

# **MALLARD EXPLORATION**

**WELD COUNTY, COLORADO (NAD 83)**

**NE NE SEC. 30 T8N R60W 6th P.M.**

**GADWALL FED 30-31-12HN**

**ORIGINAL WELLBORE**

**31 August, 2017**

**Plan: PROPOSAL #1**





Project: WELD COUNTY, COLORADO (NAD 83)  
Site: NE NE SEC. 30 T8N R60W 6th P.M.  
Well: GADWALL FED 30-31-12HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #1

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Dep	Annotation
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 750ft FNL & 2067ft FEL of Sec 30
500.0	500.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUUDGE (2°/100ft BUR)
1095.4	1099.8	12.00	26.66	55.9	28.1	-55.4	62.6	EOB TO 12° INC
4317.7	4394.0	12.00	26.66	667.8	335.3	-661.6	747.3	END OF TANGENT
4913.1	4993.8	0.00	0.00	723.7	363.4	-717.0	809.8	EOD TO VERTICAL
5773.1	5853.8	0.00	0.00	723.7	363.4	-717.0	809.8	KOP (10°/100ft BUR)
6346.0	6753.7	90.00	180.84	150.8	355.0	-144.4	1382.7	HZ LP: 600ft FNL & 1715ft FEL of Sec 30
6346.0	16130.1	90.00	181.45	-9223.6	167.4	9225.1	10759.1	BHL: 600ft FSL & 1715ft FEL of Sec 31

PROPOSED LOCAL COORDINATES:

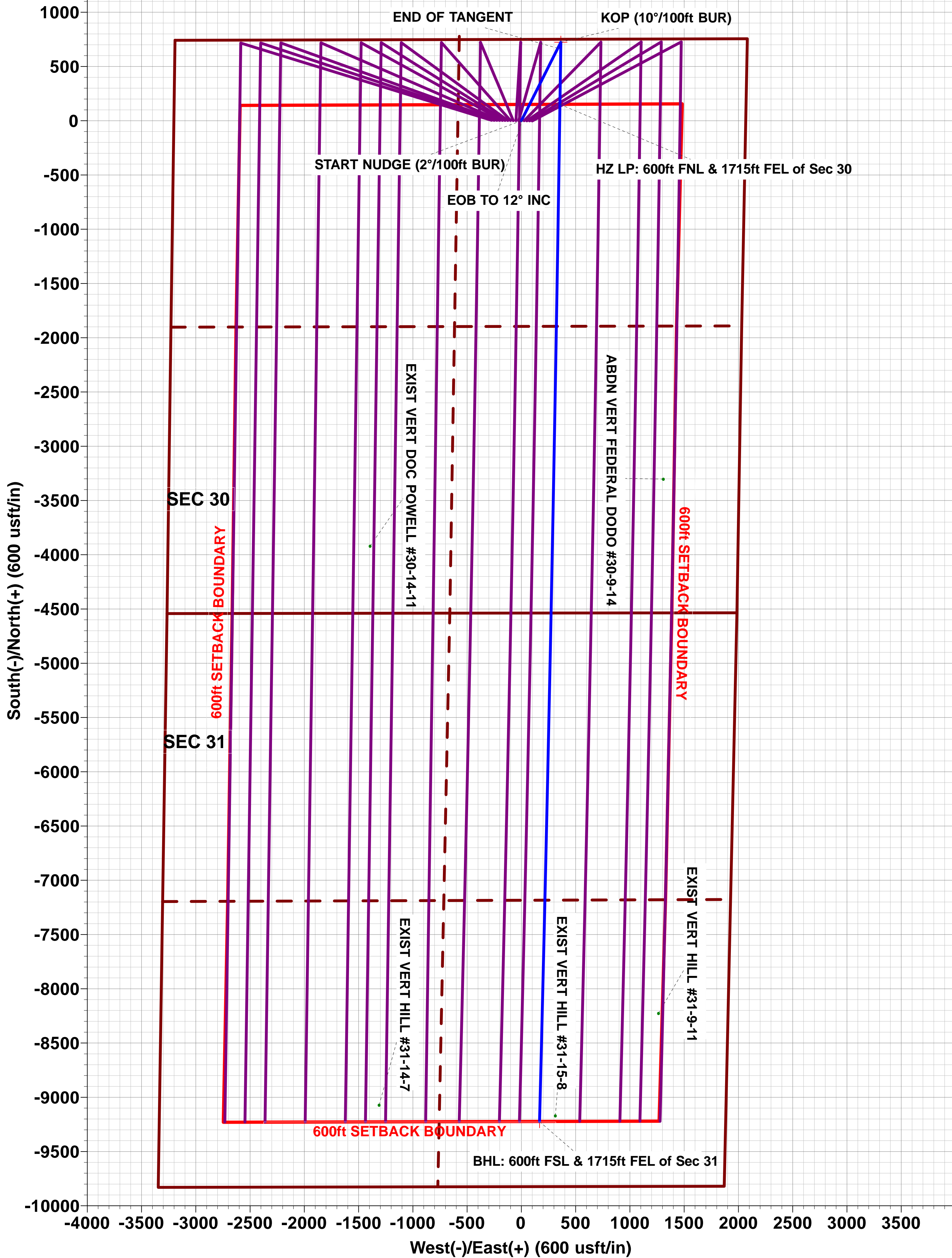
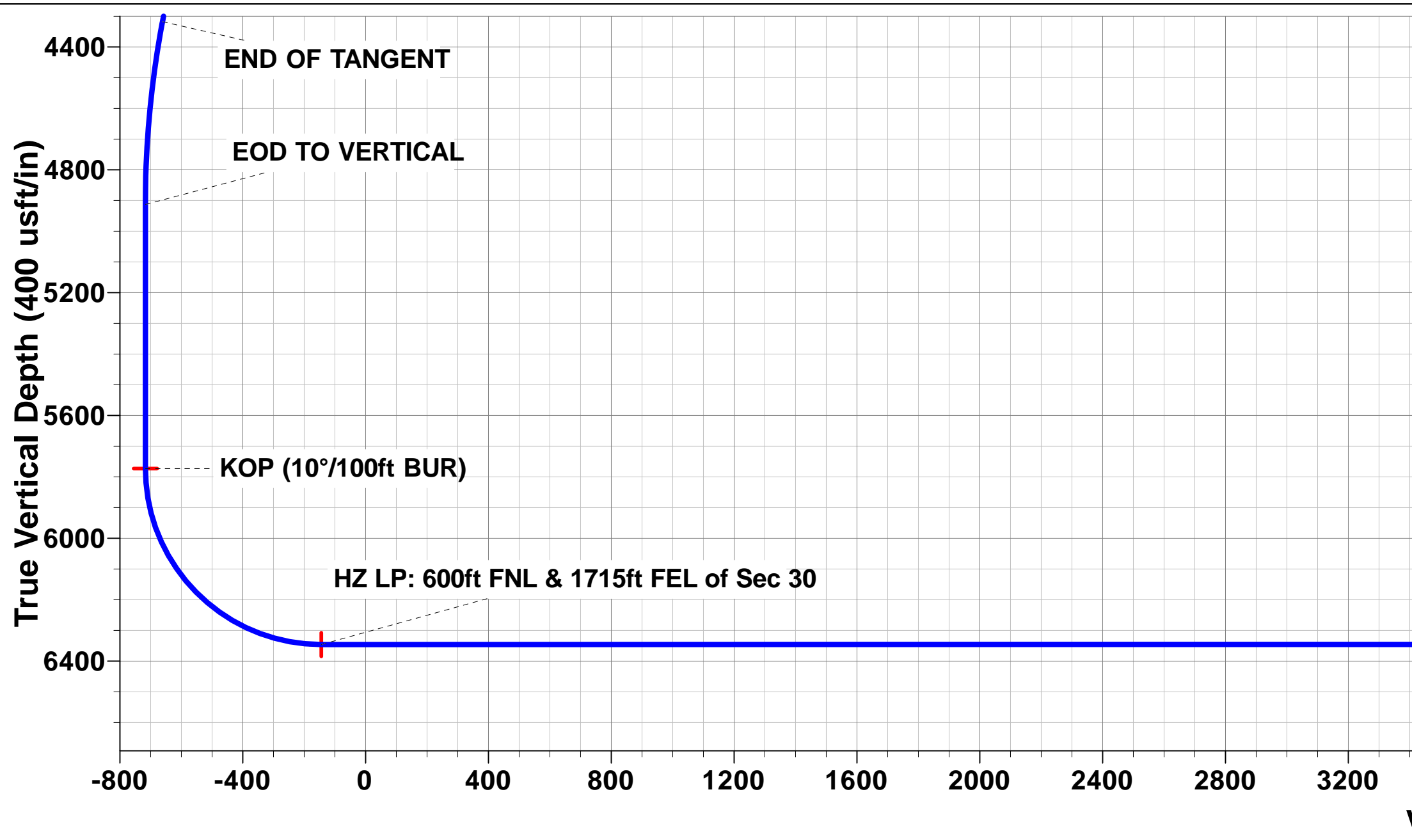
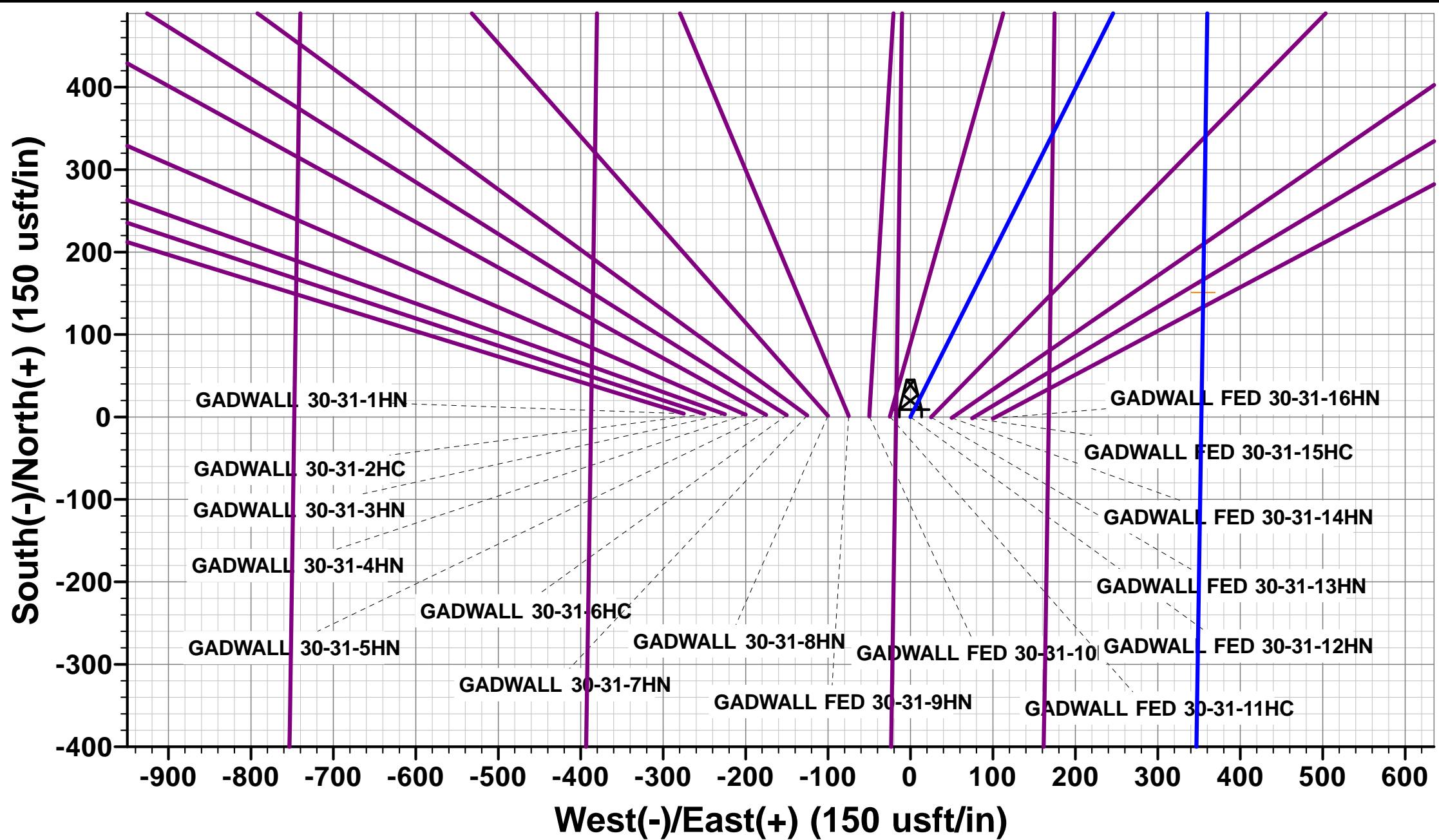
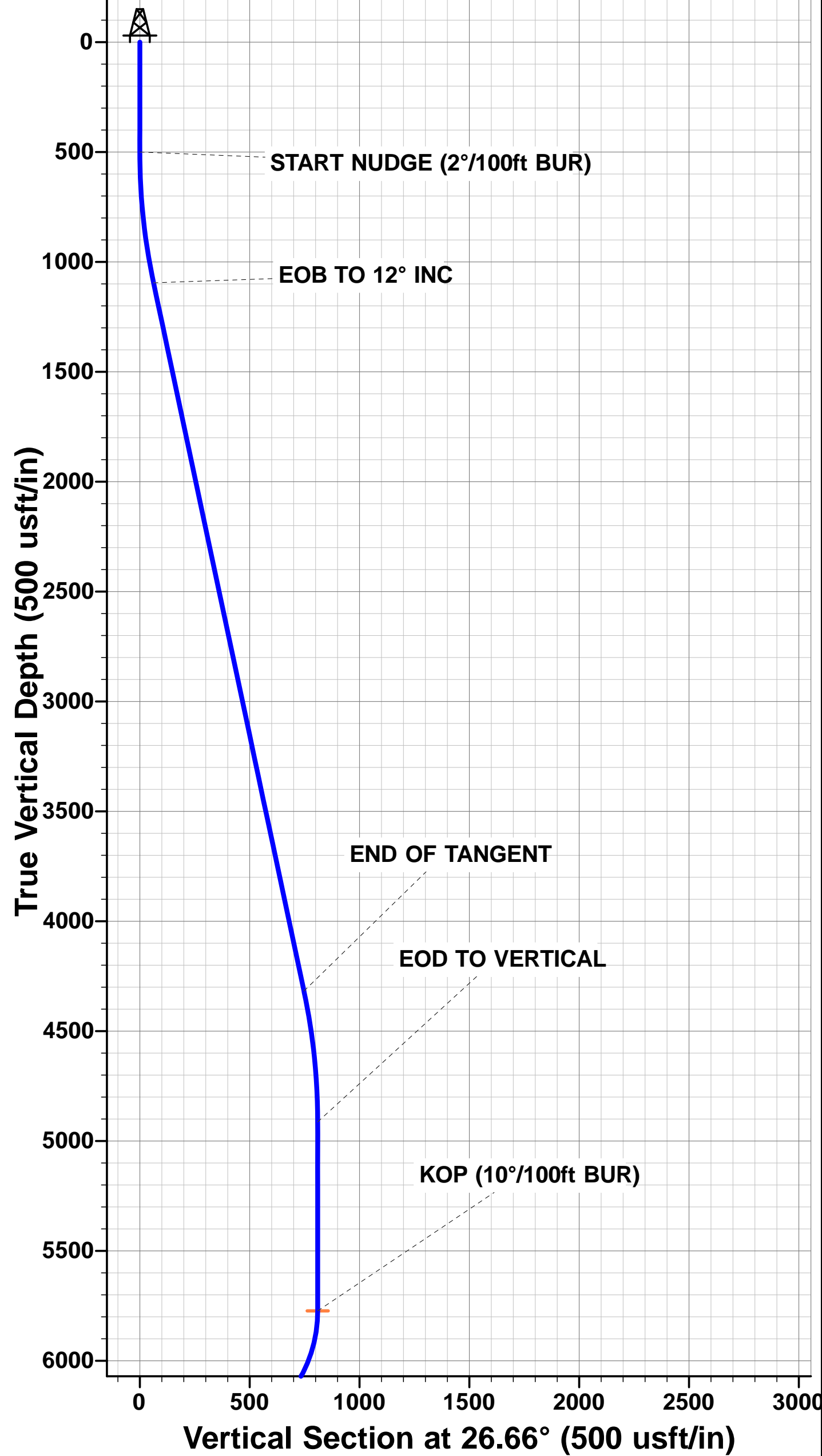
SHL: 750ft FNL & 2067ft FEL of Sec 30

HZ LP: 600ft FNL & 1715ft FEL of Sec 30

BHL: 600ft FSL & 1715ft FEL of Sec 31

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL FED 30-31-12HN	5773.1	723.7	363.4	40.640415	-104.131516
HZ LP: GADWALL FED 30-31-12HN	6346.0	150.8	355.0	40.638843	-104.131546
BHL: GADWALL FED 30-31-12HN	6346.0	-9223.6	167.4	40.613112	-104.132222



BHL: 600ft FSL & 1715ft FEL of Sec 31

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well GADWALL FED 30-31-12HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NE NE SEC. 30 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	GADWALL FED 30-31-12HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

<b>Project</b>	WELD COUNTY, COLORADO (NAD 83)		
<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

<b>Site</b>	NE NE SEC. 30 T8N R60W 6th P.M.			
<b>Site Position:</b>		<b>Northing:</b>	1,478,346.58 usft	<b>Latitude:</b> 40.638440
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,379,143.09 usft	<b>Longitude:</b> -104.133816
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	1.10000 ft	<b>Grid Convergence:</b> 0.88 °

<b>Well</b>	GADWALL FED 30-31-12HN			
<b>Well Position</b>	<b>+N/-S</b>	-4.0 usft	<b>Northing:</b>	1,478,346.81 usft
	<b>+E/-W</b>	275.0 usft	<b>Easting:</b>	3,379,418.15 usft
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft
			<b>Ground Level:</b>	4,948.0 usft

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	30/08/2017	7.87	67.14	52,556

<b>Design</b>	PROPOSAL #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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	178.96

<b>Plan Sections</b>											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	-4,964.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	-4,464.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,099.8	12.00	26.66	1,095.4	-3,868.6	55.9	28.1	2.00	2.00	0.00	26.66	
4,394.0	12.00	26.66	4,317.7	-646.3	667.8	335.3	0.00	0.00	0.00	0.00	
4,993.8	0.00	0.00	4,913.1	-50.9	723.7	363.4	2.00	-2.00	0.00	180.00	
5,853.8	0.00	0.00	5,773.1	809.1	723.7	363.4	0.00	0.00	0.00	0.00	KOP: GADWALL FED
6,753.7	90.00	180.84	6,346.0	1,382.0	150.8	355.0	10.00	10.00	-19.91	180.84	HZ LP: GADWALL FE
16,130.1	90.00	181.45	6,346.0	1,382.0	-9,223.6	167.4	0.01	0.00	0.01	90.38	BHL: GADWALL FED

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well GADWALL FED 30-31-12HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NE NE SEC. 30 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	GADWALL FED 30-31-12HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>SHL: 750ft FNL &amp; 2067ft FEL of Sec 30</b>										
0.0	0.00	0.00	0.0	4,964.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,864.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	4,764.00	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	4,664.00	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	4,564.00	0.0	0.0	0.0	0.00	0.00	0.00
<b>START NUDGE (2°/100ft BUR)</b>										
500.0	0.00	0.00	500.0	4,464.00	0.0	0.0	0.0	0.00	0.00	0.00
600.0	2.00	26.66	600.0	4,364.02	1.6	0.8	-1.5	2.00	2.00	0.00
700.0	4.00	26.66	699.8	4,264.16	6.2	3.1	-6.2	2.00	2.00	0.00
800.0	6.00	26.66	799.5	4,164.55	14.0	7.0	-13.9	2.00	2.00	0.00
900.0	8.00	26.66	898.7	4,065.30	24.9	12.5	-24.7	2.00	2.00	0.00
1,000.0	10.00	26.66	997.5	3,966.53	38.9	19.5	-38.5	2.00	2.00	0.00
<b>EOB TO 12° INC</b>										
1,099.8	12.00	26.66	1,095.4	3,868.56	55.9	28.1	-55.4	2.00	2.00	0.00
1,100.0	12.00	26.66	1,095.6	3,868.38	55.9	28.1	-55.4	0.00	0.00	0.00
1,200.0	12.00	26.66	1,193.4	3,770.56	74.5	37.4	-73.8	0.00	0.00	0.00
1,300.0	12.00	26.66	1,291.3	3,672.74	93.1	46.7	-92.2	0.00	0.00	0.00
1,400.0	12.00	26.66	1,389.1	3,574.93	111.7	56.1	-110.6	0.00	0.00	0.00
1,500.0	12.00	26.66	1,486.9	3,477.11	130.2	65.4	-129.0	0.00	0.00	0.00
<b>FOX HILLS BASE</b>										
1,556.3	12.00	26.66	1,542.0	3,422.00	140.7	70.7	-139.4	0.00	0.00	0.00
1,600.0	12.00	26.66	1,584.7	3,379.30	148.8	74.7	-147.4	0.00	0.00	0.00
1,700.0	12.00	26.66	1,682.5	3,281.48	167.4	84.1	-165.8	0.00	0.00	0.00
1,800.0	12.00	26.66	1,780.3	3,183.66	186.0	93.4	-184.2	0.00	0.00	0.00
1,900.0	12.00	26.66	1,878.2	3,085.85	204.5	102.7	-202.6	0.00	0.00	0.00
2,000.0	12.00	26.66	1,976.0	2,988.03	223.1	112.0	-221.0	0.00	0.00	0.00
2,100.0	12.00	26.66	2,073.8	2,890.22	241.7	121.4	-239.4	0.00	0.00	0.00
2,200.0	12.00	26.66	2,171.6	2,792.40	260.3	130.7	-257.9	0.00	0.00	0.00
2,300.0	12.00	26.66	2,269.4	2,694.58	278.8	140.0	-276.3	0.00	0.00	0.00
2,400.0	12.00	26.66	2,367.2	2,596.77	297.4	149.3	-294.7	0.00	0.00	0.00
2,500.0	12.00	26.66	2,465.0	2,498.95	316.0	158.7	-313.1	0.00	0.00	0.00
2,600.0	12.00	26.66	2,562.9	2,401.14	334.6	168.0	-331.5	0.00	0.00	0.00
2,700.0	12.00	26.66	2,660.7	2,303.32	353.1	177.3	-349.9	0.00	0.00	0.00
2,800.0	12.00	26.66	2,758.5	2,205.50	371.7	186.7	-368.3	0.00	0.00	0.00
2,900.0	12.00	26.66	2,856.3	2,107.69	390.3	196.0	-386.7	0.00	0.00	0.00
3,000.0	12.00	26.66	2,954.1	2,009.87	408.9	205.3	-405.1	0.00	0.00	0.00
3,100.0	12.00	26.66	3,051.9	1,912.06	427.4	214.6	-423.5	0.00	0.00	0.00
3,200.0	12.00	26.66	3,149.8	1,814.24	446.0	224.0	-441.9	0.00	0.00	0.00
3,300.0	12.00	26.66	3,247.6	1,716.42	464.6	233.3	-460.3	0.00	0.00	0.00
3,400.0	12.00	26.66	3,345.4	1,618.61	483.2	242.6	-478.7	0.00	0.00	0.00
<b>RICHARD SNADSTONE</b>										
3,451.7	12.00	26.66	3,396.0	1,568.00	492.8	247.4	-488.2	0.00	0.00	0.00
3,500.0	12.00	26.66	3,443.2	1,520.79	501.7	251.9	-497.1	0.00	0.00	0.00
<b>PARKMAN SANDSTONE</b>										
3,568.3	12.00	26.66	3,510.0	1,454.00	514.4	258.3	-509.6	0.00	0.00	0.00
3,600.0	12.00	26.66	3,541.0	1,422.97	520.3	261.3	-515.5	0.00	0.00	0.00
3,700.0	12.00	26.66	3,638.8	1,325.16	538.9	270.6	-533.9	0.00	0.00	0.00
3,800.0	12.00	26.66	3,736.7	1,227.34	557.5	279.9	-552.3	0.00	0.00	0.00
3,900.0	12.00	26.66	3,834.5	1,129.53	576.0	289.3	-570.7	0.00	0.00	0.00
4,000.0	12.00	26.66	3,932.3	1,031.71	594.6	298.6	-589.1	0.00	0.00	0.00
4,100.0	12.00	26.66	4,030.1	933.89	613.2	307.9	-607.5	0.00	0.00	0.00
4,200.0	12.00	26.66	4,127.9	836.08	631.8	317.2	-625.9	0.00	0.00	0.00



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well GADWALL FED 30-31-12HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NE NE SEC. 30 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	GADWALL FED 30-31-12HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,300.0	12.00	26.66	4,225.7	738.26	650.3	326.6	-644.3	0.00	0.00	0.00
<b>SUSSEX SANDSTONE</b>										
<b>4,332.0</b>	<b>12.00</b>	<b>26.66</b>	<b>4,257.0</b>	<b>707.00</b>	<b>656.3</b>	<b>329.5</b>	<b>-650.2</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>END OF TANGENT</b>										
<b>4,394.0</b>	<b>12.00</b>	<b>26.66</b>	<b>4,317.7</b>	<b>646.34</b>	<b>667.8</b>	<b>335.3</b>	<b>-661.6</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,400.0	11.88	26.66	4,323.6	640.44	668.9	335.9	-662.7	2.00	-2.00	0.00
4,500.0	9.88	26.66	4,421.8	542.25	685.8	344.4	-679.4	2.00	-2.00	0.00
4,600.0	7.88	26.66	4,520.6	443.45	699.6	351.3	-693.1	2.00	-2.00	0.00
4,700.0	5.88	26.66	4,619.8	344.17	710.2	356.6	-703.7	2.00	-2.00	0.00
<b>SHANNON SANDSTONE</b>										
<b>4,794.5</b>	<b>3.99</b>	<b>26.66</b>	<b>4,714.0</b>	<b>250.00</b>	<b>717.5</b>	<b>360.3</b>	<b>-710.9</b>	<b>2.00</b>	<b>-2.00</b>	<b>0.00</b>
4,800.0	3.88	26.66	4,719.5	244.54	717.8	360.5	-711.2	2.00	-2.00	0.00
4,900.0	1.88	26.66	4,819.3	144.67	722.3	362.7	-715.6	2.00	-2.00	0.00
<b>EOD TO VERTICAL</b>										
<b>4,993.8</b>	<b>0.00</b>	<b>0.00</b>	<b>4,913.1</b>	<b>50.90</b>	<b>723.7</b>	<b>363.4</b>	<b>-717.0</b>	<b>2.00</b>	<b>-2.00</b>	<b>0.00</b>
5,000.0	0.00	0.00	4,919.3	44.69	723.7	363.4	-717.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,019.3	-55.31	723.7	363.4	-717.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,119.3	-155.31	723.7	363.4	-717.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,219.3	-255.31	723.7	363.4	-717.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,319.3	-355.31	723.7	363.4	-717.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,419.3	-455.31	723.7	363.4	-717.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,519.3	-555.31	723.7	363.4	-717.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,619.3	-655.31	723.7	363.4	-717.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,719.3	-755.31	723.7	363.4	-717.0	0.00	0.00	0.00
<b>KOP (10°/100ft BUR)</b>										
<b>5,853.8</b>	<b>0.00</b>	<b>0.00</b>	<b>5,773.1</b>	<b>-809.10</b>	<b>723.7</b>	<b>363.4</b>	<b>-717.0</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,900.0	4.62	180.84	5,819.3	-855.26	721.8	363.4	-715.1	10.00	10.00	0.00
6,000.0	14.62	180.84	5,917.7	-953.73	705.1	363.1	-698.4	10.00	10.00	0.00
6,100.0	24.62	180.84	6,011.8	-1,047.80	671.6	362.6	-664.9	10.00	10.00	0.00
6,200.0	34.62	180.84	6,098.6	-1,134.62	622.2	361.9	-615.6	10.00	10.00	0.00
<b>SHARON SPRINGS</b>										
<b>6,292.3</b>	<b>43.85</b>	<b>180.84</b>	<b>6,170.0</b>	<b>-1,206.00</b>	<b>564.0</b>	<b>361.0</b>	<b>-557.3</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,300.0	44.63	180.84	6,175.5	-1,211.55	558.6	361.0	-551.9	10.00	10.00	0.00
6,400.0	54.63	180.84	6,240.2	-1,276.24	482.5	359.8	-475.9	10.00	10.00	0.00
<b>NIOBRARA A CHALK</b>										
<b>6,410.1</b>	<b>55.63</b>	<b>180.84</b>	<b>6,246.0</b>	<b>-1,282.00</b>	<b>474.2</b>	<b>359.7</b>	<b>-467.6</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
<b>NIOBRARA A CHALK BASE</b>										
<b>6,463.4</b>	<b>60.97</b>	<b>180.84</b>	<b>6,274.0</b>	<b>-1,310.00</b>	<b>428.9</b>	<b>359.1</b>	<b>-422.3</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,500.0	64.63	180.84	6,290.7	-1,326.74	396.3	358.6	-389.7	10.00	10.00	0.00
<b>NIOBRARA B1 CHALK TOP</b>										
<b>6,543.9</b>	<b>69.01</b>	<b>180.84</b>	<b>6,308.0</b>	<b>-1,344.00</b>	<b>356.0</b>	<b>358.0</b>	<b>-349.5</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
<b>NIOBRARA B1 CHALK BASE</b>										
<b>6,594.4</b>	<b>74.07</b>	<b>180.84</b>	<b>6,324.0</b>	<b>-1,360.00</b>	<b>308.1</b>	<b>357.3</b>	<b>-301.5</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,600.0	74.63	180.84	6,325.5	-1,361.51	302.7	357.2	-296.2	10.00	10.00	0.00
6,700.0	84.63	180.84	6,343.5	-1,379.49	204.5	355.8	-198.0	10.00	10.00	0.00
<b>HZ LP: 600ft FNL &amp; 1715ft FEL of Sec 30 - NIOBRARA B2 CHALK TOP</b>										
<b>6,753.7</b>	<b>90.00</b>	<b>180.84</b>	<b>6,346.0</b>	<b>-1,382.00</b>	<b>150.8</b>	<b>355.0</b>	<b>-144.4</b>	<b>10.00</b>	<b>10.00</b>	<b>0.00</b>
6,800.0	90.00	180.85	6,346.0	-1,382.00	104.6	354.3	-98.1	0.01	0.00	0.01
6,900.0	90.00	180.85	6,346.0	-1,381.99	4.6	352.8	1.8	0.01	0.00	0.01
7,000.0	90.00	180.86	6,346.0	-1,381.99	-95.4	351.3	101.8	0.01	0.00	0.01
7,100.0	90.00	180.87	6,346.0	-1,381.99	-195.4	349.8	201.7	0.01	0.00	0.01
7,200.0	90.00	180.87	6,346.0	-1,381.98	-295.4	348.3	301.7	0.01	0.00	0.01
7,300.0	90.00	180.88	6,346.0	-1,381.98	-395.4	346.8	401.6	0.01	0.00	0.01

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well GADWALL FED 30-31-12HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NE NE SEC. 30 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	GADWALL FED 30-31-12HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,400.0	90.00	180.89	6,346.0	-1,381.98	-495.4	345.2	501.6	0.01	0.00	0.01
7,500.0	90.00	180.89	6,346.0	-1,381.98	-595.4	343.7	601.5	0.01	0.00	0.01
7,600.0	90.00	180.90	6,346.0	-1,381.97	-695.3	342.1	701.4	0.01	0.00	0.01
7,700.0	90.00	180.90	6,346.0	-1,381.97	-795.3	340.5	801.4	0.01	0.00	0.01
7,800.0	90.00	180.91	6,346.0	-1,381.97	-895.3	338.9	901.3	0.01	0.00	0.01
7,900.0	90.00	180.92	6,346.0	-1,381.96	-995.3	337.4	1,001.3	0.01	0.00	0.01
8,000.0	90.00	180.92	6,346.0	-1,381.96	-1,095.3	335.7	1,101.2	0.01	0.00	0.01
8,100.0	90.00	180.93	6,346.0	-1,381.96	-1,195.3	334.1	1,201.1	0.01	0.00	0.01
8,200.0	90.00	180.94	6,346.0	-1,381.96	-1,295.3	332.5	1,301.1	0.01	0.00	0.01
8,300.0	90.00	180.94	6,346.0	-1,381.95	-1,395.3	330.9	1,401.0	0.01	0.00	0.01
8,400.0	90.00	180.95	6,346.0	-1,381.95	-1,495.2	329.2	1,501.0	0.01	0.00	0.01
8,500.0	90.00	180.96	6,345.9	-1,381.95	-1,595.2	327.5	1,600.9	0.01	0.00	0.01
8,600.0	90.00	180.96	6,345.9	-1,381.95	-1,695.2	325.9	1,700.8	0.01	0.00	0.01
8,700.0	90.00	180.97	6,345.9	-1,381.95	-1,795.2	324.2	1,800.8	0.01	0.00	0.01
8,800.0	90.00	180.98	6,345.9	-1,381.94	-1,895.2	322.5	1,900.7	0.01	0.00	0.01
8,900.0	90.00	180.98	6,345.9	-1,381.94	-1,995.2	320.8	2,000.7	0.01	0.00	0.01
9,000.0	90.00	180.99	6,345.9	-1,381.94	-2,095.2	319.1	2,100.6	0.01	0.00	0.01
9,100.0	90.00	180.99	6,345.9	-1,381.94	-2,195.1	317.3	2,200.5	0.01	0.00	0.01
9,200.0	90.00	181.00	6,345.9	-1,381.94	-2,295.1	315.6	2,300.5	0.01	0.00	0.01
9,300.0	90.00	181.01	6,345.9	-1,381.93	-2,395.1	313.8	2,400.4	0.01	0.00	0.01
9,400.0	90.00	181.01	6,345.9	-1,381.93	-2,495.1	312.1	2,500.3	0.01	0.00	0.01
9,500.0	90.00	181.02	6,345.9	-1,381.93	-2,595.1	310.3	2,600.3	0.01	0.00	0.01
9,600.0	90.00	181.03	6,345.9	-1,381.93	-2,695.1	308.5	2,700.2	0.01	0.00	0.01
9,700.0	90.00	181.03	6,345.9	-1,381.93	-2,795.0	306.7	2,800.2	0.01	0.00	0.01
9,800.0	90.00	181.04	6,345.9	-1,381.93	-2,895.0	304.9	2,900.1	0.01	0.00	0.01
9,900.0	90.00	181.05	6,345.9	-1,381.93	-2,995.0	303.1	3,000.0	0.01	0.00	0.01
10,000.0	90.00	181.05	6,345.9	-1,381.92	-3,095.0	301.2	3,100.0	0.01	0.00	0.01
10,100.0	90.00	181.06	6,345.9	-1,381.92	-3,195.0	299.4	3,199.9	0.01	0.00	0.01
10,200.0	90.00	181.07	6,345.9	-1,381.92	-3,295.0	297.5	3,299.8	0.01	0.00	0.01
10,300.0	90.00	181.07	6,345.9	-1,381.92	-3,394.9	295.7	3,399.8	0.01	0.00	0.01
10,400.0	90.00	181.08	6,345.9	-1,381.92	-3,494.9	293.8	3,499.7	0.01	0.00	0.01
10,500.0	90.00	181.09	6,345.9	-1,381.92	-3,594.9	291.9	3,599.6	0.01	0.00	0.01
10,600.0	90.00	181.09	6,345.9	-1,381.92	-3,694.9	290.0	3,699.5	0.01	0.00	0.01
10,700.0	90.00	181.10	6,345.9	-1,381.92	-3,794.9	288.1	3,799.5	0.01	0.00	0.01
10,800.0	90.00	181.10	6,345.9	-1,381.92	-3,894.9	286.2	3,899.4	0.01	0.00	0.01
10,900.0	90.00	181.11	6,345.9	-1,381.92	-3,994.8	284.2	3,999.3	0.01	0.00	0.01
11,000.0	90.00	181.12	6,345.9	-1,381.92	-4,094.8	282.3	4,099.3	0.01	0.00	0.01
11,100.0	90.00	181.12	6,345.9	-1,381.92	-4,194.8	280.3	4,199.2	0.01	0.00	0.01
11,200.0	90.00	181.13	6,345.9	-1,381.92	-4,294.8	278.4	4,299.1	0.01	0.00	0.01
11,300.0	90.00	181.14	6,345.9	-1,381.92	-4,394.8	276.4	4,399.1	0.01	0.00	0.01
11,400.0	90.00	181.14	6,345.9	-1,381.92	-4,494.7	274.4	4,499.0	0.01	0.00	0.01
11,500.0	90.00	181.15	6,345.9	-1,381.92	-4,594.7	272.4	4,598.9	0.01	0.00	0.01
11,600.0	90.00	181.16	6,345.9	-1,381.92	-4,694.7	270.4	4,698.8	0.01	0.00	0.01
11,700.0	90.00	181.16	6,345.9	-1,381.92	-4,794.7	268.4	4,798.8	0.01	0.00	0.01
11,800.0	90.00	181.17	6,345.9	-1,381.92	-4,894.7	266.3	4,898.7	0.01	0.00	0.01
11,900.0	90.00	181.18	6,345.9	-1,381.92	-4,994.6	264.3	4,998.6	0.01	0.00	0.01
12,000.0	90.00	181.18	6,345.9	-1,381.92	-5,094.6	262.2	5,098.5	0.01	0.00	0.01
12,100.0	90.00	181.19	6,345.9	-1,381.92	-5,194.6	260.2	5,198.5	0.01	0.00	0.01
12,200.0	90.00	181.20	6,345.9	-1,381.92	-5,294.6	258.1	5,298.4	0.01	0.00	0.01
12,300.0	90.00	181.20	6,345.9	-1,381.92	-5,394.5	256.0	5,398.3	0.01	0.00	0.01
12,400.0	90.00	181.21	6,345.9	-1,381.92	-5,494.5	253.9	5,498.2	0.01	0.00	0.01
12,500.0	90.00	181.21	6,345.9	-1,381.92	-5,594.5	251.8	5,598.2	0.01	0.00	0.01
12,600.0	90.00	181.22	6,345.9	-1,381.92	-5,694.5	249.7	5,698.1	0.01	0.00	0.01
12,700.0	90.00	181.23	6,345.9	-1,381.92	-5,794.5	247.5	5,798.0	0.01	0.00	0.01

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well GADWALL FED 30-31-12HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NE NE SEC. 30 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	GADWALL FED 30-31-12HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,800.0	90.00	181.23	6,345.9	-1,381.92	-5,894.4	245.4	5,897.9	0.01	0.00	0.01
12,900.0	90.00	181.24	6,345.9	-1,381.92	-5,994.4	243.2	5,997.8	0.01	0.00	0.01
13,000.0	90.00	181.25	6,345.9	-1,381.93	-6,094.4	241.0	6,097.8	0.01	0.00	0.01
13,100.0	90.00	181.25	6,345.9	-1,381.93	-6,194.4	238.9	6,197.7	0.01	0.00	0.01
13,200.0	90.00	181.26	6,345.9	-1,381.93	-6,294.3	236.7	6,297.6	0.01	0.00	0.01
13,300.0	90.00	181.27	6,345.9	-1,381.93	-6,394.3	234.5	6,397.5	0.01	0.00	0.01
13,400.0	90.00	181.27	6,345.9	-1,381.93	-6,494.3	232.2	6,497.4	0.01	0.00	0.01
13,500.0	90.00	181.28	6,345.9	-1,381.93	-6,594.3	230.0	6,597.4	0.01	0.00	0.01
13,600.0	90.00	181.29	6,345.9	-1,381.93	-6,694.2	227.8	6,697.3	0.01	0.00	0.01
13,700.0	90.00	181.29	6,345.9	-1,381.94	-6,794.2	225.5	6,797.2	0.01	0.00	0.01
13,800.0	90.00	181.30	6,345.9	-1,381.94	-6,894.2	223.3	6,897.1	0.01	0.00	0.01
13,900.0	90.00	181.30	6,345.9	-1,381.94	-6,994.2	221.0	6,997.0	0.01	0.00	0.01
14,000.0	90.00	181.31	6,345.9	-1,381.94	-7,094.1	218.7	7,096.9	0.01	0.00	0.01
14,100.0	90.00	181.32	6,345.9	-1,381.94	-7,194.1	216.4	7,196.9	0.01	0.00	0.01
14,200.0	90.00	181.32	6,345.9	-1,381.95	-7,294.1	214.1	7,296.8	0.01	0.00	0.01
14,300.0	90.00	181.33	6,345.9	-1,381.95	-7,394.1	211.8	7,396.7	0.01	0.00	0.01
14,400.0	90.00	181.34	6,345.9	-1,381.95	-7,494.0	209.5	7,496.6	0.01	0.00	0.01
14,500.0	90.00	181.34	6,346.0	-1,381.95	-7,594.0	207.1	7,596.5	0.01	0.00	0.01
14,600.0	90.00	181.35	6,346.0	-1,381.95	-7,694.0	204.8	7,696.4	0.01	0.00	0.01
14,700.0	90.00	181.36	6,346.0	-1,381.96	-7,794.0	202.4	7,796.3	0.01	0.00	0.01
14,800.0	90.00	181.36	6,346.0	-1,381.96	-7,893.9	200.1	7,896.3	0.01	0.00	0.01
14,900.0	90.00	181.37	6,346.0	-1,381.96	-7,993.9	197.7	7,996.2	0.01	0.00	0.01
15,000.0	90.00	181.38	6,346.0	-1,381.96	-8,093.9	195.3	8,096.1	0.01	0.00	0.01
15,100.0	90.00	181.38	6,346.0	-1,381.97	-8,193.8	192.9	8,196.0	0.01	0.00	0.01
15,200.0	90.00	181.39	6,346.0	-1,381.97	-8,293.8	190.4	8,295.9	0.01	0.00	0.01
15,300.0	90.00	181.40	6,346.0	-1,381.97	-8,393.8	188.0	8,395.8	0.01	0.00	0.01
15,400.0	90.00	181.40	6,346.0	-1,381.98	-8,493.7	185.6	8,495.7	0.01	0.00	0.01
15,500.0	90.00	181.41	6,346.0	-1,381.98	-8,593.7	183.1	8,595.6	0.01	0.00	0.01
15,600.0	90.00	181.41	6,346.0	-1,381.98	-8,693.7	180.7	8,695.5	0.01	0.00	0.01
15,700.0	90.00	181.42	6,346.0	-1,381.99	-8,793.7	178.2	8,795.4	0.01	0.00	0.01
15,800.0	90.00	181.43	6,346.0	-1,381.99	-8,893.6	175.7	8,895.4	0.01	0.00	0.01
15,900.0	90.00	181.43	6,346.0	-1,381.99	-8,993.6	173.2	8,995.3	0.01	0.00	0.01
16,000.0	90.00	181.44	6,346.0	-1,382.00	-9,093.6	170.7	9,095.2	0.01	0.00	0.01
16,100.0	90.00	181.45	6,346.0	-1,382.00	-9,193.5	168.2	9,195.1	0.01	0.00	0.01
<b>BHL: 600ft FSL &amp; 1715ft FEL of Sec 31</b>										
<b>16,130.1</b>	<b>90.00</b>	<b>181.45</b>	<b>6,346.0</b>	<b>-1,382.00</b>	<b>-9,223.6</b>	<b>167.4</b>	<b>9,225.1</b>	<b>0.01</b>	<b>0.00</b>	<b>0.01</b>

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well GADWALL FED 30-31-12HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4964.0usft (Original Well Elev)
<b>Site:</b>	NE NE SEC. 30 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	GADWALL FED 30-31-12HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,556.3	1,542.0	FOX HILLS BASE			
3,451.7	3,396.0	RICHARD SNADSTONE			
3,568.3	3,510.0	PARKMAN SANDSTONE			
4,332.0	4,257.0	SUSSEX SANDSTONE			
4,794.5	4,714.0	SHANNON SANDSTONE			
6,292.3	6,170.0	SHARON SPRINGS			
6,410.1	6,246.0	NIOBRARA A CHALK			
6,463.4	6,274.0	NIOBRARA A CHALK BASE			
6,543.9	6,308.0	NIOBRARA B1 CHALK TOP			
6,594.4	6,324.0	NIOBRARA B1 CHALK BASE			
6,753.7	6,346.0	NIOBRARA B2 CHALK TOP			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.0	0.0	0.0	0.0	SHL: 750ft FNL & 2067ft FEL of Sec 30
500.0	500.0	0.0	0.0	START NUDGE (2°/100ft BUR)
1,099.8	1,095.4	55.9	28.1	EOB TO 12° INC
4,394.0	4,317.7	667.8	335.3	END OF TANGENT
4,993.8	4,913.1	723.7	363.4	EOD TO VERTICAL
5,853.8	5,773.1	723.7	363.4	KOP (10°/100ft BUR)
6,753.7	6,346.0	150.8	355.0	HZ LP: 600ft FNL & 1715ft FEL of Sec 30
16,130.1	6,346.0	-9,223.6	167.4	BHL: 600ft FSL & 1715ft FEL of Sec 31