

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

GADWALL FED 30-31-14HN

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 30-31-14HN
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 & 2017ft FEL of Sec 30		
300.0	300.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2°/100ft BUR)		
1069.7	1079.2	15.58	55.40	59.8	86.7	-51.5	105.3	EOB TO 15.58° INC		
4902.3	5058.2	15.58	55.40	666.9	966.6	-574.5	1174.3	END OF TANGENT		
5672.0	5837.4	0.00	0.00	726.7	1053.3	-626.1	1279.7	EOD TO VERTICAL		
5772.0	5937.4	0.00	0.00	726.7	1053.3	-626.1	1279.7	KOP (10°/100ft BUR)		
6345.0	6837.5	90.00	180.84	153.8	1044.9	-56.4	1852.6	HZ LP: 600ft FNL & 975ft FEL of Sec 30		
6345.0	16214.2	90.00	181.45	-9221.0	857.4	9260.8	11229.4	BHL: 600ft FSL & 975ft FEL of Sec 31		

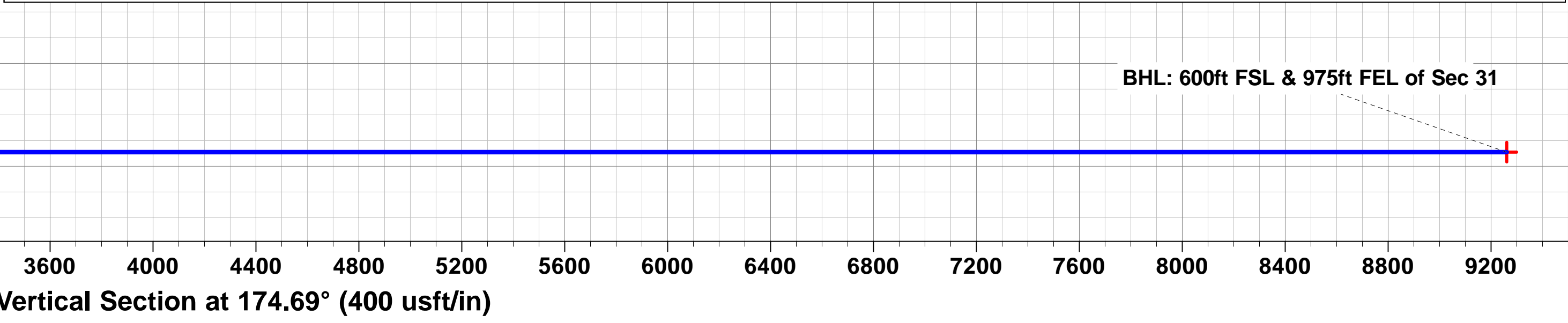
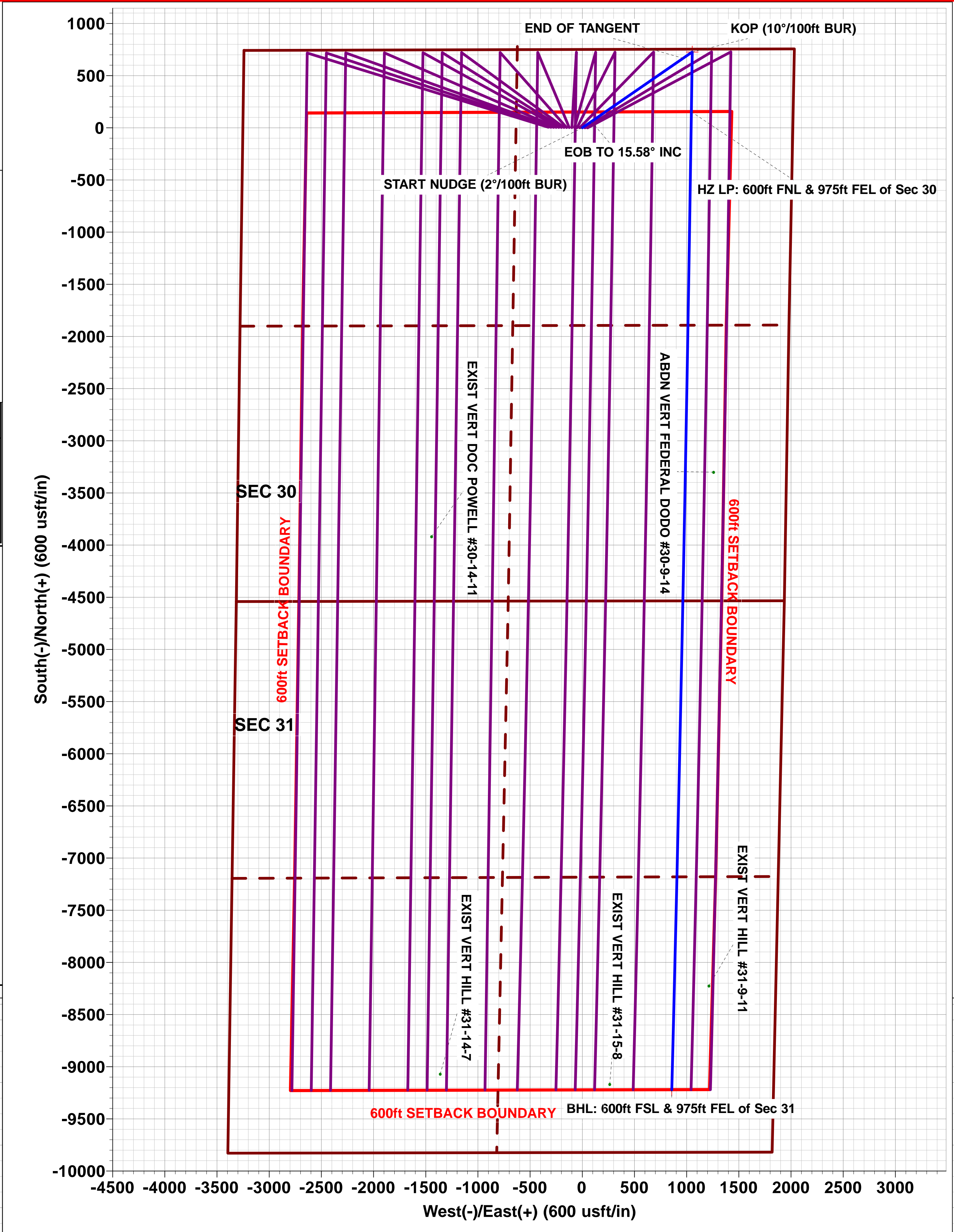
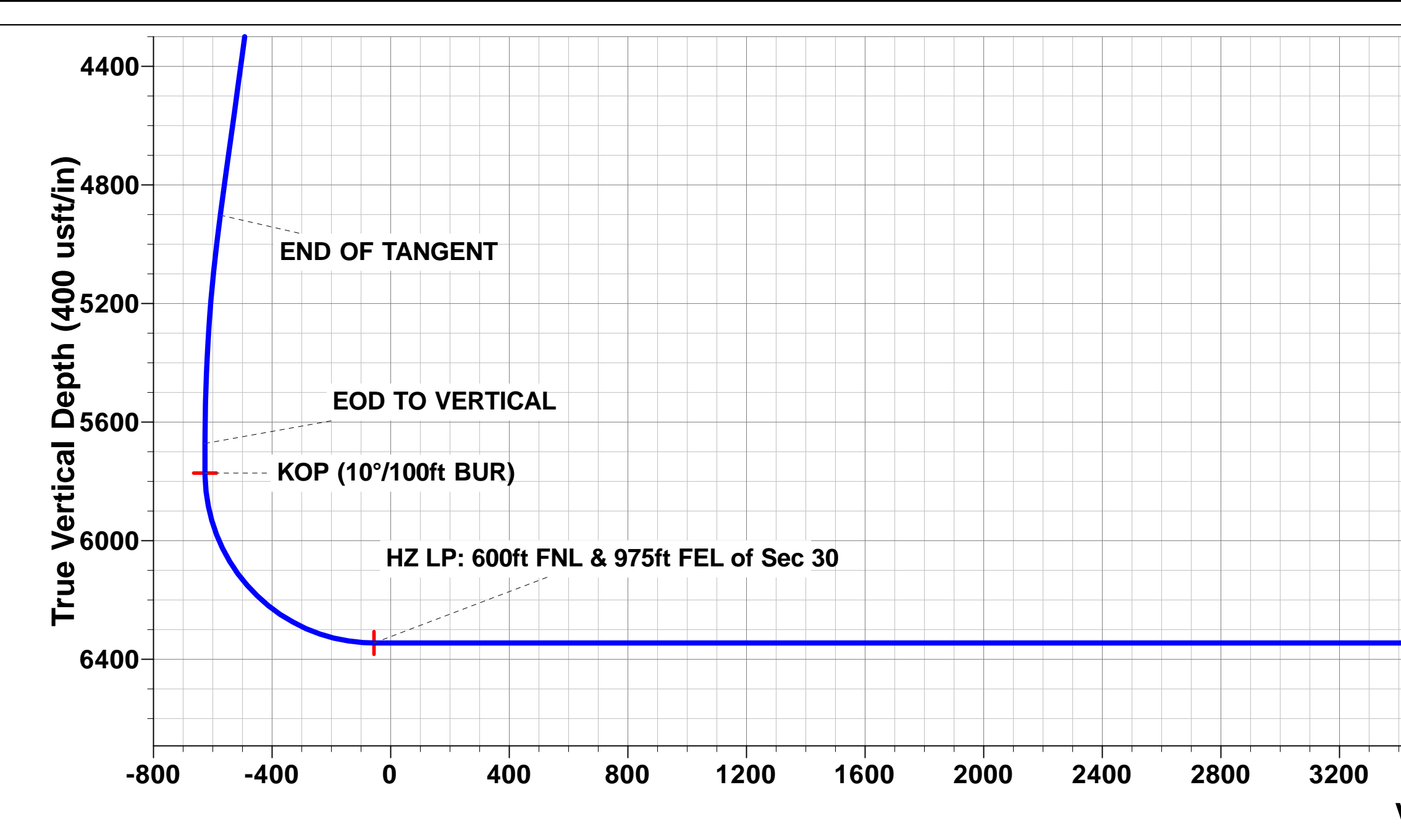
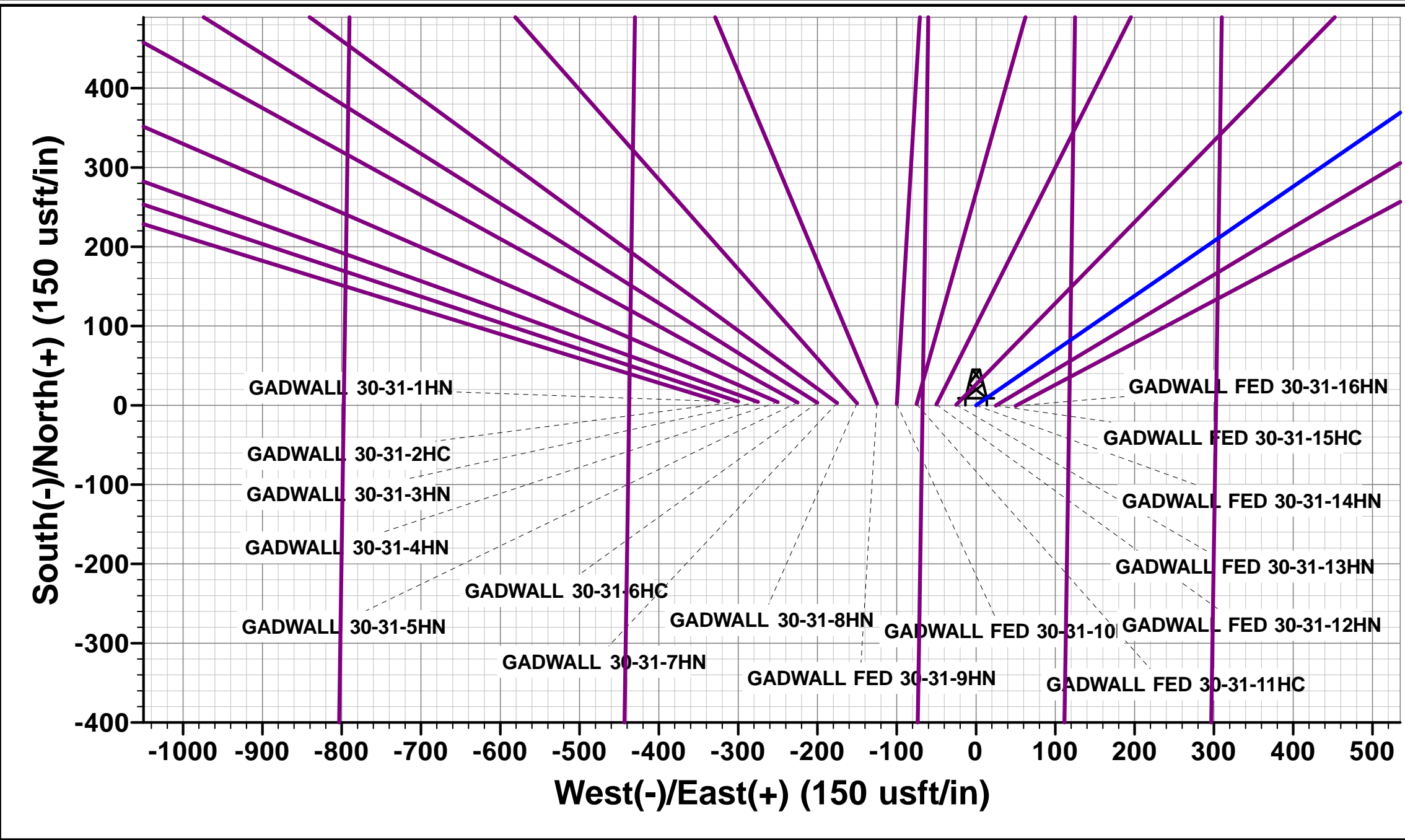
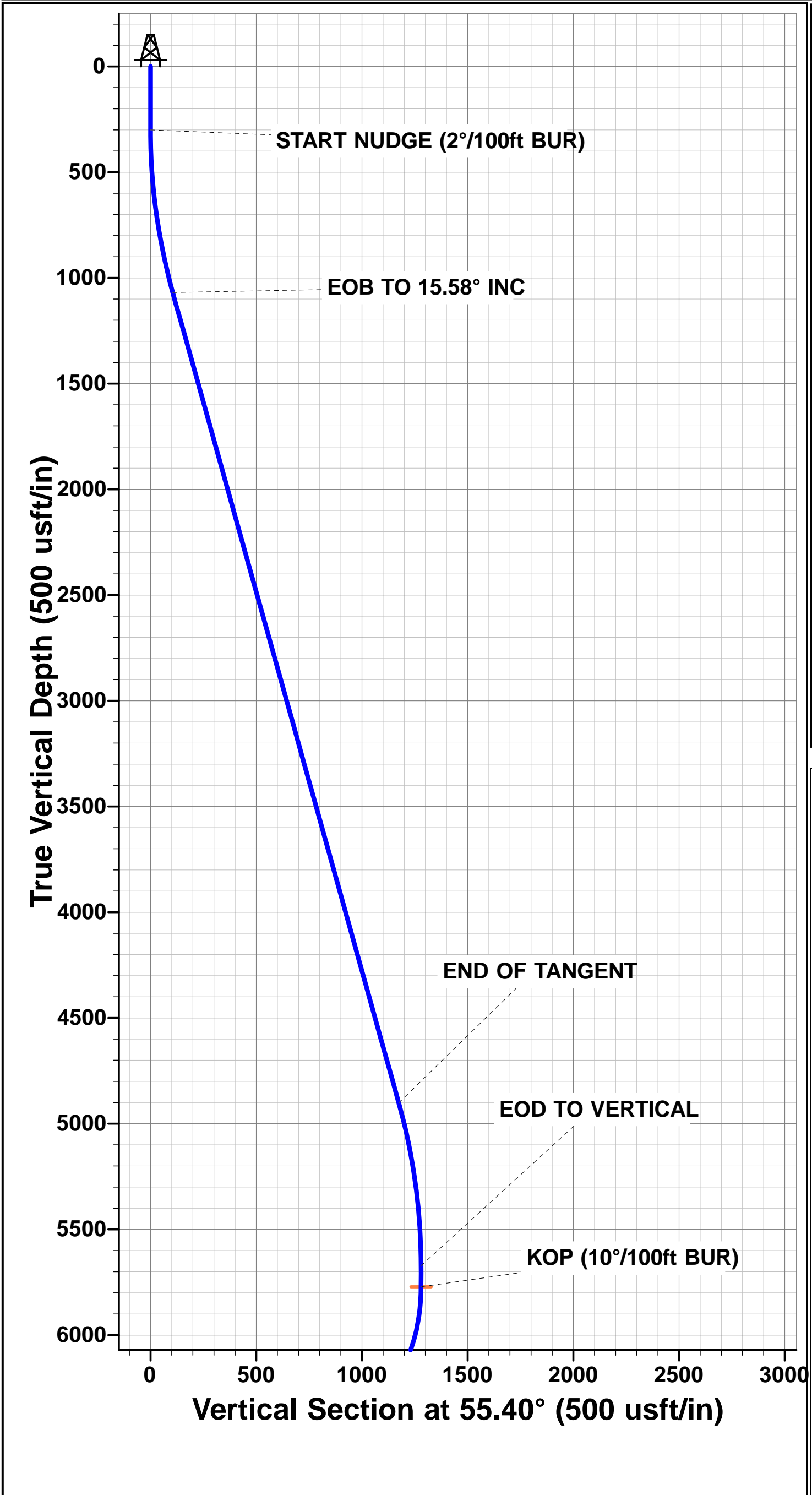
PROPOSED LOCAL COORDINATES:

SHL: 751ft FNL & 2017ft FEL of Sec 30

HZ LP: 600ft FNL & 975ft FEL of Sec 30

BHL: 600ft FSL & 975ft FEL of Sec 31

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL FED 30-31-14HN	5772.0	726.7	1053.3	40.640421	-104.128850
HZ LP: GADWALL FED 30-31-14HN	6345.0	153.8	1044.9	40.638848	-104.128880
BHL: GADWALL FED 30-31-14HN	6345.0	-9221.0	857.4	40.613116	-104.129557



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-14HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-14HN	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 30-31-14HN					
Well Position	+N/-S	-5.1 usft	Northing:	1,478,346.48 usft	Latitude:	40.638426
	+E/-W	325.0 usft	Easting:	3,379,468.11 usft	Longitude:	-104.132645
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,947.0 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	174.69

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	-4,963.0	0.0	0.0	0.00	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	-4,663.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,079.2	15.58	55.40	1,069.7	-3,893.3	59.8	86.7	2.00	2.00	0.00	55.40	
5,058.2	15.58	55.40	4,902.3	-60.7	666.9	966.6	0.00	0.00	0.00	0.00	
5,837.4	0.00	0.00	5,672.0	709.0	726.7	1,053.3	2.00	-2.00	0.00	180.00	
5,937.4	0.00	0.00	5,772.0	809.0	726.7	1,053.3	0.00	0.00	0.00	0.00	KOP: GADWALL FED
6,837.5	90.00	180.84	6,345.0	1,382.0	153.8	1,044.9	10.00	10.00	-19.91	180.84	HZ LP: GADWALL FE
16,214.2	90.00	181.45	6,345.0	1,382.0	-9,221.0	857.4	0.01	0.00	0.01	89.73	BHL: GADWALL FED

Planning Report



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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-14HN	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 & 2017ft FEL of Sec 30										
0.0	0.00	0.00	0.0	4,963.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,863.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	4,763.00	0.0	0.0	0.0	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
300.0	0.00	0.00	300.0	4,663.00	0.0	0.0	0.0	0.00	0.00	0.00
400.0	2.00	55.40	400.0	4,563.02	1.0	1.4	-0.9	2.00	2.00	0.00
500.0	4.00	55.40	499.8	4,463.16	4.0	5.7	-3.4	2.00	2.00	0.00
600.0	6.00	55.40	599.5	4,363.55	8.9	12.9	-7.7	2.00	2.00	0.00
700.0	8.00	55.40	698.7	4,264.30	15.8	22.9	-13.6	2.00	2.00	0.00
800.0	10.00	55.40	797.5	4,165.53	24.7	35.8	-21.3	2.00	2.00	0.00
900.0	12.00	55.40	895.6	4,067.38	35.6	51.5	-30.6	2.00	2.00	0.00
1,000.0	14.00	55.40	993.1	3,969.94	48.3	70.0	-41.6	2.00	2.00	0.00
EOB TO 15.58° INC										
1,079.2	15.58	55.40	1,069.7	3,893.33	59.8	86.7	-51.5	2.00	2.00	0.00
1,100.0	15.58	55.40	1,089.7	3,873.34	63.0	91.3	-54.3	0.00	0.00	0.00
1,200.0	15.58	55.40	1,186.0	3,777.01	78.2	113.4	-67.4	0.00	0.00	0.00
1,300.0	15.58	55.40	1,282.3	3,680.69	93.5	135.5	-80.5	0.00	0.00	0.00
1,400.0	15.58	55.40	1,378.6	3,584.37	108.8	157.6	-93.7	0.00	0.00	0.00
1,500.0	15.58	55.40	1,475.0	3,488.04	124.0	179.7	-106.8	0.00	0.00	0.00
FOX HILLS BASE										
1,568.6	15.58	55.40	1,541.0	3,422.00	134.5	194.9	-115.8	0.00	0.00	0.00
1,600.0	15.58	55.40	1,571.3	3,391.72	139.3	201.9	-120.0	0.00	0.00	0.00
1,700.0	15.58	55.40	1,667.6	3,295.40	154.5	224.0	-133.1	0.00	0.00	0.00
1,800.0	15.58	55.40	1,763.9	3,199.07	169.8	246.1	-146.3	0.00	0.00	0.00
1,900.0	15.58	55.40	1,860.3	3,102.75	185.0	268.2	-159.4	0.00	0.00	0.00
2,000.0	15.58	55.40	1,956.6	3,006.43	200.3	290.3	-172.6	0.00	0.00	0.00
2,100.0	15.58	55.40	2,052.9	2,910.10	215.6	312.4	-185.7	0.00	0.00	0.00
2,200.0	15.58	55.40	2,149.2	2,813.78	230.8	334.5	-198.8	0.00	0.00	0.00
2,300.0	15.58	55.40	2,245.5	2,717.46	246.1	356.7	-212.0	0.00	0.00	0.00
2,400.0	15.58	55.40	2,341.9	2,621.13	261.3	378.8	-225.1	0.00	0.00	0.00
2,500.0	15.58	55.40	2,438.2	2,524.81	276.6	400.9	-238.3	0.00	0.00	0.00
2,600.0	15.58	55.40	2,534.5	2,428.49	291.8	423.0	-251.4	0.00	0.00	0.00
2,700.0	15.58	55.40	2,630.8	2,332.16	307.1	445.1	-264.6	0.00	0.00	0.00
2,800.0	15.58	55.40	2,727.2	2,235.84	322.4	467.2	-277.7	0.00	0.00	0.00
2,900.0	15.58	55.40	2,823.5	2,139.52	337.6	489.3	-290.9	0.00	0.00	0.00
3,000.0	15.58	55.40	2,919.8	2,043.19	352.9	511.5	-304.0	0.00	0.00	0.00
3,100.0	15.58	55.40	3,016.1	1,946.87	368.1	533.6	-317.1	0.00	0.00	0.00
3,200.0	15.58	55.40	3,112.5	1,850.55	383.4	555.7	-330.3	0.00	0.00	0.00
3,300.0	15.58	55.40	3,208.8	1,754.22	398.6	577.8	-343.4	0.00	0.00	0.00
3,400.0	15.58	55.40	3,305.1	1,657.90	413.9	599.9	-356.6	0.00	0.00	0.00
RICHARD SNADSTONE										
3,493.3	15.58	55.40	3,395.0	1,568.00	428.1	620.5	-368.8	0.00	0.00	0.00
3,500.0	15.58	55.40	3,401.4	1,561.58	429.2	622.0	-369.7	0.00	0.00	0.00
3,600.0	15.58	55.40	3,497.7	1,465.25	444.4	644.1	-382.9	0.00	0.00	0.00
PARKMAN SANDSTONE										
3,611.7	15.58	55.40	3,509.0	1,454.00	446.2	646.7	-384.4	0.00	0.00	0.00
3,700.0	15.58	55.40	3,594.1	1,368.93	459.7	666.3	-396.0	0.00	0.00	0.00
3,800.0	15.58	55.40	3,690.4	1,272.61	474.9	688.4	-409.2	0.00	0.00	0.00
3,900.0	15.58	55.40	3,786.7	1,176.28	490.2	710.5	-422.3	0.00	0.00	0.00
4,000.0	15.58	55.40	3,883.0	1,079.96	505.4	732.6	-435.4	0.00	0.00	0.00
4,100.0	15.58	55.40	3,979.4	983.64	520.7	754.7	-448.6	0.00	0.00	0.00
4,200.0	15.58	55.40	4,075.7	887.31	536.0	776.8	-461.7	0.00	0.00	0.00

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Well:	GADWALL FED 30-31-14HN	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	15.58	55.40	4,172.0	790.99	551.2	798.9	-474.9	0.00	0.00	0.00
SUSSEX SANDSTONE										
4,387.2	15.58	55.40	4,256.0	707.00	564.5	818.2	-486.3	0.00	0.00	0.00
4,400.0	15.58	55.40	4,268.3	694.67	566.5	821.0	-488.0	0.00	0.00	0.00
4,500.0	15.58	55.40	4,364.7	598.34	581.7	843.2	-501.2	0.00	0.00	0.00
4,600.0	15.58	55.40	4,461.0	502.02	597.0	865.3	-514.3	0.00	0.00	0.00
4,700.0	15.58	55.40	4,557.3	405.70	612.2	887.4	-527.5	0.00	0.00	0.00
4,800.0	15.58	55.40	4,653.6	309.37	627.5	909.5	-540.6	0.00	0.00	0.00
SHANNON SANDSTONE										
4,861.6	15.58	55.40	4,713.0	250.00	636.9	923.1	-548.7	0.00	0.00	0.00
4,900.0	15.58	55.40	4,750.0	213.05	642.7	931.6	-553.7	0.00	0.00	0.00
5,000.0	15.58	55.40	4,846.3	116.73	658.0	953.7	-566.9	0.00	0.00	0.00
END OF TANGENT										
5,058.2	15.58	55.40	4,902.3	60.67	666.9	966.6	-574.5	0.00	0.00	0.00
5,100.0	14.75	55.40	4,942.7	20.32	673.1	975.6	-579.9	2.00	-2.00	0.00
5,200.0	12.75	55.40	5,039.8	-76.81	686.6	995.2	-591.5	2.00	-2.00	0.00
5,300.0	10.75	55.40	5,137.7	-174.71	698.2	1,011.9	-601.5	2.00	-2.00	0.00
5,400.0	8.75	55.40	5,236.3	-273.26	707.8	1,025.9	-609.8	2.00	-2.00	0.00
5,500.0	6.75	55.40	5,335.3	-372.34	715.4	1,037.0	-616.4	2.00	-2.00	0.00
5,600.0	4.75	55.40	5,434.8	-471.83	721.1	1,045.2	-621.3	2.00	-2.00	0.00
5,700.0	2.75	55.40	5,534.6	-571.61	724.8	1,050.6	-624.5	2.00	-2.00	0.00
5,800.0	0.75	55.40	5,634.6	-671.56	726.6	1,053.1	-625.9	2.00	-2.00	0.00
EOD TO VERTICAL										
5,837.4	0.00	0.00	5,672.0	-709.00	726.7	1,053.3	-626.1	2.00	-2.00	0.00
5,900.0	0.00	0.00	5,734.6	-771.56	726.7	1,053.3	-626.1	0.00	0.00	0.00
KOP (10°/100ft BUR)										
5,937.4	0.00	0.00	5,772.0	-809.00	726.7	1,053.3	-626.1	0.00	0.00	0.00
6,000.0	6.26	180.84	5,834.4	-871.44	723.3	1,053.3	-622.7	10.00	10.00	0.00
6,100.0	16.25	180.84	5,932.4	-969.39	703.8	1,053.0	-603.3	10.00	10.00	0.00
6,200.0	26.25	180.84	6,025.5	-1,062.47	667.6	1,052.4	-567.3	10.00	10.00	0.00
6,300.0	36.25	180.84	6,110.8	-1,147.85	615.8	1,051.7	-515.8	10.00	10.00	0.00
SHARON SPRINGS										
6,376.0	43.86	180.84	6,169.0	-1,206.00	566.9	1,051.0	-467.2	10.00	10.00	0.00
6,400.0	46.25	180.84	6,185.9	-1,222.93	549.9	1,050.7	-450.3	10.00	10.00	0.00
NIORARA A CHALK										
6,493.9	55.64	180.84	6,245.0	-1,282.00	477.1	1,049.6	-377.9	10.00	10.00	0.00
6,500.0	56.25	180.84	6,248.4	-1,285.44	472.1	1,049.6	-372.9	10.00	10.00	0.00
NIORARA A CHALK BASE										
6,547.2	60.97	180.84	6,273.0	-1,310.00	431.8	1,049.0	-332.8	10.00	10.00	0.00
6,600.0	66.25	180.84	6,296.5	-1,333.48	384.5	1,048.3	-285.8	10.00	10.00	0.00
NIORARA B1 CHALK TOP										
6,627.7	69.02	180.84	6,307.0	-1,344.00	358.9	1,047.9	-260.4	10.00	10.00	0.00
NIORARA B1 CHALK BASE										
6,678.2	74.07	180.84	6,323.0	-1,360.00	311.0	1,047.2	-212.7	10.00	10.00	0.00
6,700.0	76.25	180.84	6,328.6	-1,365.58	289.9	1,046.9	-191.8	10.00	10.00	0.00
6,800.0	86.25	180.84	6,343.8	-1,380.77	191.2	1,045.5	-93.6	10.00	10.00	0.00
HZ LP: 600ft FNL & 975ft FEL of Sec 30 - NIOBRARA B2 CHALK TOP										
6,837.5	90.00	180.84	6,345.0	-1,382.00	153.8	1,044.9	-56.4	10.00	10.00	0.00
6,900.0	90.00	180.84	6,345.0	-1,382.00	91.3	1,044.0	5.8	0.01	0.00	0.01
7,000.0	90.00	180.85	6,345.0	-1,382.00	-8.7	1,042.5	105.2	0.01	0.00	0.01
7,100.0	90.00	180.86	6,345.0	-1,382.01	-108.7	1,041.0	204.6	0.01	0.00	0.01
7,200.0	90.00	180.86	6,345.0	-1,382.01	-208.7	1,039.5	304.0	0.01	0.00	0.01
7,300.0	90.00	180.87	6,345.0	-1,382.01	-308.7	1,038.0	403.5	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-14HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-14HN	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)
7,400.0	90.00	180.88	6,345.0	-1,382.01	-408.7	1,036.5	502.9	0.01	0.00	0.01
7,500.0	90.00	180.88	6,345.0	-1,382.02	-508.7	1,035.0	602.3	0.01	0.00	0.01
7,600.0	90.00	180.89	6,345.0	-1,382.02	-608.6	1,033.4	701.7	0.01	0.00	0.01
7,700.0	90.00	180.89	6,345.0	-1,382.02	-708.6	1,031.9	801.1	0.01	0.00	0.01
7,800.0	90.00	180.90	6,345.0	-1,382.02	-808.6	1,030.3	900.5	0.01	0.00	0.01
7,900.0	90.00	180.91	6,345.0	-1,382.02	-908.6	1,028.7	999.9	0.01	0.00	0.01
8,000.0	90.00	180.91	6,345.0	-1,382.03	-1,008.6	1,027.1	1,099.4	0.01	0.00	0.01
8,100.0	90.00	180.92	6,345.0	-1,382.03	-1,108.6	1,025.5	1,198.8	0.01	0.00	0.01
8,200.0	90.00	180.93	6,345.0	-1,382.03	-1,208.6	1,023.9	1,298.2	0.01	0.00	0.01
8,300.0	90.00	180.93	6,345.0	-1,382.03	-1,308.6	1,022.3	1,397.6	0.01	0.00	0.01
8,400.0	90.00	180.94	6,345.0	-1,382.03	-1,408.5	1,020.7	1,497.0	0.01	0.00	0.01
8,500.0	90.00	180.95	6,345.0	-1,382.03	-1,508.5	1,019.0	1,596.4	0.01	0.00	0.01
8,600.0	90.00	180.95	6,345.0	-1,382.04	-1,608.5	1,017.4	1,695.8	0.01	0.00	0.01
8,700.0	90.00	180.96	6,345.0	-1,382.04	-1,708.5	1,015.7	1,795.2	0.01	0.00	0.01
8,800.0	90.00	180.97	6,345.0	-1,382.04	-1,808.5	1,014.0	1,894.6	0.01	0.00	0.01
8,900.0	90.00	180.97	6,345.0	-1,382.04	-1,908.5	1,012.3	1,994.0	0.01	0.00	0.01
9,000.0	90.00	180.98	6,345.0	-1,382.04	-2,008.5	1,010.6	2,093.4	0.01	0.00	0.01
9,100.0	90.00	180.99	6,345.0	-1,382.04	-2,108.4	1,008.9	2,192.8	0.01	0.00	0.01
9,200.0	90.00	180.99	6,345.0	-1,382.05	-2,208.4	1,007.2	2,292.2	0.01	0.00	0.01
9,300.0	90.00	181.00	6,345.0	-1,382.05	-2,308.4	1,005.4	2,391.6	0.01	0.00	0.01
9,400.0	90.00	181.01	6,345.0	-1,382.05	-2,408.4	1,003.7	2,491.0	0.01	0.00	0.01
9,500.0	90.00	181.01	6,345.0	-1,382.05	-2,508.4	1,001.9	2,590.4	0.01	0.00	0.01
9,600.0	90.00	181.02	6,345.0	-1,382.05	-2,608.4	1,000.1	2,689.8	0.01	0.00	0.01
9,700.0	90.00	181.03	6,345.1	-1,382.05	-2,708.4	998.3	2,789.1	0.01	0.00	0.01
9,800.0	90.00	181.03	6,345.1	-1,382.05	-2,808.3	996.6	2,888.5	0.01	0.00	0.01
9,900.0	90.00	181.04	6,345.1	-1,382.05	-2,908.3	994.7	2,987.9	0.01	0.00	0.01
10,000.0	90.00	181.05	6,345.1	-1,382.05	-3,008.3	992.9	3,087.3	0.01	0.00	0.01
10,100.0	90.00	181.05	6,345.1	-1,382.05	-3,108.3	991.1	3,186.7	0.01	0.00	0.01
10,200.0	90.00	181.06	6,345.1	-1,382.06	-3,208.3	989.2	3,286.1	0.01	0.00	0.01
10,300.0	90.00	181.07	6,345.1	-1,382.06	-3,308.3	987.4	3,385.5	0.01	0.00	0.01
10,400.0	90.00	181.07	6,345.1	-1,382.06	-3,408.2	985.5	3,484.8	0.01	0.00	0.01
10,500.0	90.00	181.08	6,345.1	-1,382.06	-3,508.2	983.7	3,584.2	0.01	0.00	0.01
10,600.0	90.00	181.09	6,345.1	-1,382.06	-3,608.2	981.8	3,683.6	0.01	0.00	0.01
10,700.0	90.00	181.09	6,345.1	-1,382.06	-3,708.2	979.9	3,783.0	0.01	0.00	0.01
10,800.0	90.00	181.10	6,345.1	-1,382.06	-3,808.2	978.0	3,882.3	0.01	0.00	0.01
10,900.0	90.00	181.11	6,345.1	-1,382.06	-3,908.1	976.0	3,981.7	0.01	0.00	0.01
11,000.0	90.00	181.11	6,345.1	-1,382.06	-4,008.1	974.1	4,081.1	0.01	0.00	0.01
11,100.0	90.00	181.12	6,345.1	-1,382.06	-4,108.1	972.1	4,180.5	0.01	0.00	0.01
11,200.0	90.00	181.12	6,345.1	-1,382.06	-4,208.1	970.2	4,279.8	0.01	0.00	0.01
11,300.0	90.00	181.13	6,345.1	-1,382.06	-4,308.1	968.2	4,379.2	0.01	0.00	0.01
11,400.0	90.00	181.14	6,345.1	-1,382.06	-4,408.1	966.2	4,478.6	0.01	0.00	0.01
11,500.0	90.00	181.14	6,345.1	-1,382.06	-4,508.0	964.3	4,577.9	0.01	0.00	0.01
11,600.0	90.00	181.15	6,345.1	-1,382.06	-4,608.0	962.2	4,677.3	0.01	0.00	0.01
11,700.0	90.00	181.16	6,345.1	-1,382.06	-4,708.0	960.2	4,776.7	0.01	0.00	0.01
11,800.0	90.00	181.16	6,345.1	-1,382.06	-4,808.0	958.2	4,876.0	0.01	0.00	0.01
11,900.0	90.00	181.17	6,345.1	-1,382.06	-4,907.9	956.2	4,975.4	0.01	0.00	0.01
12,000.0	90.00	181.18	6,345.1	-1,382.06	-5,007.9	954.1	5,074.8	0.01	0.00	0.01
12,100.0	90.00	181.18	6,345.1	-1,382.06	-5,107.9	952.1	5,174.1	0.01	0.00	0.01
12,200.0	90.00	181.19	6,345.1	-1,382.06	-5,207.9	950.0	5,273.5	0.01	0.00	0.01
12,300.0	90.00	181.20	6,345.1	-1,382.06	-5,307.9	947.9	5,372.8	0.01	0.00	0.01
12,400.0	90.00	181.20	6,345.1	-1,382.06	-5,407.8	945.8	5,472.2	0.01	0.00	0.01
12,500.0	90.00	181.21	6,345.1	-1,382.06	-5,507.8	943.7	5,571.5	0.01	0.00	0.01
12,600.0	90.00	181.22	6,345.1	-1,382.06	-5,607.8	941.6	5,670.9	0.01	0.00	0.01
12,700.0	90.00	181.22	6,345.1	-1,382.06	-5,707.8	939.5	5,770.2	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-14HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-14HN	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)
12,800.0	90.00	181.23	6,345.1	-1,382.06	-5,807.8	937.3	5,869.6	0.01	0.00	0.01
12,900.0	90.00	181.24	6,345.1	-1,382.05	-5,907.7	935.2	5,968.9	0.01	0.00	0.01
13,000.0	90.00	181.24	6,345.1	-1,382.05	-6,007.7	933.0	6,068.3	0.01	0.00	0.01
13,100.0	90.00	181.25	6,345.1	-1,382.05	-6,107.7	930.8	6,167.6	0.01	0.00	0.01
13,200.0	90.00	181.26	6,345.1	-1,382.05	-6,207.7	928.6	6,267.0	0.01	0.00	0.01
13,300.0	90.00	181.26	6,345.1	-1,382.05	-6,307.6	926.4	6,366.3	0.01	0.00	0.01
13,400.0	90.00	181.27	6,345.1	-1,382.05	-6,407.6	924.2	6,465.7	0.01	0.00	0.01
13,500.0	90.00	181.28	6,345.0	-1,382.05	-6,507.6	922.0	6,565.0	0.01	0.00	0.01
13,600.0	90.00	181.28	6,345.0	-1,382.05	-6,607.6	919.8	6,664.3	0.01	0.00	0.01
13,700.0	90.00	181.29	6,345.0	-1,382.05	-6,707.5	917.5	6,763.7	0.01	0.00	0.01
13,800.0	90.00	181.30	6,345.0	-1,382.05	-6,807.5	915.3	6,863.0	0.01	0.00	0.01
13,900.0	90.00	181.30	6,345.0	-1,382.04	-6,907.5	913.0	6,962.3	0.01	0.00	0.01
14,000.0	90.00	181.31	6,345.0	-1,382.04	-7,007.5	910.7	7,061.7	0.01	0.00	0.01
14,100.0	90.00	181.32	6,345.0	-1,382.04	-7,107.4	908.4	7,161.0	0.01	0.00	0.01
14,200.0	90.00	181.32	6,345.0	-1,382.04	-7,207.4	906.1	7,260.3	0.01	0.00	0.01
14,300.0	90.00	181.33	6,345.0	-1,382.04	-7,307.4	903.8	7,359.7	0.01	0.00	0.01
14,400.0	90.00	181.34	6,345.0	-1,382.04	-7,407.4	901.5	7,459.0	0.01	0.00	0.01
14,500.0	90.00	181.34	6,345.0	-1,382.04	-7,507.3	899.2	7,558.3	0.01	0.00	0.01
14,600.0	90.00	181.35	6,345.0	-1,382.03	-7,607.3	896.8	7,657.7	0.01	0.00	0.01
14,700.0	90.00	181.35	6,345.0	-1,382.03	-7,707.3	894.5	7,757.0	0.01	0.00	0.01
14,800.0	90.00	181.36	6,345.0	-1,382.03	-7,807.2	892.1	7,856.3	0.01	0.00	0.01
14,900.0	90.00	181.37	6,345.0	-1,382.03	-7,907.2	889.7	7,955.6	0.01	0.00	0.01
15,000.0	90.00	181.37	6,345.0	-1,382.03	-8,007.2	887.3	8,054.9	0.01	0.00	0.01
15,100.0	90.00	181.38	6,345.0	-1,382.03	-8,107.2	884.9	8,154.3	0.01	0.00	0.01
15,200.0	90.00	181.39	6,345.0	-1,382.02	-8,207.1	882.5	8,253.6	0.01	0.00	0.01
15,300.0	90.00	181.39	6,345.0	-1,382.02	-8,307.1	880.1	8,352.9	0.01	0.00	0.01
15,400.0	90.00	181.40	6,345.0	-1,382.02	-8,407.1	877.6	8,452.2	0.01	0.00	0.01
15,500.0	90.00	181.41	6,345.0	-1,382.02	-8,507.0	875.2	8,551.5	0.01	0.00	0.01
15,600.0	90.00	181.41	6,345.0	-1,382.01	-8,607.0	872.7	8,650.8	0.01	0.00	0.01
15,700.0	90.00	181.42	6,345.0	-1,382.01	-8,707.0	870.3	8,750.1	0.01	0.00	0.01
15,800.0	90.00	181.43	6,345.0	-1,382.01	-8,806.9	867.8	8,849.5	0.01	0.00	0.01
15,900.0	90.00	181.43	6,345.0	-1,382.01	-8,906.9	865.3	8,948.8	0.01	0.00	0.01
16,000.0	90.00	181.44	6,345.0	-1,382.01	-9,006.9	862.8	9,048.1	0.01	0.00	0.01
16,100.0	90.00	181.45	6,345.0	-1,382.00	-9,106.8	860.2	9,147.4	0.01	0.00	0.01
16,200.0	90.00	181.45	6,345.0	-1,382.00	-9,206.8	857.7	9,246.7	0.01	0.00	0.01
BHL: 600ft FSL & 975ft FEL of Sec 31										
16,214.2	90.00	181.45	6,345.0	-1,382.00	-9,221.0	857.4	9,260.8	0.01	0.00	0.01

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-14HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4963.0usft (Original Well Elev)
Site:	NE NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-14HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,568.6	1,541.0	FOX HILLS BASE			
3,493.3	3,395.0	RICHARD SNADSTONE			
3,611.7	3,509.0	PARKMAN SANDSTONE			
4,387.2	4,256.0	SUSSEX SANDSTONE			
4,861.6	4,713.0	SHANNON SANDSTONE			
6,376.0	6,169.0	SHARON SPRINGS			
6,493.9	6,245.0	NIOBRARA A CHALK			
6,547.2	6,273.0	NIOBRARA A CHALK BASE			
6,627.7	6,307.0	NIOBRARA B1 CHALK TOP			
6,678.2	6,323.0	NIOBRARA B1 CHALK BASE			
6,837.5	6,345.0	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: 751ft FNL & 2017ft FEL of Sec 30
300.0	300.0	0.0	0.0	START NUDGE (2°/100ft BUR)
1,079.2	1,069.7	59.8	86.7	EOB TO 15.58° INC
5,058.2	4,902.3	666.9	966.6	END OF TANGENT
5,837.4	5,672.0	726.7	1,053.3	EOD TO VERTICAL
5,937.4	5,772.0	726.7	1,053.3	KOP (10°/100ft BUR)
6,837.5	6,345.0	153.8	1,044.9	HZ LP: 600ft FNL & 975ft FEL of Sec 30
16,214.2	6,345.0	-9,221.0	857.4	BHL: 600ft FSL & 975ft FEL of Sec 31