



MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

NW NW SEC. 4 T7N R60W 6th P.M.

WIGEON FED 33-28-4HN

ORIGINAL WELLBORE

02 March, 2020

Plan: PROPOSAL #3





Project: WELD COUNTY, COLORADO (NAD 83)
Site: NW NW SEC. 4 T7N R60W 6th P.M.
Well: WIGEON FED 33-28-4HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #3

ANNOTATIONS

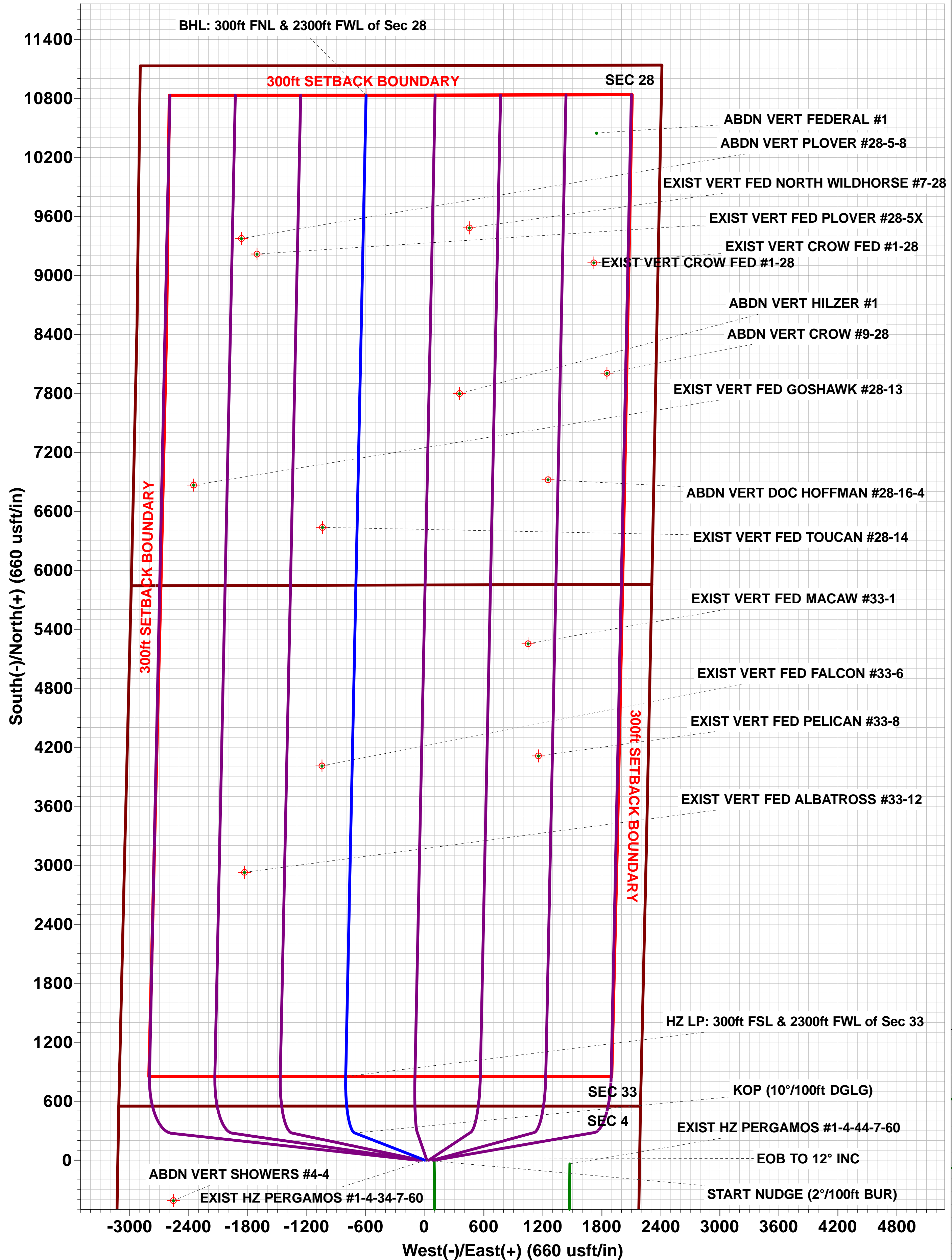
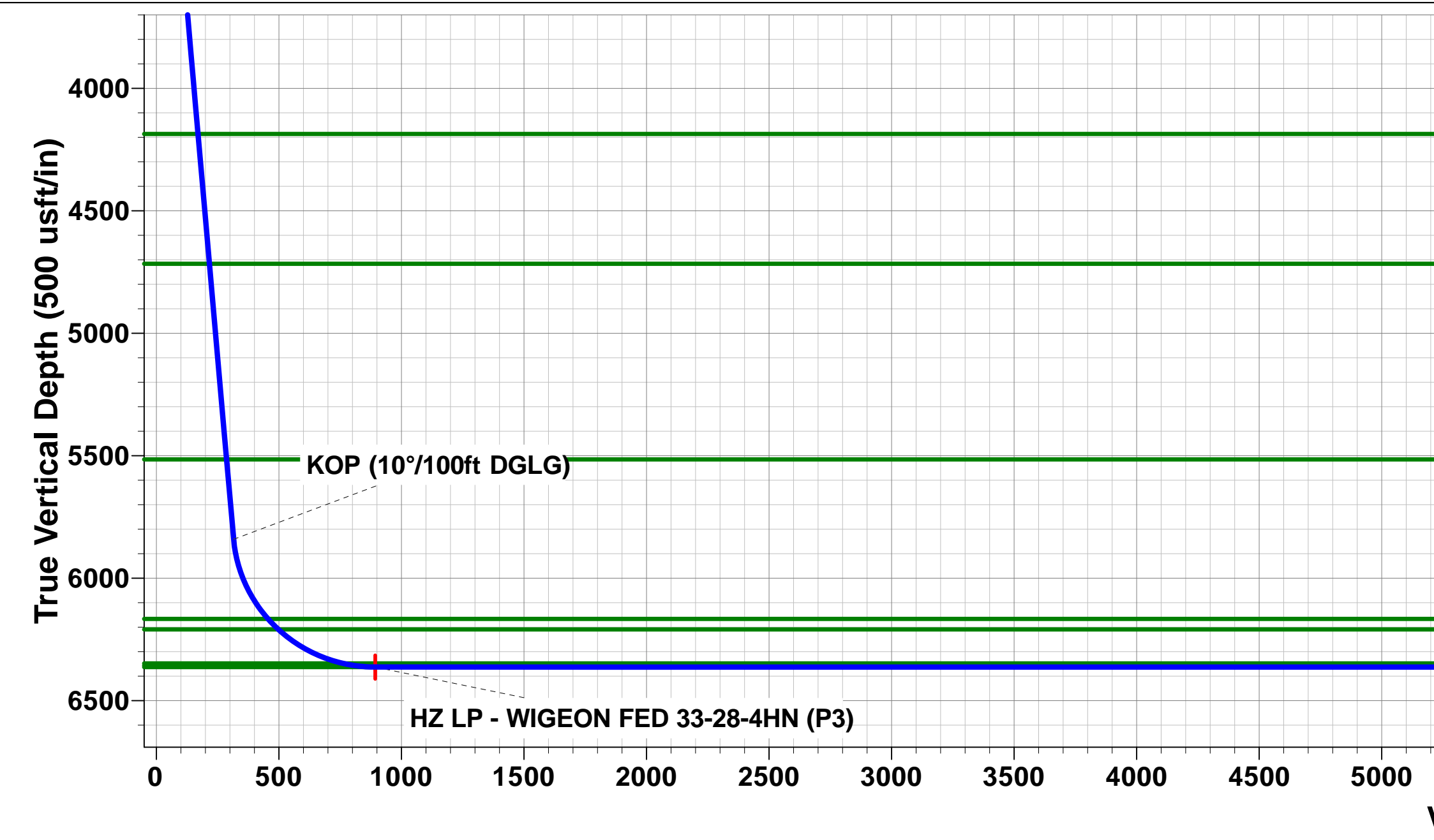
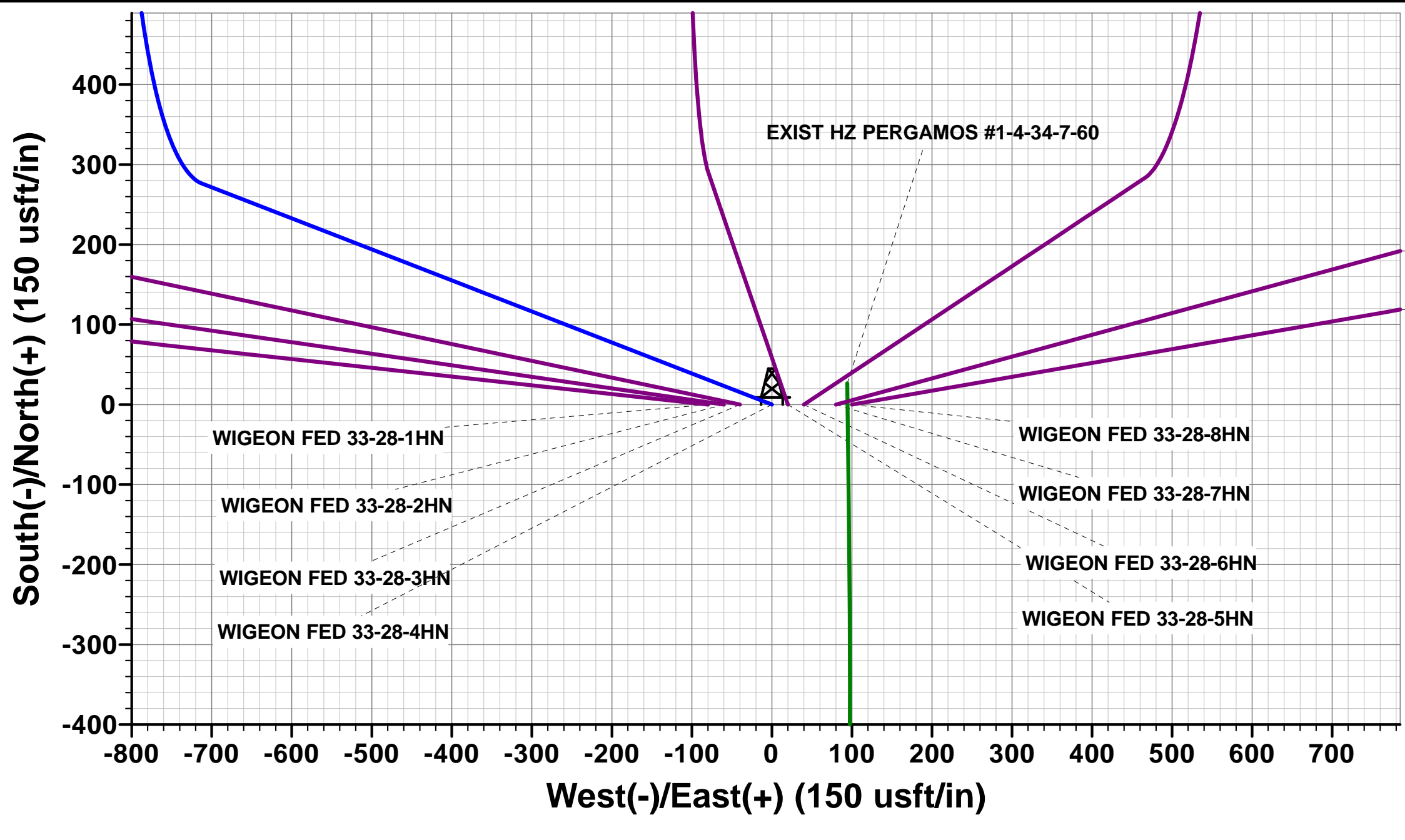
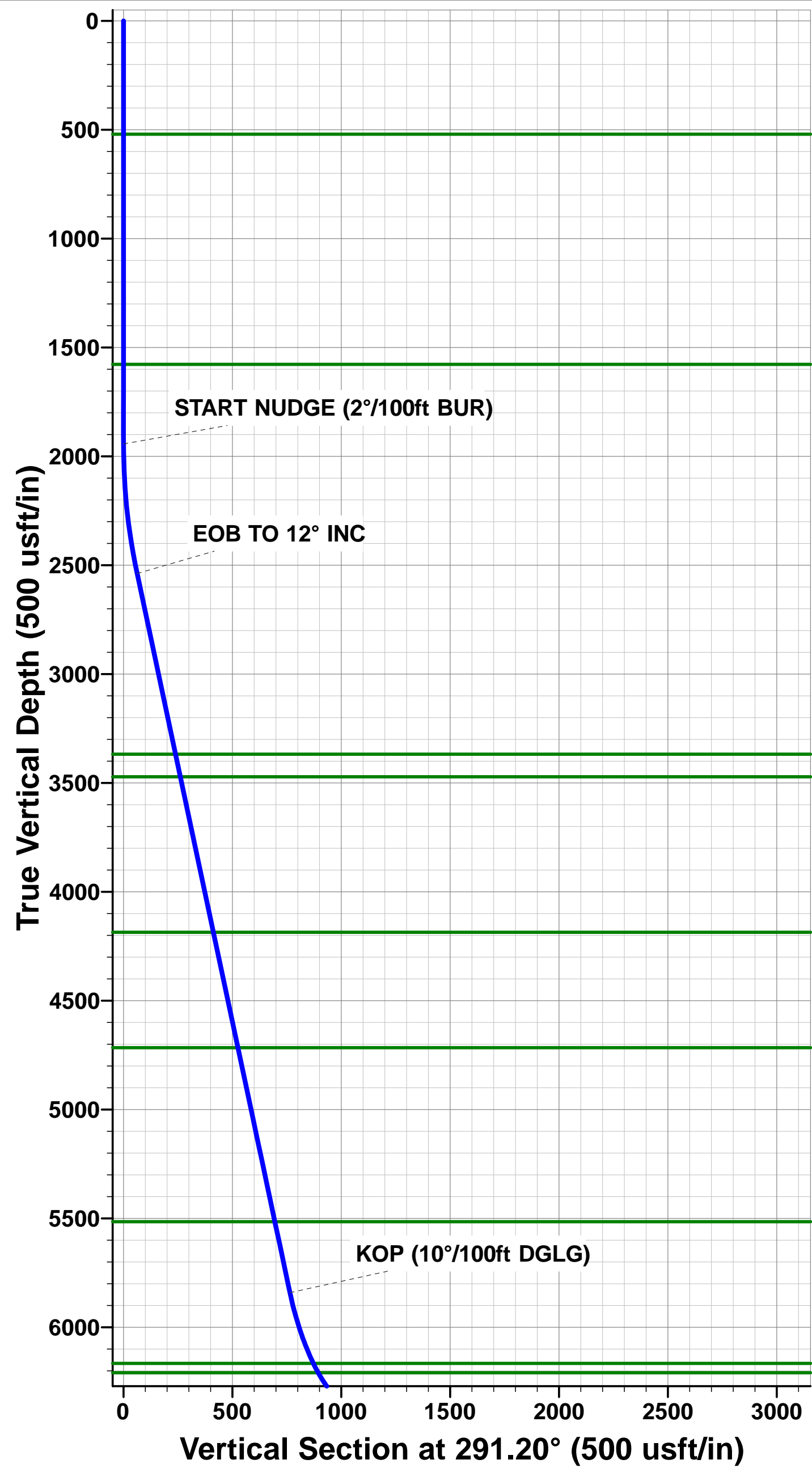
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 550ft FNL & 2184ft FEL of Sec 4
1943.00	0.00	0.00	1943.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
2542.80	12.00	291.20	2538.42	22.63	-58.32	25.81	62.56	EOB TO 12° INC
5919.21	12.00	291.20	5841.10	276.45	-712.57	315.30	764.32	KOP (10°/100ft DGLG)
6778.41	90.00	1.19	6363.00	850.00	-804.89	893.06	1357.25	HZ LP: 300ft FSL & 2300ft FWL of Sec 33
16762.00	90.00	1.19	6363.00	10831.44	-597.80	10847.93	11340.84	BHL: 300ft FNL & 2300ft FWL of Sec 28

PROPOSED LOCAL COORDINATES:

SHL: 550ft FNL & 2184ft FEL Sec 4
HZ LP: 300ft FSL & 2300ft FWL Sec 33
BHL: 300ft FNL & 2300ft FWL of Sec 28

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - WIGEON FED 33-28-4HN (P3)	6363.00	850.00	-804.89	40.612317	-104.098803
BHL - WIGEON FED 33-28-4HN (P3)	6363.00	10831.44	-597.80	40.639714	-104.098058



Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well WIGEON FED 33-28-4HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4982.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4982.00usft
Site:	NW NW SEC. 4 T7N R60W 6th P.M.	North Reference:	True
Well:	WIGEON FED 33-28-4HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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 NW SEC. 4 T7N R60W 6th P.M.		
Site Position:		Northing:	1,467,825.37 usft
From:	Lat/Long	Easting:	3,388,564.57 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10 ft
		Latitude:	40.609161
		Longitude:	-104.100471
		Grid Convergence:	0.90 °

Well	WIGEON FED 33-28-4HN		
Well Position	+N/-S	299.86 usft	Northing:
	+E/-W	1,268.05 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	2020-03-02	7.64	66.97	52,265.81935504

Design	PROPOSAL #3			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	6,363.00	0.00	0.00	356.84

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	-4,982.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,943.00	0.00	0.00	1,943.00	-3,039.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,542.80	12.00	291.20	2,538.42	-2,443.58	22.63	-58.32	2.00	2.00	0.00	291.20	
5,919.21	12.00	291.20	5,841.10	859.10	276.45	-712.57	0.00	0.00	0.00	0.00	
6,778.41	90.00	1.19	6,363.00	1,381.00	850.00	-804.89	10.00	9.08	8.15	70.39	HZ LP - WIGEON F
16,762.00	90.00	1.19	6,363.00	1,381.00	10,831.44	-597.80	0.00	0.00	0.00	0.00	BHL - WIGEON FE

Planning Report

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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4982.00usft
Site:	NW NW SEC. 4 T7N R60W 6th P.M.	North Reference:	True
Well:	WIGEON FED 33-28-4HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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: 550ft FNL & 2184ft FEL of Sec 4										
0.00	0.00	0.00	0.00	4,982.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,882.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,782.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,682.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,582.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4,482.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base										
521.00	0.00	0.00	521.00	4,461.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	4,382.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	4,282.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	4,182.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	4,082.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	3,982.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	3,882.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	3,782.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	3,682.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	3,582.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	3,482.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierre Shale Top										
1,578.00	0.00	0.00	1,578.00	3,404.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	3,382.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	3,282.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	3,182.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	3,082.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
1,943.00	0.00	0.00	1,943.00	3,039.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	1.14	291.20	2,000.00	2,982.00	0.21	-0.53	0.23	2.00	2.00	0.00
2,100.00	3.14	291.20	2,099.92	2,882.08	1.56	-4.01	1.77	2.00	2.00	0.00
2,200.00	5.14	291.20	2,199.66	2,782.34	4.17	-10.74	4.75	2.00	2.00	0.00
2,300.00	7.14	291.20	2,299.08	2,682.92	8.04	-20.71	9.16	2.00	2.00	0.00
2,400.00	9.14	291.20	2,398.06	2,583.94	13.16	-33.91	15.01	2.00	2.00	0.00
2,500.00	11.14	291.20	2,496.50	2,485.50	19.52	-50.32	22.27	2.00	2.00	0.00
EOB TO 12" INC										
2,542.80	12.00	291.20	2,538.42	2,443.58	22.63	-58.32	25.81	2.00	2.00	0.00
2,600.00	12.00	291.20	2,594.38	2,387.62	26.93	-69.41	30.71	0.00	0.00	0.00
2,700.00	12.00	291.20	2,692.19	2,289.81	34.45	-88.79	39.29	0.00	0.00	0.00
2,800.00	12.00	291.20	2,790.01	2,191.99	41.96	-108.16	47.86	0.00	0.00	0.00
2,900.00	12.00	291.20	2,887.83	2,094.17	49.48	-127.54	56.43	0.00	0.00	0.00
3,000.00	12.00	291.20	2,985.64	1,996.36	57.00	-146.92	65.01	0.00	0.00	0.00
3,100.00	12.00	291.20	3,083.46	1,898.54	64.52	-166.29	73.58	0.00	0.00	0.00
3,200.00	12.00	291.20	3,181.28	1,800.72	72.03	-185.67	82.16	0.00	0.00	0.00
3,300.00	12.00	291.20	3,279.09	1,702.91	79.55	-205.05	90.73	0.00	0.00	0.00
Richard Sandstone										
3,390.89	12.00	291.20	3,368.00	1,614.00	86.38	-222.66	98.52	0.00	0.00	0.00
3,400.00	12.00	291.20	3,376.91	1,605.09	87.07	-224.43	99.30	0.00	0.00	0.00
Parkman Sandstone										
3,497.21	12.00	291.20	3,472.00	1,510.00	94.38	-243.26	107.64	0.00	0.00	0.00
3,500.00	12.00	291.20	3,474.72	1,507.28	94.59	-243.80	107.88	0.00	0.00	0.00
3,600.00	12.00	291.20	3,572.54	1,409.46	102.10	-263.18	116.45	0.00	0.00	0.00
3,700.00	12.00	291.20	3,670.36	1,311.64	109.62	-282.56	125.03	0.00	0.00	0.00
3,800.00	12.00	291.20	3,768.17	1,213.83	117.14	-301.93	133.60	0.00	0.00	0.00
3,900.00	12.00	291.20	3,865.99	1,116.01	124.66	-321.31	142.17	0.00	0.00	0.00

Planning Report

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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4982.00usft
Site:	NW NW SEC. 4 T7N R60W 6th P.M.	North Reference:	True
Well:	WIGEON FED 33-28-4HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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)
4,000.00	12.00	291.20	3,963.81	1,018.19	132.18	-340.69	150.75	0.00	0.00	0.00
4,100.00	12.00	291.20	4,061.62	920.38	139.69	-360.06	159.32	0.00	0.00	0.00
4,200.00	12.00	291.20	4,159.44	822.56	147.21	-379.44	167.90	0.00	0.00	0.00
Sussex Sandstone										
4,227.15	12.00	291.20	4,186.00	796.00	149.25	-384.70	170.23	0.00	0.00	0.00
4,300.00	12.00	291.20	4,257.25	724.75	154.73	-398.82	176.47	0.00	0.00	0.00
4,400.00	12.00	291.20	4,355.07	626.93	162.25	-418.20	185.05	0.00	0.00	0.00
4,500.00	12.00	291.20	4,452.89	529.11	169.76	-437.57	193.62	0.00	0.00	0.00
4,600.00	12.00	291.20	4,550.70	431.30	177.28	-456.95	202.19	0.00	0.00	0.00
4,700.00	12.00	291.20	4,648.52	333.48	184.80	-476.33	210.77	0.00	0.00	0.00
Shannon Sandstone										
4,768.99	12.00	291.20	4,716.00	266.00	189.99	-489.69	216.68	0.00	0.00	0.00
4,800.00	12.00	291.20	4,746.34	235.66	192.32	-495.70	219.34	0.00	0.00	0.00
4,900.00	12.00	291.20	4,844.15	137.85	199.83	-515.08	227.92	0.00	0.00	0.00
5,000.00	12.00	291.20	4,941.97	40.03	207.35	-534.46	236.49	0.00	0.00	0.00
5,100.00	12.00	291.20	5,039.78	-57.78	214.87	-553.83	245.06	0.00	0.00	0.00
5,200.00	12.00	291.20	5,137.60	-155.60	222.39	-573.21	253.64	0.00	0.00	0.00
5,300.00	12.00	291.20	5,235.42	-253.42	229.90	-592.59	262.21	0.00	0.00	0.00
5,400.00	12.00	291.20	5,333.23	-351.23	237.42	-611.97	270.79	0.00	0.00	0.00
5,500.00	12.00	291.20	5,431.05	-449.05	244.94	-631.34	279.36	0.00	0.00	0.00
TeePee Buttes										
5,585.83	12.00	291.20	5,515.00	-533.00	251.39	-647.97	286.72	0.00	0.00	0.00
5,600.00	12.00	291.20	5,528.87	-546.87	252.46	-650.72	287.93	0.00	0.00	0.00
5,700.00	12.00	291.20	5,626.68	-644.68	259.98	-670.10	296.51	0.00	0.00	0.00
5,800.00	12.00	291.20	5,724.50	-742.50	267.49	-689.47	305.08	0.00	0.00	0.00
5,900.00	12.00	291.20	5,822.31	-840.31	275.01	-708.85	313.66	0.00	0.00	0.00
KOP (10°/100ft DGLG)										
5,919.21	12.00	291.20	5,841.10	-859.10	276.45	-712.57	315.30	0.00	0.00	0.00
6,000.00	16.53	318.93	5,919.47	-937.47	288.18	-727.98	327.86	10.00	5.62	34.31
6,100.00	24.74	335.51	6,013.05	-1,031.05	318.02	-746.05	358.65	10.00	8.21	16.59
6,200.00	33.88	343.89	6,100.19	-1,118.19	363.96	-762.50	405.43	10.00	9.14	8.38
Sharon Springs										
6,283.36	41.78	348.28	6,166.00	-1,184.00	413.57	-774.61	455.62	10.00	9.47	5.26
6,300.00	43.37	348.99	6,178.25	-1,196.25	424.60	-776.82	466.76	10.00	9.57	4.28
Niobrara Top										
6,343.86	47.59	350.68	6,209.00	-1,227.00	455.37	-782.33	497.79	10.00	9.61	3.86
6,400.00	53.02	352.54	6,244.85	-1,262.85	498.09	-788.60	540.79	10.00	9.67	3.32
6,500.00	62.74	355.28	6,297.96	-1,315.96	582.20	-797.46	625.26	10.00	9.73	2.74
6,600.00	72.52	357.58	6,335.98	-1,353.98	674.38	-803.14	717.62	10.00	9.77	2.30
Niobrara B2 Chalk Top										
6,645.72	76.99	358.55	6,348.00	-1,366.00	718.46	-804.63	761.71	10.00	9.79	2.10
Niobrara B2 Chalk Target Top										
6,687.88	81.12	359.40	6,356.00	-1,374.00	759.83	-805.36	803.06	10.00	9.80	2.03
6,700.00	82.31	359.64	6,357.75	-1,375.75	771.83	-805.46	815.04	10.00	9.80	2.00
HZ LP: 300ft FSL & 2300ft FWL of Sec 33 - Niobrara B2 Chalk Landing Point										
6,778.41	90.00	1.19	6,363.00	-1,381.00	850.00	-804.89	893.06	10.00	9.81	1.97
6,800.00	90.00	1.19	6,363.00	-1,381.00	871.58	-804.44	914.59	0.00	0.00	0.00
6,900.00	90.00	1.19	6,363.00	-1,381.00	971.56	-802.37	1,014.30	0.00	0.00	0.00
7,000.00	90.00	1.19	6,363.00	-1,381.00	1,071.54	-800.30	1,114.01	0.00	0.00	0.00
7,100.00	90.00	1.19	6,363.00	-1,381.00	1,171.52	-798.22	1,213.72	0.00	0.00	0.00
7,200.00	90.00	1.19	6,363.00	-1,381.00	1,271.50	-796.15	1,313.44	0.00	0.00	0.00
7,300.00	90.00	1.19	6,363.00	-1,381.00	1,371.47	-794.07	1,413.15	0.00	0.00	0.00
7,400.00	90.00	1.19	6,363.00	-1,381.00	1,471.45	-792.00	1,512.86	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well WIGEON FED 33-28-4HN
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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4982.00usft
Site:	NW NW SEC. 4 T7N R60W 6th P.M.	North Reference:	True
Well:	WIGEON FED 33-28-4HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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)
7,500.00	90.00	1.19	6,363.00	-1,381.00	1,571.43	-789.92	1,612.57	0.00	0.00	0.00
7,600.00	90.00	1.19	6,363.00	-1,381.00	1,671.41	-787.85	1,712.29	0.00	0.00	0.00
7,700.00	90.00	1.19	6,363.00	-1,381.00	1,771.39	-785.78	1,812.00	0.00	0.00	0.00
7,800.00	90.00	1.19	6,363.00	-1,381.00	1,871.37	-783.70	1,911.71	0.00	0.00	0.00
7,900.00	90.00	1.19	6,363.00	-1,381.00	1,971.34	-781.63	2,011.42	0.00	0.00	0.00
8,000.00	90.00	1.19	6,363.00	-1,381.00	2,071.32	-779.55	2,111.14	0.00	0.00	0.00
8,100.00	90.00	1.19	6,363.00	-1,381.00	2,171.30	-777.48	2,210.85	0.00	0.00	0.00
8,200.00	90.00	1.19	6,363.00	-1,381.00	2,271.28	-775.40	2,310.56	0.00	0.00	0.00
8,300.00	90.00	1.19	6,363.00	-1,381.00	2,371.26	-773.33	2,410.27	0.00	0.00	0.00
8,400.00	90.00	1.19	6,363.00	-1,381.00	2,471.24	-771.26	2,509.98	0.00	0.00	0.00
8,500.00	90.00	1.19	6,363.00	-1,381.00	2,571.22	-769.18	2,609.70	0.00	0.00	0.00
8,600.00	90.00	1.19	6,363.00	-1,381.00	2,671.19	-767.11	2,709.41	0.00	0.00	0.00
8,700.00	90.00	1.19	6,363.00	-1,381.00	2,771.17	-765.03	2,809.12	0.00	0.00	0.00
8,800.00	90.00	1.19	6,363.00	-1,381.00	2,871.15	-762.96	2,908.83	0.00	0.00	0.00
8,900.00	90.00	1.19	6,363.00	-1,381.00	2,971.13	-760.88	3,008.55	0.00	0.00	0.00
9,000.00	90.00	1.19	6,363.00	-1,381.00	3,071.11	-758.81	3,108.26	0.00	0.00	0.00
9,100.00	90.00	1.19	6,363.00	-1,381.00	3,171.09	-756.74	3,207.97	0.00	0.00	0.00
9,200.00	90.00	1.19	6,363.00	-1,381.00	3,271.07	-754.66	3,307.68	0.00	0.00	0.00
9,300.00	90.00	1.19	6,363.00	-1,381.00	3,371.04	-752.59	3,407.39	0.00	0.00	0.00
9,400.00	90.00	1.19	6,363.00	-1,381.00	3,471.02	-750.51	3,507.11	0.00	0.00	0.00
9,500.00	90.00	1.19	6,363.00	-1,381.00	3,571.00	-748.44	3,606.82	0.00	0.00	0.00
9,600.00	90.00	1.19	6,363.00	-1,381.00	3,670.98	-746.36	3,706.53	0.00	0.00	0.00
9,700.00	90.00	1.19	6,363.00	-1,381.00	3,770.96	-744.29	3,806.24	0.00	0.00	0.00
9,800.00	90.00	1.19	6,363.00	-1,381.00	3,870.94	-742.22	3,905.96	0.00	0.00	0.00
9,900.00	90.00	1.19	6,363.00	-1,381.00	3,970.91	-740.14	4,005.67	0.00	0.00	0.00
10,000.00	90.00	1.19	6,363.00	-1,381.00	4,070.89	-738.07	4,105.38	0.00	0.00	0.00
10,100.00	90.00	1.19	6,363.00	-1,381.00	4,170.87	-735.99	4,205.09	0.00	0.00	0.00
10,200.00	90.00	1.19	6,363.00	-1,381.00	4,270.85	-733.92	4,304.80	0.00	0.00	0.00
10,300.00	90.00	1.19	6,363.00	-1,381.00	4,370.83	-731.84	4,404.52	0.00	0.00	0.00
10,400.00	90.00	1.19	6,363.00	-1,381.00	4,470.81	-729.77	4,504.23	0.00	0.00	0.00
10,500.00	90.00	1.19	6,363.00	-1,381.00	4,570.79	-727.70	4,603.94	0.00	0.00	0.00
10,600.00	90.00	1.19	6,363.00	-1,381.00	4,670.76	-725.62	4,703.65	0.00	0.00	0.00
10,700.00	90.00	1.19	6,363.00	-1,381.00	4,770.74	-723.55	4,803.37	0.00	0.00	0.00
10,800.00	90.00	1.19	6,363.00	-1,381.00	4,870.72	-721.47	4,903.08	0.00	0.00	0.00
10,900.00	90.00	1.19	6,363.00	-1,381.00	4,970.70	-719.40	5,002.79	0.00	0.00	0.00
11,000.00	90.00	1.19	6,363.00	-1,381.00	5,070.68	-717.32	5,102.50	0.00	0.00	0.00
11,100.00	90.00	1.19	6,363.00	-1,381.00	5,170.66	-715.25	5,202.21	0.00	0.00	0.00
11,200.00	90.00	1.19	6,363.00	-1,381.00	5,270.63	-713.18	5,301.93	0.00	0.00	0.00
11,300.00	90.00	1.19	6,363.00	-1,381.00	5,370.61	-711.10	5,401.64	0.00	0.00	0.00
11,400.00	90.00	1.19	6,363.00	-1,381.00	5,470.59	-709.03	5,501.35	0.00	0.00	0.00
11,500.00	90.00	1.19	6,363.00	-1,381.00	5,570.57	-706.95	5,601.06	0.00	0.00	0.00
11,600.00	90.00	1.19	6,363.00	-1,381.00	5,670.55	-704.88	5,700.78	0.00	0.00	0.00
11,700.00	90.00	1.19	6,363.00	-1,381.00	5,770.53	-702.80	5,800.49	0.00	0.00	0.00
11,800.00	90.00	1.19	6,363.00	-1,381.00	5,870.51	-700.73	5,900.20	0.00	0.00	0.00
11,900.00	90.00	1.19	6,363.00	-1,381.00	5,970.48	-698.66	5,999.91	0.00	0.00	0.00
12,000.00	90.00	1.19	6,363.00	-1,381.00	6,070.46	-696.58	6,099.63	0.00	0.00	0.00
12,100.00	90.00	1.19	6,363.00	-1,381.00	6,170.44	-694.51	6,199.34	0.00	0.00	0.00
12,200.00	90.00	1.19	6,363.00	-1,381.00	6,270.42	-692.43	6,299.05	0.00	0.00	0.00
12,300.00	90.00	1.19	6,363.00	-1,381.00	6,370.40	-690.36	6,398.76	0.00	0.00	0.00
12,400.00	90.00	1.19	6,363.00	-1,381.00	6,470.38	-688.28	6,498.47	0.00	0.00	0.00
12,500.00	90.00	1.19	6,363.00	-1,381.00	6,570.36	-686.21	6,598.19	0.00	0.00	0.00
12,600.00	90.00	1.19	6,363.00	-1,381.00	6,670.33	-684.14	6,697.90	0.00	0.00	0.00
12,700.00	90.00	1.19	6,363.00	-1,381.00	6,770.31	-682.06	6,797.61	0.00	0.00	0.00
12,800.00	90.00	1.19	6,363.00	-1,381.00	6,870.29	-679.99	6,897.32	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well WIGEON FED 33-28-4HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4982.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4982.00usft
Site:	NW NW SEC. 4 T7N R60W 6th P.M.	North Reference:	True
Well:	WIGEON FED 33-28-4HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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)
12,900.00	90.00	1.19	6,363.00	-1,381.00	6,970.27	-677.91	6,997.04	0.00	0.00	0.00
13,000.00	90.00	1.19	6,363.00	-1,381.00	7,070.25	-675.84	7,096.75	0.00	0.00	0.00
13,100.00	90.00	1.19	6,363.00	-1,381.00	7,170.23	-673.76	7,196.46	0.00	0.00	0.00
13,200.00	90.00	1.19	6,363.00	-1,381.00	7,270.20	-671.69	7,296.17	0.00	0.00	0.00
13,300.00	90.00	1.19	6,363.00	-1,381.00	7,370.18	-669.62	7,395.88	0.00	0.00	0.00
13,400.00	90.00	1.19	6,363.00	-1,381.00	7,470.16	-667.54	7,495.60	0.00	0.00	0.00
13,500.00	90.00	1.19	6,363.00	-1,381.00	7,570.14	-665.47	7,595.31	0.00	0.00	0.00
13,600.00	90.00	1.19	6,363.00	-1,381.00	7,670.12	-663.39	7,695.02	0.00	0.00	0.00
13,700.00	90.00	1.19	6,363.00	-1,381.00	7,770.10	-661.32	7,794.73	0.00	0.00	0.00
13,800.00	90.00	1.19	6,363.00	-1,381.00	7,870.08	-659.24	7,894.45	0.00	0.00	0.00
13,900.00	90.00	1.19	6,363.00	-1,381.00	7,970.05	-657.17	7,994.16	0.00	0.00	0.00
14,000.00	90.00	1.19	6,363.00	-1,381.00	8,070.03	-655.10	8,093.87	0.00	0.00	0.00
14,100.00	90.00	1.19	6,363.00	-1,381.00	8,170.01	-653.02	8,193.58	0.00	0.00	0.00
14,200.00	90.00	1.19	6,363.00	-1,381.00	8,269.99	-650.95	8,293.29	0.00	0.00	0.00
14,300.00	90.00	1.19	6,363.00	-1,381.00	8,369.97	-648.87	8,393.01	0.00	0.00	0.00
14,400.00	90.00	1.19	6,363.00	-1,381.00	8,469.95	-646.80	8,492.72	0.00	0.00	0.00
14,500.00	90.00	1.19	6,363.00	-1,381.00	8,569.92	-644.72	8,592.43	0.00	0.00	0.00
14,600.00	90.00	1.19	6,363.00	-1,381.00	8,669.90	-642.65	8,692.14	0.00	0.00	0.00
14,700.00	90.00	1.19	6,363.00	-1,381.00	8,769.88	-640.58	8,791.86	0.00	0.00	0.00
14,800.00	90.00	1.19	6,363.00	-1,381.00	8,869.86	-638.50	8,891.57	0.00	0.00	0.00
14,900.00	90.00	1.19	6,363.00	-1,381.00	8,969.84	-636.43	8,991.28	0.00	0.00	0.00
15,000.00	90.00	1.19	6,363.00	-1,381.00	9,069.82	-634.35	9,090.99	0.00	0.00	0.00
15,100.00	90.00	1.19	6,363.00	-1,381.00	9,169.80	-632.28	9,190.70	0.00	0.00	0.00
15,200.00	90.00	1.19	6,363.00	-1,381.00	9,269.77	-630.20	9,290.42	0.00	0.00	0.00
15,300.00	90.00	1.19	6,363.00	-1,381.00	9,369.75	-628.13	9,390.13	0.00	0.00	0.00
15,400.00	90.00	1.19	6,363.00	-1,381.00	9,469.73	-626.06	9,489.84	0.00	0.00	0.00
15,500.00	90.00	1.19	6,363.00	-1,381.00	9,569.71	-623.98	9,589.55	0.00	0.00	0.00
15,600.00	90.00	1.19	6,363.00	-1,381.00	9,669.69	-621.91	9,689.27	0.00	0.00	0.00
15,700.00	90.00	1.19	6,363.00	-1,381.00	9,769.67	-619.83	9,788.98	0.00	0.00	0.00
15,800.00	90.00	1.19	6,363.00	-1,381.00	9,869.65	-617.76	9,888.69	0.00	0.00	0.00
15,900.00	90.00	1.19	6,363.00	-1,381.00	9,969.62	-615.68	9,988.40	0.00	0.00	0.00
16,000.00	90.00	1.19	6,363.00	-1,381.00	10,069.60	-613.61	10,088.12	0.00	0.00	0.00
16,100.00	90.00	1.19	6,363.00	-1,381.00	10,169.58	-611.54	10,187.83	0.00	0.00	0.00
16,200.00	90.00	1.19	6,363.00	-1,381.00	10,269.56	-609.46	10,287.54	0.00	0.00	0.00
16,300.00	90.00	1.19	6,363.00	-1,381.00	10,369.54	-607.39	10,387.25	0.00	0.00	0.00
16,400.00	90.00	1.19	6,363.00	-1,381.00	10,469.52	-605.31	10,486.96	0.00	0.00	0.00
16,500.00	90.00	1.19	6,363.00	-1,381.00	10,569.49	-603.24	10,586.68	0.00	0.00	0.00
16,600.00	90.00	1.19	6,363.00	-1,381.00	10,669.47	-601.16	10,686.39	0.00	0.00	0.00
16,700.00	90.00	1.19	6,363.00	-1,381.00	10,769.45	-599.09	10,786.10	0.00	0.00	0.00
BHL: 300ft FNL & 2300ft FWL of Sec 28										
16,762.00	90.00	1.19	6,363.00	-1,381.00	10,831.44	-597.80	10,847.93	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well WIGEON FED 33-28-4HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4982.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4982.00usft
Site:	NW NW SEC. 4 T7N R60W 6th P.M.	North Reference:	True
Well:	WIGEON FED 33-28-4HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
521.00	521.00	Fox Hills Base			
1,578.00	1,578.00	Pierre Shale Top			
3,390.89	3,368.00	Richard Sandstone			
3,497.21	3,472.00	Parkman Sandstone			
4,227.15	4,186.00	Sussex Sandstone			
4,768.99	4,716.00	Shannon Sandstone			
5,585.83	5,515.00	TeePee Buttes			
6,283.36	6,166.00	Sharon Springs			
6,343.86	6,209.00	Niobrara Top			
6,645.72	6,348.00	Niobrara B2 Chalk Top			
6,687.88	6,356.00	Niobrara B2 Chalk Target Top			
6,778.41	6,363.00	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: 550ft FNL & 2184ft FEL of Sec 4
1,943.00	1,943.00	0.00	0.00	START NUDGE (2°/100ft BUR)
2,542.80	2,538.42	22.63	-58.32	EOB TO 12° INC
5,919.21	5,841.10	276.45	-712.57	KOP (10°/100ft DGLG)
6,778.41	6,363.00	850.00	-804.89	HZ LP: 300ft FSL & 2300ft FWL of Sec 33
16,762.00	6,363.00	10,831.44	-597.80	BHL: 300ft FNL & 2300ft FWL of Sec 28