

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 1-T2N-R66W

Dolph 4C-1HZ

Plan A

Plan: Rev A0 Permit

Sperry Drilling Services

Proposal Report

04 February, 2014

Well Coordinates: 1,302,486.53 N, 3,215,443.93 E (40° 09' 40.14" N, 104° 43' 44.93" W)

Ground Level: 4,999.00 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 Dolph 4C-1HZ

RKB = 17' @ 5016.00usft (Drilling Rig)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 1-T2N-R66W
 Well: Dolph 4C-1HZ
 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	1680.00	0.00	0.00	1680.00	0.00	0.00	0.00	0.00	0.00	
3	2180.00	10.00	234.00	2177.47	-25.58	-35.21	2.00	234.00	-25.32	
4	6280.00	10.00	234.00	6215.18	-444.06	-611.20	0.00	0.00	-439.46	
5	6780.00	0.00	0.00	6712.64	-469.64	-646.41	2.00	180.00	-464.78	
6	6889.20	0.00	0.00	6821.84	-469.64	-646.41	0.00	0.00	-464.78	
7	7121.68	23.25	359.57	7048.00	-423.12	-646.76	10.00	359.57	-418.25	
8	7237.06	30.17	359.57	7151.00	-371.30	-647.14	6.00	0.00	-366.43	
9	7834.69	89.93	359.57	7436.00	123.37	-650.83	10.00	0.01	128.25	
10	12168.63	89.93	359.57	7441.00	4457.19	-682.98	0.00	0.00	4462.19	Dolph 4C-1H_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
Dolph 4C-1HZ_LD	0.00	0.00	0.00	40° 9' 40.140 N	104° 43' 44.933 W	Polygon
Dolph 4C-1HZ_SEC	0.00	0.00	0.00	40° 9' 40.140 N	104° 43' 44.933 W	
Dolph 4C-1HZ_SHL	0.00	0.00	0.00	40° 9' 40.140 N	104° 43' 44.933 W	
Dolph 4C-1HZ_CP	7436.00	93.28	-649.84	40° 9' 41.062 N	104° 43' 53.303 W	
Dolph 4C-1H_BHL	7441.00	4457.19	-682.98	40° 10' 24.186 N	104° 43' 53.731 W	Point

WELL DETAILS: Dolph 4C-1HZ

Ground Level: 4999.00

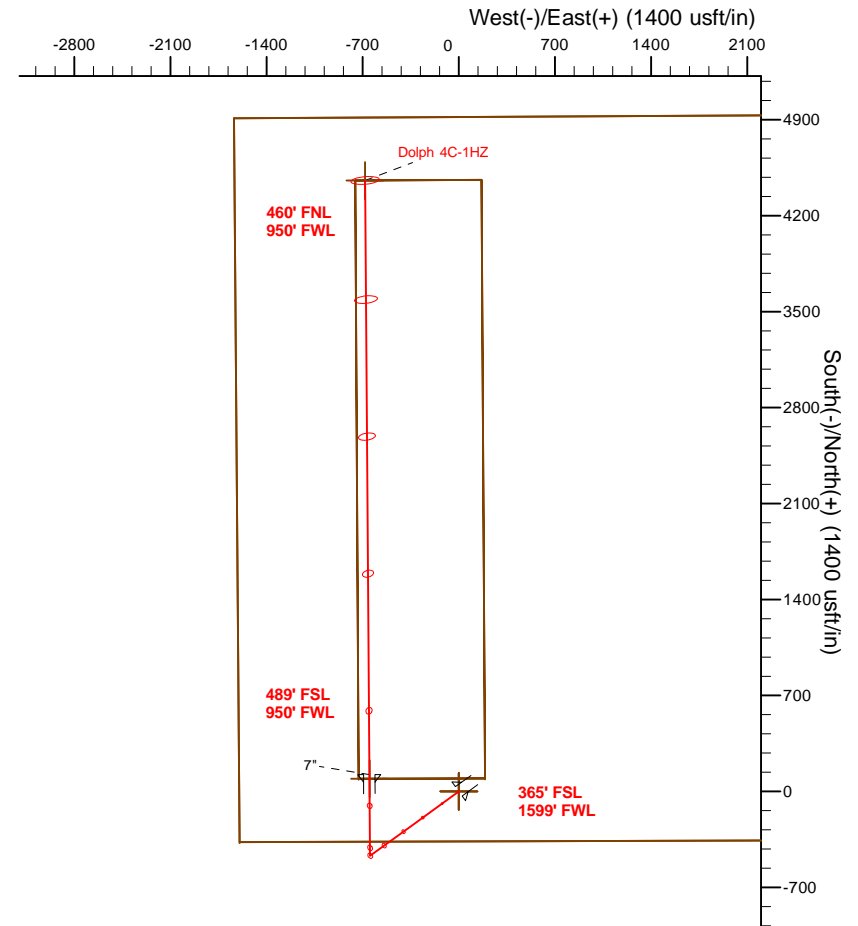
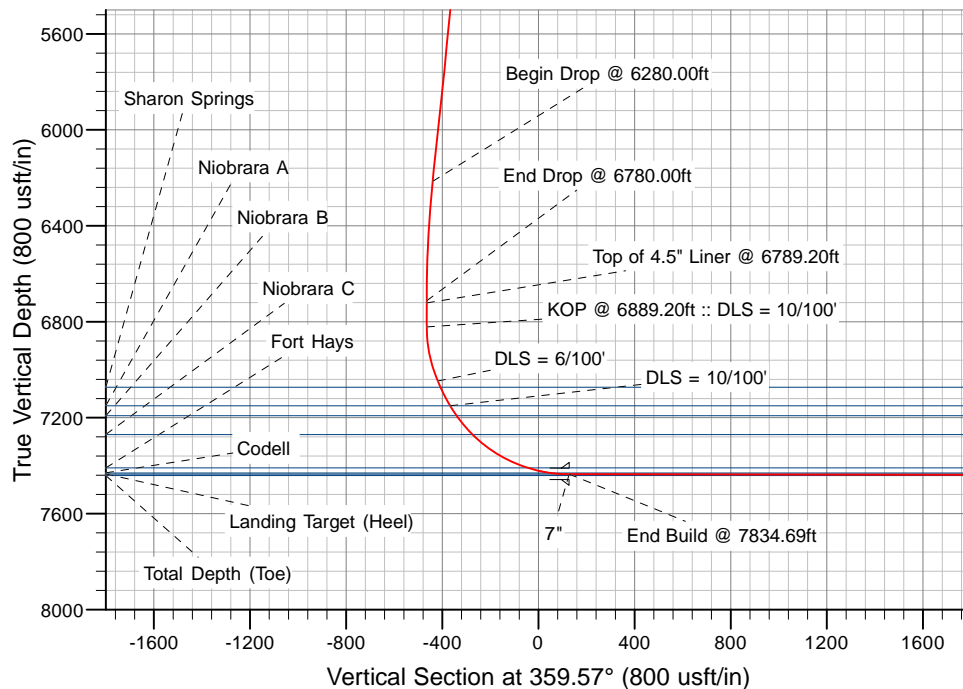
RKB = 17" @ 5016.00usft (Drilling Rig)

Plan: Rev A0 Permit (Dolph 4C-1HZ/Plan A)

Created By: Clint Eshelman Date: 2/4/2013
 Reviewed: _____ Date: _____

TVD MD

6721.84 6789.20 Top of 4.5" Liner @ 6789.20ft
 6821.84 6889.20 KOP @ 6889.20ft :: DLS = 10/100'



Plan Report for Dolph 4C-1HZ - 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
Dolph 4C-1HZ_LD - Dolph 4C-1HZ_SHL - Dolph 4C-1HZ_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
1,100.00	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
1,320.00	0.00	0.00	1,320.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Marker										
1,370.00	0.00	0.00	1,370.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
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
1,680.00	0.00	0.00	1,680.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1680.00ft										
1,700.00	0.40	234.00	1,700.00	-0.04	-0.06	-0.04	2.00	2.00	0.00	234.00
1,800.00	2.40	234.00	1,799.96	-1.48	-2.03	-1.46	2.00	2.00	0.00	0.00
1,900.00	4.40	234.00	1,899.78	-4.96	-6.83	-4.91	2.00	2.00	0.00	0.00
2,000.00	6.40	234.00	1,999.33	-10.49	-14.44	-10.39	2.00	2.00	0.00	0.00
2,100.00	8.40	234.00	2,098.50	-18.06	-24.86	-17.88	2.00	2.00	0.00	0.00
2,180.00	10.00	234.00	2,177.47	-25.58	-35.21	-25.32	2.00	2.00	0.00	0.00
End Nudge @ 2180.00ft										
2,200.00	10.00	234.00	2,197.16	-27.62	-38.02	-27.34	0.00	0.00	0.00	0.00
2,300.00	10.00	234.00	2,295.64	-37.83	-52.07	-37.44	0.00	0.00	0.00	0.00
2,400.00	10.00	234.00	2,394.12	-48.04	-66.12	-47.54	0.00	0.00	0.00	0.00
2,500.00	10.00	234.00	2,492.60	-58.24	-80.17	-57.64	0.00	0.00	0.00	0.00
2,600.00	10.00	234.00	2,591.08	-68.45	-94.21	-67.74	0.00	0.00	0.00	0.00
2,700.00	10.00	234.00	2,689.57	-78.66	-108.26	-77.84	0.00	0.00	0.00	0.00
2,800.00	10.00	234.00	2,788.05	-88.86	-122.31	-87.94	0.00	0.00	0.00	0.00
2,900.00	10.00	234.00	2,886.53	-99.07	-136.36	-98.04	0.00	0.00	0.00	0.00
3,000.00	10.00	234.00	2,985.01	-109.28	-150.41	-108.15	0.00	0.00	0.00	0.00
3,100.00	10.00	234.00	3,083.49	-119.48	-164.46	-118.25	0.00	0.00	0.00	0.00
3,200.00	10.00	234.00	3,181.97	-129.69	-178.50	-128.35	0.00	0.00	0.00	0.00
3,300.00	10.00	234.00	3,280.45	-139.90	-192.55	-138.45	0.00	0.00	0.00	0.00
3,400.00	10.00	234.00	3,378.93	-150.10	-206.60	-148.55	0.00	0.00	0.00	0.00
3,500.00	10.00	234.00	3,477.41	-160.31	-220.65	-158.65	0.00	0.00	0.00	0.00
3,600.00	10.00	234.00	3,575.89	-170.52	-234.70	-168.75	0.00	0.00	0.00	0.00
3,700.00	10.00	234.00	3,674.37	-180.73	-248.75	-178.85	0.00	0.00	0.00	0.00
3,800.00	10.00	234.00	3,772.85	-190.93	-262.80	-188.95	0.00	0.00	0.00	0.00
3,900.00	10.00	234.00	3,871.33	-201.14	-276.84	-199.06	0.00	0.00	0.00	0.00
4,000.00	10.00	234.00	3,969.82	-211.35	-290.89	-209.16	0.00	0.00	0.00	0.00
4,078.38	10.00	234.00	4,047.00	-219.34	-301.90	-217.07	0.00	0.00	0.00	0.00
Parkman										
4,100.00	10.00	234.00	4,068.30	-221.55	-304.94	-219.26	0.00	0.00	0.00	0.00
4,200.00	10.00	234.00	4,166.78	-231.76	-318.99	-229.36	0.00	0.00	0.00	0.00
4,300.00	10.00	234.00	4,265.26	-241.97	-333.04	-239.46	0.00	0.00	0.00	0.00
4,400.00	10.00	234.00	4,363.74	-252.17	-347.09	-249.56	0.00	0.00	0.00	0.00
4,498.76	10.00	234.00	4,461.00	-262.25	-360.96	-259.54	0.00	0.00	0.00	0.00

Plan Report for Dolph 4C-1HZ - 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 (°)
Sussex										
4,500.00	10.00	234.00	4,462.22	-262.38	-361.13	-259.66	0.00	0.00	0.00	0.00
4,600.00	10.00	234.00	4,560.70	-272.59	-375.18	-269.76	0.00	0.00	0.00	0.00
4,700.00	10.00	234.00	4,659.18	-282.79	-389.23	-279.86	0.00	0.00	0.00	0.00
4,800.00	10.00	234.00	4,757.66	-293.00	-403.28	-289.96	0.00	0.00	0.00	0.00
4,900.00	10.00	234.00	4,856.14	-303.21	-417.33	-300.07	0.00	0.00	0.00	0.00
5,000.00	10.00	234.00	4,954.62	-313.41	-431.38	-310.17	0.00	0.00	0.00	0.00
5,100.00	10.00	234.00	5,053.10	-323.62	-445.42	-320.27	0.00	0.00	0.00	0.00
5,200.00	10.00	234.00	5,151.58	-333.83	-459.47	-330.37	0.00	0.00	0.00	0.00
5,300.00	10.00	234.00	5,250.07	-344.03	-473.52	-340.47	0.00	0.00	0.00	0.00
5,400.00	10.00	234.00	5,348.55	-354.24	-487.57	-350.57	0.00	0.00	0.00	0.00
5,500.00	10.00	234.00	5,447.03	-364.45	-501.62	-360.67	0.00	0.00	0.00	0.00
5,600.00	10.00	234.00	5,545.51	-374.65	-515.67	-370.77	0.00	0.00	0.00	0.00
5,700.00	10.00	234.00	5,643.99	-384.86	-529.72	-380.87	0.00	0.00	0.00	0.00
5,800.00	10.00	234.00	5,742.47	-395.07	-543.76	-390.98	0.00	0.00	0.00	0.00
5,900.00	10.00	234.00	5,840.95	-405.27	-557.81	-401.08	0.00	0.00	0.00	0.00
6,000.00	10.00	234.00	5,939.43	-415.48	-571.86	-411.18	0.00	0.00	0.00	0.00
6,100.00	10.00	234.00	6,037.91	-425.69	-585.91	-421.28	0.00	0.00	0.00	0.00
6,200.00	10.00	234.00	6,136.39	-435.89	-599.96	-431.38	0.00	0.00	0.00	0.00
6,280.00	10.00	234.00	6,215.18	-444.06	-611.20	-439.46	0.00	0.00	0.00	0.00
Begin Drop @ 6280.00ft										
6,300.00	9.60	234.00	6,234.89	-446.06	-613.95	-441.44	2.00	-2.00	0.00	180.00
6,400.00	7.60	234.00	6,333.76	-454.85	-626.05	-450.14	2.00	-2.00	0.00	180.00
6,500.00	5.60	234.00	6,433.09	-461.61	-635.35	-456.82	2.00	-2.00	0.00	180.00
6,600.00	3.60	234.00	6,532.76	-466.32	-641.83	-461.49	2.00	-2.00	0.00	180.00
6,700.00	1.60	234.00	6,632.65	-468.99	-645.50	-464.13	2.00	-2.00	0.00	180.00
6,780.00	0.00	0.00	6,712.64	-469.64	-646.41	-464.78	2.00	-2.00	0.00	180.00
End Drop @ 6780.00ft										
6,789.20	0.00	0.00	6,721.84	-469.64	-646.41	-464.78	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6789.20ft										
6,800.00	0.00	0.00	6,732.64	-469.64	-646.41	-464.78	0.00	0.00	0.00	0.00
6,889.20	0.00	0.00	6,821.84	-469.64	-646.41	-464.78	0.00	0.00	0.00	0.00
KOP @ 6889.20ft :: DLS = 10/100'										
6,900.00	1.08	359.57	6,832.64	-469.54	-646.41	-464.68	10.00	10.00	0.00	359.57
7,000.00	11.08	359.57	6,931.95	-458.96	-646.49	-454.10	10.00	10.00	0.00	0.00
7,100.00	21.08	359.57	7,027.92	-431.30	-646.69	-426.43	10.00	10.00	0.00	0.00
7,121.68	23.25	359.57	7,048.00	-423.12	-646.76	-418.26	10.00	10.00	0.00	0.00
DLS = 6/100'										
7,149.07	24.89	359.57	7,073.00	-411.95	-646.84	-407.09	6.00	6.00	0.00	0.00
Sharon Springs										
7,200.00	27.95	359.57	7,118.61	-389.29	-647.01	-384.43	6.00	6.00	0.00	0.00
7,237.06	30.17	359.57	7,151.00	-371.30	-647.14	-366.43	6.00	6.00	0.00	0.00
DLS = 10/100' - Niobrara A										
7,285.74	35.04	359.57	7,192.00	-345.07	-647.34	-340.20	10.00	10.00	0.00	0.01
Niobrara B										
7,300.00	36.47	359.57	7,203.57	-336.74	-647.40	-331.87	10.00	10.00	0.00	0.00
7,389.34	45.40	359.57	7,271.00	-278.27	-647.84	-273.40	10.00	10.00	0.00	0.00
Niobrara C										
7,400.00	46.47	359.57	7,278.41	-270.61	-647.90	-265.74	10.00	10.00	0.00	0.00
7,500.00	56.47	359.57	7,340.63	-192.49	-648.48	-187.62	10.00	10.00	0.00	0.00
7,600.00	66.47	359.57	7,388.34	-104.75	-649.13	-99.88	10.00	10.00	0.00	0.00
7,658.75	72.34	359.57	7,409.00	-49.78	-649.54	-44.90	10.00	10.00	0.00	0.00
Fort Hays										
7,700.00	76.47	359.57	7,420.09	-10.06	-649.84	-5.18	10.00	10.00	0.00	0.00
7,759.60	82.42	359.57	7,431.00	48.50	-650.27	53.38	10.00	10.00	0.00	0.00
Codell										
7,800.00	86.47	359.57	7,434.91	88.70	-650.57	93.58	10.00	10.00	0.00	0.00
7,804.60	86.93	359.57	7,435.18	93.30	-650.61	98.18	10.00	10.00	0.00	0.00

Plan Report for Dolph 4C-1HZ - 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 (°)
Dolph 4C-1HZ_CP										
7,834.69	89.93	359.57	7,436.00	123.37	-650.83	128.25	10.00	10.00	0.00	0.00
End Build @ 7834.69ft - Landing Target (Heel) - 7"										
7,900.00	89.93	359.57	7,436.08	188.68	-651.31	193.56	0.00	0.00	0.00	0.00
8,000.00	89.93	359.57	7,436.19	288.68	-652.06	293.56	0.00	0.00	0.00	0.00
8,100.00	89.93	359.57	7,436.31	388.67	-652.80	393.56	0.00	0.00	0.00	0.00
8,200.00	89.93	359.57	7,436.42	488.67	-653.54	493.56	0.00	0.00	0.00	0.00
8,300.00	89.93	359.57	7,436.54	588.67	-654.28	593.56	0.00	0.00	0.00	0.00
8,400.00	89.93	359.57	7,436.65	688.66	-655.02	693.56	0.00	0.00	0.00	0.00
8,500.00	89.93	359.57	7,436.77	788.66	-655.77	793.56	0.00	0.00	0.00	0.00
8,600.00	89.93	359.57	7,436.88	888.66	-656.51	893.56	0.00	0.00	0.00	0.00
8,700.00	89.93	359.57	7,437.00	988.66	-657.25	993.56	0.00	0.00	0.00	0.00
8,800.00	89.93	359.57	7,437.11	1,088.65	-657.99	1,093.56	0.00	0.00	0.00	0.00
8,900.00	89.93	359.57	7,437.23	1,188.65	-658.73	1,193.56	0.00	0.00	0.00	0.00
9,000.00	89.93	359.57	7,437.34	1,288.65	-659.47	1,293.56	0.00	0.00	0.00	0.00
9,100.00	89.93	359.57	7,437.46	1,388.64	-660.22	1,393.56	0.00	0.00	0.00	0.00
9,200.00	89.93	359.57	7,437.58	1,488.64	-660.96	1,493.56	0.00	0.00	0.00	0.00
9,300.00	89.93	359.57	7,437.69	1,588.64	-661.70	1,593.56	0.00	0.00	0.00	0.00
9,400.00	89.93	359.57	7,437.81	1,688.64	-662.44	1,693.56	0.00	0.00	0.00	0.00
9,500.00	89.93	359.57	7,437.92	1,788.63	-663.18	1,793.56	0.00	0.00	0.00	0.00
9,600.00	89.93	359.57	7,438.04	1,888.63	-663.93	1,893.56	0.00	0.00	0.00	0.00
9,700.00	89.93	359.57	7,438.15	1,988.63	-664.67	1,993.56	0.00	0.00	0.00	0.00
9,800.00	89.93	359.57	7,438.27	2,088.62	-665.41	2,093.56	0.00	0.00	0.00	0.00
9,900.00	89.93	359.57	7,438.38	2,188.62	-666.15	2,193.56	0.00	0.00	0.00	0.00
10,000.00	89.93	359.57	7,438.50	2,288.62	-666.89	2,293.56	0.00	0.00	0.00	0.00
10,100.00	89.93	359.57	7,438.61	2,388.62	-667.64	2,393.56	0.00	0.00	0.00	0.00
10,200.00	89.93	359.57	7,438.73	2,488.61	-668.38	2,493.56	0.00	0.00	0.00	0.00
10,300.00	89.93	359.57	7,438.84	2,588.61	-669.12	2,593.56	0.00	0.00	0.00	0.00
10,400.00	89.93	359.57	7,438.96	2,688.61	-669.86	2,693.56	0.00	0.00	0.00	0.00
10,500.00	89.93	359.57	7,439.07	2,788.60	-670.60	2,793.56	0.00	0.00	0.00	0.00
10,600.00	89.93	359.57	7,439.19	2,888.60	-671.35	2,893.56	0.00	0.00	0.00	0.00
10,700.00	89.93	359.57	7,439.31	2,988.60	-672.09	2,993.56	0.00	0.00	0.00	0.00
10,800.00	89.93	359.57	7,439.42	3,088.60	-672.83	3,093.56	0.00	0.00	0.00	0.00
10,900.00	89.93	359.57	7,439.54	3,188.59	-673.57	3,193.56	0.00	0.00	0.00	0.00
11,000.00	89.93	359.57	7,439.65	3,288.59	-674.31	3,293.56	0.00	0.00	0.00	0.00
11,100.00	89.93	359.57	7,439.77	3,388.59	-675.05	3,393.56	0.00	0.00	0.00	0.00
11,200.00	89.93	359.57	7,439.88	3,488.59	-675.80	3,493.56	0.00	0.00	0.00	0.00
11,300.00	89.93	359.57	7,440.00	3,588.58	-676.54	3,593.56	0.00	0.00	0.00	0.00
11,400.00	89.93	359.57	7,440.11	3,688.58	-677.28	3,693.56	0.00	0.00	0.00	0.00
11,500.00	89.93	359.57	7,440.23	3,788.58	-678.02	3,793.56	0.00	0.00	0.00	0.00
11,600.00	89.93	359.57	7,440.34	3,888.57	-678.76	3,893.56	0.00	0.00	0.00	0.00
11,700.00	89.93	359.57	7,440.46	3,988.57	-679.51	3,993.56	0.00	0.00	0.00	0.00
11,800.00	89.93	359.57	7,440.57	4,088.57	-680.25	4,093.56	0.00	0.00	0.00	0.00
11,900.00	89.93	359.57	7,440.69	4,188.57	-680.99	4,193.56	0.00	0.00	0.00	0.00
12,000.00	89.93	359.57	7,440.81	4,288.56	-681.73	4,293.56	0.00	0.00	0.00	0.00
12,100.00	89.93	359.57	7,440.92	4,388.56	-682.47	4,393.56	0.00	0.00	0.00	0.00
12,168.63	89.93	359.57	7,441.00	4,457.19	-682.98	4,462.19	0.00	0.00	0.00	0.00
TD Well @ 12184.41ft - Dolph 4C-1H_BHL										

Plan Report for Dolph 4C-1HZ - Rev A0 Permit

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,680.00	1,680.00	0.00	0.00	Begin Nudge @ 1680.00ft
2,180.00	2,177.47	-25.58	-35.21	End Nudge @ 2180.00ft
6,280.00	6,215.18	-444.06	-611.20	Begin Drop @ 6280.00ft
6,780.00	6,712.64	-469.64	-646.41	End Drop @ 6780.00ft
6,789.20	6,721.84	-469.64	-646.41	Top of 4.5" Liner @ 6789.20ft
6,889.20	6,821.84	-469.64	-646.41	KOP @ 6889.20ft :: DLS = 10/100'
7,121.68	7,048.00	-423.12	-646.76	DLS = 6/100'
7,237.06	7,151.00	-371.30	-647.14	DLS = 10/100'
7,834.69	7,436.00	123.37	-650.83	End Build @ 7834.69ft
12,168.63	7,441.00	4,457.19	-682.98	TD Well @ 12184.41ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.57	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,834.69	Rev A0 Permit	MWD
7,834.69	12,168.63	Rev A0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,370.00	1,370.00	9 5/8"	9-5/8	13-1/2
7,834.69	7,436.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,320.00	1,320.00	Fox Hills Marker		0.00	
4,078.38	4,047.00	Parkman		0.00	
4,498.76	4,461.00	Sussex		0.00	
7,149.07	7,073.00	Sharon Springs		0.00	
7,237.06	7,151.00	Niobrara A		0.00	
7,285.74	7,192.00	Niobrara B		0.00	
7,389.34	7,271.00	Niobrara C		0.00	
7,658.75	7,409.00	Fort Hays		0.00	
7,759.60	7,431.00	Codell		0.00	
7,834.69	7,436.00	Landing Target (Heel)		0.00	
12,168.63	7,441.00	Total Depth (Toe)		0.00	

Plan Report for Dolph 4C-1HZ - Rev A0 Permit

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Dolph 4C-1HZ_LD	0.00	0.00	0.00	Polygon
Dolph 4C-1HZ_SHL	0.00	0.00	0.00	Point
Dolph 4C-1HZ_SEC	0.00	0.00	0.00	Polygon
Dolph 4C-1HZ_CP	7,436.00	93.28	-649.84	Point
Dolph 4C-1H_BHL	7,441.00	4,457.19	-682.98	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.90 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,829.74 usft
Net Tortousity applicable to Plans:	0.90 °/100usft	Directional Difficulty Index:	6.178

Audit Info

North Reference Sheet for Sec. 1-T2N-R66W - Dolph 4C-1HZ - 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' @ 5016.00usft (Drilling Rig). Northing and Easting are relative to Dolph 4C-1HZ
 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° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°
 False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995806

Grid Coordinates of Well: 1,302,486.53 usft N, 3,215,443.93 usft E
 Geographical Coordinates of Well: 40° 09' 40.14" N, 104° 43' 44.93" W
 Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,168.63usft
 the Bottom Hole Displacement is 4,509.21usft in the Direction of 351.29° (True).
 Magnetic Convergence at surface is: -8.01° (4 February 2014, , BGGM2013)

