



Noble Energy Inc.

Weld County, CO
Sec 4, T9N, R58W
Rohn State LD04-68-1HN

Wellbore #1

Survey: MWD **FINAL**

DDC Survey Report

24 September, 2013





Survey Certification Sheet

Noble Energy Inc
Company

RM-13623
Job Number

9/11/13
Date

Sec4,T9N,R58W
Lease

Rohn State LD04-68-1HN
Well Name

Weld, CO
County & State

API: 05-123-37465

Surveyed from a depth of: 636' to 6223' MD(DDC Certified Survey Data)
:6223' to 14802' 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: 2013.09.24 12:06:41 -05'00'

Larry Wright
MWD General Manager

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Rohn State LD04-68-1HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4778.0usft (H&P #326)
Site:	Sec 4, T9N, R58W	MD Reference:	WELL @ 4778.0usft (H&P #326)
Well:	Rohn State LD04-68-1HN	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 LD04-68-1HN					
Well Position	+N/-S	0.0 usft	Northing:	1,533,305.94 usft	Latitude:	40° 47' 9.708 N
	+E/-W	0.0 usft	Easting:	3,449,207.20 usft	Longitude:	103° 52' 40.008 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,748.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/25/2013	8.13	67.43	53,209

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	91.21	

Survey Program		Date	9/24/2013	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
384.0	636.0	FLEX TOOL (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool
738.0	6,159.0	MWD (Wellbore #1)	MWD default	MWD - Standard
6,223.0	14,802.0	RAW SURVEY (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)
636.0	0.40	205.00	636.0	-0.3	-0.7	-0.7	0.00	0.00	0.00
TIE IN @ 636.1' MD / 636.1' TVD									
636.1	0.40	205.00	636.1	-0.3	-0.7	-0.7	0.00	0.00	0.00
738.0	0.20	173.40	738.0	-0.8	-0.8	-0.8	0.25	-0.20	-31.01
832.0	0.30	111.70	832.0	-1.1	-0.6	-0.5	0.29	0.11	-65.64
927.0	0.30	159.80	927.0	-1.4	-0.2	-0.2	0.26	0.00	50.63
1,022.0	0.70	162.80	1,022.0	-2.2	0.0	0.1	0.42	0.42	3.16
1,116.0	0.50	165.60	1,116.0	-3.1	0.3	0.4	0.21	-0.21	2.98
1,211.0	0.40	159.30	1,211.0	-3.9	0.5	0.6	0.12	-0.11	-6.63

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Well:	Rohn State LD04-68-1HN	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)
1,307.0	0.50	172.70	1,307.0	-4.6	0.7	0.8	0.15	0.10	13.96
1,401.0	0.60	173.20	1,401.0	-5.5	0.8	0.9	0.11	0.11	0.53
1,492.0	3.40	194.10	1,491.9	-8.6	0.2	0.4	3.13	3.08	22.97
1,586.0	5.40	182.70	1,585.6	-15.7	-0.7	-0.4	2.31	2.13	-12.13
1,679.0	6.80	181.60	1,678.1	-25.6	-1.1	-0.5	1.51	1.51	-1.18
1,773.0	8.40	177.80	1,771.3	-38.0	-0.9	-0.1	1.78	1.70	-4.04
1,864.0	9.80	175.60	1,861.1	-52.4	-0.1	1.0	1.58	1.54	-2.42
1,956.0	10.60	169.50	1,951.7	-68.5	2.0	3.5	1.46	0.87	-6.63
2,049.0	11.70	166.50	2,042.9	-86.1	5.8	7.6	1.34	1.18	-3.23
2,143.0	12.60	165.30	2,134.8	-105.2	10.6	12.9	0.99	0.96	-1.28
2,235.0	12.90	163.00	2,224.5	-124.8	16.2	18.8	0.64	0.33	-2.50
2,327.0	15.20	166.30	2,313.8	-146.3	22.0	25.1	2.65	2.50	3.59
2,421.0	14.60	166.30	2,404.6	-169.8	27.8	31.3	0.64	-0.64	0.00
2,513.0	16.00	164.40	2,493.4	-193.3	33.9	38.0	1.62	1.52	-2.07
2,606.0	16.50	164.20	2,582.6	-218.3	41.0	45.6	0.54	0.54	-0.22
2,698.0	16.30	162.80	2,670.9	-243.2	48.3	53.5	0.48	-0.22	-1.52
2,792.0	15.80	161.90	2,761.2	-268.0	56.2	61.9	0.59	-0.53	-0.96
2,885.0	15.50	160.20	2,850.8	-291.7	64.4	70.5	0.59	-0.32	-1.83
2,978.0	12.80	158.60	2,941.0	-313.0	72.3	78.9	2.93	-2.90	-1.72
3,070.0	10.10	158.20	3,031.1	-330.0	79.0	86.0	2.94	-2.93	-0.43
3,165.0	8.50	164.60	3,124.9	-344.5	84.0	91.3	2.00	-1.68	6.74
3,260.0	7.50	172.30	3,219.0	-357.4	86.7	94.2	1.54	-1.05	8.11
3,355.0	6.20	171.30	3,313.3	-368.6	88.3	96.1	1.37	-1.37	-1.05
3,449.0	5.30	166.90	3,406.8	-377.9	90.1	98.0	1.07	-0.96	-4.68
3,544.0	4.10	160.00	3,501.5	-385.3	92.2	100.3	1.39	-1.26	-7.26
3,639.0	2.50	152.60	3,596.3	-390.4	94.3	102.6	1.74	-1.68	-7.79
3,734.0	0.50	229.30	3,691.3	-392.5	95.0	103.2	2.56	-2.11	80.74
3,829.0	0.80	196.00	3,786.3	-393.4	94.5	102.8	0.50	0.32	-35.05
3,923.0	1.10	187.40	3,880.3	-394.9	94.2	102.5	0.35	0.32	-9.15
4,018.0	1.40	201.10	3,975.2	-396.9	93.6	102.0	0.44	0.32	14.42
4,113.0	0.30	254.90	4,070.2	-398.1	93.0	101.4	1.31	-1.16	56.63
4,208.0	0.50	184.10	4,165.2	-398.5	92.7	101.1	0.52	0.21	-74.53
4,302.0	1.10	182.10	4,259.2	-399.8	92.6	101.1	0.64	0.64	-2.13
4,397.0	0.30	319.60	4,354.2	-400.6	92.5	100.9	1.41	-0.84	144.74
4,492.0	0.50	225.90	4,449.2	-400.7	92.0	100.4	0.63	0.21	-98.63
4,586.0	0.70	251.40	4,543.2	-401.1	91.2	99.6	0.35	0.21	27.13
4,681.0	0.90	231.70	4,638.2	-401.8	90.0	98.5	0.36	0.21	-20.74
4,776.0	0.70	199.20	4,733.2	-402.8	89.2	97.7	0.51	-0.21	-34.21
4,870.0	0.90	148.40	4,827.2	-404.0	89.4	98.0	0.75	0.21	-54.04
4,965.0	0.40	152.10	4,922.2	-404.9	90.0	98.5	0.53	-0.53	3.89
5,060.0	1.90	90.20	5,017.2	-405.2	91.7	100.3	1.84	1.58	-65.16
5,154.0	15.40	77.40	5,109.9	-402.5	105.5	114.0	14.42	14.36	-13.62
5,249.0	29.10	79.70	5,197.6	-395.5	140.7	149.1	14.45	14.42	2.42

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Site:	Sec 4, T9N, R58W	MD Reference:	WELL @ 4778.0usft (H&P #326)
Well:	Rohn State LD04-68-1HN	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)
5,344.0	31.10	87.10	5,279.8	-390.2	188.0	196.2	4.43	2.11	7.79
5,438.0	34.30	90.20	5,358.9	-389.0	238.7	246.9	3.84	3.40	3.30
5,533.0	44.80	95.80	5,432.1	-392.5	299.0	307.2	11.66	11.05	5.89
5,627.0	52.80	98.50	5,494.0	-401.4	369.1	377.5	8.78	8.51	2.87
5,722.0	52.60	96.70	5,551.5	-411.4	444.0	452.6	1.52	-0.21	-1.89
5,817.0	54.90	94.30	5,607.7	-418.7	520.2	529.0	3.16	2.42	-2.53
5,912.0	64.20	89.00	5,655.8	-420.9	602.0	610.7	10.90	9.79	-5.58
6,006.0	70.90	85.30	5,691.7	-416.5	688.7	697.3	8.00	7.13	-3.94
6,051.0	73.90	84.10	5,705.3	-412.6	731.4	739.9	7.13	6.67	-2.67
6,099.0	78.50	83.50	5,716.8	-407.5	777.7	786.1	9.66	9.58	-1.25
LAST CORRECTED DDC SURVEY @ 6159' MD / 5725.2' TVD									
6,159.0	85.40	81.10	5,725.2	-399.6	836.5	844.8	12.16	11.50	-4.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
636.1	636.1	-0.3	-0.7	TIE IN @ 636.1' MD / 636.1' TVD
6,159.0	5,725.2	-399.6	836.5	LAST CORRECTED DDC SURVEY @ 6159' MD / 5725.2' TVD

Checked By: _____ Approved By: _____ Date: _____



Noble Energy Inc.

Weld County, CO
Sec 4, T9N, R58W
Rohn State LD04-68-1HN

Wellbore #1

Survey: RAW SURVEY

DDC Survey Report

24 September, 2013



Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Rohn State LD04-68-1HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4778.0usft (H&P #326)
Site:	Sec 4, T9N, R58W	MD Reference:	WELL @ 4778.0usft (H&P #326)
Well:	Rohn State LD04-68-1HN	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 LD04-68-1HN					
Well Position	+N/-S	0.0 usft	Northing:	1,533,305.94 usft	Latitude:	40° 47' 9.708 N
	+E/-W	0.0 usft	Easting:	3,449,207.20 usft	Longitude:	103° 52' 40.008 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,748.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/25/2013	8.13	67.43	53,209

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	91.21	

Survey Program		Date	9/24/2013	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
384.0	636.0	FLEX TOOL (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool
738.0	6,159.0	MWD (Wellbore #1)	MWD default	MWD - Standard
6,223.0	14,802.0	RAW SURVEY (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 SURVEY @ 6223' MD / 5730.3' TVD									
6,223.0	85.40	81.60	5,730.3	-390.0	899.6	907.6	0.78	0.00	0.78
6,318.0	88.30	85.20	5,735.5	-379.1	993.8	1,001.6	4.86	3.05	3.79
6,413.0	89.70	85.90	5,737.2	-371.7	1,088.5	1,096.1	1.65	1.47	0.74
6,507.0	90.90	85.90	5,736.7	-365.0	1,182.2	1,189.7	1.28	1.28	0.00
6,601.0	89.30	88.60	5,736.5	-360.5	1,276.1	1,283.5	3.34	-1.70	2.87
6,695.0	89.40	89.80	5,737.6	-359.2	1,370.1	1,377.4	1.28	0.11	1.28
6,790.0	88.50	89.20	5,739.3	-358.3	1,465.1	1,472.3	1.14	-0.95	-0.63
6,885.0	90.50	91.60	5,740.1	-359.0	1,560.1	1,567.3	3.29	2.11	2.53

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Rohn State LD04-68-1HN
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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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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)
6,979.0	91.00	89.90	5,738.9	-360.2	1,654.1	1,661.3	1.88	0.53	-1.81
7,074.0	90.00	91.30	5,738.1	-361.2	1,749.0	1,756.3	1.81	-1.05	1.47
7,168.0	90.50	92.40	5,737.7	-364.2	1,843.0	1,850.3	1.29	0.53	1.17
7,263.0	90.50	90.60	5,736.8	-366.7	1,937.9	1,945.3	1.89	0.00	-1.89
7,357.0	89.70	89.60	5,736.7	-366.9	2,031.9	2,039.2	1.36	-0.85	-1.06
7,451.0	91.80	90.60	5,735.5	-367.1	2,125.9	2,133.2	2.47	2.23	1.06
7,546.0	91.20	91.60	5,733.0	-368.9	2,220.9	2,228.2	1.23	-0.63	1.05
7,641.0	89.80	91.60	5,732.1	-371.5	2,315.8	2,323.2	1.47	-1.47	0.00
7,735.0	88.30	90.70	5,733.7	-373.4	2,409.8	2,417.1	1.86	-1.60	-0.96
7,830.0	91.10	90.20	5,734.2	-374.2	2,504.8	2,512.1	2.99	2.95	-0.53
7,925.0	90.40	89.00	5,733.0	-373.5	2,599.8	2,607.1	1.46	-0.74	-1.26
8,019.0	92.90	88.30	5,730.2	-371.3	2,693.7	2,700.9	2.76	2.66	-0.74
8,114.0	92.50	89.30	5,725.8	-369.3	2,788.6	2,795.7	1.13	-0.42	1.05
8,208.0	92.10	89.00	5,722.0	-367.9	2,882.5	2,889.6	0.53	-0.43	-0.32
8,302.0	89.30	87.80	5,720.8	-365.3	2,976.4	2,983.5	3.24	-2.98	-1.28
8,397.0	90.40	89.70	5,721.1	-363.2	3,071.4	3,078.4	2.31	1.16	2.00
8,491.0	90.40	89.90	5,720.4	-362.9	3,165.4	3,172.4	0.21	0.00	0.21
8,586.0	90.30	90.10	5,719.9	-362.9	3,260.4	3,267.3	0.24	-0.11	0.21
8,680.0	90.20	89.80	5,719.5	-362.8	3,354.4	3,361.3	0.34	-0.11	-0.32
8,774.0	90.40	91.50	5,719.0	-363.9	3,448.4	3,455.3	1.82	0.21	1.81
8,868.0	90.10	89.00	5,718.5	-364.3	3,542.4	3,549.3	2.68	-0.32	-2.66
8,963.0	90.40	90.40	5,718.1	-363.8	3,637.4	3,644.2	1.51	0.32	1.47
9,058.0	90.10	91.20	5,717.7	-365.1	3,732.4	3,739.2	0.90	-0.32	0.84
9,153.0	89.60	91.40	5,718.0	-367.3	3,827.3	3,834.2	0.57	-0.53	0.21
9,247.0	91.10	88.90	5,717.4	-367.5	3,921.3	3,928.2	3.10	1.60	-2.66
9,342.0	90.10	88.00	5,716.4	-364.9	4,016.3	4,023.1	1.42	-1.05	-0.95
9,436.0	90.30	88.20	5,716.1	-361.8	4,110.2	4,117.0	0.30	0.21	0.21
9,531.0	90.60	88.40	5,715.3	-359.0	4,205.2	4,211.8	0.38	0.32	0.21
9,626.0	90.40	87.30	5,714.5	-355.4	4,300.1	4,306.7	1.18	-0.21	-1.16
9,720.0	89.30	87.50	5,714.7	-351.2	4,394.0	4,400.4	1.19	-1.17	0.21
9,814.0	89.50	92.40	5,715.7	-351.1	4,488.0	4,494.4	5.22	0.21	5.21
9,909.0	90.30	90.40	5,715.9	-353.4	4,582.9	4,589.4	2.27	0.84	-2.11
10,001.0	89.60	89.60	5,716.0	-353.4	4,674.9	4,681.4	1.16	-0.76	-0.87
10,095.0	89.40	89.20	5,716.8	-352.4	4,768.9	4,775.3	0.48	-0.21	-0.43
10,186.0	87.70	88.20	5,719.1	-350.4	4,859.9	4,866.2	2.17	-1.87	-1.10
10,280.0	89.30	88.90	5,721.6	-348.0	4,953.8	4,960.1	1.86	1.70	0.74
10,373.0	91.30	90.70	5,721.1	-347.7	5,046.8	5,053.0	2.89	2.15	1.94
10,467.0	90.60	90.00	5,719.5	-348.2	5,140.8	5,147.0	1.05	-0.74	-0.74
10,558.0	91.40	90.40	5,717.9	-348.6	5,231.8	5,238.0	0.98	0.88	0.44
10,650.0	90.60	89.90	5,716.3	-348.8	5,323.8	5,329.9	1.03	-0.87	-0.54
10,744.0	93.30	89.20	5,713.1	-348.1	5,417.7	5,423.8	2.97	2.87	-0.74
10,837.0	92.80	90.50	5,708.2	-347.8	5,510.6	5,516.7	1.50	-0.54	1.40
10,929.0	92.30	90.00	5,704.1	-348.2	5,602.5	5,608.6	0.77	-0.54	-0.54

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Rohn State LD04-68-1HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4778.0usft (H&P #326)
Site:	Sec 4, T9N, R58W	MD Reference:	WELL @ 4778.0usft (H&P #326)
Well:	Rohn State LD04-68-1HN	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)
11,022.0	90.90	89.70	5,701.5	-348.0	5,695.4	5,701.5	1.54	-1.51	-0.32
11,115.0	90.70	88.90	5,700.2	-346.8	5,788.4	5,794.4	0.89	-0.22	-0.86
11,208.0	90.50	87.60	5,699.2	-344.0	5,881.4	5,887.3	1.41	-0.22	-1.40
11,300.0	90.80	89.40	5,698.2	-341.6	5,973.3	5,979.2	1.98	0.33	1.96
11,392.0	91.00	89.30	5,696.7	-340.5	6,065.3	6,071.1	0.24	0.22	-0.11
11,486.0	89.70	92.10	5,696.1	-341.7	6,159.3	6,165.1	3.28	-1.38	2.98
11,579.0	89.30	91.80	5,697.0	-344.9	6,252.2	6,258.1	0.54	-0.43	-0.32
11,672.0	88.30	91.10	5,698.9	-347.2	6,345.2	6,351.1	1.31	-1.08	-0.75
11,765.0	87.40	90.50	5,702.4	-348.5	6,438.1	6,444.0	1.16	-0.97	-0.65
11,859.0	88.40	89.00	5,705.8	-348.1	6,532.0	6,537.9	1.92	1.06	-1.60
11,954.0	90.30	88.90	5,706.9	-346.4	6,627.0	6,632.8	2.00	2.00	-0.11
12,048.0	90.40	88.20	5,706.3	-344.0	6,721.0	6,726.7	0.75	0.11	-0.74
12,143.0	90.40	87.90	5,705.7	-340.8	6,815.9	6,821.6	0.32	0.00	-0.32
12,237.0	91.80	88.70	5,703.9	-338.0	6,909.8	6,915.4	1.72	1.49	0.85
12,332.0	91.30	87.80	5,701.3	-335.1	7,004.8	7,010.3	1.08	-0.53	-0.95
12,426.0	90.30	86.80	5,700.0	-330.6	7,098.6	7,104.0	1.50	-1.06	-1.06
12,521.0	92.20	88.30	5,697.9	-326.6	7,193.5	7,198.8	2.55	2.00	1.58
12,616.0	92.20	88.10	5,694.3	-323.6	7,288.4	7,293.6	0.21	0.00	-0.21
12,710.0	90.50	88.50	5,692.1	-320.8	7,382.3	7,387.5	1.86	-1.81	0.43
12,804.0	89.90	87.90	5,691.7	-317.9	7,476.3	7,481.3	0.90	-0.64	-0.64
12,898.0	90.40	89.70	5,691.5	-315.9	7,570.3	7,575.3	1.99	0.53	1.91
12,993.0	89.80	88.90	5,691.3	-314.7	7,665.3	7,670.2	1.05	-0.63	-0.84
13,087.0	89.80	90.30	5,691.6	-314.1	7,759.3	7,764.2	1.49	0.00	1.49
13,181.0	88.90	89.10	5,692.7	-313.6	7,853.2	7,858.1	1.60	-0.96	-1.28
13,275.0	91.00	91.20	5,692.8	-313.8	7,947.2	7,952.1	3.16	2.23	2.23
13,370.0	90.40	88.90	5,691.6	-313.9	8,042.2	8,047.1	2.50	-0.63	-2.42
13,464.0	91.10	89.40	5,690.4	-312.5	8,136.2	8,141.0	0.92	0.74	0.53
13,559.0	91.00	89.70	5,688.7	-311.8	8,231.2	8,235.9	0.33	-0.11	0.32
13,654.0	90.80	88.90	5,687.2	-310.6	8,326.2	8,330.9	0.87	-0.21	-0.84
13,748.0	91.30	88.10	5,685.4	-308.1	8,420.1	8,424.7	1.00	0.53	-0.85
13,842.0	91.90	87.20	5,682.8	-304.3	8,514.0	8,518.5	1.15	0.64	-0.96
13,937.0	89.80	88.50	5,681.4	-300.7	8,608.9	8,613.3	2.60	-2.21	1.37
14,032.0	89.40	87.30	5,682.1	-297.2	8,703.8	8,708.2	1.33	-0.42	-1.26
14,126.0	88.30	86.50	5,684.0	-292.2	8,797.7	8,801.9	1.45	-1.17	-0.85
14,220.0	89.50	88.80	5,685.8	-288.3	8,891.6	8,895.7	2.76	1.28	2.45
14,315.0	89.90	89.20	5,686.3	-286.7	8,986.6	8,990.6	0.60	0.42	0.42
14,410.0	89.50	88.70	5,686.8	-284.9	9,081.5	9,085.5	0.67	-0.42	-0.53
14,505.0	89.50	87.20	5,687.6	-281.5	9,176.5	9,180.4	1.58	0.00	-1.58
14,600.0	89.20	86.80	5,688.7	-276.5	9,271.3	9,275.1	0.53	-0.32	-0.42
14,694.0	90.30	88.00	5,689.1	-272.3	9,365.2	9,368.9	1.73	1.17	1.28
14,789.0	89.70	87.50	5,689.1	-268.5	9,460.2	9,463.7	0.82	-0.63	-0.53
TD @ 14802' MD / 5689.2' TVD									
14,802.0	89.50	87.40	5,689.2	-268.0	9,473.2	9,476.7	1.72	-1.54	-0.77

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Rohn State LD04-68-1HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4778.0usft (H&P #326)
Site:	Sec 4, T9N, R58W	MD Reference:	WELL @ 4778.0usft (H&P #326)
Well:	Rohn State LD04-68-1HN	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		Comment
		+N/-S (usft)	+E/-W (usft)	
6,223.0	5,730.3	-390.0	899.6	FIRST RAW SURVEY @ 6223' MD / 5730.3' TVD
14,802.0	5,689.2	-268.0	9,473.2	TD @ 14802' MD / 5689.2' TVD

Checked By: _____ Approved By: _____ Date: _____

Company Name: Noble Energy Inc.
Rohn State LD04-68-1HN
Weld County, CO
Rig: H&P #326
Created By: TIFFANI MIZELL
Date: 9/24/2013

Rohn State LD04-68-1HN
Weld County, CO
Q130557 & RM-13623
Design #1

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 LD04-68-1HN					
Ground Level:		4748.0			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1533305.94	3449207.20	40° 47' 9.708 N	103° 52' 40.008 W



T

G

M

Azimuths to Grid North

Correction: 7.08°

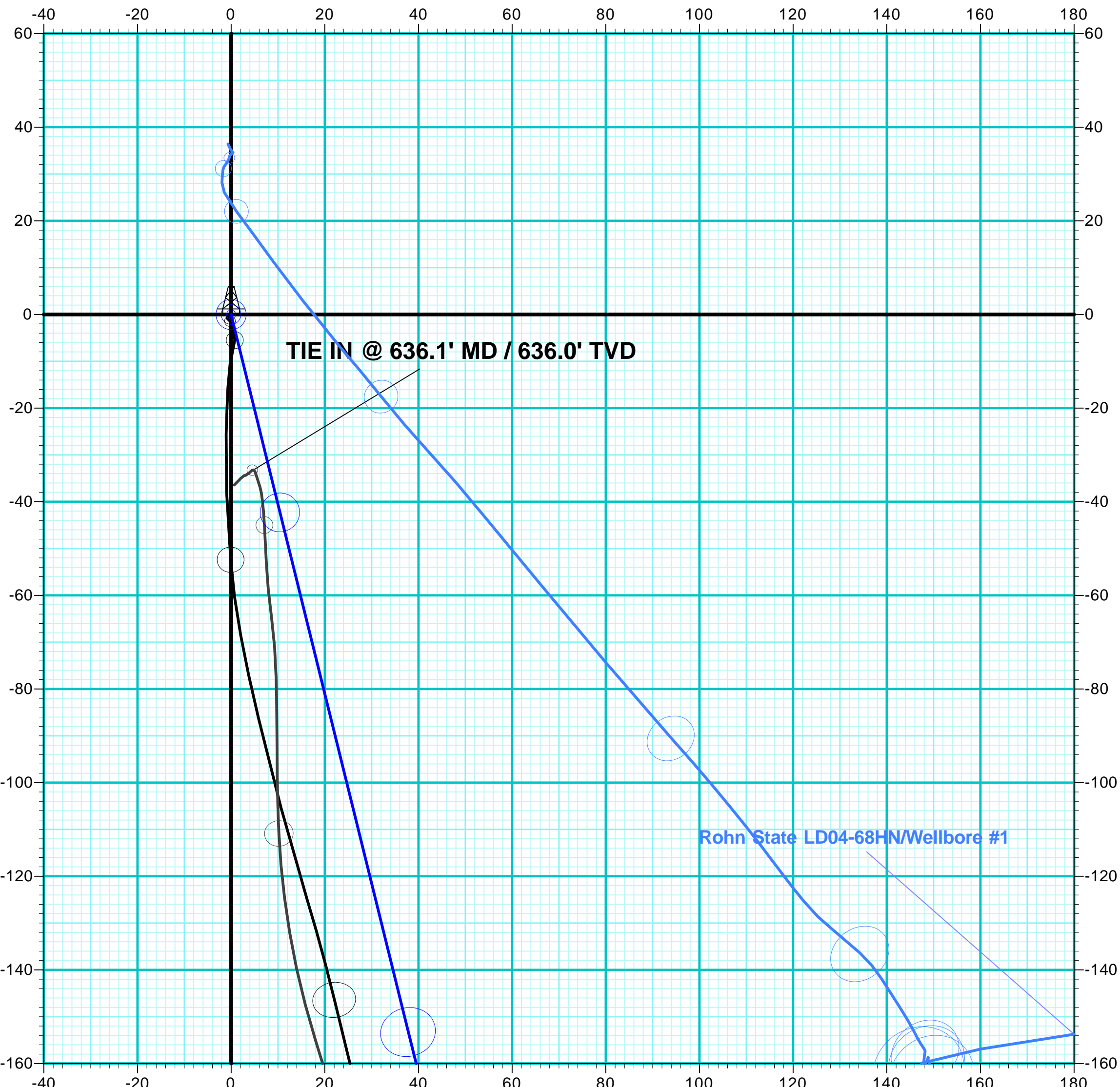
Magnetic Field

Strength: 53209.3snT

Dip Angle: 67.43°

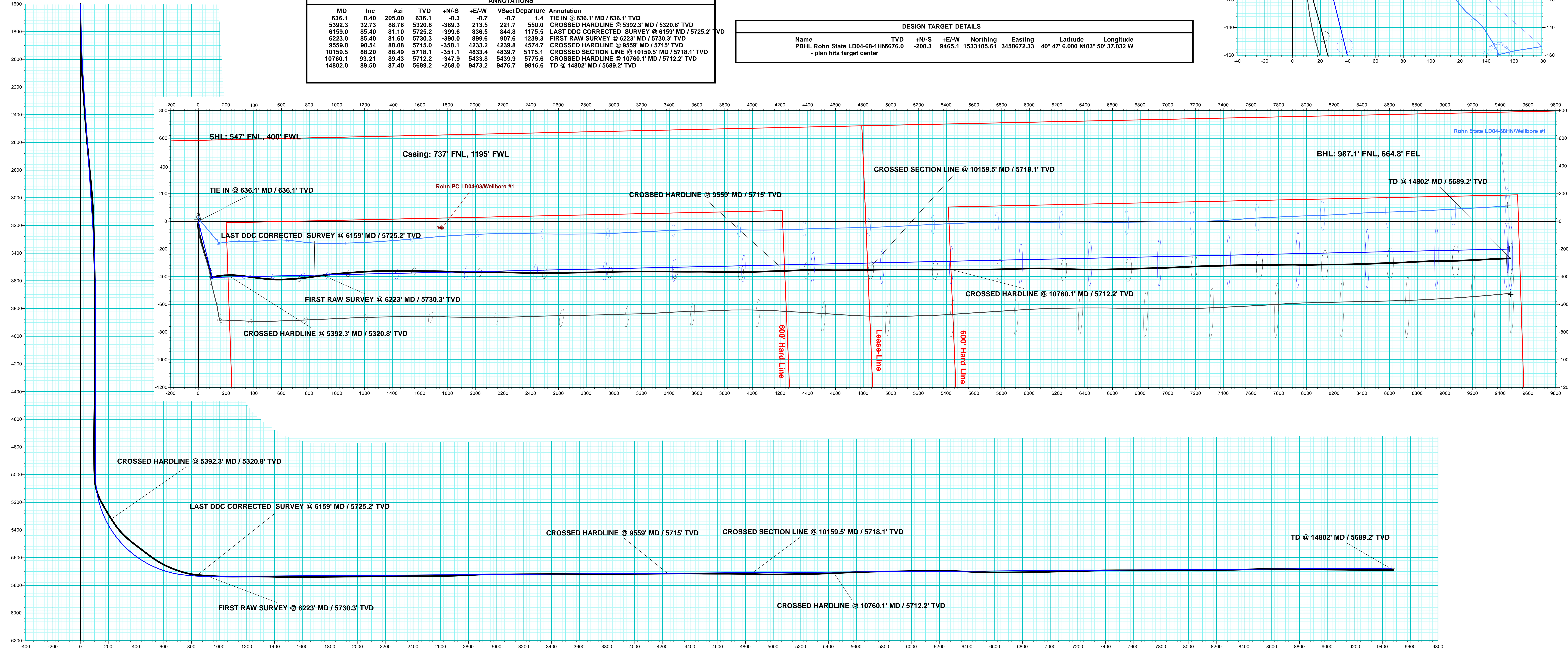
Date: 6/25/2013

Model: IGRF2010



ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation	
636.1	0.40	205.00	636.1	-0.3	-0.7	-0.7	1.4	TIE IN @ 636.1' MD / 636.1' TVD	
5392.3	32.73	88.76	5320.8	-389.3	213.5	221.7	550.0	CROSSED HARDLINE @ 5392.3' MD / 5320.8' TVD	
6159.0	85.40	81.10	5725.2	-399.6	836.5	844.8	1175.5	LAST DDC CORRECTED SURVEY @ 6159' MD / 5725.2' TVD	
6223.0	85.40	81.60	5730.3	-390.0	899.6	907.6	1239.3	FIRST RAW SURVEY @ 6223' MD / 5730.3' TVD	
9559.0	90.54	88.08	5715.0	-358.1	4233.2	4239.8	4574.7	CROSSED HARDLINE @ 9559' MD / 5715' TVD	
10159.5	88.20	88.49	5718.1	-351.1	4833.4	4839.7	5175.1	CROSSED SECTION LINE @ 10159.5' MD / 5718.1' TVD	
10760.1	93.21	89.43	5712.2	-347.9	5433.8	5439.9	5775.6	CROSSED HARDLINE @ 10760.1' MD / 5712.2' TVD	
14802.0	89.50	87.40	5689.2	-268.0	9473.2	9476.7	9816.6	TD @ 14802' MD / 5689.2' TVD	

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL Rohn State LD04-68-1HN	5676.0	-200.3	9465.1	1533105.61	3458672.33	40° 47' 6.000 N	103° 50' 37.032 W
- plan hits target center							



Vertical Section at 91.21° (200 usft/in)