

Northern Region - DJ Basin

Wells Ranch

BB Section 06

SLW Ranch State BB06-642

Original Drilling

Plan 1

Anticollision Summary Report

26 September, 2017

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well SLW Ranch State BB06-642
Project:	Wells Ranch	TVD Reference:	WELL @ 4639.0ft (Original Well Elev.)
Reference Site:	BB Section 06	MD Reference:	WELL @ 4639.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	SLW Ranch State BB06-642	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Reference	Plan 1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	9/26/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	12,369.1	Plan 1 (Original Drilling)	2_MWD+IFR1+MS	A008Mb: IFR dec & multi-station analysis

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
B Section 01						
Lucci B01-69HNL - Original Drilling - Original Drilling - As	6,164.4	10,764.4	3,166.9	3,054.0	28.050	CC
Lucci B01-69HNL - Original Drilling - Original Drilling - As	11,500.0	15,648.0	3,228.9	2,961.9	12.096	ES
Lucci B01-69HNL - Original Drilling - Original Drilling - As	11,700.0	15,648.0	3,236.6	2,968.1	12.053	SF
Lucci B01-99HZ - Original Drilling - Original Drilling - As	6,484.8	11,336.8	918.6	842.5	12.070	CC
Lucci B01-99HZ - Original Drilling - Original Drilling - As	6,500.0	11,343.3	918.8	842.4	12.018	ES
Lucci B01-99HZ - Original Drilling - Original Drilling - As	6,600.0	11,391.5	932.4	854.0	11.897	SF
Lucci B03-69HNL - Original Drilling - Original Drilling - As	5,259.6	4,963.0	5,261.6	5,228.0	156.566	CC
Lucci B03-69HNL - Original Drilling - Original Drilling - As	5,300.0	4,982.0	5,261.7	5,227.8	155.560	ES
Lucci B03-69HNL - Original Drilling - Original Drilling - As	6,000.0	6,000.0	5,276.3	5,236.1	131.336	SF
Lucci BC B1-16 - Wellbore #1 - Wellbore #1	6,498.3	6,383.3	1,572.2	1,527.2	34.995	CC
Lucci BC B1-16 - Wellbore #1 - Wellbore #1	6,500.0	6,384.8	1,572.2	1,527.2	34.987	ES
Lucci BC B1-16 - Wellbore #1 - Wellbore #1	6,700.0	6,536.5	1,587.7	1,541.8	34.551	SF
SLW Ranch B01-62-1HN - Original Drilling - As Drilled	6,668.3	6,550.5	1,683.9	1,633.2	33.169	CC, ES
SLW Ranch B01-62-1HN - Original Drilling - As Drilled	6,800.0	6,558.6	1,690.2	1,638.9	32.966	SF
SLW Ranch B01-63-1HN - Original Drilling - As Drilled	6,611.8	6,546.8	1,192.6	1,142.7	23.921	CC, ES
SLW Ranch B01-63-1HN - Original Drilling - As Drilled	6,650.0	6,551.5	1,193.3	1,143.4	23.920	SF
SLW Ranch B01-64-1HN - Original Drilling - As Drilled	6,550.0	6,611.0	491.2	442.5	10.079	SF
SLW Ranch B01-64-1HN - Original Drilling - As Drilled	6,561.8	6,613.7	491.1	442.5	10.101	CC, ES
SLW Ranch B01-66-1HN - Original Drilling - Original Drill	6,433.7	6,710.7	862.3	817.2	19.125	CC, ES
SLW Ranch B01-66-1HN - Original Drilling - Original Drill	6,500.0	6,728.0	865.4	819.7	18.933	SF
SLW Ranch B01-67-1HN - Original Drilling - As Drilled - S	3,000.3	3,129.4	978.7	958.6	48.609	CC, ES
SLW Ranch B01-67-1HN - Original Drilling - As Drilled - S	6,550.0	6,552.5	1,469.6	1,424.8	32.788	SF
SLW Ranch B01-68-1HN - Original Drilling - Original Drill	1,774.9	1,773.8	1,183.6	1,172.3	104.963	CC
SLW Ranch B01-68-1HN - Original Drilling - Original Drill	1,800.0	1,790.0	1,183.7	1,172.3	103.613	ES
SLW Ranch B01-68-1HN - Original Drilling - Original Drill	6,600.0	6,588.0	2,126.1	2,081.0	47.215	SF
SLW Ranch B01-69-1HN - Original Drilling - As Drilled	818.9	819.1	1,208.8	1,204.4	272.449	CC
SLW Ranch B01-69-1HN - Original Drilling - As Drilled	900.0	883.5	1,209.3	1,204.3	244.196	ES
SLW Ranch B01-69-1HN - Original Drilling - As Drilled	6,550.0	6,069.5	2,454.3	2,411.7	57.573	SF
SLW Ranch B12-69-1HN - Wellbore #1 - Wellbore #1- As	5,804.2	6,048.2	2,233.8	2,191.3	52.571	CC, ES
SLW Ranch B12-69-1HN - Wellbore #1 - Wellbore #1- As	6,000.0	6,115.0	2,240.2	2,197.0	51.815	SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

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Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well SLW Ranch State BB06-642
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Reference Site:	BB Section 06	MD Reference:	WELL @ 4639.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	SLW Ranch State BB06-642	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
BB Section 05						
UPV 05-03H3 - Original Drilling - Original Drilling - As Dri	12,369.1	6,716.8	2,978.0	2,889.9	33.795	CC, ES, SF
UPV 05-04H3 - Original Drilling - Original Drilling - As Dri	12,369.1	6,798.8	2,270.1	2,173.1	23.404	CC, ES, SF
UPV 05-05H3 - Original Drilling - Original Drilling - As Dri	12,369.1	6,777.6	964.0	870.9	10.348	CC, ES, SF
UPV 05-06H3 - Original Drilling - Original Drilling - As Dri	12,369.1	6,733.6	2,003.2	1,932.0	28.151	CC, ES, SF
Well Ranch AA32-757 - Wellbore #1 - Plan 1	12,369.1	6,200.0	2,946.5	2,866.8	36.977	CC, ES, SF
Wells Ranch 31-05 - Original Drilling - Original Drilling - A	12,369.1	6,793.6	3,998.5	3,923.4	53.233	CC, ES, SF
Wells Ranch 32-05 - Original Drilling - Original Drilling - A	12,369.1	6,766.9	3,220.8	3,160.2	53.163	CC, ES, SF
Wells Ranch 41-05 - Original Drilling - Original Drilling - A	12,369.1	6,635.0	4,938.9	4,872.5	74.422	CC, ES, SF
Wells Ranch 42-05 - Original Drilling - Original Drilling - A	12,369.1	6,725.9	4,404.7	4,349.5	79.780	CC, ES, SF
Wells Ranch AA32-718 - Wellbore #1 - Plan 1	12,369.1	6,173.2	4,865.5	4,802.6	77.282	CC, ES, SF
Wells Ranch AA32-725 - Wellbore #1 - Plan 1	12,369.1	6,300.0	4,579.2	4,514.3	70.538	CC, ES, SF
Wells Ranch AA32-731 - Wellbore #1 - Plan 1	12,369.1	6,350.0	4,177.3	4,110.2	62.284	CC, ES, SF
Wells Ranch AA32-738 - Wellbore #1 - Plan 1	12,369.1	6,525.7	3,835.7	3,765.2	54.452	CC, ES, SF
Wells Ranch AA32-744 - Wellbore #1 - Plan 1	12,369.1	6,150.0	3,394.0	3,319.4	45.454	CC, ES, SF
Wells Ranch AA32-750 - Wellbore #1 - Plan 1	12,369.1	6,250.0	3,184.8	3,108.0	41.479	CC, ES, SF
Wells Ranch AA32-763 - Wellbore #1 - Plan 1	12,369.1	6,400.0	2,568.3	2,484.6	30.666	CC, ES, SF
Wells Ranch AA32-770 - Wellbore #1 - Plan 1	12,369.1	6,250.0	2,482.7	2,393.0	27.655	CC, ES, SF
Wells Ranch AA32-776 - Wellbore #1 - Plan 1	12,369.1	6,300.0	2,402.3	2,310.3	26.096	CC, ES, SF
Wells Ranch AA32-783 - Wellbore #1 - Plan 1	12,369.1	6,250.0	2,336.2	2,243.9	25.310	CC, ES, SF
Wells Ranch AA32-790 - Wellbore #1 - Plan 1	12,077.9	6,318.5	2,278.3	2,188.3	25.295	CC, ES
Wells Ranch AA32-790 - Wellbore #1 - Plan 1	12,369.1	6,300.0	2,295.6	2,202.7	24.728	SF
Wells Ranch BB01-611 - Original Drilling - APD - Rev 2						Out of range
Wells Ranch BB01-611 - Original Drilling - Original Drillin						Out of range
Wells Ranch BB01-615 - Original Drilling - APD - Rev 2						Out of range
Wells Ranch BB01-615 - Original Drilling - Option 2						Out of range
Wells Ranch BB01-615 - Original Drilling - Original Drillin						Out of range
Wells Ranch BB01-624 - Original Drilling - APD - Rev 2						Out of range
Wells Ranch BB01-624 - Original Drilling - As Drilled - 1						Out of range
Wells Ranch BB01-624 - Original Drilling - New Plan						Out of range
Wells Ranch BB01-624 - Original Drilling - Original Drillin						Out of range
Wells Ranch BB01-624 - Original Drilling - Original Plan						Out of range
Wells Ranch BB01-624 - Original Drilling - ST01 - ST01 -						Out of range
Wells Ranch BB01-638 - Original Drilling - APD - Rev 2						Out of range
Wells Ranch BB01-638 - Original Drilling - Original Drillin						Out of range
Wells Ranch BB01-649 - Original Drilling - APD - Rev 2						Out of range
Wells Ranch BB01-649 - Original Drilling - Original Drillin						Out of range
Wells Ranch BB01-655 - Original Drilling - APD - Rev 2						Out of range
Wells Ranch BB01-655 - Original Drilling - Original Drillin						Out of range
Wells Ranch BB01-669 - Original Drilling - APD - Rev 2						Out of range
Wells Ranch BB01-669 - Original Drilling - Original Drillin						Out of range
Wells Ranch BB01-675 - Original Drilling - APD - Rev 2						Out of range
Wells Ranch BB01-675 - Original Drilling - Original Drillin						Out of range
Wells Ranch State BB01-690 - Original Drilling - APD - R						Out of range
Wells Ranch State BB01-690 - Original Drilling - Original						Out of range
Wells Ranch USX BB05-09 - Original Drilling - Original D	12,369.1	6,779.9	4,427.1	4,378.8	91.523	CC, ES, SF
Wells Ranch USX BB05-10 - Original Drilling - Original D	12,369.1	6,755.1	3,082.3	3,033.9	63.594	CC, ES, SF
Wells Ranch USX BB05-11 - Original Drilling - Original D	12,369.1	6,838.6	1,690.9	1,642.1	34.657	CC, ES, SF
Wells Ranch USX BB05-12 - Original Drilling - Original D	12,369.1	6,807.8	457.2	385.5	6.378	CC, ES, SF
Wells Ranch USX BB05-13 - Original Drilling - Original D	12,369.1	6,835.5	1,516.6	1,419.6	15.630	CC, ES, SF
Wells Ranch USX BB05-14 - Original Drilling - Original D	12,369.1	6,889.9	2,127.8	2,053.8	28.770	CC, ES, SF
Wells Ranch USX BB05-15 - Original Drilling - Original D	12,369.1	6,763.8	3,281.3	3,219.7	53.280	CC, ES, SF
Wells Ranch USX BB05-16 - Original Drilling - Original D	12,369.1	6,732.5	4,452.9	4,397.9	80.950	CC, ES, SF
Wells Ranch USX BB05-23 - Original Drilling - Original D	12,369.1	6,797.1	3,893.2	3,842.1	76.165	CC, ES, SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Noble Energy, Inc.
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well SLW Ranch State BB06-642
Project:	Wells Ranch	TVD Reference:	WELL @ 4639.0ft (Original Well Elev.)
Reference Site:	BB Section 06	MD Reference:	WELL @ 4639.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	SLW Ranch State BB06-642	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
BB Section 05						
Wells Ranch USX BB05-25 - Original Drilling - Original D	12,369.1	6,841.1	1,135.2	1,057.5	14.598	CC, ES, SF
BB Section 06						
Skurich-Roth 21-06 - Original Drilling - Original Drilling - A	8,780.0	6,739.4	2,435.5	2,377.2	41.787	CC
Skurich-Roth 21-06 - Original Drilling - Original Drilling - A	8,800.0	6,739.3	2,435.5	2,377.1	41.668	ES
Skurich-Roth 21-06 - Original Drilling - Original Drilling - A	9,400.0	6,736.3	2,513.1	2,450.1	39.877	SF
Skurich-Roth 23-06 - Original Drilling - Original Drilling - A	8,819.4	6,735.5	136.8	78.1	2.330	CC, ES, SF
Skurich-Roth 24-06 - Original Drilling - Original Drilling - A	8,773.9	6,762.8	1,436.1	1,377.8	24.650	CC
Skurich-Roth 24-06 - Original Drilling - Original Drilling - A	8,800.0	6,762.9	1,436.3	1,377.8	24.549	ES
Skurich-Roth 24-06 - Original Drilling - Original Drilling - A	9,000.0	6,763.5	1,453.8	1,393.5	24.126	SF
Skurich-Roth 33-06 - Original Drilling - Original Drilling - A	10,049.9	6,746.9	188.5	117.5	2.655	CC, ES, SF
Skurich-Roth 42-06 - Original Drilling - Original Drilling - A	11,329.9	6,783.4	1,117.8	1,032.4	13.098	CC, ES
Skurich-Roth 42-06 - Original Drilling - Original Drilling - A	11,400.0	6,784.9	1,120.0	1,034.0	13.033	SF
Skurich-Roth 6D - Original Drilling - Original Drilling - As	2,007.1	1,981.1	1,685.0	1,671.3	122.949	CC
Skurich-Roth 6D - Original Drilling - Original Drilling - As	2,200.0	2,160.5	1,685.8	1,670.8	112.223	ES
Skurich-Roth 6D - Original Drilling - Original Drilling - As	8,700.0	6,714.3	1,854.8	1,798.0	32.654	SF
Skurich-Roth 11-06 - Original Drilling - Original Drilling -	2,425.4	2,414.1	1,865.3	1,848.5	111.491	CC, ES
Skurich-Roth 11-06 - Original Drilling - Original Drilling -	8,000.0	6,731.1	2,531.3	2,466.5	39.071	SF
Skurich-Roth 12-06 - Original Drilling - Original Drilling -	282.9	258.9	747.7	746.2	494.525	CC
Skurich-Roth 12-06 - Original Drilling - Original Drilling -	2,401.0	2,377.2	750.9	734.4	45.503	ES
Skurich-Roth 12-06 - Original Drilling - Original Drilling -	7,700.0	6,715.3	1,221.2	1,171.2	24.412	SF
Skurich-Roth 13-06 - Original Drilling - Original Drilling -	7,456.2	6,722.0	111.4	59.7	2.157	CC, ES, SF
Skurich-Roth 14-06 - Original Drilling - Original Drilling -	7,541.1	6,716.1	1,447.8	1,398.5	29.341	CC, ES
Skurich-Roth 14-06 - Original Drilling - Original Drilling -	7,800.0	6,729.0	1,470.7	1,420.0	29.001	SF
Skurich-Roth 22-06 - Original Drilling - Original Drilling -	8,761.1	6,721.4	939.5	881.5	16.210	CC, ES
Skurich-Roth 22-06 - Original Drilling - Original Drilling -	8,900.0	6,720.4	949.7	890.9	16.144	SF
Skurich-Roth 31-06 - Original Drilling - Original Drilling -	10,000.0	6,855.6	2,444.7	2,373.8	34.483	CC, ES
Skurich-Roth 31-06 - Original Drilling - Original Drilling -	10,500.0	6,852.1	2,495.5	2,420.3	33.219	SF
Skurich-Roth 34-06 - Original Drilling - Original Drilling -	10,054.4	6,747.1	1,453.3	1,382.2	20.462	CC, ES
Skurich-Roth 34-06 - Original Drilling - Original Drilling -	10,300.0	6,748.3	1,473.9	1,400.5	20.080	SF
Skurich-Roth 41-06 - Original Drilling - Original Drilling -	11,363.9	6,809.1	2,463.1	2,377.0	28.595	CC
Skurich-Roth 41-06 - Original Drilling - Original Drilling -	11,400.0	6,810.7	2,463.4	2,376.8	28.467	ES
Skurich-Roth 41-06 - Original Drilling - Original Drilling -	11,800.0	6,828.8	2,501.3	2,411.2	27.761	SF
Skurich-Roth 43-06 - Original Drilling - Original Drilling -	11,233.4	6,769.3	55.8	-28.4	0.663	Level 1, CC, ES, SF
Skurich-Roth 44-06 - Original Drilling - Original Drilling -	11,366.1	6,785.4	1,350.3	1,264.3	15.702	CC, ES
Skurich-Roth 44-06 - Original Drilling - Original Drilling -	11,500.0	6,785.3	1,356.9	1,269.5	15.519	SF
Skurich-Roth 6A - Original Drilling - Original Drilling - As	10,773.9	6,758.7	753.9	674.9	9.550	CC, ES
Skurich-Roth 6A - Original Drilling - Original Drilling - As	10,800.0	6,758.8	754.3	675.1	9.517	SF
Skurich-Roth 32-06 - Original Drilling - Original Drilling -	10,032.6	6,754.0	1,195.4	1,012.9	6.552	CC, ES
Skurich-Roth 32-06 - Original Drilling - Original Drilling -	10,100.0	6,754.0	1,197.3	1,014.2	6.542	SF
SLW Ranch State BB06-619 - Original Drilling - Prelim -	2,000.0	2,000.0	47.4	33.5	3.414	CC, ES
SLW Ranch State BB06-619 - Original Drilling - Prelim -	2,100.0	2,098.4	49.0	34.5	3.366	SF
SLW Ranch State BB06-631 - Original Drilling - Plan 1	2,200.0	2,200.0	21.9	6.6	1.428	Level 3, CC, ES, SF
SLW Ranch State BB06-652 - Original Drilling - Plan 1	2,400.0	2,400.0	21.9	5.1	1.306	Level 3, CC, ES, SF
SLW Ranch State BB06-662 - Original Drilling - Plan 1	2,400.0	2,400.0	43.7	27.0	2.611	CC, ES, SF
SLW Ranch State BB06-672 - Original Drilling - Plan 1	2,200.0	2,201.0	65.6	50.3	4.283	CC, ES
SLW Ranch State BB06-672 - Original Drilling - Plan 1	2,300.0	2,298.9	67.1	51.1	4.193	SF
SLW Ranch State BB06-682 - SLW Ranch State BB06-6	2,000.0	2,000.0	91.1	77.2	6.565	CC, ES
SLW Ranch State BB06-682 - SLW Ranch State BB06-6	2,100.0	2,097.1	92.7	78.1	6.359	SF

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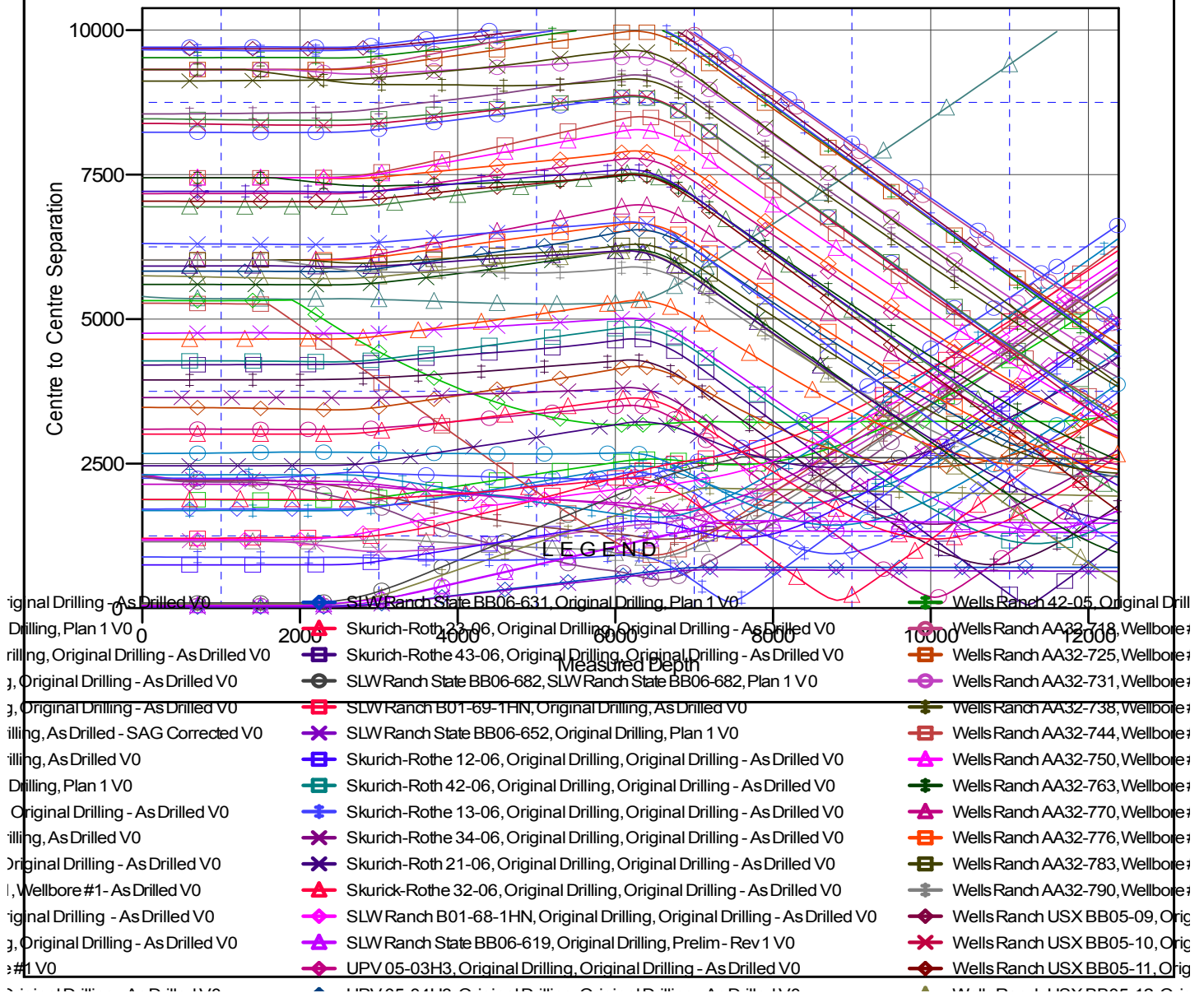
Noble Energy, Inc.
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Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well SLW Ranch State BB06-642
Project:	Wells Ranch	TVD Reference:	WELL @ 4639.0ft (Original Well Elev.)
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Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	SLW Ranch State BB06-642	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDMP
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4639.0ft (Original Well Elev.)
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: SLW Ranch State BB06-642
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.65°

Ladder Plot



CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

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