Northern Region - DJ Basin

Wells Ranch
BB Section 18
SLW Ranch State B14-653

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 B14-653
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4619.0ft
Reference Site:	BB Section 18	**MD Reference:**	WELL @ 4619.0ft
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	SLW Ranch State B14-653	**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	17,621.4	Plan 1 (Original Drilling)	2_MWD+IFR1+MS	A008Mb: IFR dec & multi-station analysis

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
B Section 13						
Ford 13-01 - Wellbore #1 - Wellbore #1- As Drilled	10,473.6	6,525.7	2,098.7	2,021.0	27.009	CC
Ford 13-01 - Wellbore #1 - Wellbore #1- As Drilled	10,500.0	6,526.3	2,098.9	2,020.9	26.892	ES
Ford 13-01 - Wellbore #1 - Wellbore #1- As Drilled	10,900.0	6,534.6	2,141.6	2,059.3	26.007	SF
Ford 23-13 - Wellbore #1 - Wellbore #1- As Drilled	10,422.2	6,463.7	973.3	896.2	12.623	CC, ES
Ford 23-13 - Wellbore #1 - Wellbore #1- As Drilled	10,500.0	6,467.0	976.4	898.3	12.496	SF
Lohr 13-01 - Original Drilling - Original Drilling - As Drilled	8,797.0	6,446.0	875.5	781.7	9.332	CC
Lohr 13-01 - Original Drilling - Original Drilling - As Drilled	8,800.0	6,446.0	875.5	781.7	9.331	ES, SF
Lohr 13-02 - Original Drilling - Original Drilling - As Drilled	9,226.8	6,380.9	1,822.7	1,759.1	28.629	CC, ES
Lohr 13-02 - Original Drilling - Original Drilling - As Drilled	9,500.0	6,382.2	1,843.1	1,777.5	28.082	SF
Lohr 13-04 - Original Drilling - Original Drilling - As Drilled	7,798.2	6,449.0	470.2	385.0	5.518	CC
Lohr 13-04 - Original Drilling - Original Drilling - As Drilled	7,800.0	6,449.0	470.2	385.0	5.518	ES, SF
Lohr 32-13 - Original Drilling - Original Drilling - APD - Re	9,099.4	6,444.4	352.6	289.8	5.611	CC, ES
Lohr 32-13 - Original Drilling - Original Drilling - APD - Re	9,100.0	6,444.5	352.6	289.8	5.611	SF
Lohr 41-13 - Original Drilling - Original Drilling - As Drilled	1,978.1	1,934.2	1,612.1	1,598.6	119.727	CC
Lohr 41-13 - Original Drilling - Original Drilling - As Drilled	7,900.0	6,413.8	1,643.7	1,591.9	31.713	ES
Lohr 41-13 - Original Drilling - Original Drilling - As Drilled	8,200.0	6,413.8	1,672.5	1,619.0	31.259	SF
Lohr 5 - Original Drilling - Original Drilling - as Drilled	8,689.3	6,414.2	1,372.1	1,278.5	14.646	CC
Lohr 5 - Original Drilling - Original Drilling - as Drilled	8,700.0	6,414.3	1,372.2	1,278.4	14.629	ES
Lohr 5 - Original Drilling - Original Drilling - as Drilled	8,900.0	6,416.6	1,388.2	1,292.5	14.504	SF
Maggie B13-12 - Wellbore #1 - Wellbore #1- As Drilled	12,098.7	6,433.2	765.0	668.4	7.918	CC
Maggie B13-12 - Wellbore #1 - Wellbore #1- As Drilled	12,100.0	6,433.3	765.0	668.4	7.916	ES
Maggie B13-12 - Wellbore #1 - Wellbore #1- As Drilled	12,200.0	6,436.4	771.7	673.9	7.893	SF
Maggie B13-13 - Wellbore #1 - Wellbore #1- As Drilled	11,942.3	6,391.3	2,223.1	2,128.6	23.515	CC
Maggie B13-13 - Wellbore #1 - Wellbore #1- As Drilled	12,000.0	6,391.9	2,223.9	2,128.6	23.335	ES
Maggie B13-13 - Wellbore #1 - Wellbore #1- As Drilled	12,400.0	6,395.5	2,269.8	2,170.4	22.846	SF
Miller Deppe 1 - Original Drilling - Original Drilling - As Dr	10,431.3	6,502.4	1,603.1	1,525.5	20.671	CC, ES
Miller Deppe 1 - Original Drilling - Original Drilling - As Dr	10,600.0	6,499.1	1,611.9	1,533.2	20.463	SF
Miller Deppe 11-13 - Original Drilling - Original Drilling - A	11,919.3	6,504.8	1,599.3	1,504.5	16.881	CC, ES
Miller Deppe 11-13 - Original Drilling - Original Drilling - A	12,100.0	6,500.6	1,609.4	1,513.5	16.771	SF
Miller Deppe 12-13 - Original Drilling - Original Drilling - A	11,790.5	6,498.4	657.8	564.5	7.054	CC, ES
Miller Deppe 12-13 - Original Drilling - Original Drilling - A	11,800.0	6,498.4	657.9	564.5	7.051	SF
Miller Deppe 22-13 - Original Drilling - Original Drilling - A	10,223.6	6,440.9	710.6	635.8	9.497	CC, ES, SF
Nakagawa PM B13-10 - Wellbore #1 - Wellbore #1- As D	9,161.2	6,440.0	862.1	798.6	13.576	CC, ES
Nakagawa PM B13-10 - Wellbore #1 - Wellbore #1- As D	9,300.0	6,441.1	873.2	808.0	13.410	SF
Nakagawa PMB13-09 - Original Drilling - Original Drilling	7,730.9	6,431.2	754.9	704.1	14.860	CC, ES
Nakagawa PMB13-09 - Original Drilling - Original Drilling	7,800.0	6,429.8	758.1	706.6	14.730	SF
Nakagawa PMB13-16 - Original Drilling - Original Drilling	7,715.9	6,429.7	2,155.4	2,104.7	42.548	CC, ES

CC - Min centre to center distance or covergent 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 B14-653
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4619.0ft
Reference Site:	BB Section 18	**MD Reference:**	WELL @ 4619.0ft
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	SLW Ranch State B14-653	**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 Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
B Section 13						
Nakagawa PMB13-16 - Original Drilling - Original Drilling	8,400.0	6,418.0	2,261.3	2,205.1	40.208	SF
B Section 14						
Cockroft B15-69-1HNM - Original Drilling - APD - Rev 0	17,621.4	8,801.9	2,120.7	1,979.7	15.039	CC, ES, SF
Cockroft B15-69-1HNM - Original Drilling - Original Drillin	16,447.8	7,848.5	2,118.5	1,956.1	13.047	CC
Cockroft B15-69-1HNM - Original Drilling - Original Drillin	17,621.4	9,036.6	2,125.5	1,921.5	10.423	ES, SF
Holman 14-01 - Original Drilling - Original Drilling - As Dr	14,295.0	6,465.0	562.0	439.1	4.571	CC, ES
Holman 14-01 - Original Drilling - Original Drilling - As Dr	14,300.0	6,464.9	562.1	439.1	4.571	SF
Holman B15-65HNM - Original Drilling - Aaron Pre Drill	15,574.3	6,565.8	83.8	-31.2	0.729	Level 1, CC, ES, SF
Holman B15-65HNM - Original Drilling - APD - Rev 0	15,673.6	6,636.9	118.2	1.0	1.009	Level 2, CC, ES, SF
Holman B15-65HNM - Original Drilling - Design #3	15,536.3	6,518.4	86.6	-43.5	0.666	Level 1, CC, ES, SF
Holman B15-65HNM - Original Drilling - Original Drilling -	15,536.3	6,518.4	86.6	-43.5	0.666	Level 1, CC, ES, SF
Holman B15-66HN - Original Drilling - APD - Rev 0	17,621.4	8,612.6	495.0	355.2	3.542	CC, ES, SF
Holman B15-66HN - Original Drilling - Original Drilling	17,621.4	8,661.6	508.8	339.1	2.998	CC, ES, SF
Holman PM B14-08 - Original Drilling - Original Drilling -	12,923.8	6,452.0	511.2	371.0	3.645	CC, ES, SF
KCB #27-14 - Original Well - Original Well - As Drilled	13,713.9	6,550.2	2,372.2	2,254.3	20.117	CC, ES
KCB #27-14 - Original Well - Original Well - As Drilled	14,000.0	6,549.2	2,389.4	2,268.8	19.815	SF
KCB 17-14 - Original Drilling - Original Drilling - As Drilled	13,854.7	6,539.4	1,226.9	1,098.6	9.560	CC, ES, SF
KCB 27-14 - Original Drilling - Original Drilling - As Drilled	13,710.8	6,531.3	2,378.6	2,260.7	20.175	CC, ES
KCB 27-14 - Original Drilling - Original Drilling - As Drilled	14,000.0	6,530.4	2,396.1	2,275.5	19.869	SF
Seylor 02-14 - Original Drilling - Original Drilling - As Drill	14,446.5	6,449.0	1,791.2	1,632.7	11.301	CC, ES
Seylor 02-14 - Original Drilling - Original Drilling - As Drill	14,600.0	6,449.0	1,797.8	1,638.1	11.261	SF
Trebor B14-03 - Wellbore #1 - Wellbore #1- As Drilled	15,544.8	6,436.5	1,648.2	1,510.4	11.959	CC, ES
Trebor B14-03 - Wellbore #1 - Wellbore #1- As Drilled	15,600.0	6,432.5	1,649.1	1,510.9	11.928	SF
Trebor B14-04 - Original Drilling - Original Drilling - As Dr	17,000.3	6,448.5	1,641.5	1,485.9	10.546	CC, ES
Trebor B14-04 - Original Drilling - Original Drilling - As Dr	17,100.0	6,446.1	1,644.5	1,488.2	10.518	SF
Trebor B14-05 - Wellbore #1 - Wellbore #1- As Drilled	17,018.2	6,462.8	837.6	681.6	5.371	CC, ES, SF
Trebor B14-06 - Wellbore #1 - Wellbore #1- As Drilled	15,814.2	6,460.1	463.8	322.5	3.282	CC, ES, SF
Trebor B14-19 - Original Drilling - Original Drilling - As Dr	16,320.5	6,453.0	1,127.7	946.4	6.220	CC, ES, SF
B Section 15						
Frenzel B15-05 - Wellbore #1 - Wellbore #1- As Drilled	17,621.4	6,464.6	4,768.6	4,716.7	91.989	CC, ES, SF
Frenzel B15-06 - Wellbore #1 - Wellbore #1- As Drilled	17,621.4	6,832.1	3,187.7	3,100.4	36.543	CC, ES, SF
Glover USX B15-02CD - Wellbore #1 - Wellbore #1- As D	17,621.4	6,417.8	2,592.7	2,465.8	20.427	CC, ES, SF
Loustalet 21-15 - Wellbore #1 - Wellbore #1- As Drilled	17,621.4	6,369.5	3,636.3	3,533.8	35.475	CC, ES, SF
Loustalet 41-15 - Wellbore #1 - Wellbore #1- As Drilled	17,621.4	6,465.3	1,901.0	1,748.2	12.447	CC, ES, SF
Loustalet 42-15 - Wellbore #1 - Wellbore #1- As Drilled	17,621.4	6,480.4	962.6	887.9	12.877	CC, ES, SF

Noble Energy, Inc.

Anticollision Summary Report

Company:	Northern Region - DJ Basin	**Local Co-ordinate Reference:**	Well SLW Ranch State B14-653
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4619.0ft
Reference Site:	BB Section 18	**MD Reference:**	WELL @ 4619.0ft
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	SLW Ranch State B14-653	**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

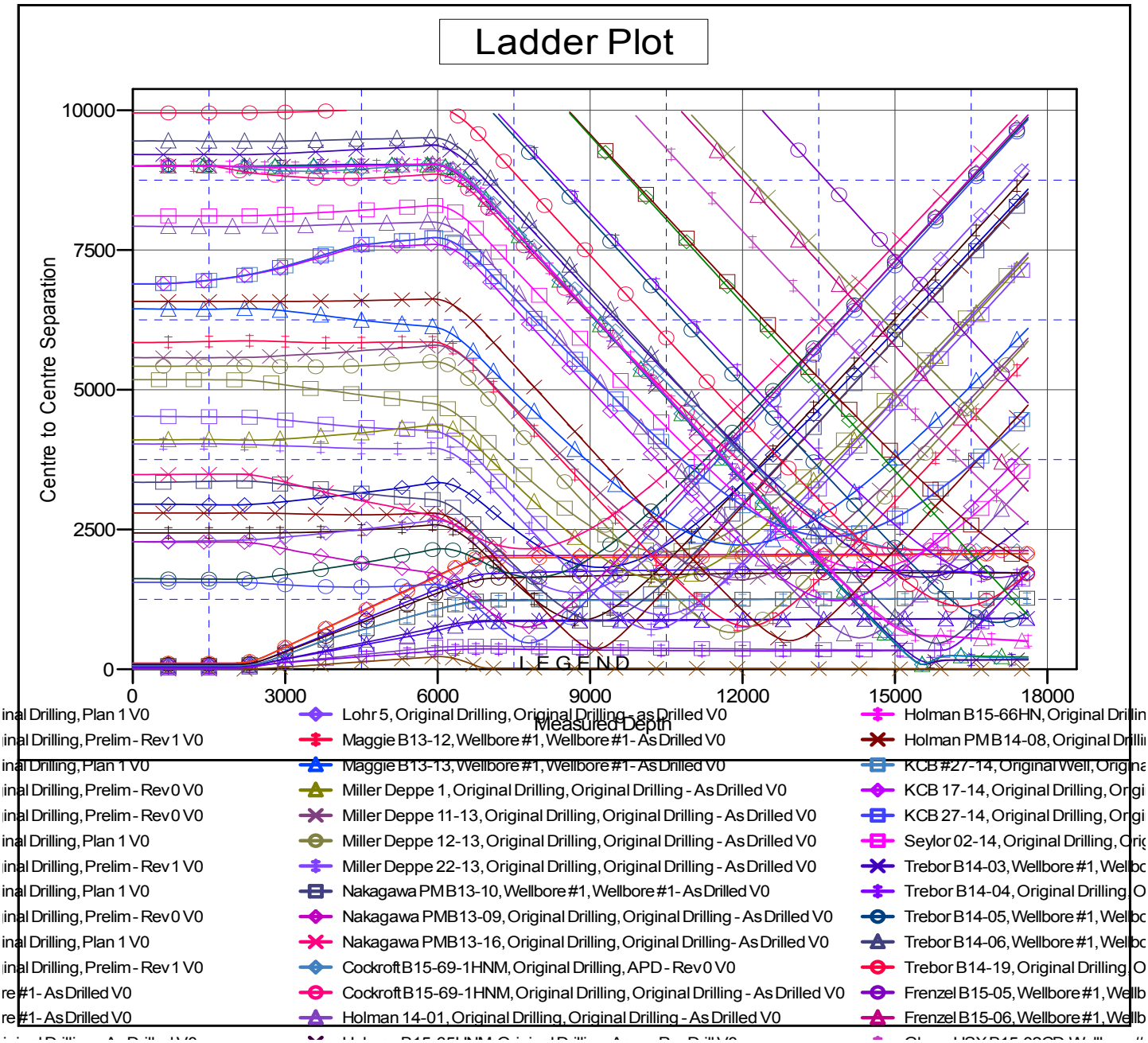
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
BB Section 18						
SLW Ranch State B14-653 - Original Drilling - Prelim - R	2,000.0	2,000.0	0.0	0.0	0.000	Level 1, SF
SLW Ranch State B14-653 - Original Drilling - Prelim - R	17,600.0	17,859.6	0.1	-283.4	0.000	Level 1, ES
SLW Ranch State B14-653 - Original Drilling - Prelim - R	17,621.4	17,881.0	0.0	0.0	10,000.000	CC
SLW Ranch State B14-658 - Original Drilling - Plan 1	2,000.0	2,000.0	21.9	8.0	1.576	CC, ES
SLW Ranch State B14-658 - Original Drilling - Plan 1	15,931.3	15,901.2	337.9	101.4	1.429	Level 3, SF
SLW Ranch State B14-658 - Original Drilling - Prelim - R	2,000.0	2,000.0	21.9	8.0	1.576	CC, ES
SLW Ranch State B14-658 - Original Drilling - Prelim - R	15,900.0	15,888.4	337.8	101.9	1.432	Level 3, SF
SLW Ranch State B14-667 - Original Drilling - Plan 1	2,000.0	2,000.0	43.7	29.8	3.151	CC, ES
SLW Ranch State B14-667 - Original Drilling - Plan 1	2,100.0	2,100.0	45.5	30.9	3.120	SF
SLW Ranch State B14-667 - Original Drilling - Prelim - R	2,000.0	2,000.0	43.7	29.8	3.151	CC, ES
SLW Ranch State B14-667 - Original Drilling - Prelim - R	2,100.0	2,100.0	45.5	30.9	3.120	SF
SLW Ranch State B14-672 - Original Drilling - Plan 1	2,000.0	2,001.0	65.6	51.7	4.726	CC, ES
SLW Ranch State B14-672 - Original Drilling - Plan 1	17,621.4	17,464.4	1,270.7	990.2	4.530	SF
SLW Ranch State B14-672 - Original Drilling - Prelim - R	2,000.0	2,001.0	65.6	51.7	4.726	CC, ES
SLW Ranch State B14-672 - Original Drilling - Prelim - R	17,621.4	17,403.6	1,270.7	990.6	4.537	SF
SLW Ranch State B14-679 - Original Drilling - Plan 1	2,000.0	2,001.0	87.4	73.6	6.301	CC, ES
SLW Ranch State B14-679 - Original Drilling - Plan 1	17,621.4	17,534.6	1,720.3	1,438.2	6.099	SF
SLW Ranch State B14-679 - Original Drilling - Prelim - R	2,000.0	2,001.0	87.4	73.6	6.301	CC, ES
SLW Ranch State B14-679 - Original Drilling - Prelim - R	17,621.4	17,495.7	1,719.6	1,437.8	6.102	SF
SLW Ranch State B14-685 - Original Drilling - Plan 1	2,000.0	2,001.0	109.3	95.4	7.876	CC, ES
SLW Ranch State B14-685 - Original Drilling - Plan 1	17,621.4	17,589.9	2,070.8	1,789.6	7.365	SF
SLW Ranch State B14-685 - Original Drilling - Prelim - R	2,000.0	2,001.0	109.3	95.4	7.876	CC, ES
SLW Ranch State B14-685 - Original Drilling - Prelim - R	17,621.4	17,869.2	2,070.4	1,786.9	7.303	SF

Noble Energy, Inc.

Anticollision Summary Report

Company:	Northern Region - DJ Basin	**Local Co-ordinate Reference:**	Well SLW Ranch State B14-653
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4619.0ft
Reference Site:	BB Section 18	**MD Reference:**	WELL @ 4619.0ft
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	SLW Ranch State B14-653	**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 @ 4619.0ft	Coordinates are relative to: SLW Ranch State B14-653
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.5000000	Grid Convergence at Surface is: 0.65°



CC - Min centre to center distance or covergent 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 B14-653
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4619.0ft
Reference Site:	BB Section 18	**MD Reference:**	WELL @ 4619.0ft
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	SLW Ranch State B14-653	**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 @ 4619.0ft
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: SLW Ranch State B14-653
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.65°