

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

SW SW SEC. 35 T9N R60W 6TH P.M.

PINTAIL FED 2-1HN

ORIGINAL WELLBORE

12 October, 2017

Plan: PROPOSAL #2





Project: WELD COUNTY, COLORADO (NAD 83)
Site: SW SW SEC. 35 T9N R60W 6TH P.M.
Well: PINTAIL FED 2-1HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #2

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Dep	Annotation	
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 892ft FSL & 1079ft FWL of Sec 35	
1555.0	1555.0	0.00	0.00	0.0	0.0	0.0	0.0	SURFACE CASING	
2350.0	2350.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2°/100ft BUR)	
3188.5	3201.0	17.02	180.34	-125.5	-0.7	125.5	125.5	EOB TO 17.02° INC	
5863.0	5997.9	17.02	180.34	-944.1	-5.5	944.1	944.1	KOP (10°/100ft DGLG)	
6268.2	6727.8	90.00	180.95	-1491.9	-13.3	1492.0	1492.0	HZ LP: 600ft FNL & 605ft FWL of Sec 2	
6268.2	16222.4	90.00	180.95	-10985.2	-171.4	10986.6	10986.6	BHL: 600ft FSL & 605ft FWL of Sec 11	

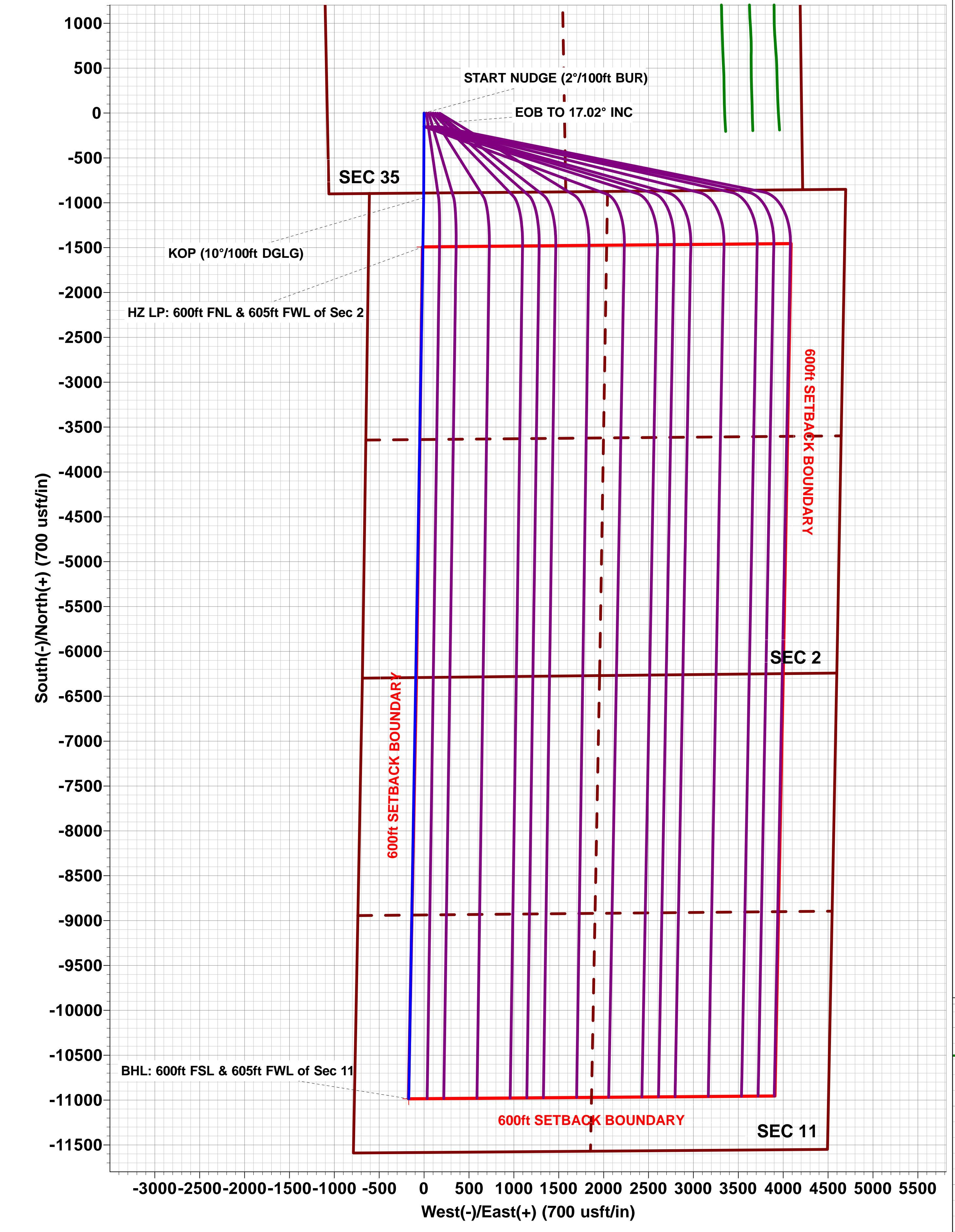
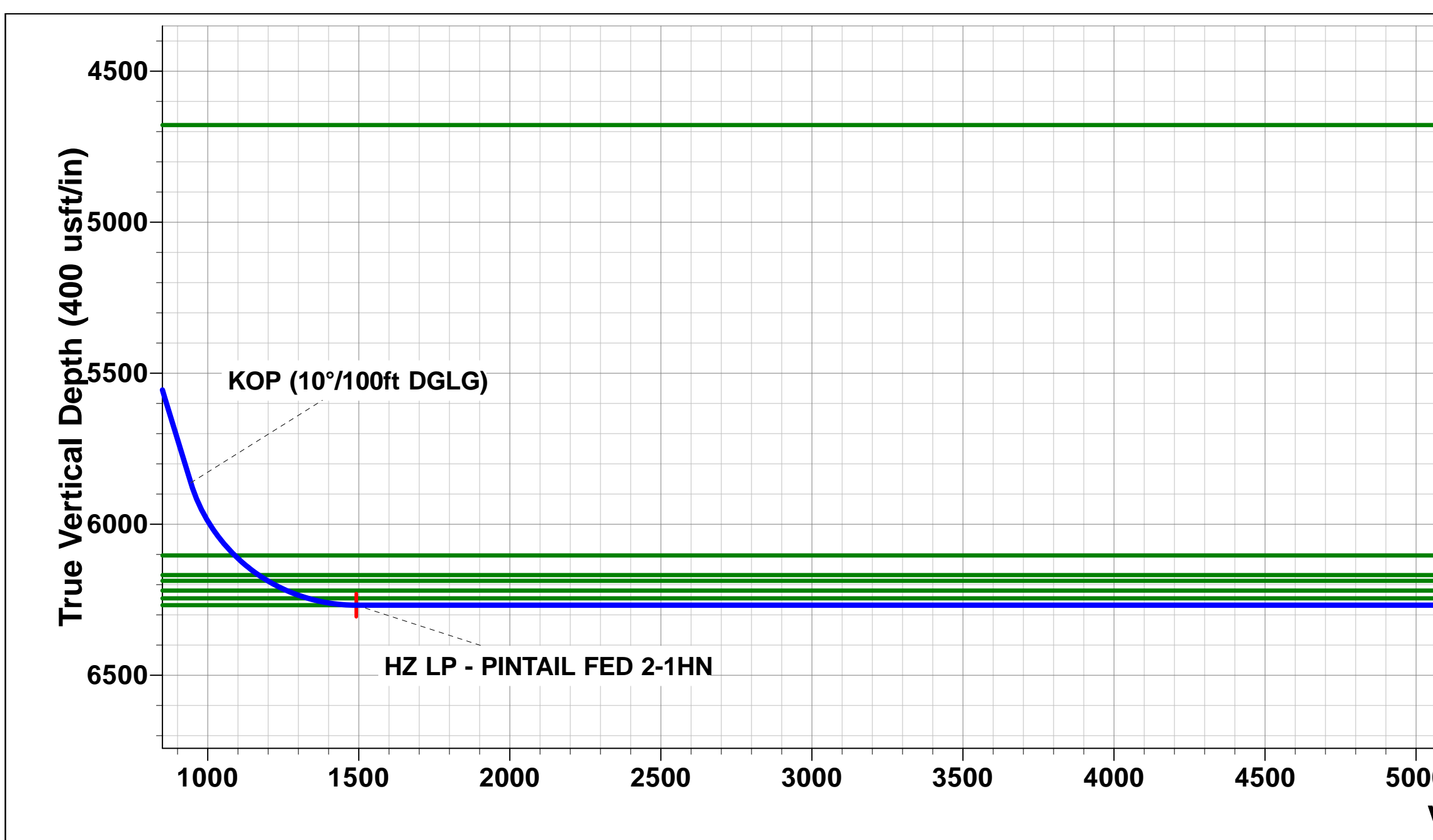
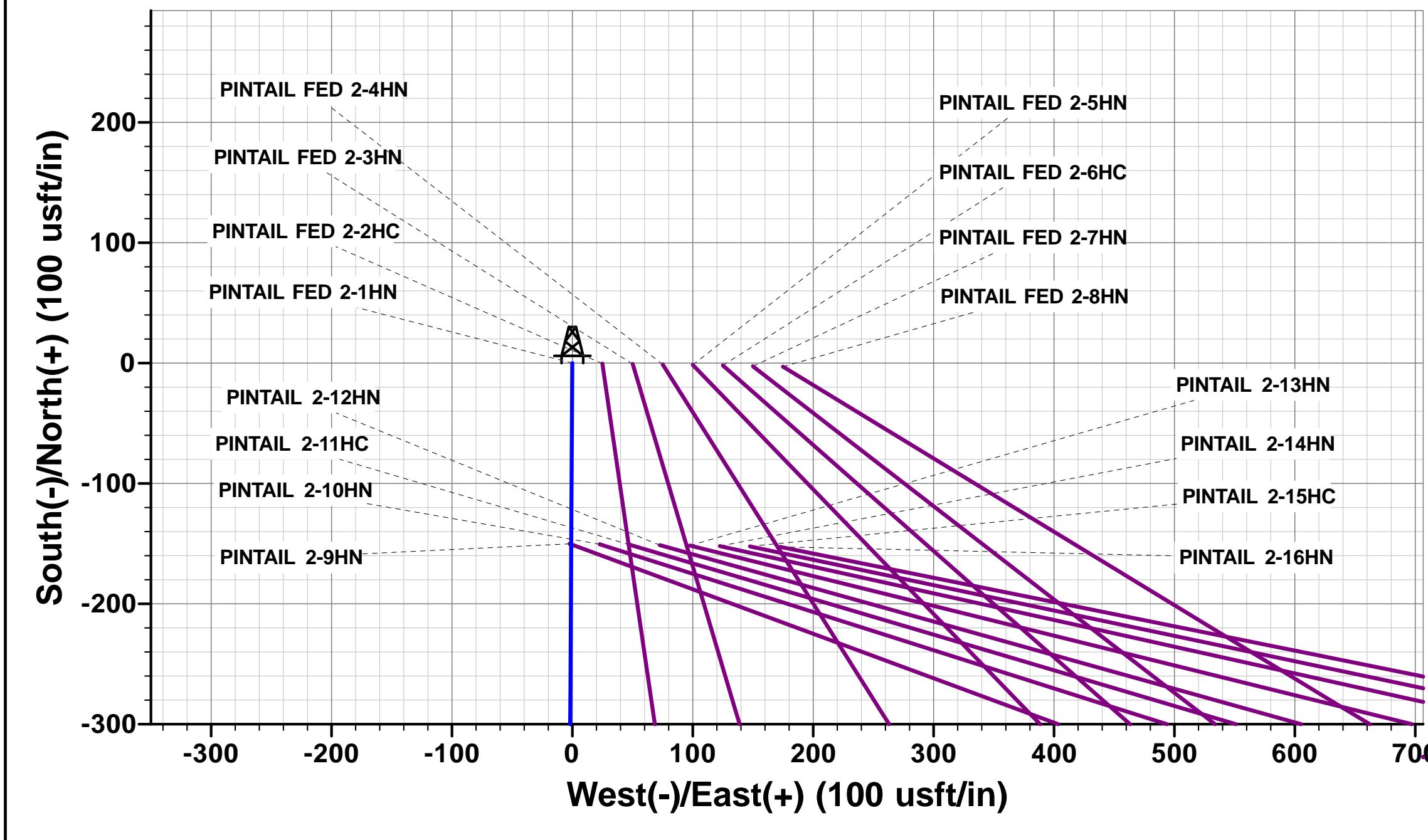
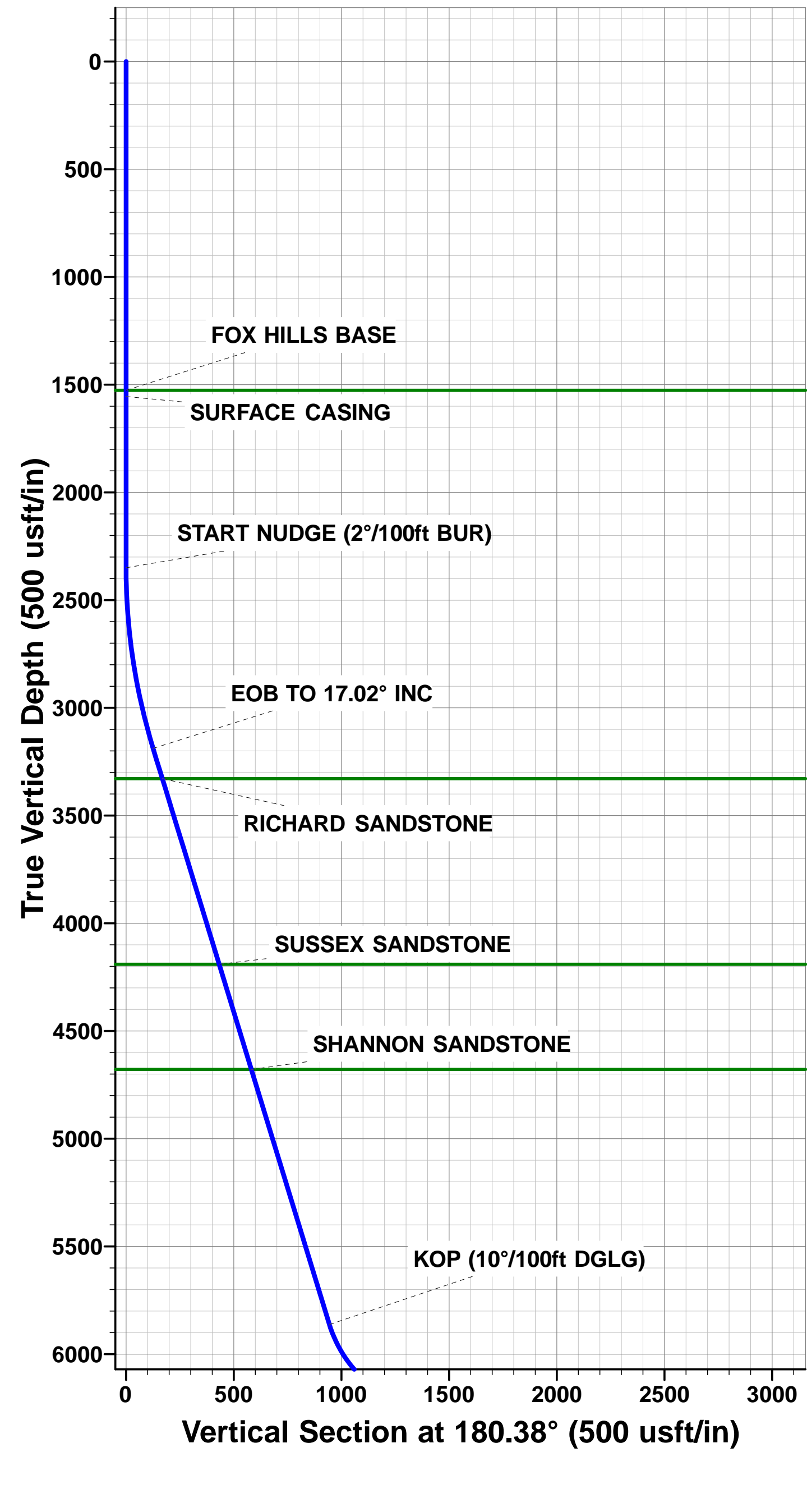
PROPOSED LOCAL COORDINATES:

SHL: 892ft FSL & 1079ft FWL Sec 35

HZ LP: 600ft FNL & 605ft FWL Sec 2

BHL: 600ft FSL & 605ft FWL of Sec 11

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - PINTAIL FED 2-1HN	6268.2	-1491.9	-13.3	40.697451	-104.064551
BHL - PINTAIL FED 2-1HN (P2)	6268.2	-10985.2	-171.4	40.671394	-104.065121



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4942.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4942.0usft (Original Well Elev)
Site:	SW SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-1HN	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	SW SW SEC. 35 T9N R60W 6TH P.M.		
Site Position:		Northing:	1,501,638.38 usft
From:	Lat/Long	Easting:	3,398,005.01 usft
Position Uncertainty:	0.0 usft	Slot Radius:	1.10000ft
		Latitude:	40.701546
		Longitude:	-104.064503
		Grid Convergence:	0.93 °

Well	PINTAIL FED 2-1HN		
Well Position	+N-S	0.0 usft	Northing:
	+E-W	0.0 usft	Easting:
Position Uncertainty		0.0 usft	Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	25/08/2017	7.84	67.20	52,597

Design	PROPOSAL #2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	6,268.2	0.0	0.0	180.89

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
0.0	0.00	0.00	0.0	-4,942.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,350.0	0.00	0.00	2,350.0	-2,592.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,201.0	17.02	180.34	3,188.5	-1,753.5	-125.5	-0.7	2.00	2.00	0.00	180.34	
5,997.9	17.02	180.34	5,863.0	921.0	-944.1	-5.5	0.00	0.00	0.00	0.00	
6,727.8	90.00	180.95	6,268.2	1,326.2	-1,491.9	-13.3	10.00	10.00	0.08	0.65	HZ LP - PINTAIL FI
16,222.4	90.00	180.95	6,268.2	1,326.2	-10,985.2	-171.4	0.00	0.00	0.00	0.00	BHL - PINTAIL FEC

Planning Report



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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4942.0usft (Original Well Elev)
Site:	SW SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-1HN	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: 892ft FSL & 1079ft FWL of Sec 35										
0.0	0.00	0.00	0.0	4,942.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,842.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	4,742.00	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	4,642.00	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	4,542.00	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	4,442.00	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	4,342.00	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	4,242.00	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	4,142.00	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	4,042.00	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	3,942.00	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	3,842.00	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	3,742.00	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	3,642.00	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	3,542.00	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	3,442.00	0.0	0.0	0.0	0.00	0.00	0.00
FOX HILLS BASE										
1,526.7	0.00	0.00	1,526.7	3,415.25	0.0	0.0	0.0	0.00	0.00	0.00
SURFACE CASING										
1,555.0	0.00	0.00	1,555.0	3,387.00	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	3,342.00	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	3,242.00	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	3,142.00	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	3,042.00	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	2,942.00	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	2,842.00	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	2,742.00	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	2,642.00	0.0	0.0	0.0	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
2,350.0	0.00	0.00	2,350.0	2,592.00	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	1.00	180.34	2,400.0	2,542.00	-0.4	0.0	0.4	2.00	2.00	0.00
2,500.0	3.00	180.34	2,499.9	2,442.07	-3.9	0.0	3.9	2.00	2.00	0.00
2,600.0	5.00	180.34	2,599.7	2,342.32	-10.9	-0.1	10.9	2.00	2.00	0.00
2,700.0	7.00	180.34	2,699.1	2,242.87	-21.4	-0.1	21.4	2.00	2.00	0.00
2,800.0	9.00	180.34	2,798.2	2,143.85	-35.3	-0.2	35.3	2.00	2.00	0.00
2,900.0	11.00	180.34	2,896.6	2,045.37	-52.6	-0.3	52.6	2.00	2.00	0.00
3,000.0	13.00	180.34	2,994.4	1,947.56	-73.4	-0.4	73.4	2.00	2.00	0.00
3,100.0	15.00	180.34	3,091.5	1,850.54	-97.6	-0.6	97.6	2.00	2.00	0.00
3,200.0	17.00	180.34	3,187.6	1,754.42	-125.2	-0.7	125.2	2.00	2.00	0.00
EOB TO 17.02° INC										
3,201.0	17.02	180.34	3,188.5	1,753.49	-125.5	-0.7	125.5	2.00	2.00	0.00
3,300.0	17.02	180.34	3,283.2	1,658.80	-154.4	-0.9	154.4	0.00	0.00	0.00
RICHARD SANDSTONE										
3,348.2	17.02	180.34	3,329.2	1,612.75	-168.5	-1.0	168.5	0.00	0.00	0.00
3,400.0	17.02	180.34	3,378.8	1,563.18	-183.7	-1.1	183.7	0.00	0.00	0.00
3,500.0	17.02	180.34	3,474.4	1,467.56	-213.0	-1.2	213.0	0.00	0.00	0.00
3,600.0	17.02	180.34	3,570.1	1,371.93	-242.3	-1.4	242.2	0.00	0.00	0.00
3,700.0	17.02	180.34	3,665.7	1,276.31	-271.5	-1.6	271.5	0.00	0.00	0.00
3,800.0	17.02	180.34	3,761.3	1,180.69	-300.8	-1.8	300.8	0.00	0.00	0.00
3,900.0	17.02	180.34	3,856.9	1,085.07	-330.1	-1.9	330.1	0.00	0.00	0.00
4,000.0	17.02	180.34	3,952.5	989.45	-359.3	-2.1	359.3	0.00	0.00	0.00
4,100.0	17.02	180.34	4,048.2	893.83	-388.6	-2.3	388.6	0.00	0.00	0.00

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Site:	SW SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-1HN	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)
4,200.0	17.02	180.34	4,143.8	798.21	-417.9	-2.4	417.9	0.00	0.00	0.00
SUSSEX SANDSTONE										
4,249.1	17.02	180.34	4,190.7	751.25	-432.2	-2.5	432.2	0.00	0.00	0.00
4,300.0	17.02	180.34	4,239.4	702.59	-447.1	-2.6	447.1	0.00	0.00	0.00
4,400.0	17.02	180.34	4,335.0	606.97	-476.4	-2.8	476.4	0.00	0.00	0.00
4,500.0	17.02	180.34	4,430.6	511.35	-505.7	-3.0	505.7	0.00	0.00	0.00
4,600.0	17.02	180.34	4,526.3	415.73	-534.9	-3.1	534.9	0.00	0.00	0.00
4,700.0	17.02	180.34	4,621.9	320.11	-564.2	-3.3	564.2	0.00	0.00	0.00
SHANNON SANDSTONE										
4,759.5	17.02	180.34	4,678.7	263.25	-581.6	-3.4	581.6	0.00	0.00	0.00
4,800.0	17.02	180.34	4,717.5	224.49	-593.5	-3.5	593.5	0.00	0.00	0.00
4,900.0	17.02	180.34	4,813.1	128.87	-622.8	-3.6	622.7	0.00	0.00	0.00
5,000.0	17.02	180.34	4,908.8	33.25	-652.0	-3.8	652.0	0.00	0.00	0.00
5,100.0	17.02	180.34	5,004.4	-62.37	-681.3	-4.0	681.3	0.00	0.00	0.00
5,200.0	17.02	180.34	5,100.0	-157.99	-710.6	-4.2	710.5	0.00	0.00	0.00
5,300.0	17.02	180.34	5,195.6	-253.61	-739.8	-4.3	739.8	0.00	0.00	0.00
5,400.0	17.02	180.34	5,291.2	-349.23	-769.1	-4.5	769.1	0.00	0.00	0.00
5,500.0	17.02	180.34	5,386.9	-444.85	-798.4	-4.7	798.3	0.00	0.00	0.00
5,600.0	17.02	180.34	5,482.5	-540.47	-827.6	-4.8	827.6	0.00	0.00	0.00
5,700.0	17.02	180.34	5,578.1	-636.10	-856.9	-5.0	856.9	0.00	0.00	0.00
5,800.0	17.02	180.34	5,673.7	-731.72	-886.2	-5.2	886.2	0.00	0.00	0.00
5,900.0	17.02	180.34	5,769.3	-827.34	-915.4	-5.4	915.4	0.00	0.00	0.00
KOP (10°/100ft DGLG)										
5,997.9	17.02	180.34	5,863.0	-920.99	-944.1	-5.5	944.1	0.00	0.00	0.00
6,000.0	17.23	180.34	5,865.0	-922.96	-944.7	-5.5	944.7	10.00	10.00	0.38
6,100.0	27.22	180.59	5,957.4	-1,015.41	-982.5	-5.9	982.5	10.00	10.00	0.24
6,200.0	37.22	180.70	6,041.9	-1,099.90	-1,035.7	-6.5	1,035.7	10.00	10.00	0.12
SHARON SPRINGS										
6,281.8	45.40	180.77	6,103.2	-1,161.25	-1,089.7	-7.2	1,089.6	10.00	10.00	0.08
6,300.0	47.22	180.78	6,115.9	-1,173.85	-1,102.9	-7.3	1,102.8	10.00	10.00	0.06
NIOBRARA A CHALK										
6,385.0	55.72	180.83	6,168.7	-1,226.75	-1,169.3	-8.3	1,169.3	10.00	10.00	0.05
6,400.0	57.22	180.83	6,177.0	-1,235.03	-1,181.8	-8.4	1,181.8	10.00	10.00	0.05
NIOBRARA A CHALK BASE										
6,419.4	59.16	180.84	6,187.2	-1,245.25	-1,198.3	-8.7	1,198.3	10.00	10.00	0.05
NIOBRARA B1 CHALK TOP										
6,490.3	66.26	180.87	6,219.7	-1,277.75	-1,261.3	-9.6	1,261.2	10.00	10.00	0.04
6,500.0	67.22	180.87	6,223.6	-1,281.58	-1,270.2	-9.8	1,270.1	10.00	10.00	0.04
NIOBRARA B1 CHALK BASE										
6,564.9	73.71	180.90	6,245.2	-1,303.25	-1,331.2	-10.7	1,331.2	10.00	10.00	0.04
6,600.0	77.22	180.91	6,254.1	-1,312.07	-1,365.2	-11.2	1,365.3	10.00	10.00	0.04
6,700.0	87.22	180.95	6,267.6	-1,325.58	-1,464.2	-12.9	1,464.2	10.00	10.00	0.03
HZ LP: 600ft FNL & 605ft FWL of Sec 2 - NIOBRARA B2 CHALK TOP										
6,727.8	90.00	180.95	6,268.2	-1,326.25	-1,491.9	-13.3	1,492.0	10.00	10.00	0.03
6,800.0	90.00	180.95	6,268.2	-1,326.25	-1,564.2	-14.5	1,564.2	0.00	0.00	0.00
6,900.0	90.00	180.95	6,268.2	-1,326.25	-1,664.1	-16.2	1,664.2	0.00	0.00	0.00
7,000.0	90.00	180.95	6,268.2	-1,326.25	-1,764.1	-17.8	1,764.2	0.00	0.00	0.00
7,100.0	90.00	180.95	6,268.2	-1,326.25	-1,864.1	-19.5	1,864.2	0.00	0.00	0.00
7,200.0	90.00	180.95	6,268.2	-1,326.25	-1,964.1	-21.2	1,964.2	0.00	0.00	0.00
7,300.0	90.00	180.95	6,268.2	-1,326.25	-2,064.1	-22.8	2,064.2	0.00	0.00	0.00
7,400.0	90.00	180.95	6,268.2	-1,326.25	-2,164.1	-24.5	2,164.2	0.00	0.00	0.00
7,500.0	90.00	180.95	6,268.2	-1,326.25	-2,264.1	-26.2	2,264.2	0.00	0.00	0.00
7,600.0	90.00	180.95	6,268.2	-1,326.25	-2,364.1	-27.8	2,364.2	0.00	0.00	0.00

Planning Report



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Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4942.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4942.0usft (Original Well Elev)
Site:	SW SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-1HN	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)
7,700.0	90.00	180.95	6,268.2	-1,326.24	-2,464.0	-29.5	2,464.2	0.00	0.00	0.00
7,800.0	90.00	180.95	6,268.2	-1,326.24	-2,564.0	-31.2	2,564.2	0.00	0.00	0.00
7,900.0	90.00	180.95	6,268.2	-1,326.24	-2,664.0	-32.8	2,664.2	0.00	0.00	0.00
8,000.0	90.00	180.95	6,268.2	-1,326.24	-2,764.0	-34.5	2,764.2	0.00	0.00	0.00
8,100.0	90.00	180.95	6,268.2	-1,326.24	-2,864.0	-36.2	2,864.2	0.00	0.00	0.00
8,200.0	90.00	180.95	6,268.2	-1,326.24	-2,964.0	-37.8	2,964.2	0.00	0.00	0.00
8,300.0	90.00	180.95	6,268.2	-1,326.24	-3,064.0	-39.5	3,064.2	0.00	0.00	0.00
8,400.0	90.00	180.95	6,268.2	-1,326.24	-3,163.9	-41.2	3,164.2	0.00	0.00	0.00
8,500.0	90.00	180.95	6,268.2	-1,326.24	-3,263.9	-42.8	3,264.2	0.00	0.00	0.00
8,600.0	90.00	180.95	6,268.2	-1,326.24	-3,363.9	-44.5	3,364.2	0.00	0.00	0.00
8,700.0	90.00	180.95	6,268.2	-1,326.24	-3,463.9	-46.2	3,464.2	0.00	0.00	0.00
8,800.0	90.00	180.95	6,268.2	-1,326.24	-3,563.9	-47.8	3,564.2	0.00	0.00	0.00
8,900.0	90.00	180.95	6,268.2	-1,326.24	-3,663.9	-49.5	3,664.2	0.00	0.00	0.00
9,000.0	90.00	180.95	6,268.2	-1,326.24	-3,763.9	-51.2	3,764.2	0.00	0.00	0.00
9,100.0	90.00	180.95	6,268.2	-1,326.24	-3,863.8	-52.8	3,864.2	0.00	0.00	0.00
9,200.0	90.00	180.95	6,268.2	-1,326.24	-3,963.8	-54.5	3,964.2	0.00	0.00	0.00
9,300.0	90.00	180.95	6,268.2	-1,326.24	-4,063.8	-56.1	4,064.2	0.00	0.00	0.00
9,400.0	90.00	180.95	6,268.2	-1,326.24	-4,163.8	-57.8	4,164.2	0.00	0.00	0.00
9,500.0	90.00	180.95	6,268.2	-1,326.24	-4,263.8	-59.5	4,264.2	0.00	0.00	0.00
9,600.0	90.00	180.95	6,268.2	-1,326.23	-4,363.8	-61.1	4,364.2	0.00	0.00	0.00
9,700.0	90.00	180.95	6,268.2	-1,326.23	-4,463.8	-62.8	4,464.2	0.00	0.00	0.00
9,800.0	90.00	180.95	6,268.2	-1,326.23	-4,563.7	-64.5	4,564.2	0.00	0.00	0.00
9,900.0	90.00	180.95	6,268.2	-1,326.23	-4,663.7	-66.1	4,664.2	0.00	0.00	0.00
10,000.0	90.00	180.95	6,268.2	-1,326.23	-4,763.7	-67.8	4,764.2	0.00	0.00	0.00
10,100.0	90.00	180.95	6,268.2	-1,326.23	-4,863.7	-69.5	4,864.2	0.00	0.00	0.00
10,200.0	90.00	180.95	6,268.2	-1,326.23	-4,963.7	-71.1	4,964.2	0.00	0.00	0.00
10,300.0	90.00	180.95	6,268.2	-1,326.23	-5,063.7	-72.8	5,064.2	0.00	0.00	0.00
10,400.0	90.00	180.95	6,268.2	-1,326.23	-5,163.7	-74.5	5,164.2	0.00	0.00	0.00
10,500.0	90.00	180.95	6,268.2	-1,326.23	-5,263.6	-76.1	5,264.2	0.00	0.00	0.00
10,600.0	90.00	180.95	6,268.2	-1,326.23	-5,363.6	-77.8	5,364.2	0.00	0.00	0.00
10,700.0	90.00	180.95	6,268.2	-1,326.23	-5,463.6	-79.5	5,464.2	0.00	0.00	0.00
10,800.0	90.00	180.95	6,268.2	-1,326.23	-5,563.6	-81.1	5,564.2	0.00	0.00	0.00
10,900.0	90.00	180.95	6,268.2	-1,326.23	-5,663.6	-82.8	5,664.2	0.00	0.00	0.00
11,000.0	90.00	180.95	6,268.2	-1,326.23	-5,763.6	-84.5	5,764.2	0.00	0.00	0.00
11,100.0	90.00	180.95	6,268.2	-1,326.23	-5,863.6	-86.1	5,864.2	0.00	0.00	0.00
11,200.0	90.00	180.95	6,268.2	-1,326.23	-5,963.6	-87.8	5,964.2	0.00	0.00	0.00
11,300.0	90.00	180.95	6,268.2	-1,326.23	-6,063.5	-89.5	6,064.2	0.00	0.00	0.00
11,400.0	90.00	180.95	6,268.2	-1,326.23	-6,163.5	-91.1	6,164.2	0.00	0.00	0.00
11,500.0	90.00	180.95	6,268.2	-1,326.22	-6,263.5	-92.8	6,264.2	0.00	0.00	0.00
11,600.0	90.00	180.95	6,268.2	-1,326.22	-6,363.5	-94.5	6,364.2	0.00	0.00	0.00
11,700.0	90.00	180.95	6,268.2	-1,326.22	-6,463.5	-96.1	6,464.2	0.00	0.00	0.00
11,800.0	90.00	180.95	6,268.2	-1,326.22	-6,563.5	-97.8	6,564.2	0.00	0.00	0.00
11,900.0	90.00	180.95	6,268.2	-1,326.22	-6,663.5	-99.4	6,664.2	0.00	0.00	0.00
12,000.0	90.00	180.95	6,268.2	-1,326.22	-6,763.4	-101.1	6,764.2	0.00	0.00	0.00
12,100.0	90.00	180.95	6,268.2	-1,326.22	-6,863.4	-102.8	6,864.2	0.00	0.00	0.00
12,200.0	90.00	180.95	6,268.2	-1,326.22	-6,963.4	-104.4	6,964.2	0.00	0.00	0.00
12,300.0	90.00	180.95	6,268.2	-1,326.22	-7,063.4	-106.1	7,064.2	0.00	0.00	0.00
12,400.0	90.00	180.95	6,268.2	-1,326.22	-7,163.4	-107.8	7,164.2	0.00	0.00	0.00
12,500.0	90.00	180.95	6,268.2	-1,326.22	-7,263.4	-109.4	7,264.2	0.00	0.00	0.00
12,600.0	90.00	180.95	6,268.2	-1,326.22	-7,363.4	-111.1	7,364.2	0.00	0.00	0.00
12,700.0	90.00	180.95	6,268.2	-1,326.22	-7,463.3	-112.8	7,464.2	0.00	0.00	0.00
12,800.0	90.00	180.95	6,268.2	-1,326.22	-7,563.3	-114.4	7,564.2	0.00	0.00	0.00
12,900.0	90.00	180.95	6,268.2	-1,326.22	-7,663.3	-116.1	7,664.2	0.00	0.00	0.00
13,000.0	90.00	180.95	6,268.2	-1,326.22	-7,763.3	-117.8	7,764.2	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4942.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4942.0usft (Original Well Elev)
Site:	SW SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-1HN	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)
13,100.0	90.00	180.95	6,268.2	-1,326.22	-7,863.3	-119.4	7,864.2	0.00	0.00	0.00
13,200.0	90.00	180.95	6,268.2	-1,326.22	-7,963.3	-121.1	7,964.2	0.00	0.00	0.00
13,300.0	90.00	180.95	6,268.2	-1,326.22	-8,063.3	-122.8	8,064.2	0.00	0.00	0.00
13,400.0	90.00	180.95	6,268.2	-1,326.21	-8,163.2	-124.4	8,164.2	0.00	0.00	0.00
13,500.0	90.00	180.95	6,268.2	-1,326.21	-8,263.2	-126.1	8,264.2	0.00	0.00	0.00
13,600.0	90.00	180.95	6,268.2	-1,326.21	-8,363.2	-127.8	8,364.2	0.00	0.00	0.00
13,700.0	90.00	180.95	6,268.2	-1,326.21	-8,463.2	-129.4	8,464.2	0.00	0.00	0.00
13,800.0	90.00	180.95	6,268.2	-1,326.21	-8,563.2	-131.1	8,564.2	0.00	0.00	0.00
13,900.0	90.00	180.95	6,268.2	-1,326.21	-8,663.2	-132.8	8,664.2	0.00	0.00	0.00
14,000.0	90.00	180.95	6,268.2	-1,326.21	-8,763.2	-134.4	8,764.2	0.00	0.00	0.00
14,100.0	90.00	180.95	6,268.2	-1,326.21	-8,863.2	-136.1	8,864.2	0.00	0.00	0.00
14,200.0	90.00	180.95	6,268.2	-1,326.21	-8,963.1	-137.8	8,964.2	0.00	0.00	0.00
14,300.0	90.00	180.95	6,268.2	-1,326.21	-9,063.1	-139.4	9,064.2	0.00	0.00	0.00
14,400.0	90.00	180.95	6,268.2	-1,326.21	-9,163.1	-141.1	9,164.2	0.00	0.00	0.00
14,500.0	90.00	180.95	6,268.2	-1,326.21	-9,263.1	-142.7	9,264.2	0.00	0.00	0.00
14,600.0	90.00	180.95	6,268.2	-1,326.21	-9,363.1	-144.4	9,364.2	0.00	0.00	0.00
14,700.0	90.00	180.95	6,268.2	-1,326.21	-9,463.1	-146.1	9,464.2	0.00	0.00	0.00
14,800.0	90.00	180.95	6,268.2	-1,326.21	-9,563.1	-147.7	9,564.2	0.00	0.00	0.00
14,900.0	90.00	180.95	6,268.2	-1,326.21	-9,663.0	-149.4	9,664.2	0.00	0.00	0.00
15,000.0	90.00	180.95	6,268.2	-1,326.21	-9,763.0	-151.1	9,764.2	0.00	0.00	0.00
15,100.0	90.00	180.95	6,268.2	-1,326.21	-9,863.0	-152.7	9,864.2	0.00	0.00	0.00
15,200.0	90.00	180.95	6,268.2	-1,326.21	-9,963.0	-154.4	9,964.2	0.00	0.00	0.00
15,300.0	90.00	180.95	6,268.2	-1,326.20	-10,063.0	-156.1	10,064.2	0.00	0.00	0.00
15,400.0	90.00	180.95	6,268.2	-1,326.20	-10,163.0	-157.7	10,164.2	0.00	0.00	0.00
15,500.0	90.00	180.95	6,268.2	-1,326.20	-10,263.0	-159.4	10,264.2	0.00	0.00	0.00
15,600.0	90.00	180.95	6,268.2	-1,326.20	-10,362.9	-161.1	10,364.2	0.00	0.00	0.00
15,700.0	90.00	180.95	6,268.2	-1,326.20	-10,462.9	-162.7	10,464.2	0.00	0.00	0.00
15,800.0	90.00	180.95	6,268.2	-1,326.20	-10,562.9	-164.4	10,564.2	0.00	0.00	0.00
15,900.0	90.00	180.95	6,268.2	-1,326.20	-10,662.9	-166.1	10,664.2	0.00	0.00	0.00
16,000.0	90.00	180.95	6,268.2	-1,326.20	-10,762.9	-167.7	10,764.2	0.00	0.00	0.00
16,100.0	90.00	180.95	6,268.2	-1,326.20	-10,862.9	-169.4	10,864.2	0.00	0.00	0.00
16,200.0	90.00	180.95	6,268.2	-1,326.20	-10,962.9	-171.1	10,964.2	0.00	0.00	0.00
BHL: 600ft FSL & 605ft FWL of Sec 11										
16,222.4	90.00	180.95	6,268.2	-1,326.20	-10,985.2	-171.4	10,986.6	0.00	0.00	0.00

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,526.7	1,526.7	FOX HILLS BASE				
3,348.2	3,329.2	RICHARD SANDSTONE				
4,249.1	4,190.7	SUSSEX SANDSTONE				
4,759.5	4,678.7	SHANNON SANDSTONE				
6,281.8	6,103.2	SHARON SPRINGS				
6,385.0	6,168.7	NIOBRARA A CHALK				
6,419.4	6,187.2	NIOBRARA A CHALK BASE				
6,490.3	6,219.7	NIOBRARA B1 CHALK TOP				
6,564.9	6,245.2	NIOBRARA B1 CHALK BASE				
6,727.8	6,268.2	NIOBRARA B2 CHALK TOP				

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-1HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4942.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4942.0usft (Original Well Elev)
Site:	SW SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.0	0.0	0.0	0.0	SHL: 892ft FSL & 1079ft FWL of Sec 35
1,555.0	1,555.0	0.0	0.0	SURFACE CASING
2,350.0	2,350.0	0.0	0.0	START NUDGE (2°/100ft BUR)
3,201.0	3,188.5	-125.5	-0.7	EOB TO 17.02° INC
5,997.9	5,863.0	-944.1	-5.5	KOP (10°/100ft DGLG)
6,727.8	6,268.2	-1,491.9	-13.3	HZ LP: 600ft FNL & 605ft FWL of Sec 2
16,222.4	6,268.2	-10,985.2	-171.4	BHL: 600ft FSL & 605ft FWL of Sec 11