

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 6-T1N-R65W

THOMASON 22C-31HZ

Plan A

Plan: Plan A0 Permit

Sperry Drilling Services

Proposal Report

06 September, 2013

Well Coordinates: 1,270,781.62 N, 3,220,812.17 E (40° 04' 26.36" N, 104° 42' 39.42" W)

Ground Level: 5,001.00 ft

Local Coordinate Origin: Centered on Well THOMASON 22C-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 22C-31HZ
 Wellbore: Plan A
 Design: Plan A0 Permit

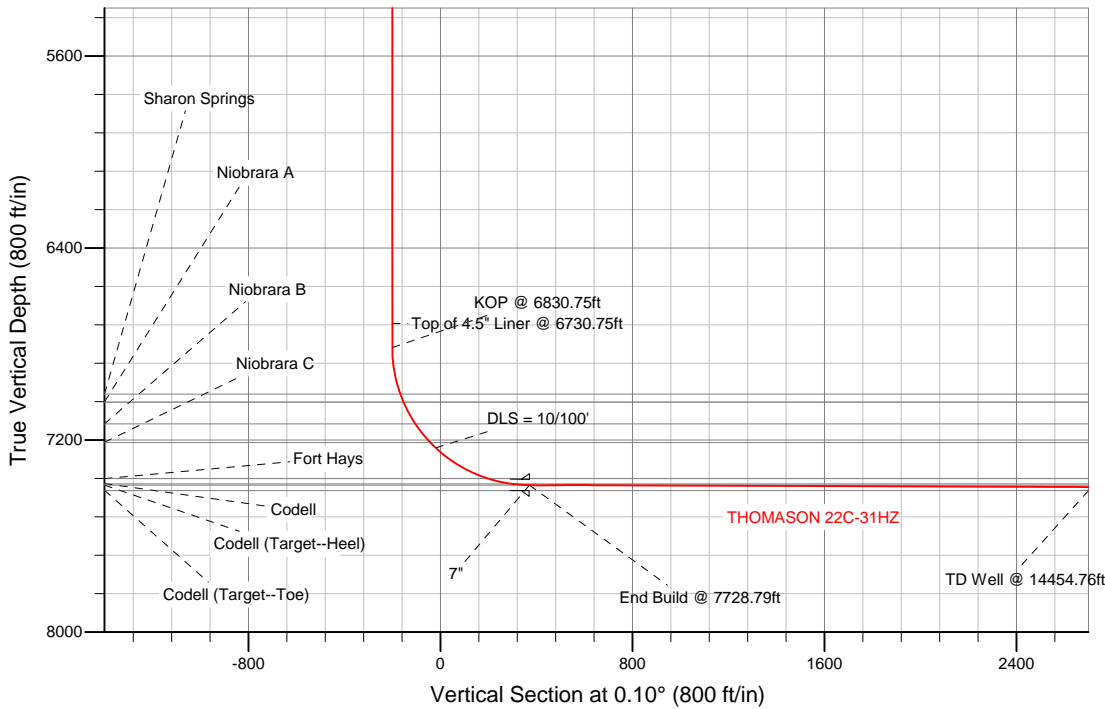


SECTION DETAILS

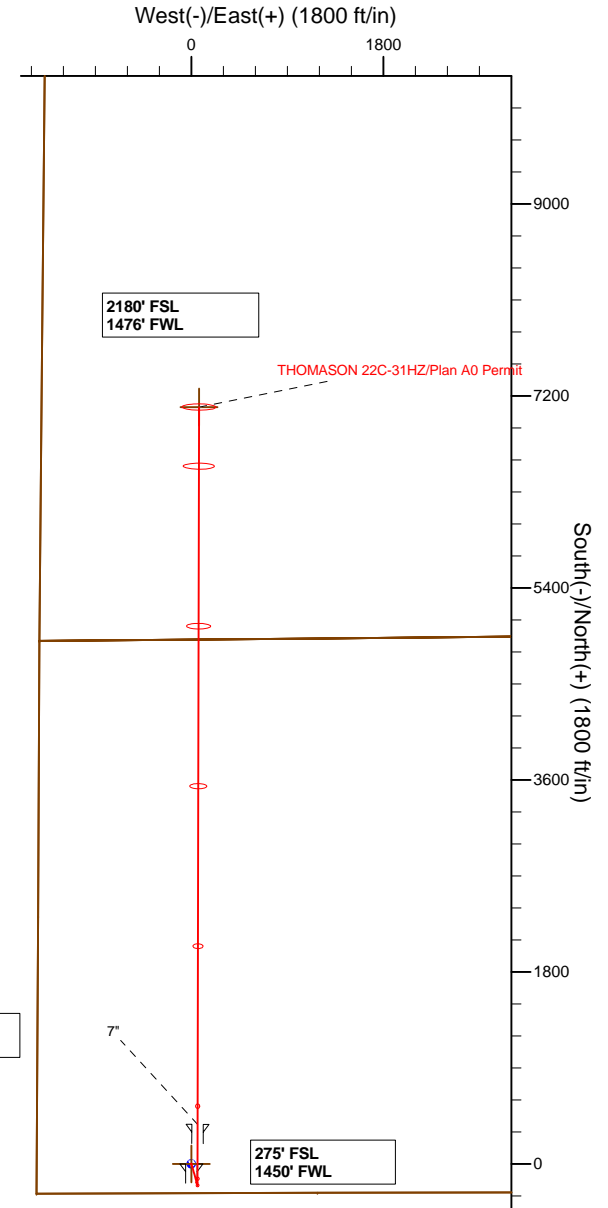
Sec	MD	Inc	Azi	TVD	+N-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3200.00	0.00	0.00	3200.00	0.00	0.00	0.00	0.00	0.00	
3	3700.00	10.00	164.00	3697.47	-41.84	12.00	2.00	164.00	-41.82	
4	4400.00	10.00	164.00	4386.83	-158.68	45.50	0.00	0.00	-158.60	
5	4900.00	0.00	0.00	4884.30	-200.52	57.50	2.00	180.00	-200.42	
6	6830.75	0.00	0.00	6815.05	-200.52	57.50	0.00	0.00	-200.42	
7	7728.79	89.80	0.10	7388.00	370.48	58.54	10.00	0.10	370.58	
8	14454.76	89.80	0.10	7411.00	7096.40	70.78	0.00	0.00	7096.51	Thomason 22C-31HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

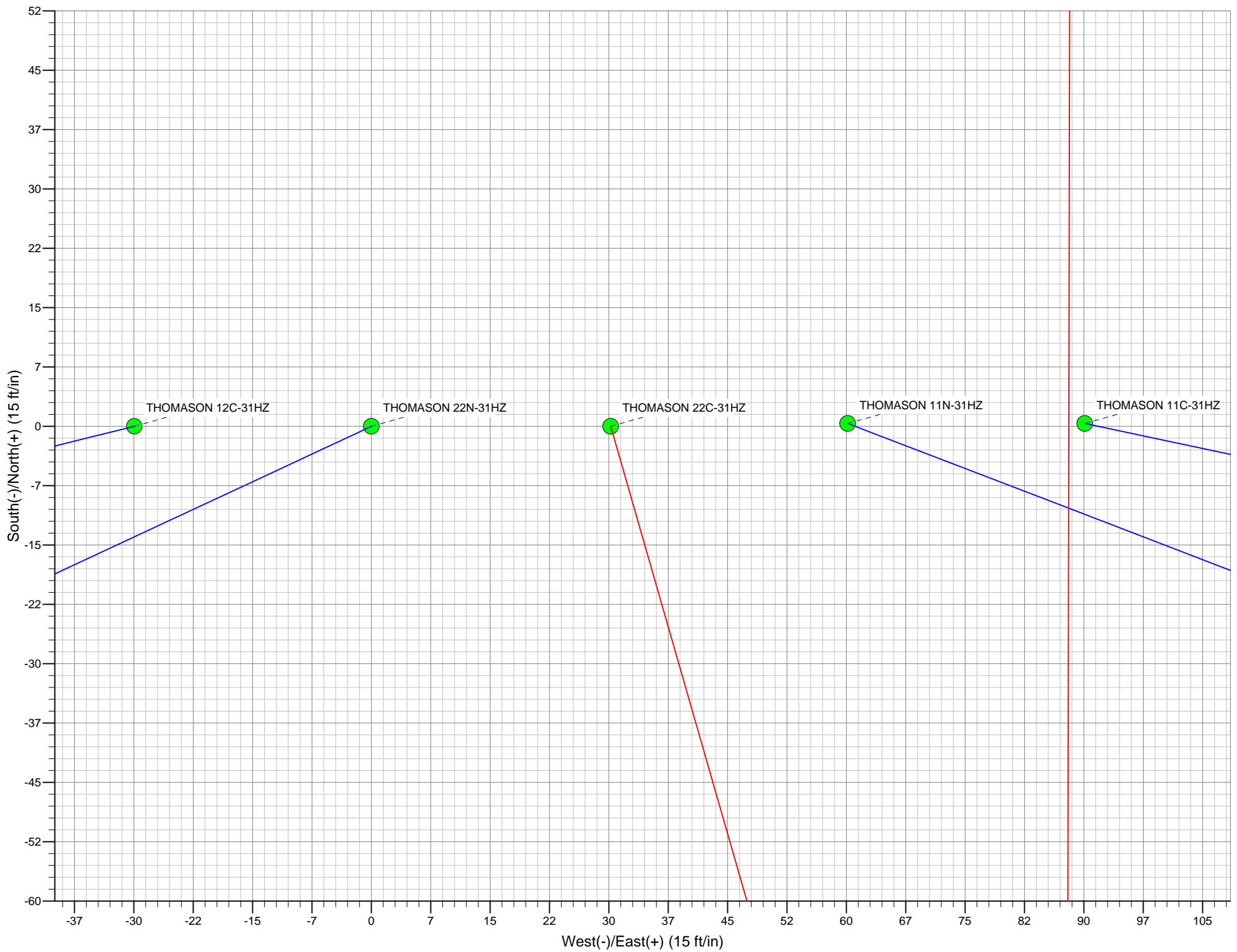
Name	TVD	+N-S	+E/-W	Latitude	Longitude	Shape
Thomason 22C-31HZ_SHL	0.00	0.00	0.00	40.073989	-104.710951	Point
Thomason_Section	0.00	155.06	3504.67	40.074414	-104.698428	Polygon
Thomason 22C-31HZ_BHL	7411.00	7096.40	70.78	40.093469	-104.710698	Point



TVD	MD	Description
6715.05	6730.75	Top of 4.5" Liner @ 6730.75ft
6815.05	6830.75	KOP @ 6830.75ft



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



Plan Report for THOMASON 22C-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 22C-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
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 3200.00ft										
3,300.00	2.00	164.00	3,299.98	-1.68	0.48	-1.68	2.00	2.00	0.00	164.00
3,400.00	4.00	164.00	3,399.84	-6.71	1.92	-6.70	2.00	2.00	0.00	0.00
3,500.00	6.00	164.00	3,499.45	-15.09	4.33	-15.08	2.00	2.00	0.00	0.00
3,600.00	8.00	164.00	3,598.70	-26.80	7.68	-26.79	2.00	2.00	0.00	0.00
3,700.00	10.00	164.00	3,697.47	-41.84	12.00	-41.82	2.00	2.00	0.00	0.00
End Nudge @ 3700.00ft										
3,800.00	10.00	164.00	3,795.95	-58.53	16.78	-58.50	0.00	0.00	0.00	0.00
3,900.00	10.00	164.00	3,894.43	-75.22	21.57	-75.18	0.00	0.00	0.00	0.00
4,000.00	10.00	164.00	3,992.91	-91.91	26.36	-91.87	0.00	0.00	0.00	0.00
4,100.00	10.00	164.00	4,091.39	-108.61	31.14	-108.55	0.00	0.00	0.00	0.00
4,200.00	10.00	164.00	4,189.87	-125.30	35.93	-125.23	0.00	0.00	0.00	0.00
4,300.00	10.00	164.00	4,288.35	-141.99	40.71	-141.92	0.00	0.00	0.00	0.00
4,400.00	10.00	164.00	4,386.83	-158.68	45.50	-158.60	0.00	0.00	0.00	0.00
Begin Drop @ 4400.00ft										
4,500.00	8.00	164.00	4,485.59	-173.72	49.81	-173.63	2.00	-2.00	0.00	180.00
4,600.00	6.00	164.00	4,584.84	-185.43	53.17	-185.34	2.00	-2.00	0.00	180.00
4,700.00	4.00	164.00	4,684.46	-193.81	55.57	-193.71	2.00	-2.00	0.00	180.00
4,800.00	2.00	164.00	4,784.32	-198.84	57.02	-198.74	2.00	-2.00	0.00	180.00
4,900.00	0.00	0.00	4,884.30	-200.52	57.50	-200.42	2.00	-2.00	0.00	-180.00

Plan Report for THOMASON 22C-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 (°)
End Drop @ 4900.00ft										
5,000.00	0.00	0.00	4,984.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
5,032.70	0.00	0.00	5,017.00	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
Sussex										
5,100.00	0.00	0.00	5,084.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,184.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,284.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,384.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,484.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,584.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,684.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,784.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,884.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,984.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,084.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,184.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,284.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,384.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,484.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,584.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,684.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,730.75	0.00	0.00	6,715.05	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6730.75ft										
6,800.00	0.00	0.00	6,784.30	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
6,830.75	0.00	0.00	6,815.05	-200.52	57.50	-200.42	0.00	0.00	0.00	0.00
KOP @ 6830.75ft										
6,900.00	6.93	0.10	6,884.13	-196.34	57.51	-196.24	10.00	10.00	0.00	0.10
7,000.00	16.93	0.10	6,981.85	-175.70	57.54	-175.60	10.00	10.00	0.00	0.00
7,028.61	19.79	0.10	7,009.00	-166.69	57.56	-166.59	10.00	10.00	0.00	0.00
Sharon Springs										
7,065.19	23.44	0.10	7,043.00	-153.22	57.58	-153.12	10.00	10.00	0.00	0.00
Niobrara A										
7,100.00	26.93	0.10	7,074.50	-138.41	57.61	-138.31	10.00	10.00	0.00	0.00
7,167.81	33.71	0.10	7,133.00	-104.20	57.67	-104.10	10.00	10.00	0.00	0.00
Niobrara B										
7,200.00	36.93	0.10	7,159.26	-85.60	57.71	-85.50	10.00	10.00	0.00	0.00
7,267.90	43.71	0.10	7,211.00	-41.69	57.79	-41.59	10.00	10.00	0.00	0.00
Niobrara C										
7,300.00	46.93	0.10	7,233.57	-18.87	57.83	-18.76	10.00	10.00	0.00	0.00
DLS = 10/100'										
7,400.00	56.93	0.10	7,295.16	59.76	57.97	59.86	10.00	10.00	0.00	0.00
7,500.00	66.93	0.10	7,342.16	147.88	58.13	147.98	10.00	10.00	0.00	0.00
7,554.14	72.34	0.10	7,361.00	198.61	58.22	198.72	10.00	10.00	0.00	0.00
Fort Hays										
7,600.00	76.93	0.10	7,373.15	242.82	58.30	242.92	10.00	10.00	0.00	0.00
7,654.97	82.42	0.10	7,383.00	296.88	58.40	296.98	10.00	10.00	0.00	0.00
Codell										
7,700.00	86.93	0.10	7,387.18	341.70	58.48	341.81	10.00	10.00	0.00	0.00
7,728.79	89.80	0.10	7,388.00	370.48	58.54	370.58	10.00	10.00	0.00	0.00
End Build @ 7728.79ft - Codell (Target--Heel) - 7"										
7,800.00	89.80	0.10	7,388.24	441.69	58.67	441.79	0.00	0.00	0.00	0.00
7,900.00	89.80	0.10	7,388.59	541.69	58.85	541.79	0.00	0.00	0.00	0.00
8,000.00	89.80	0.10	7,388.93	641.69	59.03	641.79	0.00	0.00	0.00	0.00
8,100.00	89.80	0.10	7,389.27	741.69	59.21	741.79	0.00	0.00	0.00	0.00
8,200.00	89.80	0.10	7,389.61	841.69	59.40	841.79	0.00	0.00	0.00	0.00
8,300.00	89.80	0.10	7,389.95	941.68	59.58	941.79	0.00	0.00	0.00	0.00
8,400.00	89.80	0.10	7,390.30	1,041.68	59.76	1,041.79	0.00	0.00	0.00	0.00
8,500.00	89.80	0.10	7,390.64	1,141.68	59.94	1,141.79	0.00	0.00	0.00	0.00

Plan Report for THOMASON 22C-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 (°)
8,600.00	89.80	0.10	7,390.98	1,241.68	60.12	1,241.79	0.00	0.00	0.00	0.00
8,700.00	89.80	0.10	7,391.32	1,341.68	60.31	1,341.78	0.00	0.00	0.00	0.00
8,800.00	89.80	0.10	7,391.66	1,441.68	60.49	1,441.78	0.00	0.00	0.00	0.00
8,900.00	89.80	0.10	7,392.01	1,541.68	60.67	1,541.78	0.00	0.00	0.00	0.00
9,000.00	89.80	0.10	7,392.35	1,641.68	60.85	1,641.78	0.00	0.00	0.00	0.00
9,100.00	89.80	0.10	7,392.69	1,741.68	61.03	1,741.78	0.00	0.00	0.00	0.00
9,200.00	89.80	0.10	7,393.03	1,841.68	61.22	1,841.78	0.00	0.00	0.00	0.00
9,300.00	89.80	0.10	7,393.37	1,941.68	61.40	1,941.78	0.00	0.00	0.00	0.00
9,400.00	89.80	0.10	7,393.72	2,041.68	61.58	2,041.78	0.00	0.00	0.00	0.00
9,500.00	89.80	0.10	7,394.06	2,141.68	61.76	2,141.78	0.00	0.00	0.00	0.00
9,600.00	89.80	0.10	7,394.40	2,241.67	61.94	2,241.78	0.00	0.00	0.00	0.00
9,700.00	89.80	0.10	7,394.74	2,341.67	62.13	2,341.78	0.00	0.00	0.00	0.00
9,800.00	89.80	0.10	7,395.08	2,441.67	62.31	2,441.78	0.00	0.00	0.00	0.00
9,900.00	89.80	0.10	7,395.43	2,541.67	62.49	2,541.78	0.00	0.00	0.00	0.00
10,000.00	89.80	0.10	7,395.77	2,641.67	62.67	2,641.78	0.00	0.00	0.00	0.00
10,100.00	89.80	0.10	7,396.11	2,741.67	62.86	2,741.78	0.00	0.00	0.00	0.00
10,200.00	89.80	0.10	7,396.45	2,841.67	63.04	2,841.78	0.00	0.00	0.00	0.00
10,300.00	89.80	0.10	7,396.79	2,941.67	63.22	2,941.78	0.00	0.00	0.00	0.00
10,400.00	89.80	0.10	7,397.13	3,041.67	63.40	3,041.77	0.00	0.00	0.00	0.00
10,500.00	89.80	0.10	7,397.48	3,141.67	63.58	3,141.77	0.00	0.00	0.00	0.00
10,600.00	89.80	0.10	7,397.82	3,241.67	63.77	3,241.77	0.00	0.00	0.00	0.00
10,700.00	89.80	0.10	7,398.16	3,341.67	63.95	3,341.77	0.00	0.00	0.00	0.00
10,800.00	89.80	0.10	7,398.50	3,441.67	64.13	3,441.77	0.00	0.00	0.00	0.00
10,900.00	89.80	0.10	7,398.84	3,541.66	64.31	3,541.77	0.00	0.00	0.00	0.00
11,000.00	89.80	0.10	7,399.19	3,641.66	64.49	3,641.77	0.00	0.00	0.00	0.00
11,100.00	89.80	0.10	7,399.53	3,741.66	64.68	3,741.77	0.00	0.00	0.00	0.00
11,200.00	89.80	0.10	7,399.87	3,841.66	64.86	3,841.77	0.00	0.00	0.00	0.00
11,300.00	89.80	0.10	7,400.21	3,941.66	65.04	3,941.77	0.00	0.00	0.00	0.00
11,400.00	89.80	0.10	7,400.55	4,041.66	65.22	4,041.77	0.00	0.00	0.00	0.00
11,500.00	89.80	0.10	7,400.90	4,141.66	65.40	4,141.77	0.00	0.00	0.00	0.00
11,600.00	89.80	0.10	7,401.24	4,241.66	65.59	4,241.77	0.00	0.00	0.00	0.00
11,700.00	89.80	0.10	7,401.58	4,341.66	65.77	4,341.77	0.00	0.00	0.00	0.00
11,800.00	89.80	0.10	7,401.92	4,441.66	65.95	4,441.77	0.00	0.00	0.00	0.00
11,900.00	89.80	0.10	7,402.26	4,541.66	66.13	4,541.77	0.00	0.00	0.00	0.00
12,000.00	89.80	0.10	7,402.61	4,641.66	66.31	4,641.77	0.00	0.00	0.00	0.00
12,100.00	89.80	0.10	7,402.95	4,741.66	66.50	4,741.76	0.00	0.00	0.00	0.00
12,200.00	89.80	0.10	7,403.29	4,841.66	66.68	4,841.76	0.00	0.00	0.00	0.00
12,300.00	89.80	0.10	7,403.63	4,941.65	66.86	4,941.76	0.00	0.00	0.00	0.00
12,400.00	89.80	0.10	7,403.97	5,041.65	67.04	5,041.76	0.00	0.00	0.00	0.00
12,500.00	89.80	0.10	7,404.32	5,141.65	67.23	5,141.76	0.00	0.00	0.00	0.00
12,600.00	89.80	0.10	7,404.66	5,241.65	67.41	5,241.76	0.00	0.00	0.00	0.00
12,700.00	89.80	0.10	7,405.00	5,341.65	67.59	5,341.76	0.00	0.00	0.00	0.00
12,800.00	89.80	0.10	7,405.34	5,441.65	67.77	5,441.76	0.00	0.00	0.00	0.00
12,900.00	89.80	0.10	7,405.68	5,541.65	67.95	5,541.76	0.00	0.00	0.00	0.00
13,000.00	89.80	0.10	7,406.03	5,641.65	68.14	5,641.76	0.00	0.00	0.00	0.00
13,100.00	89.80	0.10	7,406.37	5,741.65	68.32	5,741.76	0.00	0.00	0.00	0.00
13,200.00	89.80	0.10	7,406.71	5,841.65	68.50	5,841.76	0.00	0.00	0.00	0.00
13,300.00	89.80	0.10	7,407.05	5,941.65	68.68	5,941.76	0.00	0.00	0.00	0.00
13,400.00	89.80	0.10	7,407.39	6,041.65	68.86	6,041.76	0.00	0.00	0.00	0.00
13,500.00	89.80	0.10	7,407.74	6,141.65	69.05	6,141.76	0.00	0.00	0.00	0.00
13,600.00	89.80	0.10	7,408.08	6,241.64	69.23	6,241.76	0.00	0.00	0.00	0.00
13,700.00	89.80	0.10	7,408.42	6,341.64	69.41	6,341.76	0.00	0.00	0.00	0.00
13,800.00	89.80	0.10	7,408.76	6,441.64	69.59	6,441.75	0.00	0.00	0.00	0.00
13,900.00	89.80	0.10	7,409.10	6,541.64	69.77	6,541.75	0.00	0.00	0.00	0.00
14,000.00	89.80	0.10	7,409.44	6,641.64	69.96	6,641.75	0.00	0.00	0.00	0.00
14,100.00	89.80	0.10	7,409.79	6,741.64	70.14	6,741.75	0.00	0.00	0.00	0.00
14,200.00	89.80	0.10	7,410.13	6,841.64	70.32	6,841.75	0.00	0.00	0.00	0.00
14,300.00	89.80	0.10	7,410.47	6,941.64	70.50	6,941.75	0.00	0.00	0.00	0.00
14,400.00	89.80	0.10	7,410.81	7,041.64	70.68	7,041.75	0.00	0.00	0.00	0.00
14,454.75	89.80	0.10	7,411.00	7,096.39	70.78	7,096.50	0.00	0.00	0.00	0.00

Plan Report for THOMASON 22C-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 (°)
Codell (Target--Toe)										
14,454.76	89.80	0.10	7,411.00	7,096.40	70.78	7,096.51	0.00	0.00	0.00	0.00
Thomason 22C-31HZ_BHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,200.00	3,200.00	0.00	0.00	Begin Nudge @ 3200.00ft
3,700.00	3,697.47	-41.84	12.00	End Nudge @ 3700.00ft
4,400.00	4,386.83	-158.68	45.50	Begin Drop @ 4400.00ft
4,900.00	4,884.30	-200.52	57.50	End Drop @ 4900.00ft
6,730.75	6,715.05	-200.52	57.50	Top of 4.5" Liner @ 6730.75ft
6,830.75	6,815.05	-200.52	57.50	KOP @ 6830.75ft
7,300.00	7,233.57	-18.87	57.83	DLS = 10/100'
7,728.79	7,388.00	370.48	58.54	End Build @ 7728.79ft
14,454.76	7,411.00	7,096.40	70.78	TD Well @ 14454.76ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	+N/_S (ft)	+E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	0.10	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	7,728.79	Plan A0 Permit	MWD
7,728.79	14,454.76	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
7,728.79	7,388.00	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	
5,032.70	5,017.00	Sussex		0.00	
7,028.61	7,009.00	Sharon Springs		0.00	
7,065.19	7,043.00	Niobrara A		0.00	
7,167.81	7,133.00	Niobrara B		0.00	
7,267.90	7,211.00	Niobrara C		0.00	
7,554.14	7,361.00	Fort Hays		0.00	
7,654.97	7,383.00	Codell		0.00	
7,728.79	7,388.00	Codell (Target--Heel)		0.00	
14,454.75	7,411.00	Codell (Target--Toe)		0.00	

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

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Thomason 22C-31HZ_BHL	7,411.00	7,096.40	70.78	Point
Thomason_Section	0.00	155.06	3,504.67	Polygon
Thomason 22C-31HZ_SHL	0.00	0.00	0.00	Point

North Reference Sheet for Sec. 6-T1N-R65W - THOMASON 22C-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 22C-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: 1,270,781.62 ft N, 3,220,812.17 ft E
 Geographical Coordinates of Well: 40° 04' 26.36" N, 104° 42' 39.42" W
 Grid Convergence at Surface is: 0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,454.76ft
 the Bottom Hole Displacement is 7,096.75ft in the Direction of 0.57° (True).

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

