

Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: **Rohn State LD10-68-1HN**

Surface Location: Rohn State LD10-69-1HN Pad Sec.9-T9N-R58W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

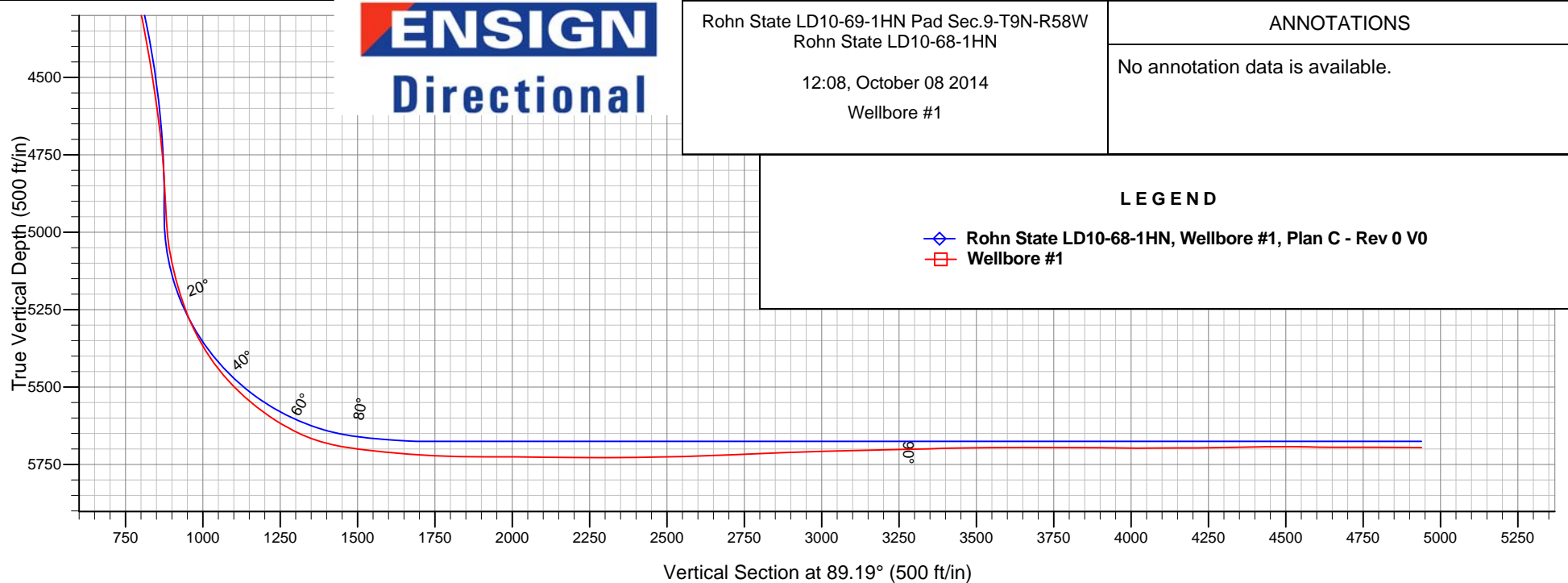
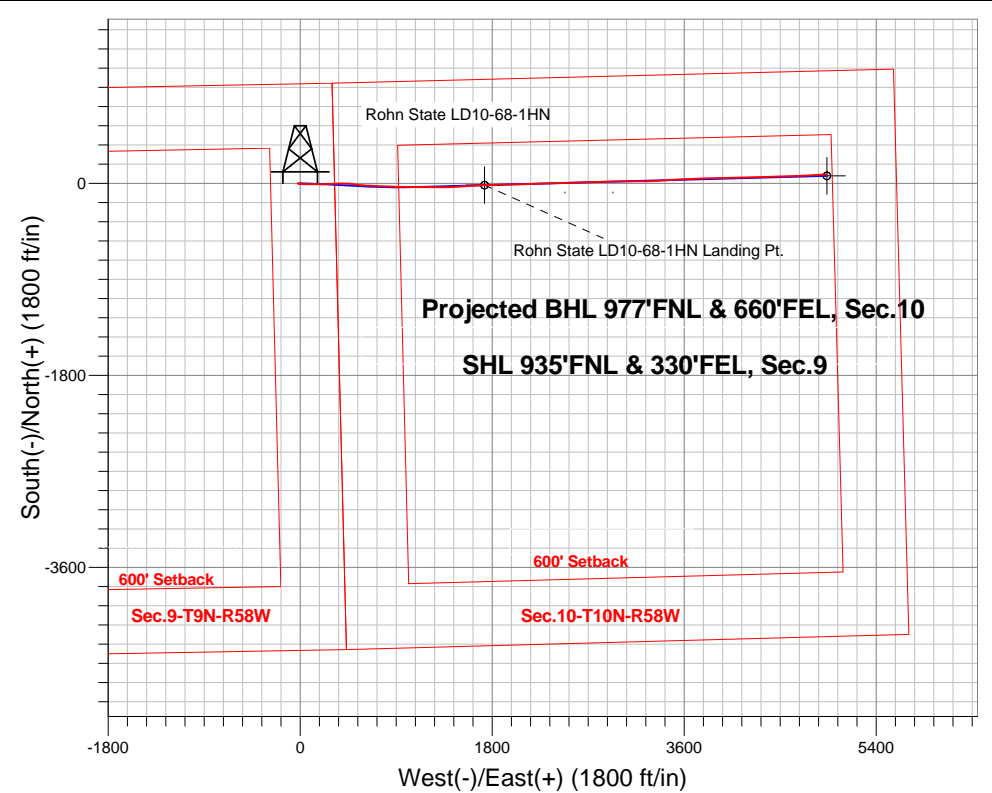
Ground Elevation: 4739.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1527766.18	3453912.87	40.770590	-103.861160	

PD 828 RKB - 16' WELL @ 4755.0ft (PD 828 RKB - 16')

FINAL SURVEY

Projected Bottom Hole Location
9590'MD 5696'TVD 83'N & 4938'E of SHL
89.5 degree Incl @ 86.9 degree AZM



ENSIGN
Directional

Rohn State LD10-69-1HN Pad Sec.9-T9N-R58W
Rohn State LD10-68-1HN

12:08, October 08 2014

Wellbore #1

ANNOTATIONS

No annotation data is available.

LEGEND

- ◆ Rohn State LD10-68-1HN, Wellbore #1, Plan C - Rev 0 V0
- Wellbore #1



Noble Energy Inc.- Weld County, CO (Grid North)

SEC.9-T9N-R58W

Rohn State LD10-69-1HN Pad Sec.9-T9N-R58W

Rohn State LD10-68-1HN

Wellbore #1

Design: Wellbore #1

Final Survey

08 October, 2014

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Rohn State LD10-68-1HN
Project:	SEC.9-T9N-R58W	TVD Reference:	WELL @ 4755.0ft (PD 828 RKB - 16')
Site:	Rohn State LD10-69-1HN Pad Sec.9-T9N-R58W	MD Reference:	WELL @ 4755.0ft (PD 828 RKB - 16')
Well:	Rohn State LD10-68-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.9-T9N-R58W, Weld County, CO		
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	Rohn State LD10-69-1HN Pad Sec.9-T9N-R58W				
Site Position:		Northing:	1,527,802.62 ft	Latitude:	40.770690
From:	Lat/Long	Easting:	3,453,912.19 ft	Longitude:	-103.861160
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	1.06 °

Well	Rohn State LD10-68-1HN					
Well Position	+N/-S	0.0 ft	Northing:	1,527,766.18 ft	Latitude:	40.770590
	+E/-W	0.0 ft	Easting:	3,453,912.87 ft	Longitude:	-103.861160
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,739.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/1/2014	7.95	67.37	53,068

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	89.19	

Survey Program	Date	10/8/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
414.0	1,211.0	Survey #1 (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
1,258.0	6,116.0	Survey #2 (Wellbore #1)	MWD	MWD - Standard	
6,192.0	9,590.0	Survey #3 (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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	
414.0	0.20	275.70	414.0	0.1	-0.7	-0.7	0.05	
827.0	1.60	265.10	826.9	-0.3	-7.2	-7.2	0.34	
1,211.0	1.60	265.10	1,210.8	-1.3	-17.9	-17.9	0.00	
1,258.0	3.10	292.50	1,257.7	-0.8	-19.7	-19.7	3.90	
1,353.0	0.80	250.70	1,352.7	-0.1	-22.7	-22.7	2.69	
1,447.0	1.50	126.00	1,446.7	-1.0	-22.3	-22.3	2.19	
1,542.0	4.00	117.60	1,541.6	-3.3	-18.4	-18.4	2.66	
1,637.0	5.00	101.40	1,636.3	-5.6	-11.4	-11.5	1.69	
1,732.0	7.10	91.50	1,730.7	-6.6	-1.4	-1.5	2.46	

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Site:	Rohn State LD10-69-1HN Pad Sec.9-T9N-R58W	MD Reference:	WELL @ 4755.0ft (PD 828 RKB - 16')
Well:	Rohn State LD10-68-1HN	North Reference:	Grid
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)
1,827.0	8.00	88.10	1,824.9	-6.5	11.0	10.9	1.06
1,922.0	9.50	93.60	1,918.8	-6.8	25.5	25.4	1.81
2,019.0	11.30	95.80	2,014.2	-8.3	42.9	42.8	1.90
2,109.0	11.90	85.60	2,102.4	-8.5	60.9	60.8	2.37
2,199.0	13.30	90.60	2,190.2	-7.8	80.5	80.4	1.97
2,289.0	15.30	89.00	2,277.4	-7.8	102.8	102.6	2.26
2,379.0	17.20	89.40	2,363.8	-7.4	127.9	127.8	2.11
2,469.0	19.80	92.10	2,449.2	-7.8	156.5	156.4	3.04
2,559.0	21.50	89.50	2,533.4	-8.2	188.2	188.1	2.15
2,648.0	21.00	88.50	2,616.3	-7.7	220.5	220.3	0.69
2,738.0	22.10	89.60	2,700.0	-7.1	253.5	253.4	1.30
2,828.0	21.50	88.20	2,783.6	-6.5	286.9	286.8	0.88
2,918.0	20.60	86.40	2,867.6	-5.0	319.2	319.1	1.23
3,008.0	20.50	86.40	2,951.9	-3.0	350.8	350.7	0.11
3,097.0	20.40	87.80	3,035.3	-1.4	381.8	381.7	0.56
3,187.0	20.70	93.60	3,119.5	-1.8	413.4	413.3	2.29
3,277.0	21.10	92.60	3,203.6	-3.6	445.4	445.3	0.60
3,366.0	20.20	98.70	3,286.9	-6.6	476.6	476.5	2.62
3,456.0	20.90	96.60	3,371.2	-10.8	507.9	507.7	1.13
3,546.0	21.20	95.90	3,455.2	-14.3	540.1	539.8	0.43
3,636.0	21.50	94.90	3,539.0	-17.4	572.7	572.4	0.52
3,726.0	21.10	94.50	3,622.9	-20.1	605.3	604.9	0.47
3,816.0	20.00	93.80	3,707.1	-22.4	636.8	636.4	1.25
3,906.0	18.20	92.70	3,792.2	-24.1	666.2	665.8	2.04
3,996.0	17.20	92.10	3,877.9	-25.2	693.5	693.1	1.13
4,085.0	16.40	91.10	3,963.1	-25.9	719.2	718.8	0.96
4,175.0	15.30	89.10	4,049.7	-26.0	743.8	743.3	1.36
4,265.0	13.60	91.90	4,136.8	-26.2	766.2	765.8	2.04
4,355.0	12.40	96.40	4,224.5	-27.6	786.4	786.0	1.74
4,445.0	11.30	95.90	4,312.6	-29.6	804.8	804.3	1.23
4,535.0	10.10	92.30	4,401.0	-30.8	821.5	820.9	1.53
4,625.0	8.70	86.80	4,489.8	-30.7	836.1	835.6	1.85
4,715.0	8.30	90.00	4,578.9	-30.3	849.4	848.9	0.69
4,804.0	6.90	93.60	4,667.1	-30.7	861.2	860.7	1.66
4,894.0	5.00	89.80	4,756.6	-31.0	870.5	870.0	2.15
4,984.0	3.30	96.90	4,846.3	-31.3	877.0	876.5	1.97
5,074.0	3.00	97.30	4,936.2	-31.9	881.9	881.4	0.33
5,119.0	3.30	97.20	4,981.1	-32.2	884.4	883.8	0.67
5,164.0	7.10	97.70	5,025.9	-32.8	888.4	887.8	8.44
5,209.0	10.60	97.90	5,070.4	-33.7	895.3	894.7	7.78
5,254.0	13.10	94.10	5,114.4	-34.6	904.4	903.9	5.82
5,299.0	14.70	87.00	5,158.1	-34.7	915.2	914.7	5.19
5,344.0	17.30	87.40	5,201.4	-34.1	927.6	927.0	5.78
5,389.0	20.30	88.40	5,244.0	-33.6	942.1	941.5	6.70
5,434.0	23.60	90.50	5,285.7	-33.4	958.9	958.4	7.54

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Site:	Rohn State LD10-69-1HN Pad Sec.9-T9N-R58W	MD Reference:	WELL @ 4755.0ft (PD 828 RKB - 16')
Well:	Rohn State LD10-68-1HN	North Reference:	Grid
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)
5,478.0	27.20	91.60	5,325.4	-33.8	977.8	977.2	8.25
5,523.0	30.00	91.20	5,364.9	-34.3	999.3	998.7	6.24
5,568.0	33.50	90.20	5,403.2	-34.6	1,023.0	1,022.4	7.86
5,613.0	37.80	89.40	5,439.8	-34.5	1,049.2	1,048.6	9.61
5,658.0	42.10	89.30	5,474.3	-34.2	1,078.1	1,077.5	9.56
5,703.0	45.30	91.10	5,506.8	-34.3	1,109.2	1,108.6	7.63
5,748.0	48.80	91.90	5,537.4	-35.2	1,142.1	1,141.5	7.89
5,793.0	52.10	90.70	5,566.1	-35.9	1,176.8	1,176.2	7.62
5,838.0	55.20	91.30	5,592.8	-36.6	1,213.0	1,212.4	6.97
5,883.0	59.20	90.00	5,617.1	-37.0	1,250.8	1,250.2	9.21
5,928.0	62.40	89.30	5,639.1	-36.8	1,290.1	1,289.5	7.24
5,973.0	66.80	89.40	5,658.4	-36.3	1,330.8	1,330.1	9.78
6,018.0	72.80	89.70	5,673.9	-36.0	1,373.0	1,372.3	13.35
6,063.0	77.20	88.10	5,685.6	-35.1	1,416.4	1,415.8	10.36
6,116.0	80.90	86.40	5,695.6	-32.6	1,468.4	1,467.8	7.66
6,192.0	84.40	85.30	5,705.3	-27.2	1,543.5	1,543.0	4.82
6,284.0	84.70	86.90	5,714.1	-20.9	1,634.9	1,634.5	1.76
6,379.0	87.00	88.80	5,721.0	-17.4	1,729.6	1,729.2	3.14
6,472.0	88.50	88.60	5,724.6	-15.3	1,822.5	1,822.1	1.63
6,565.0	90.40	88.00	5,725.5	-12.5	1,915.4	1,915.1	2.14
6,657.0	89.60	89.30	5,725.5	-10.4	2,007.4	2,007.1	1.66
6,751.0	89.10	88.30	5,726.6	-8.4	2,101.4	2,101.1	1.19
6,845.0	89.50	88.00	5,727.7	-5.3	2,195.3	2,195.0	0.53
6,921.0	89.80	88.10	5,728.2	-2.8	2,271.3	2,271.0	0.42
7,011.0	90.80	88.90	5,727.7	-0.4	2,361.2	2,361.0	1.42
7,101.0	90.50	87.60	5,726.7	2.3	2,451.2	2,451.0	1.48
7,191.0	92.10	88.90	5,724.7	5.1	2,541.1	2,540.9	2.29
7,281.0	91.60	87.80	5,721.7	7.7	2,631.0	2,630.9	1.34
7,371.0	92.40	88.30	5,718.6	10.7	2,720.9	2,720.8	1.05
7,460.0	92.40	88.00	5,714.9	13.6	2,809.8	2,809.7	0.34
7,550.0	91.90	89.20	5,711.5	15.8	2,899.7	2,899.6	1.44
7,640.0	92.30	90.00	5,708.2	16.4	2,989.7	2,989.6	0.99
7,730.0	91.40	89.00	5,705.3	17.2	3,079.6	3,079.5	1.49
7,820.0	90.50	89.40	5,703.8	18.5	3,169.6	3,169.5	1.09
7,910.0	91.20	88.60	5,702.5	20.0	3,259.6	3,259.5	1.18
7,999.0	92.20	87.70	5,699.8	22.9	3,348.5	3,348.5	1.51
8,089.0	91.10	86.00	5,697.2	27.9	3,438.3	3,438.3	2.25
8,179.0	90.20	86.10	5,696.2	34.1	3,528.1	3,528.2	1.01
8,269.0	90.70	86.60	5,695.5	39.8	3,617.9	3,618.1	0.79
8,359.0	89.90	87.40	5,695.0	44.5	3,707.8	3,708.0	1.26
8,449.0	89.50	89.30	5,695.5	47.1	3,797.7	3,798.0	2.16
8,539.0	89.60	88.80	5,696.2	48.6	3,887.7	3,888.0	0.57
8,629.0	89.20	88.70	5,697.2	50.5	3,977.7	3,978.0	0.46
8,718.0	90.50	89.70	5,697.4	51.8	4,066.7	4,067.0	1.84

Company: Noble Energy Inc.- Weld County, CO (Grid North)
Project: SEC.9-T9N-R58W
Site: Rohn State LD10-69-1HN Pad Sec.9-T9N-R58W
Well: Rohn State LD10-68-1HN
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Rohn State LD10-68-1HN
TVD Reference: WELL @ 4755.0ft (PD 828 RKB - 16')
MD Reference: WELL @ 4755.0ft (PD 828 RKB - 16')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Landmark

Survey							
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,808.0	90.60	88.30	5,696.5	53.4	4,156.6	4,157.0	1.56
8,898.0	89.90	87.80	5,696.1	56.4	4,246.6	4,247.0	0.96
8,988.0	91.20	87.90	5,695.3	59.8	4,336.5	4,336.9	1.45
9,078.0	91.10	89.30	5,693.5	62.0	4,426.5	4,426.9	1.56
9,167.0	89.50	88.50	5,693.0	63.7	4,515.4	4,515.9	2.01
9,257.0	88.90	88.10	5,694.3	66.4	4,605.4	4,605.9	0.80
9,347.0	90.40	87.10	5,694.8	70.1	4,695.3	4,695.8	2.00
9,437.0	89.80	87.00	5,694.6	74.8	4,785.2	4,785.8	0.68
9,530.0	89.50	86.90	5,695.2	79.7	4,878.1	4,878.7	0.34
9,589.4	89.50	86.90	5,695.7	82.9	4,937.4	4,938.1	0.00
Rohn State LD10-68-1HN BHL 990'FNL & 660'FEL							
9,590.0	89.50	86.90	5,695.7	83.0	4,938.0	4,938.6	0.00

Checked By: _____ Approved By: _____ Date: _____