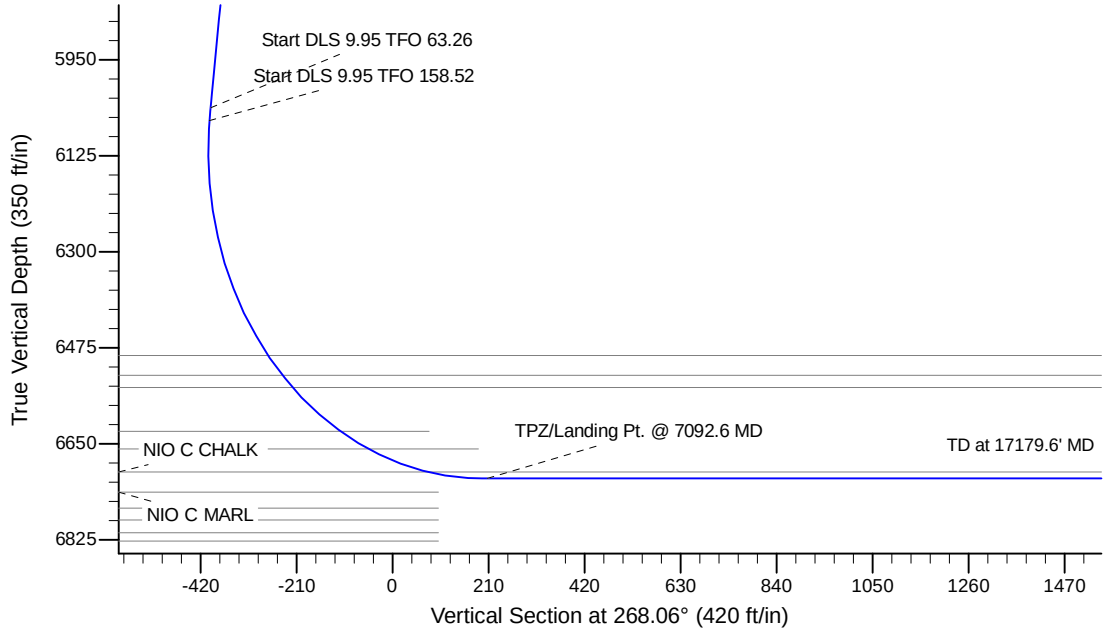
Project: Wells Ranch
Site: AA Section 19-T6N-R63W Weld County, CO
Well: Larson A23-678
Wellbore: Original Drilling
Design: APD - Rev 0

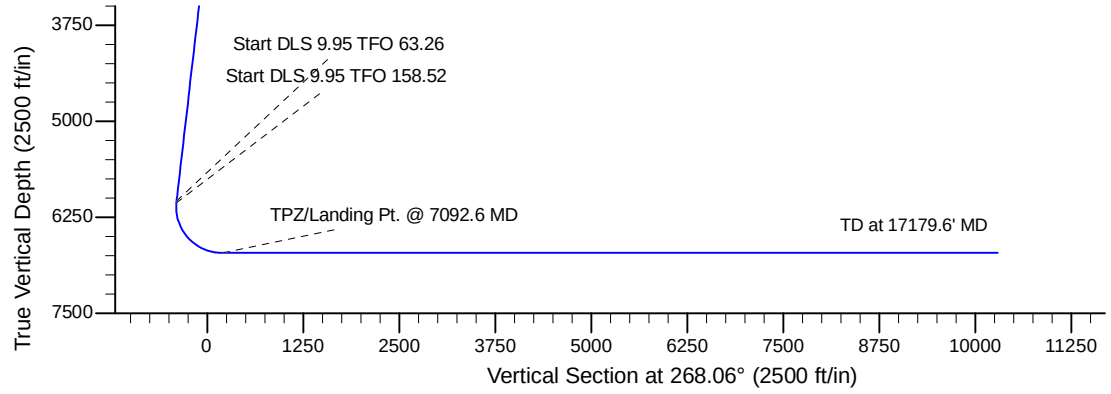
Northern Region - DJ Basin

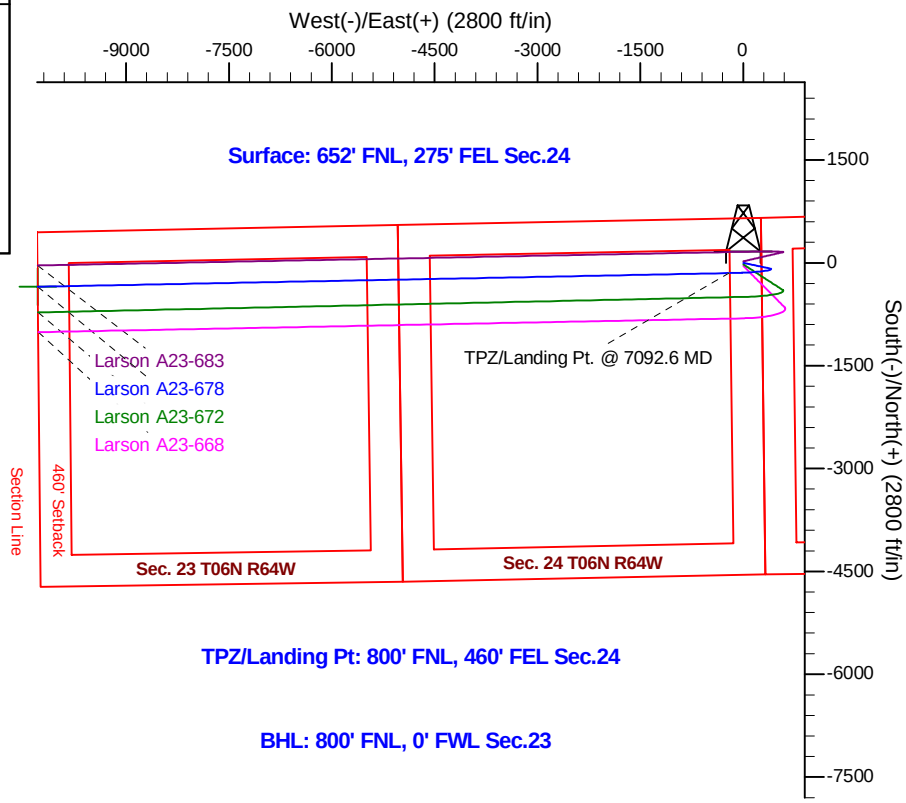
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
System Datum: Mean Sea Level

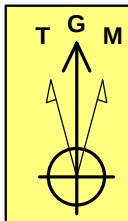
SECTION DETAILS

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	2400.0	0.00	0.00	2400.0	0.0	0.0	0.00	0.00	0.0	
3	2737.5	6.75	102.00	2736.7	-4.1	19.4	2.00	102.00	-19.3	
4	6036.6	6.75	102.00	6013.0	-84.8	398.7	0.00	0.00	-395.6	
5	6067.2	8.35	120.85	6043.3	-86.3	402.4	9.58	66.74	-399.2	
6	7080.5	90.00	268.87	6713.0	-150.0	-190.0	9.58	147.75	195.0	
7	17179.6	90.00	268.88	6713.0	-348.2	-10287.2	0.00	90.00	10293.1	Larson A23-678 BHL 800'FNL, 0'FWL









Azimuths to Grid North
True North: -0.65°
Magnetic North: 7.47°

Magnetic Field
Strength: 52515.8snT
Dip Angle: 66.97°
Date: 12/28/2016
Model: IGRF2015

WELL DETAILS: Larson A23-678

Original Well Elevation: 4651.0

		Northing	Easting	Latitude	Longitude
0.0	0.0	1418299.78	3281032.87	40.4772400	-104.4897700

Plan: APD - Rev 0 (Larson A23-678/Original Drilling)

Created By: Shailey Jewell Date: 8:33, January 06 2017

Checked: _____ Date: _____

Reviewed: _____ Date: _____

Approved: _____ Date: _____

Northern Region - DJ Basin

Wells Ranch
AA Section 19
Larson A23-678

Original Drilling

Plan: APD - Rev 0

Standard Planning Report

06 January, 2017

Database:	EDM Producction	**Local Co-ordinate Reference:**	Well Larson A23-678
Company:	Northern Region - DJ Basin	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Project:	Wells Ranch	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site:	AA Section 19	**North Reference:**	Grid
Well:	Larson A23-678	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Project Wells Ranch, Weld County Colorado

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site AA Section 19

Site Position:		**Northing:**	1,418,321.64 usft	**Latitude:**	40.4773000
From:	Lat/Long	**Easting:**	3,281,032.62 usft	**Longitude:**	-104.4897700
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.65 °

Well Larson A23-678

Well Position	**+N/-S**	-21.9 ft	**Northing:**	1,418,299.78 usft	**Latitude:**	40.4772400
	+E/-W	0.2 ft	**Easting:**	3,281,032.87 usft	**Longitude:**	-104.4897700
Position Uncertainty		0.0 ft	**Wellhead Elevation:**		**Ground Level:**	4,651.0 ft

Wellbore Original Drilling

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/28/2016	8.12	66.97	52,515.81567364

Design APD - Rev 0

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	268.06

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,737.5	6.75	102.00	2,736.7	-4.1	19.4	2.00	2.00	0.00	102.00	
6,036.6	6.75	102.00	6,013.0	-84.8	398.7	0.00	0.00	0.00	0.00	
6,067.2	8.35	120.85	6,043.3	-86.3	402.4	9.58	5.23	61.70	66.74	
7,080.5	90.00	268.87	6,713.0	-150.0	-190.0	9.58	8.06	14.61	147.75	
17,179.6	90.00	268.88	6,713.0	-348.2	-10,287.2	0.00	0.00	0.00	90.00	Larson A23-678 BHL

Database:	EDM Producction	**Local Co-ordinate Reference:**	Well Larson A23-678
Company:	Northern Region - DJ Basin	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Project:	Wells Ranch	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site:	AA Section 19	**North Reference:**	Grid
Well:	Larson A23-678	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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	1.00	102.00	2,450.0	-0.1	0.4	-0.4	2.00	2.00	0.00
2,500.0	2.00	102.00	2,500.0	-0.4	1.7	-1.7	2.00	2.00	0.00
2,550.0	3.00	102.00	2,549.9	-0.8	3.8	-3.8	2.00	2.00	0.00
2,600.0	4.00	102.00	2,599.8	-1.5	6.8	-6.8	2.00	2.00	0.00
2,650.0	5.00	102.00	2,649.7	-2.3	10.7	-10.6	2.00	2.00	0.00

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Site:	AA Section 19	**North Reference:**	Grid
Well:	Larson A23-678	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,700.0	6.00	102.00	2,699.5	-3.3	15.4	-15.2	2.00	2.00	0.00
2,737.5	6.75	102.00	2,736.7	-4.1	19.4	-19.3	2.00	2.00	0.00
2,750.0	6.75	102.00	2,749.1	-4.4	20.9	-20.7	0.00	0.00	0.00
2,800.0	6.75	102.00	2,798.8	-5.7	26.6	-26.4	0.00	0.00	0.00
2,850.0	6.75	102.00	2,848.4	-6.9	32.4	-32.1	0.00	0.00	0.00
2,900.0	6.75	102.00	2,898.1	-8.1	38.1	-37.8	0.00	0.00	0.00
2,950.0	6.75	102.00	2,947.7	-9.3	43.9	-43.5	0.00	0.00	0.00
3,000.0	6.75	102.00	2,997.4	-10.5	49.6	-49.2	0.00	0.00	0.00
3,050.0	6.75	102.00	3,047.1	-11.8	55.4	-54.9	0.00	0.00	0.00
3,100.0	6.75	102.00	3,096.7	-13.0	61.1	-60.6	0.00	0.00	0.00
3,150.0	6.75	102.00	3,146.4	-14.2	66.8	-66.3	0.00	0.00	0.00
3,200.0	6.75	102.00	3,196.0	-15.4	72.6	-72.0	0.00	0.00	0.00
3,250.0	6.75	102.00	3,245.7	-16.7	78.3	-77.7	0.00	0.00	0.00
3,300.0	6.75	102.00	3,295.3	-17.9	84.1	-83.4	0.00	0.00	0.00
3,350.0	6.75	102.00	3,345.0	-19.1	89.8	-89.1	0.00	0.00	0.00
3,400.0	6.75	102.00	3,394.6	-20.3	95.6	-94.8	0.00	0.00	0.00
3,450.0	6.75	102.00	3,444.3	-21.5	101.3	-100.6	0.00	0.00	0.00
3,500.0	6.75	102.00	3,493.9	-22.8	107.1	-106.3	0.00	0.00	0.00
3,550.0	6.75	102.00	3,543.6	-24.0	112.8	-112.0	0.00	0.00	0.00
3,600.0	6.75	102.00	3,593.2	-25.2	118.6	-117.7	0.00	0.00	0.00
3,650.0	6.75	102.00	3,642.9	-26.4	124.3	-123.4	0.00	0.00	0.00
3,700.0	6.75	102.00	3,692.5	-27.6	130.1	-129.1	0.00	0.00	0.00
3,750.0	6.75	102.00	3,742.2	-28.9	135.8	-134.8	0.00	0.00	0.00
3,800.0	6.75	102.00	3,791.9	-30.1	141.6	-140.5	0.00	0.00	0.00
3,850.0	6.75	102.00	3,841.5	-31.3	147.3	-146.2	0.00	0.00	0.00
3,900.0	6.75	102.00	3,891.2	-32.5	153.1	-151.9	0.00	0.00	0.00
3,950.0	6.75	102.00	3,940.8	-33.8	158.8	-157.6	0.00	0.00	0.00
4,000.0	6.75	102.00	3,990.5	-35.0	164.6	-163.3	0.00	0.00	0.00
4,050.0	6.75	102.00	4,040.1	-36.2	170.3	-169.0	0.00	0.00	0.00
4,100.0	6.75	102.00	4,089.8	-37.4	176.1	-174.7	0.00	0.00	0.00
4,150.0	6.75	102.00	4,139.4	-38.6	181.8	-180.4	0.00	0.00	0.00
4,200.0	6.75	102.00	4,189.1	-39.9	187.6	-186.1	0.00	0.00	0.00
4,250.0	6.75	102.00	4,238.7	-41.1	193.3	-191.8	0.00	0.00	0.00
4,300.0	6.75	102.00	4,288.4	-42.3	199.1	-197.5	0.00	0.00	0.00
4,350.0	6.75	102.00	4,338.0	-43.5	204.8	-203.2	0.00	0.00	0.00
4,400.0	6.75	102.00	4,387.7	-44.8	210.6	-208.9	0.00	0.00	0.00
4,450.0	6.75	102.00	4,437.3	-46.0	216.3	-214.6	0.00	0.00	0.00
4,500.0	6.75	102.00	4,487.0	-47.2	222.1	-220.3	0.00	0.00	0.00
4,550.0	6.75	102.00	4,536.7	-48.4	227.8	-226.0	0.00	0.00	0.00
4,600.0	6.75	102.00	4,586.3	-49.6	233.6	-231.7	0.00	0.00	0.00
4,650.0	6.75	102.00	4,636.0	-50.9	239.3	-237.4	0.00	0.00	0.00
4,700.0	6.75	102.00	4,685.6	-52.1	245.0	-243.1	0.00	0.00	0.00
4,750.0	6.75	102.00	4,735.3	-53.3	250.8	-248.9	0.00	0.00	0.00
4,800.0	6.75	102.00	4,784.9	-54.5	256.5	-254.6	0.00	0.00	0.00
4,850.0	6.75	102.00	4,834.6	-55.8	262.3	-260.3	0.00	0.00	0.00
4,900.0	6.75	102.00	4,884.2	-57.0	268.0	-266.0	0.00	0.00	0.00
4,950.0	6.75	102.00	4,933.9	-58.2	273.8	-271.7	0.00	0.00	0.00
5,000.0	6.75	102.00	4,983.5	-59.4	279.5	-277.4	0.00	0.00	0.00
5,050.0	6.75	102.00	5,033.2	-60.6	285.3	-283.1	0.00	0.00	0.00
5,100.0	6.75	102.00	5,082.8	-61.9	291.0	-288.8	0.00	0.00	0.00
5,150.0	6.75	102.00	5,132.5	-63.1	296.8	-294.5	0.00	0.00	0.00
5,200.0	6.75	102.00	5,182.2	-64.3	302.5	-300.2	0.00	0.00	0.00
5,250.0	6.75	102.00	5,231.8	-65.5	308.3	-305.9	0.00	0.00	0.00
5,300.0	6.75	102.00	5,281.5	-66.7	314.0	-311.6	0.00	0.00	0.00

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Site:	AA Section 19	**North Reference:**	Grid
Well:	Larson A23-678	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,350.0	6.75	102.00	5,331.1	-68.0	319.8	-317.3	0.00	0.00	0.00
5,400.0	6.75	102.00	5,380.8	-69.2	325.5	-323.0	0.00	0.00	0.00
5,450.0	6.75	102.00	5,430.4	-70.4	331.3	-328.7	0.00	0.00	0.00
5,500.0	6.75	102.00	5,480.1	-71.6	337.0	-334.4	0.00	0.00	0.00
5,550.0	6.75	102.00	5,529.7	-72.9	342.8	-340.1	0.00	0.00	0.00
5,600.0	6.75	102.00	5,579.4	-74.1	348.5	-345.8	0.00	0.00	0.00
5,650.0	6.75	102.00	5,629.0	-75.3	354.3	-351.5	0.00	0.00	0.00
5,700.0	6.75	102.00	5,678.7	-76.5	360.0	-357.2	0.00	0.00	0.00
5,750.0	6.75	102.00	5,728.3	-77.7	365.8	-362.9	0.00	0.00	0.00
5,800.0	6.75	102.00	5,778.0	-79.0	371.5	-368.6	0.00	0.00	0.00
5,850.0	6.75	102.00	5,827.6	-80.2	377.3	-374.3	0.00	0.00	0.00
5,900.0	6.75	102.00	5,877.3	-81.4	383.0	-380.0	0.00	0.00	0.00
5,950.0	6.75	102.00	5,927.0	-82.6	388.8	-385.7	0.00	0.00	0.00
6,000.0	6.75	102.00	5,976.6	-83.9	394.5	-391.4	0.00	0.00	0.00
6,036.6	6.75	102.00	6,013.0	-84.8	398.7	-395.6	0.00	0.00	0.00
6,050.0	7.35	111.23	6,026.3	-85.2	400.3	-397.2	9.58	4.49	69.10
6,067.2	8.35	120.85	6,043.3	-86.3	402.4	-399.2	9.58	5.81	55.96
6,100.0	5.93	137.30	6,075.8	-88.7	405.6	-402.3	9.58	-7.37	50.14
6,150.0	4.53	189.82	6,125.7	-92.6	407.0	-403.6	9.58	-2.81	105.04
6,200.0	7.18	230.80	6,175.4	-96.5	404.2	-400.7	9.58	5.31	81.96
6,250.0	11.34	246.06	6,224.8	-100.5	397.3	-393.7	9.58	8.31	30.53
6,300.0	15.85	252.98	6,273.3	-104.5	386.3	-382.5	9.58	9.03	13.84
6,350.0	20.49	256.86	6,320.8	-108.4	371.2	-367.4	9.58	9.27	7.76
6,400.0	25.18	259.36	6,366.9	-112.4	352.2	-348.2	9.58	9.39	4.98
6,450.0	29.90	261.10	6,411.2	-116.3	329.5	-325.3	9.58	9.44	3.50
6,500.0	34.64	262.41	6,453.5	-120.1	303.1	-298.8	9.58	9.48	2.62
6,550.0	39.39	263.44	6,493.4	-123.8	273.2	-268.8	9.58	9.50	2.06
6,600.0	44.15	264.28	6,530.7	-127.3	240.1	-235.6	9.58	9.51	1.68
6,650.0	48.91	264.98	6,565.1	-130.7	204.0	-199.4	9.58	9.53	1.41
6,700.0	53.68	265.59	6,596.3	-133.9	165.1	-160.5	9.58	9.53	1.22
6,750.0	58.44	266.13	6,624.3	-136.9	123.7	-119.0	9.58	9.54	1.08
6,800.0	63.22	266.62	6,648.6	-139.7	80.2	-75.4	9.58	9.54	0.97
6,850.0	67.99	267.07	6,669.3	-142.2	34.7	-29.9	9.58	9.55	0.90
6,900.0	72.76	267.49	6,686.1	-144.4	-12.3	17.2	9.58	9.55	0.84
6,950.0	77.54	267.89	6,698.9	-146.3	-60.6	65.5	9.58	9.55	0.79
7,000.0	82.31	268.27	6,707.6	-148.0	-109.8	114.7	9.58	9.55	0.77
7,050.0	87.09	268.64	6,712.2	-149.3	-159.5	164.5	9.58	9.55	0.75
7,080.5	90.00	268.87	6,713.0	-150.0	-190.0	195.0	9.58	9.55	0.74
7,100.0	90.00	268.87	6,713.0	-150.4	-209.5	214.5	0.00	0.00	0.00
7,150.0	90.00	268.87	6,713.0	-151.4	-259.5	264.5	0.00	0.00	0.00
7,200.0	90.00	268.87	6,713.0	-152.4	-309.5	314.5	0.00	0.00	0.00
7,250.0	90.00	268.87	6,713.0	-153.3	-359.5	364.5	0.00	0.00	0.00
7,300.0	90.00	268.87	6,713.0	-154.3	-409.5	414.4	0.00	0.00	0.00
7,350.0	90.00	268.87	6,713.0	-155.3	-459.5	464.4	0.00	0.00	0.00
7,400.0	90.00	268.87	6,713.0	-156.3	-509.4	514.4	0.00	0.00	0.00
7,450.0	90.00	268.87	6,713.0	-157.3	-559.4	564.4	0.00	0.00	0.00
7,500.0	90.00	268.87	6,713.0	-158.3	-609.4	614.4	0.00	0.00	0.00
7,550.0	90.00	268.87	6,713.0	-159.3	-659.4	664.4	0.00	0.00	0.00
7,600.0	90.00	268.87	6,713.0	-160.2	-709.4	714.4	0.00	0.00	0.00
7,650.0	90.00	268.87	6,713.0	-161.2	-759.4	764.4	0.00	0.00	0.00
7,700.0	90.00	268.87	6,713.0	-162.2	-809.4	814.4	0.00	0.00	0.00
7,750.0	90.00	268.87	6,713.0	-163.2	-859.4	864.4	0.00	0.00	0.00
7,800.0	90.00	268.87	6,713.0	-164.2	-909.4	914.4	0.00	0.00	0.00
7,850.0	90.00	268.87	6,713.0	-165.2	-959.4	964.4	0.00	0.00	0.00

Database:	EDM Producction	**Local Co-ordinate Reference:**	Well Larson A23-678
Company:	Northern Region - DJ Basin	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Project:	Wells Ranch	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site:	AA Section 19	**North Reference:**	Grid
Well:	Larson A23-678	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,900.0	90.00	268.87	6,713.0	-166.2	-1,009.3	1,014.4	0.00	0.00	0.00
7,950.0	90.00	268.87	6,713.0	-167.1	-1,059.3	1,064.4	0.00	0.00	0.00
8,000.0	90.00	268.87	6,713.0	-168.1	-1,109.3	1,114.4	0.00	0.00	0.00
8,050.0	90.00	268.87	6,713.0	-169.1	-1,159.3	1,164.4	0.00	0.00	0.00
8,100.0	90.00	268.87	6,713.0	-170.1	-1,209.3	1,214.4	0.00	0.00	0.00
8,150.0	90.00	268.87	6,713.0	-171.1	-1,259.3	1,264.4	0.00	0.00	0.00
8,200.0	90.00	268.87	6,713.0	-172.1	-1,309.3	1,314.4	0.00	0.00	0.00
8,250.0	90.00	268.87	6,713.0	-173.1	-1,359.3	1,364.4	0.00	0.00	0.00
8,300.0	90.00	268.87	6,713.0	-174.0	-1,409.3	1,414.3	0.00	0.00	0.00
8,350.0	90.00	268.87	6,713.0	-175.0	-1,459.3	1,464.3	0.00	0.00	0.00
8,400.0	90.00	268.87	6,713.0	-176.0	-1,509.2	1,514.3	0.00	0.00	0.00
8,450.0	90.00	268.87	6,713.0	-177.0	-1,559.2	1,564.3	0.00	0.00	0.00
8,500.0	90.00	268.87	6,713.0	-178.0	-1,609.2	1,614.3	0.00	0.00	0.00
8,550.0	90.00	268.87	6,713.0	-179.0	-1,659.2	1,664.3	0.00	0.00	0.00
8,600.0	90.00	268.87	6,713.0	-179.9	-1,709.2	1,714.3	0.00	0.00	0.00
8,650.0	90.00	268.87	6,713.0	-180.9	-1,759.2	1,764.3	0.00	0.00	0.00
8,700.0	90.00	268.87	6,713.0	-181.9	-1,809.2	1,814.3	0.00	0.00	0.00
8,750.0	90.00	268.87	6,713.0	-182.9	-1,859.2	1,864.3	0.00	0.00	0.00
8,800.0	90.00	268.87	6,713.0	-183.9	-1,909.2	1,914.3	0.00	0.00	0.00
8,850.0	90.00	268.87	6,713.0	-184.9	-1,959.2	1,964.3	0.00	0.00	0.00
8,900.0	90.00	268.87	6,713.0	-185.9	-2,009.1	2,014.3	0.00	0.00	0.00
8,950.0	90.00	268.87	6,713.0	-186.8	-2,059.1	2,064.3	0.00	0.00	0.00
9,000.0	90.00	268.87	6,713.0	-187.8	-2,109.1	2,114.3	0.00	0.00	0.00
9,050.0	90.00	268.87	6,713.0	-188.8	-2,159.1	2,164.3	0.00	0.00	0.00
9,100.0	90.00	268.87	6,713.0	-189.8	-2,209.1	2,214.3	0.00	0.00	0.00
9,150.0	90.00	268.87	6,713.0	-190.8	-2,259.1	2,264.3	0.00	0.00	0.00
9,200.0	90.00	268.87	6,713.0	-191.8	-2,309.1	2,314.3	0.00	0.00	0.00
9,250.0	90.00	268.87	6,713.0	-192.7	-2,359.1	2,364.3	0.00	0.00	0.00
9,300.0	90.00	268.87	6,713.0	-193.7	-2,409.1	2,414.2	0.00	0.00	0.00
9,350.0	90.00	268.87	6,713.0	-194.7	-2,459.1	2,464.2	0.00	0.00	0.00
9,400.0	90.00	268.87	6,713.0	-195.7	-2,509.1	2,514.2	0.00	0.00	0.00
9,450.0	90.00	268.87	6,713.0	-196.7	-2,559.0	2,564.2	0.00	0.00	0.00
9,500.0	90.00	268.87	6,713.0	-197.7	-2,609.0	2,614.2	0.00	0.00	0.00
9,550.0	90.00	268.87	6,713.0	-198.6	-2,659.0	2,664.2	0.00	0.00	0.00
9,600.0	90.00	268.87	6,713.0	-199.6	-2,709.0	2,714.2	0.00	0.00	0.00
9,650.0	90.00	268.87	6,713.0	-200.6	-2,759.0	2,764.2	0.00	0.00	0.00
9,700.0	90.00	268.87	6,713.0	-201.6	-2,809.0	2,814.2	0.00	0.00	0.00
9,750.0	90.00	268.87	6,713.0	-202.6	-2,859.0	2,864.2	0.00	0.00	0.00
9,800.0	90.00	268.87	6,713.0	-203.6	-2,909.0	2,914.2	0.00	0.00	0.00
9,850.0	90.00	268.87	6,713.0	-204.5	-2,959.0	2,964.2	0.00	0.00	0.00
9,900.0	90.00	268.87	6,713.0	-205.5	-3,009.0	3,014.2	0.00	0.00	0.00
9,950.0	90.00	268.87	6,713.0	-206.5	-3,058.9	3,064.2	0.00	0.00	0.00
10,000.0	90.00	268.87	6,713.0	-207.5	-3,108.9	3,114.2	0.00	0.00	0.00
10,050.0	90.00	268.87	6,713.0	-208.5	-3,158.9	3,164.2	0.00	0.00	0.00
10,100.0	90.00	268.87	6,713.0	-209.5	-3,208.9	3,214.2	0.00	0.00	0.00
10,150.0	90.00	268.87	6,713.0	-210.4	-3,258.9	3,264.2	0.00	0.00	0.00
10,200.0	90.00	268.87	6,713.0	-211.4	-3,308.9	3,314.2	0.00	0.00	0.00
10,250.0	90.00	268.87	6,713.0	-212.4	-3,358.9	3,364.2	0.00	0.00	0.00
10,300.0	90.00	268.87	6,713.0	-213.4	-3,408.9	3,414.1	0.00	0.00	0.00
10,350.0	90.00	268.87	6,713.0	-214.4	-3,458.9	3,464.1	0.00	0.00	0.00
10,400.0	90.00	268.87	6,713.0	-215.4	-3,508.9	3,514.1	0.00	0.00	0.00
10,450.0	90.00	268.87	6,713.0	-216.3	-3,558.8	3,564.1	0.00	0.00	0.00
10,500.0	90.00	268.87	6,713.0	-217.3	-3,608.8	3,614.1	0.00	0.00	0.00
10,550.0	90.00	268.87	6,713.0	-218.3	-3,658.8	3,664.1	0.00	0.00	0.00

Database:	EDM Producction	**Local Co-ordinate Reference:**	Well Larson A23-678
Company:	Northern Region - DJ Basin	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Project:	Wells Ranch	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site:	AA Section 19	**North Reference:**	Grid
Well:	Larson A23-678	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,600.0	90.00	268.87	6,713.0	-219.3	-3,708.8	3,714.1	0.00	0.00	0.00
10,650.0	90.00	268.87	6,713.0	-220.3	-3,758.8	3,764.1	0.00	0.00	0.00
10,700.0	90.00	268.87	6,713.0	-221.3	-3,808.8	3,814.1	0.00	0.00	0.00
10,750.0	90.00	268.87	6,713.0	-222.2	-3,858.8	3,864.1	0.00	0.00	0.00
10,800.0	90.00	268.87	6,713.0	-223.2	-3,908.8	3,914.1	0.00	0.00	0.00
10,850.0	90.00	268.87	6,713.0	-224.2	-3,958.8	3,964.1	0.00	0.00	0.00
10,900.0	90.00	268.87	6,713.0	-225.2	-4,008.8	4,014.1	0.00	0.00	0.00
10,950.0	90.00	268.87	6,713.0	-226.2	-4,058.8	4,064.1	0.00	0.00	0.00
11,000.0	90.00	268.87	6,713.0	-227.2	-4,108.7	4,114.1	0.00	0.00	0.00
11,050.0	90.00	268.87	6,713.0	-228.1	-4,158.7	4,164.1	0.00	0.00	0.00
11,100.0	90.00	268.87	6,713.0	-229.1	-4,208.7	4,214.1	0.00	0.00	0.00
11,150.0	90.00	268.87	6,713.0	-230.1	-4,258.7	4,264.1	0.00	0.00	0.00
11,200.0	90.00	268.87	6,713.0	-231.1	-4,308.7	4,314.1	0.00	0.00	0.00
11,250.0	90.00	268.87	6,713.0	-232.1	-4,358.7	4,364.1	0.00	0.00	0.00
11,300.0	90.00	268.87	6,713.0	-233.0	-4,408.7	4,414.0	0.00	0.00	0.00
11,350.0	90.00	268.87	6,713.0	-234.0	-4,458.7	4,464.0	0.00	0.00	0.00
11,400.0	90.00	268.87	6,713.0	-235.0	-4,508.7	4,514.0	0.00	0.00	0.00
11,450.0	90.00	268.87	6,713.0	-236.0	-4,558.7	4,564.0	0.00	0.00	0.00
11,500.0	90.00	268.87	6,713.0	-237.0	-4,608.6	4,614.0	0.00	0.00	0.00
11,550.0	90.00	268.87	6,713.0	-238.0	-4,658.6	4,664.0	0.00	0.00	0.00
11,600.0	90.00	268.87	6,713.0	-238.9	-4,708.6	4,714.0	0.00	0.00	0.00
11,650.0	90.00	268.87	6,713.0	-239.9	-4,758.6	4,764.0	0.00	0.00	0.00
11,700.0	90.00	268.87	6,713.0	-240.9	-4,808.6	4,814.0	0.00	0.00	0.00
11,750.0	90.00	268.87	6,713.0	-241.9	-4,858.6	4,864.0	0.00	0.00	0.00
11,800.0	90.00	268.88	6,713.0	-242.9	-4,908.6	4,914.0	0.00	0.00	0.00
11,850.0	90.00	268.88	6,713.0	-243.8	-4,958.6	4,964.0	0.00	0.00	0.00
11,900.0	90.00	268.88	6,713.0	-244.8	-5,008.6	5,014.0	0.00	0.00	0.00
11,950.0	90.00	268.88	6,713.0	-245.8	-5,058.6	5,064.0	0.00	0.00	0.00
12,000.0	90.00	268.88	6,713.0	-246.8	-5,108.6	5,114.0	0.00	0.00	0.00
12,050.0	90.00	268.88	6,713.0	-247.8	-5,158.5	5,164.0	0.00	0.00	0.00
12,100.0	90.00	268.88	6,713.0	-248.8	-5,208.5	5,214.0	0.00	0.00	0.00
12,150.0	90.00	268.88	6,713.0	-249.7	-5,258.5	5,264.0	0.00	0.00	0.00
12,200.0	90.00	268.88	6,713.0	-250.7	-5,308.5	5,314.0	0.00	0.00	0.00
12,250.0	90.00	268.88	6,713.0	-251.7	-5,358.5	5,364.0	0.00	0.00	0.00
12,300.0	90.00	268.88	6,713.0	-252.7	-5,408.5	5,413.9	0.00	0.00	0.00
12,350.0	90.00	268.88	6,713.0	-253.7	-5,458.5	5,463.9	0.00	0.00	0.00
12,400.0	90.00	268.88	6,713.0	-254.6	-5,508.5	5,513.9	0.00	0.00	0.00
12,450.0	90.00	268.88	6,713.0	-255.6	-5,558.5	5,563.9	0.00	0.00	0.00
12,500.0	90.00	268.88	6,713.0	-256.6	-5,608.5	5,613.9	0.00	0.00	0.00
12,550.0	90.00	268.88	6,713.0	-257.6	-5,658.4	5,663.9	0.00	0.00	0.00
12,600.0	90.00	268.88	6,713.0	-258.6	-5,708.4	5,713.9	0.00	0.00	0.00
12,650.0	90.00	268.88	6,713.0	-259.5	-5,758.4	5,763.9	0.00	0.00	0.00
12,700.0	90.00	268.88	6,713.0	-260.5	-5,808.4	5,813.9	0.00	0.00	0.00
12,750.0	90.00	268.88	6,713.0	-261.5	-5,858.4	5,863.9	0.00	0.00	0.00
12,800.0	90.00	268.88	6,713.0	-262.5	-5,908.4	5,913.9	0.00	0.00	0.00
12,850.0	90.00	268.88	6,713.0	-263.5	-5,958.4	5,963.9	0.00	0.00	0.00
12,900.0	90.00	268.88	6,713.0	-264.5	-6,008.4	6,013.9	0.00	0.00	0.00
12,950.0	90.00	268.88	6,713.0	-265.4	-6,058.4	6,063.9	0.00	0.00	0.00
13,000.0	90.00	268.88	6,713.0	-266.4	-6,108.4	6,113.9	0.00	0.00	0.00
13,050.0	90.00	268.88	6,713.0	-267.4	-6,158.3	6,163.9	0.00	0.00	0.00
13,100.0	90.00	268.88	6,713.0	-268.4	-6,208.3	6,213.9	0.00	0.00	0.00
13,150.0	90.00	268.88	6,713.0	-269.4	-6,258.3	6,263.9	0.00	0.00	0.00
13,200.0	90.00	268.88	6,713.0	-270.3	-6,308.3	6,313.9	0.00	0.00	0.00
13,250.0	90.00	268.88	6,713.0	-271.3	-6,358.3	6,363.8	0.00	0.00	0.00

Database:	EDM Producction	**Local Co-ordinate Reference:**	Well Larson A23-678
Company:	Northern Region - DJ Basin	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Project:	Wells Ranch	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site:	AA Section 19	**North Reference:**	Grid
Well:	Larson A23-678	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,300.0	90.00	268.88	6,713.0	-272.3	-6,408.3	6,413.8	0.00	0.00	0.00
13,350.0	90.00	268.88	6,713.0	-273.3	-6,458.3	6,463.8	0.00	0.00	0.00
13,400.0	90.00	268.88	6,713.0	-274.3	-6,508.3	6,513.8	0.00	0.00	0.00
13,450.0	90.00	268.88	6,713.0	-275.2	-6,558.3	6,563.8	0.00	0.00	0.00
13,500.0	90.00	268.88	6,713.0	-276.2	-6,608.3	6,613.8	0.00	0.00	0.00
13,550.0	90.00	268.88	6,713.0	-277.2	-6,658.3	6,663.8	0.00	0.00	0.00
13,600.0	90.00	268.88	6,713.0	-278.2	-6,708.2	6,713.8	0.00	0.00	0.00
13,650.0	90.00	268.88	6,713.0	-279.2	-6,758.2	6,763.8	0.00	0.00	0.00
13,700.0	90.00	268.88	6,713.0	-280.1	-6,808.2	6,813.8	0.00	0.00	0.00
13,750.0	90.00	268.88	6,713.0	-281.1	-6,858.2	6,863.8	0.00	0.00	0.00
13,800.0	90.00	268.88	6,713.0	-282.1	-6,908.2	6,913.8	0.00	0.00	0.00
13,850.0	90.00	268.88	6,713.0	-283.1	-6,958.2	6,963.8	0.00	0.00	0.00
13,900.0	90.00	268.88	6,713.0	-284.1	-7,008.2	7,013.8	0.00	0.00	0.00
13,950.0	90.00	268.88	6,713.0	-285.0	-7,058.2	7,063.8	0.00	0.00	0.00
14,000.0	90.00	268.88	6,713.0	-286.0	-7,108.2	7,113.8	0.00	0.00	0.00
14,050.0	90.00	268.88	6,713.0	-287.0	-7,158.2	7,163.8	0.00	0.00	0.00
14,100.0	90.00	268.88	6,713.0	-288.0	-7,208.1	7,213.8	0.00	0.00	0.00
14,150.0	90.00	268.88	6,713.0	-289.0	-7,258.1	7,263.8	0.00	0.00	0.00
14,200.0	90.00	268.88	6,713.0	-289.9	-7,308.1	7,313.8	0.00	0.00	0.00
14,250.0	90.00	268.88	6,713.0	-290.9	-7,358.1	7,363.7	0.00	0.00	0.00
14,300.0	90.00	268.88	6,713.0	-291.9	-7,408.1	7,413.7	0.00	0.00	0.00
14,350.0	90.00	268.88	6,713.0	-292.9	-7,458.1	7,463.7	0.00	0.00	0.00
14,400.0	90.00	268.88	6,713.0	-293.9	-7,508.1	7,513.7	0.00	0.00	0.00
14,450.0	90.00	268.88	6,713.0	-294.8	-7,558.1	7,563.7	0.00	0.00	0.00
14,500.0	90.00	268.88	6,713.0	-295.8	-7,608.1	7,613.7	0.00	0.00	0.00
14,550.0	90.00	268.88	6,713.0	-296.8	-7,658.1	7,663.7	0.00	0.00	0.00
14,600.0	90.00	268.88	6,713.0	-297.8	-7,708.1	7,713.7	0.00	0.00	0.00
14,650.0	90.00	268.88	6,713.0	-298.7	-7,758.0	7,763.7	0.00	0.00	0.00
14,700.0	90.00	268.88	6,713.0	-299.7	-7,808.0	7,813.7	0.00	0.00	0.00
14,750.0	90.00	268.88	6,713.0	-300.7	-7,858.0	7,863.7	0.00	0.00	0.00
14,800.0	90.00	268.88	6,713.0	-301.7	-7,908.0	7,913.7	0.00	0.00	0.00
14,850.0	90.00	268.88	6,713.0	-302.7	-7,958.0	7,963.7	0.00	0.00	0.00
14,900.0	90.00	268.88	6,713.0	-303.6	-8,008.0	8,013.7	0.00	0.00	0.00
14,950.0	90.00	268.88	6,713.0	-304.6	-8,058.0	8,063.7	0.00	0.00	0.00
15,000.0	90.00	268.88	6,713.0	-305.6	-8,108.0	8,113.7	0.00	0.00	0.00
15,050.0	90.00	268.88	6,713.0	-306.6	-8,158.0	8,163.7	0.00	0.00	0.00
15,100.0	90.00	268.88	6,713.0	-307.6	-8,208.0	8,213.7	0.00	0.00	0.00
15,150.0	90.00	268.88	6,713.0	-308.5	-8,257.9	8,263.7	0.00	0.00	0.00
15,200.0	90.00	268.88	6,713.0	-309.5	-8,307.9	8,313.7	0.00	0.00	0.00
15,250.0	90.00	268.88	6,713.0	-310.5	-8,357.9	8,363.6	0.00	0.00	0.00
15,300.0	90.00	268.88	6,713.0	-311.5	-8,407.9	8,413.6	0.00	0.00	0.00
15,350.0	90.00	268.88	6,713.0	-312.4	-8,457.9	8,463.6	0.00	0.00	0.00
15,400.0	90.00	268.88	6,713.0	-313.4	-8,507.9	8,513.6	0.00	0.00	0.00
15,450.0	90.00	268.88	6,713.0	-314.4	-8,557.9	8,563.6	0.00	0.00	0.00
15,500.0	90.00	268.88	6,713.0	-315.4	-8,607.9	8,613.6	0.00	0.00	0.00
15,550.0	90.00	268.88	6,713.0	-316.4	-8,657.9	8,663.6	0.00	0.00	0.00
15,600.0	90.00	268.88	6,713.0	-317.3	-8,707.9	8,713.6	0.00	0.00	0.00
15,650.0	90.00	268.88	6,713.0	-318.3	-8,757.8	8,763.6	0.00	0.00	0.00
15,700.0	90.00	268.88	6,713.0	-319.3	-8,807.8	8,813.6	0.00	0.00	0.00
15,750.0	90.00	268.88	6,713.0	-320.3	-8,857.8	8,863.6	0.00	0.00	0.00
15,800.0	90.00	268.88	6,713.0	-321.3	-8,907.8	8,913.6	0.00	0.00	0.00
15,850.0	90.00	268.88	6,713.0	-322.2	-8,957.8	8,963.6	0.00	0.00	0.00
15,900.0	90.00	268.88	6,713.0	-323.2	-9,007.8	9,013.6	0.00	0.00	0.00
15,950.0	90.00	268.88	6,713.0	-324.2	-9,057.8	9,063.6	0.00	0.00	0.00

Database:	EDM Producction	**Local Co-ordinate Reference:**	Well Larson A23-678
Company:	Northern Region - DJ Basin	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Project:	Wells Ranch	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site:	AA Section 19	**North Reference:**	Grid
Well:	Larson A23-678	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,000.0	90.00	268.88	6,713.0	-325.2	-9,107.8	9,113.6	0.00	0.00	0.00
16,050.0	90.00	268.88	6,713.0	-326.1	-9,157.8	9,163.6	0.00	0.00	0.00
16,100.0	90.00	268.88	6,713.0	-327.1	-9,207.8	9,213.6	0.00	0.00	0.00
16,150.0	90.00	268.88	6,713.0	-328.1	-9,257.8	9,263.6	0.00	0.00	0.00
16,200.0	90.00	268.88	6,713.0	-329.1	-9,307.7	9,313.5	0.00	0.00	0.00
16,250.0	90.00	268.88	6,713.0	-330.1	-9,357.7	9,363.5	0.00	0.00	0.00
16,300.0	90.00	268.88	6,713.0	-331.0	-9,407.7	9,413.5	0.00	0.00	0.00
16,350.0	90.00	268.88	6,713.0	-332.0	-9,457.7	9,463.5	0.00	0.00	0.00
16,400.0	90.00	268.88	6,713.0	-333.0	-9,507.7	9,513.5	0.00	0.00	0.00
16,450.0	90.00	268.88	6,713.0	-334.0	-9,557.7	9,563.5	0.00	0.00	0.00
16,500.0	90.00	268.88	6,713.0	-334.9	-9,607.7	9,613.5	0.00	0.00	0.00
16,550.0	90.00	268.88	6,713.0	-335.9	-9,657.7	9,663.5	0.00	0.00	0.00
16,600.0	90.00	268.88	6,713.0	-336.9	-9,707.7	9,713.5	0.00	0.00	0.00
16,650.0	90.00	268.88	6,713.0	-337.9	-9,757.7	9,763.5	0.00	0.00	0.00
16,700.0	90.00	268.88	6,713.0	-338.8	-9,807.6	9,813.5	0.00	0.00	0.00
16,750.0	90.00	268.88	6,713.0	-339.8	-9,857.6	9,863.5	0.00	0.00	0.00
16,800.0	90.00	268.88	6,713.0	-340.8	-9,907.6	9,913.5	0.00	0.00	0.00
16,850.0	90.00	268.88	6,713.0	-341.8	-9,957.6	9,963.5	0.00	0.00	0.00
16,900.0	90.00	268.88	6,713.0	-342.8	-10,007.6	10,013.5	0.00	0.00	0.00
16,950.0	90.00	268.88	6,713.0	-343.7	-10,057.6	10,063.5	0.00	0.00	0.00
17,000.0	90.00	268.88	6,713.0	-344.7	-10,107.6	10,113.5	0.00	0.00	0.00
17,050.0	90.00	268.88	6,713.0	-345.7	-10,157.6	10,163.5	0.00	0.00	0.00
17,100.0	90.00	268.88	6,713.0	-346.7	-10,207.6	10,213.5	0.00	0.00	0.00
17,150.0	90.00	268.88	6,713.0	-347.6	-10,257.6	10,263.5	0.00	0.00	0.00
17,179.6	90.00	268.88	6,713.0	-348.2	-10,287.2	10,293.1	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Larson A23-678 BHL 80 - plan hits target center - Point	0.00	0.00	6,713.0	-348.2	-10,287.2	1,417,951.56	3,270,745.71	40.4766000	-104.5267600

Database:	EDM Producction	**Local Co-ordinate Reference:**	Well Larson A23-678
Company:	Northern Region - DJ Basin	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Project:	Wells Ranch	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site:	AA Section 19	**North Reference:**	Grid
Well:	Larson A23-678	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Drilling		
Design:	APD - Rev 0		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
299.0	299.0	FOX HILLS		0.00	
442.0	442.0	UPPER PIERRE AQUIFER TOP		0.00	
465.0	465.0	PIERRE		0.00	
1,498.0	1,498.0	UPPER PIERRE AQUIFER BASE		0.00	
3,586.7	3,580.0	PARKMAN		0.00	
4,278.5	4,267.0	SUSSEX		0.00	
4,864.5	4,849.0	SHANNON		0.00	
5,800.0	5,778.0	TEEPEE BUTTES		0.00	
6,544.3	6,489.0	SHARON SPRINGS		0.00	
6,592.1	6,525.0	NIO A CHALK		0.00	
6,623.2	6,547.0	NIO A MARL		0.00	
6,755.3	6,627.0	NIO B CHALK		0.00	
6,824.0	6,659.0	NIO B MARL		0.00	
6,960.3	6,701.0	NIO C CHALK		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
2,400.0	2,400.0	0.0	0.0	KOP - Start Build 2.00
6,061.2	6,013.0	-90.6	571.7	Start DLS 9.95 TFO 63.26
6,084.7	6,036.1	-91.6	575.8	Start DLS 9.95 TFO 158.52
7,092.6	6,713.0	-150.0	10.0	TPZ/Landing Pt. @ 7092.6 MD
17,391.6	6,713.0	-348.2	-10,287.2	TD at 17391.7

Northern Region - DJ Basin

Wells Ranch
AA Section 19
Larson A23-678

Original Drilling
APD - Rev 0

Anticollision Summary Report

06 January, 2017

Anticollision Summary Report

Company:	Northern Region - DJ Basin	**Local Co-ordinate Reference:**	Well Larson A23-678
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Reference Site:	AA Section 19	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	Larson A23-678	**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

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**		
From (ft)	**To (ft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
0.0	17,391.6	APD - Rev 0 (Original Drilling)	MWD+IFR1+MS_WY	Fixed:v2:Rockies, crustal dec + 3-axis correction

Summary

Site Name **Offset Well - Wellbore - Design**	**Reference Measured Depth (ft)**	**Offset Measured Depth (ft)**	**Distance Between Centres (ft)**	**Distance Between Ellipses (ft)**	**Separation Factor**	**Warning**
A Section 23						
Cecil 23-13 - Original Drilling - Original Drilling - As Drille	14,176.1	6,676.3	946.4	786.1	5.904	CC
Cecil 23-13 - Original Drilling - Original Drilling - As Drille	14,200.0	6,675.9	946.7	786.0	5.890	ES, SF
Champlin 23-02 (PA) - Original Drilling - Original Drilling -	16,591.7	6,716.0	2,371.3	1,994.0	6.286	CC
Champlin 23-02 (PA) - Original Drilling - Original Drilling -	16,600.0	6,716.0	2,371.3	1,993.9	6.283	ES
Champlin 23-02 (PA) - Original Drilling - Original Drilling -	16,800.0	6,716.0	2,380.4	1,999.8	6.255	SF
Champlin 23-03 - Original Drilling - Original Drilling - As D	15,471.0	6,671.3	3,654.3	3,469.6	19.778	CC
Champlin 23-03 - Original Drilling - Original Drilling - As D	15,500.0	6,671.0	3,654.4	3,469.1	19.720	ES
Champlin 23-03 - Original Drilling - Original Drilling - As D	16,200.0	6,665.1	3,726.3	3,531.0	19.077	SF
Champlin Amoco A 1 #308 - Original Drilling - Original Dr	15,634.9	6,691.0	3,709.2	3,350.8	10.349	CC
Champlin Amoco A 1 #308 - Original Drilling - Original Dr	15,700.0	6,691.0	3,709.8	3,350.1	10.315	ES
Champlin Amoco A 1 #308 - Original Drilling - Original Dr	16,100.0	6,691.0	3,738.2	3,372.2	10.214	SF
Cooper 23-1-17 - Orignal Drilling - Orignal Drilling - As Dr	13,242.9	6,713.3	493.0	350.2	3.452	CC, ES, SF
Cooper 23-1-19 - Original Drilling - Original Drilling - As D	14,380.8	6,690.1	332.8	168.5	2.026	CC, ES, SF
Cooper 23-12 - Original Drilling - Original Drilling - As Dri	13,845.8	6,701.5	138.3	-16.0	0.896	Level 1, CC, ES, SF
Cooper 23-1-20 - Original Drilling - Original Drilling - As D	14,379.1	6,645.2	1,681.3	1,517.0	10.232	CC
Cooper 23-1-20 - Original Drilling - Original Drilling - As D	14,400.0	6,645.1	1,681.4	1,516.7	10.208	ES
Cooper 23-1-20 - Original Drilling - Original Drilling - As D	14,600.0	6,643.8	1,695.7	1,528.3	10.130	SF
Cooper 23-15 - Original Drilling - Original Drilling - As Dri	13,196.5	6,701.1	411.7	269.3	2.890	CC
Cooper 23-15 - Original Drilling - Original Drilling - As Dri	13,200.0	6,701.1	411.7	269.2	2.889	ES, SF
Foss 41-23D - Original Drilling - Original Drilling - As Drill	12,546.6	6,955.7	151.6	19.3	1.146	Level 2, CC, ES, SF
Foss 42-23 - Original Drilling - Original Drilling - As Drille	12,766.9	6,690.6	1,291.6	1,157.7	9.650	CC
Foss 42-23 - Original Drilling - Original Drilling - As Drille	12,800.0	6,690.5	1,292.0	1,157.6	9.610	ES
Foss 42-23 - Original Drilling - Original Drilling - As Drille	12,900.0	6,690.2	1,298.4	1,162.6	9.558	SF
J&L Farms 23-11 - Original Drilling - Original Drilling - As	16,651.3	6,716.5	198.2	-9.0	0.956	Level 1, CC, ES, SF
J&L Farms 23-12 - Original Drilling - Original Drilling - As	16,771.5	6,788.4	1,286.6	1,076.7	6.131	CC
J&L Farms 23-12 - Original Drilling - Original Drilling - As	16,800.0	6,788.8	1,286.9	1,076.6	6.118	ES
J&L Farms 23-12 - Original Drilling - Original Drilling - As	16,900.0	6,789.9	1,293.0	1,081.6	6.116	SF
J&L Farms 23-21 - Original Drilling - Original Drilling - As	15,032.4	6,702.1	406.7	230.1	2.303	CC, ES, SF
J&L Farms 23-22 - Original Drilling - Original Drilling - As	15,284.3	6,741.9	1,073.8	892.2	5.912	CC
J&L Farms 23-22 - Original Drilling - Original Drilling - As	15,300.0	6,742.2	1,073.9	892.0	5.902	ES
J&L Farms 23-22 - Original Drilling - Original Drilling - As	15,400.0	6,744.1	1,080.0	897.0	5.900	SF
McIntosh 33-23 - Original Drilling - Original Drilling - As D	13,886.8	6,555.1	2,613.4	2,459.0	16.924	CC
McIntosh 33-23 - Original Drilling - Original Drilling - As D	13,900.0	6,555.6	2,613.5	2,458.8	16.897	ES
McIntosh 33-23 - Original Drilling - Original Drilling - As D	14,300.0	6,571.0	2,645.9	2,485.1	16.463	SF
McIntosh 34-23 - Original Drilling - Original Drilling - As D	13,769.4	6,631.2	3,732.9	3,580.4	24.473	CC
McIntosh 34-23 - Original Drilling - Original Drilling - As D	13,800.0	6,631.5	3,733.1	3,579.9	24.381	ES
McIntosh 34-23 - Original Drilling - Original Drilling - As D	14,700.0	6,638.8	3,847.2	3,681.2	23.181	SF

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

Anticollision Summary Report

Company:	Northern Region - DJ Basin	**Local Co-ordinate Reference:**	Well Larson A23-678
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Reference Site:	AA Section 19	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	Larson A23-678	**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 Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
A Section 23						
McIntosh 43-23 - Original Drilling - Original Drilling - As D	12,402.9	6,645.4	2,345.0	2,218.1	18.478	CC, ES
McIntosh 43-23 - Original Drilling - Original Drilling - As D	12,800.0	6,644.0	2,378.4	2,245.5	17.893	SF
McIntosh 44-23 - Original Drilling - Original Drilling - As D	12,347.7	6,582.0	3,921.5	3,795.7	31.192	CC
McIntosh 44-23 - Original Drilling - Original Drilling - As D	12,400.0	6,584.0	3,921.8	3,795.1	30.952	ES
McIntosh 44-23 - Original Drilling - Original Drilling - As D	13,500.0	6,610.6	4,087.1	3,944.6	28.668	SF
Schroeder 23-31 - Original Drilling - Original Drilling - As	15,049.1	6,638.2	2,669.1	2,492.4	15.104	CC
Schroeder 23-31 - Original Drilling - Original Drilling - As	15,100.0	6,638.0	2,669.6	2,491.9	15.025	ES
Schroeder 23-31 - Original Drilling - Original Drilling - As	15,500.0	6,636.0	2,707.0	2,523.8	14.782	SF
Schroeder 23-33 - Original Drilling - Original Drilling - As	16,718.5	6,691.5	3,962.1	3,753.5	18.992	CC
Schroeder 23-33 - Original Drilling - Original Drilling - As	16,800.0	6,691.1	3,963.0	3,752.8	18.858	ES
Schroeder 23-33 - Original Drilling - Original Drilling - As	17,179.6	6,688.8	3,988.9	3,772.7	18.453	SF
A Section 24						
Larson Farms 01-24 - Original Drilling - Original Drilling -	7,294.7	6,901.1	153.4	92.2	2.507	CC, ES, SF
Larson Farms 02-24 - Original Drilling - Original Drilling -	7,253.0	6,860.9	1,160.7	1,099.0	18.788	CC, ES, SF
Larson Farms 03-24 - Original Drilling - Original Drilling -	8,583.7	6,797.0	2,446.9	2,375.4	34.210	CC
Larson Farms 03-24 - Original Drilling - Original Drilling -	8,600.0	6,796.9	2,447.0	2,375.2	34.095	ES
Larson Farms 03-24 - Original Drilling - Original Drilling -	9,300.0	6,794.3	2,549.6	2,469.3	31.727	SF
Larson Farms 04-24 - Original Drilling - Original Drilling -	7,294.1	7,217.3	2,457.2	2,368.0	27.552	CC
Larson Farms 04-24 - Original Drilling - Original Drilling -	7,300.0	7,217.4	2,457.2	2,368.0	27.541	ES
Larson Farms 04-24 - Original Drilling - Original Drilling -	7,700.0	7,220.1	2,490.5	2,398.8	27.168	SF
Larson Farms 05-24 - Original Drilling - Original Drilling -	7,991.0	7,060.7	3,072.1	2,993.8	39.245	CC
Larson Farms 05-24 - Original Drilling - Original Drilling -	8,000.0	7,060.6	3,072.1	2,993.8	39.208	ES
Larson Farms 05-24 - Original Drilling - Original Drilling -	8,700.0	7,053.6	3,152.9	3,069.2	37.667	SF
Larson Farms 06-24 - Original Drilling - Original Drilling -	2,238.6	2,394.7	3,374.9	3,347.4	122.750	CC
Larson Farms 06-24 - Original Drilling - Original Drilling -	2,421.0	2,615.1	3,375.6	3,344.4	108.102	ES
Larson Farms 06-24 - Original Drilling - Original Drilling -	7,800.0	6,851.0	3,751.5	3,663.5	42.627	SF
Larson Farms 07-24 - Original Drilling - Original Drilling -	913.5	888.7	3,522.9	3,517.8	691.403	CC, ES
Larson Farms 07-24 - Original Drilling - Original Drilling -	10,300.0	7,100.1	4,140.6	4,048.7	45.057	SF
Peppler 24-32 - Original Drilling - Original Drilling - As Dr	11,406.2	6,714.5	2,250.3	2,141.9	20.748	CC, ES
Peppler 24-32 - Original Drilling - Original Drilling - As Dr	11,900.0	6,693.1	2,303.8	2,188.2	19.926	SF
Roth 24-21 - Original Drilling - Original Drilling - As Drilled	9,965.2	6,678.1	83.7	1.8	1.022	Level 2, CC, ES, SF

Anticollision Summary Report

Company:	Northern Region - DJ Basin	**Local Co-ordinate Reference:**	Well Larson A23-678
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Reference Site:	AA Section 19	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	Larson A23-678	**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 Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
AA Section 19						
J&L Farms 31-19 - Original Drilling - Original Drilling - As	6,135.2	6,076.8	2,886.4	2,852.8	86.132	CC, ES
J&L Farms 31-19 - Original Drilling - Original Drilling - As	6,650.0	6,538.9	3,093.4	3,056.4	83.625	SF
J&L Farms 32-19 - Original Drilling - Original Drilling - As	6,180.8	6,197.0	3,096.4	3,062.7	91.886	CC, ES
J&L Farms 32-19 - Original Drilling - Original Drilling - As	6,450.0	6,515.3	3,146.7	3,111.7	90.013	SF
J&L Farms 41-19 - Original Drilling - Original Drilling - As	6,139.9	6,114.5	4,167.8	4,134.2	124.277	CC, ES
J&L Farms 41-19 - Original Drilling - Original Drilling - As	6,400.0	6,336.8	4,224.5	4,189.8	121.990	SF
J&L Farms 42-19 - Original Drilling - Original Drilling - As	6,145.7	6,026.6	4,744.4	4,711.1	142.296	CC
J&L Farms 42-19 - Original Drilling - Original Drilling - As	6,150.0	6,030.3	4,744.4	4,711.1	142.209	ES
J&L Farms 42-19 - Original Drilling - Original Drilling - As	6,450.0	6,282.4	4,818.2	4,783.6	139.255	SF
Larson A23-668 - Original Drilling - APD - Rev 0	2,000.0	2,001.0	43.7	31.6	3.602	CC, ES
Larson A23-668 - Original Drilling - APD - Rev 0	17,179.6	17,460.6	663.0	260.9	1.649	SF
Larson A23-672 - Original Drilling - APD - Rev 0	2,200.0	2,201.0	21.9	8.5	1.632	CC, ES
Larson A23-672 - Original Drilling - APD - Rev 0	17,179.6	17,445.6	472.8	126.9	1.367	Level 3, SF
Larson A23-683 - Original Drilling - APD - Rev 0	2,000.0	2,001.0	21.9	9.7	1.801	CC
Larson A23-683 - Original Drilling - APD - Rev 0	17,179.6	17,320.2	317.2	-78.9	0.801	Level 1, ES, SF
Larson USX AA19-03 - Original Drilling - Original Drilling	6,138.0	6,076.7	1,902.2	1,868.6	56.623	CC, ES
Larson USX AA19-03 - Original Drilling - Original Drilling	6,250.0	6,168.7	1,913.0	1,878.9	56.118	SF
Larson USX AA19-04 - Original Drilling - Original Drilling	6,123.9	6,051.7	674.6	641.2	20.166	CC, ES
Larson USX AA19-04 - Original Drilling - Original Drilling	6,200.0	6,126.4	679.5	645.7	20.084	SF
Larson USX AA19-05 - Original Drilling - Original Drilling	6,244.8	6,175.8	1,380.4	1,346.3	40.455	CC
Larson USX AA19-05 - Original Drilling - Original Drilling	6,250.0	6,180.9	1,380.4	1,346.3	40.427	ES
Larson USX AA19-05 - Original Drilling - Original Drilling	6,450.0	6,357.9	1,395.0	1,360.1	39.964	SF
Larson USX AA19-06 - Original Drilling - Original Drilling	6,157.5	6,067.3	1,970.8	1,937.5	59.074	CC, ES
Larson USX AA19-06 - Original Drilling - Original Drilling	6,300.0	6,206.5	1,985.0	1,951.0	58.356	SF
Thrall USX AA19-11 - Original Drilling - Original Drilling -	6,220.8	6,206.7	3,264.5	3,230.5	96.022	CC, ES
Thrall USX AA19-11 - Original Drilling - Original Drilling -	6,550.0	6,523.0	3,316.6	3,281.3	93.918	SF
Thrall USX AA19-12 - Original Drilling - Original Drilling -	6,432.9	6,360.7	2,374.7	2,339.6	67.721	CC
Thrall USX AA19-12 - Original Drilling - Original Drilling -	6,450.0	6,374.7	2,374.8	2,339.6	67.607	ES
Thrall USX AA19-12 - Original Drilling - Original Drilling -	7,700.0	6,669.7	2,760.8	2,718.4	65.134	SF
Thrall USX AA19-13 - Original Drilling - Original Drilling -	6,404.3	6,347.6	3,815.2	3,780.2	109.176	CC, ES
Thrall USX AA19-13 - Original Drilling - Original Drilling -	9,400.0	6,690.1	5,119.4	5,059.7	85.822	SF
Thrall USX AA19-14 - Original Drilling - Original Drilling -	6,246.3	6,161.5	4,321.9	4,287.7	126.405	CC
Thrall USX AA19-14 - Original Drilling - Original Drilling -	6,250.0	6,165.4	4,321.9	4,287.7	126.339	ES
Thrall USX AA19-14 - Original Drilling - Original Drilling -	9,600.0	6,400.0	6,172.0	6,114.2	106.923	SF
Thrall USX AA19-25 - Original Drilling - Original Drilling -	6,280.3	6,208.8	3,004.9	2,970.5	87.571	CC
Thrall USX AA19-25 - Original Drilling - Original Drilling -	6,300.0	6,231.2	3,005.0	2,970.5	87.338	ES
Thrall USX AA19-25 - Original Drilling - Original Drilling -	8,100.0	6,676.2	3,774.7	3,729.5	83.623	SF
Wells Ranch USX AA19-09 - Original Drilling - Original D	6,167.7	6,123.6	4,989.7	4,956.1	148.429	CC, ES
Wells Ranch USX AA19-09 - Original Drilling - Original D	6,500.0	6,448.1	5,068.2	5,033.1	144.693	SF
Wells Ranch USX AA19-10 - Original Drilling - Original D	6,180.3	6,140.2	3,911.8	3,878.2	116.306	CC, ES
Wells Ranch USX AA19-10 - Original Drilling - Original D	6,600.0	6,610.7	4,022.0	3,986.6	113.405	SF
Wells Ranch USX AA19-15 - Original Drilling - Original D	6,216.4	6,228.8	4,767.1	4,732.3	137.161	CC, ES
Wells Ranch USX AA19-15 - Original Drilling - Original D	8,700.0	6,792.4	6,308.8	6,253.4	113.897	SF
Wells Ranch USX AA19-16 - Original Drilling - Original D	6,164.0	5,977.9	5,885.5	5,852.2	176.904	CC, ES
Wells Ranch USX AA19-16 - Original Drilling - Original D	6,600.0	6,325.6	6,001.2	5,966.3	171.928	SF
Wells Ranch USX AA19-23 - Original Drilling - Original D	6,202.1	6,280.1	4,926.5	4,892.4	144.470	CC, ES
Wells Ranch USX AA19-23 - Original Drilling - Original D	6,500.0	6,448.5	4,985.1	4,950.0	142.243	SF

Anticollision Summary Report

Company:	Northern Region - DJ Basin	**Local Co-ordinate Reference:**	Well Larson A23-678
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Reference Site:	AA Section 19	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	Larson A23-678	**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

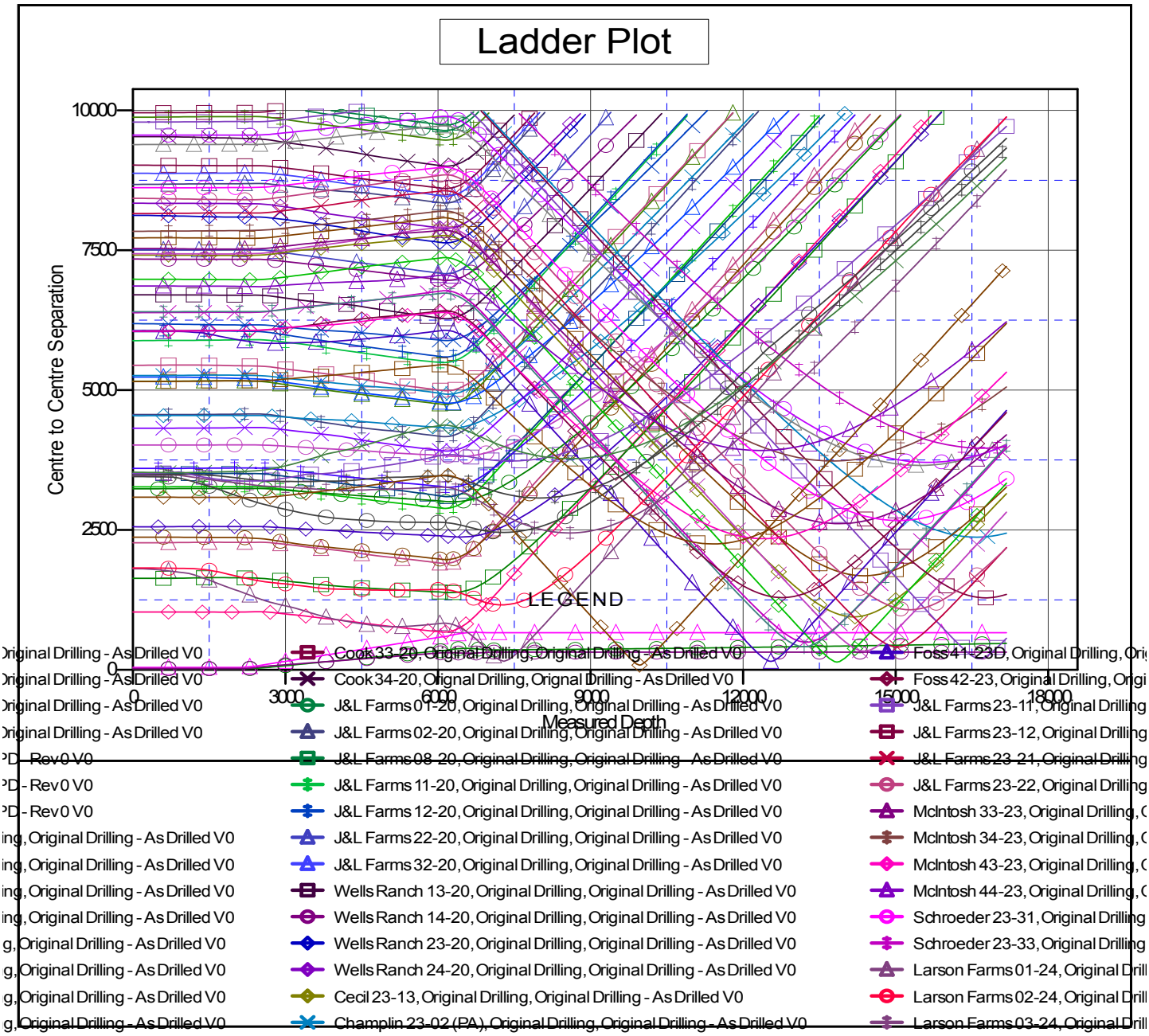
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
AA Section 20						
Cook 20D - Original Drilling - Original Drilling - As Drilled	6,150.6	6,033.0	9,469.5	9,436.3	284.638	CC, ES
Cook 20D - Original Drilling - Original Drilling - As Drilled	6,650.0	6,459.2	9,656.1	9,620.9	274.488	SF
Cook 33-20 - Original Drilling - Original Drilling - As Drille	6,153.3	6,079.8	8,604.6	8,571.2	257.907	CC, ES
Cook 33-20 - Original Drilling - Original Drilling - As Drille	6,750.0	6,579.0	8,866.3	8,830.8	249.544	SF
Cook 34-20 - Orignal Drilling - Orignal Drilling - As Drilled	6,166.5	6,186.0	9,003.4	8,969.1	262.781	CC, ES
Cook 34-20 - Orignal Drilling - Orignal Drilling - As Drilled	6,650.0	6,565.7	9,173.8	9,137.8	255.057	SF
Cook 43-20 - Original Drilling - Original Drilling - As Drille						Out of range
Cook 43-20 - Original Drilling - Original Drilling - As Drille						Out of range
Cook 44-20 - Original Drilling - Original Drilling - As Drille						Out of range
J&L Farms 01-20 - Original Drilling - Original Drilling - As	6,139.4	6,097.7	9,640.7	9,604.4	266.275	CC, ES
J&L Farms 01-20 - Original Drilling - Original Drilling - As	6,550.0	6,331.1	9,778.6	9,741.0	259.715	SF
J&L Farms 02-20 - Original Drilling - Original Drilling - As	6,140.3	6,109.8	8,344.2	8,310.3	246.245	CC, ES
J&L Farms 02-20 - Original Drilling - Original Drilling - As	6,600.0	6,508.3	8,513.1	8,477.4	238.659	SF
J&L Farms 08-20 - Original Drilling - Original Drilling - As	6,146.7	6,113.4	9,736.6	9,547.3	51.444	CC
J&L Farms 08-20 - Original Drilling - Original Drilling - As	6,150.0	6,116.7	9,736.6	9,547.2	51.416	ES
J&L Farms 08-20 - Original Drilling - Original Drilling - As	6,700.0	6,587.3	9,973.2	9,769.9	49.035	SF
J&L Farms 11-20 - Original Drilling - Original Drilling - As	6,113.5	5,843.0	5,491.6	5,458.7	167.139	CC, ES
J&L Farms 11-20 - Original Drilling - Original Drilling - As	6,450.0	6,517.0	5,573.1	5,538.0	158.524	SF
J&L Farms 12-20 - Original Drilling - Original Drilling - As	6,150.8	6,091.4	5,592.6	5,558.7	165.403	CC, ES
J&L Farms 12-20 - Original Drilling - Original Drilling - As	6,500.0	6,421.2	5,688.8	5,653.5	161.520	SF
J&L Farms 22-20 - Original Drilling - Original Drilling - As	6,147.7	6,093.3	7,081.0	7,047.6	211.812	CC
J&L Farms 22-20 - Original Drilling - Original Drilling - As	6,150.0	6,095.4	7,081.0	7,047.5	211.742	ES
J&L Farms 22-20 - Original Drilling - Original Drilling - As	6,550.0	6,437.0	7,209.8	7,174.8	205.962	SF
J&L Farms 32-20 - Original Drilling - Original Drilling - As	6,156.6	6,246.9	8,465.5	8,431.7	250.315	CC, ES
J&L Farms 32-20 - Original Drilling - Original Drilling - As	6,550.0	6,500.0	8,591.4	8,556.3	244.393	SF
Wells Ranch 13-20 - Original Drilling - Original Drilling - A	6,166.3	6,154.5	6,275.6	6,242.0	186.458	CC, ES
Wells Ranch 13-20 - Original Drilling - Original Drilling - A	6,550.0	6,505.2	6,383.7	6,348.4	181.226	SF
Wells Ranch 14-20 - Original Drilling - Original Drilling - A	6,180.2	6,190.6	6,962.5	6,928.7	206.471	CC, ES
Wells Ranch 14-20 - Original Drilling - Original Drilling - A	6,750.0	6,576.6	7,173.2	7,137.5	201.390	SF
Wells Ranch 23-20 - Original Drilling - Original Drilling - A	6,155.2	6,071.8	7,632.6	7,598.9	226.515	CC, ES
Wells Ranch 23-20 - Original Drilling - Original Drilling - A	6,550.0	6,362.1	7,752.0	7,716.9	221.035	SF
Wells Ranch 24-20 - Original Drilling - Original Drilling - A	6,166.4	6,097.8	7,891.4	7,857.8	234.882	CC, ES
Wells Ranch 24-20 - Original Drilling - Original Drilling - A	6,650.0	6,467.4	8,054.2	8,018.9	228.259	SF

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

Company:	Northern Region - DJ Basin	**Local Co-ordinate Reference:**	Well Larson A23-678
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Reference Site:	AA Section 19	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	Larson A23-678	**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

Reference Depths are relative to WELL @ 4681.0ft (Original Well Elev.
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: Larson A23-678
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.65°



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

Company:	Northern Region - DJ Basin	**Local Co-ordinate Reference:**	Well Larson A23-678
Project:	Wells Ranch	**TVD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Reference Site:	AA Section 19	**MD Reference:**	WELL @ 4681.0ft (Original Well Elev.)
Site Error:	0.0 ft	**North Reference:**	Grid
Reference Well:	Larson A23-678	**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

Reference Depths are relative to WELL @ 4681.0ft (Original Well Elev.
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: Larson A23-678
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.65°