

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 15-T3N-R66W

Morning Fresh 35N-15HZ

API # 05-123-37001 JOB # 901442850

Plan B

Plan: Rev B0

Sperry Drilling Services

Proposal Report

01 July, 2014

Well Coordinates: 1,328,023.61 N, 3,203,325.79 E (40° 13' 53.51" N, 104° 46' 18.31" W)

Ground Level: 4,851.00 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 35N-15HZ

RKB = 13' @ 4864.00usft (Ensign 138)

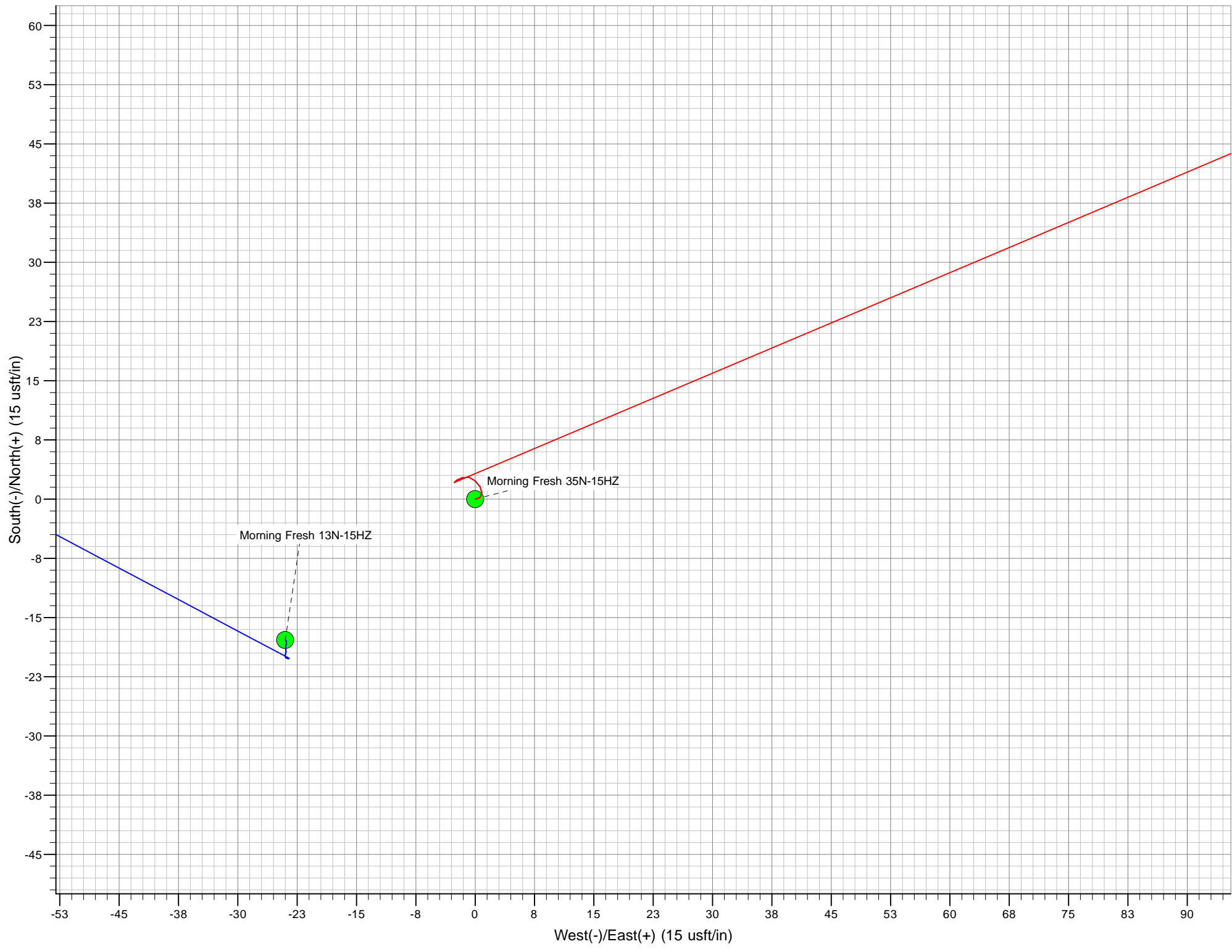
N

True

API - US Survey Feet - Custom

HALLIBURTON

HALLIBURTON
Sperry Drilling



Plan Report for Morning Fresh 35N-15HZ - 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 (°)
949.00	0.07	19.44	948.98	2.08	-2.63	-1.96	0.00	0.00	0.00	0.00
Tie-On to Gyro Surveys @ 949.00ft - 9 5/8" - Morning Fresh 35N-15HZ_SHL - Morning Fresh 35N-15HZ_LD - Morning Fresh 35N-15HZ_SEC										
1,000.00	0.00	0.00	999.98	2.11	-2.62	-1.99	0.14	-0.14	0.00	-180.00
0° INC, 0° AZI @ 1000.00ft										
1,004.02	0.00	0.00	1,004.00	2.11	-2.62	-1.99	0.00	0.00	0.00	0.00
Fox Hills Marker										
1,100.00	0.00	0.00	1,099.98	2.11	-2.62	-1.99	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,199.98	2.11	-2.62	-1.99	0.00	0.00	0.00	0.00
Begin Nudge @ 1200.00ft										
1,300.00	2.00	74.00	1,299.96	2.59	-0.94	-2.55	2.00	2.00	0.00	74.00
1,400.00	4.00	74.00	1,399.81	4.04	4.09	-4.23	2.00	2.00	0.00	0.00
1,500.00	6.00	74.00	1,499.43	6.44	12.46	-7.02	2.00	2.00	0.00	0.00
1,600.00	8.00	74.00	1,598.68	9.80	24.18	-10.93	2.00	2.00	0.00	0.00
1,700.00	10.00	74.00	1,697.44	14.11	39.22	-15.94	2.00	2.00	0.00	0.00
1,800.00	12.00	74.00	1,795.60	19.37	57.56	-22.06	2.00	2.00	0.00	0.00
1,900.00	14.00	74.00	1,893.03	25.57	79.18	-29.27	2.00	2.00	0.00	0.00
End Nudge @ 1900.00ft										
2,000.00	14.00	74.00	1,990.06	32.24	102.43	-37.03	0.00	0.00	0.00	0.00
2,100.00	14.00	74.00	2,087.09	38.91	125.69	-44.78	0.00	0.00	0.00	0.00
2,200.00	14.00	74.00	2,184.12	45.57	148.94	-52.54	0.00	0.00	0.00	0.00
2,300.00	14.00	74.00	2,281.15	52.24	172.20	-60.30	0.00	0.00	0.00	0.00
2,400.00	14.00	74.00	2,378.18	58.91	195.45	-68.05	0.00	0.00	0.00	0.00
2,500.00	14.00	74.00	2,475.21	65.58	218.71	-75.81	0.00	0.00	0.00	0.00
2,600.00	14.00	74.00	2,572.24	72.25	241.96	-83.56	0.00	0.00	0.00	0.00
2,700.00	14.00	74.00	2,669.27	78.92	265.22	-91.32	0.00	0.00	0.00	0.00
2,800.00	14.00	74.00	2,766.30	85.58	288.47	-99.08	0.00	0.00	0.00	0.00
2,900.00	14.00	74.00	2,863.33	92.25	311.73	-106.83	0.00	0.00	0.00	0.00
3,000.00	14.00	74.00	2,960.36	98.92	334.98	-114.59	0.00	0.00	0.00	0.00
3,100.00	14.00	74.00	3,057.39	105.59	358.24	-122.35	0.00	0.00	0.00	0.00
3,200.00	14.00	74.00	3,154.42	112.26	381.49	-130.10	0.00	0.00	0.00	0.00
3,300.00	14.00	74.00	3,251.45	118.93	404.75	-137.86	0.00	0.00	0.00	0.00
3,400.00	14.00	74.00	3,348.48	125.59	428.00	-145.62	0.00	0.00	0.00	0.00
3,500.00	14.00	74.00	3,445.51	132.26	451.26	-153.37	0.00	0.00	0.00	0.00
3,600.00	14.00	74.00	3,542.53	138.93	474.51	-161.13	0.00	0.00	0.00	0.00
3,700.00	14.00	74.00	3,639.56	145.60	497.77	-168.88	0.00	0.00	0.00	0.00
3,800.00	14.00	74.00	3,736.59	152.27	521.02	-176.64	0.00	0.00	0.00	0.00
3,900.00	14.00	74.00	3,833.62	158.93	544.28	-184.40	0.00	0.00	0.00	0.00
4,000.00	14.00	74.00	3,930.65	165.60	567.53	-192.15	0.00	0.00	0.00	0.00
4,015.82	14.00	74.00	3,946.00	166.66	571.21	-193.38	0.00	0.00	0.00	0.00
Parkman										
4,100.00	14.00	74.00	4,027.68	172.27	590.79	-199.91	0.00	0.00	0.00	0.00
4,200.00	14.00	74.00	4,124.71	178.94	614.04	-207.67	0.00	0.00	0.00	0.00
4,256.00	14.00	74.00	4,179.05	182.67	627.07	-212.01	0.00	0.00	0.00	0.00
Begin Drop @ 4256.00ft										
4,300.00	13.12	74.00	4,221.82	185.52	636.98	-215.32	2.00	-2.00	0.00	180.00
4,400.00	11.12	74.00	4,319.59	191.30	657.17	-222.05	2.00	-2.00	0.00	180.00
4,500.00	9.12	74.00	4,418.03	196.15	674.05	-227.68	2.00	-2.00	0.00	180.00
4,538.42	8.35	74.00	4,456.00	197.76	679.66	-229.55	2.00	-2.00	0.00	-180.00
Sussex										
4,600.00	7.12	74.00	4,517.02	200.04	687.63	-232.21	2.00	-2.00	0.00	180.00
4,700.00	5.12	74.00	4,616.44	202.98	697.88	-235.63	2.00	-2.00	0.00	180.00
4,800.00	3.12	74.00	4,716.18	204.96	704.78	-237.93	2.00	-2.00	0.00	180.00
4,900.00	1.12	74.00	4,816.11	205.98	708.34	-239.12	2.00	-2.00	0.00	180.00
4,956.00	0.00	0.00	4,872.10	206.13	708.87	-239.29	2.00	-2.00	0.00	-180.00
End Drop @ 4956.00ft										
5,000.00	0.00	0.00	4,916.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,016.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,116.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00

Plan Report for Morning Fresh 35N-15HZ - 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 (°)
5,300.00	0.00	0.00	5,216.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,316.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,416.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,516.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,616.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,716.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,816.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,916.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,016.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,116.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,216.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,316.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,416.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,516.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,616.10	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
6,734.95	0.00	0.00	6,651.05	206.13	708.87	-239.29	0.00	0.00	0.00	0.00
KOP @ 6734.95ft										
6,800.00	6.51	182.70	6,715.96	202.44	708.69	-235.60	10.00	10.00	0.00	182.70
6,900.00	16.51	182.70	6,813.83	182.55	707.75	-215.68	10.00	10.00	0.00	0.00
7,000.00	26.51	182.70	6,906.75	145.98	706.03	-179.07	10.00	10.00	0.00	0.00
7,090.23	35.53	182.70	6,984.00	99.58	703.84	-132.63	10.00	10.00	0.00	0.00
Sharon Springs										
7,100.00	36.51	182.70	6,991.90	93.84	703.57	-126.88	10.00	10.00	0.00	0.00
7,161.12	42.62	182.70	7,039.00	54.98	701.73	-87.97	10.00	10.00	0.00	0.00
Niobrara A										
7,200.00	46.51	182.70	7,066.70	27.73	700.44	-60.70	10.00	10.00	0.00	0.00
DLS = 10°/100'										
7,273.95	53.90	182.70	7,114.00	-28.98	697.77	-3.92	10.00	10.00	0.00	0.00
Niobrara B										
7,300.00	56.51	182.70	7,128.86	-50.35	696.76	17.47	10.00	10.00	0.00	0.00
7,400.00	66.51	182.70	7,176.51	-138.02	692.62	105.24	10.00	10.00	0.00	0.00
7,465.03	73.01	182.70	7,199.00	-198.94	689.74	166.23	10.00	10.00	0.00	0.00
Niobrara C										
7,500.00	76.51	182.70	7,208.19	-232.63	688.15	199.96	10.00	10.00	0.00	0.00
7,600.00	86.51	182.70	7,222.95	-331.30	683.49	298.74	10.00	10.00	0.00	0.00
7,638.66	90.37	182.70	7,224.00	-369.90	681.67	337.37	10.00	10.00	0.00	0.00
End Build @ 7638.66ft - Landing Target (Heel) - 7"										
7,700.00	90.37	182.70	7,223.60	-431.17	678.78	398.71	0.00	0.00	0.00	0.00
7,800.00	90.37	182.70	7,222.96	-531.05	674.06	498.71	0.00	0.00	0.00	0.00
7,900.00	90.37	182.70	7,222.31	-630.94	669.35	598.71	0.00	0.00	0.00	0.00
8,000.00	90.37	182.70	7,221.66	-730.83	664.63	698.71	0.00	0.00	0.00	0.00
8,100.00	90.37	182.70	7,221.01	-830.71	659.91	798.71	0.00	0.00	0.00	0.00
8,200.00	90.37	182.70	7,220.37	-930.60	655.20	898.70	0.00	0.00	0.00	0.00
8,300.00	90.37	182.70	7,219.72	-1,030.49	650.48	998.70	0.00	0.00	0.00	0.00
8,400.00	90.37	182.70	7,219.07	-1,130.37	645.77	1,098.70	0.00	0.00	0.00	0.00
8,500.00	90.37	182.70	7,218.43	-1,230.26	641.05	1,198.70	0.00	0.00	0.00	0.00
8,600.00	90.37	182.70	7,217.78	-1,330.15	636.33	1,298.69	0.00	0.00	0.00	0.00
8,700.00	90.37	182.70	7,217.13	-1,430.03	631.62	1,398.69	0.00	0.00	0.00	0.00
8,800.00	90.37	182.70	7,216.48	-1,529.92	626.90	1,498.69	0.00	0.00	0.00	0.00
8,900.00	90.37	182.70	7,215.84	-1,629.81	622.19	1,598.69	0.00	0.00	0.00	0.00
9,000.00	90.37	182.70	7,215.19	-1,729.69	617.47	1,698.69	0.00	0.00	0.00	0.00
9,100.00	90.37	182.70	7,214.54	-1,829.58	612.75	1,798.68	0.00	0.00	0.00	0.00
9,200.00	90.37	182.70	7,213.90	-1,929.47	608.04	1,898.68	0.00	0.00	0.00	0.00
9,300.00	90.37	182.70	7,213.25	-2,029.35	603.32	1,998.68	0.00	0.00	0.00	0.00
9,400.00	90.37	182.70	7,212.60	-2,129.24	598.61	2,098.68	0.00	0.00	0.00	0.00
9,500.00	90.37	182.70	7,211.96	-2,229.13	593.89	2,198.68	0.00	0.00	0.00	0.00
9,600.00	90.37	182.70	7,211.31	-2,329.01	589.17	2,298.67	0.00	0.00	0.00	0.00
9,700.00	90.37	182.70	7,210.66	-2,428.90	584.46	2,398.67	0.00	0.00	0.00	0.00

Plan Report for Morning Fresh 35N-15HZ - 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 (°)
9,800.00	90.37	182.70	7,210.01	-2,528.79	579.74	2,498.67	0.00	0.00	0.00	0.00
9,900.00	90.37	182.70	7,209.37	-2,628.67	575.03	2,598.67	0.00	0.00	0.00	0.00
10,000.00	90.37	182.70	7,208.72	-2,728.56	570.31	2,698.67	0.00	0.00	0.00	0.00
10,100.00	90.37	182.70	7,208.07	-2,828.45	565.59	2,798.66	0.00	0.00	0.00	0.00
10,200.00	90.37	182.70	7,207.43	-2,928.33	560.88	2,898.66	0.00	0.00	0.00	0.00
10,300.00	90.37	182.70	7,206.78	-3,028.22	556.16	2,998.66	0.00	0.00	0.00	0.00
10,400.00	90.37	182.70	7,206.13	-3,128.11	551.45	3,098.66	0.00	0.00	0.00	0.00
10,500.00	90.37	182.70	7,205.48	-3,227.99	546.73	3,198.66	0.00	0.00	0.00	0.00
10,600.00	90.37	182.70	7,204.84	-3,327.88	542.01	3,298.65	0.00	0.00	0.00	0.00
10,700.00	90.37	182.70	7,204.19	-3,427.77	537.30	3,398.65	0.00	0.00	0.00	0.00
10,800.00	90.37	182.70	7,203.54	-3,527.65	532.58	3,498.65	0.00	0.00	0.00	0.00
10,900.00	90.37	182.70	7,202.90	-3,627.54	527.86	3,598.65	0.00	0.00	0.00	0.00
11,000.00	90.37	182.70	7,202.25	-3,727.43	523.15	3,698.64	0.00	0.00	0.00	0.00
11,100.00	90.37	182.70	7,201.60	-3,827.31	518.43	3,798.64	0.00	0.00	0.00	0.00
11,200.00	90.37	182.70	7,200.95	-3,927.20	513.72	3,898.64	0.00	0.00	0.00	0.00
11,300.00	90.37	182.70	7,200.31	-4,027.09	509.00	3,998.64	0.00	0.00	0.00	0.00
11,400.00	90.37	182.70	7,199.66	-4,126.97	504.28	4,098.64	0.00	0.00	0.00	0.00
11,500.00	90.37	182.70	7,199.01	-4,226.86	499.57	4,198.63	0.00	0.00	0.00	0.00
11,600.00	90.37	182.70	7,198.37	-4,326.75	494.85	4,298.63	0.00	0.00	0.00	0.00
11,700.00	90.37	182.70	7,197.72	-4,426.63	490.14	4,398.63	0.00	0.00	0.00	0.00
11,800.00	90.37	182.70	7,197.07	-4,526.52	485.42	4,498.63	0.00	0.00	0.00	0.00
11,900.00	90.37	182.70	7,196.42	-4,626.41	480.70	4,598.63	0.00	0.00	0.00	0.00
12,000.00	90.37	182.70	7,195.78	-4,726.29	475.99	4,698.62	0.00	0.00	0.00	0.00
12,100.00	90.37	182.70	7,195.13	-4,826.18	471.27	4,798.62	0.00	0.00	0.00	0.00
12,200.00	90.37	182.70	7,194.48	-4,926.07	466.56	4,898.62	0.00	0.00	0.00	0.00
12,274.75	90.37	182.70	7,194.00	-5,000.73	463.03	4,973.37	0.00	0.00	0.00	0.00
Total Depth (Toe)										
12,274.76	90.37	182.70	7,194.00	-5,000.74	463.03	4,973.37	0.00	0.00	0.00	0.00
TD Well @ 12274.76ft - Morning Fresh 35N-15HZ_TOE										

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
949.00	948.98	2.08	-2.63	Tie-On to Gyro Surveys @ 949.00ft
1,000.00	999.98	2.11	-2.62	0° INC, 0° AZI @ 1000.00ft
1,200.00	1,199.98	2.11	-2.62	Begin Nudge @ 1200.00ft
1,900.00	1,893.03	25.57	79.18	End Nudge @ 1900.00ft
4,256.00	4,179.05	182.67	627.07	Begin Drop @ 4256.00ft
4,956.00	4,872.10	206.13	708.87	End Drop @ 4956.00ft
6,734.95	6,651.05	206.13	708.87	KOP @ 6734.95ft
7,200.00	7,066.70	27.73	700.44	DLS = 10°/100'
7,638.66	7,224.00	-369.90	681.67	End Build @ 7638.66ft
12,274.76	7,194.00	-5,000.74	463.03	TD Well @ 12274.76ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	182.70	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	949.00	MS Energy Gyros	NS-GYRO-MS
949.00	7,638.66	Rev B0	MWD+IFR1+SC

Plan Report for Morning Fresh 35N-15HZ - Rev B0

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
7,638.66	12,274.76	Rev B0	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
949.00	948.98	9 5/8"	9-5/8	13-1/2
7,638.66	7,224.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,004.02	1,004.00	Fox Hills Marker		0.00	
4,015.82	3,946.00	Parkman		0.00	
4,538.42	4,456.00	Sussex		0.00	
7,090.23	6,984.00	Sharon Springs		0.00	
7,161.12	7,039.00	Niobrara A		0.00	
7,273.95	7,114.00	Niobrara B		0.00	
7,465.03	7,199.00	Niobrara C		0.00	
7,638.66	7,224.00	Landing Target (Heel)		0.00	
12,274.75	7,194.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Morning Fresh 35N-15HZ_SHL	0.00	0.00	0.00	Point
Morning Fresh 35N-15HZ_LD	0.00	0.00	0.00	Polygon
Morning Fresh 35N-15HZ_SEC	0.00	0.00	0.00	Polygon
Morning Fresh 35N-15HZ_TOE	7,194.00	-5,000.74	463.03	Point

Directional Difficulty Index

Average Dogleg over Survey:	1.09 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,639.06 usft
Net Tortousity applicable to Plans:	1.09 °/100usft	Directional Difficulty Index:	6.225

Audit Info

North Reference Sheet for Sec. 15-T3N-R66W - Morning Fresh 35N-15HZ - 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 = 13' @ 4864.00usft (Ensign 138). Northing and Easting are relative to Morning Fresh 35N-15HZ

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: 0.99995690

Grid Coordinates of Well: 1,328,023.61 usft N, 3,203,325.79 usft E

Geographical Coordinates of Well: 40° 13' 53.51" N, 104° 46' 18.31" W

Grid Convergence at Surface is: 0.47°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,274.76usft the Bottom Hole Displacement is 5,022.13usft in the Direction of 174.71° (True).

Magnetic Convergence at surface is: -8.06° (4 July 2014, , BGGM2014)

