

Well Name: **Drake PC MM14-15D**

Surface Location: Drake PC MM14-08D Pad Sec.14-T7N-R67W
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

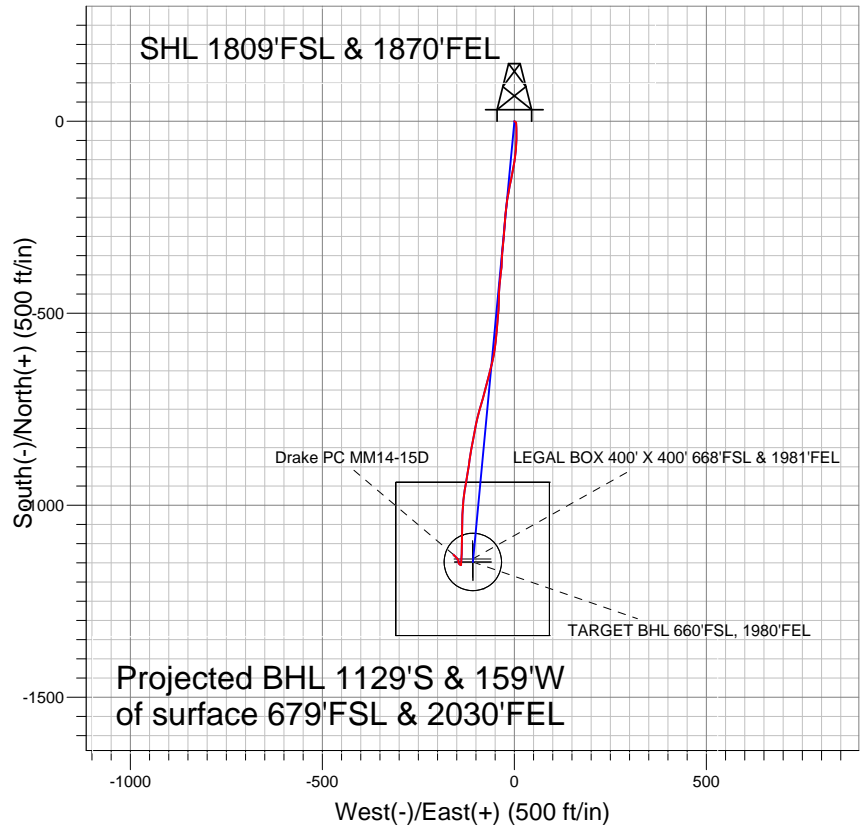
Ground Elevation: 5002.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1451812.50	3178459.95	40.571850	-104.857600

Original Well Elev WELL @ 5015.0ft (Original Well Elev)

Slot

NOBLE ENERGY INC WELD COUNTY CO



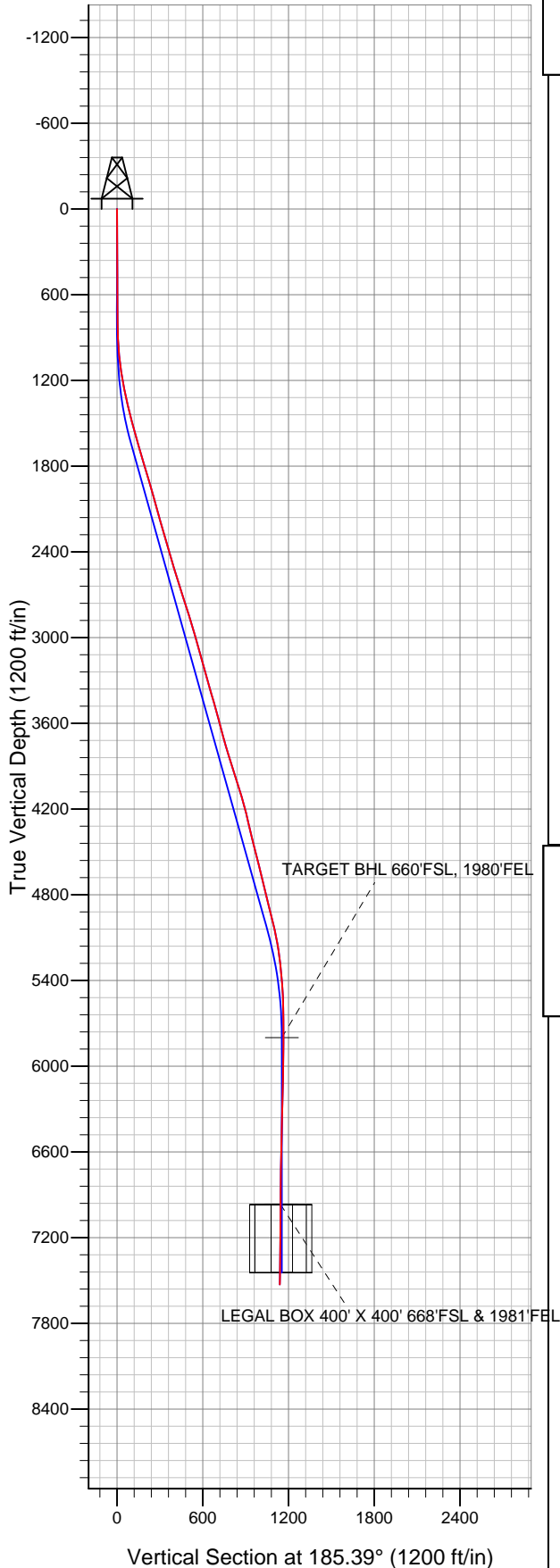
LEGEND

- ✕ Drake PC MM14-15D, Wellbore #1, Noble Drake PC MM14-15D Plan #1 (5-24-11) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7681'MD & 7527'TVD @ 1139'VS
0.6 deg Inc 321.0 deg AZ

Project: SEC.14-T7N-R67W
Site: Drake PC MM14-08D Pad Sec.14-T7N-R67W
Well: Drake PC MM14-15D
Plan: Wellbore #1





Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.14-T7N-R67W

Drake PC MM14-08D Pad Sec.14-T7N-R67W

Drake PC MM14-15D

Wellbore #1

Survey: Survey #1

Standard Survey Report

09 September, 2011



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Drake PC MM14-15D
Project:	SEC.14-T7N-R67W	TVD Reference:	WELL @ 5015.0ft (Original Well Elev)
Site:	Drake PC MM14-08D Pad Sec.14-T7N-R67W	MD Reference:	WELL @ 5015.0ft (Original Well Elev)
Well:	Drake PC MM14-15D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.14-T7N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Drake PC MM14-08D Pad Sec.14-T7N-R67W				
Site Position:		Northing:	1,451,834.37 ft	Latitude:	40.571910
From:	Lat/Long	Easting:	3,178,459.79 ft	Longitude:	-104.857600
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.42 °

Well	Drake PC MM14-15D					
Well Position	+N/-S	0.0 ft	Northing:	1,451,812.50 ft	Latitude:	40.571850
	+E/-W	0.0 ft	Easting:	3,178,459.95 ft	Longitude:	-104.857600
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,002.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/24/2011	8.94	67.18	53,216

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	185.39	

Survey Program	Date	9/9/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
675.0	7,681.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey										
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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
675.0	0.70	127.40	675.0	-2.5	3.3	2.2	0.10	0.10	0.00	
799.0	0.70	167.70	799.0	-3.7	4.0	3.3	0.39	0.00	32.50	
924.0	3.00	174.00	923.9	-7.7	4.5	7.2	1.84	1.84	5.04	
1,049.0	6.20	178.00	1,048.5	-17.7	5.1	17.1	2.57	2.56	3.20	
1,174.0	9.50	179.60	1,172.3	-34.8	5.4	34.1	2.65	2.64	1.28	
1,299.0	11.80	182.40	1,295.1	-57.9	5.0	57.1	1.89	1.84	2.24	
1,423.0	14.20	187.10	1,416.0	-85.6	2.6	85.0	2.11	1.94	3.79	
1,548.0	15.70	189.50	1,536.7	-117.5	-2.1	117.2	1.30	1.20	1.92	
1,673.0	15.70	192.10	1,657.1	-150.7	-8.5	150.9	0.56	0.00	2.08	
1,798.0	16.70	190.30	1,777.1	-184.9	-15.2	185.6	0.90	0.80	-1.44	
1,923.0	16.60	187.80	1,896.9	-220.3	-20.9	221.3	0.58	-0.08	-2.00	
2,047.0	15.40	184.50	2,016.0	-254.3	-24.6	255.5	1.21	-0.97	-2.66	

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Well:	Drake PC MM14-15D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey

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)
2,172.0	15.90	183.20	2,136.4	-287.9	-26.8	289.2	0.49	0.40	-1.04
2,297.0	16.10	187.20	2,256.6	-322.2	-29.9	323.6	0.90	0.16	3.20
2,422.0	15.80	181.30	2,376.8	-356.4	-32.5	357.9	1.32	-0.24	-4.72
2,547.0	17.10	187.00	2,496.7	-391.7	-35.1	393.2	1.66	1.04	4.56
2,671.0	17.30	185.20	2,615.1	-428.1	-39.0	429.9	0.46	0.16	-1.45
2,796.0	18.40	180.40	2,734.1	-466.4	-40.8	468.1	1.47	0.88	-3.84
2,921.0	16.80	185.70	2,853.3	-504.1	-42.8	505.9	1.81	-1.28	4.24
3,046.0	16.30	183.80	2,973.1	-539.6	-45.7	541.5	0.59	-0.40	-1.52
3,171.0	15.90	187.10	3,093.2	-574.1	-49.0	576.1	0.80	-0.32	2.64
3,295.0	15.00	189.60	3,212.7	-606.7	-53.8	609.1	0.90	-0.73	2.02
3,420.0	16.70	195.60	3,332.9	-640.0	-61.3	642.9	1.89	1.36	4.80
3,545.0	15.60	191.40	3,453.0	-673.8	-69.5	677.3	1.28	-0.88	-3.36
3,670.0	15.10	198.00	3,573.6	-705.7	-77.8	709.9	1.45	-0.40	5.28
3,795.0	15.60	195.40	3,694.1	-737.4	-87.3	742.4	0.68	0.40	-2.08
3,920.0	16.90	193.20	3,814.1	-771.3	-95.9	776.9	1.15	1.04	-1.76
4,044.0	18.60	191.00	3,932.2	-808.3	-103.8	814.5	1.47	1.37	-1.77
4,169.0	17.60	190.60	4,051.0	-846.4	-111.1	853.1	0.81	-0.80	-0.32
4,294.0	14.40	186.90	4,171.2	-880.4	-116.4	887.5	2.69	-2.56	-2.96
4,419.0	13.60	190.80	4,292.5	-910.3	-121.1	917.7	0.99	-0.64	3.12
4,543.0	13.20	188.20	4,413.1	-938.6	-125.8	946.3	0.58	-0.32	-2.10
4,668.0	15.30	189.30	4,534.2	-969.0	-130.5	977.0	1.69	1.68	0.88
4,793.0	12.90	184.30	4,655.5	-999.2	-134.2	1,007.4	2.15	-1.92	-4.00
4,918.0	13.80	181.40	4,777.1	-1,028.1	-135.6	1,036.3	0.90	0.72	-2.32
5,043.0	14.40	181.10	4,898.3	-1,058.5	-136.3	1,066.6	0.48	0.48	-0.24
5,168.0	13.60	180.40	5,019.6	-1,088.7	-136.7	1,096.8	0.65	-0.64	-0.56
5,292.0	9.70	181.90	5,141.0	-1,113.8	-137.2	1,121.7	3.15	-3.15	1.21
5,417.0	6.90	181.90	5,264.7	-1,131.8	-137.8	1,139.7	2.24	-2.24	0.00
5,542.0	4.50	185.80	5,389.1	-1,144.2	-138.5	1,152.1	1.94	-1.92	3.12
5,667.0	2.90	180.80	5,513.8	-1,152.2	-139.0	1,160.2	1.30	-1.28	-4.00
5,791.0	0.50	202.10	5,637.7	-1,155.9	-139.3	1,163.8	1.97	-1.94	17.18
5,916.0	0.60	313.50	5,762.7	-1,155.9	-140.0	1,164.0	0.73	0.08	89.12
5,953.0	0.64	310.64	5,799.7	-1,155.6	-140.3	1,163.7	0.13	0.10	-7.74
TARGET BHL 660'FSL, 1980'FEL									
6,103.0	0.80	301.90	5,949.7	-1,154.6	-141.8	1,162.8	0.13	0.11	-5.82
6,291.0	1.50	321.70	6,137.7	-1,151.9	-144.4	1,160.4	0.42	0.37	10.53
6,478.0	1.90	2.00	6,324.6	-1,146.9	-145.8	1,155.5	0.66	0.21	21.55
6,665.0	1.50	337.70	6,511.5	-1,141.5	-146.6	1,150.3	0.44	-0.21	-12.99
6,852.0	1.90	306.40	6,698.5	-1,137.4	-150.1	1,146.5	0.53	0.21	-16.74
7,039.0	0.30	350.50	6,885.4	-1,135.1	-152.6	1,144.4	0.91	-0.86	23.58
7,121.2	0.59	308.66	6,967.6	-1,134.6	-153.0	1,144.0	0.51	0.36	-50.93
LEGAL BOX 400' X 400' 668'FSL & 1981'FEL - TARGET CIRCLE 660'FSL & 1980'FEL									
7,227.0	1.10	295.10	7,073.4	-1,133.9	-154.4	1,143.4	0.51	0.48	-12.81
7,351.0	1.00	323.90	7,197.4	-1,132.5	-156.1	1,142.1	0.43	-0.08	23.23
7,635.0	0.60	321.00	7,481.4	-1,129.3	-158.5	1,139.2	0.14	-0.14	-1.02
7,681.0	0.60	321.00	7,527.4	-1,129.0	-158.8	1,138.9	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
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