

ENSIGN

Directional

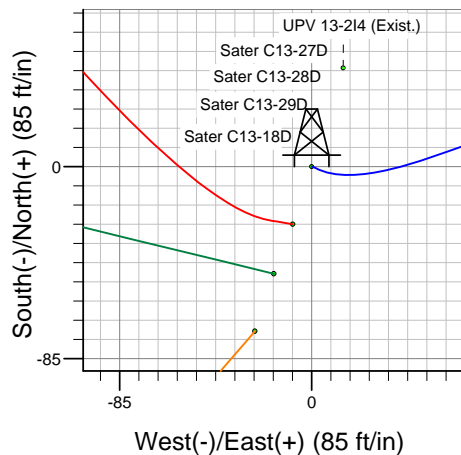
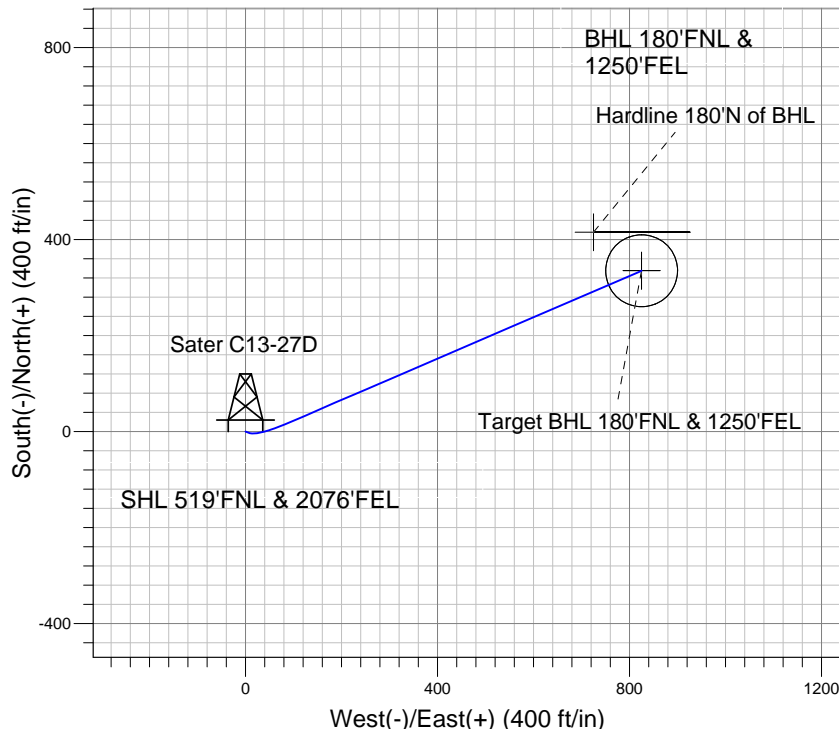
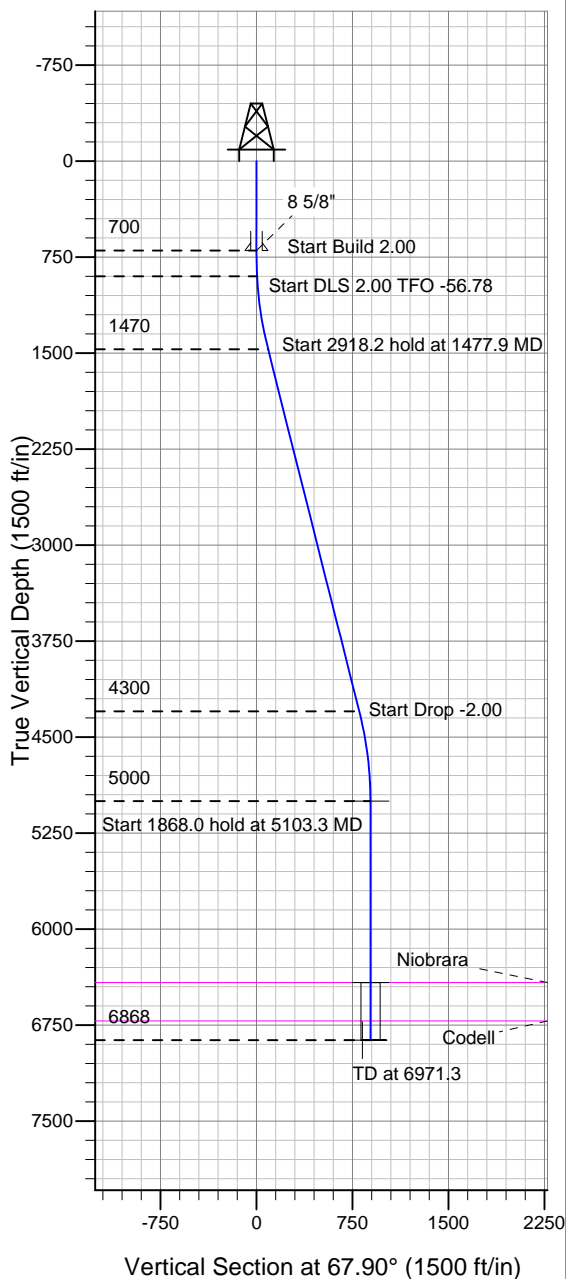
Well Name: **Sater C13-27D**

Surface Location: Noble Sater C13-18D Pad Sec.13-T4N-R64W
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4630.0

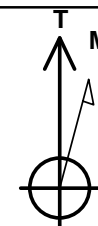
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	414636.56	999638.16	40° 19' 5.628 N	104° 29' 49.596 W	

Original Well ElevWELL @ 4643.0ft (Original Well Elev)

NOBLE ENERGY INC WELD COUNTY CO



Sater C13-27D
Noble Sater C13-27D Plan #1 (7-14-10)
8:32, July 20 2010



Azimuths to True North
Magnetic North: 8.87°
Magnetic Field
Strength: 53291.3snT
Dip Angle: 67.09°
Date: 12/31/2009
Model: IGRF200510

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Target BHL 180'FNL & 1250'FEL	5000.0	335.2	825.4	40° 19' 8.940 N	104° 29' 38.940 W	Point
Target Circle 180'FNL & 1250'FEL	6418.0	335.2	825.4	40° 19' 8.940 N	104° 29' 38.940 W	Circle (Radius: 75.0)
Hardline 180°N of BHL	6868.0	415.2	725.4	40° 19' 9.731 N	104° 29' 40.231 W	Polygon

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.0	
3	900.0	4.00	110.00	899.8	-2.4	6.6	2.00	110.00	5.2	
4	1477.9	14.15	66.70	1470.2	18.7	90.6	2.00	-56.78	91.0	
5	54396.1	14.15	66.70	4299.9	300.8	745.6	0.00	0.00	804.0	
6	65103.3	0.00	0.00	5000.0	335.2	825.4	2.00	180.00	890.9	Target BHL 180'FNL & 1250'FEL
7	76971.3	0.00	0.00	6868.0	335.2	825.4	0.00	0.00	890.9	



NOBLE ENERGY INC WELD COUNTY CO

SEC.13-T4N-R64W

Noble Sater C13-18D Pad Sec.13-T4N-R64W

Sater C13-27D

Wellbore #1

Plan: Noble Sater C13-27D Plan #1 (7-14-10)

Standard Survey Report

20 July, 2010

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Sater C13-27D
Project:	SEC.13-T4N-R64W	TVD Reference:	WELL @ 4643.0ft (Original Well Elev)
Site:	Noble Sater C13-18D Pad Sec.13-T4N-R64W	MD Reference:	WELL @ 4643.0ft (Original Well Elev)
Well:	Sater C13-27D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Noble Sater C13-27D Plan #1 (7-14-10)	Database:	Landmark

Project	SEC.13-T4N-R64W		
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		Noble Sater C13-18D Pad Sec.13-T4N-R64W			
Site Position:		Northing:	414,614.28 m	Latitude:	40° 19' 4.908 N
From:	Lat/Long	Easting:	999,630.76 m	Longitude:	104° 29' 49.920 W
Position Uncertainty:	0.0 ft	Slot Radius:	in	Grid Convergence:	0.65 °

Well	Sater C13-27D					
Well Position	+N-S	0.0 ft	Northing:	414,636.56 m	Latitude:	40° 19' 5.628 N
	+E-W	0.0 ft	Easting:	999,638.16 m	Longitude:	104° 29' 49.596 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,630.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	8.87	67.09	53,291

Design	Noble Sater C13-27D Plan #1 (7-14-10)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	67.90

Survey Tool Program		Date	7/19/2010	
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	6,970.5	Noble Sater C13-27D Plan #1 (7-14-10) (V	MWD	MWD - Standard

Planned 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
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Sater C13-27D
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Site:	Noble Sater C13-18D Pad Sec.13-T4N-R64W	MD Reference:	WELL @ 4643.0ft (Original Well Elev)
Well:	Sater C13-27D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Noble Sater C13-27D Plan #1 (7-14-10)	Database:	Landmark

Planned 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)
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
8 5/8"									
720.0	0.40	110.00	720.0	0.0	0.1	0.1	2.00	2.00	0.00
760.0	1.20	110.00	760.0	-0.2	0.6	0.5	2.00	2.00	0.00
800.0	2.00	110.00	800.0	-0.6	1.6	1.3	2.00	2.00	0.00
840.0	2.80	110.00	839.9	-1.2	3.2	2.5	2.00	2.00	0.00
880.0	3.60	110.00	879.9	-1.9	5.3	4.2	2.00	2.00	0.00
900.0	4.00	110.00	899.8	-2.4	6.6	5.2	2.00	2.00	0.00
920.0	4.23	105.46	919.8	-2.8	7.9	6.3	2.00	1.16	-22.69
960.0	4.76	97.82	959.7	-3.4	11.0	8.9	2.00	1.33	-19.10
1,000.0	5.36	91.80	999.5	-3.7	14.5	12.0	2.00	1.50	-15.06
1,040.0	6.01	87.02	1,039.3	-3.7	18.5	15.7	2.00	1.61	-11.94
1,080.0	6.69	83.19	1,079.1	-3.3	22.9	20.0	2.00	1.70	-9.58
1,120.0	7.39	80.07	1,118.8	-2.6	27.7	24.7	2.00	1.76	-7.79
1,160.0	8.11	77.50	1,158.4	-1.5	33.0	30.0	2.00	1.80	-6.43
1,200.0	8.85	75.35	1,198.0	-0.1	38.7	35.8	2.00	1.84	-5.38
1,240.0	9.59	73.53	1,237.4	1.6	44.9	42.2	2.00	1.86	-4.56
1,280.0	10.34	71.96	1,276.8	3.7	51.5	49.1	2.00	1.88	-3.90
1,320.0	11.10	70.62	1,316.1	6.0	58.6	56.5	2.00	1.90	-3.37
1,360.0	11.87	69.44	1,355.3	8.8	66.1	64.5	2.00	1.91	-2.95
1,400.0	12.64	68.40	1,394.4	11.8	74.0	73.0	2.00	1.92	-2.59
1,440.0	13.41	67.48	1,433.4	15.2	82.3	82.0	2.00	1.93	-2.30
1,477.9	14.15	66.70	1,470.2	18.7	90.6	91.0	2.00	1.94	-2.06
1,480.0	14.15	66.70	1,472.2	18.9	91.1	91.5	0.00	0.00	0.00
1,520.0	14.15	66.70	1,511.0	22.8	100.1	101.3	0.00	0.00	0.00
1,560.0	14.15	66.70	1,549.8	26.7	109.1	111.1	0.00	0.00	0.00
1,600.0	14.15	66.70	1,588.6	30.5	118.0	120.9	0.00	0.00	0.00
1,640.0	14.15	66.70	1,627.4	34.4	127.0	130.6	0.00	0.00	0.00
1,680.0	14.15	66.70	1,666.2	38.3	136.0	140.4	0.00	0.00	0.00
1,720.0	14.15	66.70	1,705.0	42.1	145.0	150.2	0.00	0.00	0.00
1,760.0	14.15	66.70	1,743.8	46.0	154.0	160.0	0.00	0.00	0.00
1,800.0	14.15	66.70	1,782.5	49.9	162.9	169.7	0.00	0.00	0.00
1,840.0	14.15	66.70	1,821.3	53.7	171.9	179.5	0.00	0.00	0.00
1,880.0	14.15	66.70	1,860.1	57.6	180.9	189.3	0.00	0.00	0.00
1,920.0	14.15	66.70	1,898.9	61.5	189.9	199.0	0.00	0.00	0.00
1,960.0	14.15	66.70	1,937.7	65.3	198.8	208.8	0.00	0.00	0.00
2,000.0	14.15	66.70	1,976.5	69.2	207.8	218.6	0.00	0.00	0.00
2,040.0	14.15	66.70	2,015.3	73.1	216.8	228.4	0.00	0.00	0.00
2,080.0	14.15	66.70	2,054.1	76.9	225.8	238.1	0.00	0.00	0.00
2,120.0	14.15	66.70	2,092.8	80.8	234.8	247.9	0.00	0.00	0.00
2,160.0	14.15	66.70	2,131.6	84.7	243.7	257.7	0.00	0.00	0.00
2,200.0	14.15	66.70	2,170.4	88.5	252.7	267.5	0.00	0.00	0.00
2,240.0	14.15	66.70	2,209.2	92.4	261.7	277.2	0.00	0.00	0.00
2,280.0	14.15	66.70	2,248.0	96.3	270.7	287.0	0.00	0.00	0.00
2,320.0	14.15	66.70	2,286.8	100.1	279.7	296.8	0.00	0.00	0.00
2,360.0	14.15	66.70	2,325.6	104.0	288.6	306.5	0.00	0.00	0.00
2,400.0	14.15	66.70	2,364.3	107.9	297.6	316.3	0.00	0.00	0.00
2,440.0	14.15	66.70	2,403.1	111.7	306.6	326.1	0.00	0.00	0.00
2,480.0	14.15	66.70	2,441.9	115.6	315.6	335.9	0.00	0.00	0.00

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Site:	Noble Sater C13-18D Pad Sec.13-T4N-R64W	MD Reference:	WELL @ 4643.0ft (Original Well Elev)
Well:	Sater C13-27D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Noble Sater C13-27D Plan #1 (7-14-10)	Database:	Landmark

Planned 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)	
2,520.0	14.15	66.70	2,480.7	119.5	324.5	345.6	0.00	0.00	0.00	
2,560.0	14.15	66.70	2,519.5	123.3	333.5	355.4	0.00	0.00	0.00	
2,600.0	14.15	66.70	2,558.3	127.2	342.5	365.2	0.00	0.00	0.00	
2,640.0	14.15	66.70	2,597.1	131.1	351.5	375.0	0.00	0.00	0.00	
2,680.0	14.15	66.70	2,635.9	134.9	360.5	384.7	0.00	0.00	0.00	
2,720.0	14.15	66.70	2,674.6	138.8	369.4	394.5	0.00	0.00	0.00	
2,760.0	14.15	66.70	2,713.4	142.7	378.4	404.3	0.00	0.00	0.00	
2,800.0	14.15	66.70	2,752.2	146.5	387.4	414.1	0.00	0.00	0.00	
2,840.0	14.15	66.70	2,791.0	150.4	396.4	423.8	0.00	0.00	0.00	
2,880.0	14.15	66.70	2,829.8	154.3	405.3	433.6	0.00	0.00	0.00	
2,920.0	14.15	66.70	2,868.6	158.1	414.3	443.4	0.00	0.00	0.00	
2,960.0	14.15	66.70	2,907.4	162.0	423.3	453.1	0.00	0.00	0.00	
3,000.0	14.15	66.70	2,946.2	165.9	432.3	462.9	0.00	0.00	0.00	
3,040.0	14.15	66.70	2,984.9	169.7	441.3	472.7	0.00	0.00	0.00	
3,080.0	14.15	66.70	3,023.7	173.6	450.2	482.5	0.00	0.00	0.00	
3,120.0	14.15	66.70	3,062.5	177.5	459.2	492.2	0.00	0.00	0.00	
3,160.0	14.15	66.70	3,101.3	181.3	468.2	502.0	0.00	0.00	0.00	
3,200.0	14.15	66.70	3,140.1	185.2	477.2	511.8	0.00	0.00	0.00	
3,240.0	14.15	66.70	3,178.9	189.1	486.1	521.6	0.00	0.00	0.00	
3,280.0	14.15	66.70	3,217.7	192.9	495.1	531.3	0.00	0.00	0.00	
3,320.0	14.15	66.70	3,256.5	196.8	504.1	541.1	0.00	0.00	0.00	
3,360.0	14.15	66.70	3,295.2	200.7	513.1	550.9	0.00	0.00	0.00	
3,400.0	14.15	66.70	3,334.0	204.5	522.1	560.7	0.00	0.00	0.00	
3,440.0	14.15	66.70	3,372.8	208.4	531.0	570.4	0.00	0.00	0.00	
3,480.0	14.15	66.70	3,411.6	212.3	540.0	580.2	0.00	0.00	0.00	
3,520.0	14.15	66.70	3,450.4	216.1	549.0	590.0	0.00	0.00	0.00	
3,560.0	14.15	66.70	3,489.2	220.0	558.0	599.7	0.00	0.00	0.00	
3,600.0	14.15	66.70	3,528.0	223.9	567.0	609.5	0.00	0.00	0.00	
3,640.0	14.15	66.70	3,566.7	227.7	575.9	619.3	0.00	0.00	0.00	
3,680.0	14.15	66.70	3,605.5	231.6	584.9	629.1	0.00	0.00	0.00	
3,720.0	14.15	66.70	3,644.3	235.5	593.9	638.8	0.00	0.00	0.00	
3,760.0	14.15	66.70	3,683.1	239.3	602.9	648.6	0.00	0.00	0.00	
3,800.0	14.15	66.70	3,721.9	243.2	611.8	658.4	0.00	0.00	0.00	
3,840.0	14.15	66.70	3,760.7	247.1	620.8	668.2	0.00	0.00	0.00	
3,880.0	14.15	66.70	3,799.5	250.9	629.8	677.9	0.00	0.00	0.00	
3,920.0	14.15	66.70	3,838.3	254.8	638.8	687.7	0.00	0.00	0.00	
3,960.0	14.15	66.70	3,877.0	258.7	647.8	697.5	0.00	0.00	0.00	
4,000.0	14.15	66.70	3,915.8	262.5	656.7	707.3	0.00	0.00	0.00	
4,040.0	14.15	66.70	3,954.6	266.4	665.7	717.0	0.00	0.00	0.00	
4,080.0	14.15	66.70	3,993.4	270.3	674.7	726.8	0.00	0.00	0.00	
4,120.0	14.15	66.70	4,032.2	274.1	683.7	736.6	0.00	0.00	0.00	
4,160.0	14.15	66.70	4,071.0	278.0	692.6	746.3	0.00	0.00	0.00	
4,200.0	14.15	66.70	4,109.8	281.9	701.6	756.1	0.00	0.00	0.00	
4,240.0	14.15	66.70	4,148.6	285.7	710.6	765.9	0.00	0.00	0.00	
4,280.0	14.15	66.70	4,187.3	289.6	719.6	775.7	0.00	0.00	0.00	
4,320.0	14.15	66.70	4,226.1	293.5	728.6	785.4	0.00	0.00	0.00	
4,360.0	14.15	66.70	4,264.9	297.3	737.5	795.2	0.00	0.00	0.00	
4,396.1	14.15	66.70	4,299.9	300.8	745.6	804.0	0.00	0.00	0.00	
4,400.0	14.07	66.70	4,303.7	301.2	746.5	805.0	2.00	-2.00	0.00	
4,440.0	13.27	66.70	4,342.6	304.9	755.2	814.4	2.00	-2.00	0.00	
4,480.0	12.47	66.70	4,381.6	308.5	763.4	823.3	2.00	-2.00	0.00	
4,520.0	11.67	66.70	4,420.7	311.8	771.1	831.7	2.00	-2.00	0.00	
4,560.0	10.87	66.70	4,459.9	314.9	778.2	839.5	2.00	-2.00	0.00	
4,600.0	10.07	66.70	4,499.2	317.7	784.9	846.8	2.00	-2.00	0.00	

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Site:	Noble Sater C13-18D Pad Sec.13-T4N-R64W	MD Reference:	WELL @ 4643.0ft (Original Well Elev)
Well:	Sater C13-27D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Noble Sater C13-27D Plan #1 (7-14-10)	Database:	Landmark

Planned 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)
4,640.0	9.27	66.70	4,538.7	320.4	791.1	853.5	2.00	-2.00	0.00
4,680.0	8.47	66.70	4,578.2	322.8	796.7	859.7	2.00	-2.00	0.00
4,720.0	7.67	66.70	4,617.8	325.1	801.9	865.3	2.00	-2.00	0.00
4,760.0	6.87	66.70	4,657.5	327.1	806.5	870.3	2.00	-2.00	0.00
4,800.0	6.07	66.70	4,697.2	328.8	810.7	874.8	2.00	-2.00	0.00
4,840.0	5.27	66.70	4,737.0	330.4	814.3	878.8	2.00	-2.00	0.00
4,880.0	4.47	66.70	4,776.9	331.7	817.4	882.2	2.00	-2.00	0.00
4,920.0	3.67	66.70	4,816.8	332.9	820.0	885.0	2.00	-2.00	0.00
4,960.0	2.87	66.70	4,856.7	333.8	822.1	887.3	2.00	-2.00	0.00
5,000.0	2.07	66.70	4,896.7	334.5	823.7	889.0	2.00	-2.00	0.00
5,040.0	1.27	66.70	4,936.7	334.9	824.8	890.2	2.00	-2.00	0.00
5,080.0	0.47	66.70	4,976.7	335.2	825.3	890.8	2.00	-2.00	0.00
5,103.3	0.00	0.00	5,000.0	335.2	825.4	890.9	2.00	-2.00	0.00
Target BHL 180°FNL & 1250°FEL									
5,120.0	0.00	0.00	5,016.7	335.2	825.4	890.9	0.00	0.00	0.00
5,160.0	0.00	0.00	5,056.7	335.2	825.4	890.9	0.00	0.00	0.00
5,200.0	0.00	0.00	5,096.7	335.2	825.4	890.9	0.00	0.00	0.00
5,240.0	0.00	0.00	5,136.7	335.2	825.4	890.9	0.00	0.00	0.00
5,280.0	0.00	0.00	5,176.7	335.2	825.4	890.9	0.00	0.00	0.00
5,320.0	0.00	0.00	5,216.7	335.2	825.4	890.9	0.00	0.00	0.00
5,360.0	0.00	0.00	5,256.7	335.2	825.4	890.9	0.00	0.00	0.00
5,400.0	0.00	0.00	5,296.7	335.2	825.4	890.9	0.00	0.00	0.00
5,440.0	0.00	0.00	5,336.7	335.2	825.4	890.9	0.00	0.00	0.00
5,480.0	0.00	0.00	5,376.7	335.2	825.4	890.9	0.00	0.00	0.00
5,520.0	0.00	0.00	5,416.7	335.2	825.4	890.9	0.00	0.00	0.00
5,560.0	0.00	0.00	5,456.7	335.2	825.4	890.9	0.00	0.00	0.00
5,600.0	0.00	0.00	5,496.7	335.2	825.4	890.9	0.00	0.00	0.00
5,640.0	0.00	0.00	5,536.7	335.2	825.4	890.9	0.00	0.00	0.00
5,680.0	0.00	0.00	5,576.7	335.2	825.4	890.9	0.00	0.00	0.00
5,720.0	0.00	0.00	5,616.7	335.2	825.4	890.9	0.00	0.00	0.00
5,760.0	0.00	0.00	5,656.7	335.2	825.4	890.9	0.00	0.00	0.00
5,800.0	0.00	0.00	5,696.7	335.2	825.4	890.9	0.00	0.00	0.00
5,840.0	0.00	0.00	5,736.7	335.2	825.4	890.9	0.00	0.00	0.00
5,880.0	0.00	0.00	5,776.7	335.2	825.4	890.9	0.00	0.00	0.00
5,920.0	0.00	0.00	5,816.7	335.2	825.4	890.9	0.00	0.00	0.00
5,960.0	0.00	0.00	5,856.7	335.2	825.4	890.9	0.00	0.00	0.00
6,000.0	0.00	0.00	5,896.7	335.2	825.4	890.9	0.00	0.00	0.00
6,040.0	0.00	0.00	5,936.7	335.2	825.4	890.9	0.00	0.00	0.00
6,080.0	0.00	0.00	5,976.7	335.2	825.4	890.9	0.00	0.00	0.00
6,120.0	0.00	0.00	6,016.7	335.2	825.4	890.9	0.00	0.00	0.00
6,160.0	0.00	0.00	6,056.7	335.2	825.4	890.9	0.00	0.00	0.00
6,200.0	0.00	0.00	6,096.7	335.2	825.4	890.9	0.00	0.00	0.00
6,240.0	0.00	0.00	6,136.7	335.2	825.4	890.9	0.00	0.00	0.00
6,280.0	0.00	0.00	6,176.7	335.2	825.4	890.9	0.00	0.00	0.00
6,320.0	0.00	0.00	6,216.7	335.2	825.4	890.9	0.00	0.00	0.00
6,360.0	0.00	0.00	6,256.7	335.2	825.4	890.9	0.00	0.00	0.00
6,400.0	0.00	0.00	6,296.7	335.2	825.4	890.9	0.00	0.00	0.00
6,440.0	0.00	0.00	6,336.7	335.2	825.4	890.9	0.00	0.00	0.00
6,480.0	0.00	0.00	6,376.7	335.2	825.4	890.9	0.00	0.00	0.00
6,520.0	0.00	0.00	6,416.7	335.2	825.4	890.9	0.00	0.00	0.00
6,521.3	0.00	0.00	6,418.0	335.2	825.4	890.9	0.00	0.00	0.00
Niobrara - Target Circle 180°FNL & 1250°FEL									
6,560.0	0.00	0.00	6,456.7	335.2	825.4	890.9	0.00	0.00	0.00
6,600.0	0.00	0.00	6,496.7	335.2	825.4	890.9	0.00	0.00	0.00

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Sater C13-27D
Project:	SEC.13-T4N-R64W	TVD Reference:	WELL @ 4643.0ft (Original Well Elev)
Site:	Noble Sater C13-18D Pad Sec.13-T4N-R64W	MD Reference:	WELL @ 4643.0ft (Original Well Elev)
Well:	Sater C13-27D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Noble Sater C13-27D Plan #1 (7-14-10)	Database:	Landmark

Planned 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)	
6,640.0	0.00	0.00	6,536.7	335.2	825.4	890.9	0.00	0.00	0.00	
6,680.0	0.00	0.00	6,576.7	335.2	825.4	890.9	0.00	0.00	0.00	
6,720.0	0.00	0.00	6,616.7	335.2	825.4	890.9	0.00	0.00	0.00	
6,760.0	0.00	0.00	6,656.7	335.2	825.4	890.9	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,696.7	335.2	825.4	890.9	0.00	0.00	0.00	
6,821.3	0.00	0.00	6,718.0	335.2	825.4	890.9	0.00	0.00	0.00	
Codell										
6,840.0	0.00	0.00	6,736.7	335.2	825.4	890.9	0.00	0.00	0.00	
6,880.0	0.00	0.00	6,776.7	335.2	825.4	890.9	0.00	0.00	0.00	
6,920.0	0.00	0.00	6,816.7	335.2	825.4	890.9	0.00	0.00	0.00	
6,960.0	0.00	0.00	6,856.7	335.2	825.4	890.9	0.00	0.00	0.00	
6,971.3	0.00	0.00	6,868.0	335.2	825.4	890.9	0.00	0.00	0.00	
Hardline 180°N of BHL										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (m)	Easting (m)	Latitude	Longitude	
- hit/miss target										
- Shape										
Target BHL 180°FNL	0.00	0.00	5,000.0	335.2	825.4	414,741.56	999,888.56	40° 19' 8.940 N	104° 29' 38.940 W	
- plan hits target										
- Point										
Target Circle 180°FNL	0.00	0.00	6,418.0	335.2	825.4	414,741.56	999,888.56	40° 19' 8.940 N	104° 29' 38.940 W	
- plan hits target										
- Circle (radius 75.0)										
Hardline 180°N of BHL	0.00	0.00	6,868.0	415.2	725.4	414,765.60	999,857.81	40° 19' 9.731 N	104° 29' 40.231 W	
- plan misses by 128.1ft at 6971.3ft MD (6868.0 TVD, 335.2 N, 825.4 E)										
- Polygon										
Point 1			6,868.0	0.0	0.0	414,765.60	999,857.81			
Point 2			6,868.0	0.0	200.0	414,766.29	999,918.77			

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name			Casing Diameter (in)	Hole Diameter (in)
700.0	700.0	8 5/8"			8.625	12.250

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,521.3	6,418.0	Niobrara		0.00		
6,821.3	6,718.0	Codell		0.00		

Checked By: _____ Approved By: _____ Date: _____