

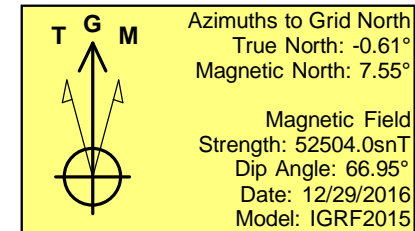
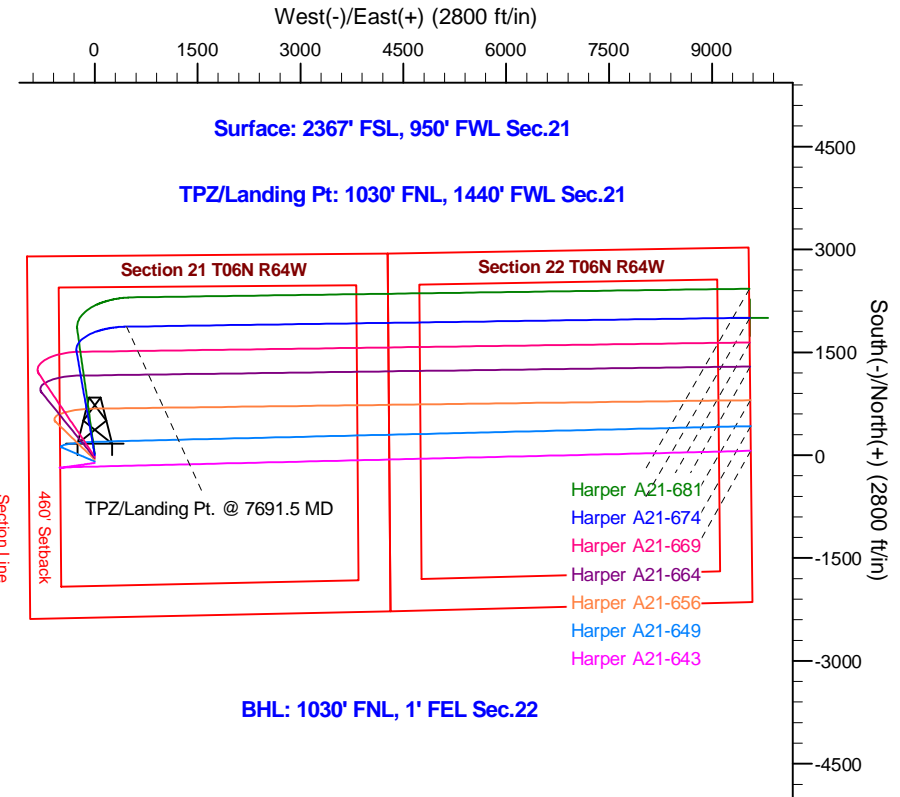
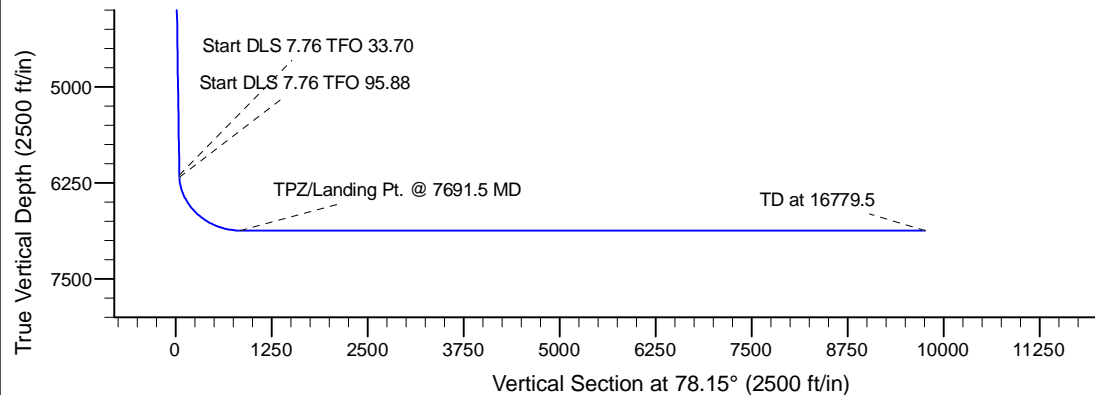
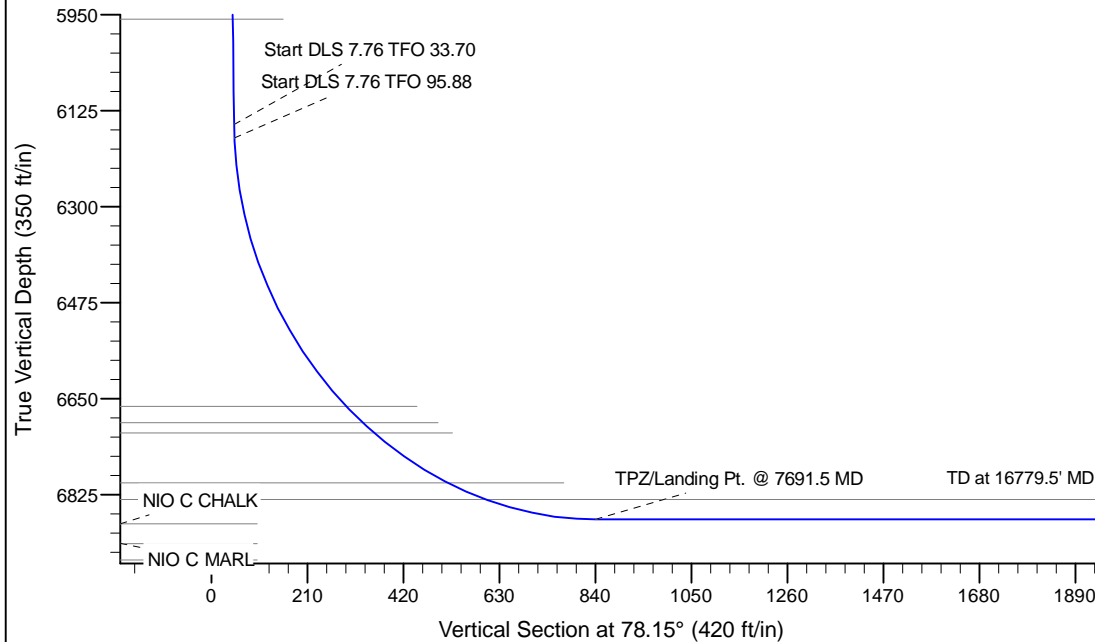
Project: Wells Ranch
 Site: A Section 21-T6N-R64W Weld County, CO
 Well: Harper A21-674
 Wellbore: Original Drilling
 Design: APD - Rev 0

Northern Region - DJ Basin

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Northern Zone
 System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2200.0	0.00	0.00	2200.0	0.0	0.0	0.00	0.00	0.0	
3	3437.5	24.75	350.00	3399.4	259.2	-45.7	2.00	350.00	8.5	
4	6466.3	24.75	350.00	6150.0	1507.9	-265.9	0.00	0.00	49.5	
5	6493.5	26.53	352.62	6174.5	1519.6	-267.7	7.76	33.70	50.2	
6	7691.5	90.00	89.18	6870.0	1875.0	465.0	7.76	95.88	840.2	
7	16779.5	90.00	89.18	6870.0	2004.8	9552.1	0.00	0.00	9760.2	Harper A21-674 BHL 1030'FNL, 1'FEL



WELL DETAILS: Harper A21-674

Northing		Easting		Ground Elevation: 4743.0		Longitude	
0.0		0.0		Latitude		-104.5611700	
1415717.29	3261196.12	40.4707500					

Plan: APD - Rev 0 (Harper A21-674/Original Drilling)

Created By: Shailey Jewell Date: 10:02, January 03 2017

OK to submit with 2A as per Noble Drilling
1/3/2017 10:22

Northern Region - DJ Basin

Wells Ranch

A Section 21

Harper A21-674

Original Drilling

APD - Rev 0

Anticollision Summary Report

03 January, 2017

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-674
Project:	Wells Ranch	TVD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-674	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Produccction
Reference Design:	APD - Rev 0	Offset TVD Reference:	Offset Datum

Reference	APD - Rev 0		
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:	2.79 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	1/3/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	16,779.5	APD - Rev 0 (Original Drilling)	MWD+IFR1+MS_WY	Fixed:v2:Rockies, crustal dec + 3-axis correction

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						
A Section 19						
Anderson 03-19 (PA) - Original Drilling - Original Drilling -	6,555.7	6,130.2	9,156.1	8,957.5	46.092	CC
Anderson 03-19 (PA) - Original Drilling - Original Drilling -	6,600.0	6,169.8	9,157.5	8,957.5	45.787	ES
Anderson 03-19 (PA) - Original Drilling - Original Drilling -	7,200.0	6,628.8	9,423.0	9,207.4	43.713	SF
Ley 07-19 - Original Drilling - Original Drilling - As Drilled	6,511.2	6,170.2	8,017.0	7,974.5	188.605	CC, ES
Ley 07-19 - Original Drilling - Original Drilling - As Drilled	7,100.0	6,638.4	8,241.6	8,195.2	177.794	SF
Ley 08-19 - Original Drilling - Original Drilling - As Drilled	6,500.9	6,100.0	6,826.4	6,784.2	161.411	CC, ES
Ley 08-19 - Original Drilling - Original Drilling - As Drilled	7,100.0	6,588.6	7,059.6	7,013.4	152.702	SF
Luppens 05-19 - Original Drilling - Original Drilling - As D						Out of range
Roth 11-19 - Original Drilling - Original Drilling - As Drilled	4,704.9	4,287.6	9,520.4	9,492.7	343.396	CC
Roth 11-19 - Original Drilling - Original Drilling - As Drilled	4,900.0	4,412.8	9,521.2	9,492.1	326.850	ES
Roth 11-19 - Original Drilling - Original Drilling - As Drilled	7,300.0	6,659.2	9,963.9	9,908.5	179.979	SF
Roth 14-19 (PA) - Original Drilling - Original Drilling - As D	2,200.0	2,101.0	9,678.3	9,613.0	148.185	CC
Roth 14-19 (PA) - Original Drilling - Original Drilling - As D	4,000.0	3,811.2	9,701.9	9,582.1	80.974	ES
Roth 14-19 (PA) - Original Drilling - Original Drilling - As D	6,900.0	6,426.1	9,976.5	9,767.8	47.800	SF
Roth 19-19 - Original Drilling - Original Drilling - As Drilled	102.0	0.0	9,590.5	9,590.4	10,000.000	CC
Roth 19-19 - Original Drilling - Original Drilling - As Drilled	400.0	241.4	9,590.9	9,589.4	6,290.373	ES
Roth 19-19 - Original Drilling - Original Drilling - As Drilled	3,900.0	1,200.0	9,995.1	9,978.2	594.372	SF
Roth 22-19 - Original Drilling - Original Drilling - As Drilled	102.0	0.0	9,558.3	9,558.2	10,000.000	CC
Roth 22-19 - Original Drilling - Original Drilling - As Drilled	200.0	61.8	9,558.5	9,558.0	10,000.000	ES
Roth 22-19 - Original Drilling - Original Drilling - As Drilled	7,000.0	6,550.2	9,982.3	9,934.6	208.978	SF
Roth 23-19 - Original Drilling - Original Drilling - As Drilled	3,448.4	3,300.0	9,161.3	9,140.8	448.338	CC
Roth 23-19 - Original Drilling - Original Drilling - As Drilled	3,500.0	3,300.0	9,161.4	9,140.7	443.696	ES
Roth 23-19 - Original Drilling - Original Drilling - As Drilled	7,250.0	6,619.4	9,918.1	9,871.0	210.771	SF
Roth 25-19 - Original Drilling - Original Drilling - As Drilled	6,480.4	6,259.6	8,819.1	8,775.4	201.903	CC
Roth 25-19 - Original Drilling - Original Drilling - As Drilled	6,493.5	6,267.5	8,819.2	8,775.4	201.457	ES
Roth 25-19 - Original Drilling - Original Drilling - As Drilled	7,150.0	6,878.3	9,095.4	9,047.3	189.094	SF
Roth A19-12 - Original Drilling - Original Drilling - As Drill						Out of range
Roth A19-13 (PA) - Original Drilling - Original Drilling - As						Out of range
Weber 04-19 (PA) - Original Drilling - Original Drilling - As						Out of range
Winter 09-19 - Original Drilling - Original Drilling - As Drill	5,242.6	5,180.4	6,967.2	6,934.3	211.952	CC
Winter 09-19 - Original Drilling - Original Drilling - As Drill	5,300.0	5,200.0	6,967.3	6,934.0	209.531	ES
Winter 09-19 - Original Drilling - Original Drilling - As Drill	7,200.0	7,200.0	7,368.9	7,321.1	154.117	SF
Winter 15-19 - Original Drilling - Original Drilling - As Drill	2,200.0	2,101.0	8,564.3	8,498.9	131.128	CC
Winter 15-19 - Original Drilling - Original Drilling - As Drill	3,437.5	3,300.4	8,579.3	8,476.4	83.354	ES
Winter 15-19 - Original Drilling - Original Drilling - As Drill	7,150.0	6,601.0	9,089.7	8,875.5	42.430	SF
Winter 15-19-0 (PA) - Original Drilling - Original Drilling -	2,200.0	2,103.0	8,574.8	8,509.4	131.177	CC
Winter 15-19-0 (PA) - Original Drilling - Original Drilling -	3,300.0	3,176.2	8,587.9	8,489.0	86.833	ES

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

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-674
Project:	Wells Ranch	TVD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-674	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	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
A Section 19						
Winter 15-19-0 (PA) - Original Drilling - Original Drilling -	4,200.0	3,994.8	8,624.0	8,498.1	68.464	SF
Winters 10-19 - Original Drilling - Original Drilling - As Dr	252.1	159.1	8,507.1	8,506.2	9,960.512	CC
Winters 10-19 - Original Drilling - Original Drilling - As Dr	5,900.0	5,500.0	8,537.7	8,500.1	227.462	ES
Winters 10-19 - Original Drilling - Original Drilling - As Dr	7,300.0	7,300.0	8,969.2	8,920.7	184.814	SF
A Section 20						
Foe 16-20 - Original Drilling - Original Drilling - As Drilled	2,244.5	2,204.0	2,382.0	2,369.9	196.381	CC, ES
Foe 16-20 - Original Drilling - Original Drilling - As Drilled	6,700.0	6,295.5	3,611.0	3,569.6	87.179	SF
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	531.2	478.2	2,915.9	2,913.3	1,158.642	CC
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	600.0	533.4	2,916.0	2,913.1	1,017.477	ES
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	6,700.0	6,272.1	3,443.8	3,400.8	80.059	SF
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	2,200.0	2,127.0	3,504.5	3,438.5	53.068	CC
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	2,400.0	2,326.8	3,507.3	3,435.1	48.553	ES
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	6,850.0	6,412.1	4,517.9	4,311.4	21.881	SF
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	355.6	311.6	1,490.2	1,488.7	946.210	CC
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	800.0	749.1	1,492.2	1,488.2	372.240	ES
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	6,500.0	6,142.3	2,163.8	2,123.0	53.030	SF
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	355.7	283.7	7,326.8	7,325.3	4,919.712	CC
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	2,300.0	2,213.9	7,329.8	7,317.5	594.545	ES
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	7,400.0	6,809.4	8,079.6	8,017.0	129.025	SF
Simmons 42-20D - Original Drilling - Original Drilling - As	5,554.4	5,294.2	1,396.8	1,359.1	37.035	CC
Simmons 42-20D - Original Drilling - Original Drilling - As	5,600.0	5,338.2	1,396.9	1,358.8	36.668	ES
Simmons 42-20D - Original Drilling - Original Drilling - As	6,600.0	6,292.9	1,455.4	1,409.1	31.433	SF
Snider 1-20EG - Original Drilling - Original Drilling - As D	2,232.5	2,172.8	4,615.0	4,603.0	383.985	CC
Snider 1-20EG - Original Drilling - Original Drilling - As D	2,300.0	2,234.6	4,615.2	4,602.8	372.791	ES
Snider 1-20EG - Original Drilling - Original Drilling - As D	7,200.0	7,200.0	5,573.2	5,526.7	119.948	SF
Stump A20-11 - Original Drilling - Original Drilling - As Dr	3,608.8	3,556.9	4,474.1	4,453.9	222.202	CC
Stump A20-11 - Original Drilling - Original Drilling - As Dr	3,900.0	3,829.8	4,475.7	4,453.5	201.697	ES
Stump A20-11 - Original Drilling - Original Drilling - As Dr	6,850.0	6,438.3	4,771.5	4,726.8	106.772	SF
Stump A20-12 - Original Drilling - Original Drilling - As Dr	4,481.2	4,292.9	5,405.5	5,379.1	205.130	CC
Stump A20-12 - Original Drilling - Original Drilling - As Dr	4,600.0	4,377.5	5,405.9	5,378.7	198.723	ES
Stump A20-12 - Original Drilling - Original Drilling - As Dr	7,050.0	6,724.2	5,682.9	5,636.6	122.766	SF
Stump A20-13 - Original Drilling - Original Drilling - As Dr	2,578.2	2,630.8	5,854.2	5,840.0	411.603	CC
Stump A20-13 - Original Drilling - Original Drilling - As Dr	2,600.0	2,648.4	5,854.2	5,839.9	408.391	ES
Stump A20-13 - Original Drilling - Original Drilling - As Dr	6,950.0	6,470.9	6,446.5	6,401.5	143.562	SF
Winter 20-19 - Original Drilling - Original Drilling - As Dril	449.4	380.5	7,387.0	7,384.9	3,628.440	CC
Winter 20-19 - Original Drilling - Original Drilling - As Dril	1,100.0	1,000.0	7,387.9	7,382.2	1,307.907	ES
Winter 20-19 - Original Drilling - Original Drilling - As Dril	7,000.0	6,715.2	7,774.7	7,728.0	166.607	SF
Winter 24-19 - Original Drilling - Original Drilling - As Dril	6,305.4	6,319.8	7,110.2	7,058.9	138.427	CC
Winter 24-19 - Original Drilling - Original Drilling - As Dril	6,466.3	6,433.1	7,110.9	7,058.4	135.491	ES
Winter 24-19 - Original Drilling - Original Drilling - As Dril	7,000.0	6,871.3	7,292.7	7,237.1	131.073	SF
Winter 39-19 - Original Drilling - Original Drilling - As Dril	3,966.6	4,263.8	6,435.0	6,409.7	253.855	CC, ES
Winter 39-19 - Original Drilling - Original Drilling - As Dril	6,950.0	6,610.6	6,806.7	6,760.4	146.968	SF
Winter 40-19 - Original Drilling - Original Drilling - As Dril	5,908.8	6,100.0	6,084.2	6,037.5	130.271	CC
Winter 40-19 - Original Drilling - Original Drilling - As Dril	6,000.0	6,137.1	6,084.6	6,037.4	128.785	ES
Winter 40-19 - Original Drilling - Original Drilling - As Dril	6,900.0	6,857.3	6,228.7	6,175.9	117.806	SF

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

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-674
Project:	Wells Ranch	TVD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-674	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	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
A Section 21						
Culbreath 23-21 - Original Drilling - Original Drilling - As D	2,231.2	2,196.6	1,319.1	1,306.9	108.013	CC, ES
Culbreath 23-21 - Original Drilling - Original Drilling - As D	9,000.0	6,816.3	2,248.3	2,190.0	38.569	SF
Culbreath 33-21 (PA) - Original Drilling - Original Drilling	9,501.8	6,815.0	2,302.9	2,059.9	9.477	CC, ES
Culbreath 33-21 (PA) - Original Drilling - Original Drilling	9,700.0	6,815.0	2,311.4	2,066.2	9.429	SF
Harper A21-618 - Original Drilling - APD - Rev 0	2,000.0	1,984.0	1,516.5	1,504.4	125.497	CC
Harper A21-618 - Original Drilling - APD - Rev 0	2,100.0	2,065.0	1,517.0	1,504.4	120.097	ES
Harper A21-618 - Original Drilling - APD - Rev 0	16,779.5	16,708.2	3,636.3	3,261.0	9.688	SF
Harper A21-626 - Original Drilling - APD - Rev 0	2,200.0	2,184.0	1,491.0	1,477.7	111.786	CC, ES
Harper A21-626 - Original Drilling - APD - Rev 0	16,779.5	16,776.3	3,111.2	2,735.4	8.278	SF
Harper A21-631 - Original Drilling - APD - Rev 0	2,200.0	2,184.0	1,469.2	1,455.9	110.148	CC
Harper A21-631 - Original Drilling - APD - Rev 0	2,300.0	2,319.5	1,469.9	1,455.8	104.507	ES
Harper A21-631 - Original Drilling - APD - Rev 0	16,779.5	16,721.6	2,737.1	2,361.7	7.291	SF
Harper A21-637 - Original Drilling - APD - Rev 0	2,707.3	2,938.8	1,397.3	1,380.1	81.091	CC, ES
Harper A21-637 - Original Drilling - APD - Rev 0	16,779.5	16,571.3	2,360.7	1,987.9	6.333	SF
Harper A21-643 - Original Drilling - APD - Rev 0	2,000.0	1,998.0	112.9	100.8	9.312	CC
Harper A21-643 - Original Drilling - APD - Rev 0	2,100.0	2,097.5	113.2	100.4	8.888	ES
Harper A21-643 - Original Drilling - APD - Rev 0	16,779.5	16,636.4	1,943.5	1,569.9	5.202	SF
Harper A21-649 - Original Drilling - APD - Rev 0	2,200.0	2,201.0	91.1	77.7	6.801	CC, ES
Harper A21-649 - Original Drilling - APD - Rev 0	16,779.5	16,731.8	1,581.1	1,206.2	4.217	SF
Harper A21-656 - Original Drilling - APD - Rev 0	2,200.0	2,201.0	65.6	52.2	4.897	CC, ES
Harper A21-656 - Original Drilling - APD - Rev 0	16,779.5	16,804.8	1,204.8	830.5	3.219	SF
Harper A21-664 - Original Drilling - APD - Rev 0	2,200.0	2,201.0	43.7	30.3	3.264	CC, ES
Harper A21-664 - Original Drilling - APD - Rev 0	16,779.5	17,315.6	829.9	476.4	2.348	SF
Harper A21-669 - Original Drilling - APD - Rev 0	2,200.0	2,200.0	21.9	8.5	1.632	CC
Harper A21-669 - Original Drilling - APD - Rev 0	16,779.5	17,287.9	370.5	1.7	1.005	Level 2, ES, SF
Harper A21-681 - Original Drilling - APD - Rev 0	2,000.0	2,001.0	21.9	9.7	1.801	CC, ES
Harper A21-681 - Original Drilling - APD - Rev 0	16,779.5	16,828.2	429.4	57.1	1.153	Level 2, SF
Kona A19-616 - Original Drilling - APD - Rev 0	1,900.0	1,880.0	1,518.5	1,507.0	132.679	CC, ES
Kona A19-616 - Original Drilling - APD - Rev 0	10,000.0	6,300.0	4,428.4	4,361.0	65.722	SF
Kona A19-624 - Original Drilling - APD - Rev 0	2,200.0	2,180.0	1,496.6	1,483.3	112.311	CC, ES
Kona A19-624 - Original Drilling - APD - Rev 0	9,300.0	6,800.0	3,645.7	3,582.3	57.495	SF
Kona A19-630 - Original Drilling - APD - Rev 0	2,431.0	2,530.3	1,467.6	1,452.5	97.273	CC, ES
Kona A19-630 - Original Drilling - APD - Rev 0	6,550.0	7,385.1	2,674.2	2,624.8	54.047	SF
Kona A19-636 - Original Drilling - APD - Rev 0	2,588.0	2,769.3	1,414.2	1,397.8	86.384	CC
Kona A19-636 - Original Drilling - APD - Rev 0	2,600.0	2,781.0	1,414.2	1,397.8	85.966	ES
Kona A19-636 - Original Drilling - APD - Rev 0	6,550.0	7,806.5	2,341.0	2,287.4	43.742	SF
Kona A19-640 - Original Drilling - APD - Rev 0	1,900.0	1,898.0	187.9	176.4	16.342	CC, ES
Kona A19-640 - Original Drilling - APD - Rev 0	2,200.0	2,179.3	202.1	188.9	15.335	SF
Kona A19-646 - Original Drilling - APD - Rev 0	2,200.0	2,201.0	175.7	162.3	13.119	CC, ES
Kona A19-646 - Original Drilling - APD - Rev 0	2,500.0	2,501.5	186.3	171.0	12.202	SF
Kona A19-652 - Original Drilling - APD - Rev 0	2,200.0	2,201.0	163.9	150.5	12.241	CC, ES
Kona A19-652 - Original Drilling - APD - Rev 0	2,500.0	2,501.5	173.0	157.7	11.332	SF
Kona A19-662 - Original Drilling - APD - Rev 0	2,100.0	2,101.0	150.2	137.5	11.770	CC
Kona A19-662 - Original Drilling - APD - Rev 0	2,200.0	2,199.7	150.7	137.3	11.256	ES
Kona A19-662 - Original Drilling - APD - Rev 0	2,600.0	2,593.1	165.6	149.7	10.471	SF
Kona A19-670 - Original Drilling - APD - Rev 0	1,900.0	1,901.0	151.8	140.3	13.190	CC
Kona A19-670 - Original Drilling - APD - Rev 0	2,000.0	1,999.3	152.4	140.2	12.561	ES
Kona A19-670 - Original Drilling - APD - Rev 0	7,151.6	7,208.3	217.2	162.5	3.967	SF
Kona A19-679 - Original Drilling - APD - Rev 0	2,200.0	2,200.0	156.5	143.1	11.687	CC
Kona A19-679 - Original Drilling - APD - Rev 0	7,888.9	7,508.3	167.6	103.5	2.616	ES, SF
Kona A19-685 - Original Drilling - APD - Rev 0	2,200.0	2,200.0	151.8	138.4	11.340	CC
Kona A19-685 - Original Drilling - APD - Rev 0	2,300.0	2,300.0	152.4	138.3	10.872	ES
Kona A19-685 - Original Drilling - APD - Rev 0	8,200.0	7,327.2	413.3	345.2	6.066	SF

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

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-674
Project:	Wells Ranch	TVD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-674	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Producction
Reference Design:	APD - Rev 0	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						
A Section 21						
McKee 12-21 (PA) - Original Drilling - Original Drilling - A	4,547.6	4,388.5	239.4	100.6	1.725	CC
McKee 12-21 (PA) - Original Drilling - Original Drilling - A	4,600.0	4,436.1	240.4	100.0	1.712	ES, SF
McKee 21-21 (PA) - Original Drilling - Original Drilling - A	8,428.5	6,867.0	152.8	-75.6	0.669	Level 1, CC, ES, SF
McKee 22-21 - Original Drilling - Original Drilling - As Dril	8,237.5	6,844.6	1,047.1	995.4	20.253	CC, ES
McKee 22-21 - Original Drilling - Original Drilling - As Dril	8,300.0	6,844.9	1,049.0	997.0	20.179	SF
McKee 31-21 - Original Drilling - Original Drilling - As Dril	9,476.0	6,884.5	522.3	453.7	7.613	CC
McKee 31-21 - Original Drilling - Original Drilling - As Dril	9,500.0	6,883.9	522.8	453.4	7.525	ES
McKee 31-21 - Original Drilling - Original Drilling - As Dril	9,600.0	6,881.6	536.8	464.5	7.427	SF
McKee 32-21 - Original Drilling - Original Drilling - As Dril	9,481.7	6,824.9	1,020.3	951.0	14.726	CC, ES
McKee 32-21 - Original Drilling - Original Drilling - As Dril	9,500.0	6,824.9	1,020.5	951.1	14.711	SF
McKee 41-21 - Original Drilling - Original Drilling - As Dril	10,774.1	6,824.9	465.3	373.6	5.076	CC
McKee 41-21 - Original Drilling - Original Drilling - As Dril	10,800.0	6,825.1	466.0	373.3	5.025	ES, SF
McKee 42-21 - Original Drilling - Original Drilling - As Dril	10,839.3	6,806.7	1,197.0	1,104.3	12.911	CC, ES
McKee 42-21 - Original Drilling - Original Drilling - As Dril	10,900.0	6,806.6	1,198.5	1,105.4	12.878	SF
Sexton 43-21 (PA) - Original Drilling - Original Drilling - A	10,792.2	6,807.0	2,076.2	1,811.2	7.837	CC
Sexton 43-21 (PA) - Original Drilling - Original Drilling - A	10,800.0	6,807.0	2,076.2	1,811.2	7.834	ES
Sexton 43-21 (PA) - Original Drilling - Original Drilling - A	10,900.0	6,807.0	2,079.0	1,812.9	7.813	SF
Wells Trust 13-21 - Original Drilling - Original Drilling - As	100.0	55.9	669.2	669.0	3,633.866	CC
Wells Trust 13-21 - Original Drilling - Original Drilling - As	1,400.0	1,355.4	670.2	662.9	91.005	ES
Wells Trust 13-21 - Original Drilling - Original Drilling - As	3,200.0	3,137.9	814.1	796.5	46.451	SF
Wells Trust 14-21 - Original Drilling - Original Drilling - As	2,217.7	2,169.1	1,840.6	1,828.6	152.599	CC, ES
Wells Trust 14-21 - Original Drilling - Original Drilling - As	8,900.0	6,814.5	4,243.0	4,190.7	81.201	SF
Wells Trust 24-21 - Original Drilling - Original Drilling - As	2,220.1	2,163.3	1,743.7	1,731.7	145.648	CC, ES
Wells Trust 24-21 - Original Drilling - Original Drilling - As	9,500.0	6,833.7	4,032.7	3,972.8	67.291	SF

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-674
Project:	Wells Ranch	TVD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-674	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Produccction
Reference Design:	APD - Rev 0	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						
A Section 22						
Carpio 22-01 - Original Drilling - Original Drilling - As Dril	16,096.1	6,746.1	3,437.9	3,248.2	18.119	CC
Carpio 22-01 - Original Drilling - Original Drilling - As Dril	16,100.0	6,746.1	3,437.9	3,248.1	18.114	ES
Carpio 22-01 - Original Drilling - Original Drilling - As Dril	16,600.0	6,754.0	3,474.7	3,279.3	17.785	SF
Carpio 22-04-19 - Original Drilling - Original Drilling - As D	14,609.3	6,913.5	2,863.3	2,693.9	16.910	CC, ES
Carpio 22-04-19 - Original Drilling - Original Drilling - As D	15,000.0	6,912.5	2,889.8	2,716.3	16.658	SF
Carpio 22-41 - Original Drilling - Original Drilling - As Dril	16,254.1	6,785.0	2,413.1	2,184.3	10.546	CC
Carpio 22-41 - Original Drilling - Original Drilling - As Dril	16,300.0	6,784.8	2,413.5	2,184.1	10.522	ES
Carpio 22-41 - Original Drilling - Original Drilling - As Dril	16,400.0	6,784.4	2,417.5	2,187.1	10.492	SF
Carpio 22-43 - Original Drilling - Original Drilling - As Dril	14,776.4	6,837.6	3,465.0	3,300.1	21.007	CC
Carpio 22-43 - Original Drilling - Original Drilling - As Dril	14,800.0	6,838.1	3,465.1	3,299.8	20.963	ES
Carpio 22-43 - Original Drilling - Original Drilling - As Dril	15,300.0	6,848.4	3,504.3	3,333.2	20.482	SF
Carpio 22-45 - Original Drilling - Original Drilling - As Dril	15,746.4	6,869.4	3,017.9	2,834.6	16.456	CC
Carpio 22-45 - Original Drilling - Original Drilling - As Dril	15,800.0	6,870.1	3,018.4	2,834.3	16.393	ES
Carpio 22-45 - Original Drilling - Original Drilling - As Dril	16,100.0	6,873.5	3,038.6	2,851.3	16.221	SF
Eisenstat 22-11 (PA) - Original Drilling - Original Drilling -	16,124.1	6,821.0	566.2	202.2	1.556	CC, ES, SF
Eisenstat 22-13 - Original Drilling - Original Drilling - As D	14,661.4	6,862.1	1,332.0	1,169.1	8.175	CC, ES
Eisenstat 22-13 - Original Drilling - Original Drilling - As D	14,700.0	6,862.4	1,332.6	1,169.4	8.165	SF
Eisenstat 22-15 - Original Drilling - Original Drilling - As D	15,470.5	6,837.6	100.9	-77.2	0.566	Level 1, CC, ES, SF
Eisenstat 22-21 - Original Drilling - Original Drilling - As D	13,666.1	6,851.8	164.5	20.5	1.143	Level 2, CC, ES, SF
Eisenstat 22-23 - Original Drilling - Original Drilling - As D	12,258.3	6,833.2	815.5	697.4	6.904	CC, ES, SF
Gill Land Assoc. 1 (PA) - Original Drilling - Original Drillin	16,117.6	6,822.0	952.6	588.7	2.618	CC, ES, SF
Gill Land Assoc. 22-02 (PA) - Original Drilling - Original D	13,441.9	6,832.0	989.0	674.9	3.149	CC, ES, SF
Gill Land Assoc. 22-03 - Original Drilling - Original Drilling	12,153.2	6,841.5	298.8	182.2	2.564	CC, ES
Gill Land Assoc. 22-03 - Original Drilling - Original Drilling	12,200.0	6,841.5	302.4	184.1	2.557	SF
Gill Land Assoc. 22-04 (PA) - Original Drilling - Original D	14,734.5	6,830.0	332.7	-5.5	0.984	Level 1, CC, ES, SF
Gruen 22-01 - Original Drilling - Original Drilling - As Drill	12,096.2	6,821.2	2,266.8	2,151.9	19.719	CC
Gruen 22-01 - Original Drilling - Original Drilling - As Drill	12,100.0	6,821.2	2,266.8	2,151.8	19.711	ES
Gruen 22-01 - Original Drilling - Original Drilling - As Drill	12,400.0	6,819.5	2,287.1	2,169.1	19.382	SF
Gruen 22-02 - Original Drilling - Original Drilling - As Drill	13,401.3	6,783.4	3,549.2	3,410.2	25.550	CC
Gruen 22-02 - Original Drilling - Original Drilling - As Drill	13,500.0	6,781.5	3,550.5	3,410.2	25.304	ES
Gruen 22-02 - Original Drilling - Original Drilling - As Drill	14,100.0	6,769.0	3,617.2	3,470.4	24.635	SF
Gruen 22-31 - Original Drilling - Original Drilling - As Drill	13,420.6	6,830.1	2,250.6	2,111.1	16.133	CC, ES
Gruen 22-31 - Original Drilling - Original Drilling - As Drill	13,700.0	6,828.9	2,267.8	2,125.7	15.958	SF
Gruen 22-33 - Original Drilling - Original Drilling - As Drill	12,135.0	6,733.6	3,523.7	3,408.4	30.561	CC
Gruen 22-33 - Original Drilling - Original Drilling - As Drill	12,200.0	6,734.6	3,524.3	3,408.1	30.320	ES
Gruen 22-33 - Original Drilling - Original Drilling - As Drill	13,000.0	6,746.8	3,628.3	3,503.2	29.012	SF
Gruen 22-35 - Original Drilling - Original Drilling - As Drill	12,747.3	6,806.2	2,992.6	2,865.4	23.527	CC
Gruen 22-35 - Original Drilling - Original Drilling - As Drill	12,800.0	6,806.4	2,993.0	2,865.1	23.398	ES
Gruen 22-35 - Original Drilling - Original Drilling - As Drill	13,300.0	6,806.1	3,043.2	2,910.1	22.860	SF
Ottinger 22-01 - Original Drilling - Original Drilling - As Dr	14,773.9	6,810.4	2,140.8	1,976.1	12.998	CC
Ottinger 22-01 - Original Drilling - Original Drilling - As Dr	14,800.0	6,810.4	2,141.0	1,976.0	12.974	ES
Ottinger 22-01 - Original Drilling - Original Drilling - As Dr	15,000.0	6,811.0	2,152.8	1,986.0	12.914	SF

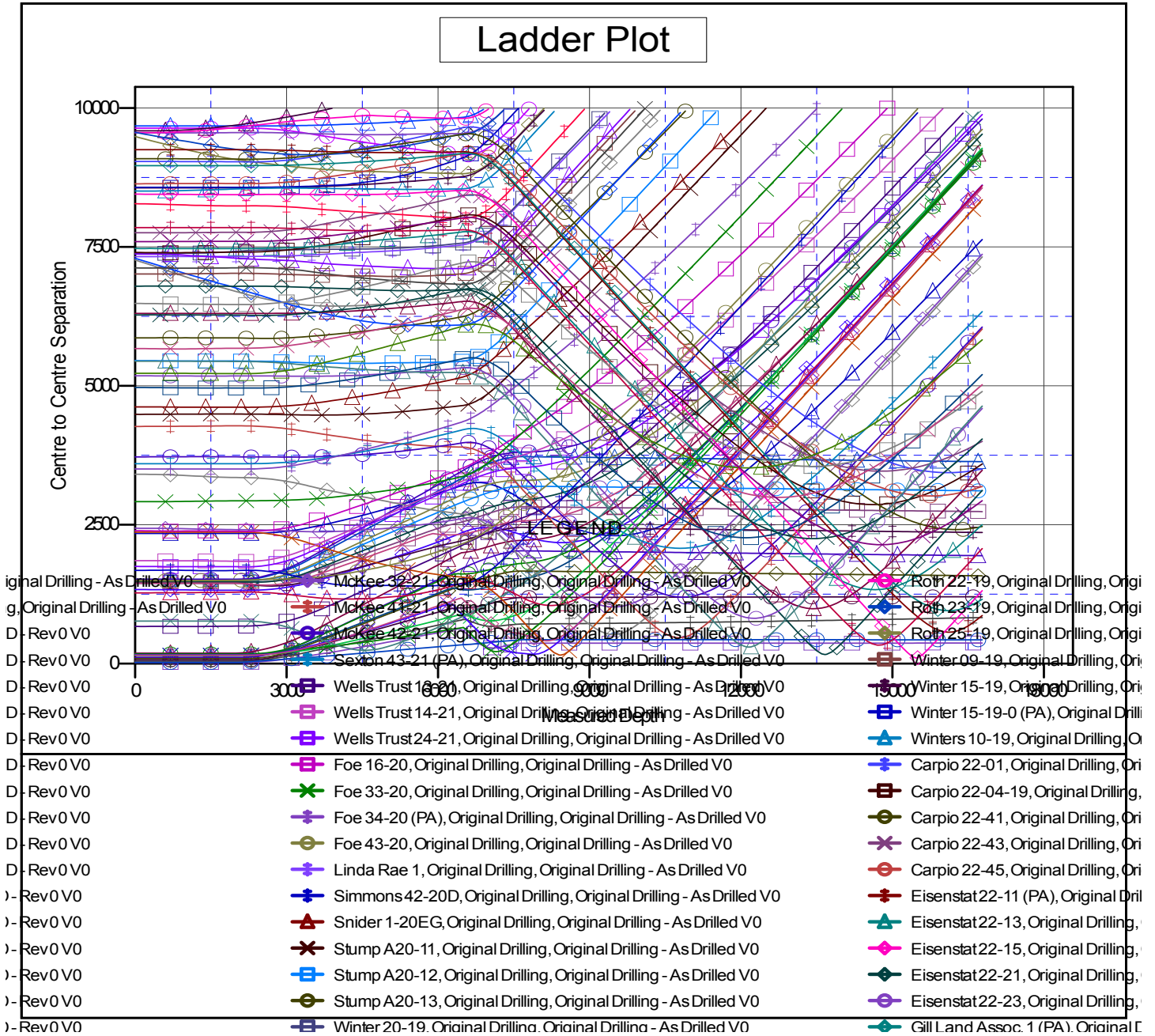
Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-674
Project:	Wells Ranch	TVD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-674	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	Offset TVD Reference:	Offset Datum

Coordinates are relative to: Harper A21-674

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.61°



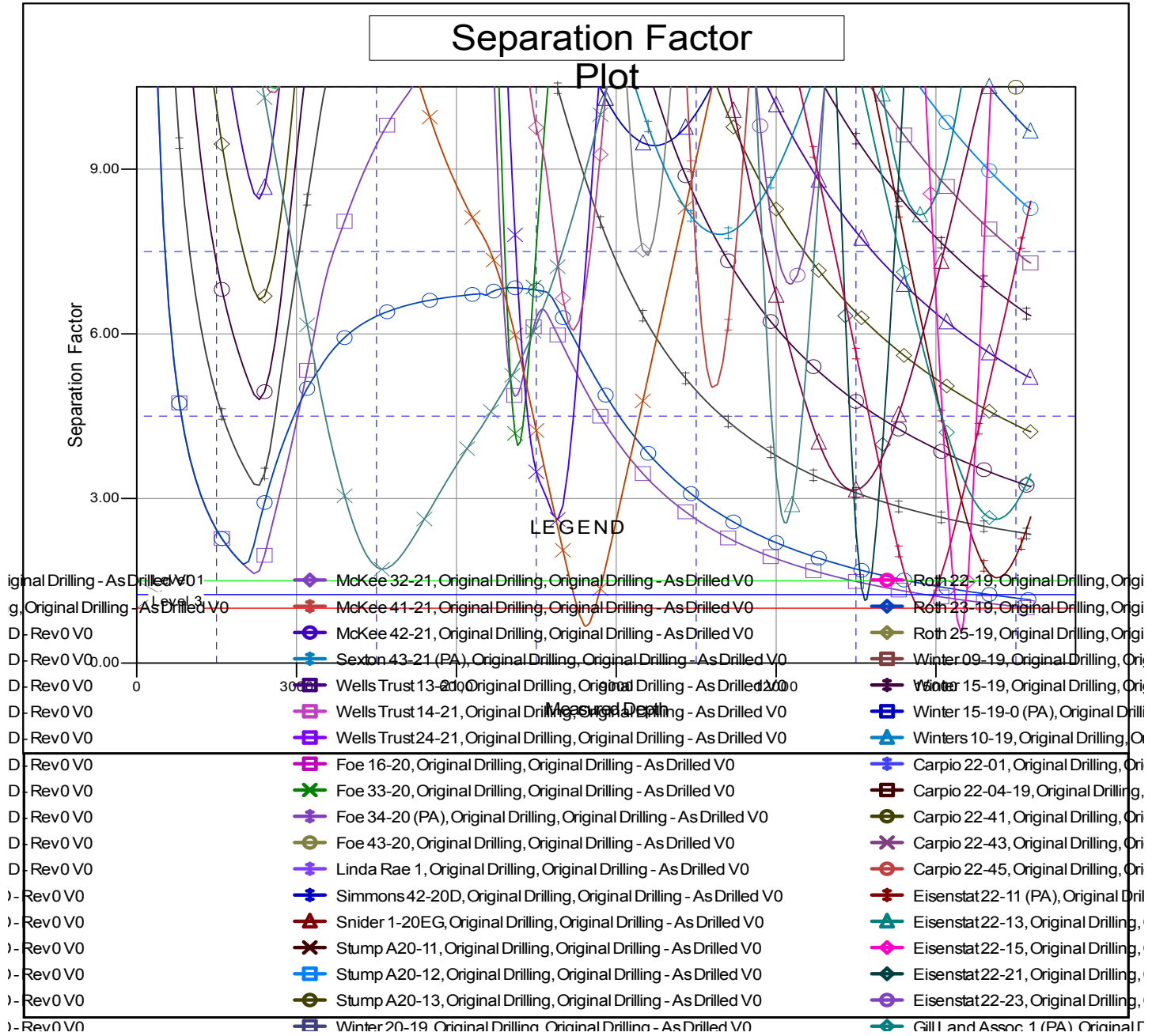
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-674
Project:	Wells Ranch	TVD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4773.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-674	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4773.0ft (Original Well Elev.)
 Offset Depths are relative to Offset Datum
 Central Meridian is -105.5000000

Coordinates are relative to: Harper A21-674
 Coordinate System is US State Plane 1983, Colorado Northern Zone
 Grid Convergence at Surface is: 0.61°



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