



MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

GADWALL FED 30-31-8HN

ORIGINAL WELLBORE

05 March, 2020

Plan: PROPOSAL #2





Project: WELD COUNTY, COLORADO (NAD 83)
Site: NW NE SEC. 30 T8N R60W 6th P.M.
Well: GADWALL FED 30-31-8HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #2

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 751ft FNL & 2042ft FEL of Sec 30
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1194.50	21.89	76.23	1168.07	49.18	200.61	-16.39	206.55	EOB TO 21.89° INC
4907.08	21.89	76.23	4612.97	378.73	1544.95	-126.26	1590.70	END OF TANGENT
6001.58	0.00	0.00	5681.04	427.91	1745.56	-142.65	1797.24	EOD TO VERTICAL
6101.58	0.00	0.00	5781.04	427.91	1745.56	-142.65	1797.24	KOP (10°/100ft BUR)
7001.58	90.00	181.15	6354.00	-144.93	1734.06	420.94	2370.20	HZ LP: 900ft FNL & 305ft FEL of Sec 30
16379.03	90.00	181.15	6354.00	-9520.49	1545.64	9645.14	11747.65	BHL: 300ft FSL & 305ft FEL of Sec 31

PROPOSED LOCAL COORDINATES:

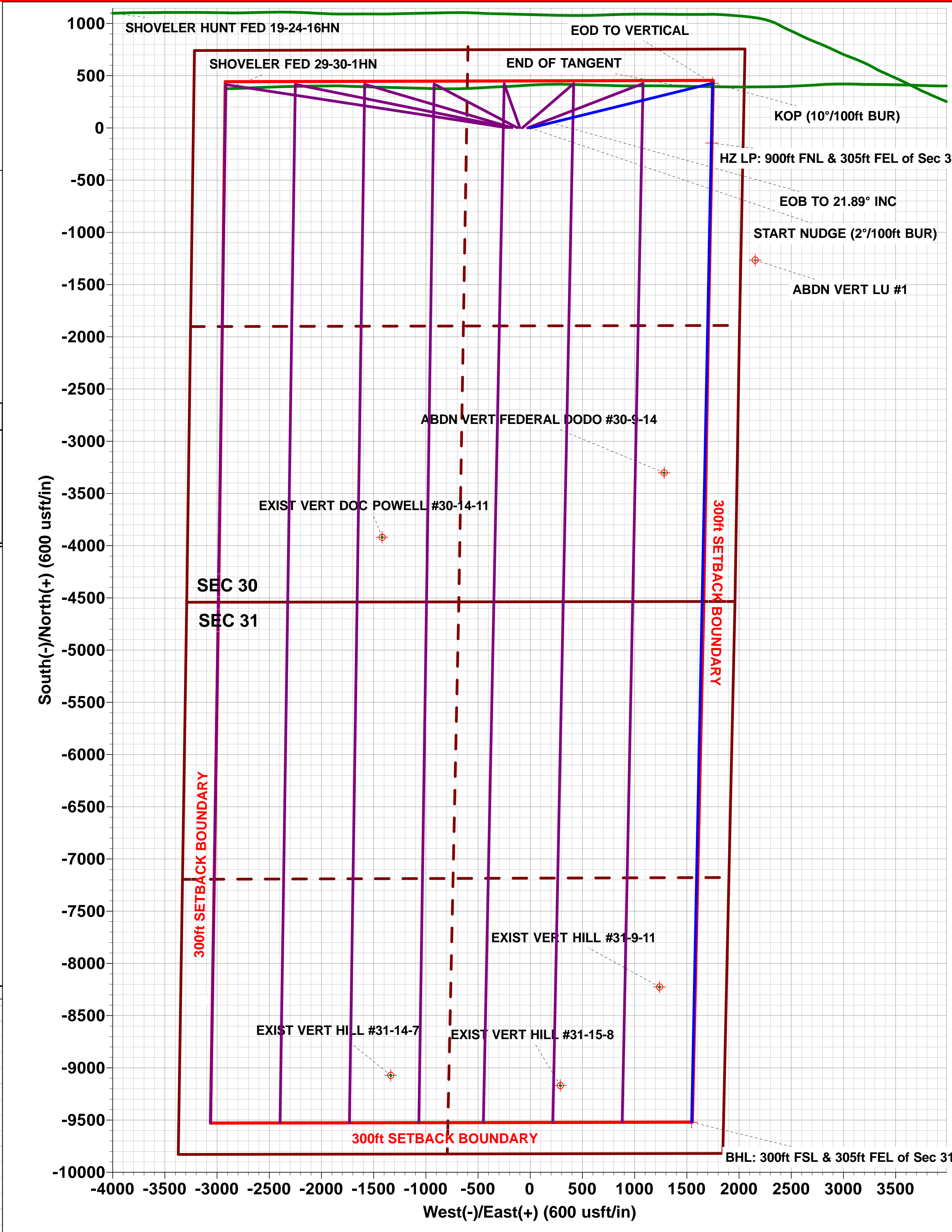
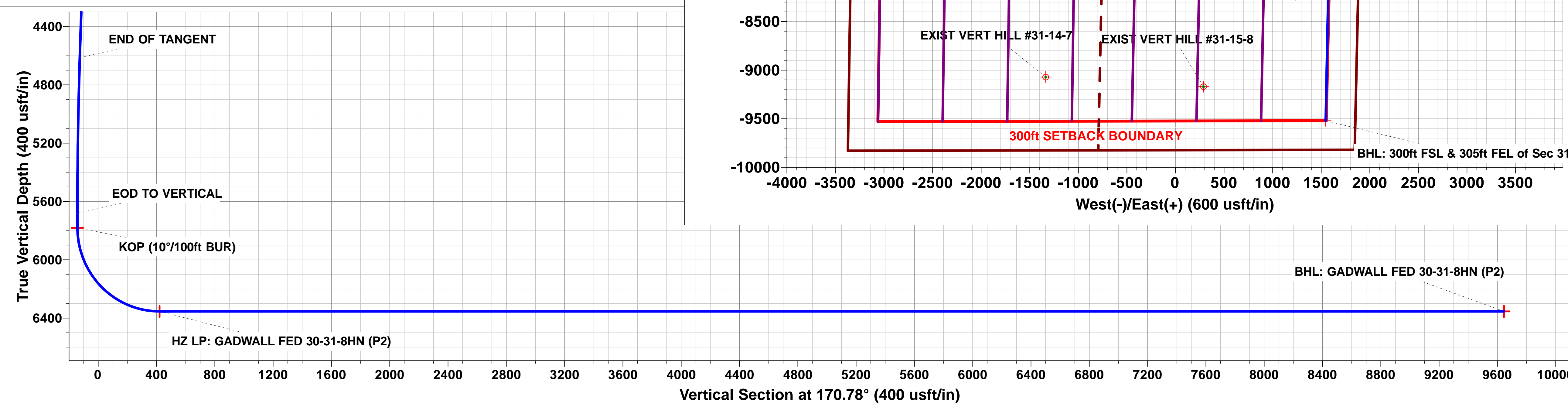
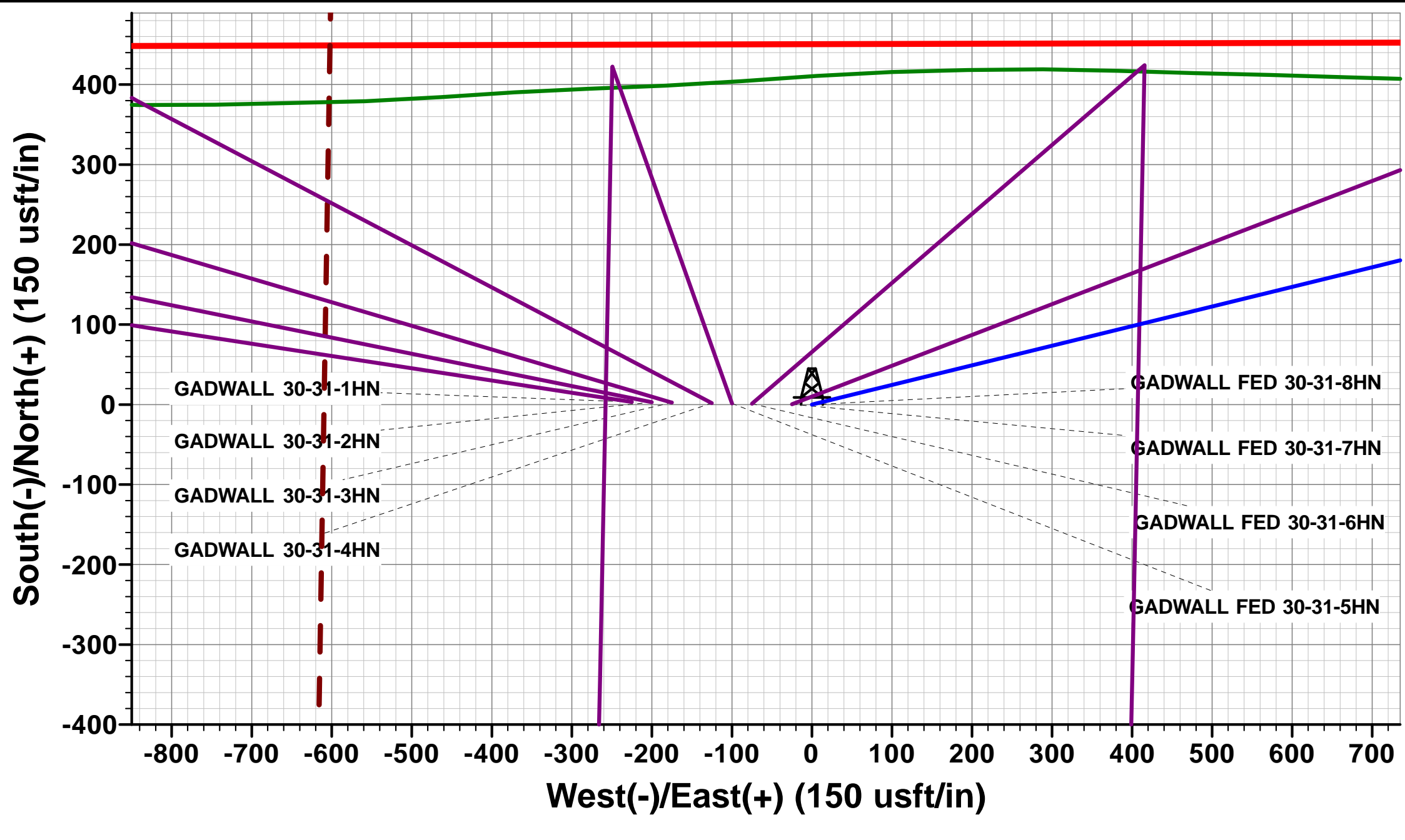
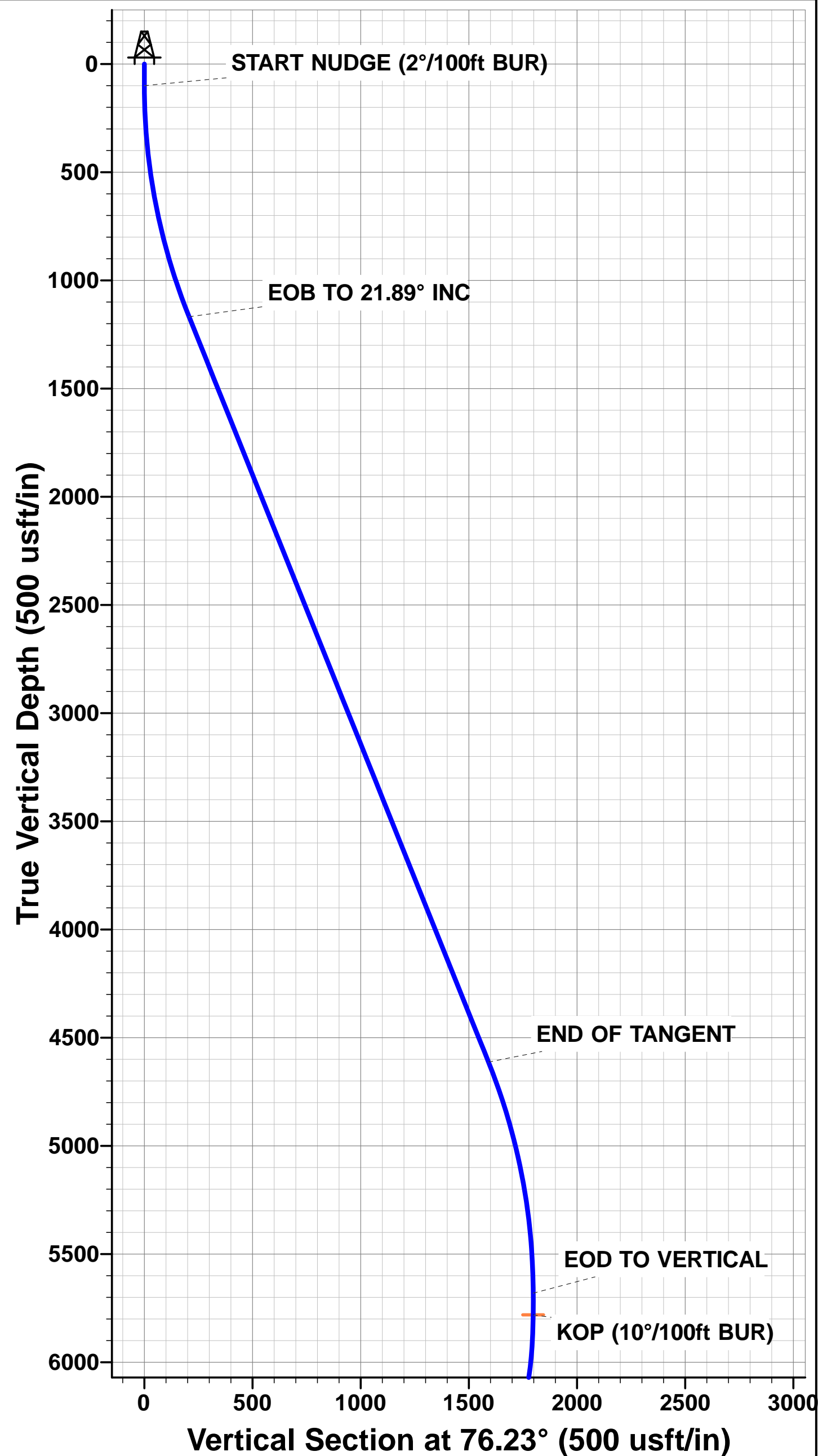
SHL: 751ft FNL & 2042ft FEL Sec 30

HZ LP: 900ft FNL & 305ft FEL Sec 30

BHL: 300ft FSL & 305ft FEL of Sec 31

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL FED 30-31-8HN (P2)	5781.04	427.91	1745.56	40.639602	-104.126445
HZ LP: GADWALL FED 30-31-8HN (P2)	6354.00	-144.93	1734.06	40.638030	-104.126487
BHL: GADWALL FED 30-31-8HN (P2)	6354.00	-9520.49	1545.64	40.612296	-104.127168



Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well GADWALL FED 30-31-8HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4974.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4974.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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	NW NE SEC. 30 T8N R60W 6th P.M.		
Site Position:		Northing:	1,478,346.58 usft
From:	Lat/Long	Easting:	3,379,143.09 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10 ft
		Latitude:	40.638440
		Longitude:	-104.133816
		Grid Convergence:	0.88 °

Well	GADWALL FED 30-31-8HN					
Well Position	+N-S	-4.38 usft	Northing:	1,478,346.83 usft	Latitude:	40.638428
	+E-W	300.02 usft	Easting:	3,379,443.13 usft	Longitude:	-104.132735
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,947.00 usft	

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	2020-03-05	7.66	66.99	52,276.05422861

Design	PROPOSAL #2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	6,354.00	0.00	0.00	170.78

Plan Sections											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100usf)	Turn Rate (°/100usf)	TFO (°)	Target
0.00	0.00	0.00	0.00	-4,974.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	-4,874.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,194.50	21.89	76.23	1,168.07	-3,805.93	49.18	200.61	2.00	2.00	0.00	76.23	
4,907.08	21.89	76.23	4,612.97	-361.03	378.73	1,544.95	0.00	0.00	0.00	0.00	
6,001.58	0.00	0.00	5,681.04	707.04	427.91	1,745.56	2.00	-2.00	0.00	180.00	
6,101.58	0.00	0.00	5,781.04	807.04	427.91	1,745.56	0.00	0.00	0.00	0.00	KOP: GADWALL FE
7,001.58	90.00	181.15	6,354.00	1,380.00	-144.93	1,734.06	10.00	10.00	-19.87	181.15	HZ LP: GADWALL I
16,379.03	90.00	181.15	6,354.00	1,380.00	-9,520.49	1,545.64	0.00	0.00	0.00	0.00	BHL: GADWALL FE

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Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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 & 2042ft FEL of Sec 30										
0.00	0.00	0.00	0.00	4,974.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
100.00	0.00	0.00	100.00	4,874.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	2.00	76.23	199.98	4,774.02	0.42	1.69	-0.14	2.00	2.00	0.00
300.00	4.00	76.23	299.84	4,674.16	1.66	6.78	-0.55	2.00	2.00	0.00
400.00	6.00	76.23	399.45	4,574.55	3.74	15.24	-1.25	2.00	2.00	0.00
Fox Hills Base										
490.21	7.80	76.23	489.00	4,485.00	6.32	25.77	-2.11	2.00	2.00	0.00
500.00	8.00	76.23	498.70	4,475.30	6.64	27.08	-2.21	2.00	2.00	0.00
600.00	10.00	76.23	597.47	4,376.53	10.36	42.27	-3.45	2.00	2.00	0.00
700.00	12.00	76.23	695.62	4,278.38	14.91	60.80	-4.97	2.00	2.00	0.00
800.00	14.00	76.23	793.06	4,180.94	20.26	82.65	-6.75	2.00	2.00	0.00
900.00	16.00	76.23	889.64	4,084.36	26.42	107.79	-8.81	2.00	2.00	0.00
1,000.00	18.00	76.23	985.27	3,988.73	33.38	136.18	-11.13	2.00	2.00	0.00
1,100.00	20.00	76.23	1,079.82	3,894.18	41.13	167.80	-13.71	2.00	2.00	0.00
EOB TO 21.89° INC										
1,194.50	21.89	76.23	1,168.07	3,805.93	49.18	200.61	-16.39	2.00	2.00	0.00
1,200.00	21.89	76.23	1,173.17	3,800.83	49.67	202.60	-16.56	0.00	0.00	0.00
1,300.00	21.89	76.23	1,265.96	3,708.04	58.54	238.81	-19.52	0.00	0.00	0.00
1,400.00	21.89	76.23	1,358.75	3,615.25	67.42	275.02	-22.48	0.00	0.00	0.00
1,500.00	21.89	76.23	1,451.54	3,522.46	76.30	311.23	-25.43	0.00	0.00	0.00
Pierre Shale Top										
1,581.32	21.89	76.23	1,527.00	3,447.00	83.51	340.68	-27.84	0.00	0.00	0.00
1,600.00	21.89	76.23	1,544.33	3,429.67	85.17	347.44	-28.39	0.00	0.00	0.00
1,700.00	21.89	76.23	1,637.12	3,336.88	94.05	383.65	-31.35	0.00	0.00	0.00
1,800.00	21.89	76.23	1,729.91	3,244.09	102.93	419.86	-34.31	0.00	0.00	0.00
1,900.00	21.89	76.23	1,822.70	3,151.30	111.80	456.07	-37.27	0.00	0.00	0.00
2,000.00	21.89	76.23	1,915.49	3,058.51	120.68	492.28	-40.23	0.00	0.00	0.00
2,100.00	21.89	76.23	2,008.28	2,965.72	129.56	528.49	-43.19	0.00	0.00	0.00
2,200.00	21.89	76.23	2,101.07	2,872.93	138.43	564.70	-46.15	0.00	0.00	0.00
2,300.00	21.89	76.23	2,193.86	2,780.14	147.31	600.92	-49.11	0.00	0.00	0.00
2,400.00	21.89	76.23	2,286.65	2,687.35	156.19	637.13	-52.07	0.00	0.00	0.00
2,500.00	21.89	76.23	2,379.44	2,594.56	165.06	673.34	-55.03	0.00	0.00	0.00
2,600.00	21.89	76.23	2,472.23	2,501.77	173.94	709.55	-57.99	0.00	0.00	0.00
2,700.00	21.89	76.23	2,565.02	2,408.98	182.82	745.76	-60.95	0.00	0.00	0.00
2,800.00	21.89	76.23	2,657.81	2,316.19	191.69	781.97	-63.90	0.00	0.00	0.00
2,900.00	21.89	76.23	2,750.60	2,223.40	200.57	818.18	-66.86	0.00	0.00	0.00
3,000.00	21.89	76.23	2,843.39	2,130.61	209.45	854.39	-69.82	0.00	0.00	0.00
3,100.00	21.89	76.23	2,936.18	2,037.82	218.32	890.60	-72.78	0.00	0.00	0.00
3,200.00	21.89	76.23	3,028.97	1,945.03	227.20	926.81	-75.74	0.00	0.00	0.00
3,300.00	21.89	76.23	3,121.76	1,852.24	236.08	963.02	-78.70	0.00	0.00	0.00
3,400.00	21.89	76.23	3,214.55	1,759.45	244.95	999.23	-81.66	0.00	0.00	0.00
3,500.00	21.89	76.23	3,307.34	1,666.66	253.83	1,035.44	-84.62	0.00	0.00	0.00
Richard Sandstone										
3,579.38	21.89	76.23	3,381.00	1,593.00	260.88	1,064.19	-86.97	0.00	0.00	0.00
3,600.00	21.89	76.23	3,400.13	1,573.87	262.71	1,071.65	-87.58	0.00	0.00	0.00
3,700.00	21.89	76.23	3,492.92	1,481.08	271.58	1,107.86	-90.54	0.00	0.00	0.00
Parkman Sandstone										
3,710.86	21.89	76.23	3,503.00	1,471.00	272.55	1,111.80	-90.86	0.00	0.00	0.00
3,800.00	21.89	76.23	3,585.71	1,388.29	280.46	1,144.07	-93.50	0.00	0.00	0.00
3,900.00	21.89	76.23	3,678.50	1,295.50	289.34	1,180.28	-96.46	0.00	0.00	0.00
4,000.00	21.89	76.23	3,771.29	1,202.71	298.21	1,216.49	-99.42	0.00	0.00	0.00

Planning Report

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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4974.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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)
4,100.00	21.89	76.23	3,864.08	1,109.92	307.09	1,252.70	-102.37	0.00	0.00	0.00
4,200.00	21.89	76.23	3,956.87	1,017.13	315.97	1,288.92	-105.33	0.00	0.00	0.00
4,300.00	21.89	76.23	4,049.66	924.34	324.84	1,325.13	-108.29	0.00	0.00	0.00
4,400.00	21.89	76.23	4,142.45	831.55	333.72	1,361.34	-111.25	0.00	0.00	0.00
4,500.00	21.89	76.23	4,235.24	738.76	342.60	1,397.55	-114.21	0.00	0.00	0.00
Sussex Sandstone										
4,507.28	21.89	76.23	4,242.00	732.00	343.24	1,400.18	-114.43	0.00	0.00	0.00
4,600.00	21.89	76.23	4,328.03	645.97	351.47	1,433.76	-117.17	0.00	0.00	0.00
4,700.00	21.89	76.23	4,420.82	553.18	360.35	1,469.97	-120.13	0.00	0.00	0.00
4,800.00	21.89	76.23	4,513.61	460.39	369.23	1,506.18	-123.09	0.00	0.00	0.00
4,900.00	21.89	76.23	4,606.40	367.60	378.10	1,542.39	-126.05	0.00	0.00	0.00
END OF TANGENT										
4,907.08	21.89	76.23	4,612.97	361.03	378.73	1,544.95	-126.26	0.00	0.00	0.00
5,000.00	20.03	76.23	4,699.74	274.26	386.65	1,577.24	-128.90	2.00	-2.00	0.00
Shannon Sandstone										
5,001.34	20.00	76.23	4,701.00	273.00	386.76	1,577.68	-128.93	2.00	-2.00	0.00
5,100.00	18.03	76.23	4,794.27	179.73	394.41	1,608.91	-131.48	2.00	-2.00	0.00
5,200.00	16.03	76.23	4,889.88	84.12	401.38	1,637.35	-133.81	2.00	-2.00	0.00
5,300.00	14.03	76.23	4,986.45	-12.45	407.56	1,662.54	-135.87	2.00	-2.00	0.00
5,400.00	12.03	76.23	5,083.87	-109.87	412.93	1,684.44	-137.66	2.00	-2.00	0.00
5,500.00	10.03	76.23	5,182.02	-208.02	417.48	1,703.02	-139.18	2.00	-2.00	0.00
5,600.00	8.03	76.23	5,280.78	-306.78	421.22	1,718.27	-140.42	2.00	-2.00	0.00
5,700.00	6.03	76.23	5,380.02	-406.02	424.13	1,730.16	-141.39	2.00	-2.00	0.00
5,800.00	4.03	76.23	5,479.63	-505.63	426.22	1,738.67	-142.09	2.00	-2.00	0.00
TeePee Buttes										
5,849.47	3.04	76.23	5,529.00	-555.00	426.95	1,741.64	-142.33	2.00	-2.00	0.00
5,900.00	2.03	76.23	5,579.48	-605.48	427.48	1,743.81	-142.51	2.00	-2.00	0.00
6,000.00	0.03	76.23	5,679.46	-705.46	427.91	1,745.56	-142.65	2.00	-2.00	0.00
EOD TO VERTICAL										
6,001.58	0.00	0.00	5,681.04	-707.04	427.91	1,745.56	-142.65	2.00	-2.00	0.00
6,100.00	0.00	0.00	5,779.46	-805.46	427.91	1,745.56	-142.65	0.00	0.00	0.00
KOP (10°/100ft BUR)										
6,101.58	0.00	0.00	5,781.04	-807.04	427.91	1,745.56	-142.65	0.00	0.00	0.00
6,200.00	9.84	181.15	5,878.98	-904.98	419.48	1,745.39	-134.36	10.00	10.00	0.00
6,300.00	19.84	181.15	5,975.52	-1,001.52	393.90	1,744.88	-109.19	10.00	10.00	0.00
6,400.00	29.84	181.15	6,066.15	-1,092.15	351.95	1,744.03	-67.92	10.00	10.00	0.00
6,500.00	39.84	181.15	6,148.12	-1,174.12	294.90	1,742.89	-11.79	10.00	10.00	0.00
Sharon Springs										
6,526.41	42.48	181.15	6,168.00	-1,194.00	277.53	1,742.54	5.30	10.00	10.00	0.00
Niobrara Top										
6,577.37	47.58	181.15	6,204.00	-1,230.00	241.50	1,741.82	40.75	10.00	10.00	0.00
6,600.00	49.84	181.15	6,218.94	-1,244.94	224.49	1,741.48	57.48	10.00	10.00	0.00
6,700.00	59.84	181.15	6,276.45	-1,302.45	142.86	1,739.84	137.80	10.00	10.00	0.00
6,800.00	69.84	181.15	6,318.90	-1,344.90	52.47	1,738.02	226.72	10.00	10.00	0.00
Niobrara B2 Chalk Top										
6,870.19	76.86	181.15	6,339.00	-1,365.00	-14.72	1,736.67	292.83	10.00	10.00	0.00
6,900.00	79.84	181.15	6,345.02	-1,371.02	-43.90	1,736.09	321.55	10.00	10.00	0.00
Niobrara B2 Chalk Target Top										
6,925.83	82.43	181.15	6,349.00	-1,375.00	-69.42	1,735.57	346.65	10.00	10.00	0.00
7,000.00	89.84	181.15	6,354.00	-1,380.00	-143.35	1,734.09	419.39	10.00	10.00	0.00
HZ LP: 900ft FNL & 305ft FEL of Sec 30 - Niobrara B2 Chalk Landing Point										
7,001.58	90.00	181.15	6,354.00	-1,380.00	-144.93	1,734.06	420.94	10.00	10.00	0.00
7,100.00	90.00	181.15	6,354.00	-1,380.00	-243.33	1,732.08	517.76	0.00	0.00	0.00

Planning Report

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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4974.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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)
7,200.00	90.00	181.15	6,354.00	-1,380.00	-343.31	1,730.07	616.12	0.00	0.00	0.00
7,300.00	90.00	181.15	6,354.00	-1,380.00	-443.29	1,728.07	714.49	0.00	0.00	0.00
7,400.00	90.00	181.15	6,354.00	-1,380.00	-543.27	1,726.06	812.85	0.00	0.00	0.00
7,500.00	90.00	181.15	6,354.00	-1,380.00	-643.25	1,724.05	911.22	0.00	0.00	0.00
7,600.00	90.00	181.15	6,354.00	-1,380.00	-743.23	1,722.04	1,009.59	0.00	0.00	0.00
7,700.00	90.00	181.15	6,354.00	-1,380.00	-843.21	1,720.04	1,107.95	0.00	0.00	0.00
7,800.00	90.00	181.15	6,354.00	-1,380.00	-943.19	1,718.03	1,206.32	0.00	0.00	0.00
7,900.00	90.00	181.15	6,354.00	-1,380.00	-1,043.17	1,716.02	1,304.68	0.00	0.00	0.00
8,000.00	90.00	181.15	6,354.00	-1,380.00	-1,143.15	1,714.01	1,403.05	0.00	0.00	0.00
8,100.00	90.00	181.15	6,354.00	-1,380.00	-1,243.13	1,712.01	1,501.42	0.00	0.00	0.00
8,200.00	90.00	181.15	6,354.00	-1,380.00	-1,343.11	1,710.00	1,599.78	0.00	0.00	0.00
8,300.00	90.00	181.15	6,354.00	-1,380.00	-1,443.09	1,707.99	1,698.15	0.00	0.00	0.00
8,400.00	90.00	181.15	6,354.00	-1,380.00	-1,543.07	1,705.98	1,796.51	0.00	0.00	0.00
8,500.00	90.00	181.15	6,354.00	-1,380.00	-1,643.05	1,703.98	1,894.88	0.00	0.00	0.00
8,600.00	90.00	181.15	6,354.00	-1,380.00	-1,743.03	1,701.97	1,993.25	0.00	0.00	0.00
8,700.00	90.00	181.15	6,354.01	-1,380.01	-1,843.01	1,699.96	2,091.61	0.00	0.00	0.00
8,800.00	90.00	181.15	6,354.01	-1,380.01	-1,942.99	1,697.95	2,189.98	0.00	0.00	0.00
8,900.00	90.00	181.15	6,354.01	-1,380.01	-2,042.97	1,695.95	2,288.34	0.00	0.00	0.00
9,000.00	90.00	181.15	6,354.01	-1,380.01	-2,142.95	1,693.94	2,386.71	0.00	0.00	0.00
9,100.00	90.00	181.15	6,354.01	-1,380.01	-2,242.93	1,691.93	2,485.08	0.00	0.00	0.00
9,200.00	90.00	181.15	6,354.01	-1,380.01	-2,342.91	1,689.92	2,583.44	0.00	0.00	0.00
9,300.00	90.00	181.15	6,354.01	-1,380.01	-2,442.89	1,687.92	2,681.81	0.00	0.00	0.00
9,400.00	90.00	181.15	6,354.01	-1,380.01	-2,542.87	1,685.91	2,780.17	0.00	0.00	0.00
9,500.00	90.00	181.15	6,354.01	-1,380.01	-2,642.85	1,683.90	2,878.54	0.00	0.00	0.00
9,600.00	90.00	181.15	6,354.01	-1,380.01	-2,742.83	1,681.89	2,976.91	0.00	0.00	0.00
9,700.00	90.00	181.15	6,354.01	-1,380.01	-2,842.81	1,679.89	3,075.27	0.00	0.00	0.00
9,800.00	90.00	181.15	6,354.01	-1,380.01	-2,942.79	1,677.88	3,173.64	0.00	0.00	0.00
9,900.00	90.00	181.15	6,354.01	-1,380.01	-3,042.77	1,675.87	3,272.00	0.00	0.00	0.00
10,000.00	90.00	181.15	6,354.01	-1,380.01	-3,142.75	1,673.86	3,370.37	0.00	0.00	0.00
10,100.00	90.00	181.15	6,354.01	-1,380.01	-3,242.73	1,671.86	3,468.74	0.00	0.00	0.00
10,200.00	90.00	181.15	6,354.01	-1,380.01	-3,342.71	1,669.85	3,567.10	0.00	0.00	0.00
10,300.00	90.00	181.15	6,354.01	-1,380.01	-3,442.69	1,667.84	3,665.47	0.00	0.00	0.00
10,400.00	90.00	181.15	6,354.01	-1,380.01	-3,542.67	1,665.84	3,763.83	0.00	0.00	0.00
10,500.00	90.00	181.15	6,354.01	-1,380.01	-3,642.65	1,663.83	3,862.20	0.00	0.00	0.00
10,600.00	90.00	181.15	6,354.01	-1,380.01	-3,742.63	1,661.82	3,960.57	0.00	0.00	0.00
10,700.00	90.00	181.15	6,354.01	-1,380.01	-3,842.61	1,659.81	4,058.93	0.00	0.00	0.00
10,800.00	90.00	181.15	6,354.01	-1,380.01	-3,942.59	1,657.81	4,157.30	0.00	0.00	0.00
10,900.00	90.00	181.15	6,354.01	-1,380.01	-4,042.57	1,655.80	4,255.66	0.00	0.00	0.00
11,000.00	90.00	181.15	6,354.01	-1,380.01	-4,142.55	1,653.79	4,354.03	0.00	0.00	0.00
11,100.00	90.00	181.15	6,354.01	-1,380.01	-4,242.53	1,651.78	4,452.40	0.00	0.00	0.00
11,200.00	90.00	181.15	6,354.01	-1,380.01	-4,342.51	1,649.78	4,550.76	0.00	0.00	0.00
11,300.00	90.00	181.15	6,354.01	-1,380.01	-4,442.49	1,647.77	4,649.13	0.00	0.00	0.00
11,400.00	90.00	181.15	6,354.01	-1,380.01	-4,542.47	1,645.76	4,747.50	0.00	0.00	0.00
11,500.00	90.00	181.15	6,354.01	-1,380.01	-4,642.45	1,643.75	4,845.86	0.00	0.00	0.00
11,600.00	90.00	181.15	6,354.01	-1,380.01	-4,742.43	1,641.75	4,944.23	0.00	0.00	0.00
11,700.00	90.00	181.15	6,354.01	-1,380.01	-4,842.41	1,639.74	5,042.59	0.00	0.00	0.00
11,800.00	90.00	181.15	6,354.01	-1,380.01	-4,942.39	1,637.73	5,140.96	0.00	0.00	0.00
11,900.00	90.00	181.15	6,354.01	-1,380.01	-5,042.37	1,635.72	5,239.33	0.00	0.00	0.00
12,000.00	90.00	181.15	6,354.01	-1,380.01	-5,142.34	1,633.72	5,337.69	0.00	0.00	0.00
12,100.00	90.00	181.15	6,354.02	-1,380.02	-5,242.32	1,631.71	5,436.06	0.00	0.00	0.00
12,200.00	90.00	181.15	6,354.02	-1,380.02	-5,342.30	1,629.70	5,534.42	0.00	0.00	0.00
12,300.00	90.00	181.15	6,354.02	-1,380.02	-5,442.28	1,627.69	5,632.79	0.00	0.00	0.00
12,400.00	90.00	181.15	6,354.02	-1,380.02	-5,542.26	1,625.69	5,731.16	0.00	0.00	0.00
12,500.00	90.00	181.15	6,354.02	-1,380.02	-5,642.24	1,623.68	5,829.52	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well GADWALL FED 30-31-8HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4974.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4974.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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)
12,600.00	90.00	181.15	6,354.02	-1,380.02	-5,742.22	1,621.67	5,927.89	0.00	0.00	0.00
12,700.00	90.00	181.15	6,354.02	-1,380.02	-5,842.20	1,619.66	6,026.25	0.00	0.00	0.00
12,800.00	90.00	181.15	6,354.02	-1,380.02	-5,942.18	1,617.66	6,124.62	0.00	0.00	0.00
12,900.00	90.00	181.15	6,354.02	-1,380.02	-6,042.16	1,615.65	6,222.99	0.00	0.00	0.00
13,000.00	90.00	181.15	6,354.02	-1,380.02	-6,142.14	1,613.64	6,321.35	0.00	0.00	0.00
13,100.00	90.00	181.15	6,354.02	-1,380.02	-6,242.12	1,611.63	6,419.72	0.00	0.00	0.00
13,200.00	90.00	181.15	6,354.02	-1,380.02	-6,342.10	1,609.63	6,518.08	0.00	0.00	0.00
13,300.00	90.00	181.15	6,354.02	-1,380.02	-6,442.08	1,607.62	6,616.45	0.00	0.00	0.00
13,400.00	90.00	181.15	6,354.02	-1,380.02	-6,542.06	1,605.61	6,714.82	0.00	0.00	0.00
13,500.00	90.00	181.15	6,354.02	-1,380.02	-6,642.04	1,603.60	6,813.18	0.00	0.00	0.00
13,600.00	90.00	181.15	6,354.02	-1,380.02	-6,742.02	1,601.60	6,911.55	0.00	0.00	0.00
13,700.00	90.00	181.15	6,354.02	-1,380.02	-6,842.00	1,599.59	7,009.91	0.00	0.00	0.00
13,800.00	90.00	181.15	6,354.02	-1,380.02	-6,941.98	1,597.58	7,108.28	0.00	0.00	0.00
13,900.00	90.00	181.15	6,354.02	-1,380.02	-7,041.96	1,595.57	7,206.65	0.00	0.00	0.00
14,000.00	90.00	181.15	6,354.02	-1,380.02	-7,141.94	1,593.57	7,305.01	0.00	0.00	0.00
14,100.00	90.00	181.15	6,354.02	-1,380.02	-7,241.92	1,591.56	7,403.38	0.00	0.00	0.00
14,200.00	90.00	181.15	6,354.02	-1,380.02	-7,341.90	1,589.55	7,501.74	0.00	0.00	0.00
14,300.00	90.00	181.15	6,354.02	-1,380.02	-7,441.88	1,587.54	7,600.11	0.00	0.00	0.00
14,400.00	90.00	181.15	6,354.02	-1,380.02	-7,541.86	1,585.54	7,698.48	0.00	0.00	0.00
14,500.00	90.00	181.15	6,354.02	-1,380.02	-7,641.84	1,583.53	7,796.84	0.00	0.00	0.00
14,600.00	90.00	181.15	6,354.02	-1,380.02	-7,741.82	1,581.52	7,895.21	0.00	0.00	0.00
14,700.00	90.00	181.15	6,354.02	-1,380.02	-7,841.80	1,579.51	7,993.57	0.00	0.00	0.00
14,800.00	90.00	181.15	6,354.02	-1,380.02	-7,941.78	1,577.51	8,091.94	0.00	0.00	0.00
14,900.00	90.00	181.15	6,354.02	-1,380.02	-8,041.76	1,575.50	8,190.31	0.00	0.00	0.00
15,000.00	90.00	181.15	6,354.02	-1,380.02	-8,141.74	1,573.49	8,288.67	0.00	0.00	0.00
15,100.00	90.00	181.15	6,354.02	-1,380.02	-8,241.72	1,571.48	8,387.04	0.00	0.00	0.00
15,200.00	90.00	181.15	6,354.02	-1,380.02	-8,341.70	1,569.48	8,485.40	0.00	0.00	0.00
15,300.00	90.00	181.15	6,354.02	-1,380.02	-8,441.68	1,567.47	8,583.77	0.00	0.00	0.00
15,400.00	90.00	181.15	6,354.03	-1,380.03	-8,541.66	1,565.46	8,682.14	0.00	0.00	0.00
15,500.00	90.00	181.15	6,354.03	-1,380.03	-8,641.64	1,563.45	8,780.50	0.00	0.00	0.00
15,600.00	90.00	181.15	6,354.03	-1,380.03	-8,741.62	1,561.45	8,878.87	0.00	0.00	0.00
15,700.00	90.00	181.15	6,354.03	-1,380.03	-8,841.60	1,559.44	8,977.23	0.00	0.00	0.00
15,800.00	90.00	181.15	6,354.03	-1,380.03	-8,941.58	1,557.43	9,075.60	0.00	0.00	0.00
15,900.00	90.00	181.15	6,354.03	-1,380.03	-9,041.56	1,555.42	9,173.97	0.00	0.00	0.00
16,000.00	90.00	181.15	6,354.03	-1,380.03	-9,141.54	1,553.42	9,272.33	0.00	0.00	0.00
16,100.00	90.00	181.15	6,354.03	-1,380.03	-9,241.52	1,551.41	9,370.70	0.00	0.00	0.00
16,200.00	90.00	181.15	6,354.03	-1,380.03	-9,341.50	1,549.40	9,469.06	0.00	0.00	0.00
16,300.00	90.00	181.15	6,354.03	-1,380.03	-9,441.48	1,547.39	9,567.43	0.00	0.00	0.00
BHL: 300ft FSL & 305ft FEL of Sec 31										
16,379.03	90.00	181.15	6,354.00	-1,380.00	-9,520.49	1,545.64	9,645.14	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well GADWALL FED 30-31-8HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4974.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4974.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL FED 30-31-8HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
490.21	489.00	Fox Hills Base			
1,581.32	1,527.00	Pierre Shale Top			
3,579.38	3,381.00	Richard Sandstone			
3,710.86	3,503.00	Parkman Sandstone			
4,507.28	4,242.00	Sussex Sandstone			
5,001.34	4,701.00	Shannon Sandstone			
5,849.47	5,529.00	TeePee Buttes			
6,526.41	6,168.00	Sharon Springs			
6,577.37	6,204.00	Niobrara Top			
6,870.19	6,339.00	Niobrara B2 Chalk Top			
6,925.83	6,349.00	Niobrara B2 Chalk Target Top			
7,001.58	6,354.00	Niobrara B2 Chalk Landing Point			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 751ft FNL & 2042ft FEL of Sec 30
100.00	100.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,194.50	1,168.07	49.18	200.61	EOB TO 21.89° INC
4,907.08	4,612.97	378.73	1,544.95	END OF TANGENT
6,001.58	5,681.04	427.91	1,745.56	EOD TO VERTICAL
6,101.58	5,781.04	427.91	1,745.56	KOP (10°/100ft BUR)
7,001.58	6,354.00	-144.93	1,734.06	HZ LP: 900ft FNL & 305ft FEL of Sec 30
16,379.03	6,354.00	-9,520.49	1,545.64	BHL: 300ft FSL & 305ft FEL of Sec 31