

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 18-T3N-R67W

Elliot 32N-18HZ

Plan A

Plan: Plan A0 Permit

Sperry Drilling Services

Proposal Report

26 August, 2013

Well Coordinates: 1,326,275.23 N, 3,160,578.90 E (40° 13' 39.34" N, 104° 55' 29.62" W)

Ground Level: 4,822.00 ft

Local Coordinate Origin:

Centered on Well Elliot 32N-18HZ

Viewing Datum:

RKB = 17' @ 4839.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 18-T3N-R67W
Well: Elliot 32N-18HZ
Wellbore: Plan A
Design: Plan A0 Permit

Anadarko Petroleum Corp.

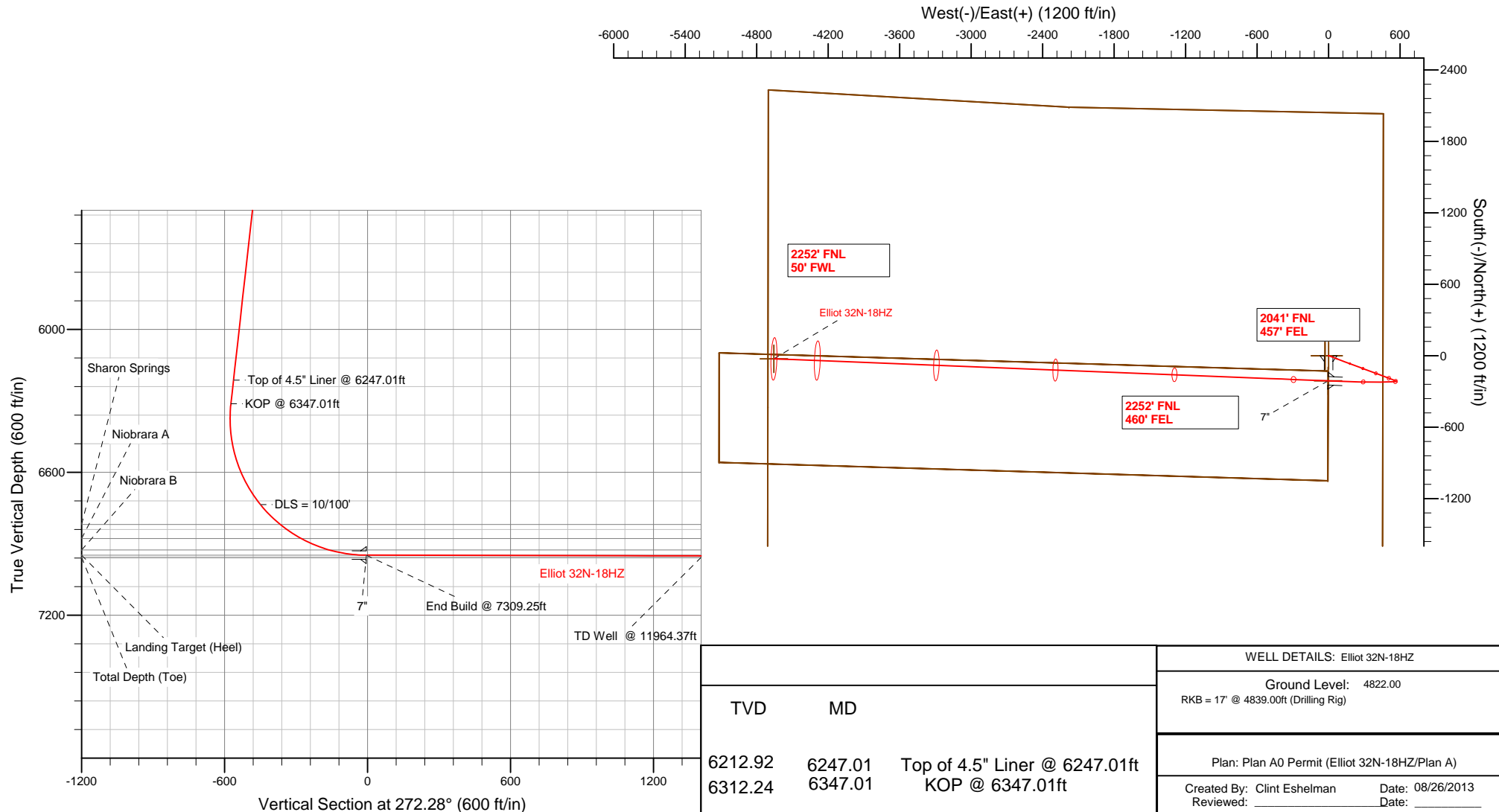
HALLIBURTON
Sperry Drilling

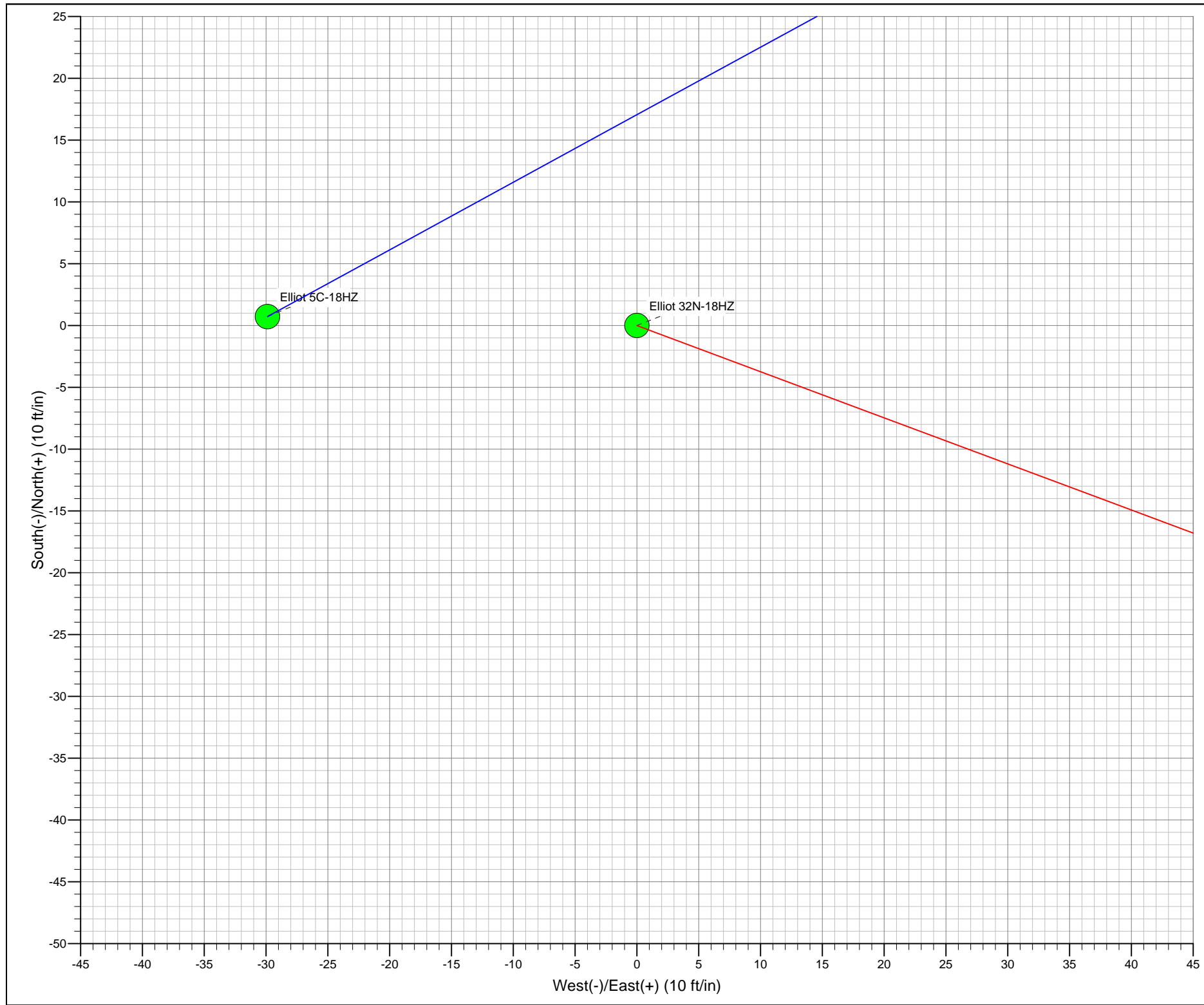
SECTION DETAILS

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	986.00	0.00	0.00	986.00	0.00	0.00	0.00	0.00	0.00	
3	1319.43	6.67	110.45	1318.68	-6.77	18.16	2.00	110.45	-18.42	
4	6347.01	6.67	110.45	6312.25	-210.77	565.19	0.00	0.00	-573.13	
5	7309.25	89.89	272.28	6948.00	-211.29	-3.63	10.00	161.72	-4.78	Elliott 32N-18HZ_CP
6	11964.37	89.89	272.28	6957.00	-26.15	-4655.06	0.00	0.00	4650.33	Elliott 32N-18HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Elliott 32N-18HZ_LD	0.00	0.74	-29.88	40.227596	-104.925002	Polygon
Elliott 32N-18HZ_SHL	0.00	0.00	0.00	40.227594	-104.924895	Point
ELLIOTT_SEC	0.00	0.74	-29.88	40.227596	-104.925002	Polygon
Elliott 32N-18HZ_CP	6948.00	-211.29	-3.63	40.227014	-104.924908	Point
Elliott 32N-18HZ_BHL	6957.00	-26.15	-4655.06	40.227521	-104.941566	Point





Plan Report for Elliot 32N-18HZ - 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
ELLIOTT_SEC - Elliott 32N-18HZ_LD - Elliott 32N-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
736.00	0.00	0.00	736.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base										
786.00	0.00	0.00	786.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
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
986.00	0.00	0.00	986.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 986.00ft										
1,000.00	0.28	110.45	1,000.00	-0.01	0.03	-0.03	2.00	2.00	0.00	110.45
1,100.00	2.28	110.45	1,099.97	-0.79	2.12	-2.15	2.00	2.00	0.00	0.00
1,200.00	4.28	110.45	1,199.80	-2.79	7.49	-7.59	2.00	2.00	0.00	0.00
1,300.00	6.28	110.45	1,299.37	-6.01	16.11	-16.33	2.00	2.00	0.00	0.00
1,319.43	6.67	110.45	1,318.68	-6.77	18.16	-18.42	2.00	2.00	0.00	0.00
End Nudge @ 1319.43ft										
1,400.00	6.67	110.45	1,398.70	-10.04	26.93	-27.30	0.00	0.00	0.00	0.00
1,500.00	6.67	110.45	1,498.03	-14.10	37.81	-38.34	0.00	0.00	0.00	0.00
1,600.00	6.67	110.45	1,597.35	-18.16	48.69	-49.37	0.00	0.00	0.00	0.00
1,700.00	6.67	110.45	1,696.67	-22.21	59.57	-60.41	0.00	0.00	0.00	0.00
1,800.00	6.67	110.45	1,796.00	-26.27	70.45	-71.44	0.00	0.00	0.00	0.00
1,900.00	6.67	110.45	1,895.32	-30.33	81.33	-82.47	0.00	0.00	0.00	0.00
2,000.00	6.67	110.45	1,994.64	-34.39	92.21	-93.51	0.00	0.00	0.00	0.00
2,100.00	6.67	110.45	2,093.97	-38.44	103.09	-104.54	0.00	0.00	0.00	0.00
2,200.00	6.67	110.45	2,193.29	-42.50	113.97	-115.57	0.00	0.00	0.00	0.00
2,300.00	6.67	110.45	2,292.61	-46.56	124.85	-126.61	0.00	0.00	0.00	0.00
2,400.00	6.67	110.45	2,391.94	-50.62	135.73	-137.64	0.00	0.00	0.00	0.00
2,500.00	6.67	110.45	2,491.26	-54.68	146.61	-148.67	0.00	0.00	0.00	0.00
2,600.00	6.67	110.45	2,590.58	-58.73	157.49	-159.71	0.00	0.00	0.00	0.00
2,700.00	6.67	110.45	2,689.91	-62.79	168.37	-170.74	0.00	0.00	0.00	0.00
2,800.00	6.67	110.45	2,789.23	-66.85	179.26	-181.77	0.00	0.00	0.00	0.00
2,900.00	6.67	110.45	2,888.55	-70.91	190.14	-192.81	0.00	0.00	0.00	0.00
3,000.00	6.67	110.45	2,987.88	-74.96	201.02	-203.84	0.00	0.00	0.00	0.00
3,100.00	6.67	110.45	3,087.20	-79.02	211.90	-214.87	0.00	0.00	0.00	0.00
3,200.00	6.67	110.45	3,186.52	-83.08	222.78	-225.91	0.00	0.00	0.00	0.00
3,300.00	6.67	110.45	3,285.85	-87.14	233.66	-236.94	0.00	0.00	0.00	0.00
3,400.00	6.67	110.45	3,385.17	-91.19	244.54	-247.97	0.00	0.00	0.00	0.00
3,500.00	6.67	110.45	3,484.50	-95.25	255.42	-259.01	0.00	0.00	0.00	0.00
3,547.83	6.67	110.45	3,532.00	-97.19	260.62	-264.28	0.00	0.00	0.00	0.00
Parkman										
3,600.00	6.67	110.45	3,583.82	-99.31	266.30	-270.04	0.00	0.00	0.00	0.00
3,700.00	6.67	110.45	3,683.14	-103.37	277.18	-281.07	0.00	0.00	0.00	0.00
3,800.00	6.67	110.45	3,782.47	-107.42	288.06	-292.11	0.00	0.00	0.00	0.00
3,900.00	6.67	110.45	3,881.79	-111.48	298.94	-303.14	0.00	0.00	0.00	0.00
4,000.00	6.67	110.45	3,981.11	-115.54	309.82	-314.17	0.00	0.00	0.00	0.00
4,004.92	6.67	110.45	3,986.00	-115.74	310.36	-314.72	0.00	0.00	0.00	0.00
Sussex										
4,100.00	6.67	110.45	4,080.44	-119.60	320.70	-325.21	0.00	0.00	0.00	0.00
4,200.00	6.67	110.45	4,179.76	-123.65	331.58	-336.24	0.00	0.00	0.00	0.00
4,300.00	6.67	110.45	4,279.08	-127.71	342.47	-347.27	0.00	0.00	0.00	0.00

Plan Report for Elliot 32N-18HZ - 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 (°)
4,400.00	6.67	110.45	4,378.41	-131.77	353.35	-358.31	0.00	0.00	0.00	0.00
4,500.00	6.67	110.45	4,477.73	-135.83	364.23	-369.34	0.00	0.00	0.00	0.00
4,600.00	6.67	110.45	4,577.05	-139.88	375.11	-380.38	0.00	0.00	0.00	0.00
4,700.00	6.67	110.45	4,676.38	-143.94	385.99	-391.41	0.00	0.00	0.00	0.00
4,800.00	6.67	110.45	4,775.70	-148.00	396.87	-402.44	0.00	0.00	0.00	0.00
4,900.00	6.67	110.45	4,875.02	-152.06	407.75	-413.48	0.00	0.00	0.00	0.00
5,000.00	6.67	110.45	4,974.35	-156.12	418.63	-424.51	0.00	0.00	0.00	0.00
5,100.00	6.67	110.45	5,073.67	-160.17	429.51	-435.54	0.00	0.00	0.00	0.00
5,200.00	6.67	110.45	5,172.99	-164.23	440.39	-446.58	0.00	0.00	0.00	0.00
5,300.00	6.67	110.45	5,272.32	-168.29	451.27	-457.61	0.00	0.00	0.00	0.00
5,400.00	6.67	110.45	5,371.64	-172.35	462.15	-468.64	0.00	0.00	0.00	0.00
5,500.00	6.67	110.45	5,470.96	-176.40	473.03	-479.68	0.00	0.00	0.00	0.00
5,600.00	6.67	110.45	5,570.29	-180.46	483.91	-490.71	0.00	0.00	0.00	0.00
5,700.00	6.67	110.45	5,669.61	-184.52	494.79	-501.74	0.00	0.00	0.00	0.00
5,800.00	6.67	110.45	5,768.93	-188.58	505.67	-512.78	0.00	0.00	0.00	0.00
5,900.00	6.67	110.45	5,868.26	-192.63	516.56	-523.81	0.00	0.00	0.00	0.00
6,000.00	6.67	110.45	5,967.58	-196.69	527.44	-534.84	0.00	0.00	0.00	0.00
6,100.00	6.67	110.45	6,066.90	-200.75	538.32	-545.88	0.00	0.00	0.00	0.00
6,200.00	6.67	110.45	6,166.23	-204.81	549.20	-556.91	0.00	0.00	0.00	0.00
6,247.01	6.67	110.45	6,212.92	-206.71	554.31	-562.10	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6247.01ft										
6,300.00	6.67	110.45	6,265.55	-208.86	560.08	-567.94	0.00	0.00	0.00	0.00
6,347.01	6.67	110.45	6,312.24	-210.77	565.19	-573.13	0.00	0.00	0.00	0.00
KOP @ 6347.01ft										
6,400.00	2.33	155.88	6,365.07	-212.83	568.52	-576.54	10.00	-8.19	85.73	161.72
6,500.00	9.20	259.28	6,464.64	-216.18	561.48	-569.63	10.00	6.87	103.40	116.38
6,600.00	19.07	266.23	6,561.50	-218.75	537.25	-545.53	10.00	9.87	6.95	13.17
6,700.00	29.03	268.52	6,652.70	-220.46	496.59	-504.97	10.00	9.96	2.29	6.40
6,800.00	39.01	269.70	6,735.48	-221.25	440.72	-449.17	10.00	9.98	1.19	4.31
DLS = 10/100'										
6,900.00	49.00	270.47	6,807.32	-221.10	371.33	-379.84	10.00	9.99	0.76	3.32
6,918.14	50.81	270.58	6,819.00	-220.98	357.46	-365.97	10.00	9.99	0.62	2.77
Sharon Springs										
7,000.00	58.99	271.03	6,866.03	-220.03	290.55	-299.07	10.00	9.99	0.55	2.69
7,024.08	61.39	271.14	6,878.00	-219.63	269.67	-278.19	10.00	9.99	0.48	2.44
Niobrara A										
7,100.00	68.98	271.48	6,909.84	-218.05	200.82	-209.34	10.00	9.99	0.44	2.38
7,151.01	74.08	271.69	6,926.00	-216.71	152.47	-160.97	10.00	9.99	0.41	2.24
Niobrara B										
7,200.00	78.97	271.88	6,937.41	-215.23	104.87	-113.35	10.00	9.99	0.39	2.17
7,300.00	88.96	272.25	6,947.91	-211.65	5.61	-14.03	10.00	9.99	0.37	2.13
7,309.25	89.89	272.28	6,948.00	-211.29	-3.63	-4.78	10.00	9.99	0.36	2.09
End Build @ 7309.25ft - Landing Target (Heel) - 7" - Elliott 32N-18HZ_CP										
7,400.00	89.89	272.28	6,948.18	-207.68	-94.31	85.97	0.00	0.00	0.00	2.09
7,500.00	89.89	272.28	6,948.37	-203.70	-194.23	185.97	0.00	0.00	0.00	0.00
7,600.00	89.89	272.28	6,948.56	-199.72	-294.15	285.97	0.00	0.00	0.00	0.00
7,700.00	89.89	272.28	6,948.76	-195.75	-394.07	385.97	0.00	0.00	0.00	0.00
7,800.00	89.89	272.28	6,948.95	-191.77	-493.99	485.97	0.00	0.00	0.00	0.00
7,900.00	89.89	272.28	6,949.14	-187.79	-593.91	585.97	0.00	0.00	0.00	0.00
8,000.00	89.89	272.28	6,949.34	-183.81	-693.83	685.97	0.00	0.00	0.00	0.00
8,100.00	89.89	272.28	6,949.53	-179.84	-793.75	785.97	0.00	0.00	0.00	0.00
8,200.00	89.89	272.28	6,949.72	-175.86	-893.67	885.97	0.00	0.00	0.00	0.00
8,300.00	89.89	272.28	6,949.92	-171.88	-993.59	985.97	0.00	0.00	0.00	0.00
8,400.00	89.89	272.28	6,950.11	-167.91	-1,093.51	1,085.97	0.00	0.00	0.00	0.00
8,500.00	89.89	272.28	6,950.30	-163.93	-1,193.43	1,185.97	0.00	0.00	0.00	0.00
8,600.00	89.89	272.28	6,950.50	-159.95	-1,293.35	1,285.97	0.00	0.00	0.00	0.00
8,700.00	89.89	272.28	6,950.69	-155.97	-1,393.27	1,385.97	0.00	0.00	0.00	0.00
8,800.00	89.89	272.28	6,950.88	-152.00	-1,493.20	1,485.97	0.00	0.00	0.00	0.00
8,900.00	89.89	272.28	6,951.08	-148.02	-1,593.12	1,585.97	0.00	0.00	0.00	0.00

Plan Report for Elliot 32N-18HZ - 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 (°)
9,000.00	89.89	272.28	6,951.27	-144.04	-1,693.04	1,685.97	0.00	0.00	0.00	0.00
9,100.00	89.89	272.28	6,951.46	-140.07	-1,792.96	1,785.97	0.00	0.00	0.00	0.00
9,200.00	89.89	272.28	6,951.66	-136.09	-1,892.88	1,885.97	0.00	0.00	0.00	0.00
9,300.00	89.89	272.28	6,951.85	-132.11	-1,992.80	1,985.97	0.00	0.00	0.00	0.00
9,400.00	89.89	272.28	6,952.04	-128.14	-2,092.72	2,085.97	0.00	0.00	0.00	0.00
9,500.00	89.89	272.28	6,952.24	-124.16	-2,192.64	2,185.96	0.00	0.00	0.00	0.00
9,600.00	89.89	272.28	6,952.43	-120.18	-2,292.56	2,285.96	0.00	0.00	0.00	0.00
9,700.00	89.89	272.28	6,952.62	-116.20	-2,392.48	2,385.96	0.00	0.00	0.00	0.00
9,800.00	89.89	272.28	6,952.82	-112.23	-2,492.40	2,485.96	0.00	0.00	0.00	0.00
9,900.00	89.89	272.28	6,953.01	-108.25	-2,592.32	2,585.96	0.00	0.00	0.00	0.00
10,000.00	89.89	272.28	6,953.20	-104.27	-2,692.24	2,685.96	0.00	0.00	0.00	0.00
10,100.00	89.89	272.28	6,953.40	-100.30	-2,792.16	2,785.96	0.00	0.00	0.00	0.00
10,200.00	89.89	272.28	6,953.59	-96.32	-2,892.08	2,885.96	0.00	0.00	0.00	0.00
10,300.00	89.89	272.28	6,953.78	-92.34	-2,992.01	2,985.96	0.00	0.00	0.00	0.00
10,400.00	89.89	272.28	6,953.98	-88.36	-3,091.93	3,085.96	0.00	0.00	0.00	0.00
10,500.00	89.89	272.28	6,954.17	-84.39	-3,191.85	3,185.96	0.00	0.00	0.00	0.00
10,600.00	89.89	272.28	6,954.36	-80.41	-3,291.77	3,285.96	0.00	0.00	0.00	0.00
10,700.00	89.89	272.28	6,954.56	-76.43	-3,391.69	3,385.96	0.00	0.00	0.00	0.00
10,800.00	89.89	272.28	6,954.75	-72.46	-3,491.61	3,485.96	0.00	0.00	0.00	0.00
10,900.00	89.89	272.28	6,954.94	-68.48	-3,591.53	3,585.96	0.00	0.00	0.00	0.00
11,000.00	89.89	272.28	6,955.14	-64.50	-3,691.45	3,685.96	0.00	0.00	0.00	0.00
11,100.00	89.89	272.28	6,955.33	-60.52	-3,791.37	3,785.96	0.00	0.00	0.00	0.00
11,200.00	89.89	272.28	6,955.52	-56.55	-3,891.29	3,885.96	0.00	0.00	0.00	0.00
11,300.00	89.89	272.28	6,955.72	-52.57	-3,991.21	3,985.96	0.00	0.00	0.00	0.00
11,400.00	89.89	272.28	6,955.91	-48.59	-4,091.13	4,085.96	0.00	0.00	0.00	0.00
11,500.00	89.89	272.28	6,956.10	-44.62	-4,191.05	4,185.96	0.00	0.00	0.00	0.00
11,600.00	89.89	272.28	6,956.30	-40.64	-4,290.97	4,285.96	0.00	0.00	0.00	0.00
11,700.00	89.89	272.28	6,956.49	-36.66	-4,390.90	4,385.96	0.00	0.00	0.00	0.00
11,800.00	89.89	272.28	6,956.68	-32.69	-4,490.82	4,485.96	0.00	0.00	0.00	0.00
11,900.00	89.89	272.28	6,956.88	-28.71	-4,590.74	4,585.96	0.00	0.00	0.00	0.00
11,964.37	89.89	272.28	6,957.00	-26.15	-4,655.06	4,650.33	0.00	0.00	0.00	0.00

TD Well @ 11964.37ft - Total Depth (Toe) - Elliott 32N-18HZ_BHL

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
986.00	986.00	0.00	0.00	Begin Nudge @ 986.00ft
1,319.43	1,318.68	-6.77	18.16	End Nudge @ 1319.43ft
6,247.01	6,212.92	-206.71	554.31	Top of 4.5" Liner @ 6247.01ft
6,347.01	6,312.24	-210.77	565.19	KOP @ 6347.01ft
6,800.00	6,735.48	-221.25	440.72	DLS = 10/100'
7,309.25	6,948.00	-211.29	-3.63	End Build @ 7309.25ft
11,964.37	6,957.00	-26.15	-4,655.06	TD Well @ 11964.37ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	No Target (Freehand)	272.28	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	7,309.25	Plan A0 Permit	MWD
7,309.25	11,964.37	Plan A0 Permit	MWD

Plan Report for Elliot 32N-18HZ - Plan A0 Permit**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
786.00	786.00	9 5/8"	9-5/8	13-1/2
7,309.25	6,948.00	7"	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
736.00	736.00	Fox Hills Base		0.00	
3,547.83	3,532.00	Parkman		0.00	
4,004.92	3,986.00	Sussex		0.00	
6,918.14	6,819.00	Sharon Springs		0.00	
7,024.08	6,878.00	Niobrara A		0.00	
7,151.01	6,926.00	Niobrara B		0.00	
7,309.25	6,948.00	Landing Target (Heel)		0.00	
11,964.37	6,957.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
ELLIOTT_SEC	0.00	0.74	-29.88	Polygon
Elliott 32N-18HZ_BHL	6,957.00	-26.15	-4,655.06	Point
Elliott 32N-18HZ_LD	0.00	0.74	-29.88	Polygon
Elliott 32N-18HZ_SHL	0.00	0.00	0.00	Point
Elliott 32N-18HZ_CP	6,948.00	-211.29	-3.63	Point

North Reference Sheet for Sec. 18-T3N-R67W - Elliot 32N-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' @ 4839.00ft (Drilling Rig). Northing and Easting are relative to Elliot 32N-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: 0.99995693

Grid Coordinates of Well: 1,326,275.23 ft N, 3,160,578.90 ft E

Geographical Coordinates of Well: 40° 13' 39.34" N, 104° 55' 29.62" W

Grid Convergence at Surface is: 0.37°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,964.37ft
the Bottom Hole Displacement is 4,655.13ft in the Direction of 269.68° (True).

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

