

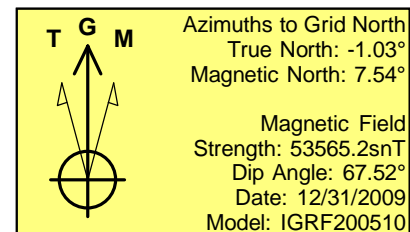
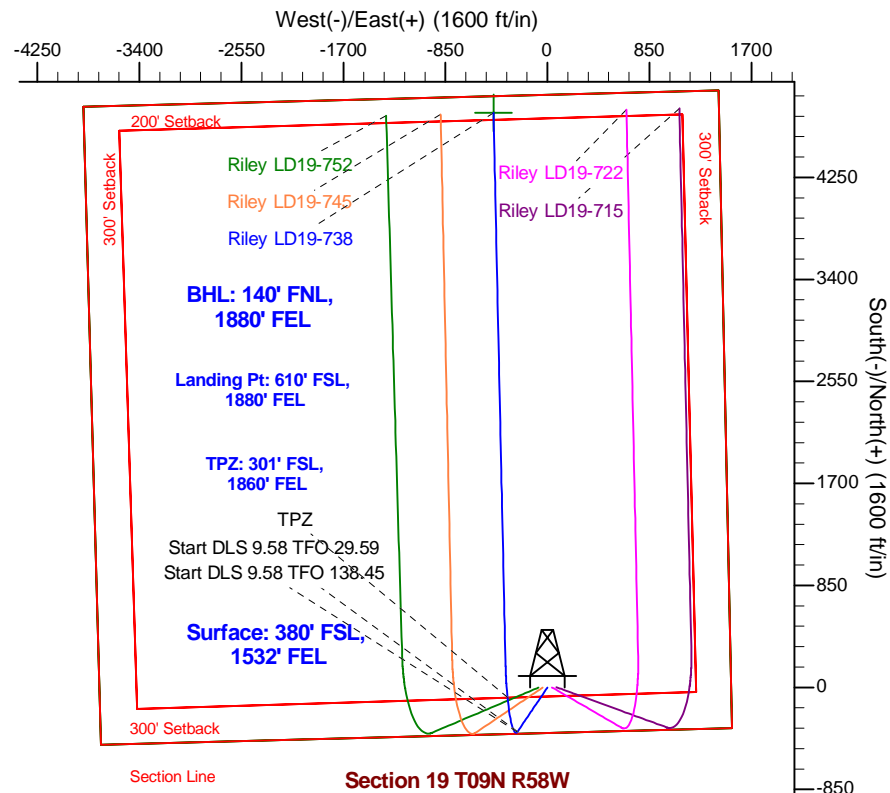
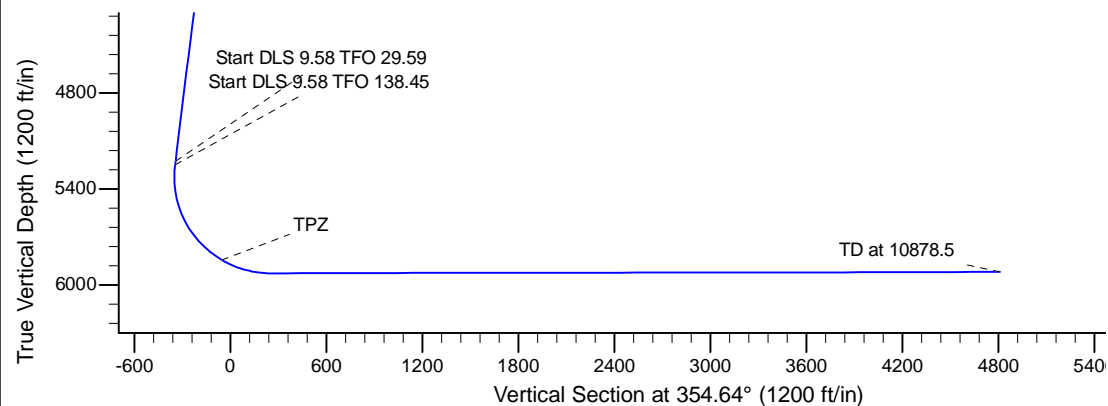
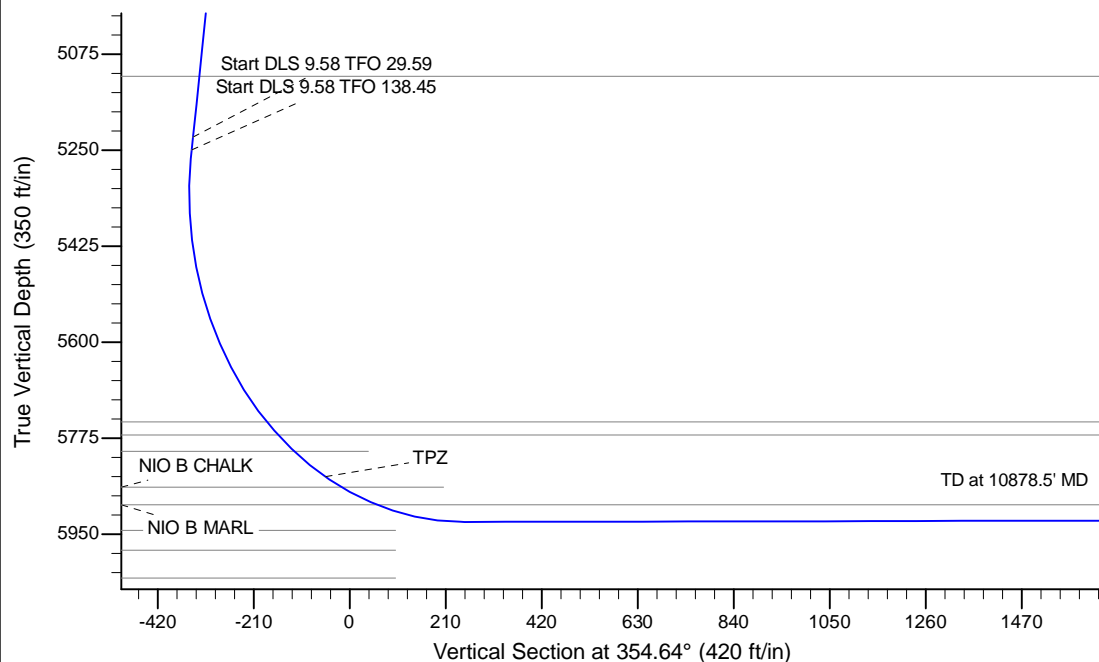
Project: Wattenberg Field
Site: LD (Sec.19-T09N-R58W) Weld County, CO
Well: Riley LD19-738
Wellbore: Original Drilling
Design: APD - Rev 1

Northern Region Drilling - Working

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	VSec	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	2650.0	9.00	214.00	2648.2	-29.2	-19.7	2.00	214.00	-27.3	
4	5260.0	9.00	214.00	5226.0	-367.7	-248.0	0.00	0.00	-342.9	
5	5283.2	10.99	219.77	5248.8	-370.9	-250.5	9.58	29.59	-345.9	
6	6310.1	90.10	358.75	5927.5	220.0	-350.0	9.58	138.45	251.7	
7	10878.5	90.10	358.76	5919.6	4787.3	-449.3	0.00	101.02	4808.4	Riley LD19-738 BHL 140'FNL, 1880'FEL



WELL DETAILS: Riley LD19-738					
Ground Level: 4820.0		Latitude		Longitude	
0.0	0.0	1512859.29	3442551.51	40.730250	-103.903140
Plan: APD - Rev 1 (Riley LD19-738/Original Drilling)					
Created By: Shailey Jewell			Date: 10:13, May 20 2016		
Checked: _____			Date: _____		
Reviewed: _____			Date: _____		
Approved: _____			Date: _____		

Northern Region Drilling - Working

Wattenberg Field

LD (09N-58W)

Riley LD19-738

Original Drilling

Plan: APD - Rev 1

Standard Planning Report

20 May, 2016

Planning Report

Database:	EDM01P	Local Co-ordinate Reference:	Well Riley LD19-738
Company:	Northern Region Drilling - Working	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site:	LD (09N-58W)	North Reference:	Grid
Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Project	Wattenberg Field, 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		Using geodetic scale factor

Site		LD (09N-58W)			
Site Position:		Northing:	1,523,557.18 usft	Latitude:	40.759270
From:	Lat/Long	Easting:	3,449,341.23 usft	Longitude:	-103.877940
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	1.05 °

Well		Riley LD19-738				
Well Position	+N/-S	-10,698.0 ft	Northing:	1,512,859.29 usft	Latitude:	40.730250
	+E/-W	-6,789.8 ft	Easting:	3,442,551.50 usft	Longitude:	-103.903140
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,820.0 ft

Wellbore	Original Drilling				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	8.58	67.52	53,565

Design	APD - Rev 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	354.64

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,650.0	9.00	214.00	2,648.2	-29.2	-19.7	2.00	2.00	0.00	214.00	
5,260.0	9.00	214.00	5,226.0	-367.7	-248.0	0.00	0.00	0.00	0.00	
5,283.2	10.99	219.77	5,248.8	-370.9	-250.5	9.58	8.56	24.85	29.59	
6,310.1	90.10	358.75	5,927.5	220.0	-350.0	9.58	7.70	13.53	138.45	
10,878.5	90.10	358.76	5,919.6	4,787.3	-449.3	0.00	0.00	0.00	101.02	Riley LD19-738 BHL

Planning Report

Database:	EDM01P	Local Co-ordinate Reference:	Well Riley LD19-738
Company:	Northern Region Drilling - Working	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site:	LD (09N-58W)	North Reference:	Grid
Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
50.0	0.00	0.00	50.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
150.0	0.00	0.00	150.0	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
250.0	0.00	0.00	250.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
350.0	0.00	0.00	350.0	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
450.0	0.00	0.00	450.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
550.0	0.00	0.00	550.0	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
650.0	0.00	0.00	650.0	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
750.0	0.00	0.00	750.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
950.0	0.00	0.00	950.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,050.0	0.00	0.00	1,050.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,150.0	0.00	0.00	1,150.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,250.0	0.00	0.00	1,250.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,350.0	0.00	0.00	1,350.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,450.0	0.00	0.00	1,450.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,550.0	0.00	0.00	1,550.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,650.0	0.00	0.00	1,650.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,750.0	0.00	0.00	1,750.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,850.0	0.00	0.00	1,850.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,950.0	0.00	0.00	1,950.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,050.0	0.00	0.00	2,050.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,150.0	0.00	0.00	2,150.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,250.0	1.00	214.00	2,250.0	-0.4	-0.2	-0.3	2.00	2.00	0.00
2,300.0	2.00	214.00	2,300.0	-1.4	-1.0	-1.3	2.00	2.00	0.00
2,350.0	3.00	214.00	2,349.9	-3.3	-2.2	-3.0	2.00	2.00	0.00
2,400.0	4.00	214.00	2,399.8	-5.8	-3.9	-5.4	2.00	2.00	0.00
2,450.0	5.00	214.00	2,449.7	-9.0	-6.1	-8.4	2.00	2.00	0.00
2,500.0	6.00	214.00	2,499.5	-13.0	-8.8	-12.1	2.00	2.00	0.00
2,550.0	7.00	214.00	2,549.1	-17.7	-11.9	-16.5	2.00	2.00	0.00
2,600.0	8.00	214.00	2,598.7	-23.1	-15.6	-21.6	2.00	2.00	0.00
2,650.0	9.00	214.00	2,648.2	-29.2	-19.7	-27.3	2.00	2.00	0.00

Planning Report

Database:	EDM01P	Local Co-ordinate Reference:	Well Riley LD19-738
Company:	Northern Region Drilling - Working	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site:	LD (09N-58W)	North Reference:	Grid
Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,700.0	9.00	214.00	2,697.5	-35.7	-24.1	-33.3	0.00	0.00	0.00
2,750.0	9.00	214.00	2,746.9	-42.2	-28.5	-39.4	0.00	0.00	0.00
2,800.0	9.00	214.00	2,796.3	-48.7	-32.8	-45.4	0.00	0.00	0.00
2,850.0	9.00	214.00	2,845.7	-55.2	-37.2	-51.5	0.00	0.00	0.00
2,900.0	9.00	214.00	2,895.1	-61.7	-41.6	-57.5	0.00	0.00	0.00
2,950.0	9.00	214.00	2,944.5	-68.1	-46.0	-63.6	0.00	0.00	0.00
3,000.0	9.00	214.00	2,993.8	-74.6	-50.3	-69.6	0.00	0.00	0.00
3,050.0	9.00	214.00	3,043.2	-81.1	-54.7	-75.6	0.00	0.00	0.00
3,100.0	9.00	214.00	3,092.6	-87.6	-59.1	-81.7	0.00	0.00	0.00
3,150.0	9.00	214.00	3,142.0	-94.1	-63.5	-87.7	0.00	0.00	0.00
3,200.0	9.00	214.00	3,191.4	-100.6	-67.8	-93.8	0.00	0.00	0.00
3,250.0	9.00	214.00	3,240.8	-107.1	-72.2	-99.8	0.00	0.00	0.00
3,300.0	9.00	214.00	3,290.1	-113.5	-76.6	-105.9	0.00	0.00	0.00
3,350.0	9.00	214.00	3,339.5	-120.0	-81.0	-111.9	0.00	0.00	0.00
3,400.0	9.00	214.00	3,388.9	-126.5	-85.3	-118.0	0.00	0.00	0.00
3,450.0	9.00	214.00	3,438.3	-133.0	-89.7	-124.0	0.00	0.00	0.00
3,500.0	9.00	214.00	3,487.7	-139.5	-94.1	-130.1	0.00	0.00	0.00
3,550.0	9.00	214.00	3,537.1	-146.0	-98.5	-136.1	0.00	0.00	0.00
3,600.0	9.00	214.00	3,586.5	-152.4	-102.8	-142.2	0.00	0.00	0.00
3,650.0	9.00	214.00	3,635.8	-158.9	-107.2	-148.2	0.00	0.00	0.00
3,700.0	9.00	214.00	3,685.2	-165.4	-111.6	-154.3	0.00	0.00	0.00
3,750.0	9.00	214.00	3,734.6	-171.9	-115.9	-160.3	0.00	0.00	0.00
3,800.0	9.00	214.00	3,784.0	-178.4	-120.3	-166.4	0.00	0.00	0.00
3,850.0	9.00	214.00	3,833.4	-184.9	-124.7	-172.4	0.00	0.00	0.00
3,900.0	9.00	214.00	3,882.8	-191.4	-129.1	-178.5	0.00	0.00	0.00
3,950.0	9.00	214.00	3,932.1	-197.8	-133.4	-184.5	0.00	0.00	0.00
4,000.0	9.00	214.00	3,981.5	-204.3	-137.8	-190.6	0.00	0.00	0.00
4,050.0	9.00	214.00	4,030.9	-210.8	-142.2	-196.6	0.00	0.00	0.00
4,100.0	9.00	214.00	4,080.3	-217.3	-146.6	-202.6	0.00	0.00	0.00
4,150.0	9.00	214.00	4,129.7	-223.8	-150.9	-208.7	0.00	0.00	0.00
4,200.0	9.00	214.00	4,179.1	-230.3	-155.3	-214.7	0.00	0.00	0.00
4,250.0	9.00	214.00	4,228.5	-236.7	-159.7	-220.8	0.00	0.00	0.00
4,300.0	9.00	214.00	4,277.8	-243.2	-164.1	-226.8	0.00	0.00	0.00
4,350.0	9.00	214.00	4,327.2	-249.7	-168.4	-232.9	0.00	0.00	0.00
4,400.0	9.00	214.00	4,376.6	-256.2	-172.8	-238.9	0.00	0.00	0.00
4,450.0	9.00	214.00	4,426.0	-262.7	-177.2	-245.0	0.00	0.00	0.00
4,500.0	9.00	214.00	4,475.4	-269.2	-181.6	-251.0	0.00	0.00	0.00
4,550.0	9.00	214.00	4,524.8	-275.7	-185.9	-257.1	0.00	0.00	0.00
4,600.0	9.00	214.00	4,574.1	-282.1	-190.3	-263.1	0.00	0.00	0.00
4,650.0	9.00	214.00	4,623.5	-288.6	-194.7	-269.2	0.00	0.00	0.00
4,700.0	9.00	214.00	4,672.9	-295.1	-199.1	-275.2	0.00	0.00	0.00
4,750.0	9.00	214.00	4,722.3	-301.6	-203.4	-281.3	0.00	0.00	0.00
4,800.0	9.00	214.00	4,771.7	-308.1	-207.8	-287.3	0.00	0.00	0.00
4,850.0	9.00	214.00	4,821.1	-314.6	-212.2	-293.4	0.00	0.00	0.00
4,900.0	9.00	214.00	4,870.5	-321.0	-216.5	-299.4	0.00	0.00	0.00
4,950.0	9.00	214.00	4,919.8	-327.5	-220.9	-305.5	0.00	0.00	0.00
5,000.0	9.00	214.00	4,969.2	-334.0	-225.3	-311.5	0.00	0.00	0.00
5,050.0	9.00	214.00	5,018.6	-340.5	-229.7	-317.5	0.00	0.00	0.00
5,100.0	9.00	214.00	5,068.0	-347.0	-234.0	-323.6	0.00	0.00	0.00
5,150.0	9.00	214.00	5,117.4	-353.5	-238.4	-329.6	0.00	0.00	0.00
5,200.0	9.00	214.00	5,166.8	-359.9	-242.8	-335.7	0.00	0.00	0.00
5,250.0	9.00	214.00	5,216.1	-366.4	-247.2	-341.7	0.00	0.00	0.00
5,260.0	9.00	214.00	5,226.0	-367.7	-248.0	-342.9	0.00	0.00	0.00
5,283.2	10.99	219.77	5,248.8	-370.9	-250.5	-345.9	9.58	8.56	24.85

Planning Report

Database:	EDM01P	Local Co-ordinate Reference:	Well Riley LD19-738
Company:	Northern Region Drilling - Working	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site:	LD (09N-58W)	North Reference:	Grid
Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,300.0	9.84	226.03	5,265.4	-373.2	-252.5	-347.9	9.58	-6.83	37.25
5,350.0	7.50	254.29	5,314.8	-377.0	-258.7	-351.2	9.58	-4.68	56.51
5,400.0	7.83	290.74	5,364.4	-376.7	-265.1	-350.3	9.58	0.66	72.90
5,450.0	10.58	315.71	5,413.8	-372.2	-271.5	-345.2	9.58	5.51	49.95
5,500.0	14.43	329.05	5,462.6	-363.6	-277.9	-336.0	9.58	7.70	26.68
5,550.0	18.71	336.64	5,510.5	-350.9	-284.3	-322.8	9.58	8.56	15.17
5,600.0	23.19	341.43	5,557.2	-334.1	-290.6	-305.5	9.58	8.95	9.59
5,650.0	27.76	344.73	5,602.3	-313.6	-296.8	-284.5	9.58	9.15	6.60
5,700.0	32.40	347.15	5,645.6	-289.3	-302.8	-259.7	9.58	9.27	4.85
5,750.0	37.07	349.02	5,686.7	-261.4	-308.7	-231.4	9.58	9.34	3.75
5,800.0	41.76	350.53	5,725.3	-230.2	-314.3	-199.8	9.58	9.39	3.01
5,850.0	46.47	351.78	5,761.2	-195.8	-319.6	-165.1	9.58	9.42	2.51
5,900.0	51.19	352.85	5,794.1	-158.5	-324.7	-127.5	9.58	9.44	2.14
5,950.0	55.92	353.79	5,823.8	-118.5	-329.3	-87.3	9.58	9.46	1.87
6,000.0	60.66	354.63	5,850.1	-76.2	-333.6	-44.7	9.58	9.47	1.68
6,050.0	65.40	355.39	5,872.7	-31.9	-337.5	-0.2	9.58	9.48	1.53
6,100.0	70.14	356.10	5,891.6	14.3	-340.9	46.1	9.58	9.49	1.41
6,150.0	74.89	356.77	5,906.6	61.9	-343.9	93.7	9.58	9.49	1.33
6,200.0	79.64	357.40	5,917.7	110.6	-346.3	142.4	9.58	9.50	1.27
6,250.0	84.39	358.02	5,924.6	160.0	-348.3	191.9	9.58	9.50	1.24
6,300.0	89.14	358.63	5,927.4	209.9	-349.8	241.7	9.58	9.50	1.22
6,310.1	90.10	358.75	5,927.5	220.0	-350.0	251.7	9.58	9.50	1.21
6,350.0	90.10	358.75	5,927.4	259.9	-350.9	291.5	0.00	0.00	0.00
6,400.0	90.10	358.75	5,927.3	309.9	-352.0	341.4	0.00	0.00	0.00
6,450.0	90.10	358.75	5,927.3	359.9	-353.1	391.3	0.00	0.00	0.00
6,500.0	90.10	358.75	5,927.2	409.9	-354.1	441.2	0.00	0.00	0.00
6,550.0	90.10	358.75	5,927.1	459.8	-355.2	491.0	0.00	0.00	0.00
6,600.0	90.10	358.75	5,927.0	509.8	-356.3	540.9	0.00	0.00	0.00
6,650.0	90.10	358.75	5,926.9	559.8	-357.4	590.8	0.00	0.00	0.00
6,700.0	90.10	358.75	5,926.8	609.8	-358.5	640.6	0.00	0.00	0.00
6,750.0	90.10	358.75	5,926.7	659.8	-359.6	690.5	0.00	0.00	0.00
6,800.0	90.10	358.75	5,926.6	709.8	-360.7	740.4	0.00	0.00	0.00
6,850.0	90.10	358.75	5,926.6	759.8	-361.8	790.3	0.00	0.00	0.00
6,900.0	90.10	358.75	5,926.5	809.8	-362.9	840.1	0.00	0.00	0.00
6,950.0	90.10	358.75	5,926.4	859.8	-364.0	890.0	0.00	0.00	0.00
7,000.0	90.10	358.75	5,926.3	909.7	-365.0	939.9	0.00	0.00	0.00
7,050.0	90.10	358.75	5,926.2	959.7	-366.1	989.7	0.00	0.00	0.00
7,100.0	90.10	358.75	5,926.1	1,009.7	-367.2	1,039.6	0.00	0.00	0.00
7,150.0	90.10	358.75	5,926.0	1,059.7	-368.3	1,089.5	0.00	0.00	0.00
7,200.0	90.10	358.75	5,925.9	1,109.7	-369.4	1,139.4	0.00	0.00	0.00
7,250.0	90.10	358.75	5,925.9	1,159.7	-370.5	1,189.2	0.00	0.00	0.00
7,300.0	90.10	358.75	5,925.8	1,209.7	-371.6	1,239.1	0.00	0.00	0.00
7,350.0	90.10	358.75	5,925.7	1,259.7	-372.7	1,289.0	0.00	0.00	0.00
7,400.0	90.10	358.75	5,925.6	1,309.6	-373.8	1,338.8	0.00	0.00	0.00
7,450.0	90.10	358.75	5,925.5	1,359.6	-374.8	1,388.7	0.00	0.00	0.00
7,500.0	90.10	358.75	5,925.4	1,409.6	-375.9	1,438.6	0.00	0.00	0.00
7,550.0	90.10	358.75	5,925.3	1,459.6	-377.0	1,488.5	0.00	0.00	0.00
7,600.0	90.10	358.75	5,925.3	1,509.6	-378.1	1,538.3	0.00	0.00	0.00
7,650.0	90.10	358.75	5,925.2	1,559.6	-379.2	1,588.2	0.00	0.00	0.00
7,700.0	90.10	358.75	5,925.1	1,609.6	-380.3	1,638.1	0.00	0.00	0.00
7,750.0	90.10	358.75	5,925.0	1,659.6	-381.4	1,687.9	0.00	0.00	0.00
7,800.0	90.10	358.75	5,924.9	1,709.5	-382.5	1,737.8	0.00	0.00	0.00
7,850.0	90.10	358.75	5,924.8	1,759.5	-383.6	1,787.7	0.00	0.00	0.00
7,900.0	90.10	358.75	5,924.7	1,809.5	-384.6	1,837.5	0.00	0.00	0.00

Planning Report

Database:	EDM01P	Local Co-ordinate Reference:	Well Riley LD19-738
Company:	Northern Region Drilling - Working	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site:	LD (09N-58W)	North Reference:	Grid
Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,950.0	90.10	358.75	5,924.6	1,859.5	-385.7	1,887.4	0.00	0.00	0.00	
8,000.0	90.10	358.75	5,924.6	1,909.5	-386.8	1,937.3	0.00	0.00	0.00	
8,050.0	90.10	358.75	5,924.5	1,959.5	-387.9	1,987.2	0.00	0.00	0.00	
8,100.0	90.10	358.75	5,924.4	2,009.5	-389.0	2,037.0	0.00	0.00	0.00	
8,150.0	90.10	358.75	5,924.3	2,059.5	-390.1	2,086.9	0.00	0.00	0.00	
8,200.0	90.10	358.75	5,924.2	2,109.5	-391.2	2,136.8	0.00	0.00	0.00	
8,250.0	90.10	358.75	5,924.1	2,159.4	-392.3	2,186.6	0.00	0.00	0.00	
8,300.0	90.10	358.75	5,924.0	2,209.4	-393.3	2,236.5	0.00	0.00	0.00	
8,350.0	90.10	358.75	5,924.0	2,259.4	-394.4	2,286.4	0.00	0.00	0.00	
8,400.0	90.10	358.75	5,923.9	2,309.4	-395.5	2,336.3	0.00	0.00	0.00	
8,450.0	90.10	358.75	5,923.8	2,359.4	-396.6	2,386.1	0.00	0.00	0.00	
8,500.0	90.10	358.75	5,923.7	2,409.4	-397.7	2,436.0	0.00	0.00	0.00	
8,550.0	90.10	358.75	5,923.6	2,459.4	-398.8	2,485.9	0.00	0.00	0.00	
8,600.0	90.10	358.75	5,923.5	2,509.4	-399.9	2,535.7	0.00	0.00	0.00	
8,650.0	90.10	358.75	5,923.4	2,559.3	-400.9	2,585.6	0.00	0.00	0.00	
8,700.0	90.10	358.75	5,923.3	2,609.3	-402.0	2,635.5	0.00	0.00	0.00	
8,750.0	90.10	358.75	5,923.3	2,659.3	-403.1	2,685.4	0.00	0.00	0.00	
8,800.0	90.10	358.76	5,923.2	2,709.3	-404.2	2,735.2	0.00	0.00	0.00	
8,850.0	90.10	358.76	5,923.1	2,759.3	-405.3	2,785.1	0.00	0.00	0.00	
8,900.0	90.10	358.76	5,923.0	2,809.3	-406.4	2,835.0	0.00	0.00	0.00	
8,950.0	90.10	358.76	5,922.9	2,859.3	-407.5	2,884.8	0.00	0.00	0.00	
9,000.0	90.10	358.76	5,922.8	2,909.3	-408.5	2,934.7	0.00	0.00	0.00	
9,050.0	90.10	358.76	5,922.7	2,959.3	-409.6	2,984.6	0.00	0.00	0.00	
9,100.0	90.10	358.76	5,922.7	3,009.2	-410.7	3,034.5	0.00	0.00	0.00	
9,150.0	90.10	358.76	5,922.6	3,059.2	-411.8	3,084.3	0.00	0.00	0.00	
9,200.0	90.10	358.76	5,922.5	3,109.2	-412.9	3,134.2	0.00	0.00	0.00	
9,250.0	90.10	358.76	5,922.4	3,159.2	-414.0	3,184.1	0.00	0.00	0.00	
9,300.0	90.10	358.76	5,922.3	3,209.2	-415.1	3,233.9	0.00	0.00	0.00	
9,350.0	90.10	358.76	5,922.2	3,259.2	-416.1	3,283.8	0.00	0.00	0.00	
9,400.0	90.10	358.76	5,922.1	3,309.2	-417.2	3,333.7	0.00	0.00	0.00	
9,450.0	90.10	358.76	5,922.1	3,359.2	-418.3	3,383.5	0.00	0.00	0.00	
9,500.0	90.10	358.76	5,922.0	3,409.1	-419.4	3,433.4	0.00	0.00	0.00	
9,550.0	90.10	358.76	5,921.9	3,459.1	-420.5	3,483.3	0.00	0.00	0.00	
9,600.0	90.10	358.76	5,921.8	3,509.1	-421.6	3,533.2	0.00	0.00	0.00	
9,650.0	90.10	358.76	5,921.7	3,559.1	-422.7	3,583.0	0.00	0.00	0.00	
9,700.0	90.10	358.76	5,921.6	3,609.1	-423.7	3,632.9	0.00	0.00	0.00	
9,750.0	90.10	358.76	5,921.5	3,659.1	-424.8	3,682.8	0.00	0.00	0.00	
9,800.0	90.10	358.76	5,921.5	3,709.1	-425.9	3,732.6	0.00	0.00	0.00	
9,850.0	90.10	358.76	5,921.4	3,759.1	-427.0	3,782.5	0.00	0.00	0.00	
9,900.0	90.10	358.76	5,921.3	3,809.1	-428.1	3,832.4	0.00	0.00	0.00	
9,950.0	90.10	358.76	5,921.2	3,859.0	-429.2	3,882.3	0.00	0.00	0.00	
10,000.0	90.10	358.76	5,921.1	3,909.0	-430.2	3,932.1	0.00	0.00	0.00	
10,050.0	90.10	358.76	5,921.0	3,959.0	-431.3	3,982.0	0.00	0.00	0.00	
10,100.0	90.10	358.76	5,920.9	4,009.0	-432.4	4,031.9	0.00	0.00	0.00	
10,150.0	90.10	358.76	5,920.8	4,059.0	-433.5	4,081.7	0.00	0.00	0.00	
10,200.0	90.10	358.76	5,920.8	4,109.0	-434.6	4,131.6	0.00	0.00	0.00	
10,250.0	90.10	358.76	5,920.7	4,159.0	-435.7	4,181.5	0.00	0.00	0.00	
10,300.0	90.10	358.76	5,920.6	4,209.0	-436.8	4,231.4	0.00	0.00	0.00	
10,350.0	90.10	358.76	5,920.5	4,258.9	-437.8	4,281.2	0.00	0.00	0.00	
10,400.0	90.10	358.76	5,920.4	4,308.9	-438.9	4,331.1	0.00	0.00	0.00	
10,450.0	90.10	358.76	5,920.3	4,358.9	-440.0	4,381.0	0.00	0.00	0.00	
10,500.0	90.10	358.76	5,920.2	4,408.9	-441.1	4,430.8	0.00	0.00	0.00	
10,550.0	90.10	358.76	5,920.2	4,458.9	-442.2	4,480.7	0.00	0.00	0.00	
10,600.0	90.10	358.76	5,920.1	4,508.9	-443.3	4,530.6	0.00	0.00	0.00	

Planning Report

Database:	EDM01P	Local Co-ordinate Reference:	Well Riley LD19-738
Company:	Northern Region Drilling - Working	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site:	LD (09N-58W)	North Reference:	Grid
Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,650.0	90.10	358.76	5,920.0	4,558.9	-444.3	4,580.4	0.00	0.00	0.00
10,700.0	90.10	358.76	5,919.9	4,608.9	-445.4	4,630.3	0.00	0.00	0.00
10,750.0	90.10	358.76	5,919.8	4,658.9	-446.5	4,680.2	0.00	0.00	0.00
10,800.0	90.10	358.76	5,919.7	4,708.8	-447.6	4,730.1	0.00	0.00	0.00
10,850.0	90.10	358.76	5,919.6	4,758.8	-448.7	4,779.9	0.00	0.00	0.00
10,878.5	90.10	358.76	5,919.6	4,787.3	-449.3	4,808.4	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Section 19	0.00	0.00	-38.0	10,698.0	6,789.8	1,523,557.18	3,449,341.23	40.759270	-103.877940
- plan misses target center by 11083.0ft at 10878.5ft MD (5919.6 TVD, 4787.3 N, -449.3 E)									
- Polygon									
Point 1			-38.0	-5,858.2	-10,656.7	1,517,699.04	3,438,684.64		
Point 2			-38.0	-5,723.4	-5,364.0	1,517,833.84	3,443,977.29		
Point 3			-38.0	-11,036.8	-5,251.0	1,512,520.50	3,444,090.29		
Point 4			-38.0	-11,176.8	-10,508.5	1,512,380.50	3,438,832.84		
Point 5			-38.0	-5,858.2	-10,656.7	1,517,699.04	3,438,684.64		
Setback	0.00	0.00	-38.0	10,698.0	6,789.8	1,523,557.18	3,449,341.23	40.759270	-103.877940
- plan misses target center by 11083.0ft at 10878.5ft MD (5919.6 TVD, 4787.3 N, -449.3 E)									
- Polygon									
Point 1			-38.0	-6,058.2	-10,356.7	1,517,499.04	3,438,984.64		
Point 2			-38.0	-5,923.4	-5,664.0	1,517,633.84	3,443,677.29		
Point 3			-38.0	-10,736.8	-5,551.0	1,512,820.49	3,443,790.29		
Point 4			-38.0	-10,876.8	-10,208.5	1,512,680.49	3,439,132.84		
Point 5			-38.0	-6,058.2	-10,356.7	1,517,499.04	3,438,984.64		
Riley LD19-738 BHL 140	0.00	0.00	5,919.6	4,787.3	-449.3	1,517,646.58	3,442,102.23	40.743410	-103.904450
- plan hits target center									
- Point									

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
814.0	814.0	PIERRE		0.00		
877.0	877.0	UPPER PIERRE AQUIFER TOP		0.00		
1,462.0	1,462.0	UPPER PIERRE AQUIFER BASE		0.00		
3,405.1	3,394.0	PARKMAN		0.00		
3,953.9	3,936.0	SUSSEX		0.00		
4,529.0	4,504.0	SHANNON		0.00		
5,147.6	5,115.0	TEEPEE BUTTES		0.00		
5,827.0	5,745.0	SHARON SPRINGS		0.00		
5,861.5	5,769.0	NIO A CHALK		0.00		
5,907.9	5,799.0	NIO A MARL		0.00		
6,029.8	5,864.0	NIO B CHALK		0.00		
6,113.3	5,896.0	NIO B MARL		0.00		

Planning Report

Database:	EDM01P	Local Co-ordinate Reference:	Well Riley LD19-738
Company:	Northern Region Drilling - Working	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Project:	Wattenberg Field	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site:	LD (09N-58W)	North Reference:	Grid
Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,200.0	2,200.0	0.0	0.0	KOP - Start Build 2.00
5,260.0	5,226.0	-367.7	-248.0	Start DLS 9.58 TFO 29.59
5,283.2	5,248.9	-370.9	-250.5	Start DLS 9.58 TFO 138.45
5,990.0	5,845.1	-84.9	-332.8	TPZ
10,878.5	5,919.6	4,787.3	-449.3	TD at 10878.5

Northern Region Drilling - Working

**Wattenberg Field
LD (09N-58W)
Riley LD19-738**

**Original Drilling
APD - Rev 1**

Anticollision Summary Report

20 May, 2016

Anticollision Summary Report

Company:	Northern Region Drilling - Working	Local Co-ordinate Reference:	Well Riley LD19-738
Project:	Wattenberg Field	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Reference Site:	LD (09N-58W)	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDM01P
Reference Design:	APD - Rev 1	Offset TVD Reference:	Offset Datum

Reference	APD - Rev 1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 50.0ft	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:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	5/20/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,878.5	APD - Rev 1 (Original Drilling)	MWD	MWD - Standard

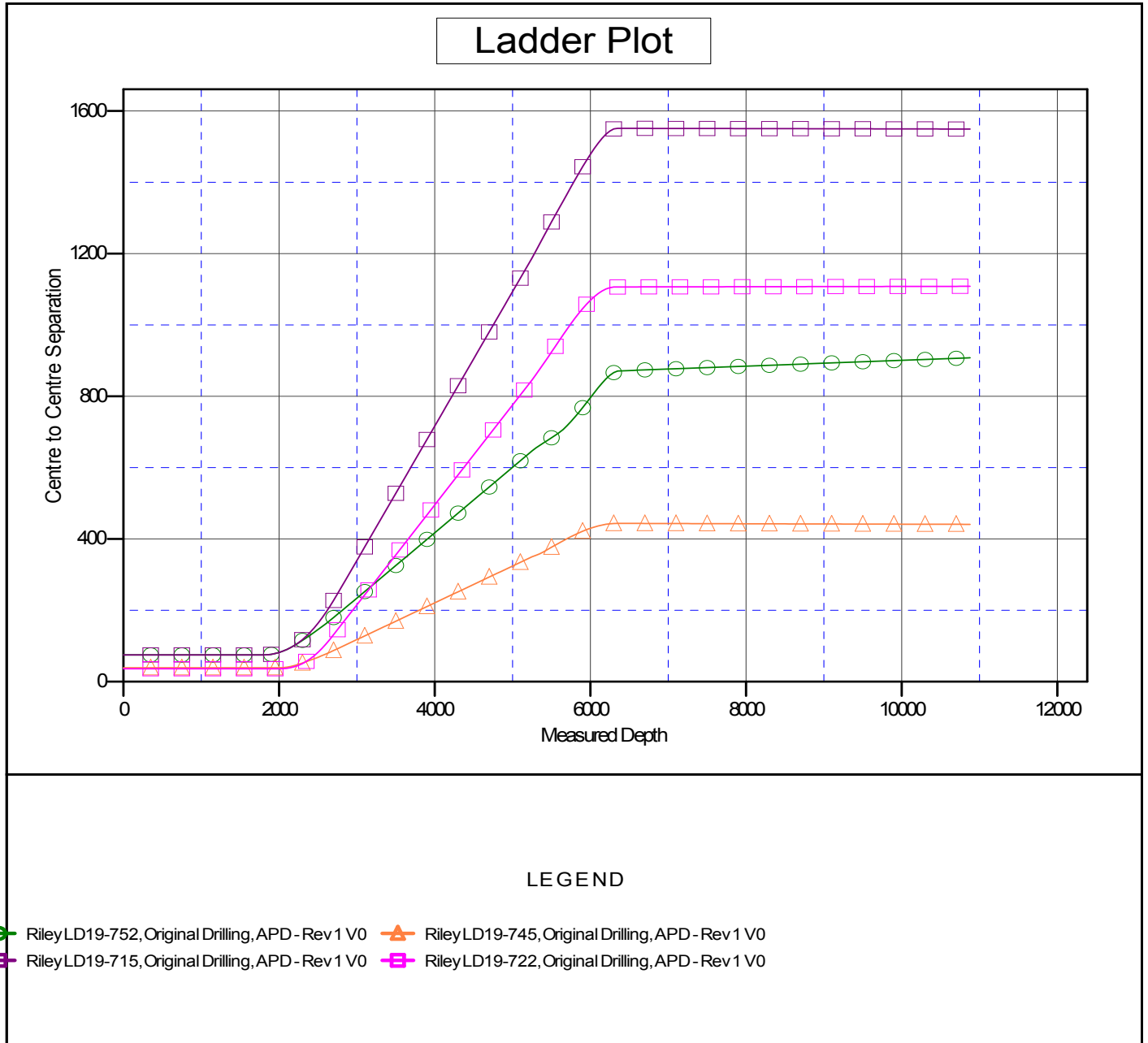
Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
LD (09N-58W)						
Riley LD19-715 - Original Drilling - APD - Rev 1	1,778.6	1,789.6	74.8	67.1	9.668	CC
Riley LD19-715 - Original Drilling - APD - Rev 1	1,800.0	1,810.7	74.9	67.0	9.555	ES
Riley LD19-715 - Original Drilling - APD - Rev 1	10,878.5	10,979.2	1,549.4	1,360.7	8.210	SF
Riley LD19-722 - Original Drilling - APD - Rev 1	2,000.0	2,000.0	36.0	27.3	4.130	CC, ES
Riley LD19-722 - Original Drilling - APD - Rev 1	2,050.0	2,049.5	36.4	27.5	4.073	SF
Riley LD19-745 - Original Drilling - APD - Rev 1	1,978.6	1,989.6	38.8	30.2	4.491	CC
Riley LD19-745 - Original Drilling - APD - Rev 1	2,000.0	2,010.9	38.8	30.1	4.445	ES
Riley LD19-745 - Original Drilling - APD - Rev 1	10,878.5	10,912.6	441.2	252.5	2.338	SF
Riley LD19-752 - Original Drilling - APD - Rev 1	1,778.6	1,789.6	74.8	67.1	9.668	CC
Riley LD19-752 - Original Drilling - APD - Rev 1	1,800.0	1,810.7	74.9	67.0	9.555	ES
Riley LD19-752 - Original Drilling - APD - Rev 1	10,878.5	11,138.3	908.1	722.8	4.901	SF

Anticollision Summary Report

Company:	Northern Region Drilling - Working	Local Co-ordinate Reference:	Well Riley LD19-738
Project:	Wattenberg Field	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Reference Site:	LD (09N-58W)	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDM01P
Reference Design:	APD - Rev 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4839.0ft (Original Well Elev)
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Riley LD19-738
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 1.03°



Anticollision Summary Report

Company:	Northern Region Drilling - Working	Local Co-ordinate Reference:	Well Riley LD19-738
Project:	Wattenberg Field	TVD Reference:	WELL @ 4839.0ft (Original Well Elev)
Reference Site:	LD (09N-58W)	MD Reference:	WELL @ 4839.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Riley LD19-738	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Original Drilling	Database:	EDM01P
Reference Design:	APD - Rev 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4839.0ft (Original Well Elev)
 Offset Depths are relative to Offset Datum
 Central Meridian is -105.500000

Coordinates are relative to: Riley LD19-738
 Coordinate System is US State Plane 1983, Colorado Northern Zone
 Grid Convergence at Surface is: 1.03°

