

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 14-T3N-R66W

FERGE 30N-14HZ

## Plan A

Plan: Rev A0 Permit

## Sperry Drilling Services

## Proposal Report

18 November, 2013

Well Coordinates: 1,323,360.63 N, 3,209,404.58 E (40° 13' 06.93" N, 104° 45' 00.45" W)

Ground Level: 4,913.00 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 FERGE 30N-14HZ

RKB = 17' @ 4930.00usft (Drilling Rig)

N

True

Dec-Deg - API - US Survey Feet - Custom

**HALLIBURTON**

Project: Weld County, CO (NAD 83)  
Site: Sec. 14-T3N-R66W  
Well: FERGE 30N-14HZ  
Wellbore: Plan A  
Design: Rev A0 Permit

# Anadarko Petroleum Corp.

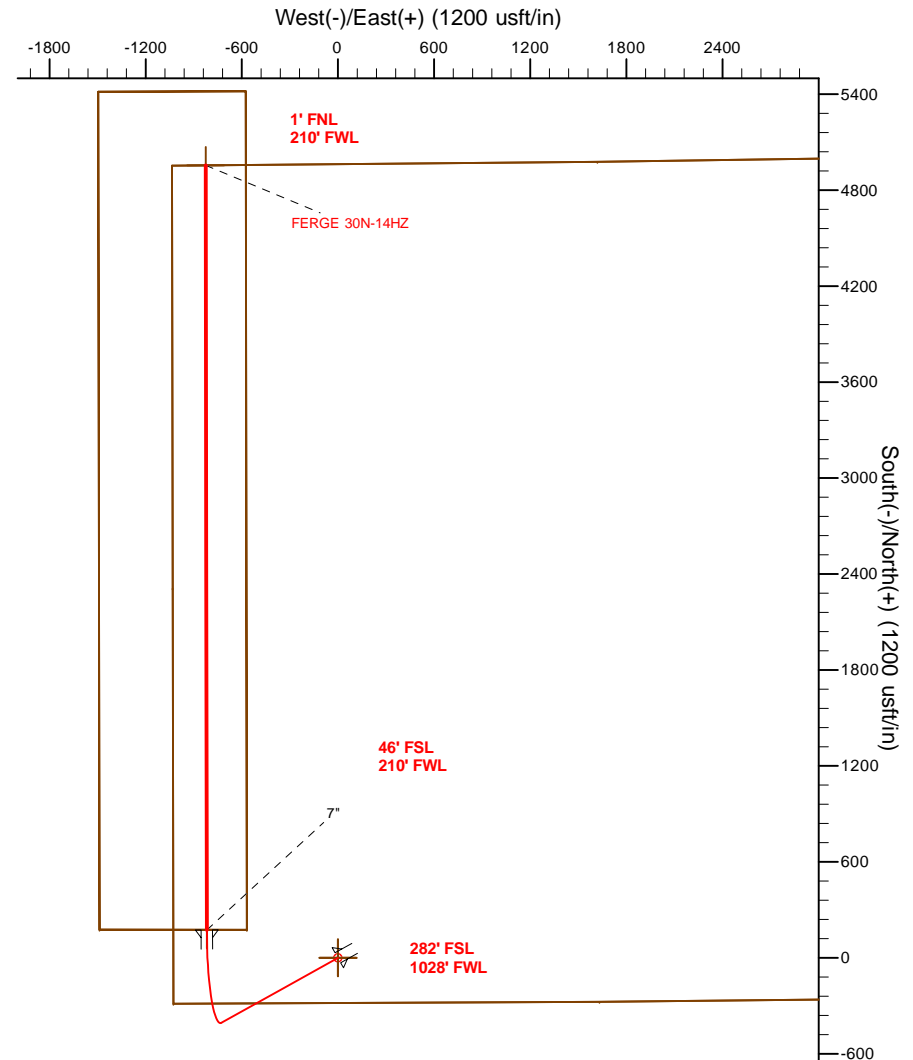
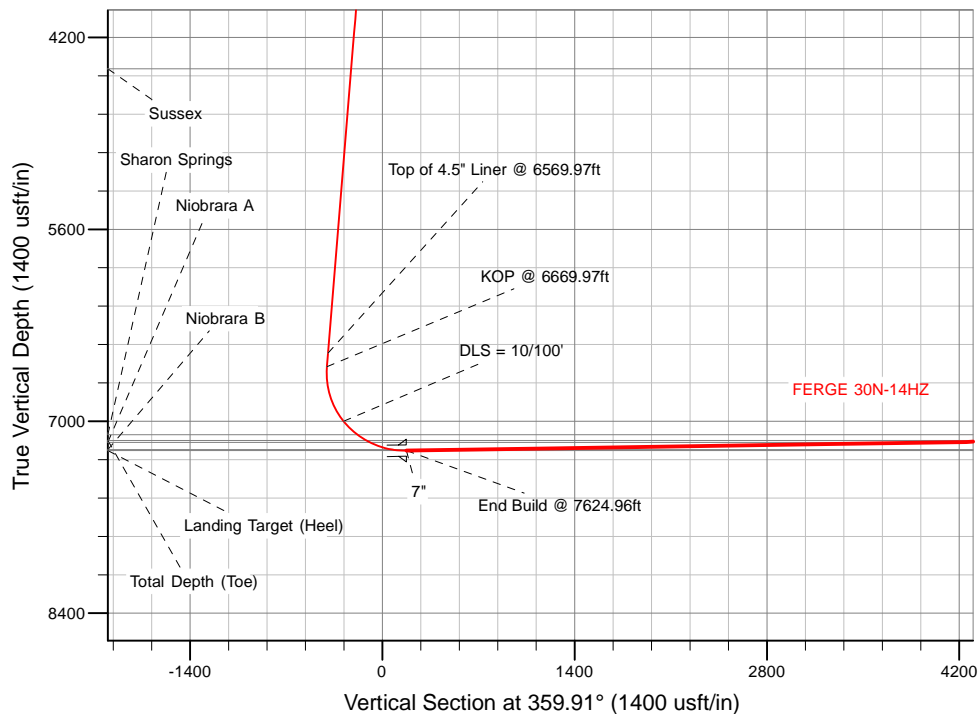
**HALLIBURTON**  
Sperry Drilling

## 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	1400.00	0.00	0.00	1400.00	0.00	0.00	0.00	0.00	0.00	
3	1875.84	9.52	240.82	1873.65	-19.22	-34.42	2.00	240.82	-19.17	
4	6669.97	9.52	240.82	6601.80	-405.69	-726.46	0.00	0.00	-404.55	
5	7624.96	90.90	359.91	7214.00	174.16	-818.53	10.00	118.62	175.44	FERGE 30N-14HZ_CP
6	12405.91	90.90	359.91	7139.00	4954.51	-826.19	0.00	0.00	4955.80	FERGE 30N-14HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Polygon
FERGE 30N-14HZ_LD	0.00	0.00	0.00	40.218592	-104.750124	Polygon
FERGE 30N-14HZ_SEC	0.00	0.00	0.00	40.218592	-104.750124	Polygon
FERGE 30N-14HZ_SHL	0.00	0.00	0.00	40.218592	-104.750124	Polygon
FERGE 30N-14HZ_BHL	7139.00	4954.51	-826.19	40.232192	-104.753083	Point
FERGE 30N-14HZ_CP	7214.00	174.16	-818.53	40.219070	-104.753055	Point



TVD MD

6503.18 6569.97 Top of 4.5" Liner @ 6569.97ft  
6601.81 6669.97 KOP @ 6669.97ft

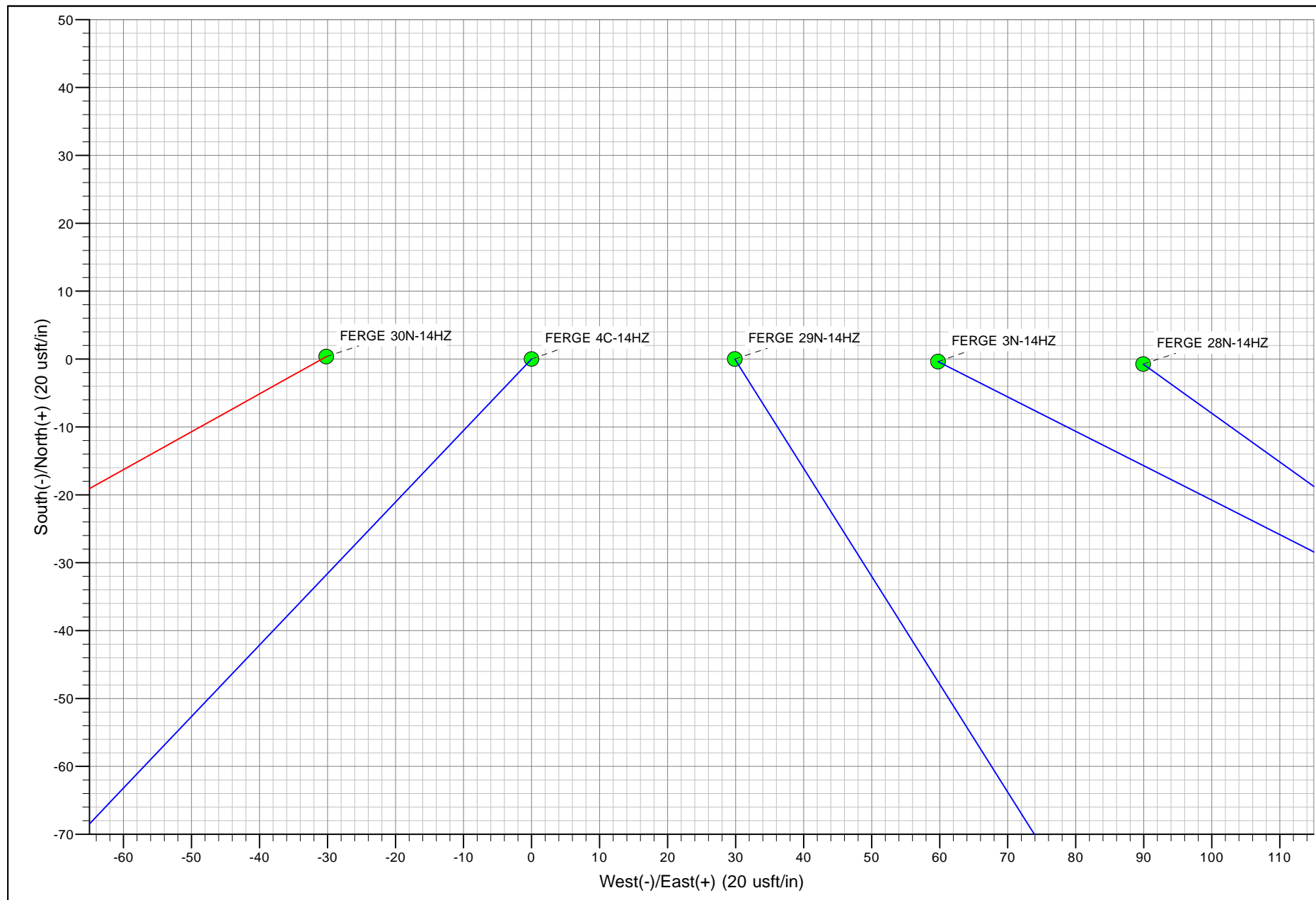
WELL DETAILS: FERGE 30N-14HZ

Ground Level: 4913.00

RKB = 17' @ 4930.00usft (Drilling Rig)

Plan: Rev A0 Permit (FERGE 30N-14HZ/Plan A)

Created By: Clint Eshelman Date: 11/18/2013  
Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_



**Plan Report for FERGE 30N-14HZ - Rev A0 Permit**

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 (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>FERGE 30N-14HZ_SEC - FERGE 30N-14HZ_LD - FERGE 30N-14HZ_SHL</b>										
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
1,095.00	0.00	0.00	1,095.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Marker</b>										
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,145.00	0.00	0.00	1,145.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
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
<b>Begin Nudge @ 1400.00ft</b>										
1,500.00	2.00	240.82	1,499.98	-0.85	-1.52	-0.85	2.00	2.00	0.00	240.82
1,600.00	4.00	240.82	1,599.84	-3.40	-6.09	-3.39	2.00	2.00	0.00	0.00
1,700.00	6.00	240.82	1,699.45	-7.65	-13.70	-7.63	2.00	2.00	0.00	0.00
1,800.00	8.00	240.82	1,798.70	-13.59	-24.34	-13.56	2.00	2.00	0.00	0.00
1,875.84	9.52	240.82	1,873.66	-19.22	-34.42	-19.17	2.00	2.00	0.00	0.00
<b>End Nudge @ 1875.84ft</b>										
1,900.00	9.52	240.82	1,897.48	-21.17	-37.91	-21.11	0.00	0.00	0.00	0.00
2,000.00	9.52	240.82	1,996.11	-29.23	-52.35	-29.15	0.00	0.00	0.00	0.00
2,100.00	9.52	240.82	2,094.73	-37.29	-66.78	-37.19	0.00	0.00	0.00	0.00
2,200.00	9.52	240.82	2,193.35	-45.36	-81.22	-45.23	0.00	0.00	0.00	0.00
2,300.00	9.52	240.82	2,291.98	-53.42	-95.65	-53.27	0.00	0.00	0.00	0.00
2,400.00	9.52	240.82	2,390.60	-61.48	-110.09	-61.30	0.00	0.00	0.00	0.00
2,500.00	9.52	240.82	2,489.22	-69.54	-124.52	-69.34	0.00	0.00	0.00	0.00
2,600.00	9.52	240.82	2,587.85	-77.60	-138.96	-77.38	0.00	0.00	0.00	0.00
2,700.00	9.52	240.82	2,686.47	-85.66	-153.39	-85.42	0.00	0.00	0.00	0.00
2,800.00	9.52	240.82	2,785.10	-93.72	-167.83	-93.46	0.00	0.00	0.00	0.00
2,900.00	9.52	240.82	2,883.72	-101.78	-182.26	-101.50	0.00	0.00	0.00	0.00
3,000.00	9.52	240.82	2,982.34	-109.85	-196.70	-109.54	0.00	0.00	0.00	0.00
3,100.00	9.52	240.82	3,080.97	-117.91	-211.13	-117.57	0.00	0.00	0.00	0.00
3,200.00	9.52	240.82	3,179.59	-125.97	-225.57	-125.61	0.00	0.00	0.00	0.00
3,300.00	9.52	240.82	3,278.21	-134.03	-240.00	-133.65	0.00	0.00	0.00	0.00
3,400.00	9.52	240.82	3,376.84	-142.09	-254.44	-141.69	0.00	0.00	0.00	0.00
3,500.00	9.52	240.82	3,475.46	-150.15	-268.87	-149.73	0.00	0.00	0.00	0.00
3,600.00	9.52	240.82	3,574.09	-158.21	-283.31	-157.77	0.00	0.00	0.00	0.00
3,700.00	9.52	240.82	3,672.71	-166.27	-297.74	-165.81	0.00	0.00	0.00	0.00
3,800.00	9.52	240.82	3,771.33	-174.34	-312.18	-173.84	0.00	0.00	0.00	0.00
3,900.00	9.52	240.82	3,869.96	-182.40	-326.61	-181.88	0.00	0.00	0.00	0.00
4,000.00	9.52	240.82	3,968.58	-190.46	-341.05	-189.92	0.00	0.00	0.00	0.00
4,026.79	9.52	240.82	3,995.00	-192.62	-344.92	-192.08	0.00	0.00	0.00	0.00
<b>Parkman</b>										
4,100.00	9.52	240.82	4,067.20	-198.52	-355.48	-197.96	0.00	0.00	0.00	0.00
4,200.00	9.52	240.82	4,165.83	-206.58	-369.92	-206.00	0.00	0.00	0.00	0.00
4,300.00	9.52	240.82	4,264.45	-214.64	-384.36	-214.04	0.00	0.00	0.00	0.00
4,400.00	9.52	240.82	4,363.08	-222.70	-398.79	-222.08	0.00	0.00	0.00	0.00
4,464.82	9.52	240.82	4,427.00	-227.93	-408.15	-227.29	0.00	0.00	0.00	0.00
<b>Sussex</b>										

**Plan Report for FERGE 30N-14HZ - Rev A0 Permit**

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 (°)
4,500.00	9.52	240.82	4,461.70	-230.76	-413.23	-230.12	0.00	0.00	0.00	0.00
4,600.00	9.52	240.82	4,560.32	-238.83	-427.66	-238.15	0.00	0.00	0.00	0.00
4,700.00	9.52	240.82	4,658.95	-246.89	-442.10	-246.19	0.00	0.00	0.00	0.00
4,800.00	9.52	240.82	4,757.57	-254.95	-456.53	-254.23	0.00	0.00	0.00	0.00
4,900.00	9.52	240.82	4,856.19	-263.01	-470.97	-262.27	0.00	0.00	0.00	0.00
5,000.00	9.52	240.82	4,954.82	-271.07	-485.40	-270.31	0.00	0.00	0.00	0.00
5,100.00	9.52	240.82	5,053.44	-279.13	-499.84	-278.35	0.00	0.00	0.00	0.00
5,200.00	9.52	240.82	5,152.07	-287.19	-514.27	-286.39	0.00	0.00	0.00	0.00
5,300.00	9.52	240.82	5,250.69	-295.25	-528.71	-294.42	0.00	0.00	0.00	0.00
5,400.00	9.52	240.82	5,349.31	-303.32	-543.14	-302.46	0.00	0.00	0.00	0.00
5,500.00	9.52	240.82	5,447.94	-311.38	-557.58	-310.50	0.00	0.00	0.00	0.00
5,600.00	9.52	240.82	5,546.56	-319.44	-572.01	-318.54	0.00	0.00	0.00	0.00
5,700.00	9.52	240.82	5,645.18	-327.50	-586.45	-326.58	0.00	0.00	0.00	0.00
5,800.00	9.52	240.82	5,743.81	-335.56	-600.88	-334.62	0.00	0.00	0.00	0.00
5,900.00	9.52	240.82	5,842.43	-343.62	-615.32	-342.66	0.00	0.00	0.00	0.00
6,000.00	9.52	240.82	5,941.06	-351.68	-629.75	-350.69	0.00	0.00	0.00	0.00
6,100.00	9.52	240.82	6,039.68	-359.74	-644.19	-358.73	0.00	0.00	0.00	0.00
6,200.00	9.52	240.82	6,138.30	-367.81	-658.62	-366.77	0.00	0.00	0.00	0.00
6,300.00	9.52	240.82	6,236.93	-375.87	-673.06	-374.81	0.00	0.00	0.00	0.00
6,400.00	9.52	240.82	6,335.55	-383.93	-687.49	-382.85	0.00	0.00	0.00	0.00
6,500.00	9.52	240.82	6,434.17	-391.99	-701.93	-390.89	0.00	0.00	0.00	0.00
6,569.97	9.52	240.82	6,503.18	-397.63	-712.03	-396.51	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 6569.97ft</b>										
6,600.00	9.52	240.82	6,532.80	-400.05	-716.36	-398.93	0.00	0.00	0.00	0.00
6,669.97	9.52	240.82	6,601.81	-405.69	-726.46	-404.55	0.00	0.00	0.00	0.00
<b>KOP @ 6669.97ft</b>										
6,700.00	8.49	258.96	6,631.47	-407.33	-730.81	-406.18	10.00	-3.41	60.42	118.62
6,800.00	11.83	315.31	6,730.11	-401.44	-745.30	-400.27	10.00	3.33	56.35	100.70
6,900.00	20.16	336.22	6,826.23	-378.33	-759.49	-377.14	10.00	8.33	20.91	45.08
7,000.00	29.51	344.76	6,916.91	-338.70	-772.95	-337.48	10.00	9.36	8.54	24.91
7,100.00	39.17	349.40	6,999.40	-283.75	-785.26	-282.52	10.00	9.66	4.65	17.13
<b>DLS = 10/100'</b>										
7,200.00	48.95	352.44	7,071.18	-215.15	-796.06	-213.90	10.00	9.78	3.03	13.28
7,241.00	52.98	353.42	7,097.00	-183.55	-799.97	-182.30	10.00	9.82	2.41	11.10
<b>Sharon Springs</b>										
7,300.00	58.78	354.68	7,130.08	-135.00	-805.01	-133.73	10.00	9.84	2.12	10.47
7,349.73	63.69	355.62	7,154.00	-91.58	-808.69	-90.31	10.00	9.86	1.89	9.77
<b>Niobrara A</b>										
7,400.00	68.65	356.49	7,174.31	-45.71	-811.85	-44.43	10.00	9.87	1.74	9.32
7,500.00	78.54	358.07	7,202.52	49.99	-816.36	51.27	10.00	9.88	1.58	8.96
7,519.08	80.42	358.36	7,206.00	68.74	-816.94	70.02	10.00	9.89	1.50	8.52
<b>Niobrara B</b>										
7,600.00	88.43	359.55	7,213.85	149.20	-818.41	150.48	10.00	9.89	1.47	8.46
7,624.96	90.90	359.91	7,214.00	174.16	-818.53	175.44	10.00	9.89	1.45	8.35
<b>End Build @ 7624.96ft - Landing Target (Heel) - 7" - FERGE 30N-14HZ_CP</b>										
7,700.00	90.90	359.91	7,212.82	249.18	-818.65	250.47	0.00	0.00	0.00	8.35
7,800.00	90.90	359.91	7,211.25	349.17	-818.81	350.46	0.00	0.00	0.00	0.00
7,900.00	90.90	359.91	7,209.69	449.16	-818.97	450.45	0.00	0.00	0.00	0.00
8,000.00	90.90	359.91	7,208.12	549.15	-819.13	550.43	0.00	0.00	0.00	0.00
8,100.00	90.90	359.91	7,206.55	649.13	-819.29	650.42	0.00	0.00	0.00	0.00
8,200.00	90.90	359.91	7,204.98	749.12	-819.45	750.41	0.00	0.00	0.00	0.00
8,300.00	90.90	359.91	7,203.41	849.11	-819.61	850.40	0.00	0.00	0.00	0.00
8,400.00	90.90	359.91	7,201.84	949.10	-819.77	950.38	0.00	0.00	0.00	0.00
8,500.00	90.90	359.91	7,200.27	1,049.08	-819.93	1,050.37	0.00	0.00	0.00	0.00
8,600.00	90.90	359.91	7,198.70	1,149.07	-820.09	1,150.36	0.00	0.00	0.00	0.00
8,700.00	90.90	359.91	7,197.14	1,249.06	-820.25	1,250.35	0.00	0.00	0.00	0.00
8,800.00	90.90	359.91	7,195.57	1,349.05	-820.41	1,350.33	0.00	0.00	0.00	0.00
8,900.00	90.90	359.91	7,194.00	1,449.03	-820.57	1,450.32	0.00	0.00	0.00	0.00
9,000.00	90.90	359.91	7,192.43	1,549.02	-820.73	1,550.31	0.00	0.00	0.00	0.00

**Plan Report for FERGE 30N-14HZ - Rev A0 Permit**

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 (°)
9,100.00	90.90	359.91	7,190.86	1,649.01	-820.89	1,650.30	0.00	0.00	0.00	0.00
9,200.00	90.90	359.91	7,189.29	1,749.00	-821.05	1,750.29	0.00	0.00	0.00	0.00
9,300.00	90.90	359.91	7,187.72	1,848.99	-821.21	1,850.27	0.00	0.00	0.00	0.00
9,400.00	90.90	359.91	7,186.15	1,948.97	-821.37	1,950.26	0.00	0.00	0.00	0.00
9,500.00	90.90	359.91	7,184.59	2,048.96	-821.53	2,050.25	0.00	0.00	0.00	0.00
9,600.00	90.90	359.91	7,183.02	2,148.95	-821.69	2,150.24	0.00	0.00	0.00	0.00
9,700.00	90.90	359.91	7,181.45	2,248.94	-821.85	2,250.22	0.00	0.00	0.00	0.00
9,800.00	90.90	359.91	7,179.88	2,348.92	-822.01	2,350.21	0.00	0.00	0.00	0.00
9,900.00	90.90	359.91	7,178.31	2,448.91	-822.17	2,450.20	0.00	0.00	0.00	0.00
10,000.00	90.90	359.91	7,176.74	2,548.90	-822.33	2,550.19	0.00	0.00	0.00	0.00
10,100.00	90.90	359.91	7,175.17	2,648.89	-822.49	2,650.17	0.00	0.00	0.00	0.00
10,200.00	90.90	359.91	7,173.60	2,748.87	-822.65	2,750.16	0.00	0.00	0.00	0.00
10,300.00	90.90	359.91	7,172.04	2,848.86	-822.81	2,850.15	0.00	0.00	0.00	0.00
10,400.00	90.90	359.91	7,170.47	2,948.85	-822.97	2,950.14	0.00	0.00	0.00	0.00
10,500.00	90.90	359.91	7,168.90	3,048.84	-823.13	3,050.13	0.00	0.00	0.00	0.00
10,600.00	90.90	359.91	7,167.33	3,148.82	-823.29	3,150.11	0.00	0.00	0.00	0.00
10,700.00	90.90	359.91	7,165.76	3,248.81	-823.45	3,250.10	0.00	0.00	0.00	0.00
10,800.00	90.90	359.91	7,164.19	3,348.80	-823.61	3,350.09	0.00	0.00	0.00	0.00
10,900.00	90.90	359.91	7,162.62	3,448.79	-823.77	3,450.08	0.00	0.00	0.00	0.00
11,000.00	90.90	359.91	7,161.05	3,548.77	-823.94	3,550.06	0.00	0.00	0.00	0.00
11,100.00	90.90	359.91	7,159.49	3,648.76	-824.10	3,650.05	0.00	0.00	0.00	0.00
11,200.00	90.90	359.91	7,157.92	3,748.75	-824.26	3,750.04	0.00	0.00	0.00	0.00
11,300.00	90.90	359.91	7,156.35	3,848.74	-824.42	3,850.03	0.00	0.00	0.00	0.00
11,400.00	90.90	359.91	7,154.78	3,948.72	-824.58	3,950.01	0.00	0.00	0.00	0.00
11,500.00	90.90	359.91	7,153.21	4,048.71	-824.74	4,050.00	0.00	0.00	0.00	0.00
11,600.00	90.90	359.91	7,151.64	4,148.70	-824.90	4,149.99	0.00	0.00	0.00	0.00
11,700.00	90.90	359.91	7,150.07	4,248.69	-825.06	4,249.98	0.00	0.00	0.00	0.00
11,800.00	90.90	359.91	7,148.51	4,348.67	-825.22	4,349.97	0.00	0.00	0.00	0.00
11,900.00	90.90	359.91	7,146.94	4,448.66	-825.38	4,449.95	0.00	0.00	0.00	0.00
12,000.00	90.90	359.91	7,145.37	4,548.65	-825.54	4,549.94	0.00	0.00	0.00	0.00
12,100.00	90.90	359.91	7,143.80	4,648.64	-825.70	4,649.93	0.00	0.00	0.00	0.00
12,200.00	90.90	359.91	7,142.23	4,748.62	-825.86	4,749.92	0.00	0.00	0.00	0.00
12,300.00	90.90	359.91	7,140.66	4,848.61	-826.02	4,849.90	0.00	0.00	0.00	0.00
12,400.00	90.90	359.91	7,139.09	4,948.60	-826.18	4,949.89	0.00	0.00	0.00	0.00
12,405.90	90.90	359.91	7,139.00	4,954.50	-826.19	4,955.79	0.00	0.00	0.00	0.00
<b>Total Depth (Toe)</b>										
12,405.91	90.90	359.91	7,139.00	4,954.51	-826.19	4,955.80	0.01	0.00	0.00	0.00
<b>TD Well @ 12405.91ft - FERGE 30N-14HZ_BHL</b>										

**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,400.00	1,400.00	0.00	0.00	Begin Nudge @ 1400.00ft
1,875.84	1,873.66	-19.22	-34.42	End Nudge @ 1875.84ft
6,569.97	6,503.18	-397.63	-712.03	Top of 4.5" Liner @ 6569.97ft
6,669.97	6,601.81	-405.69	-726.46	KOP @ 6669.97ft
7,100.00	6,999.40	-283.75	-785.26	DLS = 10/100'
7,624.96	7,214.00	174.15	-818.53	End Build @ 7624.96ft
12,405.91	7,139.00	4,954.51	-826.19	TD Well @ 12405.91ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.91	Slot	0.00	0.00	0.00

## Plan Report for FERGE 30N-14HZ - Rev A0 Permit

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,624.96	Rev A0 Permit	MWD
7,624.96	12,405.91	Rev A0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,145.00	1,145.00	9 5/8"	9-5/8	13-1/2
7,624.96	7,214.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,095.00	1,095.00	Fox Hills Marker		0.00	
4,026.79	3,995.00	Parkman		0.00	
4,464.82	4,427.00	Sussex		0.00	
7,241.00	7,097.00	Sharon Springs		0.00	
7,349.73	7,154.00	Niobrara A		0.00	
7,519.08	7,206.00	Niobrara B		0.00	
7,624.96	7,214.00	Landing Target (Heel)		0.00	
12,405.90	7,139.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
FERGE 30N-14HZ_SEC	0.00	0.00	0.00	Polygon
FERGE 30N-14HZ_LD	0.00	0.00	0.00	Polygon
FERGE 30N-14HZ_SHL	0.00	0.00	0.00	Point
FERGE 30N-14HZ_BHL	7,139.00	4,954.51	-826.19	Point
FERGE 30N-14HZ_CP	7,214.00	174.16	-818.53	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.85 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,624.96 usft
Net Tortousity applicable to Plans:	0.85 °/100usft	Directional Difficulty Index:	6.163

Audit Info

**North Reference Sheet for Sec. 14-T3N-R66W - FERGE 30N-14HZ - 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' @ 4930.00usft (Drilling Rig). Northing and Easting are relative to FERGE 30N-14HZ  
 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: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995700

Grid Coordinates of Well: 1,323,360.63 usft N, 3,209,404.58 usft E  
 Geographical Coordinates of Well: 40° 13' 06.93" N, 104° 45' 00.45" W  
 Grid Convergence at Surface is: 0.48°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,405.91usft  
 the Bottom Hole Displacement is 5,022.92usft in the Direction of 350.53° ( True).  
 Magnetic Convergence at surface is: -8.07° (14 November 2013, , BGGM2013)

