

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 18-T3N-R67W

Elliot 31N-18HZ

Plan A

Plan: Plan A0 Proposal

Sperry Drilling Services

Proposal Report

26 August, 2013

Well Coordinates: 1,327,651.32 N, 3,160,492.36 E (40° 13' 52.94" N, 104° 55' 30.62" W)

Ground Level: 4,836.00 ft

Local Coordinate Origin: Centered on Well Elliot 31N-18HZ

Viewing Datum: RKB = 17' @ 4853.00ft (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. 18-T3N-R67W
 Well: Elliot 31N-18HZ
 Wellbore: Plan A
 Design: Plan A0 Proposal

Anadarko Petroleum Corp.

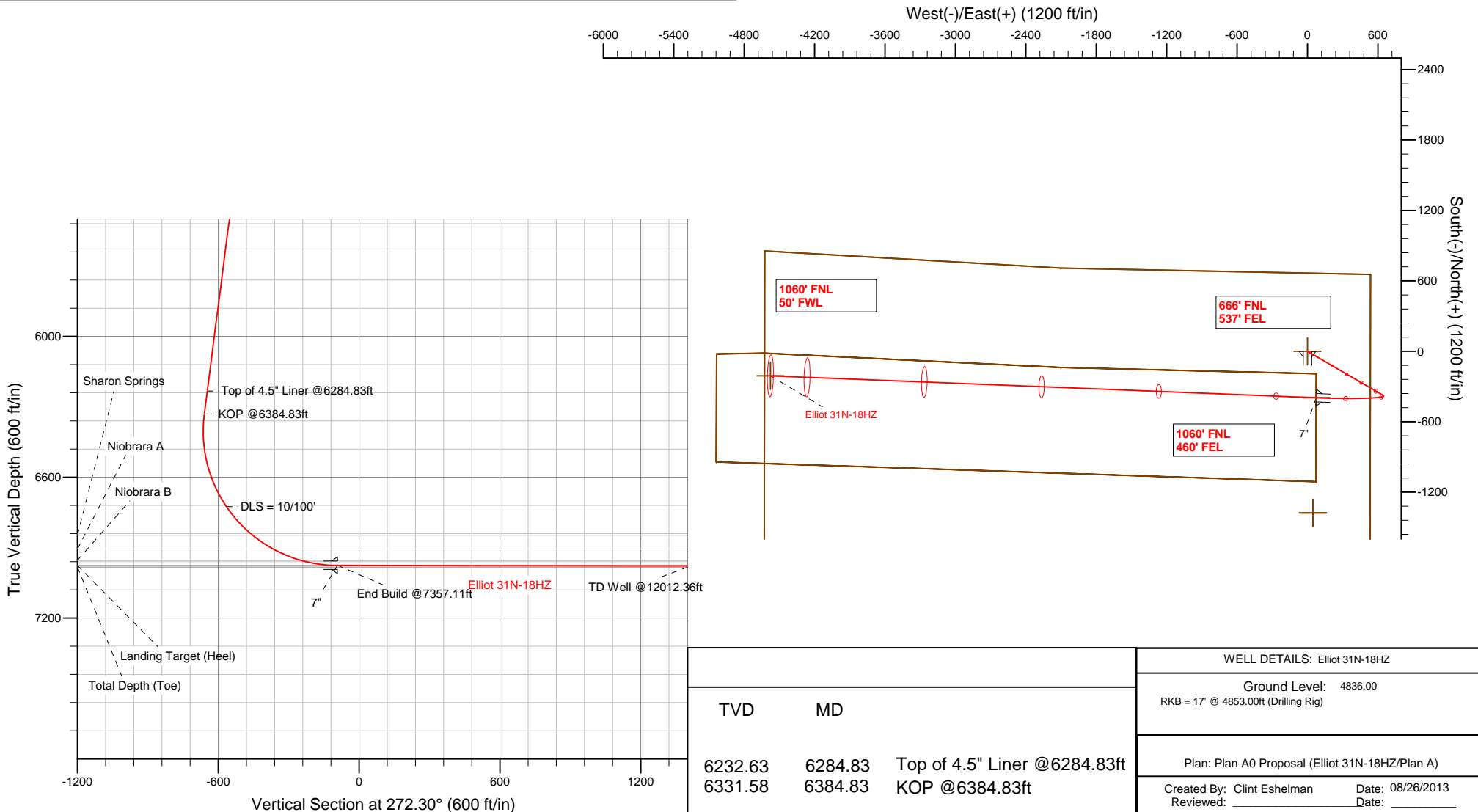


SECTION DETAILS

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	1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	0.00	
3	1413.97	8.28	120.16	1412.53	-15.00	25.81	2.00	120.16	-26.40	
4	6384.83	8.28	120.16	6331.59	-374.68	644.68	0.00	0.00	-659.20	
5	7357.11	89.91	272.30	6976.00	-395.62	75.95	10.00	151.89	-91.76	Elliot 31N-18HZ_CP
6	12012.36	89.91	272.30	6983.00	-208.67	-4575.54	0.00	0.00	4563.48	Elliot 31N-18HZ_BHL

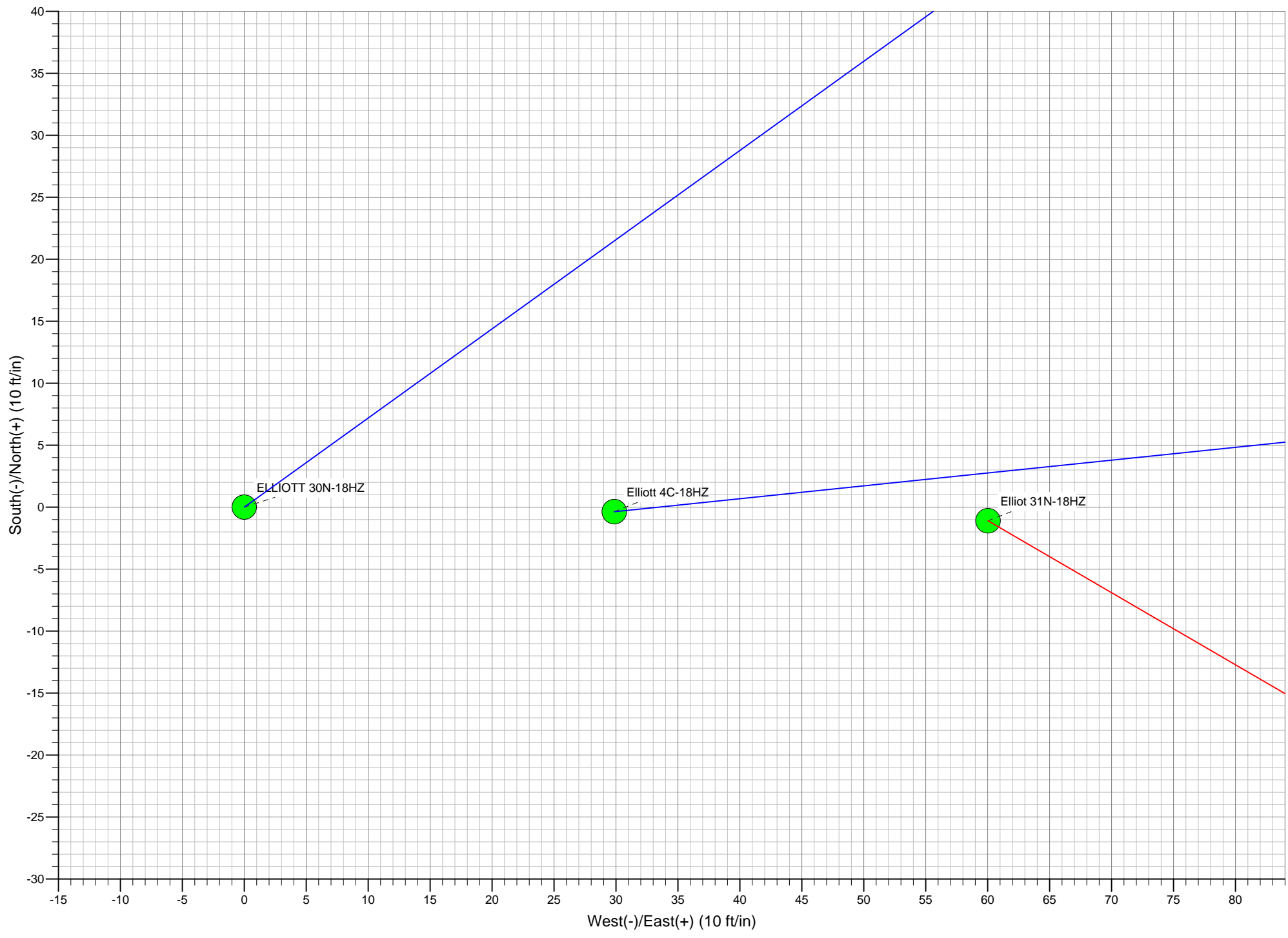
WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Elliot 31N-18HZ_LD	0.00	-1375.95	47.75	40.227596	-104.925002	Polygon
Elliot 31N-18HZ_SHL	0.00	0.00	0.00	40.231373	-104.925173	Point
ELLIOTT_SEC	0.00	-1375.95	47.75	40.227596	-104.925002	Polygon
Elliot 31N-18HZ_CP	6976.00	-395.62	75.95	40.230287	-104.924901	Point
Elliot 31N-18HZ_BHL	6983.00	-208.67	-4575.54	40.230799	-104.941560	Point



WELL DETAILS: Elliot 31N-18HZ		
Ground Level: 4836.00 RKB = 17' @ 4853.00ft (Drilling Rig)		
Plan: Plan A0 Proposal (Elliot 31N-18HZ/Plan A)		
Created By: Clint Eshelman		Date: 08/26/2013
Reviewed:		Date:

TVD	MD	Target
6232.63	6284.83	Top of 4.5" Liner @6284.83ft
6331.58	6384.83	KOP @6384.83ft



Plan Report for Elliot 31N-18HZ - Plan A0 Proposal

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
ELLIOTT_SEC - Elliot 31N-18HZ_LD - Elliot 31N-18HZ_SHL										
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
750.00	0.00	0.00	750.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base										
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
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
Begin Nudge @1000.00ft										
1,100.00	2.00	120.16	1,099.98	-0.88	1.51	-1.54	2.00	2.00	0.00	120.16
1,200.00	4.00	120.16	1,199.84	-3.51	6.03	-6.17	2.00	2.00	0.00	0.00
1,300.00	6.00	120.16	1,299.45	-7.89	13.57	-13.87	2.00	2.00	0.00	0.00
1,400.00	8.00	120.16	1,398.70	-14.01	24.10	-24.65	2.00	2.00	0.00	0.00
1,413.97	8.28	120.16	1,412.53	-15.00	25.81	-26.40	2.00	2.00	0.00	0.00
End Nudge @1413.97ft										
1,500.00	8.28	120.16	1,497.66	-21.23	36.53	-37.35	0.00	0.00	0.00	0.00
1,600.00	8.28	120.16	1,596.62	-28.46	48.98	-50.08	0.00	0.00	0.00	0.00
1,700.00	8.28	120.16	1,695.58	-35.70	61.43	-62.81	0.00	0.00	0.00	0.00
1,800.00	8.28	120.16	1,794.54	-42.94	73.88	-75.54	0.00	0.00	0.00	0.00
1,900.00	8.28	120.16	1,893.50	-50.17	86.33	-88.27	0.00	0.00	0.00	0.00
2,000.00	8.28	120.16	1,992.45	-57.41	98.78	-101.00	0.00	0.00	0.00	0.00
2,100.00	8.28	120.16	2,091.41	-64.64	111.22	-113.73	0.00	0.00	0.00	0.00
2,200.00	8.28	120.16	2,190.37	-71.88	123.67	-126.46	0.00	0.00	0.00	0.00
2,300.00	8.28	120.16	2,289.33	-79.11	136.12	-139.19	0.00	0.00	0.00	0.00
2,400.00	8.28	120.16	2,388.28	-86.35	148.57	-151.92	0.00	0.00	0.00	0.00
2,500.00	8.28	120.16	2,487.24	-93.59	161.02	-164.65	0.00	0.00	0.00	0.00
2,600.00	8.28	120.16	2,586.20	-100.82	173.47	-177.38	0.00	0.00	0.00	0.00
2,700.00	8.28	120.16	2,685.16	-108.06	185.92	-190.11	0.00	0.00	0.00	0.00
2,800.00	8.28	120.16	2,784.12	-115.29	198.37	-202.84	0.00	0.00	0.00	0.00
2,900.00	8.28	120.16	2,883.07	-122.53	210.82	-215.57	0.00	0.00	0.00	0.00
3,000.00	8.28	120.16	2,982.03	-129.76	223.27	-228.30	0.00	0.00	0.00	0.00
3,100.00	8.28	120.16	3,080.99	-137.00	235.72	-241.03	0.00	0.00	0.00	0.00
3,200.00	8.28	120.16	3,179.95	-144.24	248.17	-253.76	0.00	0.00	0.00	0.00
3,300.00	8.28	120.16	3,278.90	-151.47	260.62	-266.49	0.00	0.00	0.00	0.00
3,400.00	8.28	120.16	3,377.86	-158.71	273.07	-279.22	0.00	0.00	0.00	0.00
3,500.00	8.28	120.16	3,476.82	-165.94	285.52	-291.95	0.00	0.00	0.00	0.00
3,584.06	8.28	120.16	3,560.00	-172.02	295.99	-302.65	0.00	0.00	0.00	0.00
Parkman										
3,600.00	8.28	120.16	3,575.78	-173.18	297.97	-304.68	0.00	0.00	0.00	0.00
3,700.00	8.28	120.16	3,674.74	-180.41	310.42	-317.41	0.00	0.00	0.00	0.00
3,800.00	8.28	120.16	3,773.69	-187.65	322.87	-330.14	0.00	0.00	0.00	0.00
3,900.00	8.28	120.16	3,872.65	-194.89	335.32	-342.87	0.00	0.00	0.00	0.00
4,000.00	8.28	120.16	3,971.61	-202.12	347.77	-355.60	0.00	0.00	0.00	0.00
4,042.84	8.28	120.16	4,014.00	-205.22	353.11	-361.06	0.00	0.00	0.00	0.00
Sussex										
4,100.00	8.28	120.16	4,070.57	-209.36	360.22	-368.34	0.00	0.00	0.00	0.00
4,200.00	8.28	120.16	4,169.52	-216.59	372.67	-381.07	0.00	0.00	0.00	0.00
4,300.00	8.28	120.16	4,268.48	-223.83	385.12	-393.80	0.00	0.00	0.00	0.00
4,400.00	8.28	120.16	4,367.44	-231.06	397.57	-406.53	0.00	0.00	0.00	0.00
4,500.00	8.28	120.16	4,466.40	-238.30	410.02	-419.26	0.00	0.00	0.00	0.00

Plan Report for Elliot 31N-18HZ - Plan A0 Proposal

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 (°)
4,600.00	8.28	120.16	4,565.36	-245.54	422.47	-431.99	0.00	0.00	0.00	0.00
4,700.00	8.28	120.16	4,664.31	-252.77	434.92	-444.72	0.00	0.00	0.00	0.00
4,800.00	8.28	120.16	4,763.27	-260.01	447.37	-457.45	0.00	0.00	0.00	0.00
4,900.00	8.28	120.16	4,862.23	-267.24	459.82	-470.18	0.00	0.00	0.00	0.00
5,000.00	8.28	120.16	4,961.19	-274.48	472.27	-482.91	0.00	0.00	0.00	0.00
5,100.00	8.28	120.16	5,060.14	-281.71	484.72	-495.64	0.00	0.00	0.00	0.00
5,200.00	8.28	120.16	5,159.10	-288.95	497.17	-508.37	0.00	0.00	0.00	0.00
5,300.00	8.28	120.16	5,258.06	-296.19	509.62	-521.10	0.00	0.00	0.00	0.00
5,400.00	8.28	120.16	5,357.02	-303.42	522.07	-533.83	0.00	0.00	0.00	0.00
5,500.00	8.28	120.16	5,455.98	-310.66	534.52	-546.56	0.00	0.00	0.00	0.00
5,600.00	8.28	120.16	5,554.93	-317.89	546.97	-559.29	0.00	0.00	0.00	0.00
5,700.00	8.28	120.16	5,653.89	-325.13	559.42	-572.02	0.00	0.00	0.00	0.00
5,800.00	8.28	120.16	5,752.85	-332.36	571.87	-584.75	0.00	0.00	0.00	0.00
5,900.00	8.28	120.16	5,851.81	-339.60	584.32	-597.48	0.00	0.00	0.00	0.00
6,000.00	8.28	120.16	5,950.76	-346.84	596.77	-610.21	0.00	0.00	0.00	0.00
6,100.00	8.28	120.16	6,049.72	-354.07	609.22	-622.94	0.00	0.00	0.00	0.00
6,200.00	8.28	120.16	6,148.68	-361.31	621.67	-635.67	0.00	0.00	0.00	0.00
6,284.83	8.28	120.16	6,232.63	-367.45	632.23	-646.47	0.00	0.00	0.00	0.00
Top of 4.5" Liner @6284.83ft										
6,300.00	8.28	120.16	6,247.64	-368.54	634.12	-648.40	0.00	0.00	0.00	0.00
6,384.83	8.28	120.16	6,331.58	-374.68	644.68	-659.20	0.00	0.00	0.00	0.00
KOP @6384.83ft										
6,400.00	6.98	126.06	6,346.62	-375.77	646.37	-660.93	10.00	-8.58	38.83	151.89
6,500.00	5.72	229.59	6,446.25	-382.60	647.49	-662.32	10.00	-1.25	103.54	146.05
6,600.00	14.71	257.30	6,544.61	-388.64	631.26	-646.35	10.00	8.99	27.71	42.86
6,700.00	24.49	263.72	6,638.71	-393.71	598.18	-613.50	10.00	9.78	6.42	15.49
6,800.00	34.40	266.61	6,725.69	-397.66	549.25	-564.77	10.00	9.90	2.88	9.42
DLS = 10/100'										
6,900.00	44.34	268.32	6,802.91	-400.36	485.97	-501.64	10.00	9.94	1.71	6.90
6,965.42	50.85	269.13	6,847.00	-401.42	437.70	-453.46	10.00	9.96	1.25	5.57
Sharon Springs										
7,000.00	54.30	269.51	6,868.01	-401.74	410.25	-426.04	10.00	9.96	1.08	5.02
7,071.45	61.42	270.18	6,906.00	-401.89	349.79	-365.63	10.00	9.97	0.95	4.79
Niobrara A										
7,100.00	64.27	270.43	6,919.03	-401.75	324.39	-340.25	10.00	9.97	0.86	4.43
7,198.50	74.09	271.20	6,954.00	-400.43	232.44	-248.33	10.00	9.97	0.78	4.32
Niobrara B										
7,200.00	74.24	271.21	6,954.41	-400.40	231.00	-246.88	10.00	9.98	0.73	4.05
7,300.00	84.22	271.91	6,973.08	-397.71	132.92	-148.78	10.00	9.98	0.70	4.04
7,357.11	89.91	272.30	6,976.00	-395.62	75.95	-91.76	10.00	9.98	0.68	3.91
End Build @7357.11ft - Landing Target (Heel) - 7" - Elliot 31N-18HZ_CP										
7,400.00	89.91	272.30	6,976.06	-393.90	33.09	-48.88	0.00	0.00	0.00	3.89
7,500.00	89.91	272.30	6,976.21	-389.88	-66.82	51.12	0.00	0.00	0.00	0.00
7,600.00	89.91	272.30	6,976.37	-385.86	-166.74	151.12	0.00	0.00	0.00	0.00
7,700.00	89.91	272.30	6,976.52	-381.85	-266.66	251.12	0.00	0.00	0.00	0.00
7,800.00	89.91	272.30	6,976.67	-377.83	-366.58	351.12	0.00	0.00	0.00	0.00
7,900.00	89.91	272.30	6,976.82	-373.82	-466.50	451.12	0.00	0.00	0.00	0.00
8,000.00	89.91	272.30	6,976.97	-369.80	-566.42	551.12	0.00	0.00	0.00	0.00
8,100.00	89.91	272.30	6,977.12	-365.79	-666.34	651.12	0.00	0.00	0.00	0.00
8,200.00	89.91	272.30	6,977.27	-361.77	-766.26	751.12	0.00	0.00	0.00	0.00
8,300.00	89.91	272.30	6,977.42	-357.75	-866.18	851.12	0.00	0.00	0.00	0.00
8,400.00	89.91	272.30	6,977.57	-353.74	-966.10	951.12	0.00	0.00	0.00	0.00
8,500.00	89.91	272.30	6,977.72	-349.72	-1,066.02	1,051.12	0.00	0.00	0.00	0.00
8,600.00	89.91	272.30	6,977.87	-345.71	-1,165.94	1,151.12	0.00	0.00	0.00	0.00
8,700.00	89.91	272.30	6,978.02	-341.69	-1,265.86	1,251.12	0.00	0.00	0.00	0.00
8,800.00	89.91	272.30	6,978.17	-337.67	-1,365.77	1,351.12	0.00	0.00	0.00	0.00
8,900.00	89.91	272.30	6,978.32	-333.66	-1,465.69	1,451.12	0.00	0.00	0.00	0.00
9,000.00	89.91	272.30	6,978.47	-329.64	-1,565.61	1,551.12	0.00	0.00	0.00	0.00
9,100.00	89.91	272.30	6,978.62	-325.63	-1,665.53	1,651.12	0.00	0.00	0.00	0.00

Plan Report for Elliot 31N-18HZ - Plan A0 Proposal

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 (°)
9,200.00	89.91	272.30	6,978.77	-321.61	-1,765.45	1,751.12	0.00	0.00	0.00	0.00
9,300.00	89.91	272.30	6,978.92	-317.60	-1,865.37	1,851.12	0.00	0.00	0.00	0.00
9,400.00	89.91	272.30	6,979.07	-313.58	-1,965.29	1,951.12	0.00	0.00	0.00	0.00
9,500.00	89.91	272.30	6,979.22	-309.56	-2,065.21	2,051.12	0.00	0.00	0.00	0.00
9,600.00	89.91	272.30	6,979.37	-305.55	-2,165.13	2,151.12	0.00	0.00	0.00	0.00
9,700.00	89.91	272.30	6,979.52	-301.53	-2,265.05	2,251.12	0.00	0.00	0.00	0.00
9,800.00	89.91	272.30	6,979.67	-297.52	-2,364.97	2,351.12	0.00	0.00	0.00	0.00
9,900.00	89.91	272.30	6,979.82	-293.50	-2,464.89	2,451.12	0.00	0.00	0.00	0.00
10,000.00	89.91	272.30	6,979.97	-289.49	-2,564.81	2,551.12	0.00	0.00	0.00	0.00
10,100.00	89.91	272.30	6,980.12	-285.47	-2,664.72	2,651.12	0.00	0.00	0.00	0.00
10,200.00	89.91	272.30	6,980.27	-281.45	-2,764.64	2,751.12	0.00	0.00	0.00	0.00
10,300.00	89.91	272.30	6,980.43	-277.44	-2,864.56	2,851.12	0.00	0.00	0.00	0.00
10,400.00	89.91	272.30	6,980.58	-273.42	-2,964.48	2,951.12	0.00	0.00	0.00	0.00
10,500.00	89.91	272.30	6,980.73	-269.41	-3,064.40	3,051.12	0.00	0.00	0.00	0.00
10,600.00	89.91	272.30	6,980.88	-265.39	-3,164.32	3,151.12	0.00	0.00	0.00	0.00
10,700.00	89.91	272.30	6,981.03	-261.37	-3,264.24	3,251.12	0.00	0.00	0.00	0.00
10,800.00	89.91	272.30	6,981.18	-257.36	-3,364.16	3,351.12	0.00	0.00	0.00	0.00
10,900.00	89.91	272.30	6,981.33	-253.34	-3,464.08	3,451.12	0.00	0.00	0.00	0.00
11,000.00	89.91	272.30	6,981.48	-249.33	-3,564.00	3,551.12	0.00	0.00	0.00	0.00
11,100.00	89.91	272.30	6,981.63	-245.31	-3,663.92	3,651.12	0.00	0.00	0.00	0.00
11,200.00	89.91	272.30	6,981.78	-241.30	-3,763.84	3,751.12	0.00	0.00	0.00	0.00
11,300.00	89.91	272.30	6,981.93	-237.28	-3,863.76	3,851.12	0.00	0.00	0.00	0.00
11,400.00	89.91	272.30	6,982.08	-233.26	-3,963.67	3,951.12	0.00	0.00	0.00	0.00
11,500.00	89.91	272.30	6,982.23	-229.25	-4,063.59	4,051.12	0.00	0.00	0.00	0.00
11,600.00	89.91	272.30	6,982.38	-225.23	-4,163.51	4,151.12	0.00	0.00	0.00	0.00
11,700.00	89.91	272.30	6,982.53	-221.22	-4,263.43	4,251.12	0.00	0.00	0.00	0.00
11,800.00	89.91	272.30	6,982.68	-217.20	-4,363.35	4,351.12	0.00	0.00	0.00	0.00
11,900.00	89.91	272.30	6,982.83	-213.19	-4,463.27	4,451.12	0.00	0.00	0.00	0.00
12,000.00	89.91	272.30	6,982.98	-209.17	-4,563.19	4,551.12	0.00	0.00	0.00	0.00
12,012.36	89.91	272.30	6,983.00	-208.67	-4,575.54	4,563.48	0.00	0.00	0.00	0.00

Total Depth (Toe) - Elliot 31N-18HZ_BHL**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,000.00	1,000.00	0.00	0.00	Begin Nudge @1000.00ft
1,413.97	1,412.53	-15.00	25.81	End Nudge @1413.97ft
6,284.83	6,232.63	-367.45	632.23	Top of 4.5" Liner @6284.83ft
6,384.83	6,331.58	-374.68	644.68	KOP @6384.83ft
6,800.00	6,725.69	-397.66	549.25	DLS = 10/100'
7,357.11	6,976.00	-395.62	75.95	End Build @7357.11ft
12,012.36	6,983.00	-208.67	-4,575.54	TD Well @12012.36ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	No Target (Freehand)	272.30	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	7,357.11	Plan A0 Proposal	MWD
7,357.11	12,012.36	Plan A0 Proposal	MWD

Plan Report for Elliot 31N-18HZ - Plan A0 Proposal**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
800.00	800.00	9 5/8"	9-5/8	13-1/2
7,357.11	6,976.00	7"	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
750.00	750.00	Fox Hills Base			
3,584.06	3,560.00	Parkman			
4,042.84	4,014.00	Sussex			
6,965.42	6,847.00	Sharon Springs			
7,071.45	6,906.00	Niobrara A			
7,198.50	6,954.00	Niobrara B			
7,357.11	6,976.00	Landing Target (Heel)			
12,012.36	6,983.00	Total Depth (Toe)			

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Elliot 31N-18HZ_LD	0.00	-1,375.95	47.75	Polygon
Elliot 31N-18HZ_CP	6,976.00	-395.62	75.95	Point
Elliot 31N-18HZ_SHL	0.00	0.00	0.00	Point
ELLIOTT_SEC	0.00	-1,375.95	47.75	Polygon
Elliot 31N-18HZ_BHL	6,983.00	-208.67	-4,575.54	Point

North Reference Sheet for Sec. 18-T3N-R67W - Elliot 31N-18HZ - 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' @ 4853.00ft (Drilling Rig). Northing and Easting are relative to Elliot 31N-18HZ

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: 0.99995690

Grid Coordinates of Well: 1,327,651.32 ft N, 3,160,492.36 ft E

Geographical Coordinates of Well: 40° 13' 52.94" N, 104° 55' 30.62" W

Grid Convergence at Surface is: 0.37°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,012.36ft
the Bottom Hole Displacement is 4,580.29ft in the Direction of 267.39° (True).

Magnetic Convergence at surface is: -8.30° (21 August 2013, , BGGM2013)

