

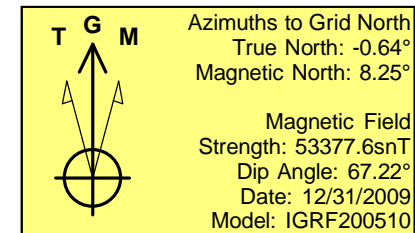
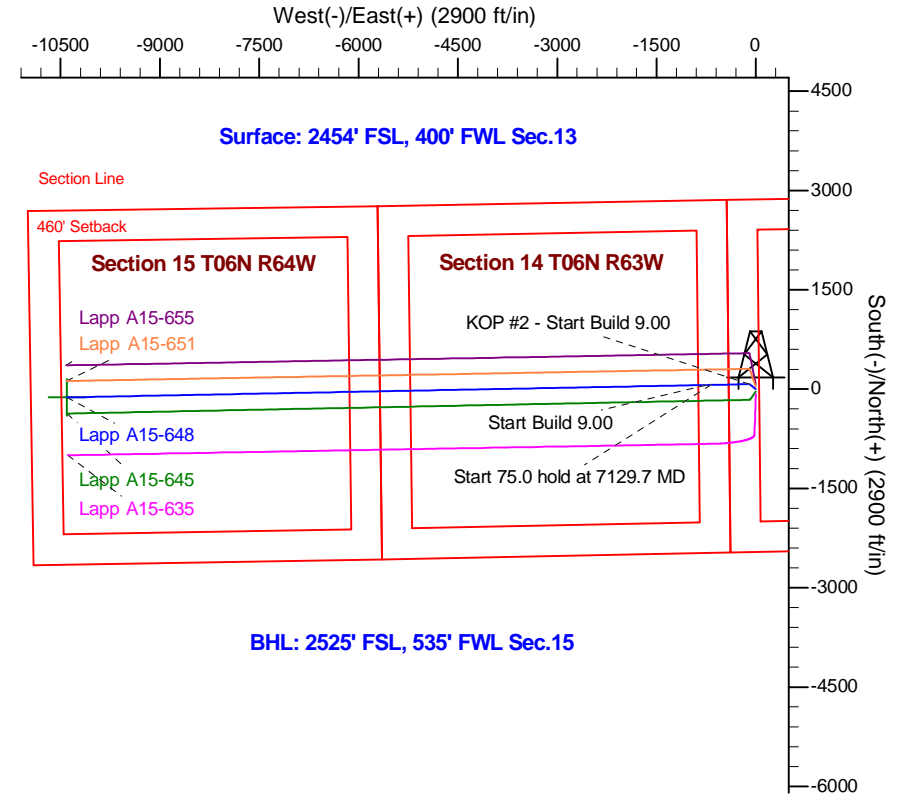
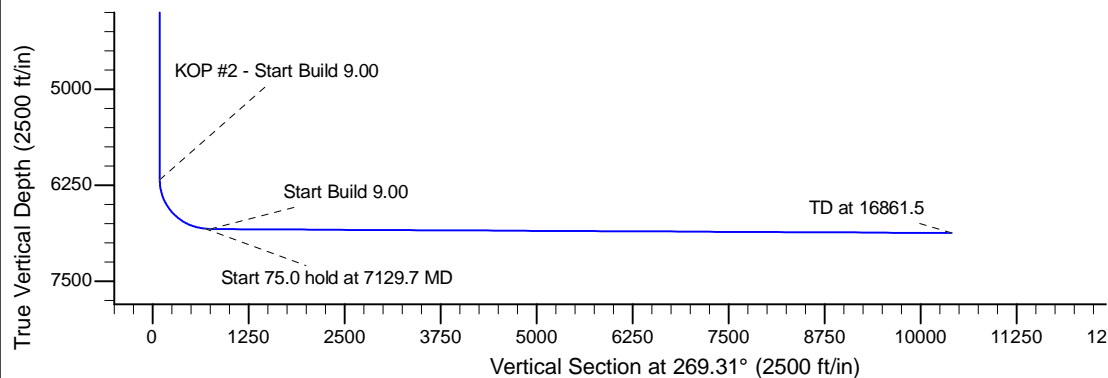
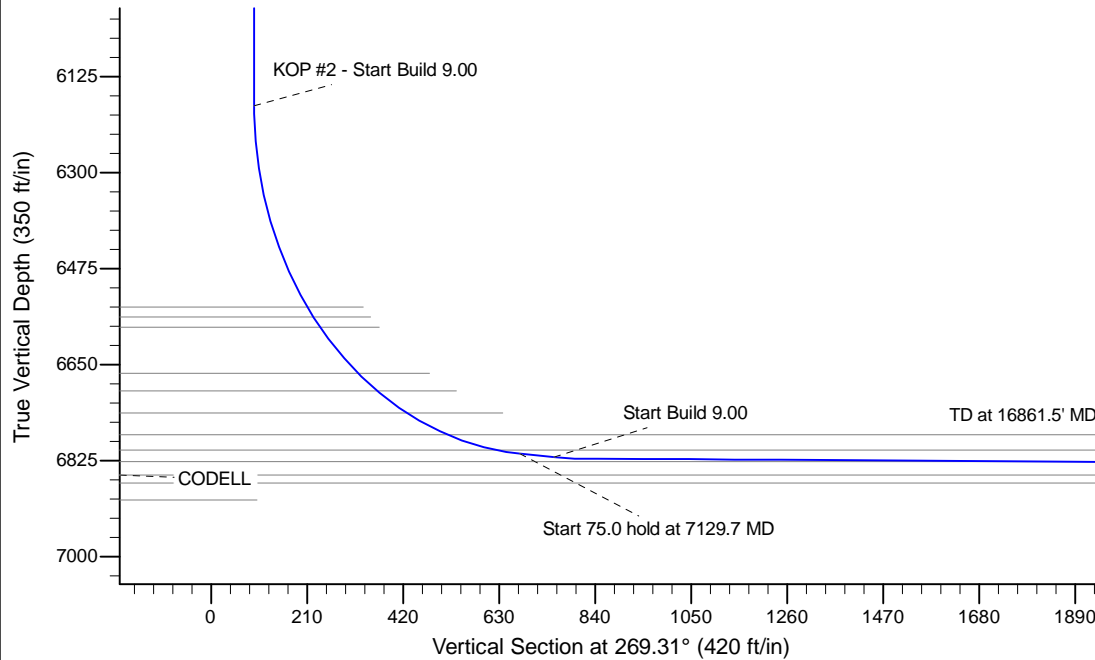
Project: Wattenberg Field  
Site: A (Sec.13-T06N-R64W) Weld County, CO  
Well: Lapp A15-648  
Wellbore: Original Drilling  
Design: APD - Rev 1

# 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	2500.0	0.00	0.00	2500.0	0.0	0.0	0.00	0.00	0.0	
3	2901.6	8.03	308.29	2900.3	17.4	-22.1	2.00	308.29	21.8	
4	3365.6	8.03	308.29	3359.7	57.6	-72.9	0.00	0.00	72.2	
5	3767.2	0.00	0.00	3760.0	75.0	-95.0	2.00	180.00	94.1	
6	6185.2	0.00	0.00	6178.1	75.0	-95.0	0.00	0.00	94.1	
7	7129.7	85.00	268.89	6812.3	63.7	-676.0	9.00	268.89	675.2	
8	7204.7	85.00	268.89	6818.8	62.3	-750.7	0.00	0.00	749.9	
9	7256.9	89.70	268.89	6821.2	61.2	-802.9	9.00	0.00	802.1	
10	16861.5	89.70	268.89	6871.5	-125.3	-10405.5	0.00	0.00	10406.3	Lapp A15-648 BHL 2525'FSL, 535'FWL



WELL DETAILS: Lapp A15-648					
Ground Level: 4668.0					
0.0	0.0	Northing	Easting	Latitude	Longitude
		1421318.43	3276375.19	40.485670	-104.506390
Plan: APD - Rev 1 (Lapp A15-648/Original Drilling)					
Created By: Shailey Jewell			Date: 15:31, January 12 2016		
Checked: _____			Date: _____		
Reviewed: _____			Date: _____		
Approved: _____			Date: _____		

# **Northern Region Drilling - Working**

**Wattenberg Field**

**A (06N-64W)**

**Lapp A15-648**

**Original Drilling**

**Plan: APD - Rev 1**

## **Standard Planning Report**

**12 January, 2016**

## Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site:</b>	A (06N-64W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 1		

<b>Project</b>	Wattenberg Field, Weld County CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site		A (06N-64W)			
Site Position:		Northing:	1,408,077.93 usft	Latitude:	40.449320
From:	Lat/Long	Easting:	3,276,618.19 usft	Longitude:	-104.506050
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.64 °

Well	Lapp A15-648					
Well Position	+N/-S	13,241.0 ft	Northing:	1,421,318.43 usft	Latitude:	40.485670
	+E/-W	-243.0 ft	Easting:	3,276,375.19 usft	Longitude:	-104.506390
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,668.0 ft

<b>Wellbore</b>	Original Drilling				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	12/31/2009	8.89	67.22	53,378

<b>Design</b>	APD - Rev 1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	269.31

<b>Plan Sections</b>										
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	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,901.6	8.03	308.29	2,900.3	17.4	-22.1	2.00	2.00	0.00	308.29	
3,365.6	8.03	308.29	3,359.7	57.6	-72.9	0.00	0.00	0.00	0.00	
3,767.2	0.00	0.00	3,760.0	75.0	-95.0	2.00	-2.00	0.00	180.00	
6,185.2	0.00	0.00	6,178.1	75.0	-95.0	0.00	0.00	0.00	0.00	
7,129.7	85.00	268.89	6,812.3	63.7	-676.0	9.00	9.00	0.00	268.89	
7,204.7	85.00	268.89	6,818.8	62.3	-750.7	0.00	0.00	0.00	0.00	
7,256.9	89.70	268.89	6,821.2	61.2	-802.9	9.00	9.00	0.00	0.00	
16,861.5	89.70	268.89	6,871.5	-125.3	-10,405.5	0.00	0.00	0.00	0.00	Lapp A15-648 BHL 25'

# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site:</b>	A (06N-64W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	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	0.00	0.00	2,250.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,350.0	0.00	0.00	2,350.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,450.0	0.00	0.00	2,450.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,550.0	1.00	308.29	2,550.0	0.3	-0.3	0.3	2.00	2.00	0.00
2,600.0	2.00	308.29	2,600.0	1.1	-1.4	1.4	2.00	2.00	0.00
2,650.0	3.00	308.29	2,649.9	2.4	-3.1	3.1	2.00	2.00	0.00

# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site:</b>	A (06N-64W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	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	4.00	308.29	2,699.8	4.3	-5.5	5.4	2.00	2.00	0.00
2,750.0	5.00	308.29	2,749.7	6.8	-8.6	8.5	2.00	2.00	0.00
2,800.0	6.00	308.29	2,799.5	9.7	-12.3	12.2	2.00	2.00	0.00
2,850.0	7.00	308.29	2,849.1	13.2	-16.8	16.6	2.00	2.00	0.00
2,900.0	8.00	308.29	2,898.7	17.3	-21.9	21.7	2.00	2.00	0.00
2,901.6	8.03	308.29	2,900.3	17.4	-22.1	21.8	2.00	2.00	0.00
2,950.0	8.03	308.29	2,948.2	21.6	-27.4	27.1	0.00	0.00	0.00
3,000.0	8.03	308.29	2,997.7	25.9	-32.8	32.5	0.00	0.00	0.00
3,050.0	8.03	308.29	3,047.2	30.3	-38.3	38.0	0.00	0.00	0.00
3,100.0	8.03	308.29	3,096.7	34.6	-43.8	43.4	0.00	0.00	0.00
3,150.0	8.03	308.29	3,146.2	38.9	-49.3	48.8	0.00	0.00	0.00
3,200.0	8.03	308.29	3,195.8	43.2	-54.8	54.3	0.00	0.00	0.00
3,250.0	8.03	308.29	3,245.3	47.6	-60.3	59.7	0.00	0.00	0.00
3,300.0	8.03	308.29	3,294.8	51.9	-65.8	65.1	0.00	0.00	0.00
3,350.0	8.03	308.29	3,344.3	56.2	-71.2	70.6	0.00	0.00	0.00
3,365.6	8.03	308.29	3,359.7	57.6	-72.9	72.2	0.00	0.00	0.00
3,400.0	7.34	308.29	3,393.8	60.4	-76.6	75.8	2.00	-2.00	0.00
3,450.0	6.34	308.29	3,443.5	64.1	-81.2	80.5	2.00	-2.00	0.00
3,500.0	5.34	308.29	3,493.2	67.3	-85.2	84.4	2.00	-2.00	0.00
3,550.0	4.34	308.29	3,543.0	69.9	-88.5	87.7	2.00	-2.00	0.00
3,600.0	3.34	308.29	3,592.9	72.0	-91.2	90.3	2.00	-2.00	0.00
3,650.0	2.34	308.29	3,642.9	73.5	-93.1	92.2	2.00	-2.00	0.00
3,700.0	1.34	308.29	3,692.8	74.5	-94.4	93.5	2.00	-2.00	0.00
3,750.0	0.34	308.29	3,742.8	75.0	-95.0	94.0	2.00	-2.00	0.00
3,767.2	0.00	0.00	3,760.0	75.0	-95.0	94.1	2.00	-2.00	0.00
3,800.0	0.00	0.00	3,792.8	75.0	-95.0	94.1	0.00	0.00	0.00
3,850.0	0.00	0.00	3,842.8	75.0	-95.0	94.1	0.00	0.00	0.00
3,900.0	0.00	0.00	3,892.8	75.0	-95.0	94.1	0.00	0.00	0.00
3,950.0	0.00	0.00	3,942.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,000.0	0.00	0.00	3,992.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,050.0	0.00	0.00	4,042.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,100.0	0.00	0.00	4,092.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,150.0	0.00	0.00	4,142.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,200.0	0.00	0.00	4,192.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,250.0	0.00	0.00	4,242.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,300.0	0.00	0.00	4,292.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,350.0	0.00	0.00	4,342.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,400.0	0.00	0.00	4,392.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,450.0	0.00	0.00	4,442.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,500.0	0.00	0.00	4,492.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,550.0	0.00	0.00	4,542.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,600.0	0.00	0.00	4,592.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,650.0	0.00	0.00	4,642.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,700.0	0.00	0.00	4,692.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,750.0	0.00	0.00	4,742.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,800.0	0.00	0.00	4,792.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,850.0	0.00	0.00	4,842.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,900.0	0.00	0.00	4,892.8	75.0	-95.0	94.1	0.00	0.00	0.00
4,950.0	0.00	0.00	4,942.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,000.0	0.00	0.00	4,992.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,050.0	0.00	0.00	5,042.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,100.0	0.00	0.00	5,092.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,150.0	0.00	0.00	5,142.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,200.0	0.00	0.00	5,192.8	75.0	-95.0	94.1	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site:</b>	A (06N-64W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	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)
5,250.0	0.00	0.00	5,242.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,300.0	0.00	0.00	5,292.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,350.0	0.00	0.00	5,342.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,400.0	0.00	0.00	5,392.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,450.0	0.00	0.00	5,442.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,500.0	0.00	0.00	5,492.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,550.0	0.00	0.00	5,542.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,600.0	0.00	0.00	5,592.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,650.0	0.00	0.00	5,642.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,700.0	0.00	0.00	5,692.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,750.0	0.00	0.00	5,742.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,800.0	0.00	0.00	5,792.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,850.0	0.00	0.00	5,842.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,900.0	0.00	0.00	5,892.8	75.0	-95.0	94.1	0.00	0.00	0.00
5,950.0	0.00	0.00	5,942.8	75.0	-95.0	94.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,992.8	75.0	-95.0	94.1	0.00	0.00	0.00
6,050.0	0.00	0.00	6,042.8	75.0	-95.0	94.1	0.00	0.00	0.00
6,100.0	0.00	0.00	6,092.8	75.0	-95.0	94.1	0.00	0.00	0.00
6,150.0	0.00	0.00	6,142.8	75.0	-95.0	94.1	0.00	0.00	0.00
6,185.2	0.00	0.00	6,178.1	75.0	-95.0	94.1	0.00	0.00	0.00
6,200.0	1.33	268.89	6,192.8	75.0	-95.2	94.3	9.00	9.00	0.00
6,250.0	5.83	268.89	6,242.7	74.9	-98.3	97.4	9.00	9.00	0.00
6,300.0	10.33	268.89	6,292.2	74.8	-105.3	104.4	9.00	9.00	0.00
6,350.0	14.83	268.89	6,341.0	74.6	-116.2	115.3	9.00	9.00	0.00
6,400.0	19.33	268.89	6,388.8	74.3	-130.9	130.0	9.00	9.00	0.00
6,450.0	23.83	268.89	6,435.3	73.9	-149.3	148.4	9.00	9.00	0.00
6,500.0	28.33	268.89	6,480.2	73.5	-171.2	170.3	9.00	9.00	0.00
6,550.0	32.83	268.89	6,523.2	73.0	-196.6	195.8	9.00	9.00	0.00
6,600.0	37.33	268.89	6,564.1	72.5	-225.4	224.5	9.00	9.00	0.00
6,650.0	41.83	268.89	6,602.6	71.8	-257.2	256.3	9.00	9.00	0.00
6,700.0	46.33	268.89	6,638.5	71.2	-292.0	291.1	9.00	9.00	0.00
6,750.0	50.83	268.89	6,671.6	70.4	-329.5	328.6	9.00	9.00	0.00
6,800.0	55.33	268.89	6,701.6	69.7	-369.4	368.5	9.00	9.00	0.00
6,850.0	59.83	268.89	6,728.4	68.8	-411.6	410.7	9.00	9.00	0.00
6,900.0	64.33	268.89	6,751.8	68.0	-455.8	454.9	9.00	9.00	0.00
6,950.0	68.83	268.89	6,771.7	67.1	-501.6	500.8	9.00	9.00	0.00
7,000.0	73.33	268.89	6,787.9	66.2	-548.9	548.1	9.00	9.00	0.00
7,050.0	77.83	268.89	6,800.4	65.2	-597.3	596.5	9.00	9.00	0.00
7,100.0	82.33	268.89	6,809.0	64.3	-646.5	645.7	9.00	9.00	0.00
7,129.7	85.00	268.89	6,812.3	63.7	-676.0	675.2	9.00	9.00	0.00
7,150.0	85.00	268.89	6,814.0	63.3	-696.3	695.4	0.00	0.00	0.00
7,200.0	85.00	268.89	6,818.4	62.4	-746.1	745.3	0.00	0.00	0.00
7,204.7	85.00	268.89	6,818.8	62.3	-750.7	749.9	0.00	0.00	0.00
7,250.0	89.08	268.89	6,821.1	61.4	-796.0	795.2	9.00	9.00	0.00
7,256.9	89.70	268.89	6,821.2	61.2	-802.9	802.1	9.00	9.00	0.00
7,300.0	89.70	268.89	6,821.4	60.4	-845.9	845.2	0.00	0.00	0.00
7,350.0	89.70	268.89	6,821.7	59.4	-895.9	895.2	0.00	0.00	0.00
7,400.0	89.70	268.89	6,822.0	58.5	-945.9	945.2	0.00	0.00	0.00
7,450.0	89.70	268.89	6,822.2	57.5	-995.9	995.2	0.00	0.00	0.00
7,500.0	89.70	268.89	6,822.5	56.5	-1,045.9	1,045.2	0.00	0.00	0.00
7,550.0	89.70	268.89	6,822.7	55.6	-1,095.9	1,095.2	0.00	0.00	0.00
7,600.0	89.70	268.89	6,823.0	54.6	-1,145.9	1,145.1	0.00	0.00	0.00
7,650.0	89.70	268.89	6,823.3	53.6	-1,195.9	1,195.1	0.00	0.00	0.00
7,700.0	89.70	268.89	6,823.5	52.6	-1,245.9	1,245.1	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site:</b>	A (06N-64W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	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)	
7,750.0	89.70	268.89	6,823.8	51.7	-1,295.9	1,295.1	0.00	0.00	0.00	
7,800.0	89.70	268.89	6,824.1	50.7	-1,345.8	1,345.1	0.00	0.00	0.00	
7,850.0	89.70	268.89	6,824.3	49.7	-1,395.8	1,395.1	0.00	0.00	0.00	
7,900.0	89.70	268.89	6,824.6	48.8	-1,445.8	1,445.1	0.00	0.00	0.00	
7,950.0	89.70	268.89	6,824.8	47.8	-1,495.8	1,495.1	0.00	0.00	0.00	
8,000.0	89.70	268.89	6,825.1	46.8	-1,545.8	1,545.1	0.00	0.00	0.00	
8,050.0	89.70	268.89	6,825.4	45.8	-1,595.8	1,595.1	0.00	0.00	0.00	
8,100.0	89.70	268.89	6,825.6	44.9	-1,645.8	1,645.1	0.00	0.00	0.00	
8,150.0	89.70	268.89	6,825.9	43.9	-1,695.8	1,695.1	0.00	0.00	0.00	
8,200.0	89.70	268.89	6,826.1	42.9	-1,745.8	1,745.1	0.00	0.00	0.00	
8,250.0	89.70	268.89	6,826.4	42.0	-1,795.8	1,795.1	0.00	0.00	0.00	
8,300.0	89.70	268.89	6,826.7	41.0	-1,845.7	1,845.1	0.00	0.00	0.00	
8,350.0	89.70	268.89	6,826.9	40.0	-1,895.7	1,895.1	0.00	0.00	0.00	
8,400.0	89.70	268.89	6,827.2	39.0	-1,945.7	1,945.1	0.00	0.00	0.00	
8,450.0	89.70	268.89	6,827.5	38.1	-1,995.7	1,995.1	0.00	0.00	0.00	
8,500.0	89.70	268.89	6,827.7	37.1	-2,045.7	2,045.1	0.00	0.00	0.00	
8,550.0	89.70	268.89	6,828.0	36.1	-2,095.7	2,095.1	0.00	0.00	0.00	
8,600.0	89.70	268.89	6,828.2	35.2	-2,145.7	2,145.1	0.00	0.00	0.00	
8,650.0	89.70	268.89	6,828.5	34.2	-2,195.7	2,195.1	0.00	0.00	0.00	
8,700.0	89.70	268.89	6,828.8	33.2	-2,245.7	2,245.1	0.00	0.00	0.00	
8,750.0	89.70	268.89	6,829.0	32.2	-2,295.7	2,295.1	0.00	0.00	0.00	
8,800.0	89.70	268.89	6,829.3	31.3	-2,345.6	2,345.1	0.00	0.00	0.00	
8,850.0	89.70	268.89	6,829.6	30.3	-2,395.6	2,395.1	0.00	0.00	0.00	
8,900.0	89.70	268.89	6,829.8	29.3	-2,445.6	2,445.1	0.00	0.00	0.00	
8,950.0	89.70	268.89	6,830.1	28.4	-2,495.6	2,495.1	0.00	0.00	0.00	
9,000.0	89.70	268.89	6,830.3	27.4	-2,545.6	2,545.1	0.00	0.00	0.00	
9,050.0	89.70	268.89	6,830.6	26.4	-2,595.6	2,595.1	0.00	0.00	0.00	
9,100.0	89.70	268.89	6,830.9	25.4	-2,645.6	2,645.1	0.00	0.00	0.00	
9,150.0	89.70	268.89	6,831.1	24.5	-2,695.6	2,695.1	0.00	0.00	0.00	
9,200.0	89.70	268.89	6,831.4	23.5	-2,745.6	2,745.1	0.00	0.00	0.00	
9,250.0	89.70	268.89	6,831.6	22.5	-2,795.6	2,795.1	0.00	0.00	0.00	
9,300.0	89.70	268.89	6,831.9	21.6	-2,845.5	2,845.1	0.00	0.00	0.00	
9,350.0	89.70	268.89	6,832.2	20.6	-2,895.5	2,895.1	0.00	0.00	0.00	
9,400.0	89.70	268.89	6,832.4	19.6	-2,945.5	2,945.1	0.00	0.00	0.00	
9,450.0	89.70	268.89	6,832.7	18.6	-2,995.5	2,995.1	0.00	0.00	0.00	
9,500.0	89.70	268.89	6,833.0	17.7	-3,045.5	3,045.1	0.00	0.00	0.00	
9,550.0	89.70	268.89	6,833.2	16.7	-3,095.5	3,095.1	0.00	0.00	0.00	
9,600.0	89.70	268.89	6,833.5	15.7	-3,145.5	3,145.1	0.00	0.00	0.00	
9,650.0	89.70	268.89	6,833.7	14.8	-3,195.5	3,195.1	0.00	0.00	0.00	
9,700.0	89.70	268.89	6,834.0	13.8	-3,245.5	3,245.1	0.00	0.00	0.00	
9,750.0	89.70	268.89	6,834.3	12.8	-3,295.5	3,295.1	0.00	0.00	0.00	
9,800.0	89.70	268.89	6,834.5	11.8	-3,345.4	3,345.1	0.00	0.00	0.00	
9,850.0	89.70	268.89	6,834.8	10.9	-3,395.4	3,395.1	0.00	0.00	0.00	
9,900.0	89.70	268.89	6,835.0	9.9	-3,445.4	3,445.1	0.00	0.00	0.00	
9,950.0	89.70	268.89	6,835.3	8.9	-3,495.4	3,495.1	0.00	0.00	0.00	
10,000.0	89.70	268.89	6,835.6	8.0	-3,545.4	3,545.1	0.00	0.00	0.00	
10,050.0	89.70	268.89	6,835.8	7.0	-3,595.4	3,595.0	0.00	0.00	0.00	
10,100.0	89.70	268.89	6,836.1	6.0	-3,645.4	3,645.0	0.00	0.00	0.00	
10,150.0	89.70	268.89	6,836.4	5.0	-3,695.4	3,695.0	0.00	0.00	0.00	
10,200.0	89.70	268.89	6,836.6	4.1	-3,745.4	3,745.0	0.00	0.00	0.00	
10,250.0	89.70	268.89	6,836.9	3.1	-3,795.4	3,795.0	0.00	0.00	0.00	
10,300.0	89.70	268.89	6,837.1	2.1	-3,845.3	3,845.0	0.00	0.00	0.00	
10,350.0	89.70	268.89	6,837.4	1.2	-3,895.3	3,895.0	0.00	0.00	0.00	
10,400.0	89.70	268.89	6,837.7	0.2	-3,945.3	3,945.0	0.00	0.00	0.00	

# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site:</b>	A (06N-64W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	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)
10,450.0	89.70	268.89	6,837.9	-0.8	-3,995.3	3,995.0	0.00	0.00	0.00
10,500.0	89.70	268.89	6,838.2	-1.8	-4,045.3	4,045.0	0.00	0.00	0.00
10,550.0	89.70	268.89	6,838.5	-2.7	-4,095.3	4,095.0	0.00	0.00	0.00
10,600.0	89.70	268.89	6,838.7	-3.7	-4,145.3	4,145.0	0.00	0.00	0.00
10,650.0	89.70	268.89	6,839.0	-4.7	-4,195.3	4,195.0	0.00	0.00	0.00
10,700.0	89.70	268.89	6,839.2	-5.6	-4,245.3	4,245.0	0.00	0.00	0.00
10,750.0	89.70	268.89	6,839.5	-6.6	-4,295.3	4,295.0	0.00	0.00	0.00
10,800.0	89.70	268.89	6,839.8	-7.6	-4,345.2	4,345.0	0.00	0.00	0.00
10,850.0	89.70	268.89	6,840.0	-8.6	-4,395.2	4,395.0	0.00	0.00	0.00
10,900.0	89.70	268.89	6,840.3	-9.5	-4,445.2	4,445.0	0.00	0.00	0.00
10,950.0	89.70	268.89	6,840.5	-10.5	-4,495.2	4,495.0	0.00	0.00	0.00
11,000.0	89.70	268.89	6,840.8	-11.5	-4,545.2	4,545.0	0.00	0.00	0.00
11,050.0	89.70	268.89	6,841.1	-12.4	-4,595.2	4,595.0	0.00	0.00	0.00
11,100.0	89.70	268.89	6,841.3	-13.4	-4,645.2	4,645.0	0.00	0.00	0.00
11,150.0	89.70	268.89	6,841.6	-14.4	-4,695.2	4,695.0	0.00	0.00	0.00
11,200.0	89.70	268.89	6,841.9	-15.4	-4,745.2	4,745.0	0.00	0.00	0.00
11,250.0	89.70	268.89	6,842.1	-16.3	-4,795.2	4,795.0	0.00	0.00	0.00
11,300.0	89.70	268.89	6,842.4	-17.3	-4,845.1	4,845.0	0.00	0.00	0.00
11,350.0	89.70	268.89	6,842.6	-18.3	-4,895.1	4,895.0	0.00	0.00	0.00
11,400.0	89.70	268.89	6,842.9	-19.2	-4,945.1	4,945.0	0.00	0.00	0.00
11,450.0	89.70	268.89	6,843.2	-20.2	-4,995.1	4,995.0	0.00	0.00	0.00
11,500.0	89.70	268.89	6,843.4	-21.2	-5,045.1	5,045.0	0.00	0.00	0.00
11,550.0	89.70	268.89	6,843.7	-22.2	-5,095.1	5,095.0	0.00	0.00	0.00
11,600.0	89.70	268.89	6,844.0	-23.1	-5,145.1	5,145.0	0.00	0.00	0.00
11,650.0	89.70	268.89	6,844.2	-24.1	-5,195.1	5,195.0	0.00	0.00	0.00
11,700.0	89.70	268.89	6,844.5	-25.1	-5,245.1	5,245.0	0.00	0.00	0.00
11,750.0	89.70	268.89	6,844.7	-26.0	-5,295.0	5,295.0	0.00	0.00	0.00
11,800.0	89.70	268.89	6,845.0	-27.0	-5,345.0	5,345.0	0.00	0.00	0.00
11,850.0	89.70	268.89	6,845.3	-28.0	-5,395.0	5,395.0	0.00	0.00	0.00
11,900.0	89.70	268.89	6,845.5	-28.9	-5,445.0	5,445.0	0.00	0.00	0.00
11,950.0	89.70	268.89	6,845.8	-29.9	-5,495.0	5,495.0	0.00	0.00	0.00
12,000.0	89.70	268.89	6,846.0	-30.9	-5,545.0	5,545.0	0.00	0.00	0.00
12,050.0	89.70	268.89	6,846.3	-31.9	-5,595.0	5,595.0	0.00	0.00	0.00
12,100.0	89.70	268.89	6,846.6	-32.8	-5,645.0	5,645.0	0.00	0.00	0.00
12,150.0	89.70	268.89	6,846.8	-33.8	-5,695.0	5,695.0	0.00	0.00	0.00
12,200.0	89.70	268.89	6,847.1	-34.8	-5,745.0	5,745.0	0.00	0.00	0.00
12,250.0	89.70	268.89	6,847.4	-35.7	-5,794.9	5,795.0	0.00	0.00	0.00
12,300.0	89.70	268.89	6,847.6	-36.7	-5,844.9	5,845.0	0.00	0.00	0.00
12,350.0	89.70	268.89	6,847.9	-37.7	-5,894.9	5,895.0	0.00	0.00	0.00
12,400.0	89.70	268.89	6,848.1	-38.7	-5,944.9	5,945.0	0.00	0.00	0.00
12,450.0	89.70	268.89	6,848.4	-39.6	-5,994.9	5,994.9	0.00	0.00	0.00
12,500.0	89.70	268.89	6,848.7	-40.6	-6,044.9	6,044.9	0.00	0.00	0.00
12,550.0	89.70	268.89	6,848.9	-41.6	-6,094.9	6,094.9	0.00	0.00	0.00
12,600.0	89.70	268.89	6,849.2	-42.5	-6,144.9	6,144.9	0.00	0.00	0.00
12,650.0	89.70	268.89	6,849.4	-43.5	-6,194.9	6,194.9	0.00	0.00	0.00
12,700.0	89.70	268.89	6,849.7	-44.5	-6,244.9	6,244.9	0.00	0.00	0.00
12,750.0	89.70	268.89	6,850.0	-45.5	-6,294.8	6,294.9	0.00	0.00	0.00
12,800.0	89.70	268.89	6,850.2	-46.4	-6,344.8	6,344.9	0.00	0.00	0.00
12,850.0	89.70	268.89	6,850.5	-47.4	-6,394.8	6,394.9	0.00	0.00	0.00
12,900.0	89.70	268.89	6,850.8	-48.4	-6,444.8	6,444.9	0.00	0.00	0.00
12,950.0	89.70	268.89	6,851.0	-49.3	-6,494.8	6,494.9	0.00	0.00	0.00
13,000.0	89.70	268.89	6,851.3	-50.3	-6,544.8	6,544.9	0.00	0.00	0.00
13,050.0	89.70	268.89	6,851.5	-51.3	-6,594.8	6,594.9	0.00	0.00	0.00
13,100.0	89.70	268.89	6,851.8	-52.3	-6,644.8	6,644.9	0.00	0.00	0.00



# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site:</b>	A (06N-64W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	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)	
13,150.0	89.70	268.89	6,852.1	-53.2	-6,694.8	6,694.9	0.00	0.00	0.00	
13,200.0	89.70	268.89	6,852.3	-54.2	-6,744.8	6,744.9	0.00	0.00	0.00	
13,250.0	89.70	268.89	6,852.6	-55.2	-6,794.7	6,794.9	0.00	0.00	0.00	
13,300.0	89.70	268.89	6,852.9	-56.1	-6,844.7	6,844.9	0.00	0.00	0.00	
13,350.0	89.70	268.89	6,853.1	-57.1	-6,894.7	6,894.9	0.00	0.00	0.00	
13,400.0	89.70	268.89	6,853.4	-58.1	-6,944.7	6,944.9	0.00	0.00	0.00	
13,450.0	89.70	268.89	6,853.6	-59.1	-6,994.7	6,994.9	0.00	0.00	0.00	
13,500.0	89.70	268.89	6,853.9	-60.0	-7,044.7	7,044.9	0.00	0.00	0.00	
13,550.0	89.70	268.89	6,854.2	-61.0	-7,094.7	7,094.9	0.00	0.00	0.00	
13,600.0	89.70	268.89	6,854.4	-62.0	-7,144.7	7,144.9	0.00	0.00	0.00	
13,650.0	89.70	268.89	6,854.7	-62.9	-7,194.7	7,194.9	0.00	0.00	0.00	
13,700.0	89.70	268.89	6,854.9	-63.9	-7,244.7	7,244.9	0.00	0.00	0.00	
13,750.0	89.70	268.89	6,855.2	-64.9	-7,294.6	7,294.9	0.00	0.00	0.00	
13,800.0	89.70	268.89	6,855.5	-65.9	-7,344.6	7,344.9	0.00	0.00	0.00	
13,850.0	89.70	268.89	6,855.7	-66.8	-7,394.6	7,394.9	0.00	0.00	0.00	
13,900.0	89.70	268.89	6,856.0	-67.8	-7,444.6	7,444.9	0.00	0.00	0.00	
13,950.0	89.70	268.89	6,856.3	-68.8	-7,494.6	7,494.9	0.00	0.00	0.00	
14,000.0	89.70	268.89	6,856.5	-69.7	-7,544.6	7,544.9	0.00	0.00	0.00	
14,050.0	89.70	268.89	6,856.8	-70.7	-7,594.6	7,594.9	0.00	0.00	0.00	
14,100.0	89.70	268.89	6,857.0	-71.7	-7,644.6	7,644.9	0.00	0.00	0.00	
14,150.0	89.70	268.89	6,857.3	-72.7	-7,694.6	7,694.9	0.00	0.00	0.00	
14,200.0	89.70	268.89	6,857.6	-73.6	-7,744.6	7,744.9	0.00	0.00	0.00	
14,250.0	89.70	268.89	6,857.8	-74.6	-7,794.5	7,794.9	0.00	0.00	0.00	
14,300.0	89.70	268.89	6,858.1	-75.6	-7,844.5	7,844.9	0.00	0.00	0.00	
14,350.0	89.70	268.89	6,858.3	-76.5	-7,894.5	7,894.9	0.00	0.00	0.00	
14,400.0	89.70	268.89	6,858.6	-77.5	-7,944.5	7,944.9	0.00	0.00	0.00	
14,450.0	89.70	268.89	6,858.9	-78.5	-7,994.5	7,994.9	0.00	0.00	0.00	
14,500.0	89.70	268.89	6,859.1	-79.5	-8,044.5	8,044.9	0.00	0.00	0.00	
14,550.0	89.70	268.89	6,859.4	-80.4	-8,094.5	8,094.9	0.00	0.00	0.00	
14,600.0	89.70	268.89	6,859.7	-81.4	-8,144.5	8,144.9	0.00	0.00	0.00	
14,650.0	89.70	268.89	6,859.9	-82.4	-8,194.5	8,194.9	0.00	0.00	0.00	
14,700.0	89.70	268.89	6,860.2	-83.3	-8,244.5	8,244.9	0.00	0.00	0.00	
14,750.0	89.70	268.89	6,860.4	-84.3	-8,294.4	8,294.9	0.00	0.00	0.00	
14,800.0	89.70	268.89	6,860.7	-85.3	-8,344.4	8,344.9	0.00	0.00	0.00	
14,850.0	89.70	268.89	6,861.0	-86.3	-8,394.4	8,394.9	0.00	0.00	0.00	
14,900.0	89.70	268.89	6,861.2	-87.2	-8,444.4	8,444.8	0.00	0.00	0.00	
14,950.0	89.70	268.89	6,861.5	-88.2	-8,494.4	8,494.8	0.00	0.00	0.00	
15,000.0	89.70	268.89	6,861.8	-89.2	-8,544.4	8,544.8	0.00	0.00	0.00	
15,050.0	89.70	268.89	6,862.0	-90.1	-8,594.4	8,594.8	0.00	0.00	0.00	
15,100.0	89.70	268.89	6,862.3	-91.1	-8,644.4	8,644.8	0.00	0.00	0.00	
15,150.0	89.70	268.89	6,862.5	-92.1	-8,694.4	8,694.8	0.00	0.00	0.00	
15,200.0	89.70	268.89	6,862.8	-93.1	-8,744.4	8,744.8	0.00	0.00	0.00	
15,250.0	89.70	268.89	6,863.1	-94.0	-8,794.3	8,794.8	0.00	0.00	0.00	
15,300.0	89.70	268.89	6,863.3	-95.0	-8,844.3	8,844.8	0.00	0.00	0.00	
15,350.0	89.70	268.89	6,863.6	-96.0	-8,894.3	8,894.8	0.00	0.00	0.00	
15,400.0	89.70	268.89	6,863.8	-96.9	-8,944.3	8,944.8	0.00	0.00	0.00	
15,450.0	89.70	268.89	6,864.1	-97.9	-8,994.3	8,994.8	0.00	0.00	0.00	
15,500.0	89.70	268.89	6,864.4	-98.9	-9,044.3	9,044.8	0.00	0.00	0.00	
15,550.0	89.70	268.89	6,864.6	-99.9	-9,094.3	9,094.8	0.00	0.00	0.00	
15,600.0	89.70	268.89	6,864.9	-100.8	-9,144.3	9,144.8	0.00	0.00	0.00	
15,650.0	89.70	268.89	6,865.2	-101.8	-9,194.3	9,194.8	0.00	0.00	0.00	
15,700.0	89.70	268.89	6,865.4	-102.8	-9,244.2	9,244.8	0.00	0.00	0.00	
15,750.0	89.70	268.89	6,865.7	-103.7	-9,294.2	9,294.8	0.00	0.00	0.00	
15,800.0	89.70	268.89	6,865.9	-104.7	-9,344.2	9,344.8	0.00	0.00	0.00	

## Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site:</b>	A (06N-64W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	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)	
15,850.0	89.70	268.89	6,866.2	-105.7	-9,394.2	9,394.8	0.00	0.00	0.00	
15,900.0	89.70	268.89	6,866.5	-106.7	-9,444.2	9,444.8	0.00	0.00	0.00	
15,950.0	89.70	268.89	6,866.7	-107.6	-9,494.2	9,494.8	0.00	0.00	0.00	
16,000.0	89.70	268.89	6,867.0	-108.6	-9,544.2	9,544.8	0.00	0.00	0.00	
16,050.0	89.70	268.89	6,867.3	-109.6	-9,594.2	9,594.8	0.00	0.00	0.00	
16,100.0	89.70	268.89	6,867.5	-110.5	-9,644.2	9,644.8	0.00	0.00	0.00	
16,150.0	89.70	268.89	6,867.8	-111.5	-9,694.2	9,694.8	0.00	0.00	0.00	
16,200.0	89.70	268.89	6,868.0	-112.5	-9,744.1	9,744.8	0.00	0.00	0.00	
16,250.0	89.70	268.89	6,868.3	-113.5	-9,794.1	9,794.8	0.00	0.00	0.00	
16,300.0	89.70	268.89	6,868.6	-114.4	-9,844.1	9,844.8	0.00	0.00	0.00	
16,350.0	89.70	268.89	6,868.8	-115.4	-9,894.1	9,894.8	0.00	0.00	0.00	
16,400.0	89.70	268.89	6,869.1	-116.4	-9,944.1	9,944.8	0.00	0.00	0.00	
16,450.0	89.70	268.89	6,869.3	-117.3	-9,994.1	9,994.8	0.00	0.00	0.00	
16,500.0	89.70	268.89	6,869.6	-118.3	-10,044.1	10,044.8	0.00	0.00	0.00	
16,550.0	89.70	268.89	6,869.9	-119.3	-10,094.1	10,094.8	0.00	0.00	0.00	
16,600.0	89.70	268.89	6,870.1	-120.3	-10,144.1	10,144.8	0.00	0.00	0.00	
16,650.0	89.70	268.89	6,870.4	-121.2	-10,194.1	10,194.8	0.00	0.00	0.00	
16,700.0	89.70	268.89	6,870.7	-122.2	-10,244.0	10,244.8	0.00	0.00	0.00	
16,750.0	89.70	268.89	6,870.9	-123.2	-10,294.0	10,294.8	0.00	0.00	0.00	
16,800.0	89.70	268.89	6,871.2	-124.1	-10,344.0	10,344.8	0.00	0.00	0.00	
16,850.0	89.70	268.89	6,871.4	-125.1	-10,394.0	10,394.8	0.00	0.00	0.00	
16,861.5	89.70	268.89	6,871.5	-125.3	-10,405.5	10,406.3	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									
Lapp A15-648 BHL 2525	0.00	0.00	6,871.5	-125.3	-10,405.5	1,421,193.10	3,265,970.03	40.485640	-104.543800
- plan hits target center									
- Point									

## Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site:</b>	A (06N-64W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 1		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
436.0	436.0	PIERRE		0.00	
456.0	456.0	UPPER PIERRE AQUIFER TOP		0.00	
1,498.0	1,498.0	UPPER PIERRE AQUIFER BASE		0.00	
3,522.9	3,516.0	PARKMAN		0.00	
4,062.2	4,055.0	SUSSEX		0.00	
4,831.2	4,824.0	SHANNON		0.00	
5,900.2	5,893.0	TEEPEE BUTTES		0.00	
6,576.3	6,545.0	SHARON SPRINGS		0.00	
6,598.6	6,563.0	NIO A CHALK		0.00	
6,622.8	6,582.0	NIO A MARL		0.00	
6,741.2	6,666.0	NIO B CHALK		0.00	
6,793.7	6,698.0	NIO B MARL		0.00	
6,869.6	6,738.0	NIO C CHALK		0.00	
6,968.1	6,778.0	NIO C MARL		0.00	
7,080.0	6,806.0	NIO D CHALK		0.00	
8,362.6	6,827.0	FT. HAYES		0.00	
12,946.3	6,851.0	CODELL		0.00	
15,811.1	6,866.0	CARLILE		0.00	

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,500.0	2,500.0	0.0	0.0	KOP - Start Build 2.00
3,365.6	3,359.7	57.6	-72.9	Start Drop -2.00
6,185.2	6,178.0	75.0	-95.0	KOP #2 - Start Build 9.00
7,129.7	6,812.3	63.7	-676.0	Start 75.0 hold at 7129.7 MD
7,204.7	6,818.8	62.3	-750.7	Start Build 9.00
16,861.5	6,871.5	-125.3	-10,405.5	TD at 16861.5

# **Northern Region Drilling - Working**

**Wattenberg Field  
A (06N-64W)  
Lapp A15-648**

**Original Drilling  
APD - Rev 1**

## **Anticollision Summary Report**

**12 January, 2016**

## Anticollision Summary Report

<b>Company:</b>	Northern Region Drilling - Working	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Project:</b>	Wattenberg Field	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Reference Site:</b>	A (06N-64W)	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Original Drilling	<b>Database:</b>	EDM01P
<b>Reference Design:</b>	APD - Rev 1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	APD - Rev 1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 50.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 10,000.0 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	1/12/2016		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	16,861.5	APD - Rev 1 (Original Drilling)	MWD	MWD - Standard

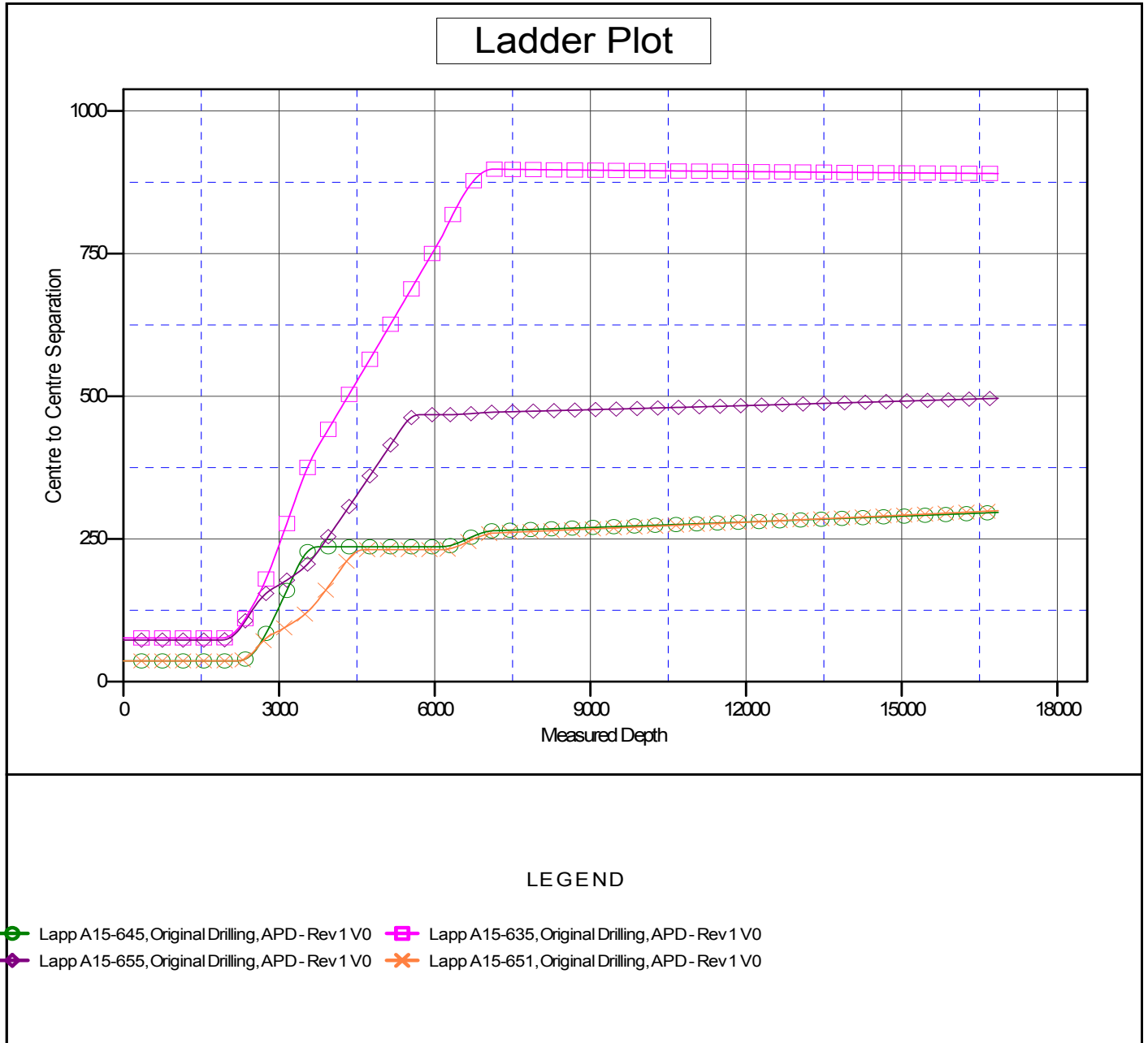
<b>Summary</b>						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
A (06N-64W)						
Lapp A15-635 - Original Drilling - APD - Rev 1	1,900.0	1,900.0	76.5	68.2	9.260	CC, ES
Lapp A15-635 - Original Drilling - APD - Rev 1	16,861.5	16,824.5	890.4	467.4	2.105	SF
Lapp A15-645 - Original Drilling - APD - Rev 1	2,200.0	2,200.0	36.4	26.8	3.791	CC
Lapp A15-645 - Original Drilling - APD - Rev 1	16,861.5	16,746.1	296.6	-185.3	0.616	Level 1, ES, SF
Lapp A15-651 - Original Drilling - APD - Rev 1	2,183.0	2,184.0	36.4	26.9	3.820	CC
Lapp A15-651 - Original Drilling - APD - Rev 1	16,861.5	16,759.4	299.6	-186.0	0.617	Level 1, ES, SF
Lapp A15-655 - Original Drilling - APD - Rev 1	1,900.0	1,900.0	72.9	64.6	8.819	CC
Lapp A15-655 - Original Drilling - APD - Rev 1	16,861.5	16,835.2	496.5	-68.2	0.879	Level 1, ES, SF

## Anticollision Summary Report

<b>Company:</b>	Northern Region Drilling - Working	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Project:</b>	Wattenberg Field	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Reference Site:</b>	A (06N-64W)	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Original Drilling	<b>Database:</b>	EDM01P
<b>Reference Design:</b>	APD - Rev 1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4692.0ft (Original Well Elev)  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: Lapp A15-648  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.64°



## Anticollision Summary Report

<b>Company:</b>	Northern Region Drilling - Working	<b>Local Co-ordinate Reference:</b>	Well Lapp A15-648
<b>Project:</b>	Wattenberg Field	<b>TVD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Reference Site:</b>	A (06N-64W)	<b>MD Reference:</b>	WELL @ 4692.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Lapp A15-648	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Original Drilling	<b>Database:</b>	EDM01P
<b>Reference Design:</b>	APD - Rev 1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4692.0ft (Original Well Elev)

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Lapp A15-648

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.64°

