

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

GADWALL FED 30-31-15HC

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 30-31-15HC
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Dep	Annotation
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 751ft FNL & 1992ft FEL of Sec 30
200.0	200.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2°/100ft BUR)
1003.4	1014.3	16.29	59.05	59.1	98.6	-48.0	115.0	EOB TO 16.29° INC
5059.6	5240.1	16.29	59.05	668.7	1114.9	-542.4	1300.1	END OF TANGENT
5863.0	6054.4	0.00	0.00	727.8	1213.5	-590.3	1415.0	EOD TO VERTICAL
5963.0	6154.4	0.00	0.00	727.8	1213.5	-590.3	1415.0	KOP (10°/100ft BUR)
6536.0	7054.5	90.00	180.84	154.9	1205.1	-21.8	1988.0	HZ LP: 600ft FNL & 790ft FEL of Sec 30
6536.0	16431.6	90.00	181.45	-9220.3	1017.3	9276.3	11365.1	BHL: 600ft FSL & 790ft FEL of Sec 31

PROPOSED LOCAL COORDINATES:

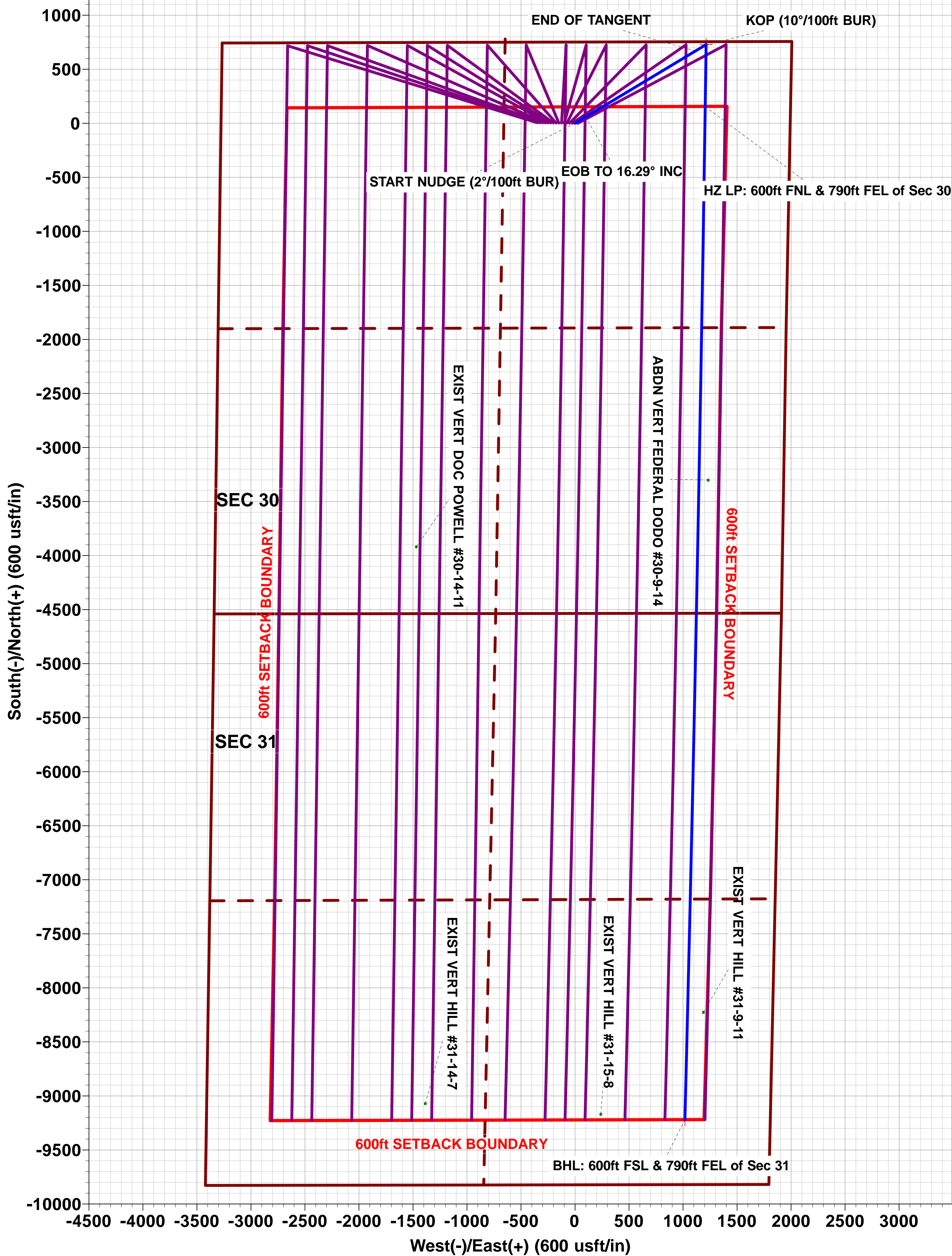
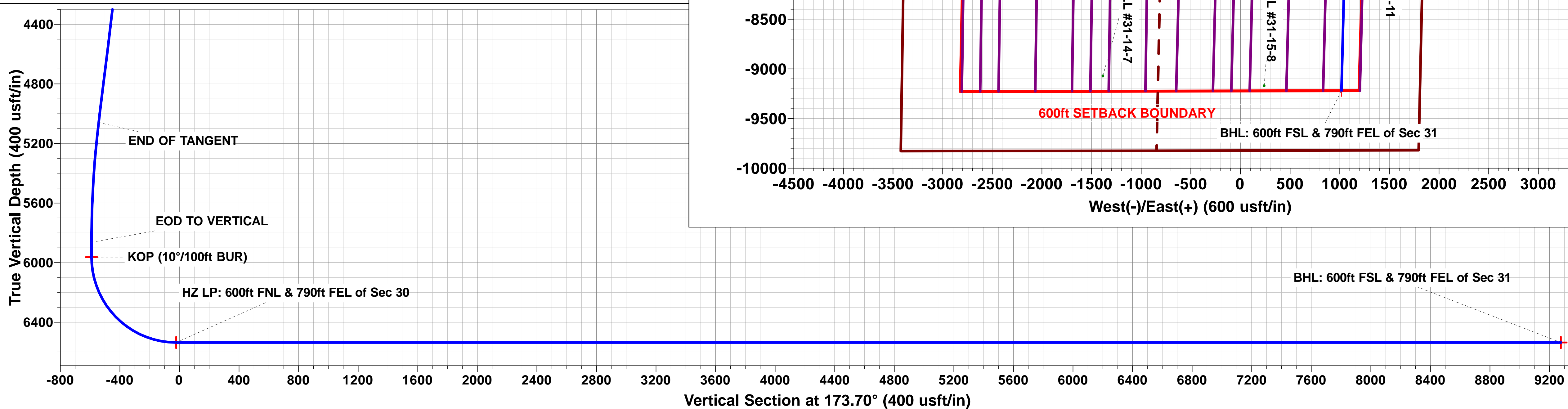
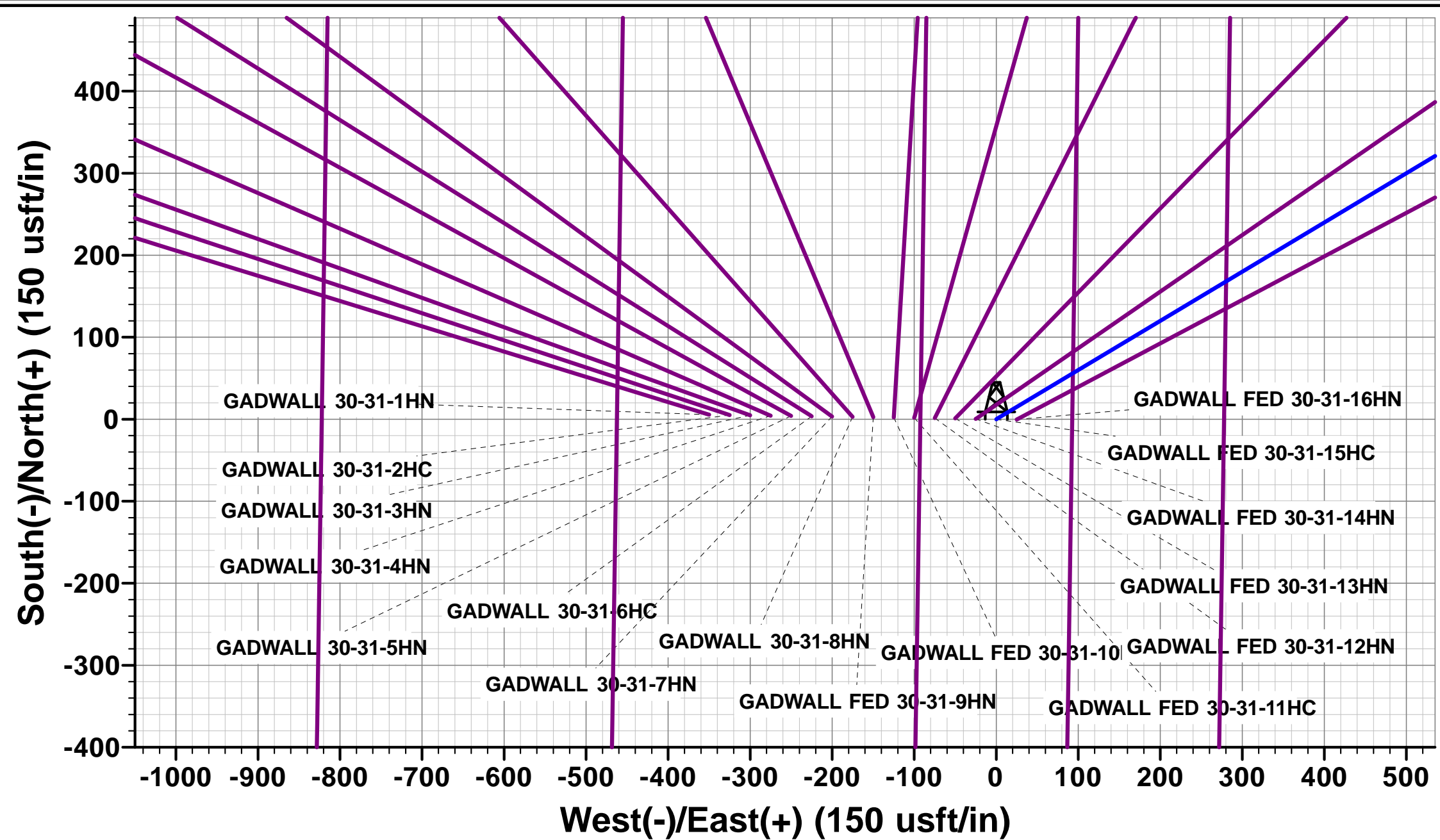
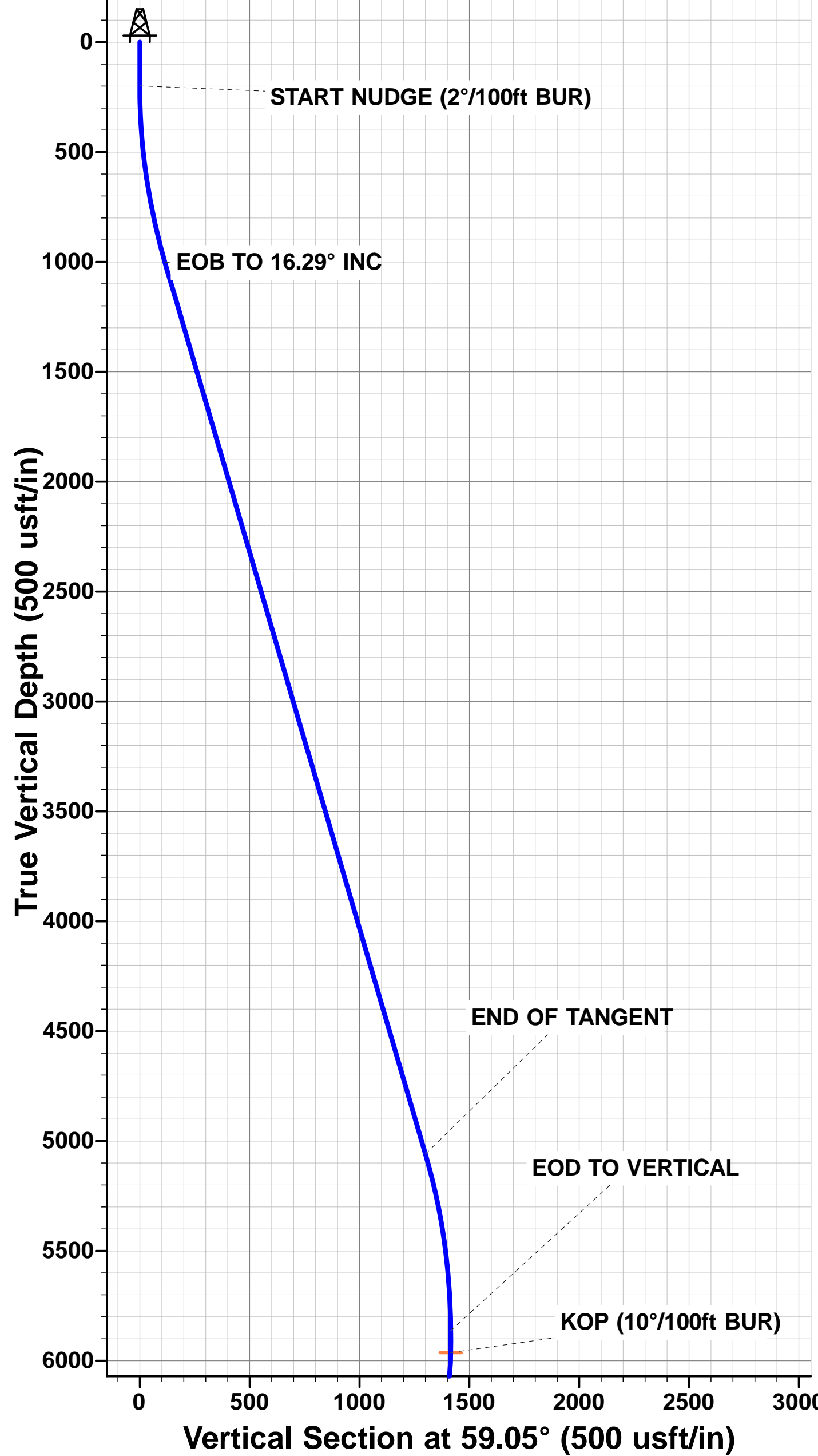
SHL: 751ft FNL & 1992ft FEL of Sec 30

HZ LP: 600ft FNL & 790ft FEL of Sec 30

BHL: 600ft FSL & 790ft FEL of Sec 31

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL FED 30-31-15HC	5963.0	727.8	1213.5	40.640423	-104.128182
HZ LP: GADWALL FED 30-31-15HC	6536.0	154.9	1205.1	40.638850	-104.128213
BHL: GADWALL FED 30-31-15HC	6536.0	-9220.3	1017.3	40.613117	-104.128891



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-15HC
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4962.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4962.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Project	WELD COUNTY, COLORADO (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

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

Well	GADWALL FED 30-31-15HC					
Well Position	+N/-S	-5.5 usft	Northing:	1,478,346.50 usft	Latitude:	40.638425
	+E/-W	350.0 usft	Easting:	3,379,493.09 usft	Longitude:	-104.132555
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,946.0 usft

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

Design	PROPOSAL #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	173.70

Plan Sections											
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	-4,962.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	-4,762.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,014.3	16.29	59.05	1,003.4	-3,958.6	59.1	98.6	2.00	2.00	0.00	59.05	
5,240.1	16.29	59.05	5,059.6	97.6	668.7	1,114.9	0.00	0.00	0.00	0.00	
6,054.4	0.00	0.00	5,863.0	901.0	727.8	1,213.5	2.00	-2.00	0.00	180.00	
6,154.4	0.00	0.00	5,963.0	1,001.0	727.8	1,213.5	0.00	0.00	0.00	0.00	KOP: GADWALL FED
7,054.5	90.00	180.84	6,536.0	1,574.0	154.9	1,205.1	10.00	10.00	-19.91	180.84	HZ LP: GADWALL FE
16,431.6	90.00	181.45	6,536.0	1,574.0	-9,220.3	1,017.3	0.01	0.00	0.01	89.73	BHL: GADWALL FED

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Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
SHL: 751ft FNL & 1992ft FEL of Sec 30										
0.0	0.00	0.00	0.0	4,962.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,862.00	0.0	0.0	0.0	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
200.0	0.00	0.00	200.0	4,762.00	0.0	0.0	0.0	0.00	0.00	0.00
300.0	2.00	59.05	300.0	4,662.02	0.9	1.5	-0.7	2.00	2.00	0.00
400.0	4.00	59.05	399.8	4,562.16	3.6	6.0	-2.9	2.00	2.00	0.00
500.0	6.00	59.05	499.5	4,462.55	8.1	13.5	-6.5	2.00	2.00	0.00
600.0	8.00	59.05	598.7	4,363.30	14.3	23.9	-11.6	2.00	2.00	0.00
700.0	10.00	59.05	697.5	4,264.53	22.4	37.3	-18.2	2.00	2.00	0.00
800.0	12.00	59.05	795.6	4,166.38	32.2	53.7	-26.1	2.00	2.00	0.00
900.0	14.00	59.05	893.1	4,068.94	43.8	73.0	-35.5	2.00	2.00	0.00
1,000.0	16.00	59.05	989.6	3,972.36	57.1	95.2	-46.3	2.00	2.00	0.00
EOB TO 16.29° INC										
1,014.3	16.29	59.05	1,003.4	3,958.58	59.1	98.6	-48.0	2.00	2.00	0.00
1,100.0	16.29	59.05	1,085.6	3,876.36	71.5	119.2	-58.0	0.00	0.00	0.00
1,200.0	16.29	59.05	1,181.6	3,780.37	85.9	143.2	-69.7	0.00	0.00	0.00
1,300.0	16.29	59.05	1,277.6	3,684.39	100.3	167.3	-81.4	0.00	0.00	0.00
1,400.0	16.29	59.05	1,373.6	3,588.40	114.8	191.3	-93.1	0.00	0.00	0.00
1,500.0	16.29	59.05	1,469.6	3,492.41	129.2	215.4	-104.8	0.00	0.00	0.00
FOX HILLS BASE										
1,573.4	16.29	59.05	1,540.0	3,422.00	139.8	233.0	-113.4	0.00	0.00	0.00
1,600.0	16.29	59.05	1,565.6	3,396.43	143.6	239.4	-116.5	0.00	0.00	0.00
1,700.0	16.29	59.05	1,661.6	3,300.44	158.0	263.5	-128.2	0.00	0.00	0.00
1,800.0	16.29	59.05	1,757.5	3,204.45	172.5	287.5	-139.9	0.00	0.00	0.00
1,900.0	16.29	59.05	1,853.5	3,108.46	186.9	311.6	-151.6	0.00	0.00	0.00
2,000.0	16.29	59.05	1,949.5	3,012.48	201.3	335.6	-163.3	0.00	0.00	0.00
2,100.0	16.29	59.05	2,045.5	2,916.49	215.7	359.7	-175.0	0.00	0.00	0.00
2,200.0	16.29	59.05	2,141.5	2,820.50	230.2	383.8	-186.7	0.00	0.00	0.00
2,300.0	16.29	59.05	2,237.5	2,724.52	244.6	407.8	-198.4	0.00	0.00	0.00
2,400.0	16.29	59.05	2,333.5	2,628.53	259.0	431.9	-210.1	0.00	0.00	0.00
2,500.0	16.29	59.05	2,429.5	2,532.54	273.4	455.9	-221.8	0.00	0.00	0.00
2,600.0	16.29	59.05	2,525.4	2,436.56	287.9	480.0	-233.5	0.00	0.00	0.00
2,700.0	16.29	59.05	2,621.4	2,340.57	302.3	504.0	-245.2	0.00	0.00	0.00
2,800.0	16.29	59.05	2,717.4	2,244.58	316.7	528.1	-256.9	0.00	0.00	0.00
2,900.0	16.29	59.05	2,813.4	2,148.59	331.1	552.1	-268.6	0.00	0.00	0.00
3,000.0	16.29	59.05	2,909.4	2,052.61	345.6	576.2	-280.3	0.00	0.00	0.00
3,100.0	16.29	59.05	3,005.4	1,956.62	360.0	600.2	-292.0	0.00	0.00	0.00
3,200.0	16.29	59.05	3,101.4	1,860.63	374.4	624.3	-303.7	0.00	0.00	0.00
3,300.0	16.29	59.05	3,197.4	1,764.65	388.8	648.3	-315.4	0.00	0.00	0.00
3,400.0	16.29	59.05	3,293.3	1,668.66	403.2	672.4	-327.1	0.00	0.00	0.00
3,500.0	16.29	59.05	3,389.3	1,572.67	417.7	696.4	-338.8	0.00	0.00	0.00
RICHARD SNADSTONE										
3,504.9	16.29	59.05	3,394.0	1,568.00	418.4	697.6	-339.4	0.00	0.00	0.00
3,600.0	16.29	59.05	3,485.3	1,476.68	432.1	720.5	-350.5	0.00	0.00	0.00
PARKMAN SANDSTONE										
3,623.6	16.29	59.05	3,508.0	1,454.00	435.5	726.1	-353.2	0.00	0.00	0.00
3,700.0	16.29	59.05	3,581.3	1,380.70	446.5	744.5	-362.2	0.00	0.00	0.00
3,800.0	16.29	59.05	3,677.3	1,284.71	460.9	768.6	-373.9	0.00	0.00	0.00
3,900.0	16.29	59.05	3,773.3	1,188.72	475.4	792.6	-385.6	0.00	0.00	0.00
4,000.0	16.29	59.05	3,869.3	1,092.74	489.8	816.7	-397.3	0.00	0.00	0.00
4,100.0	16.29	59.05	3,965.3	996.75	504.2	840.7	-409.0	0.00	0.00	0.00
4,200.0	16.29	59.05	4,061.2	900.76	518.6	864.8	-420.7	0.00	0.00	0.00

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Well:	GADWALL FED 30-31-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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	16.29	59.05	4,157.2	804.78	533.1	888.8	-432.4	0.00	0.00	0.00
4,400.0	16.29	59.05	4,253.2	708.79	547.5	912.9	-444.1	0.00	0.00	0.00
SUSSEX SANDSTONE										
4,401.9	16.29	59.05	4,255.0	707.00	547.8	913.3	-444.3	0.00	0.00	0.00
4,500.0	16.29	59.05	4,349.2	612.80	561.9	936.9	-455.8	0.00	0.00	0.00
4,600.0	16.29	59.05	4,445.2	516.81	576.3	961.0	-467.5	0.00	0.00	0.00
4,700.0	16.29	59.05	4,541.2	420.83	590.8	985.0	-479.2	0.00	0.00	0.00
4,800.0	16.29	59.05	4,637.2	324.84	605.2	1,009.1	-490.9	0.00	0.00	0.00
SHANNON SANDSTONE										
4,878.0	16.29	59.05	4,712.0	250.00	616.4	1,027.8	-500.0	0.00	0.00	0.00
4,900.0	16.29	59.05	4,733.1	228.85	619.6	1,033.1	-502.6	0.00	0.00	0.00
5,000.0	16.29	59.05	4,829.1	132.87	634.0	1,057.2	-514.3	0.00	0.00	0.00
5,100.0	16.29	59.05	4,925.1	36.88	648.5	1,081.2	-526.0	0.00	0.00	0.00
5,200.0	16.29	59.05	5,021.1	-59.11	662.9	1,105.3	-537.7	0.00	0.00	0.00
END OF TANGENT										
5,240.1	16.29	59.05	5,059.6	-97.58	668.7	1,114.9	-542.4	0.00	0.00	0.00
5,300.0	15.09	59.05	5,117.3	-155.27	677.0	1,128.8	-549.1	2.00	-2.00	0.00
5,400.0	13.09	59.05	5,214.3	-252.25	689.5	1,149.7	-559.3	2.00	-2.00	0.00
5,500.0	11.09	59.05	5,312.0	-350.03	700.3	1,167.6	-568.0	2.00	-2.00	0.00
5,600.0	9.09	59.05	5,410.5	-448.48	709.3	1,182.7	-575.3	2.00	-2.00	0.00
5,700.0	7.09	59.05	5,509.5	-547.48	716.5	1,194.7	-581.2	2.00	-2.00	0.00
5,800.0	5.09	59.05	5,608.9	-646.91	722.0	1,203.8	-585.6	2.00	-2.00	0.00
5,900.0	3.09	59.05	5,708.7	-746.65	725.7	1,209.9	-588.6	2.00	-2.00	0.00
6,000.0	1.09	59.05	5,808.6	-846.58	727.5	1,213.1	-590.1	2.00	-2.00	0.00
EOD TO VERTICAL										
6,054.4	0.00	0.00	5,863.0	-901.00	727.8	1,213.5	-590.3	2.00	-2.00	0.00
6,100.0	0.00	0.00	5,908.6	-946.58	727.8	1,213.5	-590.3	0.00	0.00	0.00
KOP (10°/100ft BUR)										
6,154.4	0.00	0.00	5,963.0	-1,001.00	727.8	1,213.5	-590.3	0.00	0.00	0.00
6,200.0	4.56	180.84	6,008.5	-1,046.53	726.0	1,213.5	-588.5	10.00	10.00	0.00
6,300.0	14.56	180.84	6,107.0	-1,145.01	709.4	1,213.2	-572.1	10.00	10.00	0.00
SHARON SPRINGS										
6,364.1	20.96	180.84	6,168.0	-1,206.00	689.9	1,212.9	-552.7	10.00	10.00	0.00
6,400.0	24.56	180.84	6,201.1	-1,239.13	676.0	1,212.7	-538.9	10.00	10.00	0.00
NIORARA A CHALK										
6,448.1	29.37	180.84	6,244.0	-1,282.00	654.2	1,212.4	-517.3	10.00	10.00	0.00
NIORARA A CHALK BASE										
6,480.8	32.63	180.84	6,272.0	-1,310.00	637.4	1,212.2	-500.6	10.00	10.00	0.00
6,500.0	34.56	180.84	6,288.0	-1,326.00	626.7	1,212.0	-490.0	10.00	10.00	0.00
NIORARA B1 CHALK TOP										
6,522.2	36.77	180.84	6,306.0	-1,344.00	613.8	1,211.8	-477.2	10.00	10.00	0.00
NIORARA B1 CHALK BASE										
6,542.4	38.79	180.84	6,322.0	-1,360.00	601.4	1,211.6	-464.9	10.00	10.00	0.00
NIORARA B2 CHALK TOP										
6,571.2	41.68	180.84	6,344.0	-1,382.00	582.8	1,211.4	-446.4	10.00	10.00	0.00
6,600.0	44.55	180.84	6,365.0	-1,403.01	563.1	1,211.1	-426.9	10.00	10.00	0.00
NIORARA B2 CHALK BASE										
6,608.5	45.40	180.84	6,371.0	-1,409.00	557.1	1,211.0	-421.0	10.00	10.00	0.00
NIORARA C CHALK TOP										
6,664.0	50.95	180.84	6,408.0	-1,446.00	515.8	1,210.4	-380.0	10.00	10.00	0.00
6,700.0	54.55	180.84	6,429.8	-1,467.80	487.1	1,210.0	-351.5	10.00	10.00	0.00
NIORARA C CHALK BASE										

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Design:	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)
6,764.1	60.97	180.84	6,464.0	-1,502.00	432.9	1,209.2	-297.7	10.00	10.00	0.00
NIOBRARA D CHALK TOP										
6,794.5	64.00	180.84	6,478.0	-1,516.00	406.0	1,208.8	-271.0	10.00	10.00	0.00
6,800.0	64.55	180.84	6,480.4	-1,518.41	401.0	1,208.7	-266.1	10.00	10.00	0.00
FT. HAYS										
6,881.2	72.67	180.84	6,510.0	-1,548.00	325.5	1,207.6	-191.1	10.00	10.00	0.00
6,900.0	74.55	180.84	6,515.3	-1,553.30	307.5	1,207.3	-173.2	10.00	10.00	0.00
7,000.0	84.55	180.84	6,533.4	-1,571.41	209.3	1,205.9	-75.8	10.00	10.00	0.00
HZ LP: 600ft FNL & 790ft FEL of Sec 30 - CODELL										
7,054.5	90.00	180.84	6,536.0	-1,574.00	154.9	1,205.1	-21.8	10.00	10.00	0.00
7,100.0	90.00	180.85	6,536.0	-1,574.00	109.4	1,204.4	23.4	0.01	0.00	0.01
7,200.0	90.00	180.85	6,536.0	-1,574.00	9.4	1,202.9	122.6	0.01	0.00	0.01
7,300.0	90.00	180.86	6,536.0	-1,574.01	-90.6	1,201.4	221.8	0.01	0.00	0.01
7,400.0	90.00	180.87	6,536.0	-1,574.01	-190.6	1,199.9	321.0	0.01	0.00	0.01
7,500.0	90.00	180.87	6,536.0	-1,574.01	-290.6	1,198.4	420.3	0.01	0.00	0.01
7,600.0	90.00	180.88	6,536.0	-1,574.01	-390.6	1,196.8	519.5	0.01	0.00	0.01
7,700.0	90.00	180.89	6,536.0	-1,574.01	-490.6	1,195.3	618.7	0.01	0.00	0.01
7,800.0	90.00	180.89	6,536.0	-1,574.02	-590.6	1,193.8	717.9	0.01	0.00	0.01
7,900.0	90.00	180.90	6,536.0	-1,574.02	-690.5	1,192.2	817.1	0.01	0.00	0.01
8,000.0	90.00	180.91	6,536.0	-1,574.02	-790.5	1,190.6	916.3	0.01	0.00	0.01
8,100.0	90.00	180.91	6,536.0	-1,574.02	-890.5	1,189.0	1,015.5	0.01	0.00	0.01
8,200.0	90.00	180.92	6,536.0	-1,574.02	-990.5	1,187.4	1,114.8	0.01	0.00	0.01
8,300.0	90.00	180.92	6,536.0	-1,574.03	-1,090.5	1,185.8	1,214.0	0.01	0.00	0.01
8,400.0	90.00	180.93	6,536.0	-1,574.03	-1,190.5	1,184.2	1,313.2	0.01	0.00	0.01
8,500.0	90.00	180.94	6,536.0	-1,574.03	-1,290.5	1,182.6	1,412.4	0.01	0.00	0.01
8,600.0	90.00	180.94	6,536.0	-1,574.03	-1,390.5	1,180.9	1,511.6	0.01	0.00	0.01
8,700.0	90.00	180.95	6,536.0	-1,574.03	-1,490.4	1,179.3	1,610.8	0.01	0.00	0.01
8,800.0	90.00	180.96	6,536.0	-1,574.03	-1,590.4	1,177.6	1,710.0	0.01	0.00	0.01
8,900.0	90.00	180.96	6,536.0	-1,574.04	-1,690.4	1,175.9	1,809.2	0.01	0.00	0.01
9,000.0	90.00	180.97	6,536.0	-1,574.04	-1,790.4	1,174.2	1,908.4	0.01	0.00	0.01
9,100.0	90.00	180.98	6,536.0	-1,574.04	-1,890.4	1,172.6	2,007.6	0.01	0.00	0.01
9,200.0	90.00	180.98	6,536.0	-1,574.04	-1,990.4	1,170.8	2,106.8	0.01	0.00	0.01
9,300.0	90.00	180.99	6,536.0	-1,574.04	-2,090.4	1,169.1	2,206.0	0.01	0.00	0.01
9,400.0	90.00	181.00	6,536.0	-1,574.04	-2,190.3	1,167.4	2,305.2	0.01	0.00	0.01
9,500.0	90.00	181.00	6,536.0	-1,574.04	-2,290.3	1,165.6	2,404.3	0.01	0.00	0.01
9,600.0	90.00	181.01	6,536.0	-1,574.05	-2,390.3	1,163.9	2,503.5	0.01	0.00	0.01
9,700.0	90.00	181.02	6,536.0	-1,574.05	-2,490.3	1,162.1	2,602.7	0.01	0.00	0.01
9,800.0	90.00	181.02	6,536.0	-1,574.05	-2,590.3	1,160.3	2,701.9	0.01	0.00	0.01
9,900.0	90.00	181.03	6,536.0	-1,574.05	-2,690.3	1,158.6	2,801.1	0.01	0.00	0.01
10,000.0	90.00	181.03	6,536.0	-1,574.05	-2,790.2	1,156.8	2,900.3	0.01	0.00	0.01
10,100.0	90.00	181.04	6,536.1	-1,574.05	-2,890.2	1,154.9	2,999.5	0.01	0.00	0.01
10,200.0	90.00	181.05	6,536.1	-1,574.05	-2,990.2	1,153.1	3,098.6	0.01	0.00	0.01
10,300.0	90.00	181.05	6,536.1	-1,574.05	-3,090.2	1,151.3	3,197.8	0.01	0.00	0.01
10,400.0	90.00	181.06	6,536.1	-1,574.05	-3,190.2	1,149.4	3,297.0	0.01	0.00	0.01
10,500.0	90.00	181.07	6,536.1	-1,574.05	-3,290.2	1,147.6	3,396.2	0.01	0.00	0.01
10,600.0	90.00	181.07	6,536.1	-1,574.05	-3,390.1	1,145.7	3,495.3	0.01	0.00	0.01
10,700.0	90.00	181.08	6,536.1	-1,574.05	-3,490.1	1,143.8	3,594.5	0.01	0.00	0.01
10,800.0	90.00	181.09	6,536.1	-1,574.06	-3,590.1	1,141.9	3,693.7	0.01	0.00	0.01
10,900.0	90.00	181.09	6,536.1	-1,574.06	-3,690.1	1,140.0	3,792.9	0.01	0.00	0.01
11,000.0	90.00	181.10	6,536.1	-1,574.06	-3,790.1	1,138.1	3,892.0	0.01	0.00	0.01
11,100.0	90.00	181.11	6,536.1	-1,574.06	-3,890.1	1,136.2	3,991.2	0.01	0.00	0.01
11,200.0	90.00	181.11	6,536.1	-1,574.06	-3,990.0	1,134.3	4,090.4	0.01	0.00	0.01
11,300.0	90.00	181.12	6,536.1	-1,574.06	-4,090.0	1,132.3	4,189.5	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-15HC
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4962.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4962.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
11,400.0	90.00	181.13	6,536.1	-1,574.06	-4,190.0	1,130.4	4,288.7	0.01	0.00	0.01
11,500.0	90.00	181.13	6,536.1	-1,574.06	-4,290.0	1,128.4	4,387.9	0.01	0.00	0.01
11,600.0	90.00	181.14	6,536.1	-1,574.06	-4,390.0	1,126.4	4,487.0	0.01	0.00	0.01
11,700.0	90.00	181.14	6,536.1	-1,574.06	-4,489.9	1,124.4	4,586.2	0.01	0.00	0.01
11,800.0	90.00	181.15	6,536.1	-1,574.06	-4,589.9	1,122.4	4,685.3	0.01	0.00	0.01
11,900.0	90.00	181.16	6,536.1	-1,574.06	-4,689.9	1,120.4	4,784.5	0.01	0.00	0.01
12,000.0	90.00	181.16	6,536.1	-1,574.06	-4,789.9	1,118.4	4,883.6	0.01	0.00	0.01
12,100.0	90.00	181.17	6,536.1	-1,574.06	-4,889.9	1,116.3	4,982.8	0.01	0.00	0.01
12,200.0	90.00	181.18	6,536.1	-1,574.06	-4,989.8	1,114.3	5,081.9	0.01	0.00	0.01
12,300.0	90.00	181.18	6,536.1	-1,574.06	-5,089.8	1,112.2	5,181.1	0.01	0.00	0.01
12,400.0	90.00	181.19	6,536.1	-1,574.06	-5,189.8	1,110.2	5,280.2	0.01	0.00	0.01
12,500.0	90.00	181.20	6,536.1	-1,574.06	-5,289.8	1,108.1	5,379.4	0.01	0.00	0.01
12,600.0	90.00	181.20	6,536.1	-1,574.06	-5,389.8	1,106.0	5,478.5	0.01	0.00	0.01
12,700.0	90.00	181.21	6,536.1	-1,574.06	-5,489.7	1,103.9	5,577.7	0.01	0.00	0.01
12,800.0	90.00	181.22	6,536.1	-1,574.05	-5,589.7	1,101.8	5,676.8	0.01	0.00	0.01
12,900.0	90.00	181.22	6,536.1	-1,574.05	-5,689.7	1,099.6	5,776.0	0.01	0.00	0.01
13,000.0	90.00	181.23	6,536.1	-1,574.05	-5,789.7	1,097.5	5,875.1	0.01	0.00	0.01
13,100.0	90.00	181.24	6,536.1	-1,574.05	-5,889.6	1,095.3	5,974.2	0.01	0.00	0.01
13,200.0	90.00	181.24	6,536.1	-1,574.05	-5,989.6	1,093.2	6,073.4	0.01	0.00	0.01
13,300.0	90.00	181.25	6,536.1	-1,574.05	-6,089.6	1,091.0	6,172.5	0.01	0.00	0.01
13,400.0	90.00	181.25	6,536.1	-1,574.05	-6,189.6	1,088.8	6,271.6	0.01	0.00	0.01
13,500.0	90.00	181.26	6,536.0	-1,574.05	-6,289.5	1,086.6	6,370.8	0.01	0.00	0.01
13,600.0	90.00	181.27	6,536.0	-1,574.05	-6,389.5	1,084.4	6,469.9	0.01	0.00	0.01
13,700.0	90.00	181.27	6,536.0	-1,574.05	-6,489.5	1,082.2	6,569.0	0.01	0.00	0.01
13,800.0	90.00	181.28	6,536.0	-1,574.05	-6,589.5	1,080.0	6,668.2	0.01	0.00	0.01
13,900.0	90.00	181.29	6,536.0	-1,574.05	-6,689.4	1,077.7	6,767.3	0.01	0.00	0.01
14,000.0	90.00	181.29	6,536.0	-1,574.04	-6,789.4	1,075.5	6,866.4	0.01	0.00	0.01
14,100.0	90.00	181.30	6,536.0	-1,574.04	-6,889.4	1,073.2	6,965.5	0.01	0.00	0.01
14,200.0	90.00	181.31	6,536.0	-1,574.04	-6,989.4	1,071.0	7,064.7	0.01	0.00	0.01
14,300.0	90.00	181.31	6,536.0	-1,574.04	-7,089.3	1,068.7	7,163.8	0.01	0.00	0.01
14,400.0	90.00	181.32	6,536.0	-1,574.04	-7,189.3	1,066.4	7,262.9	0.01	0.00	0.01
14,500.0	90.00	181.33	6,536.0	-1,574.04	-7,289.3	1,064.1	7,362.0	0.01	0.00	0.01
14,600.0	90.00	181.33	6,536.0	-1,574.04	-7,389.3	1,061.7	7,461.1	0.01	0.00	0.01
14,700.0	90.00	181.34	6,536.0	-1,574.03	-7,489.2	1,059.4	7,560.2	0.01	0.00	0.01
14,800.0	90.00	181.35	6,536.0	-1,574.03	-7,589.2	1,057.1	7,659.4	0.01	0.00	0.01
14,900.0	90.00	181.35	6,536.0	-1,574.03	-7,689.2	1,054.7	7,758.5	0.01	0.00	0.01
15,000.0	90.00	181.36	6,536.0	-1,574.03	-7,789.2	1,052.4	7,857.6	0.01	0.00	0.01
15,100.0	90.00	181.36	6,536.0	-1,574.03	-7,889.1	1,050.0	7,956.7	0.01	0.00	0.01
15,200.0	90.00	181.37	6,536.0	-1,574.03	-7,989.1	1,047.6	8,055.8	0.01	0.00	0.01
15,300.0	90.00	181.38	6,536.0	-1,574.02	-8,089.1	1,045.2	8,154.9	0.01	0.00	0.01
15,400.0	90.00	181.38	6,536.0	-1,574.02	-8,189.0	1,042.8	8,254.0	0.01	0.00	0.01
15,500.0	90.00	181.39	6,536.0	-1,574.02	-8,289.0	1,040.4	8,353.1	0.01	0.00	0.01
15,600.0	90.00	181.40	6,536.0	-1,574.02	-8,389.0	1,037.9	8,452.2	0.01	0.00	0.01
15,700.0	90.00	181.40	6,536.0	-1,574.02	-8,489.0	1,035.5	8,551.3	0.01	0.00	0.01
15,800.0	90.00	181.41	6,536.0	-1,574.01	-8,588.9	1,033.0	8,650.4	0.01	0.00	0.01
15,900.0	90.00	181.42	6,536.0	-1,574.01	-8,688.9	1,030.6	8,749.5	0.01	0.00	0.01
16,000.0	90.00	181.42	6,536.0	-1,574.01	-8,788.9	1,028.1	8,848.6	0.01	0.00	0.01
16,100.0	90.00	181.43	6,536.0	-1,574.01	-8,888.8	1,025.6	8,947.7	0.01	0.00	0.01
16,200.0	90.00	181.44	6,536.0	-1,574.01	-8,988.8	1,023.1	9,046.8	0.01	0.00	0.01
16,300.0	90.00	181.44	6,536.0	-1,574.00	-9,088.8	1,020.6	9,145.9	0.01	0.00	0.01
16,400.0	90.00	181.45	6,536.0	-1,574.00	-9,188.7	1,018.1	9,245.0	0.01	0.00	0.01
BHL: 600ft FSL & 790ft FEL of Sec 31										
16,431.6	90.00	181.45	6,536.0	-1,574.00	-9,220.3	1,017.3	9,276.3	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-15HC
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4962.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4962.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,573.4	1,540.0	FOX HILLS BASE				
3,504.9	3,394.0	RICHARD SNADSTONE				
3,623.6	3,508.0	PARKMAN SANDSTONE				
4,401.9	4,255.0	SUSSEX SANDSTONE				
4,878.0	4,712.0	SHANNON SANDSTONE				
6,364.1	6,168.0	SHARON SPRINGS				
6,448.1	6,244.0	NIOBRARA A CHALK				
6,480.8	6,272.0	NIOBRARA A CHALK BASE				
6,522.2	6,306.0	NIOBRARA B1 CHALK TOP				
6,542.4	6,322.0	NIOBRARA B1 CHALK BASE				
6,571.2	6,344.0	NIOBRARA B2 CHALK TOP				
6,608.5	6,371.0	NIOBRARA B2 CHALK BASE				
6,664.0	6,408.0	NIOBRARA C CHALK TOP				
6,764.1	6,464.0	NIOBRARA C CHALK BASE				
6,794.5	6,478.0	NIOBRARA D CHALK TOP				
6,881.2	6,510.0	FT. HAYS				
7,054.5	6,536.0	CODELL				

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.0	0.0	0.0	0.0	SHL: 751ft FNL & 1992ft FEL of Sec 30
200.0	200.0	0.0	0.0	START NUDGE (2°/100ft BUR)
1,014.3	1,003.4	59.1	98.6	EOB TO 16.29° INC
5,240.1	5,059.6	668.7	1,114.9	END OF TANGENT
6,054.4	5,863.0	727.8	1,213.5	EOD TO VERTICAL
6,154.4	5,963.0	727.8	1,213.5	KOP (10°/100ft BUR)
7,054.5	6,536.0	154.9	1,205.1	HZ LP: 600ft FNL & 790ft FEL of Sec 30
16,431.6	6,536.0	-9,220.3	1,017.3	BHL: 600ft FSL & 790ft FEL of Sec 31