

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 23-T3N-R68W

Benson Farms 14C-19HZ

Plan A

Plan: Rev A0 Permit

Sperry Drilling Services

Proposal Report

18 February, 2014

Well Coordinates: 1,318,426.36 N, 3,150,572.89 E (40° 12' 22.40" N, 104° 57' 39.24" W)

Ground Level: 4,961.00 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 Benson Farms 14C-19HZ

RKB = 17' @ 4978.00usft (Drilling Rig)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 23-T3N-R68W
Well: Benson Farms 14C-19HZ
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	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	4160.00	0.00	0.00	4160.00	0.00	0.00	0.00	0.00	0.00	
3	4249.45	1.79	323.39	4249.44	1.12	-0.83	2.00	323.39	-0.83	
4	6750.84	1.79	323.39	6749.60	63.81	-47.40	0.00	0.00	-47.31	
5	7666.48	90.50	89.92	7333.00	79.44	530.42	10.00	126.50	530.53	Benson Farms 14C-19HZ_CP
6	14551.92	90.50	89.92	7273.00	89.65	7415.60	0.00	0.00	7415.72	Benson Farms 14C-19HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
Benson Farms 14C-19HZ_LD	0.00	0.00	0.00	40° 12' 22.395 N	104° 57' 39.244 W	Polygon
Benson Farms 14C-19HZ_SEC	0.00	0.00	0.00	40° 12' 22.395 N	104° 57' 39.244 W	Polygon
Benson Farms 14C-19HZ_SHL	0.00	0.00	0.00	40° 12' 22.395 N	104° 57' 39.244 W	Polygon
Benson Farms 14C-19HZ_BHL	7273.00	89.65	7415.60	40° 12' 23.270 N	104° 56' 3.667 W	Point
Benson Farms 14C-19HZ_CP	7333.00	79.44	530.42	40° 12' 23.180 N	104° 57' 32.407 W	Point

West(-)/East(+) (1400 usft/in)

2100 2800 3500 4200 4900 5600 6300 7000

South(-)/North(+) (1400 usft/in)

2100

1400

700

0

-700

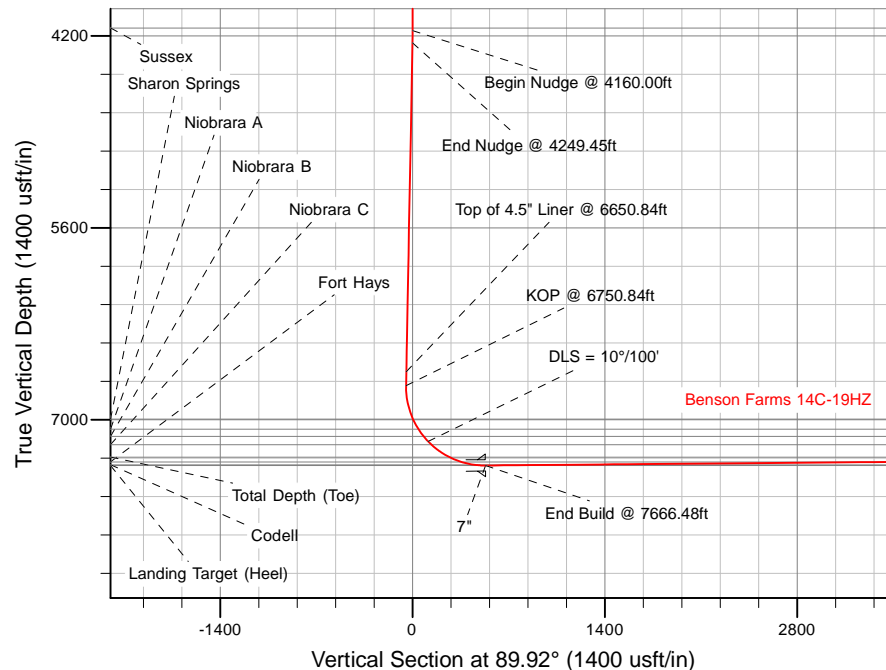
-1400

677' FSL
72' FEL

7" 750' FSL
460' FWL

750' FSL
2071' FWL

Benson Farms 14C-19HZ



TVD

MD

6649.65 6650.84 Top of 4.5" Liner @ 6650.84ft
6749.61 6750.84 KOP @ 6750.84ft

WELL DETAILS: Benson Farms 14C-19HZ

Ground Level: 4961.00

RKB = 17' @ 4978.00usft (Drilling Rig)

Plan: Rev A0 Permit (Benson Farms 14C-19HZ/Plan A)

Created By: Clint Eshelman Date: 2/18/2014
Reviewed: _____ Date: _____

Plan Report for Benson Farms 14C-19HZ - 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
Benson Farms 14C-19HZ_LD - Benson Farms 14C-19HZ_SHL - Benson Farms 14C-19HZ_SEC										
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
1,060.00	0.00	0.00	1,060.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Marker										
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,110.00	0.00	0.00	1,110.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
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
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,682.00	0.00	0.00	3,682.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parkman										
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,142.00	0.00	0.00	4,142.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sussex										
4,160.00	0.00	0.00	4,160.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 4160.00ft										
4,200.00	0.80	323.39	4,200.00	0.22	-0.17	-0.17	2.00	2.00	0.00	323.39
4,249.45	1.79	323.39	4,249.44	1.12	-0.83	-0.83	2.00	2.00	0.00	0.00
End Nudge @ 4249.45ft										
4,300.00	1.79	323.39	4,299.96	2.39	-1.77	-1.77	0.00	0.00	0.00	0.00

Plan Report for Benson Farms 14C-19HZ - 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 (°)
4,400.00	1.79	323.39	4,399.91	4.89	-3.64	-3.63	0.00	0.00	0.00	0.00
4,500.00	1.79	323.39	4,499.86	7.40	-5.50	-5.49	0.00	0.00	0.00	0.00
4,600.00	1.79	323.39	4,599.81	9.91	-7.36	-7.35	0.00	0.00	0.00	0.00
4,700.00	1.79	323.39	4,699.77	12.41	-9.22	-9.20	0.00	0.00	0.00	0.00
4,800.00	1.79	323.39	4,799.72	14.92	-11.08	-11.06	0.00	0.00	0.00	0.00
4,900.00	1.79	323.39	4,899.67	17.42	-12.94	-12.92	0.00	0.00	0.00	0.00
5,000.00	1.79	323.39	4,999.62	19.93	-14.81	-14.78	0.00	0.00	0.00	0.00
5,100.00	1.79	323.39	5,099.57	22.44	-16.67	-16.64	0.00	0.00	0.00	0.00
5,200.00	1.79	323.39	5,199.52	24.94	-18.53	-18.50	0.00	0.00	0.00	0.00
5,300.00	1.79	323.39	5,299.47	27.45	-20.39	-20.35	0.00	0.00	0.00	0.00
5,400.00	1.79	323.39	5,399.42	29.95	-22.25	-22.21	0.00	0.00	0.00	0.00
5,500.00	1.79	323.39	5,499.38	32.46	-24.12	-24.07	0.00	0.00	0.00	0.00
5,600.00	1.79	323.39	5,599.33	34.97	-25.98	-25.93	0.00	0.00	0.00	0.00
5,700.00	1.79	323.39	5,699.28	37.47	-27.84	-27.79	0.00	0.00	0.00	0.00
5,800.00	1.79	323.39	5,799.23	39.98	-29.70	-29.65	0.00	0.00	0.00	0.00
5,900.00	1.79	323.39	5,899.18	42.48	-31.56	-31.50	0.00	0.00	0.00	0.00
6,000.00	1.79	323.39	5,999.13	44.99	-33.42	-33.36	0.00	0.00	0.00	0.00
6,100.00	1.79	323.39	6,099.08	47.50	-35.29	-35.22	0.00	0.00	0.00	0.00
6,200.00	1.79	323.39	6,199.03	50.00	-37.15	-37.08	0.00	0.00	0.00	0.00
6,300.00	1.79	323.39	6,298.99	52.51	-39.01	-38.94	0.00	0.00	0.00	0.00
6,400.00	1.79	323.39	6,398.94	55.01	-40.87	-40.79	0.00	0.00	0.00	0.00
6,500.00	1.79	323.39	6,498.89	57.52	-42.73	-42.65	0.00	0.00	0.00	0.00
6,600.00	1.79	323.39	6,598.84	60.03	-44.60	-44.51	0.00	0.00	0.00	0.00
6,650.84	1.79	323.39	6,649.65	61.30	-45.54	-45.46	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6650.84ft										
6,700.00	1.79	323.39	6,698.79	62.53	-46.46	-46.37	0.00	0.00	0.00	0.00
6,750.84	1.79	323.39	6,749.61	63.81	-47.40	-47.31	0.00	0.00	0.00	0.00
KOP @ 6750.84ft										
6,800.00	4.11	69.46	6,798.72	65.04	-46.21	-46.12	10.00	4.72	215.76	126.50
6,900.00	13.92	84.09	6,897.37	67.54	-30.85	-30.75	10.00	9.81	14.63	20.49
7,000.00	23.89	86.65	6,991.86	69.97	1.42	1.52	10.00	9.97	2.56	5.99
7,003.44	24.24	86.71	6,995.00	70.05	2.82	2.92	10.00	9.98	1.51	3.55
Sharon Springs										
7,086.49	32.53	87.65	7,068.00	71.95	42.22	42.32	10.00	9.99	1.13	3.51
Niobrara A										
7,100.00	33.88	87.76	7,079.31	72.25	49.61	49.71	10.00	9.99	0.84	2.68
7,151.86	39.06	88.13	7,121.00	73.35	80.41	80.51	10.00	9.99	0.71	2.58
Niobrara B										
7,200.00	43.87	88.41	7,157.06	74.31	112.26	112.36	10.00	9.99	0.57	2.28
DLS = 10°/100'										
7,234.21	47.29	88.57	7,181.00	74.95	136.68	136.78	10.00	9.99	0.49	2.08
Niobrara C										
7,300.00	53.86	88.85	7,222.76	76.08	187.46	187.57	10.00	9.99	0.42	1.96
7,400.00	63.86	89.20	7,274.40	77.53	272.93	273.04	10.00	10.00	0.34	1.78
7,491.50	73.01	89.46	7,308.00	78.51	357.93	358.04	10.00	10.00	0.29	1.60
Fort Hays										
7,500.00	73.86	89.49	7,310.42	78.59	366.08	366.19	10.00	10.00	0.27	1.50
7,585.56	82.41	89.71	7,328.00	79.17	449.73	449.84	10.00	10.00	0.26	1.50
Codell										
7,600.00	83.85	89.75	7,329.73	79.24	464.07	464.18	10.00	10.00	0.25	1.45
7,666.48	90.50	89.92	7,333.00	79.44	530.42	530.53	10.00	10.00	0.25	1.45
End Build @ 7666.48ft - Landing Target (Heel) - 7" - Benson Farms 14C-19HZ_CP										
7,700.00	90.50	89.92	7,332.71	79.49	563.95	564.06	0.00	0.00	0.00	1.44
7,800.00	90.50	89.92	7,331.84	79.63	663.94	664.05	0.00	0.00	0.00	0.00
7,900.00	90.50	89.92	7,330.97	79.78	763.94	764.05	0.00	0.00	0.00	0.00
8,000.00	90.50	89.92	7,330.09	79.93	863.93	864.05	0.00	0.00	0.00	0.00
8,100.00	90.50	89.92	7,329.22	80.08	963.93	964.04	0.00	0.00	0.00	0.00
8,200.00	90.50	89.92	7,328.35	80.23	1,063.93	1,064.04	0.00	0.00	0.00	0.00
8,300.00	90.50	89.92	7,327.48	80.37	1,163.92	1,164.03	0.00	0.00	0.00	0.00



Plan Report for Benson Farms 14C-19HZ - 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 (°)
8,400.00	90.50	89.92	7,326.61	80.52	1,263.92	1,264.03	0.00	0.00	0.00	0.00
8,500.00	90.50	89.92	7,325.74	80.67	1,363.91	1,364.03	0.00	0.00	0.00	0.00
8,600.00	90.50	89.92	7,324.87	80.82	1,463.91	1,464.02	0.00	0.00	0.00	0.00
8,700.00	90.50	89.92	7,323.99	80.97	1,563.91	1,564.02	0.00	0.00	0.00	0.00
8,800.00	90.50	89.92	7,323.12	81.12	1,663.90	1,664.01	0.00	0.00	0.00	0.00
8,900.00	90.50	89.92	7,322.25	81.26	1,763.90	1,764.01	0.00	0.00	0.00	0.00
9,000.00	90.50	89.92	7,321.38	81.41	1,863.90	1,864.01	0.00	0.00	0.00	0.00
9,100.00	90.50	89.92	7,320.51	81.56	1,963.89	1,964.00	0.00	0.00	0.00	0.00
9,200.00	90.50	89.92	7,319.64	81.71	2,063.89	2,064.00	0.00	0.00	0.00	0.00
9,300.00	90.50	89.92	7,318.77	81.86	2,163.88	2,164.00	0.00	0.00	0.00	0.00
9,400.00	90.50	89.92	7,317.89	82.01	2,263.88	2,263.99	0.00	0.00	0.00	0.00
9,500.00	90.50	89.92	7,317.02	82.15	2,363.88	2,363.99	0.00	0.00	0.00	0.00
9,600.00	90.50	89.92	7,316.15	82.30	2,463.87	2,463.98	0.00	0.00	0.00	0.00
9,700.00	90.50	89.92	7,315.28	82.45	2,563.87	2,563.98	0.00	0.00	0.00	0.00
9,800.00	90.50	89.92	7,314.41	82.60	2,663.86	2,663.98	0.00	0.00	0.00	0.00
9,900.00	90.50	89.92	7,313.54	82.75	2,763.86	2,763.97	0.00	0.00	0.00	0.00
10,000.00	90.50	89.92	7,312.67	82.90	2,863.86	2,863.97	0.00	0.00	0.00	0.00
10,100.00	90.50	89.92	7,311.79	83.04	2,963.85	2,963.97	0.00	0.00	0.00	0.00
10,200.00	90.50	89.92	7,310.92	83.19	3,063.85	3,063.96	0.00	0.00	0.00	0.00
10,300.00	90.50	89.92	7,310.05	83.34	3,163.84	3,163.96	0.00	0.00	0.00	0.00
10,400.00	90.50	89.92	7,309.18	83.49	3,263.84	3,263.95	0.00	0.00	0.00	0.00
10,500.00	90.50	89.92	7,308.31	83.64	3,363.84	3,363.95	0.00	0.00	0.00	0.00
10,600.00	90.50	89.92	7,307.44	83.79	3,463.83	3,463.95	0.00	0.00	0.00	0.00
10,700.00	90.50	89.92	7,306.57	83.93	3,563.83	3,563.94	0.00	0.00	0.00	0.00
10,800.00	90.50	89.92	7,305.69	84.08	3,663.82	3,663.94	0.00	0.00	0.00	0.00
10,900.00	90.50	89.92	7,304.82	84.23	3,763.82	3,763.93	0.00	0.00	0.00	0.00
11,000.00	90.50	89.92	7,303.95	84.38	3,863.82	3,863.93	0.00	0.00	0.00	0.00
11,100.00	90.50	89.92	7,303.08	84.53	3,963.81	3,963.93	0.00	0.00	0.00	0.00
11,200.00	90.50	89.92	7,302.21	84.68	4,063.81	4,063.92	0.00	0.00	0.00	0.00
11,300.00	90.50	89.92	7,301.34	84.82	4,163.81	4,163.92	0.00	0.00	0.00	0.00
11,400.00	90.50	89.92	7,300.47	84.97	4,263.80	4,263.92	0.00	0.00	0.00	0.00
11,500.00	90.50	89.92	7,299.59	85.12	4,363.80	4,363.91	0.00	0.00	0.00	0.00
11,600.00	90.50	89.92	7,298.72	85.27	4,463.79	4,463.91	0.00	0.00	0.00	0.00
11,700.00	90.50	89.92	7,297.85	85.42	4,563.79	4,563.90	0.00	0.00	0.00	0.00
11,800.00	90.50	89.92	7,296.98	85.57	4,663.79	4,663.90	0.00	0.00	0.00	0.00
11,900.00	90.50	89.92	7,296.11	85.71	4,763.78	4,763.90	0.00	0.00	0.00	0.00
12,000.00	90.50	89.92	7,295.24	85.86	4,863.78	4,863.89	0.00	0.00	0.00	0.00
12,100.00	90.50	89.92	7,294.37	86.01	4,963.77	4,963.89	0.00	0.00	0.00	0.00
12,200.00	90.50	89.92	7,293.49	86.16	5,063.77	5,063.89	0.00	0.00	0.00	0.00
12,300.00	90.50	89.92	7,292.62	86.31	5,163.77	5,163.88	0.00	0.00	0.00	0.00
12,400.00	90.50	89.92	7,291.75	86.46	5,263.76	5,263.88	0.00	0.00	0.00	0.00
12,500.00	90.50	89.92	7,290.88	86.60	5,363.76	5,363.87	0.00	0.00	0.00	0.00
12,600.00	90.50	89.92	7,290.01	86.75	5,463.75	5,463.87	0.00	0.00	0.00	0.00
12,700.00	90.50	89.92	7,289.14	86.90	5,563.75	5,563.87	0.00	0.00	0.00	0.00
12,800.00	90.50	89.92	7,288.27	87.05	5,663.75	5,663.86	0.00	0.00	0.00	0.00
12,900.00	90.50	89.92	7,287.39	87.20	5,763.74	5,763.86	0.00	0.00	0.00	0.00
13,000.00	90.50	89.92	7,286.52	87.35	5,863.74	5,863.86	0.00	0.00	0.00	0.00
13,100.00	90.50	89.92	7,285.65	87.49	5,963.74	5,963.85	0.00	0.00	0.00	0.00
13,200.00	90.50	89.92	7,284.78	87.64	6,063.73	6,063.85	0.00	0.00	0.00	0.00
13,300.00	90.50	89.92	7,283.91	87.79	6,163.73	6,163.84	0.00	0.00	0.00	0.00
13,400.00	90.50	89.92	7,283.04	87.94	6,263.72	6,263.84	0.00	0.00	0.00	0.00
13,500.00	90.50	89.92	7,282.17	88.09	6,363.72	6,363.84	0.00	0.00	0.00	0.00
13,600.00	90.50	89.92	7,281.30	88.24	6,463.72	6,463.83	0.00	0.00	0.00	0.00
13,700.00	90.50	89.92	7,280.42	88.38	6,563.71	6,563.83	0.00	0.00	0.00	0.00
13,800.00	90.50	89.92	7,279.55	88.53	6,663.71	6,663.82	0.00	0.00	0.00	0.00
13,900.00	90.50	89.92	7,278.68	88.68	6,763.70	6,763.82	0.00	0.00	0.00	0.00
14,000.00	90.50	89.92	7,277.81	88.83	6,863.70	6,863.82	0.00	0.00	0.00	0.00
14,100.00	90.50	89.92	7,276.94	88.98	6,963.70	6,963.81	0.00	0.00	0.00	0.00
14,200.00	90.50	89.92	7,276.07	89.13	7,063.69	7,063.81	0.00	0.00	0.00	0.00
14,300.00	90.50	89.92	7,275.20	89.27	7,163.69	7,163.81	0.00	0.00	0.00	0.00

Plan Report for Benson Farms 14C-19HZ - 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 (°)
14,400.00	90.50	89.92	7,274.32	89.42	7,263.68	7,263.80	0.00	0.00	0.00	0.00
14,500.00	90.50	89.92	7,273.45	89.57	7,363.68	7,363.80	0.00	0.00	0.00	0.00
14,551.91	90.50	89.92	7,273.00	89.65	7,415.59	7,415.71	0.00	0.00	0.00	0.00
Total Depth (Toe)										
14,551.92	90.50	89.92	7,273.00	89.65	7,415.60	7,415.72	0.00	0.00	0.00	0.00
TD Well @ 14551.92ft - Benson Farms 14C-19HZ_BHL										

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,160.00	4,160.00	0.00	0.00	Begin Nudge @ 4160.00ft
4,249.45	4,249.44	1.12	-0.83	End Nudge @ 4249.45ft
6,650.84	6,649.65	61.30	-45.54	Top of 4.5" Liner @ 6650.84ft
6,750.84	6,749.61	63.81	-47.40	KOP @ 6750.84ft
7,200.00	7,157.06	74.31	112.26	DLS = 10°/100'
7,666.48	7,333.00	79.44	530.43	End Build @ 7666.48ft
14,551.92	7,273.00	89.65	7,415.60	TD Well @ 14551.92ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	89.92	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,666.48	Rev A0 Permit	MWD
7,666.48	14,551.92	Rev A0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,110.00	1,110.00	9 5/8"	9-5/8	13-1/2
7,666.48	7,333.00	7"	7	8-3/4

Plan Report for Benson Farms 14C-19HZ - Rev A0 Permit

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,060.00	1,060.00	Fox Hills Marker		0.00	
3,682.00	3,682.00	Parkman		0.00	
4,142.00	4,142.00	Sussex		0.00	
7,003.44	6,995.00	Sharon Springs		0.00	
7,086.49	7,068.00	Niobrara A		0.00	
7,151.86	7,121.00	Niobrara B		0.00	
7,234.21	7,181.00	Niobrara C		0.00	
7,491.50	7,308.00	Fort Hays		0.00	
7,585.56	7,328.00	Codell		0.00	
7,666.48	7,333.00	Landing Target (Heel)		0.00	
14,551.91	7,273.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Benson Farms 14C-19HZ_LD	0.00	0.00	0.00	Polygon
Benson Farms 14C-19HZ_SHL	0.00	0.00	0.00	Point
Benson Farms 14C-19HZ_SEC	0.00	0.00	0.00	Polygon
Benson Farms 14C-19HZ_BHL	7,273.00	89.65	7,415.60	Point
Benson Farms 14C-19HZ_CP	7,333.00	79.44	530.42	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.64 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,666.48 usft
Net Tortosity applicable to Plans:	0.64 °/100usft	Directional Difficulty Index:	6.382

Audit Info

North Reference Sheet for Sec. 23-T3N-R68W - Benson Farms 14C-19HZ - 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' @ 4978.00usft (Drilling Rig). Northing and Easting are relative to Benson Farms 14C-19HZ
 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: 0.99995715

Grid Coordinates of Well: 1,318,426.36 usft N, 3,150,572.89 usft E
 Geographical Coordinates of Well: 40° 12' 22.40" N, 104° 57' 39.24" W
 Grid Convergence at Surface is: 0.35°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,551.92usft
 the Bottom Hole Displacement is 7,416.14usft in the Direction of 89.31° (True).
 Magnetic Convergence at surface is: -8.29° (12 February 2014, , BGGM2013)

