**HALLIBURTON**

**HALLIBURTON**  
Sperry Drilling



## Plan Report for Morning Fresh 36N-22HZR - Rev C0

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>Morning Fresh 23N-22HZ_SEC - Morning Fresh 36N-22HZR_SHL</b>										
1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Morning Fresh 36N-22HZ_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
746.00	0.00	0.00	746.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Base</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
937.00	0.00	0.00	937.00	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
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,210.00	0.00	0.00	1,210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 1210.00ft</b>										
1,300.00	1.80	68.00	1,299.99	0.53	1.31	-0.53	2.00	2.00	0.00	68.00
1,400.00	3.80	68.00	1,399.86	2.36	5.84	-2.36	2.00	2.00	0.00	0.00
1,500.00	5.80	68.00	1,499.50	5.49	13.60	-5.49	2.00	2.00	0.00	0.00
1,600.00	7.80	68.00	1,598.80	9.93	24.58	-9.93	2.00	2.00	0.00	0.00
1,700.00	9.80	68.00	1,697.61	15.66	38.76	-15.66	2.00	2.00	0.00	0.00
1,800.00	11.80	68.00	1,795.84	22.68	56.13	-22.68	2.00	2.00	0.00	0.00
1,900.00	13.80	68.00	1,893.35	30.98	76.67	-30.98	2.00	2.00	0.00	0.00
2,000.00	15.80	68.00	1,990.03	40.55	100.36	-40.55	2.00	2.00	0.00	0.00
2,100.00	17.80	68.00	2,085.75	51.37	127.15	-51.37	2.00	2.00	0.00	0.00
2,160.00	19.00	68.00	2,142.68	58.47	144.71	-58.47	2.00	2.00	0.00	0.00
<b>End Nudge @ 2160.00ft</b>										
2,200.00	19.00	68.00	2,180.50	63.35	156.79	-63.35	0.00	0.00	0.00	0.00
2,300.00	19.00	68.00	2,275.06	75.54	186.97	-75.54	0.00	0.00	0.00	0.00
2,400.00	19.00	68.00	2,369.61	87.74	217.16	-87.74	0.00	0.00	0.00	0.00
2,500.00	19.00	68.00	2,464.16	99.93	247.35	-99.93	0.00	0.00	0.00	0.00
2,600.00	19.00	68.00	2,558.71	112.13	277.53	-112.13	0.00	0.00	0.00	0.00
2,700.00	19.00	68.00	2,653.26	124.33	307.72	-124.33	0.00	0.00	0.00	0.00
2,800.00	19.00	68.00	2,747.82	136.52	337.90	-136.52	0.00	0.00	0.00	0.00
2,900.00	19.00	68.00	2,842.37	148.72	368.09	-148.72	0.00	0.00	0.00	0.00
3,000.00	19.00	68.00	2,936.92	160.91	398.28	-160.91	0.00	0.00	0.00	0.00
3,100.00	19.00	68.00	3,031.47	173.11	428.46	-173.11	0.00	0.00	0.00	0.00
3,200.00	19.00	68.00	3,126.02	185.31	458.65	-185.31	0.00	0.00	0.00	0.00
3,300.00	19.00	68.00	3,220.58	197.50	488.83	-197.50	0.00	0.00	0.00	0.00
3,400.00	19.00	68.00	3,315.13	209.70	519.02	-209.70	0.00	0.00	0.00	0.00
3,500.00	19.00	68.00	3,409.68	221.89	549.21	-221.89	0.00	0.00	0.00	0.00
3,600.00	19.00	68.00	3,504.23	234.09	579.39	-234.09	0.00	0.00	0.00	0.00
3,700.00	19.00	68.00	3,598.78	246.29	609.58	-246.29	0.00	0.00	0.00	0.00
3,800.00	19.00	68.00	3,693.33	258.48	639.77	-258.48	0.00	0.00	0.00	0.00
3,900.00	19.00	68.00	3,787.89	270.68	669.95	-270.68	0.00	0.00	0.00	0.00
4,000.00	19.00	68.00	3,882.44	282.87	700.14	-282.87	0.00	0.00	0.00	0.00
4,090.49	19.00	68.00	3,968.00	293.91	727.45	-293.91	0.00	0.00	0.00	0.00
<b>Parkman</b>										
4,100.00	19.00	68.00	3,976.99	295.07	730.32	-295.07	0.00	0.00	0.00	0.00
4,200.00	19.00	68.00	4,071.54	307.27	760.51	-307.27	0.00	0.00	0.00	0.00
4,300.00	19.00	68.00	4,166.09	319.46	790.70	-319.46	0.00	0.00	0.00	0.00

**Plan Report for Morning Fresh 36N-22HZR - Rev C0**

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	19.00	68.00	4,260.65	331.66	820.88	-331.66	0.00	0.00	0.00	0.00
4,500.00	19.00	68.00	4,355.20	343.85	851.07	-343.85	0.00	0.00	0.00	0.00
4,558.00	19.00	68.00	4,410.04	350.93	868.58	-350.93	0.00	0.00	0.00	0.00
<b>Begin Drop @ 4558.00ft</b>										
4,600.00	18.16	68.00	4,449.85	355.94	880.98	-355.94	2.00	-2.00	0.00	-180.00
4,611.73	17.93	68.00	4,461.00	357.30	884.35	-357.30	2.00	-2.00	0.00	-180.00
<b>Sussex</b>										
4,700.00	16.16	68.00	4,545.39	366.99	908.34	-366.99	2.00	-2.00	0.00	-180.00
4,800.00	14.16	68.00	4,641.91	376.79	932.58	-376.79	2.00	-2.00	0.00	-180.00
4,900.00	12.16	68.00	4,739.28	385.32	953.69	-385.32	2.00	-2.00	0.00	-180.00
5,000.00	10.16	68.00	4,837.38	392.57	971.64	-392.57	2.00	-2.00	0.00	-180.00
5,100.00	8.16	68.00	4,936.10	398.53	986.40	-398.53	2.00	-2.00	0.00	-180.00
5,200.00	6.16	68.00	5,035.31	403.20	997.95	-403.20	2.00	-2.00	0.00	-180.00
5,300.00	4.16	68.00	5,134.90	406.57	1,006.29	-406.57	2.00	-2.00	0.00	-180.00
5,400.00	2.16	68.00	5,234.75	408.63	1,011.40	-408.63	2.00	-2.00	0.00	-180.00
5,500.00	0.16	68.00	5,334.72	409.39	1,013.28	-409.39	2.00	-2.00	0.00	-180.00
5,508.00	0.00	0.00	5,342.72	409.40	1,013.29	-409.40	2.00	-2.00	0.00	-180.00
<b>End Drop @ 5508.00ft</b>										
5,600.00	0.00	0.00	5,434.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,534.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,634.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,734.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,834.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	5,934.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,034.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,134.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,234.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,334.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,434.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,534.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,634.72	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
6,820.33	0.00	0.00	6,655.05	409.40	1,013.29	-409.40	0.00	0.00	0.00	0.00
<b>KOP @ 6820.33ft</b>										
6,900.00	7.97	180.00	6,734.47	403.87	1,013.29	-403.87	10.00	10.00	0.00	180.00
7,000.00	17.97	180.00	6,831.79	381.45	1,013.29	-381.45	10.00	10.00	0.00	0.00
7,100.00	27.97	180.00	6,923.75	342.48	1,013.29	-342.48	10.00	10.00	0.00	0.00
7,200.00	37.97	180.00	7,007.54	288.14	1,013.29	-288.14	10.00	10.00	0.00	0.00
7,213.39	39.31	180.00	7,018.00	279.78	1,013.29	-279.78	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,296.10	47.58	180.00	7,078.00	222.95	1,013.29	-222.95	10.00	10.00	0.00	0.00
<b>Niobrara A</b>										
7,300.00	47.97	180.00	7,080.62	220.07	1,013.29	-220.07	10.00	10.00	0.00	0.00
<b>DLS = 10°/100'</b>										
7,376.67	55.63	180.00	7,128.00	159.86	1,013.30	-159.86	10.00	10.00	0.00	0.00
<b>Niobrara B</b>										
7,400.00	57.97	180.00	7,140.77	140.34	1,013.30	-140.34	10.00	10.00	0.00	0.00
7,500.00	67.97	180.00	7,186.17	51.38	1,013.30	-51.38	10.00	10.00	0.00	0.00
7,576.29	75.60	180.00	7,210.00	-21.04	1,013.30	21.04	10.00	10.00	0.00	0.00
<b>Niobrara C</b>										
7,600.00	77.97	180.00	7,215.42	-44.11	1,013.30	44.11	10.00	10.00	0.00	0.00
7,700.00	87.97	180.00	7,227.65	-143.24	1,013.30	143.24	10.00	10.00	0.00	0.00
7,724.14	90.38	180.00	7,228.00	-167.37	1,013.30	167.37	10.00	10.00	0.00	0.00
<b>End Build @ 7724.14ft - Landing Target (Heel) - 7"</b>										
7,800.00	90.38	180.00	7,227.49	-243.23	1,013.30	243.23	0.00	0.00	0.00	0.00
7,900.00	90.38	180.00	7,226.83	-343.23	1,013.31	343.23	0.00	0.00	0.00	0.00
8,000.00	90.38	180.00	7,226.16	-443.23	1,013.31	443.23	0.00	0.00	0.00	0.00
8,100.00	90.38	180.00	7,225.50	-543.22	1,013.31	543.22	0.00	0.00	0.00	0.00
8,200.00	90.38	180.00	7,224.83	-643.22	1,013.31	643.22	0.00	0.00	0.00	0.00
8,300.00	90.38	180.00	7,224.17	-743.22	1,013.32	743.22	0.00	0.00	0.00	0.00

**Plan Report for Morning Fresh 36N-22HZR - Rev C0**

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 (°)
8,400.00	90.38	180.00	7,223.51	-843.22	1,013.32	843.22	0.00	0.00	0.00	0.00
8,500.00	90.38	180.00	7,222.84	-943.22	1,013.32	943.22	0.00	0.00	0.00	0.00
8,600.00	90.38	180.00	7,222.18	-1,043.21	1,013.32	1,043.21	0.00	0.00	0.00	0.00
8,700.00	90.38	180.00	7,221.51	-1,143.21	1,013.33	1,143.21	0.00	0.00	0.00	0.00
8,800.00	90.38	180.00	7,220.85	-1,243.21	1,013.33	1,243.21	0.00	0.00	0.00	0.00
8,900.00	90.38	180.00	7,220.18	-1,343.21	1,013.33	1,343.21	0.00	0.00	0.00	0.00
9,000.00	90.38	180.00	7,219.52	-1,443.20	1,013.33	1,443.20	0.00	0.00	0.00	0.00
9,100.00	90.38	180.00	7,218.85	-1,543.20	1,013.34	1,543.20	0.00	0.00	0.00	0.00
9,200.00	90.38	180.00	7,218.19	-1,643.20	1,013.34	1,643.20	0.00	0.00	0.00	0.00
9,300.00	90.38	180.00	7,217.52	-1,743.20	1,013.34	1,743.20	0.00	0.00	0.00	0.00
9,400.00	90.38	180.00	7,216.86	-1,843.20	1,013.34	1,843.20	0.00	0.00	0.00	0.00
9,500.00	90.38	180.00	7,216.20	-1,943.19	1,013.34	1,943.19	0.00	0.00	0.00	0.00
9,600.00	90.38	180.00	7,215.53	-2,043.19	1,013.35	2,043.19	0.00	0.00	0.00	0.00
9,700.00	90.38	180.00	7,214.87	-2,143.19	1,013.35	2,143.19	0.00	0.00	0.00	0.00
9,800.00	90.38	180.00	7,214.20	-2,243.19	1,013.35	2,243.19	0.00	0.00	0.00	0.00
9,900.00	90.38	180.00	7,213.54	-2,343.18	1,013.35	2,343.18	0.00	0.00	0.00	0.00
10,000.00	90.38	180.00	7,212.87	-2,443.18	1,013.36	2,443.18	0.00	0.00	0.00	0.00
10,100.00	90.38	180.00	7,212.21	-2,543.18	1,013.36	2,543.18	0.00	0.00	0.00	0.00
10,200.00	90.38	180.00	7,211.54	-2,643.18	1,013.36	2,643.18	0.00	0.00	0.00	0.00
10,300.00	90.38	180.00	7,210.88	-2,743.18	1,013.36	2,743.18	0.00	0.00	0.00	0.00
10,400.00	90.38	180.00	7,210.21	-2,843.17	1,013.37	2,843.17	0.00	0.00	0.00	0.00
10,500.00	90.38	180.00	7,209.55	-2,943.17	1,013.37	2,943.17	0.00	0.00	0.00	0.00
10,600.00	90.38	180.00	7,208.89	-3,043.17	1,013.37	3,043.17	0.00	0.00	0.00	0.00
10,700.00	90.38	180.00	7,208.22	-3,143.17	1,013.37	3,143.17	0.00	0.00	0.00	0.00
10,800.00	90.38	180.00	7,207.56	-3,243.16	1,013.38	3,243.16	0.00	0.00	0.00	0.00
10,900.00	90.38	180.00	7,206.89	-3,343.16	1,013.38	3,343.16	0.00	0.00	0.00	0.00
11,000.00	90.38	180.00	7,206.23	-3,443.16	1,013.38	3,443.16	0.00	0.00	0.00	0.00
11,100.00	90.38	180.00	7,205.56	-3,543.16	1,013.38	3,543.16	0.00	0.00	0.00	0.00
11,200.00	90.38	180.00	7,204.90	-3,643.16	1,013.38	3,643.16	0.00	0.00	0.00	0.00
11,300.00	90.38	180.00	7,204.23	-3,743.15	1,013.39	3,743.15	0.00	0.00	0.00	0.00
11,400.00	90.38	180.00	7,203.57	-3,843.15	1,013.39	3,843.15	0.00	0.00	0.00	0.00
11,500.00	90.38	180.00	7,202.90	-3,943.15	1,013.39	3,943.15	0.00	0.00	0.00	0.00
11,600.00	90.38	180.00	7,202.24	-4,043.15	1,013.39	4,043.15	0.00	0.00	0.00	0.00
11,700.00	90.38	180.00	7,201.58	-4,143.14	1,013.40	4,143.14	0.00	0.00	0.00	0.00
11,800.00	90.38	180.00	7,200.91	-4,243.14	1,013.40	4,243.14	0.00	0.00	0.00	0.00
11,900.00	90.38	180.00	7,200.25	-4,343.14	1,013.40	4,343.14	0.00	0.00	0.00	0.00
12,000.00	90.38	180.00	7,199.58	-4,443.14	1,013.40	4,443.14	0.00	0.00	0.00	0.00
12,100.00	90.38	180.00	7,198.92	-4,543.14	1,013.41	4,543.14	0.00	0.00	0.00	0.00
12,200.00	90.38	180.00	7,198.25	-4,643.13	1,013.41	4,643.13	0.00	0.00	0.00	0.00
12,238.08	90.38	180.00	7,198.00	-4,681.21	1,013.41	4,681.21	0.00	0.00	0.00	0.00
<b>Total Depth (Toe)</b>										
12,238.09	90.38	180.00	7,198.00	-4,681.22	1,013.41	4,681.22	0.00	0.00	0.00	0.00
<b>TD Well @ 12238.09ft - Morning Fresh 36N-22HZR_TOE</b>										

**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,210.00	1,210.00	0.00	0.00	Begin Nudge @ 1210.00ft
2,160.00	2,142.68	58.47	144.71	End Nudge @ 2160.00ft
4,558.00	4,410.04	350.93	868.58	Begin Drop @ 4558.00ft
5,508.00	5,342.72	409.40	1,013.29	End Drop @ 5508.00ft
6,820.33	6,655.05	409.40	1,013.29	KOP @ 6820.33ft
7,300.00	7,080.62	220.07	1,013.29	DLS = 10°/100'
7,724.14	7,228.00	-167.37	1,013.30	End Build @ 7724.14ft
12,238.09	7,198.00	-4,681.22	1,013.41	TD Well @ 12238.09ft

## Plan Report for Morning Fresh 36N-22HZR - Rev C0

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	180.00	Slot	0.00	0.00	0.00

**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	937.00	Rev C0	MWD+IFR1+SC
937.00	7,724.14	Rev C0	MWD+IFR1+SC
7,724.14	12,238.09	Rev C0	MWD+IFR1+SC

**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
937.00	937.00	9 5/8"	9-5/8	13-1/2
7,724.14	7,228.00	7"	7	8-3/4

**Formation Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
746.00	746.00	Fox Hills Base		0.00	
4,090.49	3,968.00	Parkman		0.00	
4,611.73	4,461.00	Sussex		0.00	
7,213.39	7,018.00	Sharon Springs		0.00	
7,296.10	7,078.00	Niobrara A		0.00	
7,376.67	7,128.00	Niobrara B		0.00	
7,576.29	7,210.00	Niobrara C		0.00	
7,724.14	7,228.00	Landing Target (Heel)		0.00	
12,238.08	7,198.00	Total Depth (Toe)		0.00	

**Targets associated with this wellbore**

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Morning Fresh 23N-22HZ_SEC	0.00	58.29	14.52	Polygon
Morning Fresh 36N-22HZR_SHL	0.00	0.00	0.00	Point
Morning Fresh 36N-22HZ_LD	1.00	87.43	21.78	Polygon
Morning Fresh 36N-22HZR_TOE	7,198.00	-4,681.22	1,013.41	Point

**Directional Difficulty Index**

Average Dogleg over Survey:	0.00 °/100usft	Maximum Dogleg over Survey:	0.00 °/100usft at 1.00 usft
Net Tortousity applicable to Plans:	0.00 °/100usft	Directional Difficulty Index:	6.234

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**Plan Report for Morning Fresh 36N-22HZR - Rev C0**

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*Audit Info*



North Reference Sheet for Sec. 22-T3N-R66W - Morning Fresh 36N-22HZR - Plan C

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB = 13' @ 4899.00usft (Ensign 132). Northing and Easting are relative to Morning Fresh 36N-22HZR

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: 0.99995703

Grid Coordinates of Well: 1,322,468.29 usft N, 3,204,985.90 usft E

Geographical Coordinates of Well: 40° 12' 58.48" N, 104° 45' 57.50" W

Grid Convergence at Surface is: 0.47°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,238.09usft the Bottom Hole Displacement is 4,789.66usft in the Direction of 167.78° ( True).

Magnetic Convergence at surface is: -8.04° (22 July 2014, , BGGM2014)

