

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 1-T2N-R66W

Dolph 4N-1HZ

Plan A

Plan: Rev A0 Permit

Sperry Drilling Services

Proposal Report

05 February, 2014

Well Coordinates: 1,302,486.26 N, 3,215,414.03 E (40° 09' 40.14" N, 104° 43' 45.32" W)

Ground Level: 4,999.00 usft

Local Coordinate Origin:

Centered on Well Dolph 4N-1HZ

Viewing Datum:

RKB = 17' @ 5016.00usft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 1-T2N-R66W
 Well: Dolph 4N-1HZ
 Wellbore: Plan A
 Design: Rev A0 Permit

Anadarko Petroleum Corp.



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	1510.00	0.00	0.00	1510.00	0.00	0.00	0.00	0.00	0.00	
3	2460.00	19.00	247.00	2442.68	-60.98	-143.67	2.00	247.00	-61.08	
4	5760.00	19.00	247.00	5562.90	-480.78	-1132.64	0.00	0.00	-481.57	
5	6710.00	0.00	0.00	6495.58	-541.76	-1276.31	2.00	180.00	-542.65	
6	6815.26	0.00	0.00	6600.84	-541.76	-1276.31	0.00	0.00	-542.65	
7	7344.56	52.93	0.04	7058.00	-314.18	-1276.15	10.00	0.04	-315.07	
8	7544.49	64.93	0.04	7161.00	-143.25	-1276.03	6.00	0.00	-144.14	
9	7795.23	90.00	0.04	7215.00	99.57	-1275.87	10.00	-0.01	98.68	
10	12149.60	90.00	0.04	7215.00	4453.94	-1273.19	0.00	0.00	4453.05	Dolph 4N-1HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
Dolph 4N-1HZ_LD	0.00	0.00	0.00	40° 9' 40.140 N	104° 43' 45.318 W	
Dolph 4N-1HZ_SEC	0.00	0.00	0.00	40° 9' 40.140 N	104° 43' 45.318 W	Polygon
Dolph 4N-1HZ_SHL	0.00	0.00	0.00	40° 9' 40.140 N	104° 43' 45.318 W	
Dolph 4N-1HZ_BHL	7215.00	4453.94	-1273.19	40° 10' 24.154 N	104° 44' 1.720 W	

WELL DETAILS: Dolph 4N-1HZ

Ground Level: 4999.00

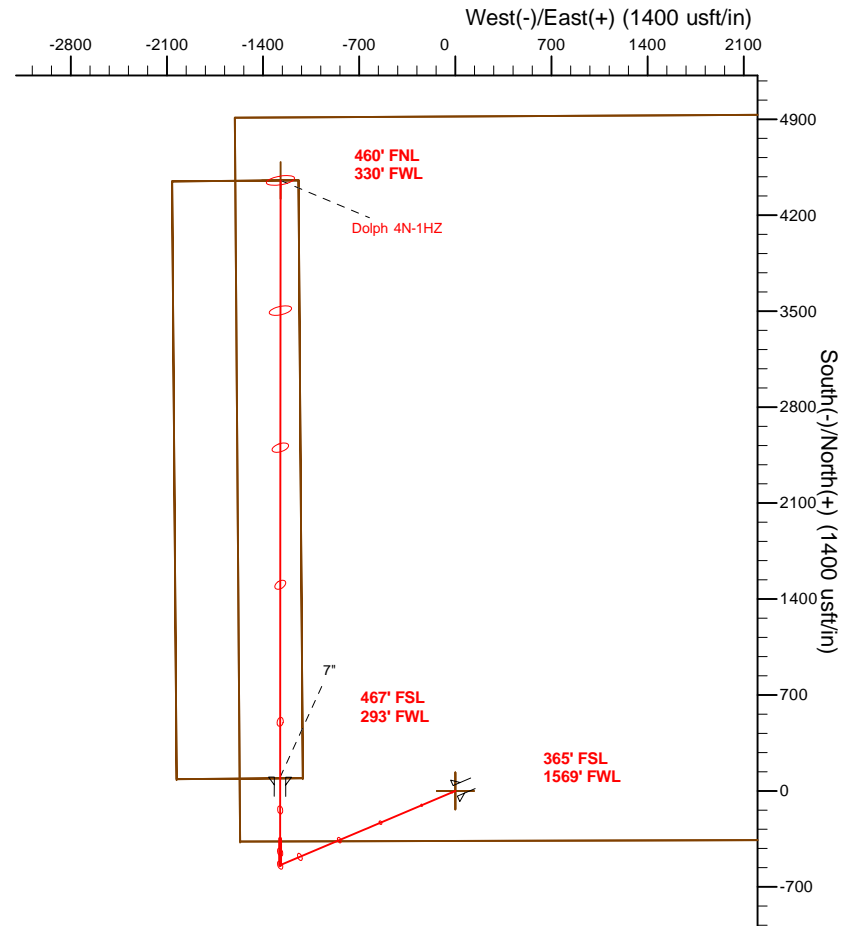
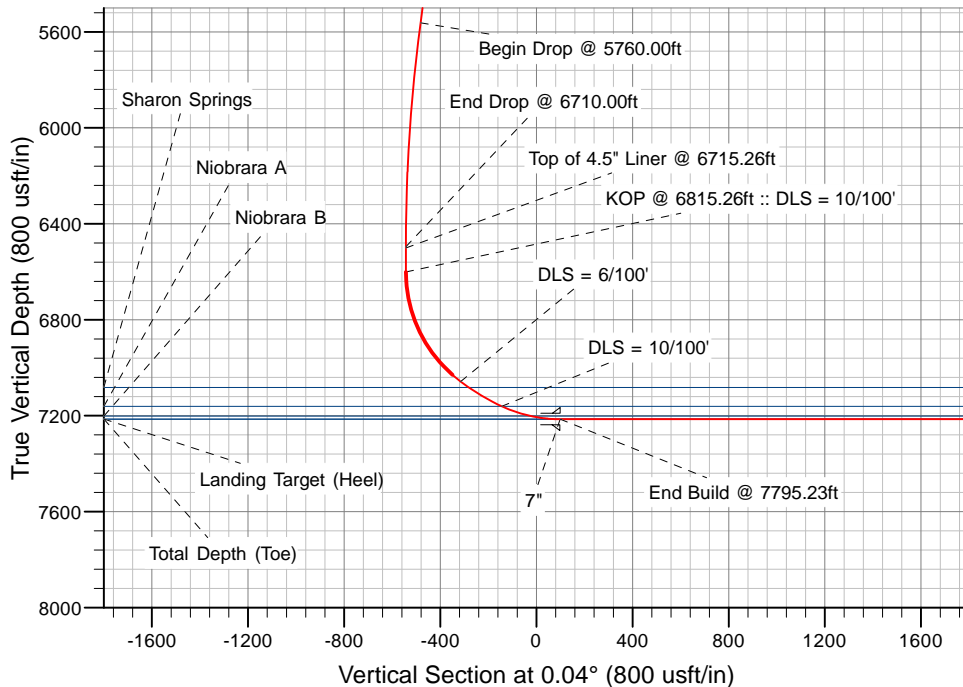
RKB = 17" @ 5016.00usft (Drilling Rig)

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

Created By: Clint Eshelman Date: 2/5/2013
 Reviewed: _____ Date: _____

TVD MD

6500.84 6715.26 Top of 4.5" Liner @ 6715.26ft
 6600.84 6815.26 KOP @ 6815.26ft :: DLS = 10/100'



Plan Report for Dolph 4N-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 4N-1HZ_LD - Dolph 4N-1HZ_SHL - Dolph 4N-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
1,510.00	0.00	0.00	1,510.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1510.00ft										
1,600.00	1.80	247.00	1,599.99	-0.55	-1.30	-0.55	2.00	2.00	0.00	247.00
1,700.00	3.80	247.00	1,699.86	-2.46	-5.80	-2.47	2.00	2.00	0.00	0.00
1,800.00	5.80	247.00	1,799.50	-5.73	-13.50	-5.74	2.00	2.00	0.00	0.00
1,900.00	7.80	247.00	1,898.80	-10.36	-24.40	-10.37	2.00	2.00	0.00	0.00
2,000.00	9.80	247.00	1,997.61	-16.33	-38.48	-16.36	2.00	2.00	0.00	0.00
2,100.00	11.80	247.00	2,095.84	-23.66	-55.73	-23.69	2.00	2.00	0.00	0.00
2,200.00	13.80	247.00	2,193.35	-32.31	-76.12	-32.36	2.00	2.00	0.00	0.00
2,300.00	15.80	247.00	2,290.03	-42.29	-99.63	-42.36	2.00	2.00	0.00	0.00
2,400.00	17.80	247.00	2,385.75	-53.58	-126.24	-53.67	2.00	2.00	0.00	0.00
2,460.00	19.00	247.00	2,442.68	-60.98	-143.67	-61.08	2.00	2.00	0.00	0.00
End Nudge @ 2460.00ft										
2,500.00	19.00	247.00	2,480.50	-66.07	-155.66	-66.18	0.00	0.00	0.00	0.00
2,600.00	19.00	247.00	2,575.06	-78.79	-185.63	-78.92	0.00	0.00	0.00	0.00
2,700.00	19.00	247.00	2,669.61	-91.51	-215.60	-91.67	0.00	0.00	0.00	0.00
2,800.00	19.00	247.00	2,764.16	-104.24	-245.56	-104.41	0.00	0.00	0.00	0.00
2,900.00	19.00	247.00	2,858.71	-116.96	-275.53	-117.15	0.00	0.00	0.00	0.00
3,000.00	19.00	247.00	2,953.26	-129.68	-305.50	-129.89	0.00	0.00	0.00	0.00
3,100.00	19.00	247.00	3,047.82	-142.40	-335.47	-142.63	0.00	0.00	0.00	0.00
3,200.00	19.00	247.00	3,142.37	-155.12	-365.44	-155.37	0.00	0.00	0.00	0.00
3,300.00	19.00	247.00	3,236.92	-167.84	-395.41	-168.12	0.00	0.00	0.00	0.00
3,400.00	19.00	247.00	3,331.47	-180.56	-425.38	-180.86	0.00	0.00	0.00	0.00
3,500.00	19.00	247.00	3,426.02	-193.28	-455.34	-193.60	0.00	0.00	0.00	0.00
3,600.00	19.00	247.00	3,520.58	-206.00	-485.31	-206.34	0.00	0.00	0.00	0.00
3,700.00	19.00	247.00	3,615.13	-218.72	-515.28	-219.08	0.00	0.00	0.00	0.00
3,800.00	19.00	247.00	3,709.68	-231.45	-545.25	-231.83	0.00	0.00	0.00	0.00
3,900.00	19.00	247.00	3,804.23	-244.17	-575.22	-244.57	0.00	0.00	0.00	0.00
4,000.00	19.00	247.00	3,898.78	-256.89	-605.19	-257.31	0.00	0.00	0.00	0.00
4,100.00	19.00	247.00	3,993.33	-269.61	-635.16	-270.05	0.00	0.00	0.00	0.00
4,167.33	19.00	247.00	4,057.00	-278.17	-655.34	-278.63	0.00	0.00	0.00	0.00
Parkman										
4,200.00	19.00	247.00	4,087.89	-282.33	-665.13	-282.79	0.00	0.00	0.00	0.00
4,300.00	19.00	247.00	4,182.44	-295.05	-695.09	-295.54	0.00	0.00	0.00	0.00
4,400.00	19.00	247.00	4,276.99	-307.77	-725.06	-308.28	0.00	0.00	0.00	0.00
4,500.00	19.00	247.00	4,371.54	-320.49	-755.03	-321.02	0.00	0.00	0.00	0.00
4,600.00	19.00	247.00	4,466.09	-333.21	-785.00	-333.76	0.00	0.00	0.00	0.00

Plan Report for Dolph 4N-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 (°)
4,605.19	19.00	247.00	4,471.00	-333.87	-786.56	-334.42	0.00	0.00	0.00	0.00
Sussex										
4,700.00	19.00	247.00	4,560.65	-345.93	-814.97	-346.50	0.00	0.00	0.00	0.00
4,800.00	19.00	247.00	4,655.20	-358.65	-844.94	-359.24	0.00	0.00	0.00	0.00
4,900.00	19.00	247.00	4,749.75	-371.38	-874.91	-371.99	0.00	0.00	0.00	0.00
5,000.00	19.00	247.00	4,844.30	-384.10	-904.88	-384.73	0.00	0.00	0.00	0.00
5,100.00	19.00	247.00	4,938.85	-396.82	-934.84	-397.47	0.00	0.00	0.00	0.00
5,200.00	19.00	247.00	5,033.40	-409.54	-964.81	-410.21	0.00	0.00	0.00	0.00
5,300.00	19.00	247.00	5,127.96	-422.26	-994.78	-422.95	0.00	0.00	0.00	0.00
5,400.00	19.00	247.00	5,222.51	-434.98	-1,024.75	-435.70	0.00	0.00	0.00	0.00
5,500.00	19.00	247.00	5,317.06	-447.70	-1,054.72	-448.44	0.00	0.00	0.00	0.00
5,600.00	19.00	247.00	5,411.61	-460.42	-1,084.69	-461.18	0.00	0.00	0.00	0.00
5,700.00	19.00	247.00	5,506.16	-473.14	-1,114.66	-473.92	0.00	0.00	0.00	0.00
5,760.00	19.00	247.00	5,562.90	-480.78	-1,132.64	-481.57	0.00	0.00	0.00	0.00
Begin Drop @ 5760.00ft										
5,800.00	18.20	247.00	5,600.81	-485.76	-1,144.38	-486.56	2.00	-2.00	0.00	180.00
5,900.00	16.20	247.00	5,696.33	-497.31	-1,171.60	-498.13	2.00	-2.00	0.00	180.00
6,000.00	14.20	247.00	5,792.83	-507.56	-1,195.73	-508.39	2.00	-2.00	0.00	180.00
6,100.00	12.20	247.00	5,890.18	-516.48	-1,216.75	-517.33	2.00	-2.00	0.00	180.00
6,200.00	10.20	247.00	5,988.27	-524.07	-1,234.63	-524.93	2.00	-2.00	0.00	180.00
6,300.00	8.20	247.00	6,086.98	-530.32	-1,249.35	-531.19	2.00	-2.00	0.00	180.00
6,400.00	6.20	247.00	6,186.18	-535.21	-1,260.88	-536.09	2.00	-2.00	0.00	180.00
6,500.00	4.20	247.00	6,285.77	-538.75	-1,269.23	-539.64	2.00	-2.00	0.00	180.00
6,600.00	2.20	247.00	6,385.61	-540.94	-1,274.36	-541.83	2.00	-2.00	0.00	180.00
6,700.00	0.20	247.00	6,485.58	-541.75	-1,276.29	-542.64	2.00	-2.00	0.00	180.00
6,710.00	0.00	0.00	6,495.58	-541.76	-1,276.31	-542.65	2.00	-2.00	1,130.00	180.00
End Drop @ 6710.00ft										
6,715.26	0.00	0.00	6,500.84	-541.76	-1,276.31	-542.65	0.00	0.00	0.00	180.00
Top of 4.5" Liner @ 6715.26ft										
6,800.00	0.00	0.00	6,585.58	-541.76	-1,276.31	-542.65	0.00	0.00	0.00	0.00
6,815.26	0.00	0.00	6,600.84	-541.76	-1,276.31	-542.65	0.00	0.00	0.00	0.00
KOP @ 6815.26ft :: DLS = 10/100'										
6,900.00	8.47	0.04	6,685.27	-535.51	-1,276.30	-536.40	10.00	10.00	0.05	0.04
7,000.00	18.47	0.04	6,782.40	-512.23	-1,276.29	-513.13	10.00	10.00	0.00	0.00
7,100.00	28.47	0.04	6,874.00	-472.45	-1,276.26	-473.34	10.00	10.00	0.00	0.00
7,200.00	38.47	0.04	6,957.31	-417.37	-1,276.22	-418.26	10.00	10.00	0.00	0.00
7,300.00	48.47	0.04	7,029.79	-348.65	-1,276.17	-349.54	10.00	10.00	0.00	0.00
7,344.56	52.93	0.04	7,058.00	-314.18	-1,276.15	-315.07	10.00	10.00	0.00	0.00
DLS = 6/100'										
7,387.31	55.49	0.04	7,083.00	-279.50	-1,276.12	-280.39	6.00	6.00	0.00	0.00
Sharon Springs										
7,400.00	56.26	0.04	7,090.12	-269.00	-1,276.12	-269.89	6.00	6.00	0.00	0.00
7,500.00	62.26	0.04	7,141.22	-183.09	-1,276.06	-183.98	6.00	6.00	0.00	0.00
7,544.49	64.93	0.04	7,161.00	-143.25	-1,276.03	-144.14	6.00	6.00	0.00	0.00
DLS = 10/100' - Niobrara A										
7,600.00	70.48	0.04	7,182.06	-91.91	-1,275.99	-92.80	10.00	10.00	0.00	-0.01
7,672.96	77.77	0.04	7,202.00	-21.78	-1,275.95	-22.67	10.00	10.00	0.00	-0.01
Niobrara B										
7,700.00	80.48	0.04	7,207.10	4.78	-1,275.93	3.88	10.00	10.00	0.00	-0.01
7,795.23	90.00	0.04	7,215.00	99.57	-1,275.87	98.68	10.00	10.00	0.00	-0.01
End Build @ 7795.23ft - Landing Target (Heel) - 7"										
7,800.00	90.00	0.04	7,215.00	104.34	-1,275.87	103.45	0.00	0.00	0.00	-0.01
7,900.00	90.00	0.04	7,215.00	204.34	-1,275.81	203.45	0.00	0.00	0.00	0.00
8,000.00	90.00	0.04	7,215.00	304.34	-1,275.74	303.45	0.00	0.00	0.00	0.00
8,100.00	90.00	0.04	7,215.00	404.34	-1,275.68	403.45	0.00	0.00	0.00	0.00
8,200.00	90.00	0.04	7,215.00	504.34	-1,275.62	503.45	0.00	0.00	0.00	0.00
8,300.00	90.00	0.04	7,215.00	604.34	-1,275.56	603.45	0.00	0.00	0.00	0.00
8,400.00	90.00	0.04	7,215.00	704.34	-1,275.50	703.45	0.00	0.00	0.00	0.00

Plan Report for Dolph 4N-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)	Tooface Azimuth (°)
8,500.00	90.00	0.04	7,215.00	804.34	-1,275.44	803.45	0.00	0.00	0.00	0.00
8,600.00	90.00	0.04	7,215.00	904.34	-1,275.37	903.45	0.00	0.00	0.00	0.00
8,700.00	90.00	0.04	7,215.00	1,004.34	-1,275.31	1,003.45	0.00	0.00	0.00	0.00
8,800.00	90.00	0.04	7,215.00	1,104.34	-1,275.25	1,103.45	0.00	0.00	0.00	0.00
8,900.00	90.00	0.04	7,215.00	1,204.34	-1,275.19	1,203.45	0.00	0.00	0.00	0.00
9,000.00	90.00	0.04	7,215.00	1,304.34	-1,275.13	1,303.45	0.00	0.00	0.00	0.00
9,100.00	90.00	0.04	7,215.00	1,404.34	-1,275.07	1,403.45	0.00	0.00	0.00	0.00
9,200.00	90.00	0.04	7,215.00	1,504.34	-1,275.01	1,503.45	0.00	0.00	0.00	0.00
9,300.00	90.00	0.04	7,215.00	1,604.34	-1,274.94	1,603.45	0.00	0.00	0.00	0.00
9,400.00	90.00	0.04	7,215.00	1,704.34	-1,274.88	1,703.45	0.00	0.00	0.00	0.00
9,500.00	90.00	0.04	7,215.00	1,804.34	-1,274.82	1,803.45	0.00	0.00	0.00	0.00
9,600.00	90.00	0.04	7,215.00	1,904.34	-1,274.76	1,903.45	0.00	0.00	0.00	0.00
9,700.00	90.00	0.04	7,215.00	2,004.34	-1,274.70	2,003.45	0.00	0.00	0.00	0.00
9,800.00	90.00	0.04	7,215.00	2,104.34	-1,274.64	2,103.45	0.00	0.00	0.00	0.00
9,900.00	90.00	0.04	7,215.00	2,204.34	-1,274.57	2,203.45	0.00	0.00	0.00	0.00
10,000.00	90.00	0.04	7,215.00	2,304.34	-1,274.51	2,303.45	0.00	0.00	0.00	0.00
10,100.00	90.00	0.04	7,215.00	2,404.34	-1,274.45	2,403.45	0.00	0.00	0.00	0.00
10,200.00	90.00	0.04	7,215.00	2,504.34	-1,274.39	2,503.45	0.00	0.00	0.00	0.00
10,300.00	90.00	0.04	7,215.00	2,604.34	-1,274.33	2,603.45	0.00	0.00	0.00	0.00
10,400.00	90.00	0.04	7,215.00	2,704.34	-1,274.27	2,703.45	0.00	0.00	0.00	0.00
10,500.00	90.00	0.04	7,215.00	2,804.34	-1,274.20	2,803.45	0.00	0.00	0.00	0.00
10,600.00	90.00	0.04	7,215.00	2,904.34	-1,274.14	2,903.45	0.00	0.00	0.00	0.00
10,700.00	90.00	0.04	7,215.00	3,004.34	-1,274.08	3,003.45	0.00	0.00	0.00	0.00
10,800.00	90.00	0.04	7,215.00	3,104.34	-1,274.02	3,103.45	0.00	0.00	0.00	0.00
10,900.00	90.00	0.04	7,215.00	3,204.34	-1,273.96	3,203.45	0.00	0.00	0.00	0.00
11,000.00	90.00	0.04	7,215.00	3,304.34	-1,273.90	3,303.45	0.00	0.00	0.00	0.00
11,100.00	90.00	0.04	7,215.00	3,404.34	-1,273.83	3,403.45	0.00	0.00	0.00	0.00
11,200.00	90.00	0.04	7,215.00	3,504.34	-1,273.77	3,503.45	0.00	0.00	0.00	0.00
11,300.00	90.00	0.04	7,215.00	3,604.34	-1,273.71	3,603.45	0.00	0.00	0.00	0.00
11,400.00	90.00	0.04	7,215.00	3,704.34	-1,273.65	3,703.45	0.00	0.00	0.00	0.00
11,500.00	90.00	0.04	7,215.00	3,804.34	-1,273.59	3,803.45	0.00	0.00	0.00	0.00
11,600.00	90.00	0.04	7,215.00	3,904.34	-1,273.53	3,903.45	0.00	0.00	0.00	0.00
11,700.00	90.00	0.04	7,215.00	4,004.34	-1,273.47	4,003.45	0.00	0.00	0.00	0.00
11,800.00	90.00	0.04	7,215.00	4,104.34	-1,273.40	4,103.45	0.00	0.00	0.00	0.00
11,900.00	90.00	0.04	7,215.00	4,204.34	-1,273.34	4,203.45	0.00	0.00	0.00	0.00
12,000.00	90.00	0.04	7,215.00	4,304.34	-1,273.28	4,303.45	0.00	0.00	0.00	0.00
12,100.00	90.00	0.04	7,215.00	4,404.34	-1,273.22	4,403.45	0.00	0.00	0.00	0.00
12,149.60	90.00	0.04	7,215.00	4,453.94	-1,273.19	4,453.05	0.00	0.00	0.00	0.00

TD Well @ 12149.60ft - Total Depth (Toe) - Dolph 4N-1HZ_BHL

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,510.00	1,510.00	0.00	0.00	Begin Nudge @ 1510.00ft
2,460.00	2,442.68	-60.98	-143.67	End Nudge @ 2460.00ft
5,760.00	5,562.90	-480.78	-1,132.64	Begin Drop @ 5760.00ft
6,710.00	6,495.58	-541.76	-1,276.31	End Drop @ 6710.00ft
6,715.26	6,500.84	-541.76	-1,276.31	Top of 4.5" Liner @ 6715.26ft
6,815.26	6,600.84	-541.76	-1,276.31	KOP @ 6815.26ft :: DLS = 10/100'
7,344.56	7,058.00	-314.18	-1,276.15	DLS = 6/100'
7,544.49	7,161.00	-143.25	-1,276.03	DLS = 10/100'
7,795.23	7,215.00	99.57	-1,275.87	End Build @ 7795.23ft
12,149.60	7,215.00	4,453.94	-1,273.19	TD Well @ 12149.60ft

Plan Report for Dolph 4N-1HZ - Rev A0 Permit**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.04	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,795.23	Rev A0 Permit	MWD
7,795.23	12,149.60	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
7,795.23	7,215.00	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	
4,167.33	4,057.00	Parkman		0.00	
4,605.19	4,471.00	Sussex		0.00	
7,387.31	7,083.00	Sharon Springs		0.00	
7,544.49	7,161.00	Niobrara A		0.00	
7,672.96	7,202.00	Niobrara B		0.00	
7,795.23	7,215.00	Landing Target (Heel)		0.00	
12,149.60	7,215.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Dolph 4N-1HZ_LD	0.00	0.00	0.00	Polygon
Dolph 4N-1HZ_SHL	0.00	0.00	0.00	Point
Dolph 4N-1HZ_SEC	0.00	0.00	0.00	Polygon
Dolph 4N-1HZ_BHL	7,215.00	4,453.94	-1,273.19	Point

Directional Difficulty Index

Average Dogleg over Survey:	1.05 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,795.23 usft
Net Tortousity applicable to Plans:	1.05 °/100usft	Directional Difficulty Index:	6.230

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

Audit Info

North Reference Sheet for Sec. 1-T2N-R66W - Dolph 4N-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 4N-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: 1,302,486.26 usft N, 3,215,414.03 usft E
Geographical Coordinates of Well: 40° 09' 40.14" N, 104° 43' 45.32" W
Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,149.60usft
the Bottom Hole Displacement is 4,632.34usft in the Direction of 344.05° (True).

Magnetic Convergence at surface is: -8.01° (4 February 2014, , BGGM2013)

Magnetic Model: BGGM2013
Date: 04-Feb-14
Declination: 8.51°
Inclination/Dip: 66.76°
Field Strength: 52650

Grid North is 0.50° East of True North (Grid Convergence)
Magnetic North is 8.51° East of True North (Magnetic Declination)
Magnetic North is 8.01° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.50°
To convert a Magnetic Direction to a True Direction, Add 8.51° East
To convert a Magnetic Direction to a Grid Direction, Add 8.01°