



MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

GADWALL 30-31-1HN

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 30-31-1HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #2

ANNOTATIONS

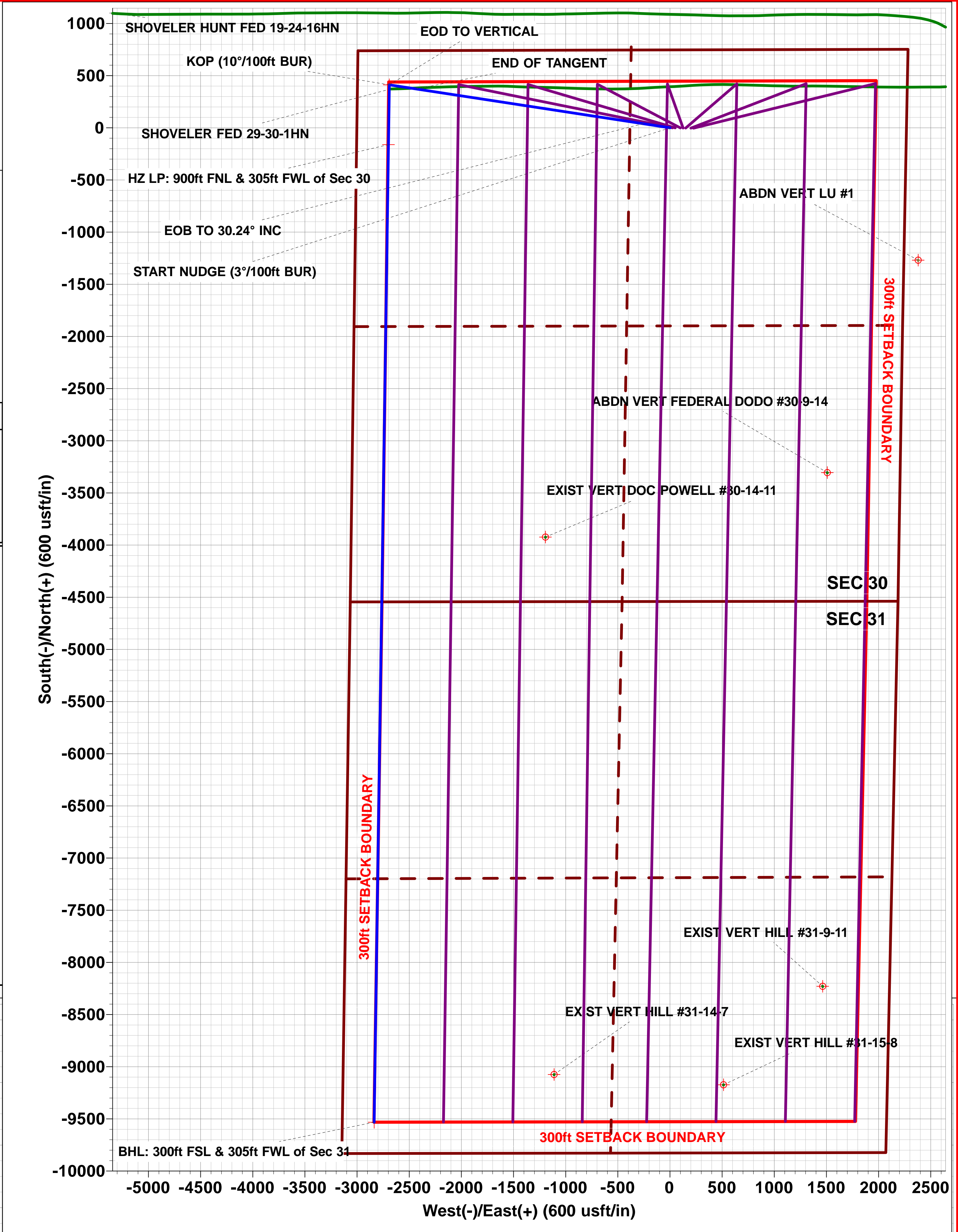
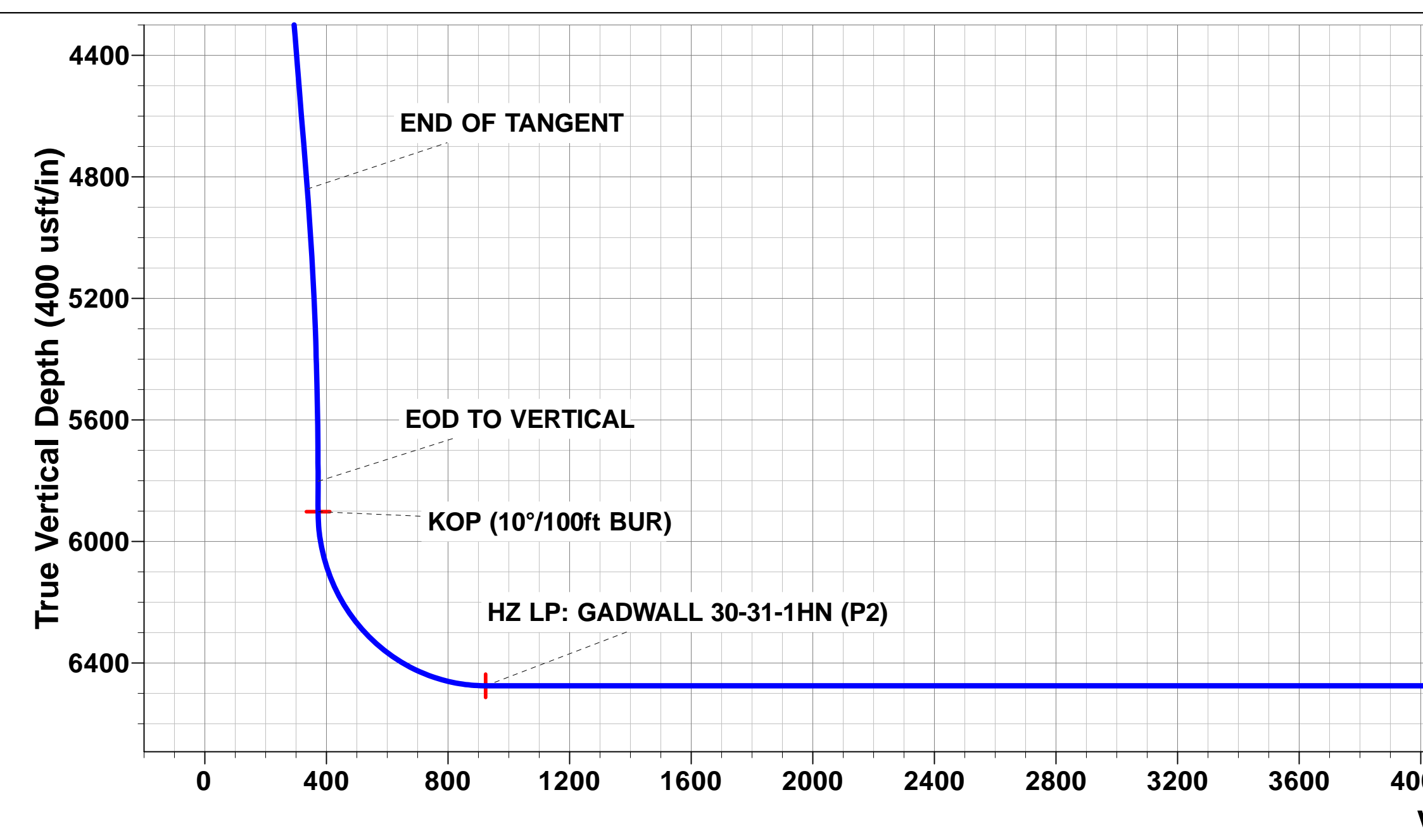
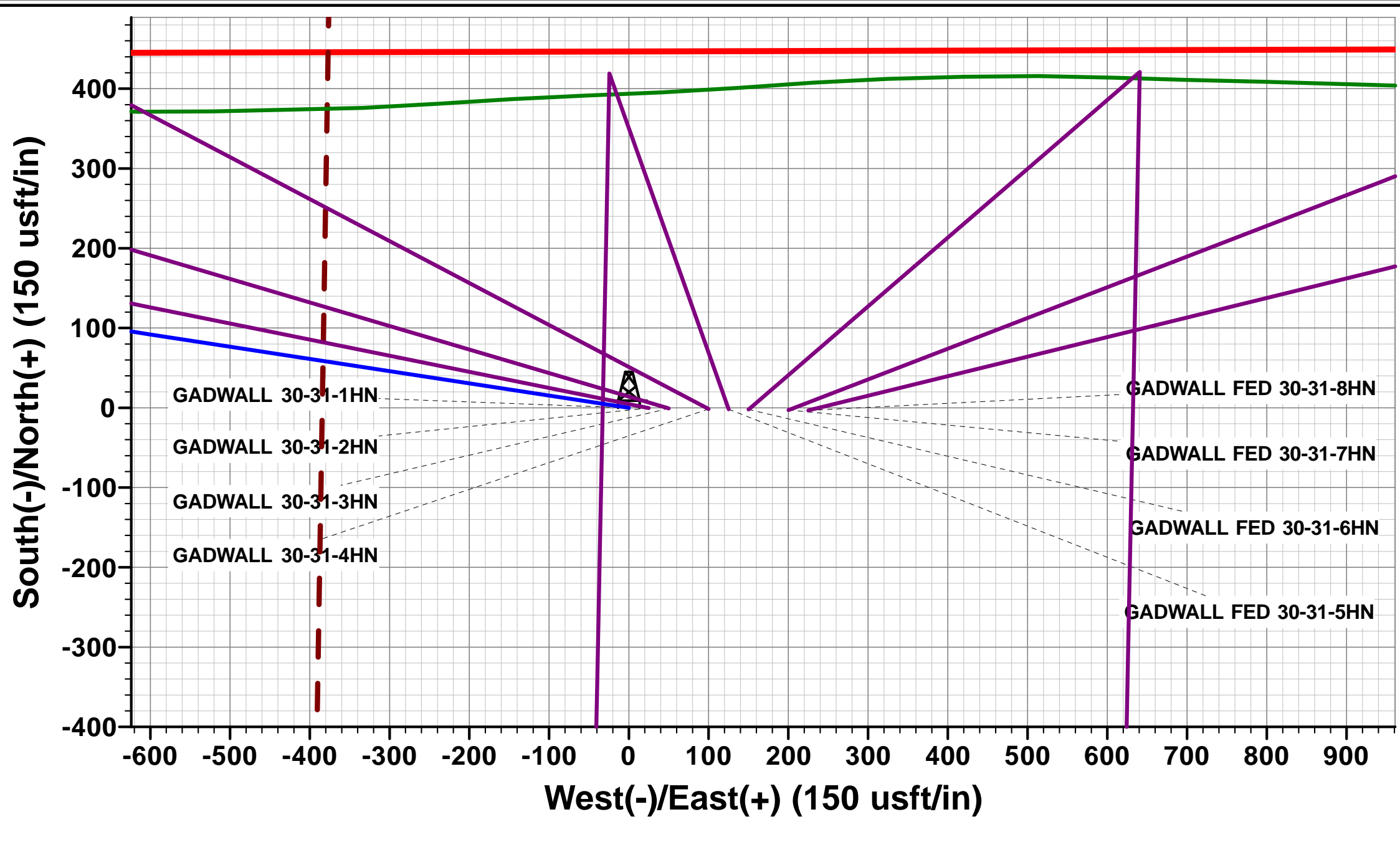
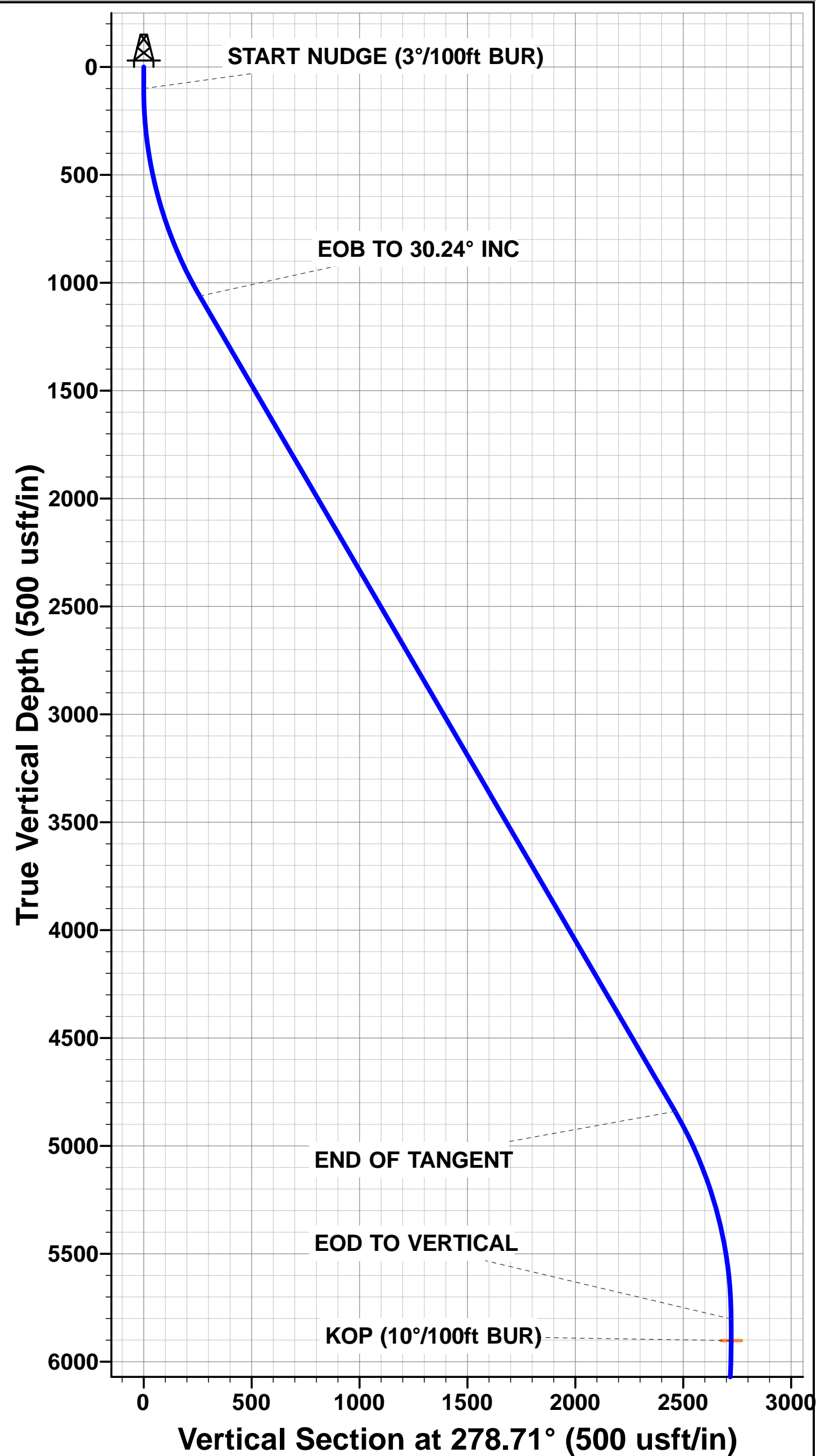
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 746ft FNL & 2267ft FEL of Sec 30
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	START NUDGE (3°/100ft BUR)
1107.88	30.24	278.71	1061.75	39.33	-256.83	35.56	259.83	EOB TO 30.24° INC
5481.43	30.24	278.71	4840.30	372.69	-2433.83	336.93	2462.20	END OF TANGENT
6489.30	0.00	0.00	5802.04	412.02	-2690.66	372.49	2722.02	EOD TO VERTICAL
6589.30	0.00	0.00	5902.04	412.02	-2690.66	372.49	2722.02	KOP (10°/100ft BUR)
7489.30	90.00	180.84	6475.00	-160.87	-2699.06	923.98	3294.98	HZ LP: 900ft FNL & 305ft FWL of Sec 30
16861.46	90.00	180.84	6475.04	-9532.03	-2836.45	9945.10	12667.14	BHL: 300ft FSL & 305ft FWL of Sec 31

PROPOSED LOCAL COORDINATES:

SHL: 746ft FNL & 2267ft FEL Sec 30
HZ LP: 900ft FNL & 305ft FWL Sec 30
BHL: 300ft FSL & 305ft FWL of Sec 31

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: GADWALL 30-31-1HN (P2)	5902.04	412.02	-2690.66	40.639567	-104.143241
HZ LP: GADWALL 30-31-1HN (P2)	6475.00	-160.88	-2699.06	40.637995	-104.143271
BHL: GADWALL 30-31-1HN (P2)	6475.00	-9532.03	-2836.41	40.612273	-104.143762



Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well GADWALL 30-31-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4975.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4975.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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 30-31-1HN		
Well Position	+N/-S	-1.10 usft	Northing:
	+E/-W	74.93 usft	Easting:
Position Uncertainty	0.00 usft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	2020-03-05	7.66	66.99	52,275.96986064

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 (°)
	0.00	0.00	0.00	196.57

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	-4,975.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	-4,875.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,107.88	30.24	278.71	1,061.74	-3,913.26	39.33	-256.83	3.00	3.00	0.00	278.71	
5,481.43	30.24	278.71	4,840.30	-134.70	372.69	-2,433.83	0.00	0.00	0.00	0.00	
6,489.30	0.00	0.00	5,802.04	827.04	412.02	-2,690.66	3.00	-3.00	0.00	180.00	
6,589.30	0.00	0.00	5,902.04	927.04	412.02	-2,690.66	0.00	0.00	0.00	0.00	KOP: GADWALL 30
7,489.30	90.00	180.84	6,475.00	1,500.00	-160.88	-2,699.06	10.00	10.00	-19.91	180.84	HZ LP: GADWALL :
16,861.46	90.00	180.84	6,475.00	1,500.00	-9,532.03	-2,836.41	0.00	0.00	0.00	0.00	BHL: GADWALL 30

Planning Report

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Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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: 746ft FNL & 2267ft FEL of Sec 30										
0.00	0.00	0.00	0.00	4,975.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (3°/100ft BUR)										
100.00	0.00	0.00	100.00	4,875.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	3.00	278.71	199.95	4,775.05	0.40	-2.59	0.36	3.00	3.00	0.00
300.00	6.00	278.71	299.63	4,675.37	1.58	-10.34	1.43	3.00	3.00	0.00
400.00	9.00	278.71	398.77	4,576.23	3.56	-23.24	3.22	3.00	3.00	0.00
500.00	12.00	278.71	497.08	4,477.92	6.32	-41.25	5.71	3.00	3.00	0.00
Fox Hills Base										
549.13	13.47	278.71	545.00	4,430.00	7.96	-51.96	7.19	3.00	3.00	0.00
600.00	15.00	278.71	594.31	4,380.69	9.85	-64.33	8.91	3.00	3.00	0.00
700.00	18.00	278.71	690.18	4,284.82	14.15	-92.40	12.79	3.00	3.00	0.00
800.00	21.00	278.71	784.43	4,190.57	19.20	-125.39	17.36	3.00	3.00	0.00
900.00	24.00	278.71	876.81	4,098.19	24.99	-163.21	22.59	3.00	3.00	0.00
1,000.00	27.00	278.71	967.06	4,007.94	31.51	-205.76	28.49	3.00	3.00	0.00
1,100.00	30.00	278.71	1,054.93	3,920.07	38.73	-252.92	35.01	3.00	3.00	0.00
EOB TO 30.24° INC										
1,107.88	30.24	278.71	1,061.75	3,913.25	39.33	-256.83	35.56	3.00	3.00	0.00
1,200.00	30.24	278.71	1,141.33	3,833.67	46.35	-302.69	41.90	0.00	0.00	0.00
1,300.00	30.24	278.71	1,227.73	3,747.27	53.97	-352.46	48.79	0.00	0.00	0.00
1,400.00	30.24	278.71	1,314.12	3,660.88	61.59	-402.24	55.69	0.00	0.00	0.00
1,500.00	30.24	278.71	1,400.52	3,574.48	69.22	-452.02	62.58	0.00	0.00	0.00
1,600.00	30.24	278.71	1,486.92	3,488.08	76.84	-501.79	69.47	0.00	0.00	0.00
1,700.00	30.24	278.71	1,573.31	3,401.69	84.46	-551.57	76.36	0.00	0.00	0.00
Pierre Shale Top										
1,711.21	30.24	278.71	1,583.00	3,392.00	85.32	-557.15	77.13	0.00	0.00	0.00
1,800.00	30.24	278.71	1,659.71	3,315.29	92.08	-601.35	83.25	0.00	0.00	0.00
1,900.00	30.24	278.71	1,746.10	3,228.90	99.71	-651.12	90.14	0.00	0.00	0.00
2,000.00	30.24	278.71	1,832.50	3,142.50	107.33	-700.90	97.03	0.00	0.00	0.00
2,100.00	30.24	278.71	1,918.89	3,056.11	114.95	-750.68	103.92	0.00	0.00	0.00
2,200.00	30.24	278.71	2,005.29	2,969.71	122.57	-800.45	110.81	0.00	0.00	0.00
2,300.00	30.24	278.71	2,091.69	2,883.31	130.20	-850.23	117.70	0.00	0.00	0.00
2,400.00	30.24	278.71	2,178.08	2,796.92	137.82	-900.00	124.59	0.00	0.00	0.00
2,500.00	30.24	278.71	2,264.48	2,710.52	145.44	-949.78	131.49	0.00	0.00	0.00
2,600.00	30.24	278.71	2,350.87	2,624.13	153.06	-999.56	138.38	0.00	0.00	0.00
2,700.00	30.24	278.71	2,437.27	2,537.73	160.68	-1,049.33	145.27	0.00	0.00	0.00
2,800.00	30.24	278.71	2,523.66	2,451.34	168.31	-1,099.11	152.16	0.00	0.00	0.00
2,900.00	30.24	278.71	2,610.06	2,364.94	175.93	-1,148.89	159.05	0.00	0.00	0.00
3,000.00	30.24	278.71	2,696.45	2,278.55	183.55	-1,198.66	165.94	0.00	0.00	0.00
3,100.00	30.24	278.71	2,782.85	2,192.15	191.17	-1,248.44	172.83	0.00	0.00	0.00
3,200.00	30.24	278.71	2,869.25	2,105.75	198.80	-1,298.22	179.72	0.00	0.00	0.00
3,300.00	30.24	278.71	2,955.64	2,019.36	206.42	-1,347.99	186.61	0.00	0.00	0.00
3,400.00	30.24	278.71	3,042.04	1,932.96	214.04	-1,397.77	193.50	0.00	0.00	0.00
3,500.00	30.24	278.71	3,128.43	1,846.57	221.66	-1,447.55	200.39	0.00	0.00	0.00
3,600.00	30.24	278.71	3,214.83	1,760.17	229.28	-1,497.32	207.29	0.00	0.00	0.00
3,700.00	30.24	278.71	3,301.22	1,673.78	236.91	-1,547.10	214.18	0.00	0.00	0.00
3,800.00	30.24	278.71	3,387.62	1,587.38	244.53	-1,596.88	221.07	0.00	0.00	0.00
Richard Sandstone										
3,857.16	30.24	278.71	3,437.00	1,538.00	248.89	-1,625.33	225.01	0.00	0.00	0.00
3,900.00	30.24	278.71	3,474.02	1,500.98	252.15	-1,646.65	227.96	0.00	0.00	0.00
Parkman Sandstone										
3,998.37	30.24	278.71	3,559.00	1,416.00	259.65	-1,695.62	234.74	0.00	0.00	0.00
4,000.00	30.24	278.71	3,560.41	1,414.59	259.77	-1,696.43	234.85	0.00	0.00	0.00

Planning Report

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Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4975.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4975.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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	30.24	278.71	3,646.81	1,328.19	267.40	-1,746.20	241.74	0.00	0.00	0.00
4,200.00	30.24	278.71	3,733.20	1,241.80	275.02	-1,795.98	248.63	0.00	0.00	0.00
4,300.00	30.24	278.71	3,819.60	1,155.40	282.64	-1,845.76	255.52	0.00	0.00	0.00
4,400.00	30.24	278.71	3,905.99	1,069.01	290.26	-1,895.53	262.41	0.00	0.00	0.00
4,500.00	30.24	278.71	3,992.39	982.61	297.88	-1,945.31	269.30	0.00	0.00	0.00
4,600.00	30.24	278.71	4,078.78	896.22	305.51	-1,995.09	276.19	0.00	0.00	0.00
4,700.00	30.24	278.71	4,165.18	809.82	313.13	-2,044.86	283.09	0.00	0.00	0.00
4,800.00	30.24	278.71	4,251.58	723.42	320.75	-2,094.64	289.98	0.00	0.00	0.00
Sussex Sandstone										
4,853.73	30.24	278.71	4,298.00	677.00	324.85	-2,121.39	293.68	0.00	0.00	0.00
4,900.00	30.24	278.71	4,337.97	637.03	328.37	-2,144.42	296.87	0.00	0.00	0.00
5,000.00	30.24	278.71	4,424.37	550.63	336.00	-2,194.19	303.76	0.00	0.00	0.00
5,100.00	30.24	278.71	4,510.76	464.24	343.62	-2,243.97	310.65	0.00	0.00	0.00
5,200.00	30.24	278.71	4,597.16	377.84	351.24	-2,293.75	317.54	0.00	0.00	0.00
5,300.00	30.24	278.71	4,683.55	291.45	358.86	-2,343.52	324.43	0.00	0.00	0.00
Shannon Sandstone										
5,385.01	30.24	278.71	4,757.00	218.00	365.34	-2,385.84	330.29	0.00	0.00	0.00
5,400.00	30.24	278.71	4,769.95	205.05	366.49	-2,393.30	331.32	0.00	0.00	0.00
END OF TANGENT										
5,481.43	30.24	278.71	4,840.30	134.70	372.69	-2,433.83	336.93	0.00	0.00	0.00
5,500.00	29.68	278.71	4,856.39	118.61	374.10	-2,443.00	338.20	3.00	-3.00	0.00
5,600.00	26.68	278.71	4,944.53	30.47	381.24	-2,489.67	344.66	3.00	-3.00	0.00
5,700.00	23.68	278.71	5,035.02	-60.02	387.68	-2,531.72	350.49	3.00	-3.00	0.00
5,800.00	20.68	278.71	5,127.61	-152.61	393.40	-2,569.03	355.65	3.00	-3.00	0.00
5,900.00	17.68	278.71	5,222.05	-247.05	398.37	-2,601.50	360.15	3.00	-3.00	0.00
6,000.00	14.68	278.71	5,318.07	-343.07	402.58	-2,629.04	363.96	3.00	-3.00	0.00
6,100.00	11.68	278.71	5,415.43	-440.43	406.04	-2,651.58	367.08	3.00	-3.00	0.00
6,200.00	8.68	278.71	5,513.84	-538.84	408.71	-2,669.04	369.50	3.00	-3.00	0.00
TeePee Buttes										
6,271.79	6.53	278.71	5,585.00	-610.00	410.15	-2,678.43	370.80	3.00	-3.00	0.00
6,300.00	5.68	278.71	5,613.05	-638.05	410.60	-2,681.39	371.21	3.00	-3.00	0.00
6,400.00	2.68	278.71	5,712.77	-737.77	411.70	-2,688.60	372.20	3.00	-3.00	0.00
EOD TO VERTICAL										
6,489.30	0.00	0.00	5,802.04	-827.04	412.02	-2,690.66	372.49	3.00	-3.00	91.03
6,500.00	0.00	0.00	5,812.74	-837.74	412.02	-2,690.66	372.49	0.00	0.00	0.00
KOP (10°/100ft BUR)										
6,589.30	0.00	0.00	5,902.04	-927.04	412.02	-2,690.66	372.49	0.00	0.00	0.00
6,600.00	1.07	180.84	5,912.74	-937.74	411.92	-2,690.66	372.58	10.00	10.00	0.00
6,700.00	11.07	180.84	6,012.05	-1,037.05	401.36	-2,690.82	382.75	10.00	10.00	0.00
6,800.00	21.07	180.84	6,108.02	-1,133.02	373.72	-2,691.22	409.36	10.00	10.00	0.00
6,900.00	31.07	180.84	6,197.73	-1,222.73	329.83	-2,691.86	451.61	10.00	10.00	0.00
Sharon Springs										
6,931.19	34.19	180.84	6,224.00	-1,249.00	313.02	-2,692.11	467.79	10.00	10.00	0.00
Niobrara Top										
6,975.95	38.66	180.84	6,260.00	-1,285.00	286.45	-2,692.50	493.37	10.00	10.00	0.00
7,000.00	41.07	180.84	6,278.46	-1,303.46	271.04	-2,692.73	508.21	10.00	10.00	0.00
7,100.00	51.07	180.84	6,347.75	-1,372.75	199.12	-2,693.78	577.44	10.00	10.00	0.00
Niobrara B2 Chalk Target Top										
7,163.80	57.45	180.84	6,385.00	-1,410.00	147.36	-2,694.54	627.26	10.00	10.00	0.00
7,200.00	61.07	180.84	6,403.50	-1,428.50	116.26	-2,695.00	657.20	10.00	10.00	0.00
Niobrara C Chalk Top										
7,288.00	69.87	180.84	6,440.00	-1,465.00	36.29	-2,696.17	734.19	10.00	10.00	0.00
7,300.00	71.07	180.84	6,444.01	-1,469.01	24.98	-2,696.33	745.07	10.00	10.00	0.00

Planning Report

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Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4975.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4975.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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)
Niobrara C Chalk Target Top										
7,357.91	76.86	180.84	6,460.00	-1,485.00	-30.65	-2,697.15	798.62	10.00	10.00	0.00
7,400.00	81.07	180.84	6,468.05	-1,493.05	-71.94	-2,697.76	838.38	10.00	10.00	0.00
HZ LP: 900ft FNL & 305ft FWL of Sec 30 - Niobrara C Chalk Landing Point										
7,489.30	90.00	180.84	6,475.00	-1,500.00	-160.88	-2,699.06	923.99	10.00	10.00	0.00
7,500.00	90.00	180.84	6,475.00	-1,500.00	-171.57	-2,699.22	934.28	0.00	0.00	0.00
7,600.00	90.00	180.84	6,475.00	-1,500.00	-271.56	-2,700.68	1,030.54	0.00	0.00	0.00
7,700.00	90.00	180.84	6,475.00	-1,500.00	-371.55	-2,702.15	1,126.79	0.00	0.00	0.00
7,800.00	90.00	180.84	6,475.00	-1,500.00	-471.54	-2,703.61	1,223.05	0.00	0.00	0.00
7,900.00	90.00	180.84	6,475.00	-1,500.00	-571.53	-2,705.08	1,319.30	0.00	0.00	0.00
8,000.00	90.00	180.84	6,475.00	-1,500.00	-671.52	-2,706.55	1,415.55	0.00	0.00	0.00
8,100.00	90.00	180.84	6,475.00	-1,500.00	-771.51	-2,708.01	1,511.81	0.00	0.00	0.00
8,200.00	90.00	180.84	6,475.00	-1,500.00	-871.50	-2,709.48	1,608.06	0.00	0.00	0.00
8,300.00	90.00	180.84	6,475.00	-1,500.00	-971.49	-2,710.94	1,704.32	0.00	0.00	0.00
8,400.00	90.00	180.84	6,475.00	-1,500.00	-1,071.48	-2,712.41	1,800.57	0.00	0.00	0.00
8,500.00	90.00	180.84	6,475.00	-1,500.00	-1,171.47	-2,713.88	1,896.83	0.00	0.00	0.00
8,600.00	90.00	180.84	6,475.00	-1,500.00	-1,271.45	-2,715.34	1,993.08	0.00	0.00	0.00
8,700.00	90.00	180.84	6,475.00	-1,500.00	-1,371.44	-2,716.81	2,089.33	0.00	0.00	0.00
8,800.00	90.00	180.84	6,475.00	-1,500.00	-1,471.43	-2,718.27	2,185.59	0.00	0.00	0.00
8,900.00	90.00	180.84	6,475.01	-1,500.01	-1,571.42	-2,719.74	2,281.84	0.00	0.00	0.00
9,000.00	90.00	180.84	6,475.01	-1,500.01	-1,671.41	-2,721.21	2,378.10	0.00	0.00	0.00
9,100.00	90.00	180.84	6,475.01	-1,500.01	-1,771.40	-2,722.67	2,474.35	0.00	0.00	0.00
9,200.00	90.00	180.84	6,475.01	-1,500.01	-1,871.39	-2,724.14	2,570.61	0.00	0.00	0.00
9,300.00	90.00	180.84	6,475.01	-1,500.01	-1,971.38	-2,725.60	2,666.86	0.00	0.00	0.00
9,400.00	90.00	180.84	6,475.01	-1,500.01	-2,071.37	-2,727.07	2,763.12	0.00	0.00	0.00
9,500.00	90.00	180.84	6,475.01	-1,500.01	-2,171.36	-2,728.53	2,859.37	0.00	0.00	0.00
9,600.00	90.00	180.84	6,475.01	-1,500.01	-2,271.35	-2,730.00	2,955.62	0.00	0.00	0.00
9,700.00	90.00	180.84	6,475.01	-1,500.01	-2,371.34	-2,731.47	3,051.88	0.00	0.00	0.00
9,800.00	90.00	180.84	6,475.01	-1,500.01	-2,471.33	-2,732.93	3,148.13	0.00	0.00	0.00
9,900.00	90.00	180.84	6,475.01	-1,500.01	-2,571.31	-2,734.40	3,244.39	0.00	0.00	0.00
10,000.00	90.00	180.84	6,475.01	-1,500.01	-2,671.30	-2,735.86	3,340.64	0.00	0.00	0.00
10,100.00	90.00	180.84	6,475.01	-1,500.01	-2,771.29	-2,737.33	3,436.90	0.00	0.00	0.00
10,200.00	90.00	180.84	6,475.01	-1,500.01	-2,871.28	-2,738.80	3,533.15	0.00	0.00	0.00
10,300.00	90.00	180.84	6,475.01	-1,500.01	-2,971.27	-2,740.26	3,629.41	0.00	0.00	0.00
10,400.00	90.00	180.84	6,475.01	-1,500.01	-3,071.26	-2,741.73	3,725.66	0.00	0.00	0.00
10,500.00	90.00	180.84	6,475.01	-1,500.01	-3,171.25	-2,743.19	3,821.91	0.00	0.00	0.00
10,600.00	90.00	180.84	6,475.01	-1,500.01	-3,271.24	-2,744.66	3,918.17	0.00	0.00	0.00
10,700.00	90.00	180.84	6,475.01	-1,500.01	-3,371.23	-2,746.13	4,014.42	0.00	0.00	0.00
10,800.00	90.00	180.84	6,475.01	-1,500.01	-3,471.22	-2,747.59	4,110.68	0.00	0.00	0.00
10,900.00	90.00	180.84	6,475.01	-1,500.01	-3,571.21	-2,749.06	4,206.93	0.00	0.00	0.00
11,000.00	90.00	180.84	6,475.01	-1,500.01	-3,671.20	-2,750.52	4,303.19	0.00	0.00	0.00
11,100.00	90.00	180.84	6,475.01	-1,500.01	-3,771.19	-2,751.99	4,399.44	0.00	0.00	0.00
11,200.00	90.00	180.84	6,475.01	-1,500.01	-3,871.18	-2,753.46	4,495.69	0.00	0.00	0.00
11,300.00	90.00	180.84	6,475.01	-1,500.01	-3,971.16	-2,754.92	4,591.95	0.00	0.00	0.00
11,400.00	90.00	180.84	6,475.01	-1,500.01	-4,071.15	-2,756.39	4,688.20	0.00	0.00	0.00
11,500.00	90.00	180.84	6,475.02	-1,500.02	-4,171.14	-2,757.85	4,784.46	0.00	0.00	0.00
11,600.00	90.00	180.84	6,475.02	-1,500.02	-4,271.13	-2,759.32	4,880.71	0.00	0.00	0.00
11,700.00	90.00	180.84	6,475.02	-1,500.02	-4,371.12	-2,760.79	4,976.97	0.00	0.00	0.00
11,800.00	90.00	180.84	6,475.02	-1,500.02	-4,471.11	-2,762.25	5,073.22	0.00	0.00	0.00
11,900.00	90.00	180.84	6,475.02	-1,500.02	-4,571.10	-2,763.72	5,169.48	0.00	0.00	0.00
12,000.00	90.00	180.84	6,475.02	-1,500.02	-4,671.09	-2,765.18	5,265.73	0.00	0.00	0.00
12,100.00	90.00	180.84	6,475.02	-1,500.02	-4,771.08	-2,766.65	5,361.98	0.00	0.00	0.00
12,200.00	90.00	180.84	6,475.02	-1,500.02	-4,871.07	-2,768.12	5,458.24	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well GADWALL 30-31-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4975.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4975.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	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)
12,300.00	90.00	180.84	6,475.02	-1,500.02	-4,971.06	-2,769.58	5,554.49	0.00	0.00	0.00
12,400.00	90.00	180.84	6,475.02	-1,500.02	-5,071.05	-2,771.05	5,650.75	0.00	0.00	0.00
12,500.00	90.00	180.84	6,475.02	-1,500.02	-5,171.04	-2,772.51	5,747.00	0.00	0.00	0.00
12,600.00	90.00	180.84	6,475.02	-1,500.02	-5,271.02	-2,773.98	5,843.26	0.00	0.00	0.00
12,700.00	90.00	180.84	6,475.02	-1,500.02	-5,371.01	-2,775.44	5,939.51	0.00	0.00	0.00
12,800.00	90.00	180.84	6,475.02	-1,500.02	-5,471.00	-2,776.91	6,035.76	0.00	0.00	0.00
12,900.00	90.00	180.84	6,475.02	-1,500.02	-5,570.99	-2,778.38	6,132.02	0.00	0.00	0.00
13,000.00	90.00	180.84	6,475.02	-1,500.02	-5,670.98	-2,779.84	6,228.27	0.00	0.00	0.00
13,100.00	90.00	180.84	6,475.02	-1,500.02	-5,770.97	-2,781.31	6,324.53	0.00	0.00	0.00
13,200.00	90.00	180.84	6,475.02	-1,500.02	-5,870.96	-2,782.77	6,420.78	0.00	0.00	0.00
13,300.00	90.00	180.84	6,475.02	-1,500.02	-5,970.95	-2,784.24	6,517.04	0.00	0.00	0.00
13,400.00	90.00	180.84	6,475.02	-1,500.02	-6,070.94	-2,785.71	6,613.29	0.00	0.00	0.00
13,500.00	90.00	180.84	6,475.02	-1,500.02	-6,170.93	-2,787.17	6,709.55	0.00	0.00	0.00
13,600.00	90.00	180.84	6,475.02	-1,500.02	-6,270.92	-2,788.64	6,805.80	0.00	0.00	0.00
13,700.00	90.00	180.84	6,475.02	-1,500.02	-6,370.91	-2,790.10	6,902.05	0.00	0.00	0.00
13,800.00	90.00	180.84	6,475.02	-1,500.02	-6,470.90	-2,791.57	6,998.31	0.00	0.00	0.00
13,900.00	90.00	180.84	6,475.02	-1,500.02	-6,570.88	-2,793.04	7,094.56	0.00	0.00	0.00
14,000.00	90.00	180.84	6,475.02	-1,500.02	-6,670.87	-2,794.50	7,190.82	0.00	0.00	0.00
14,100.00	90.00	180.84	6,475.02	-1,500.02	-6,770.86	-2,795.97	7,287.07	0.00	0.00	0.00
14,200.00	90.00	180.84	6,475.03	-1,500.03	-6,870.85	-2,797.43	7,383.33	0.00	0.00	0.00
14,300.00	90.00	180.84	6,475.03	-1,500.03	-6,970.84	-2,798.90	7,479.58	0.00	0.00	0.00
14,400.00	90.00	180.84	6,475.03	-1,500.03	-7,070.83	-2,800.37	7,575.83	0.00	0.00	0.00
14,500.00	90.00	180.84	6,475.03	-1,500.03	-7,170.82	-2,801.83	7,672.09	0.00	0.00	0.00
14,600.00	90.00	180.84	6,475.03	-1,500.03	-7,270.81	-2,803.30	7,768.34	0.00	0.00	0.00
14,700.00	90.00	180.84	6,475.03	-1,500.03	-7,370.80	-2,804.76	7,864.60	0.00	0.00	0.00
14,800.00	90.00	180.84	6,475.03	-1,500.03	-7,470.79	-2,806.23	7,960.85	0.00	0.00	0.00
14,900.00	90.00	180.84	6,475.03	-1,500.03	-7,570.78	-2,807.70	8,057.11	0.00	0.00	0.00
15,000.00	90.00	180.84	6,475.03	-1,500.03	-7,670.77	-2,809.16	8,153.36	0.00	0.00	0.00
15,100.00	90.00	180.84	6,475.03	-1,500.03	-7,770.76	-2,810.63	8,249.62	0.00	0.00	0.00
15,200.00	90.00	180.84	6,475.03	-1,500.03	-7,870.75	-2,812.09	8,345.87	0.00	0.00	0.00
15,300.00	90.00	180.84	6,475.03	-1,500.03	-7,970.73	-2,813.56	8,442.12	0.00	0.00	0.00
15,400.00	90.00	180.84	6,475.03	-1,500.03	-8,070.72	-2,815.03	8,538.38	0.00	0.00	0.00
15,500.00	90.00	180.84	6,475.03	-1,500.03	-8,170.71	-2,816.49	8,634.63	0.00	0.00	0.00
15,600.00	90.00	180.84	6,475.03	-1,500.03	-8,270.70	-2,817.96	8,730.89	0.00	0.00	0.00
15,700.00	90.00	180.84	6,475.03	-1,500.03	-8,370.69	-2,819.42	8,827.14	0.00	0.00	0.00
15,800.00	90.00	180.84	6,475.03	-1,500.03	-8,470.68	-2,820.89	8,923.40	0.00	0.00	0.00
15,900.00	90.00	180.84	6,475.03	-1,500.03	-8,570.67	-2,822.36	9,019.65	0.00	0.00	0.00
16,000.00	90.00	180.84	6,475.03	-1,500.03	-8,670.66	-2,823.82	9,115.91	0.00	0.00	0.00
16,100.00	90.00	180.84	6,475.03	-1,500.03	-8,770.65	-2,825.29	9,212.16	0.00	0.00	0.00
16,200.00	90.00	180.84	6,475.03	-1,500.03	-8,870.64	-2,826.75	9,308.41	0.00	0.00	0.00
16,300.00	90.00	180.84	6,475.03	-1,500.03	-8,970.63	-2,828.22	9,404.67	0.00	0.00	0.00
16,400.00	90.00	180.84	6,475.03	-1,500.03	-9,070.62	-2,829.68	9,500.92	0.00	0.00	0.00
16,500.00	90.00	180.84	6,475.03	-1,500.03	-9,170.61	-2,831.15	9,597.18	0.00	0.00	0.00
16,600.00	90.00	180.84	6,475.03	-1,500.03	-9,270.59	-2,832.62	9,693.43	0.00	0.00	0.00
16,700.00	90.00	180.84	6,475.03	-1,500.03	-9,370.58	-2,834.08	9,789.69	0.00	0.00	0.00
16,800.00	90.00	180.84	6,475.04	-1,500.04	-9,470.57	-2,835.55	9,885.94	0.00	0.00	0.00
BHL: 300ft FSL & 305ft FWL of Sec 31										
16,861.46	90.00	180.84	6,475.04	-1,500.04	-9,532.03	-2,836.45	9,945.10	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well GADWALL 30-31-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4975.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4975.00usft
Site:	NW NE SEC. 30 T8N R60W 6th P.M.	North Reference:	True
Well:	GADWALL 30-31-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
549.13	545.00	Fox Hills Base		0.00	
1,711.21	1,583.00	Pierre Shale Top		0.00	
3,857.16	3,437.00	Richard Sandstone		0.00	
3,998.37	3,559.00	Parkman Sandstone		0.00	
4,853.73	4,298.00	Sussex Sandstone		0.00	
5,385.01	4,757.00	Shannon Sandstone		0.00	
6,271.79	5,585.00	TeePee Buttes		0.00	
6,931.19	6,224.00	Sharon Springs		0.00	
6,975.95	6,260.00	Niobrara Top		0.00	
7,163.80	6,385.00	Niobrara B2 Chalk Target Top		0.00	
7,288.00	6,440.00	Niobrara C Chalk Top		0.00	
7,357.91	6,460.00	Niobrara C Chalk Target Top		0.00	
7,489.30	6,475.00	Niobrara C Chalk Landing Point		0.00	

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 746ft FNL & 2267ft FEL of Sec 30
100.00	100.00	0.00	0.00	START NUDGE (3°/100ft BUR)
1,107.88	1,061.75	39.33	-256.83	EOB TO 30.24° INC
5,481.43	4,840.30	372.69	-2,433.83	END OF TANGENT
6,489.30	5,802.04	412.02	-2,690.66	EOD TO VERTICAL
6,589.30	5,902.04	412.02	-2,690.66	KOP (10°/100ft BUR)
7,489.30	6,475.00	-160.87	-2,699.06	HZ LP: 900ft FNL & 305ft FWL of Sec 30
16,861.46	6,475.04	-9,532.03	-2,836.45	BHL: 300ft FSL & 305ft FWL of Sec 31