

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 6-T1N-R65W

THOMASON 22N-31HZ

Plan A

Plan: Plan A0 Permit

Sperry Drilling Services

Proposal Report

06 September, 2013

Well Coordinates: 1,270,781.34 N, 3,220,781.95 E (40° 04' 26.36" N, 104° 42' 39.81" W)

Ground Level: 5,001.00 ft

Local Coordinate Origin: Centered on Well THOMASON 22N-31HZ

Viewing Datum: RKB = 17' @ 5018.00ft (Drilling Rig)

TVDs to System: N

North Reference: True

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 6-T1N-R65W
 Well: THOMASON 22N-31HZ
 Wellbore: Plan A
 Design: Plan A0 Permit

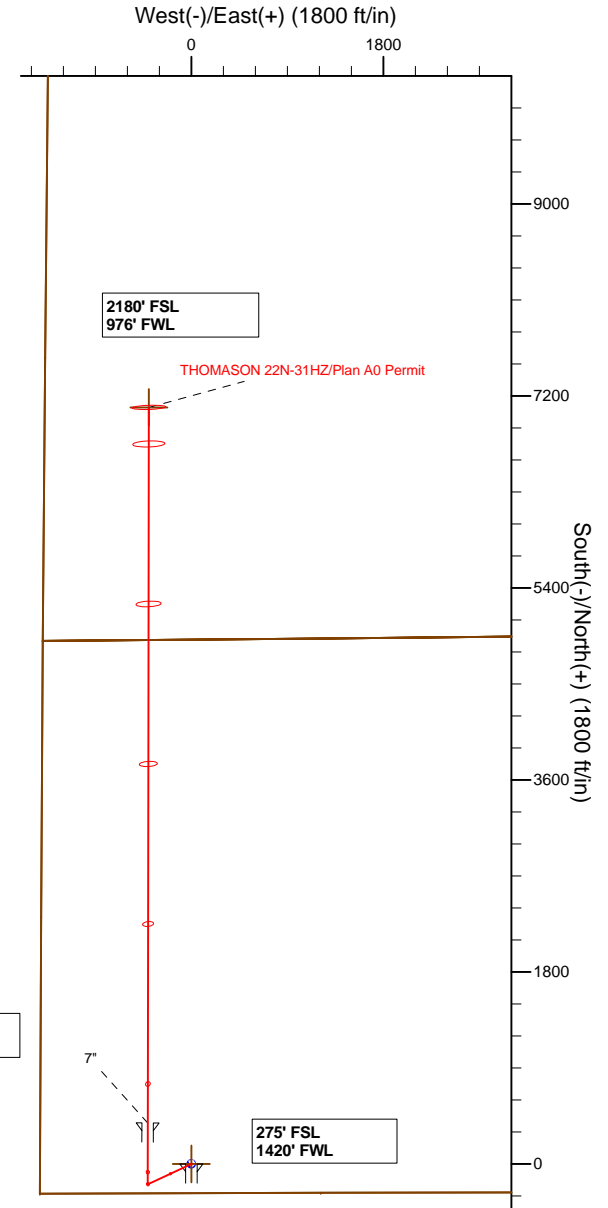
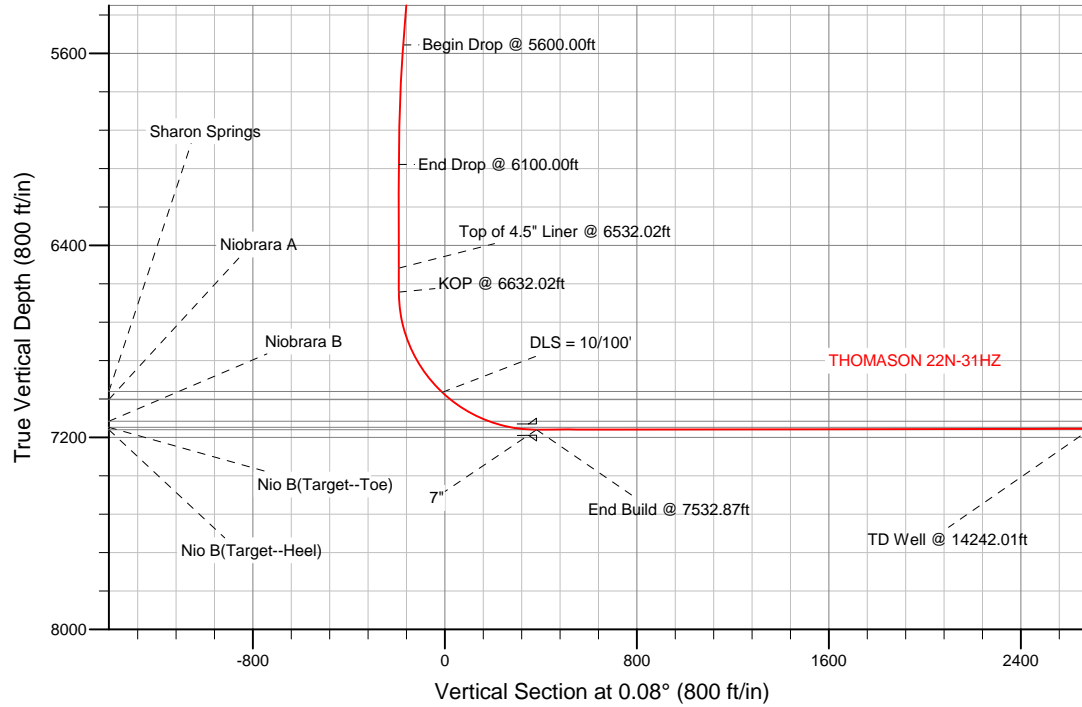


SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3000.00	0.00	0.00	3000.00	0.00	0.00	0.00	0.00	0.00	
3	3500.00	10.00	245.00	3497.47	-18.39	-39.44	2.00	245.00	-18.45	
4	5600.00	10.00	245.00	5565.56	-172.51	-369.94	0.00	0.00	-173.02	
5	6100.00	0.00	0.00	6063.03	-190.90	-409.38	2.00	180.00	-191.47	
6	6632.02	0.00	0.00	6595.05	-190.90	-409.38	0.00	0.00	-191.47	
7	7532.87	90.09	0.08	7168.00	382.91	-408.56	10.00	0.08	382.34	
8	14242.01	90.09	0.08	7158.00	7092.04	-398.97	0.00	0.00	7091.47	Thomason 22N-31HZ_BHL

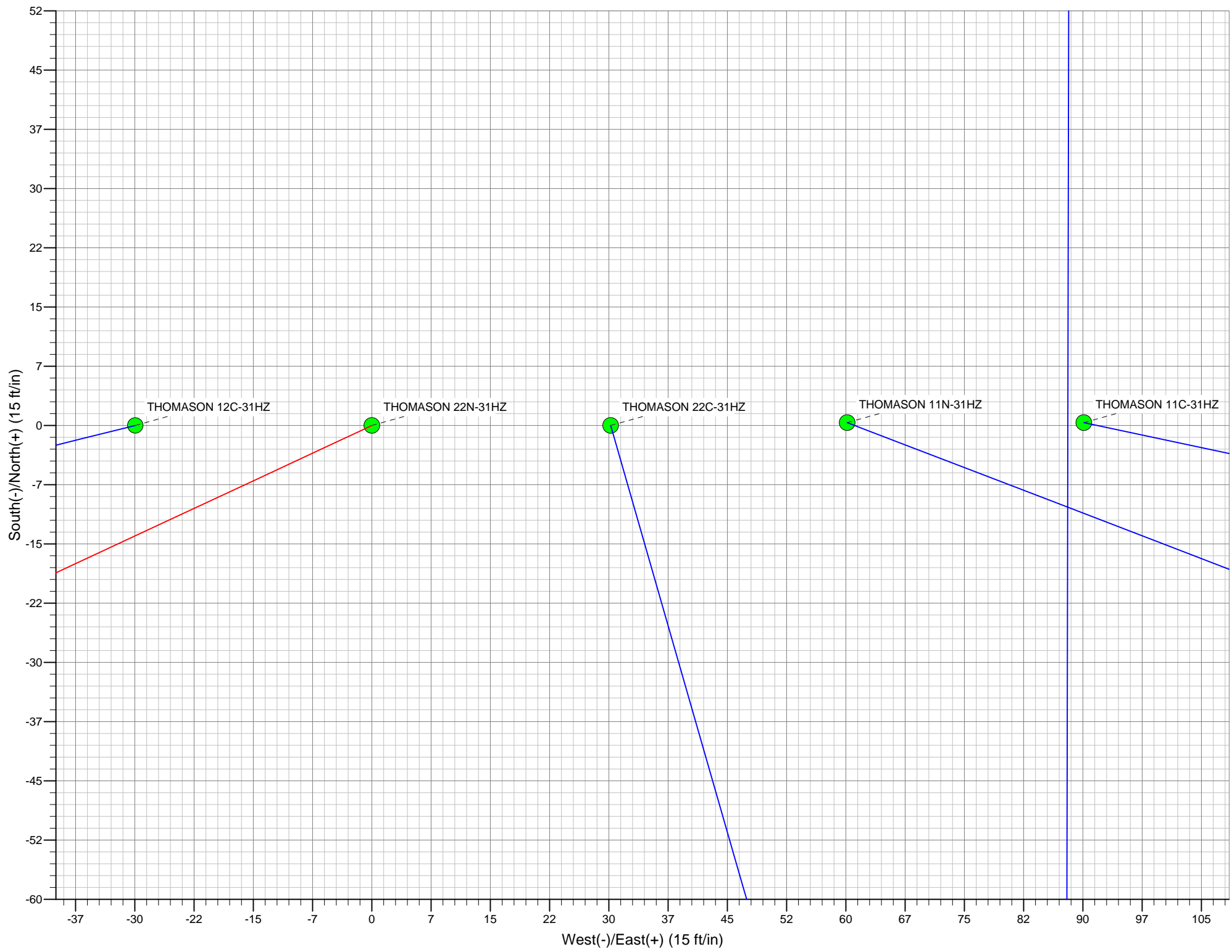
WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Thomason 22N-31HZ_SHL	0.00	0.00	0.00	40.073989	-104.711059	Point
Thomason_Section	0.00	155.08	3534.89	40.074414	-104.698428	Polygon
Thomason 22N-31HZ_BHL	7158.00	7092.04	-398.97	40.093457	-104.712485	Point



TVD	MD	Description
6495.05	6532.02	Top of 4.5" Liner @ 6532.02ft
6595.05	6632.02	KOP @ 6632.02ft

WELL DETAILS: THOMASON 22N-31HZ	
Ground Level:	5001.00
RKB = 17' @ 5018.00ft (Drilling Rig)	
Plan: Plan A0 Permit (THOMASON 22N-31HZ/Plan A)	
Created By: Clint Eshelman	Date: 09/05/2013



Plan Report for THOMASON 22N-31HZ - Plan A0 Permit

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thomason 22N-31HZ_SHL - Thomason_Section										
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
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
1,450.00	0.00	0.00	1,450.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills										
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 3000.00ft										
3,100.00	2.00	245.00	3,099.98	-0.74	-1.58	-0.74	2.00	2.00	0.00	245.00
3,200.00	4.00	245.00	3,199.84	-2.95	-6.32	-2.96	2.00	2.00	0.00	0.00
3,300.00	6.00	245.00	3,299.45	-6.63	-14.22	-6.65	2.00	2.00	0.00	0.00
3,400.00	8.00	245.00	3,398.70	-11.78	-25.27	-11.82	2.00	2.00	0.00	0.00
3,500.00	10.00	245.00	3,497.47	-18.39	-39.44	-18.45	2.00	2.00	0.00	0.00
End Nudge @ 3500.00ft										
3,600.00	10.00	245.00	3,595.95	-25.73	-55.18	-25.81	0.00	0.00	0.00	0.00
3,700.00	10.00	245.00	3,694.43	-33.07	-70.92	-33.17	0.00	0.00	0.00	0.00
3,800.00	10.00	245.00	3,792.91	-40.41	-86.66	-40.53	0.00	0.00	0.00	0.00
3,900.00	10.00	245.00	3,891.39	-47.75	-102.40	-47.89	0.00	0.00	0.00	0.00
4,000.00	10.00	245.00	3,989.87	-55.09	-118.13	-55.25	0.00	0.00	0.00	0.00
4,100.00	10.00	245.00	4,088.35	-62.43	-133.87	-62.61	0.00	0.00	0.00	0.00
4,200.00	10.00	245.00	4,186.83	-69.76	-149.61	-69.97	0.00	0.00	0.00	0.00
4,300.00	10.00	245.00	4,285.31	-77.10	-165.35	-77.33	0.00	0.00	0.00	0.00
4,400.00	10.00	245.00	4,383.79	-84.44	-181.09	-84.69	0.00	0.00	0.00	0.00
4,500.00	10.00	245.00	4,482.27	-91.78	-196.82	-92.06	0.00	0.00	0.00	0.00
4,600.00	10.00	245.00	4,580.75	-99.12	-212.56	-99.42	0.00	0.00	0.00	0.00
4,700.00	10.00	245.00	4,679.23	-106.46	-228.30	-106.78	0.00	0.00	0.00	0.00
4,800.00	10.00	245.00	4,777.72	-113.80	-244.04	-114.14	0.00	0.00	0.00	0.00
4,900.00	10.00	245.00	4,876.20	-121.14	-259.78	-121.50	0.00	0.00	0.00	0.00
5,000.00	10.00	245.00	4,974.68	-128.47	-275.51	-128.86	0.00	0.00	0.00	0.00
5,042.98	10.00	245.00	5,017.00	-131.63	-282.28	-132.02	0.00	0.00	0.00	0.00

Plan Report for THOMASON 22N-31HZ - Plan A0 Permit

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
Sussex										
5,100.00	10.00	245.00	5,073.16	-135.81	-291.25	-136.22	0.00	0.00	0.00	0.00
5,200.00	10.00	245.00	5,171.64	-143.15	-306.99	-143.58	0.00	0.00	0.00	0.00
5,300.00	10.00	245.00	5,270.12	-150.49	-322.73	-150.94	0.00	0.00	0.00	0.00
5,400.00	10.00	245.00	5,368.60	-157.83	-338.46	-158.30	0.00	0.00	0.00	0.00
5,500.00	10.00	245.00	5,467.08	-165.17	-354.20	-165.66	0.00	0.00	0.00	0.00
5,600.00	10.00	245.00	5,565.56	-172.51	-369.94	-173.02	0.00	0.00	0.00	0.00
Begin Drop @ 5600.00ft										
5,700.00	8.00	245.00	5,664.33	-179.12	-384.12	-179.65	2.00	-2.00	0.00	180.00
5,800.00	6.00	245.00	5,763.58	-184.27	-395.16	-184.82	2.00	-2.00	0.00	180.00
5,900.00	4.00	245.00	5,863.19	-187.95	-403.06	-188.51	2.00	-2.00	0.00	180.00
6,000.00	2.00	245.00	5,963.05	-190.16	-407.80	-190.73	2.00	-2.00	0.00	180.00
6,100.00	0.00	0.00	6,063.03	-190.90	-409.38	-191.47	2.00	-2.00	0.00	180.00
End Drop @ 6100.00ft										
6,200.00	0.00	0.00	6,163.03	-190.90	-409.38	-191.47	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,263.03	-190.90	-409.38	-191.47	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,363.03	-190.90	-409.38	-191.47	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,463.03	-190.90	-409.38	-191.47	0.00	0.00	0.00	0.00
6,532.02	0.00	0.00	6,495.05	-190.90	-409.38	-191.47	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6532.02ft										
6,600.00	0.00	0.00	6,563.03	-190.90	-409.38	-191.47	0.00	0.00	0.00	0.00
6,632.02	0.00	0.00	6,595.05	-190.90	-409.38	-191.47	0.00	0.00	0.00	0.00
KOP @ 6632.02ft										
6,700.00	6.80	0.08	6,662.87	-186.87	-409.38	-187.44	10.00	10.00	0.00	0.08
6,800.00	16.80	0.08	6,760.63	-166.45	-409.35	-167.02	10.00	10.00	0.00	0.00
6,900.00	26.80	0.08	6,853.36	-129.36	-409.30	-129.94	10.00	10.00	0.00	0.00
7,000.00	36.80	0.08	6,938.25	-76.74	-409.22	-77.31	10.00	10.00	0.00	0.00
7,094.62	46.26	0.08	7,009.00	-14.08	-409.13	-14.65	10.00	10.00	0.00	0.00
Sharon Springs										
7,100.00	46.80	0.08	7,012.70	-10.17	-409.13	-10.74	10.00	10.00	0.00	0.00
DLS = 10/100'										
7,146.30	51.43	0.08	7,043.00	24.82	-409.08	24.25	10.00	10.00	0.00	0.00
Niobrara A										
7,200.00	56.80	0.08	7,074.47	68.31	-409.01	67.74	10.00	10.00	0.00	0.00
7,300.00	66.80	0.08	7,121.66	156.33	-408.89	155.76	10.00	10.00	0.00	0.00
7,330.70	69.87	0.08	7,133.00	184.86	-408.85	184.29	10.00	10.00	0.00	0.00
Niobrara B										
7,400.00	76.80	0.08	7,152.86	251.20	-408.75	250.63	10.00	10.00	0.00	0.00
7,500.00	86.80	0.08	7,167.11	350.05	-408.61	349.48	10.00	10.00	0.00	0.00
7,532.87	90.09	0.08	7,168.00	382.91	-408.56	382.34	10.00	10.00	0.00	0.00
End Build @ 7532.87ft - Nio B(Target--Heel) - 7"										
7,600.00	90.09	0.08	7,167.90	450.04	-408.47	449.47	0.00	0.00	0.00	0.00
7,700.00	90.09	0.08	7,167.76	550.04	-408.33	549.47	0.00	0.00	0.00	0.00
7,800.00	90.09	0.08	7,167.61	650.04	-408.18	649.47	0.00	0.00	0.00	0.00
7,900.00	90.09	0.08	7,167.46	750.04	-408.04	749.47	0.00	0.00	0.00	0.00
8,000.00	90.09	0.08	7,167.31	850.04	-407.90	849.47	0.00	0.00	0.00	0.00
8,100.00	90.09	0.08	7,167.16	950.04	-407.75	949.47	0.00	0.00	0.00	0.00
8,200.00	90.09	0.08	7,167.01	1,050.04	-407.61	1,049.47	0.00	0.00	0.00	0.00
8,300.00	90.09	0.08	7,166.86	1,150.04	-407.47	1,149.47	0.00	0.00	0.00	0.00
8,400.00	90.09	0.08	7,166.71	1,250.04	-407.32	1,249.47	0.00	0.00	0.00	0.00
8,500.00	90.09	0.08	7,166.56	1,350.04	-407.18	1,349.47	0.00	0.00	0.00	0.00
8,600.00	90.09	0.08	7,166.41	1,450.04	-407.04	1,449.47	0.00	0.00	0.00	0.00
8,700.00	90.09	0.08	7,166.26	1,550.04	-406.89	1,549.47	0.00	0.00	0.00	0.00
8,800.00	90.09	0.08	7,166.11	1,650.04	-406.75	1,649.47	0.00	0.00	0.00	0.00
8,900.00	90.09	0.08	7,165.97	1,750.03	-406.61	1,749.47	0.00	0.00	0.00	0.00
9,000.00	90.09	0.08	7,165.82	1,850.03	-406.47	1,849.47	0.00	0.00	0.00	0.00
9,100.00	90.09	0.08	7,165.67	1,950.03	-406.32	1,949.47	0.00	0.00	0.00	0.00
9,200.00	90.09	0.08	7,165.52	2,050.03	-406.18	2,049.47	0.00	0.00	0.00	0.00

Plan Report for THOMASON 22N-31HZ - Plan A0 Permit

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
9,300.00	90.09	0.08	7,165.37	2,150.03	-406.04	2,149.47	0.00	0.00	0.00	0.00
9,400.00	90.09	0.08	7,165.22	2,250.03	-405.89	2,249.46	0.00	0.00	0.00	0.00
9,500.00	90.09	0.08	7,165.07	2,350.03	-405.75	2,349.46	0.00	0.00	0.00	0.00
9,600.00	90.09	0.08	7,164.92	2,450.03	-405.61	2,449.46	0.00	0.00	0.00	0.00
9,700.00	90.09	0.08	7,164.77	2,550.03	-405.46	2,549.46	0.00	0.00	0.00	0.00
9,800.00	90.09	0.08	7,164.62	2,650.03	-405.32	2,649.46	0.00	0.00	0.00	0.00
9,900.00	90.09	0.08	7,164.47	2,750.03	-405.18	2,749.46	0.00	0.00	0.00	0.00
10,000.00	90.09	0.08	7,164.33	2,850.03	-405.03	2,849.46	0.00	0.00	0.00	0.00
10,100.00	90.09	0.08	7,164.18	2,950.03	-404.89	2,949.46	0.00	0.00	0.00	0.00
10,200.00	90.09	0.08	7,164.03	3,050.03	-404.75	3,049.46	0.00	0.00	0.00	0.00
10,300.00	90.09	0.08	7,163.88	3,150.03	-404.61	3,149.46	0.00	0.00	0.00	0.00
10,400.00	90.09	0.08	7,163.73	3,250.03	-404.46	3,249.46	0.00	0.00	0.00	0.00
10,500.00	90.09	0.08	7,163.58	3,350.03	-404.32	3,349.46	0.00	0.00	0.00	0.00
10,600.00	90.09	0.08	7,163.43	3,450.03	-404.18	3,449.46	0.00	0.00	0.00	0.00
10,700.00	90.09	0.08	7,163.28	3,550.03	-404.03	3,549.46	0.00	0.00	0.00	0.00
10,800.00	90.09	0.08	7,163.13	3,650.03	-403.89	3,649.46	0.00	0.00	0.00	0.00
10,900.00	90.09	0.08	7,162.98	3,750.03	-403.75	3,749.46	0.00	0.00	0.00	0.00
11,000.00	90.09	0.08	7,162.83	3,850.03	-403.60	3,849.46	0.00	0.00	0.00	0.00
11,100.00	90.09	0.08	7,162.69	3,950.03	-403.46	3,949.46	0.00	0.00	0.00	0.00
11,200.00	90.09	0.08	7,162.54	4,050.03	-403.32	4,049.46	0.00	0.00	0.00	0.00
11,300.00	90.09	0.08	7,162.39	4,150.03	-403.18	4,149.46	0.00	0.00	0.00	0.00
11,400.00	90.09	0.08	7,162.24	4,250.03	-403.03	4,249.46	0.00	0.00	0.00	0.00
11,500.00	90.09	0.08	7,162.09	4,350.03	-402.89	4,349.46	0.00	0.00	0.00	0.00
11,600.00	90.09	0.08	7,161.94	4,450.03	-402.75	4,449.46	0.00	0.00	0.00	0.00
11,700.00	90.09	0.08	7,161.79	4,550.03	-402.60	4,549.46	0.00	0.00	0.00	0.00
11,800.00	90.09	0.08	7,161.64	4,650.03	-402.46	4,649.46	0.00	0.00	0.00	0.00
11,900.00	90.09	0.08	7,161.49	4,750.03	-402.32	4,749.46	0.00	0.00	0.00	0.00
12,000.00	90.09	0.08	7,161.34	4,850.03	-402.17	4,849.46	0.00	0.00	0.00	0.00
12,100.00	90.09	0.08	7,161.19	4,950.03	-402.03	4,949.46	0.00	0.00	0.00	0.00
12,200.00	90.09	0.08	7,161.04	5,050.03	-401.89	5,049.46	0.00	0.00	0.00	0.00
12,300.00	90.09	0.08	7,160.90	5,150.03	-401.74	5,149.46	0.00	0.00	0.00	0.00
12,400.00	90.09	0.08	7,160.75	5,250.03	-401.60	5,249.46	0.00	0.00	0.00	0.00
12,500.00	90.09	0.08	7,160.60	5,350.03	-401.46	5,349.46	0.00	0.00	0.00	0.00
12,600.00	90.09	0.08	7,160.45	5,450.03	-401.32	5,449.46	0.00	0.00	0.00	0.00
12,700.00	90.09	0.08	7,160.30	5,550.03	-401.17	5,549.46	0.00	0.00	0.00	0.00
12,800.00	90.09	0.08	7,160.15	5,650.03	-401.03	5,649.46	0.00	0.00	0.00	0.00
12,900.00	90.09	0.08	7,160.00	5,750.03	-400.89	5,749.46	0.00	0.00	0.00	0.00
13,000.00	90.09	0.08	7,159.85	5,850.03	-400.74	5,849.46	0.00	0.00	0.00	0.00
13,100.00	90.09	0.08	7,159.70	5,950.03	-400.60	5,949.46	0.00	0.00	0.00	0.00
13,200.00	90.09	0.08	7,159.55	6,050.03	-400.46	6,049.46	0.00	0.00	0.00	0.00
13,300.00	90.09	0.08	7,159.40	6,150.03	-400.31	6,149.46	0.00	0.00	0.00	0.00
13,400.00	90.09	0.08	7,159.26	6,250.03	-400.17	6,249.46	0.00	0.00	0.00	0.00
13,500.00	90.09	0.08	7,159.11	6,350.03	-400.03	6,349.46	0.00	0.00	0.00	0.00
13,600.00	90.09	0.08	7,158.96	6,450.02	-399.89	6,449.46	0.00	0.00	0.00	0.00
13,700.00	90.09	0.08	7,158.81	6,550.02	-399.74	6,549.46	0.00	0.00	0.00	0.00
13,800.00	90.09	0.08	7,158.66	6,650.02	-399.60	6,649.46	0.00	0.00	0.00	0.00
13,900.00	90.09	0.08	7,158.51	6,750.02	-399.46	6,749.46	0.00	0.00	0.00	0.00
14,000.00	90.09	0.08	7,158.36	6,850.02	-399.31	6,849.46	0.00	0.00	0.00	0.00
14,100.00	90.09	0.08	7,158.21	6,950.02	-399.17	6,949.46	0.00	0.00	0.00	0.00
14,200.00	90.09	0.08	7,158.06	7,050.02	-399.03	7,049.46	0.00	0.00	0.00	0.00
14,242.01	90.09	0.08	7,158.00	7,092.03	-398.97	7,091.47	0.00	0.00	0.00	0.00

TD Well @ 14242.01ft - Nio B(Target--Toe) - Thomason 22N-31HZ_BHL

Plan Report for THOMASON 22N-31HZ - Plan A0 Permit**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
3,000.00	3,000.00	0.00	0.00	Begin Nudge @ 3000.00ft
3,500.00	3,497.47	-18.39	-39.44	End Nudge @ 3500.00ft
5,600.00	5,565.56	-172.51	-369.94	Begin Drop @ 5600.00ft
6,100.00	6,063.03	-190.90	-409.38	End Drop @ 6100.00ft
6,532.02	6,495.05	-190.90	-409.38	Top of 4.5" Liner @ 6532.02ft
6,632.02	6,595.05	-190.90	-409.38	KOP @ 6632.02ft
7,100.00	7,012.70	-10.17	-409.13	DLS = 10/100'
7,532.87	7,168.00	382.91	-408.56	End Build @ 7532.87ft
14,242.01	7,158.00	7,092.03	-398.97	TD Well @ 14242.01ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N_S (ft)	+E-W (ft)	
User	No Target (Freehand)	0.08	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	7,532.87	Plan A0 Permit	MWD
7,532.87	14,242.01	Plan A0 Permit	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,500.00	1,500.00	9 5/8"	9-5/8	13-1/2
7,532.87	7,168.00	7"	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,450.00	1,450.00	Fox Hills		0.00	
5,042.98	5,017.00	Sussex		0.00	
7,094.62	7,009.00	Sharon Springs		0.00	
7,146.30	7,043.00	Niobrara A		0.00	
7,330.70	7,133.00	Niobrara B		0.00	
7,532.87	7,168.00	Nio B(Target--Heel)		0.00	
14,242.01	7,158.00	Nio B(Target--Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N-S (ft)	+E-W (ft)	Shape
Thomason_Section	0.00	155.08	3,534.89	Polygon
Thomason 22N-31HZ_SHL	0.00	0.00	0.00	Point
Thomason 22N-31HZ_BHL	7,158.00	7,092.04	-398.97	Point

North Reference Sheet for Sec. 6-T1N-R65W - THOMASON 22N-31HZ - Plan A

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' @ 5018.00ft (Drilling Rig). Northing and Easting are relative to THOMASON 22N-31HZ
 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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996158

Grid Coordinates of Well: 1,270,781.34 ft N, 3,220,781.95 ft E
 Geographical Coordinates of Well: 40° 04' 26.36" N, 104° 42' 39.81" W
 Grid Convergence at Surface is: 0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,242.01ft
 the Bottom Hole Displacement is 7,103.25ft in the Direction of 356.78° (True).

Magnetic Convergence at surface is: -8.03° (6 September 2013, , BGGM2013)

