Noble Energy Inc.

Weld County, CO
Sec 4, T9N, R58W
Rohn State LD04-68HN

Wellbore #1

Survey: MWD FINAL

DDC Survey Report

24 September, 2013

The DIRECTIONAL DRILLING COMPANY

Survey Certification Sheet

Noble Energy Inc	RM-13585	8/14/13
Company	Job Number	Date

Sec4,T9N,R58W	Rohn State LD04-68HN	Weld, CO
Lease	Well Name	County & State

API: 05-123-37465

Surveyed from a depth of: 634' to 4967' MD(DDC Certified Survey Data)
:4967' to 14739' MD(DDC Certified Raw Survey Data)

Type of Survey: MWD

Directional Supervisor/Surveyor: CHRIS ABBOTT

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The Directional Drilling Company, ou=GM of Guidance Services, email=larryw@directionaldrillers.com, c=US
Date: 2013.08.15 09:50:53 -05'00'

Larry Wright
MWD General Manager

• 11390 FM 830 • Willis, Texas 77318 •
• PH 936-856-4332 • FAX 936-856-8678 •

Company:	Noble Energy Inc.	**Local Co-ordinate Reference:**	Well Rohn State LD04-68HN
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4777.0usft (H&P #326)
Site:	Sec 4, T9N, R58W	**MD Reference:**	WELL @ 4777.0usft (H&P #326)
Well:	Rohn State LD04-68HN	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Project Weld County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site Sec 4, T9N, R58W

Site Position:		**Northing:**	1,533,342.38 usft	**Latitude:**	40° 47' 10.068 N
From:	Lat/Long	**Easting:**	3,449,206.53 usft	**Longitude:**	103° 52' 40.008 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	1.05 °

Well Rohn State LD04-68HN

Well Position	**+N/-S**	0.0 usft	**Northing:**	1,533,342.37 usft	**Latitude:**	40° 47' 10.068 N
	+E/-W	0.0 usft	**Easting:**	3,449,206.53 usft	**Longitude:**	103° 52' 40.008 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	4,747.0 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/22/2013	8.12	67.43	53,202

Design Wellbore #1

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	89.51

Survey Program **Date** 9/24/2013

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
291.0	634.0	FLEXI TOOL (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool
738.0	4,967.0	MWD (Wellbore #1)	MWD default	MWD - Standard
5,062.0	14,739.0	RAW SURVEYS (Wellbore #1)	MWD+IFR1+MS_WY	Fixed:v2:Rockies, crustal dec + 3-axis correction

Survey

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)
TIE IN @ 634' MD / 634' TVD									
634.0	0.50	236.00	634.0	-2.2	0.7	0.6	0.00	0.00	0.00
738.0	0.20	172.70	738.0	-2.7	0.3	0.3	0.43	-0.29	-60.87
833.0	0.20	196.20	833.0	-3.0	0.3	0.3	0.09	0.00	24.74
927.0	0.30	206.20	927.0	-3.4	0.1	0.1	0.12	0.11	10.64
1,022.0	0.30	211.10	1,022.0	-3.8	-0.1	-0.1	0.03	0.00	5.16
1,116.0	0.30	212.60	1,116.0	-4.2	-0.4	-0.4	0.01	0.00	1.60
1,211.0	0.30	225.90	1,211.0	-4.6	-0.7	-0.7	0.07	0.00	14.00
1,307.0	0.60	193.10	1,307.0	-5.3	-1.0	-1.0	0.40	0.31	-34.17

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Well:	Rohn State LD04-68HN	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Survey

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)
1,401.0	0.60	187.10	1,401.0	-6.2	-1.2	-1.2	0.07	0.00	-6.38
1,493.0	0.60	182.30	1,493.0	-7.2	-1.2	-1.3	0.05	0.00	-5.22
1,586.0	0.70	183.60	1,586.0	-8.2	-1.3	-1.4	0.11	0.11	1.40
1,680.0	2.00	160.70	1,679.9	-10.4	-0.8	-0.9	1.47	1.38	-24.36
1,773.0	4.00	140.70	1,772.8	-14.4	1.8	1.7	2.40	2.15	-21.51
1,865.0	3.70	146.80	1,864.6	-19.4	5.5	5.3	0.55	-0.33	6.63
1,957.0	5.20	141.90	1,956.3	-25.1	9.7	9.5	1.68	1.63	-5.33
2,050.0	7.60	143.50	2,048.7	-33.4	15.9	15.6	2.59	2.58	1.72
2,143.0	8.10	139.10	2,140.9	-43.3	23.9	23.5	0.84	0.54	-4.73
2,235.0	9.20	141.40	2,231.8	-53.9	32.7	32.2	1.25	1.20	2.50
2,328.0	10.30	137.50	2,323.5	-65.9	43.0	42.4	1.38	1.18	-4.19
2,421.0	11.40	140.80	2,414.8	-79.1	54.4	53.7	1.36	1.18	3.55
2,514.0	13.20	140.10	2,505.7	-94.4	67.0	66.2	1.94	1.94	-0.75
2,607.0	13.40	140.10	2,596.2	-110.8	80.7	79.8	0.22	0.22	0.00
2,699.0	13.20	138.20	2,685.7	-126.8	94.6	93.5	0.52	-0.22	-2.07
2,792.0	10.60	140.80	2,776.7	-141.4	107.1	105.8	2.85	-2.80	2.80
2,886.0	7.80	143.50	2,869.5	-153.2	116.3	115.0	3.01	-2.98	2.87
2,978.0	5.70	140.30	2,960.8	-161.7	123.0	121.6	2.32	-2.28	-3.48
3,073.0	4.70	127.70	3,055.5	-167.7	129.0	127.6	1.59	-1.05	-13.26
3,168.0	4.70	133.50	3,150.1	-172.8	134.9	133.5	0.50	0.00	6.11
3,263.0	4.00	147.70	3,244.9	-178.3	139.5	138.0	1.35	-0.74	14.95
3,357.0	4.40	147.00	3,338.6	-184.1	143.3	141.7	0.43	0.43	-0.74
3,452.0	3.30	152.80	3,433.4	-189.6	146.5	144.9	1.23	-1.16	6.11
3,547.0	1.30	144.00	3,528.3	-192.9	148.4	146.7	2.13	-2.11	-9.26
3,642.0	0.20	233.60	3,623.3	-193.8	148.9	147.2	1.38	-1.16	94.32
3,737.0	0.70	178.10	3,718.3	-194.5	148.8	147.1	0.64	0.53	-58.42
3,831.0	1.30	190.80	3,812.3	-196.1	148.6	146.9	0.68	0.64	13.51
3,926.0	0.50	175.30	3,907.3	-197.6	148.4	146.7	0.87	-0.84	-16.32
4,021.0	1.10	18.10	4,002.3	-197.2	148.7	147.0	1.66	0.63	-165.47
4,116.0	0.50	30.60	4,097.3	-195.9	149.2	147.5	0.65	-0.63	13.16
4,211.0	0.50	13.60	4,192.3	-195.2	149.5	147.9	0.16	0.00	-17.89
4,305.0	0.40	202.20	4,286.3	-195.1	149.5	147.8	0.95	-0.11	-182.34
4,400.0	1.50	160.70	4,381.2	-196.6	149.8	148.1	1.29	1.16	-43.68
4,495.0	0.60	157.40	4,476.2	-198.2	150.4	148.7	0.95	-0.95	-3.47
4,589.0	0.50	236.50	4,570.2	-198.9	150.2	148.5	0.75	-0.11	84.15
4,684.0	0.90	207.30	4,665.2	-199.8	149.6	147.8	0.55	0.42	-30.74
4,779.0	0.60	321.00	4,760.2	-200.0	148.9	147.2	1.33	-0.32	119.68
4,873.0	0.90	322.30	4,854.2	-199.1	148.1	146.4	0.32	0.32	1.38
4,936.0	0.90	341.40	4,917.2	-198.2	147.7	146.0	0.47	0.00	30.32
LAST DDC CORRECTED SURVEY @ 4967' MD / 4948.2' TVD									
4,967.0	0.90	333.45	4,948.2	-197.8	147.5	145.8	0.40	0.00	-25.65

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Well:	Rohn State LD04-68HN	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
634.0	634.0	-2.2	0.7	TIE IN @ 634' MD / 634' TVD
4,967.0	4,948.2	-197.8	147.5	LAST DDC CORRECTED SURVEY @ 4967' MD / 4948.2' TVD

Checked By: _____ Approved By: _____ Date: _____

Noble Energy Inc.

Weld County, CO
Sec 4, T9N, R58W
Rohn State LD04-68HN

Wellbore #1

Survey: RAW SURVEYS

DDC Survey Report

24 September, 2013

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Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
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Project Weld County, CO

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site Sec 4, T9N, R58W

Site Position:		**Northing:**	1,533,342.38 usft	**Latitude:**	40° 47' 10.068 N
From:	Lat/Long	**Easting:**	3,449,206.53 usft	**Longitude:**	103° 52' 40.008 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	1.05 °

Well Rohn State LD04-68HN

Well Position	**+N/-S**	0.0 usft	**Northing:**	1,533,342.37 usft	**Latitude:**	40° 47' 10.068 N
	+E/-W	0.0 usft	**Easting:**	3,449,206.53 usft	**Longitude:**	103° 52' 40.008 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	4,747.0 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/22/2013	8.12	67.43	53,202

Design Wellbore #1

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	89.51

Survey Program **Date** 9/24/2013

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
291.0	634.0	FLEXI TOOL (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool
738.0	4,967.0	MWD (Wellbore #1)	MWD default	MWD - Standard
5,062.0	14,739.0	RAW SURVEYS (Wellbore #1)	MWD+IFR1+MS_WY	Fixed:v2:Rockies, crustal dec + 3-axis correction

Survey

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)
FIRST RAW DATA SURVEY @ 5062' MD / 5043.2' TVD									
5,062.0	1.50	51.56	5,043.2	-196.3	148.1	146.4	1.67	0.63	82.22
5,157.0	14.30	79.14	5,137.1	-193.3	160.7	159.0	13.67	13.47	29.03
5,251.0	27.50	82.06	5,224.7	-188.1	193.7	192.1	14.08	14.04	3.11
5,346.0	31.80	87.06	5,307.3	-183.8	240.5	238.9	5.22	4.53	5.26
5,441.0	35.70	91.41	5,386.3	-183.2	293.2	291.6	4.83	4.11	4.58
5,535.0	41.70	88.32	5,459.6	-183.0	351.9	350.4	6.70	6.38	-3.29
5,630.0	46.80	87.04	5,527.6	-180.3	418.1	416.6	5.45	5.37	-1.35
5,725.0	51.50	86.46	5,589.7	-176.2	489.9	488.3	4.97	4.95	-0.61

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Survey

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)
5,819.0	54.00	87.01	5,646.6	-171.9	564.6	563.1	2.70	2.66	0.59
5,914.0	64.90	94.74	5,694.9	-173.5	646.1	644.6	13.43	11.47	8.14
6,008.0	78.40	98.06	5,724.4	-183.5	734.6	733.0	14.75	14.36	3.53
6,073.0	83.40	94.73	5,734.7	-190.6	798.3	796.7	9.21	7.69	-5.12
6,159.0	85.00	91.58	5,743.4	-195.3	883.8	882.0	4.09	1.86	-3.66
6,254.0	86.10	88.94	5,750.8	-195.8	978.5	976.7	3.00	1.16	-2.78
6,349.0	85.60	88.54	5,757.7	-193.7	1,073.2	1,071.5	0.67	-0.53	-0.42
6,443.0	88.30	87.75	5,762.7	-190.6	1,167.0	1,165.3	2.99	2.87	-0.84
6,537.0	92.00	86.41	5,762.4	-185.8	1,260.8	1,259.2	4.19	3.94	-1.43
6,631.0	92.20	85.93	5,759.0	-179.6	1,354.6	1,353.0	0.55	0.21	-0.51
6,726.0	91.20	85.30	5,756.1	-172.3	1,449.3	1,447.7	1.24	-1.05	-0.66
6,820.0	91.10	85.00	5,754.3	-164.4	1,542.9	1,541.4	0.34	-0.11	-0.32
6,915.0	88.90	84.90	5,754.3	-156.0	1,637.5	1,636.1	2.32	-2.32	-0.11
7,010.0	88.80	84.74	5,756.2	-147.4	1,732.1	1,730.8	0.20	-0.11	-0.17
7,104.0	90.00	86.25	5,757.1	-140.0	1,825.8	1,824.6	2.05	1.28	1.61
7,199.0	90.90	87.47	5,756.4	-134.8	1,920.7	1,919.4	1.60	0.95	1.28
7,293.0	91.10	86.94	5,754.8	-130.3	2,014.5	2,013.4	0.60	0.21	-0.56
7,387.0	90.50	88.93	5,753.4	-126.9	2,108.5	2,107.3	2.21	-0.64	2.12
7,482.0	91.00	88.16	5,752.2	-124.5	2,203.4	2,202.3	0.97	0.53	-0.81
7,577.0	89.90	91.62	5,751.5	-124.3	2,298.4	2,297.3	3.82	-1.16	3.64
7,671.0	89.70	91.26	5,751.8	-126.6	2,392.4	2,391.2	0.44	-0.21	-0.38
7,766.0	89.50	90.41	5,752.4	-128.0	2,487.4	2,486.2	0.92	-0.21	-0.89
7,861.0	89.50	90.20	5,753.3	-128.5	2,582.4	2,581.2	0.22	0.00	-0.22
7,955.0	90.10	90.02	5,753.6	-128.7	2,676.4	2,675.2	0.67	0.64	-0.19
8,050.0	90.40	89.63	5,753.2	-128.4	2,771.4	2,770.2	0.52	0.32	-0.41
8,144.0	90.90	89.17	5,752.1	-127.4	2,865.3	2,864.2	0.72	0.53	-0.49
8,238.0	90.20	87.92	5,751.2	-125.0	2,959.3	2,958.1	1.52	-0.74	-1.33
8,332.0	90.40	86.56	5,750.7	-120.5	3,053.2	3,052.1	1.46	0.21	-1.45
8,427.0	88.70	87.28	5,751.5	-115.4	3,148.1	3,146.9	1.94	-1.79	0.76
8,522.0	88.60	87.21	5,753.7	-110.9	3,242.9	3,241.8	0.13	-0.11	-0.07
8,616.0	88.50	86.65	5,756.1	-105.8	3,336.7	3,335.7	0.60	-0.11	-0.60
8,710.0	89.90	87.91	5,757.4	-101.4	3,430.6	3,429.6	2.00	1.49	1.34
8,804.0	89.90	87.34	5,757.6	-97.5	3,524.5	3,523.6	0.61	0.00	-0.61
8,899.0	89.70	89.42	5,757.9	-94.8	3,619.5	3,618.6	2.20	-0.21	2.19
8,994.0	89.70	89.79	5,758.4	-94.1	3,714.5	3,713.6	0.39	0.00	0.39
9,089.0	91.10	91.86	5,757.7	-95.5	3,809.5	3,808.5	2.63	1.47	2.18
9,183.0	90.90	91.05	5,756.1	-97.9	3,903.4	3,902.5	0.89	-0.21	-0.86
9,278.0	90.50	90.40	5,754.9	-99.1	3,998.4	3,997.4	0.80	-0.42	-0.68
9,372.0	90.20	89.91	5,754.4	-99.3	4,092.4	4,091.4	0.61	-0.32	-0.52
9,467.0	89.70	88.86	5,754.4	-98.3	4,187.4	4,186.4	1.22	-0.53	-1.11
9,561.0	89.40	88.16	5,755.2	-95.9	4,281.4	4,280.4	0.81	-0.32	-0.74
9,656.0	89.30	87.28	5,756.3	-92.1	4,376.3	4,375.3	0.93	-0.11	-0.93
9,748.0	90.90	88.17	5,756.1	-88.4	4,468.2	4,467.3	1.99	1.74	0.97

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Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Survey

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)
9,842.0	90.90	89.12	5,754.6	-86.2	4,562.2	4,561.3	1.01	0.00	1.01
9,933.0	91.50	89.08	5,752.7	-84.8	4,653.1	4,652.3	0.66	0.66	-0.04
10,027.0	92.10	88.50	5,749.8	-82.8	4,747.1	4,746.2	0.89	0.64	-0.62
10,121.0	89.60	88.30	5,748.4	-80.2	4,841.0	4,840.2	2.67	-2.66	-0.21
10,214.0	89.50	88.10	5,749.1	-77.3	4,934.0	4,933.1	0.24	-0.11	-0.22
10,305.0	89.50	87.57	5,749.9	-73.8	5,024.9	5,024.1	0.58	0.00	-0.58
10,397.0	88.70	86.80	5,751.3	-69.3	5,116.8	5,116.0	1.21	-0.87	-0.84
10,491.0	87.90	86.63	5,754.1	-63.9	5,210.6	5,209.8	0.87	-0.85	-0.18
10,584.0	90.10	87.22	5,755.8	-58.9	5,303.4	5,302.7	2.45	2.37	0.63
10,676.0	91.50	87.96	5,754.5	-55.1	5,395.3	5,394.7	1.72	1.52	0.80
10,769.0	91.60	87.64	5,752.0	-51.5	5,488.2	5,487.6	0.36	0.11	-0.34
10,862.0	90.40	86.55	5,750.3	-46.8	5,581.1	5,580.5	1.74	-1.29	-1.17
10,955.0	90.60	91.10	5,749.5	-44.9	5,674.1	5,673.5	4.90	0.22	4.89
11,047.0	90.00	90.93	5,749.0	-46.5	5,766.0	5,765.4	0.68	-0.65	-0.18
11,139.0	89.50	90.09	5,749.4	-47.3	5,858.0	5,857.4	1.06	-0.54	-0.91
11,233.0	89.80	90.10	5,750.0	-47.5	5,952.0	5,951.4	0.32	0.32	0.01
11,326.0	89.20	89.12	5,750.8	-46.8	6,045.0	6,044.4	1.24	-0.65	-1.05
11,419.0	90.40	90.69	5,751.1	-46.7	6,138.0	6,137.4	2.12	1.29	1.69
11,512.0	90.10	90.67	5,750.7	-47.8	6,231.0	6,230.4	0.32	-0.32	-0.02
11,606.0	89.70	90.24	5,750.9	-48.5	6,325.0	6,324.4	0.62	-0.43	-0.46
11,700.0	89.00	89.50	5,752.0	-48.3	6,419.0	6,418.3	1.08	-0.74	-0.79
11,795.0	91.20	89.34	5,751.8	-47.4	6,514.0	6,513.3	2.32	2.32	-0.17
11,889.0	90.20	88.41	5,750.7	-45.5	6,608.0	6,607.3	1.45	-1.06	-0.99
11,984.0	89.90	88.40	5,750.6	-42.9	6,702.9	6,702.3	0.32	-0.32	-0.01
12,079.0	90.70	89.95	5,750.1	-41.5	6,797.9	6,797.3	1.84	0.84	1.63
12,173.0	90.10	88.82	5,749.4	-40.5	6,891.9	6,891.3	1.36	-0.64	-1.20
12,267.0	90.50	90.28	5,748.9	-39.8	6,985.9	6,985.3	1.61	0.43	1.55
12,362.0	90.30	90.48	5,748.3	-40.4	7,080.9	7,080.3	0.30	-0.21	0.21
12,457.0	90.00	87.90	5,748.0	-39.1	7,175.9	7,175.3	2.73	-0.32	-2.72
12,551.0	89.70	88.06	5,748.3	-35.7	7,269.8	7,269.2	0.36	-0.32	0.17
12,646.0	89.10	87.55	5,749.3	-32.1	7,364.7	7,364.2	0.83	-0.63	-0.54
12,740.0	89.90	85.79	5,750.1	-26.6	7,458.6	7,458.1	2.06	0.85	-1.87
12,834.0	88.90	84.71	5,751.1	-18.9	7,552.2	7,551.8	1.57	-1.06	-1.15
12,928.0	90.50	87.54	5,751.6	-12.5	7,646.0	7,645.6	3.46	1.70	3.01
13,023.0	90.40	87.45	5,750.8	-8.4	7,740.9	7,740.6	0.14	-0.11	-0.09
13,117.0	89.10	86.64	5,751.2	-3.5	7,834.8	7,834.5	1.63	-1.38	-0.86
13,211.0	91.20	88.44	5,751.0	0.5	7,928.7	7,928.4	2.94	2.23	1.91
13,306.0	90.70	88.04	5,749.4	3.4	8,023.6	8,023.4	0.67	-0.53	-0.42
13,400.0	90.10	87.75	5,748.7	6.9	8,117.6	8,117.3	0.71	-0.64	-0.31
13,495.0	90.60	87.32	5,748.2	11.0	8,212.5	8,212.3	0.69	0.53	-0.45
13,589.0	89.40	85.66	5,748.2	16.7	8,306.3	8,306.1	2.18	-1.28	-1.77
13,684.0	90.20	86.77	5,748.5	23.0	8,401.1	8,401.0	1.44	0.84	1.17
13,778.0	92.30	88.16	5,746.4	27.2	8,495.0	8,494.9	2.68	2.23	1.48

Company:	Noble Energy Inc.	**Local Co-ordinate Reference:**	Well Rohn State LD04-68HN
Project:	Weld County, CO	**TVD Reference:**	WELL @ 4777.0usft (H&P #326)
Site:	Sec 4, T9N, R58W	**MD Reference:**	WELL @ 4777.0usft (H&P #326)
Well:	Rohn State LD04-68HN	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Survey

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)
13,872.0	91.80	88.34	5,743.1	30.0	8,588.9	8,588.8	0.57	-0.53	0.19
13,967.0	91.30	87.86	5,740.5	33.2	8,683.8	8,683.7	0.73	-0.53	-0.51
14,061.0	90.40	87.53	5,739.1	37.0	8,777.7	8,777.7	1.02	-0.96	-0.35
14,156.0	90.10	87.20	5,738.7	41.3	8,872.6	8,872.6	0.47	-0.32	-0.35
14,251.0	89.10	86.88	5,739.4	46.2	8,967.4	8,967.5	1.11	-1.05	-0.34
14,345.0	89.80	87.05	5,740.3	51.2	9,061.3	9,061.4	0.77	0.74	0.18
14,440.0	88.80	86.86	5,741.4	56.3	9,156.2	9,156.3	1.07	-1.05	-0.20
14,535.0	87.60	86.57	5,744.4	61.7	9,251.0	9,251.2	1.30	-1.26	-0.31
14,630.0	86.10	86.60	5,749.6	67.3	9,345.7	9,345.9	1.58	-1.58	0.03
14,675.0	85.30	86.44	5,753.0	70.1	9,390.4	9,390.7	1.81	-1.78	-0.36
TD @ 14739' MD / 5758.2' TVD									
14,739.0	85.30	86.44	5,758.2	74.0	9,454.1	9,454.4	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
5,062.0	5,043.2	-196.3	148.1	FIRST RAW DATA SURVEY @ 5062' MD / 5043.2' TVD
14,739.0	5,758.2	74.0	9,454.1	TD @ 14739' MD / 5758.2' TVD

Checked By: _____ Approved By: _____ Date: _____

Company Name: Noble Energy Inc.
Rohn State LD04-68HN
Weld County, CO
Rig: H&P #326
Created By: TIFFANI MIZELL
Date: 8/24/2013

Rohn State LD04-68HN
Weld County, CO
Q130555 & RM-13585
Design #2

The DIRECTIONAL DRILLING COMPANY

T G M

Azimuths to Grid North

Correction: 7.07°

Magnetic Field

Strength: 53201.5snT
Dip Angle: 67.43°
Date: 7/22/2013
Model: IGRF2010

PROJECT DETAILS:	Weld County, CO
Geodetic System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone:	Colorado Northern Zone
System Datum:	Mean Sea Level

WELL DETAILS: Rohn State LD04-68HN

Ground Level: 4747.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1533342.37	3449206.54	40° 47' 10.068 N	103° 52' 40.008 W

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
634.0	0.50	236.00	634.0	-2.2	0.7	0.6	3.1	TIE IN @ 634' MD / 634' TVD
4967.0	0.90	333.45	4948.2	-197.8	147.5	145.8	267.0	LAST DDC CORRECTED SURVEY @ 4967' MD / 4948.2' TVD
5062.0	1.50	51.56	5043.2	-196.3	148.1	146.4	269.0	FIRST RAW DATA SURVEY @ 5062' MD / 5043.2' TVD
5282.3	28.90	83.86	5252.3	-186.3	208.4	206.8	330.9	CROSSED HARDLINE @ 5282.3' MD / 5252.3' TVD
9503.6	89.58	88.59	5754.7	-97.5	4224.0	4223.0	4350.9	CROSSED HARDLINE @ 9503.6' MD / 5754.7' TVD
10103.8	90.06	88.34	5748.3	-80.7	4823.8	4823.0	4951.0	CROSSED SECTION LINE @ 10103.8' MD / 5748.3' TVD
10703.9	91.53	87.86	5753.7	-54.0	5423.2	5422.6	5551.0	CROSSED HARDLINE @ 10703.9' MD / 5753.7' TVD
14739.0	85.30	86.44	5758.2	74.0	9454.1	9454.4	9585.2	TD @ 14739' MD / 5758.2' TVD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL Rohn State LD04-68HN - plan hits target center	5744.5	80.1	9454.3	1533422.43	3458660.88	40° 47' 9.132 N	103° 50' 37.104 W