

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

PINTAIL FED 2-11-2HN

ORIGINAL WELLBORE

04 December, 2018

Plan: PROPOSAL #4





Project: WELD COUNTY, COLORADO (NAD 83)
Site: SE SW SEC. 35 T9N R60W 6TH P.M.
Well: PINTAIL FED 2-11-2HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #4

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Dep	Annotation	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 334ft FSL & 1417ft FWL of Sec 35	
1555.00	1555.00	0.00	0.00	0.00	0.00	0.00	0.00	SURFACE CASING	
5390.00	5390.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP #1 (10°/100ft BUR)	
5509.12	5510.00	12.00	163.23	-11.99	3.61	11.94	12.52	EOB TO 12° INC	
5801.72	5809.13	12.00	163.23	-71.54	21.56	71.28	74.71	KOP #2 (10°/100ft DGLG)	
6260.25	6594.91	90.00	180.96	-633.56	41.87	633.03	637.91	HZ LP: 300ft FNL & 1005ft FWL of Sec 2	
6260.25	16690.04	90.00	180.96	-10727.29	-126.54	10728.03	10733.03	BHL: 300ft FSL & 1005ft FWL Of Sec 11	

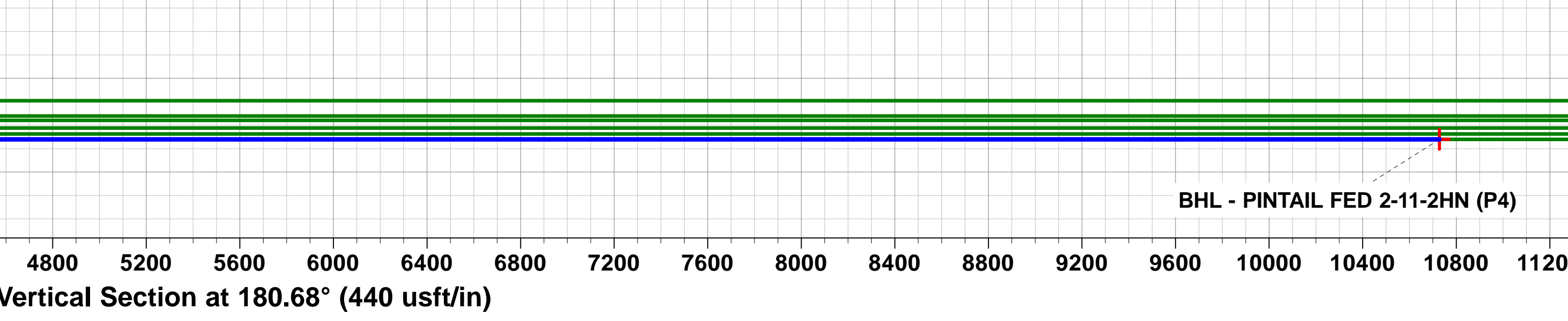
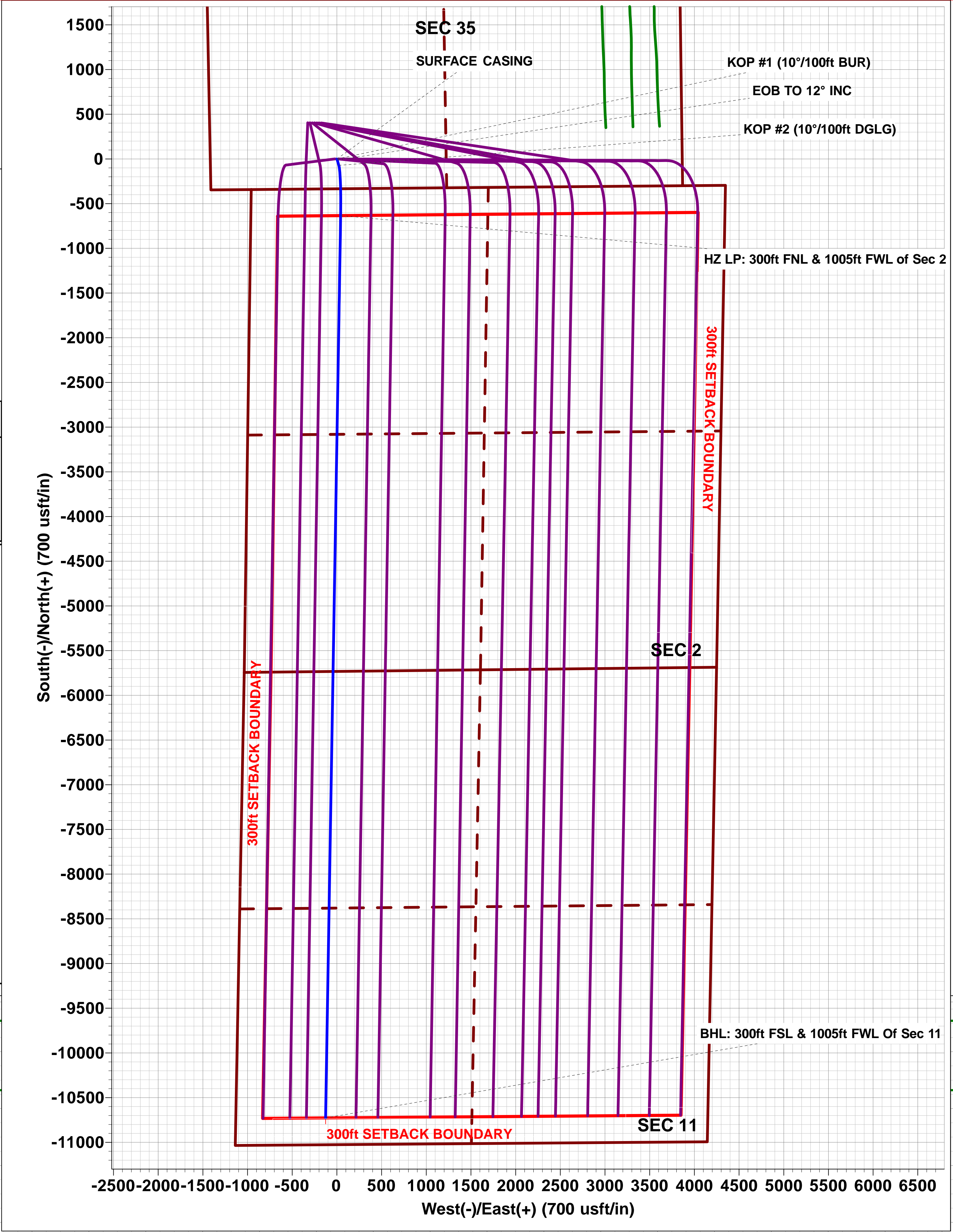
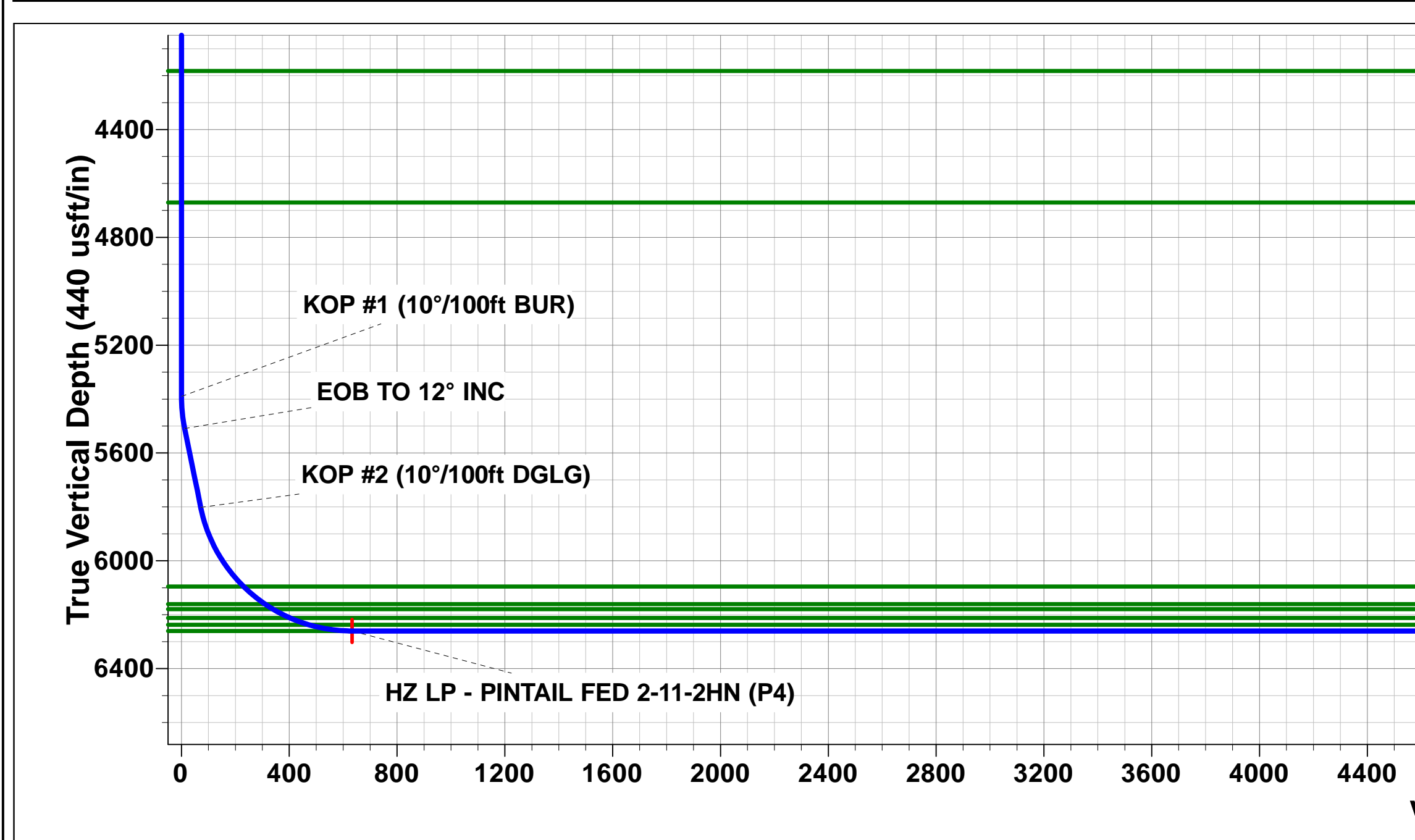
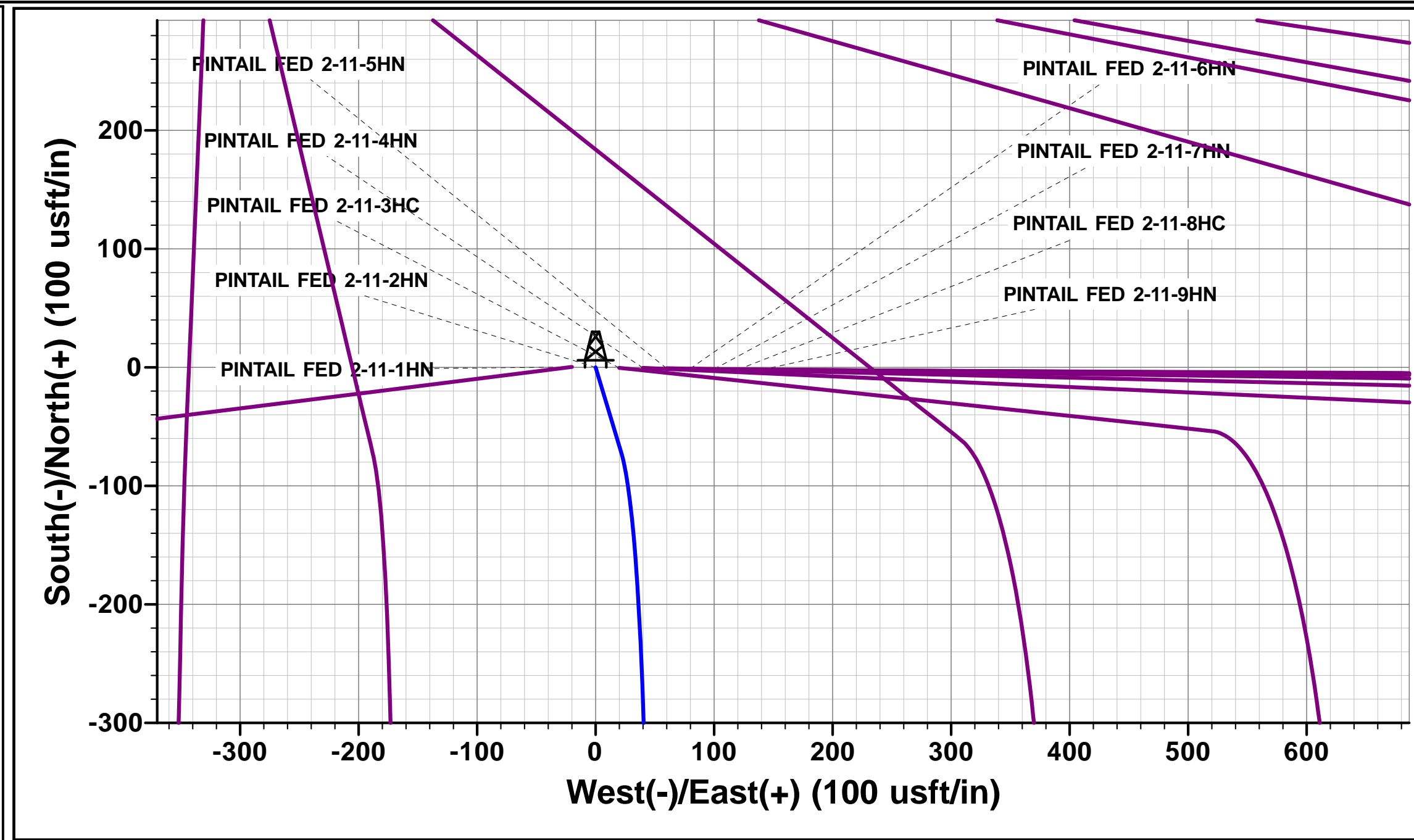
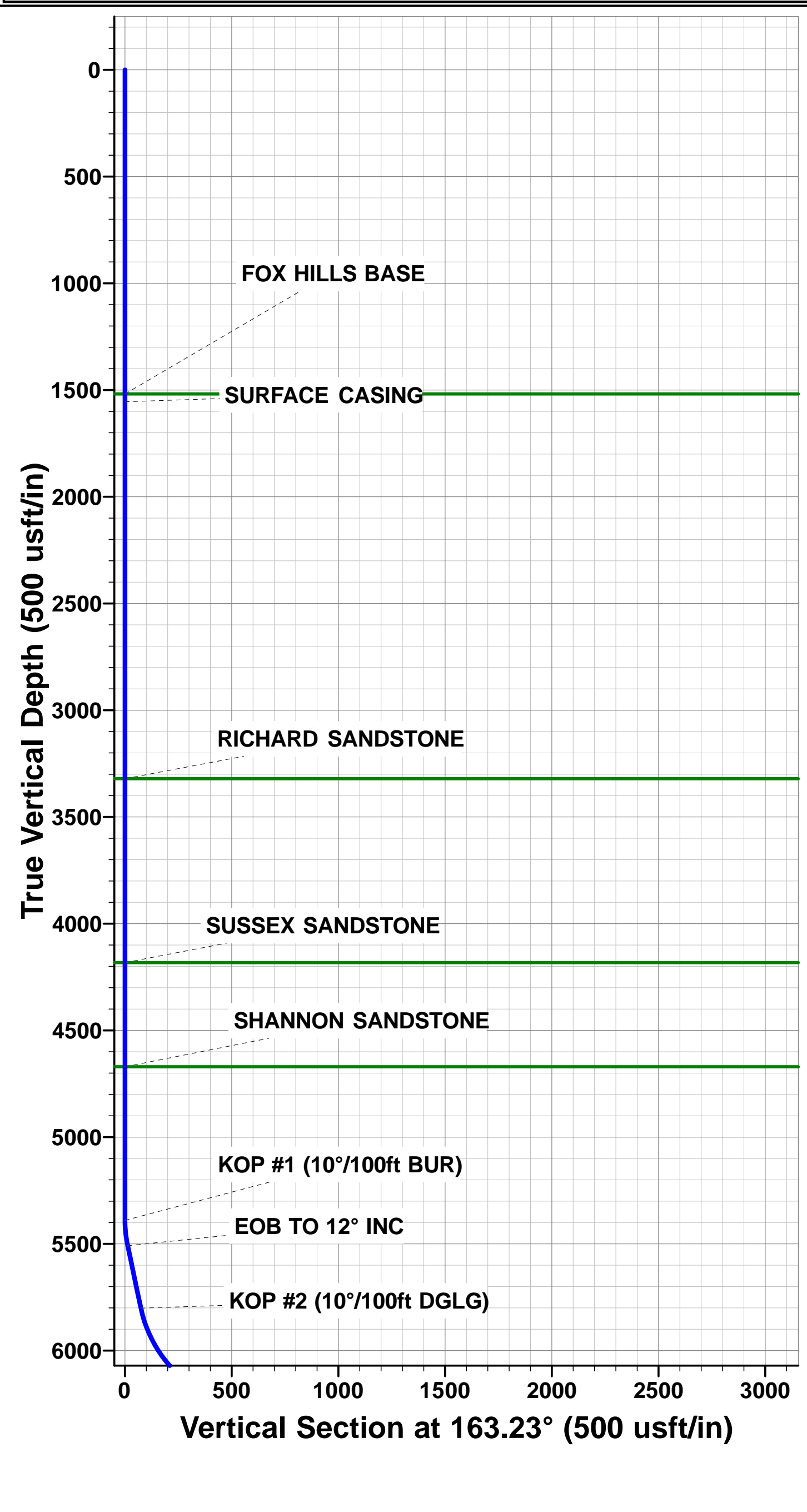
PROPOSED LOCAL COORDINATES:

SHL: 334ft FSL & 1417ft FWL Sec 35

HZ LP: 300ft FNL & 1005ft FWL Sec 2

BHL: 300ft FSL & 1005ft FWL of Sec 11

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - PINTAIL FED 2-11-2HN (P4)	6260.25	-633.56	41.87	40.698284	-104.063093
BHL - PINTAIL FED 2-11-2HN (P4)	6260.25	-10727.29	-126.50	40.670579	-104.063700



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-11-2HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4934.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4934.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #4		

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	SE 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:	0.00 usft	Slot Radius:	1.10000ft
		Latitude:	40.701546
		Longitude:	-104.064503
		Grid Convergence:	0.93 °

Well	PINTAIL FED 2-11-2HN		
Well Position	+N-S	-554.88 usft	Northing:
	+E-W	349.10 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)
	IGRF2015	04/12/2018	7.70	67.16	52,450

Design	PROPOSAL #4			
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	180.68

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	-4,934.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,390.00	0.00	0.00	5,390.00	456.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,510.00	12.00	163.23	5,509.13	575.13	-11.99	3.61	10.00	10.00	0.00	163.23	
5,809.13	12.00	163.23	5,801.72	867.72	-71.54	21.56	0.00	0.00	0.00	0.00	
6,594.91	90.00	180.96	6,260.25	1,326.25	-633.56	41.87	10.00	9.93	2.26	18.10	HZ LP - PINTAIL FI
16,690.04	90.00	180.96	6,260.25	1,326.25	-10,727.25	-126.50	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 @ 4934.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #4		

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: 334ft FSL & 1417ft FWL of Sec 35										
0.00	0.00	0.00	0.00	4,934.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,834.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,734.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,634.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,534.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4,434.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	4,334.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	4,234.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	4,134.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	4,034.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	3,934.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	3,834.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	3,734.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	3,634.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	3,534.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	3,434.00	0.00	0.00	0.00	0.00	0.00	0.00
FOX HILLS BASE										
1,518.75	0.00	0.00	1,518.75	3,415.25	0.00	0.00	0.00	0.00	0.00	0.00
SURFACE CASING										
1,555.00	0.00	0.00	1,555.00	3,379.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	3,334.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	3,234.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	3,134.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	3,034.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	2,934.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	2,834.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	2,734.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	2,634.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	2,534.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	2,434.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	2,334.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	2,234.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	2,134.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	2,034.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	1,934.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	1,834.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	1,734.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	1,634.00	0.00	0.00	0.00	0.00	0.00	0.00
RICHARD SANDSTONE										
3,321.25	0.00	0.00	3,321.25	1,612.75	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	1,534.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	1,434.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	1,334.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	1,234.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	1,134.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	1,034.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	934.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	834.00	0.00	0.00	0.00	0.00	0.00	0.00
SUSSEX SANDSTONE										
4,182.75	0.00	0.00	4,182.75	751.25	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	734.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	634.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	534.00	0.00	0.00	0.00	0.00	0.00	0.00

Planning Report



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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4934.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #4		

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)
4,500.00	0.00	0.00	4,500.00	434.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	334.00	0.00	0.00	0.00	0.00	0.00	0.00
SHANNON SANDSTONE										
4,670.75	0.00	0.00	4,670.75	263.25	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	234.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	134.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	34.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	-66.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	-166.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	-266.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	-366.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP #1 (10°/100ft BUR)										
5,390.00	0.00	0.00	5,390.00	-456.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	1.00	163.23	5,400.00	-466.00	-0.08	0.03	0.08	10.00	10.00	0.00
5,500.00	11.00	163.23	5,499.33	-565.33	-10.08	3.04	10.04	10.00	10.00	0.00
EOB TO 12° INC										
5,510.00	12.00	163.23	5,509.12	-575.12	-11.99	3.61	11.94	10.00	10.00	0.00
5,600.00	12.00	163.23	5,597.16	-663.16	-29.90	9.01	29.80	0.00	0.00	0.00
5,700.00	12.00	163.23	5,694.97	-760.97	-49.81	15.01	49.63	0.00	0.00	0.00
5,800.00	12.00	163.23	5,792.79	-858.79	-69.72	21.01	69.46	0.00	0.00	0.00
KOP #2 (10°/100ft DGLG)										
5,809.13	12.00	163.23	5,801.72	-867.72	-71.54	21.56	71.28	0.00	0.00	0.00
5,900.00	20.83	171.16	5,888.81	-954.81	-96.59	26.78	96.27	10.00	9.71	8.73
6,000.00	30.71	174.70	5,978.76	-1,044.76	-139.70	31.89	139.31	10.00	9.88	3.54
6,100.00	40.65	176.63	6,059.89	-1,125.89	-197.79	36.17	197.34	10.00	9.94	1.93
SHARON SPRINGS										
6,148.41	45.47	177.30	6,095.25	-1,161.25	-230.78	37.91	230.32	10.00	9.96	1.39
6,200.00	50.61	177.91	6,129.73	-1,195.73	-269.10	39.50	268.61	10.00	9.96	1.17
NIOBRARA A CHALK										
6,251.78	55.77	178.43	6,160.75	-1,226.75	-310.52	40.82	310.02	10.00	9.97	1.01
NIOBRARA A CHALK BASE										
6,286.21	59.20	178.74	6,179.25	-1,245.25	-339.53	41.53	339.02	10.00	9.97	0.91
6,300.00	60.58	178.86	6,186.17	-1,252.17	-351.46	41.78	350.95	10.00	9.97	0.86
NIOBRARA B1 CHALK TOP										
6,357.21	66.28	179.33	6,211.75	-1,277.75	-402.61	42.58	402.08	10.00	9.97	0.81
6,400.00	70.55	179.65	6,227.48	-1,293.48	-442.38	42.94	441.84	10.00	9.98	0.75
NIOBRARA B1 CHALK BASE										
6,431.84	73.73	179.87	6,237.25	-1,303.25	-472.69	43.07	472.15	10.00	9.98	0.71
6,500.00	80.53	180.34	6,252.42	-1,318.42	-539.09	42.94	538.55	10.00	9.98	0.68
HZ LP: 300ft FNL & 1005ft FWL of Sec 2 - NIOBRARA B2 CHALK TOP										
6,594.91	90.00	180.96	6,260.25	-1,326.25	-633.56	41.87	633.02	10.00	9.98	0.65
6,600.00	90.00	180.96	6,260.25	-1,326.25	-638.65	41.79	638.12	0.00	0.00	0.00
6,700.00	90.00	180.96	6,260.25	-1,326.25	-738.64	40.12	738.11	0.00	0.00	0.00
6,800.00	90.00	180.96	6,260.25	-1,326.25	-838.62	38.45	838.11	0.00	0.00	0.00
6,900.00	90.00	180.96	6,260.25	-1,326.25	-938.61	36.78	938.11	0.00	0.00	0.00
7,000.00	90.00	180.96	6,260.25	-1,326.25	-1,038.60	35.11	1,038.11	0.00	0.00	0.00
7,100.00	90.00	180.96	6,260.25	-1,326.25	-1,138.58	33.44	1,138.11	0.00	0.00	0.00
7,200.00	90.00	180.96	6,260.25	-1,326.25	-1,238.57	31.78	1,238.11	0.00	0.00	0.00
7,300.00	90.00	180.96	6,260.25	-1,326.25	-1,338.56	30.11	1,338.11	0.00	0.00	0.00
7,400.00	90.00	180.96	6,260.25	-1,326.25	-1,438.54	28.44	1,438.11	0.00	0.00	0.00
7,500.00	90.00	180.96	6,260.25	-1,326.25	-1,538.53	26.77	1,538.10	0.00	0.00	0.00
7,600.00	90.00	180.96	6,260.25	-1,326.25	-1,638.51	25.10	1,638.10	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-11-2HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4934.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4934.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #4		

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)
7,700.00	90.00	180.96	6,260.25	-1,326.25	-1,738.50	23.43	1,738.10	0.00	0.00	0.00
7,800.00	90.00	180.96	6,260.25	-1,326.25	-1,838.49	21.77	1,838.10	0.00	0.00	0.00
7,900.00	90.00	180.96	6,260.25	-1,326.25	-1,938.47	20.10	1,938.10	0.00	0.00	0.00
8,000.00	90.00	180.96	6,260.25	-1,326.25	-2,038.46	18.43	2,038.10	0.00	0.00	0.00
8,100.00	90.00	180.96	6,260.25	-1,326.25	-2,138.44	16.76	2,138.10	0.00	0.00	0.00
8,200.00	90.00	180.96	6,260.25	-1,326.25	-2,238.43	15.09	2,238.10	0.00	0.00	0.00
8,300.00	90.00	180.96	6,260.25	-1,326.25	-2,338.42	13.42	2,338.10	0.00	0.00	0.00
8,400.00	90.00	180.96	6,260.25	-1,326.25	-2,438.40	11.76	2,438.09	0.00	0.00	0.00
8,500.00	90.00	180.96	6,260.25	-1,326.25	-2,538.39	10.09	2,538.09	0.00	0.00	0.00
8,600.00	90.00	180.96	6,260.25	-1,326.25	-2,638.37	8.42	2,638.09	0.00	0.00	0.00
8,700.00	90.00	180.96	6,260.25	-1,326.25	-2,738.36	6.75	2,738.09	0.00	0.00	0.00
8,800.00	90.00	180.96	6,260.25	-1,326.25	-2,838.35	5.08	2,838.09	0.00	0.00	0.00
8,900.00	90.00	180.96	6,260.25	-1,326.25	-2,938.33	3.42	2,938.09	0.00	0.00	0.00
9,000.00	90.00	180.96	6,260.25	-1,326.25	-3,038.32	1.75	3,038.09	0.00	0.00	0.00
9,100.00	90.00	180.96	6,260.25	-1,326.25	-3,138.30	0.08	3,138.09	0.00	0.00	0.00
9,200.00	90.00	180.96	6,260.25	-1,326.25	-3,238.29	-1.59	3,238.08	0.00	0.00	0.00
9,300.00	90.00	180.96	6,260.25	-1,326.25	-3,338.28	-3.26	3,338.08	0.00	0.00	0.00
9,400.00	90.00	180.96	6,260.25	-1,326.25	-3,438.26	-4.93	3,438.08	0.00	0.00	0.00
9,500.00	90.00	180.96	6,260.25	-1,326.25	-3,538.25	-6.59	3,538.08	0.00	0.00	0.00
9,600.00	90.00	180.96	6,260.25	-1,326.25	-3,638.24	-8.26	3,638.08	0.00	0.00	0.00
9,700.00	90.00	180.96	6,260.25	-1,326.25	-3,738.22	-9.93	3,738.08	0.00	0.00	0.00
9,800.00	90.00	180.96	6,260.25	-1,326.25	-3,838.21	-11.60	3,838.08	0.00	0.00	0.00
9,900.00	90.00	180.96	6,260.25	-1,326.25	-3,938.19	-13.27	3,938.08	0.00	0.00	0.00
10,000.00	90.00	180.96	6,260.25	-1,326.25	-4,038.18	-14.94	4,038.07	0.00	0.00	0.00
10,100.00	90.00	180.96	6,260.25	-1,326.25	-4,138.17	-16.60	4,138.07	0.00	0.00	0.00
10,200.00	90.00	180.96	6,260.25	-1,326.25	-4,238.15	-18.27	4,238.07	0.00	0.00	0.00
10,300.00	90.00	180.96	6,260.25	-1,326.25	-4,338.14	-19.94	4,338.07	0.00	0.00	0.00
10,400.00	90.00	180.96	6,260.25	-1,326.25	-4,438.12	-21.61	4,438.07	0.00	0.00	0.00
10,500.00	90.00	180.96	6,260.25	-1,326.25	-4,538.11	-23.28	4,538.07	0.00	0.00	0.00
10,600.00	90.00	180.96	6,260.25	-1,326.25	-4,638.10	-24.95	4,638.07	0.00	0.00	0.00
10,700.00	90.00	180.96	6,260.25	-1,326.25	-4,738.08	-26.61	4,738.07	0.00	0.00	0.00
10,800.00	90.00	180.96	6,260.25	-1,326.25	-4,838.07	-28.28	4,838.07	0.00	0.00	0.00
10,900.00	90.00	180.96	6,260.25	-1,326.25	-4,938.05	-29.95	4,938.06	0.00	0.00	0.00
11,000.00	90.00	180.96	6,260.25	-1,326.25	-5,038.04	-31.62	5,038.06	0.00	0.00	0.00
11,100.00	90.00	180.96	6,260.25	-1,326.25	-5,138.03	-33.29	5,138.06	0.00	0.00	0.00
11,200.00	90.00	180.96	6,260.25	-1,326.25	-5,238.01	-34.96	5,238.06	0.00	0.00	0.00
11,300.00	90.00	180.96	6,260.25	-1,326.25	-5,338.00	-36.62	5,338.06	0.00	0.00	0.00
11,400.00	90.00	180.96	6,260.25	-1,326.25	-5,437.98	-38.29	5,438.06	0.00	0.00	0.00
11,500.00	90.00	180.96	6,260.25	-1,326.25	-5,537.97	-39.96	5,538.06	0.00	0.00	0.00
11,600.00	90.00	180.96	6,260.25	-1,326.25	-5,637.96	-41.63	5,638.06	0.00	0.00	0.00
11,700.00	90.00	180.96	6,260.25	-1,326.25	-5,737.94	-43.30	5,738.05	0.00	0.00	0.00
11,800.00	90.00	180.96	6,260.25	-1,326.25	-5,837.93	-44.97	5,838.05	0.00	0.00	0.00
11,900.00	90.00	180.96	6,260.25	-1,326.25	-5,937.91	-46.63	5,938.05	0.00	0.00	0.00
12,000.00	90.00	180.96	6,260.25	-1,326.25	-6,037.90	-48.30	6,038.05	0.00	0.00	0.00
12,100.00	90.00	180.96	6,260.25	-1,326.25	-6,137.89	-49.97	6,138.05	0.00	0.00	0.00
12,200.00	90.00	180.96	6,260.25	-1,326.25	-6,237.87	-51.64	6,238.05	0.00	0.00	0.00
12,300.00	90.00	180.96	6,260.25	-1,326.25	-6,337.86	-53.31	6,338.05	0.00	0.00	0.00
12,400.00	90.00	180.96	6,260.25	-1,326.25	-6,437.85	-54.97	6,438.05	0.00	0.00	0.00
12,500.00	90.00	180.96	6,260.25	-1,326.25	-6,537.83	-56.64	6,538.04	0.00	0.00	0.00
12,600.00	90.00	180.96	6,260.25	-1,326.25	-6,637.82	-58.31	6,638.04	0.00	0.00	0.00
12,700.00	90.00	180.96	6,260.25	-1,326.25	-6,737.80	-59.98	6,738.04	0.00	0.00	0.00
12,800.00	90.00	180.96	6,260.25	-1,326.25	-6,837.79	-61.65	6,838.04	0.00	0.00	0.00
12,900.00	90.00	180.96	6,260.25	-1,326.25	-6,937.78	-63.32	6,938.04	0.00	0.00	0.00
13,000.00	90.00	180.96	6,260.25	-1,326.25	-7,037.76	-64.98	7,038.04	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-11-2HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4934.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4934.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #4		

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)
13,100.00	90.00	180.96	6,260.25	-1,326.25	-7,137.75	-66.65	7,138.04	0.00	0.00	0.00
13,200.00	90.00	180.96	6,260.25	-1,326.25	-7,237.73	-68.32	7,238.04	0.00	0.00	0.00
13,300.00	90.00	180.96	6,260.25	-1,326.25	-7,337.72	-69.99	7,338.04	0.00	0.00	0.00
13,400.00	90.00	180.96	6,260.25	-1,326.25	-7,437.71	-71.66	7,438.03	0.00	0.00	0.00
13,500.00	90.00	180.96	6,260.25	-1,326.25	-7,537.69	-73.33	7,538.03	0.00	0.00	0.00
13,600.00	90.00	180.96	6,260.25	-1,326.25	-7,637.68	-74.99	7,638.03	0.00	0.00	0.00
13,700.00	90.00	180.96	6,260.25	-1,326.25	-7,737.66	-76.66	7,738.03	0.00	0.00	0.00
13,800.00	90.00	180.96	6,260.25	-1,326.25	-7,837.65	-78.33	7,838.03	0.00	0.00	0.00
13,900.00	90.00	180.96	6,260.25	-1,326.25	-7,937.64	-80.00	7,938.03	0.00	0.00	0.00
14,000.00	90.00	180.96	6,260.25	-1,326.25	-8,037.62	-81.67	8,038.03	0.00	0.00	0.00
14,100.00	90.00	180.96	6,260.25	-1,326.25	-8,137.61	-83.34	8,138.03	0.00	0.00	0.00
14,200.00	90.00	180.96	6,260.25	-1,326.25	-8,237.59	-85.00	8,238.02	0.00	0.00	0.00
14,300.00	90.00	180.96	6,260.25	-1,326.25	-8,337.58	-86.67	8,338.02	0.00	0.00	0.00
14,400.00	90.00	180.96	6,260.25	-1,326.25	-8,437.57	-88.34	8,438.02	0.00	0.00	0.00
14,500.00	90.00	180.96	6,260.25	-1,326.25	-8,537.55	-90.01	8,538.02	0.00	0.00	0.00
14,600.00	90.00	180.96	6,260.25	-1,326.25	-8,637.54	-91.68	8,638.02	0.00	0.00	0.00
14,700.00	90.00	180.96	6,260.25	-1,326.25	-8,737.53	-93.35	8,738.02	0.00	0.00	0.00
14,800.00	90.00	180.96	6,260.25	-1,326.25	-8,837.51	-95.01	8,838.02	0.00	0.00	0.00
14,900.00	90.00	180.96	6,260.25	-1,326.25	-8,937.50	-96.68	8,938.02	0.00	0.00	0.00
15,000.00	90.00	180.96	6,260.25	-1,326.25	-9,037.48	-98.35	9,038.01	0.00	0.00	0.00
15,100.00	90.00	180.96	6,260.25	-1,326.25	-9,137.47	-100.02	9,138.01	0.00	0.00	0.00
15,200.00	90.00	180.96	6,260.25	-1,326.25	-9,237.46	-101.69	9,238.01	0.00	0.00	0.00
15,300.00	90.00	180.96	6,260.25	-1,326.25	-9,337.44	-103.35	9,338.01	0.00	0.00	0.00
15,400.00	90.00	180.96	6,260.25	-1,326.25	-9,437.43	-105.02	9,438.01	0.00	0.00	0.00
15,500.00	90.00	180.96	6,260.25	-1,326.25	-9,537.41	-106.69	9,538.01	0.00	0.00	0.00
15,600.00	90.00	180.96	6,260.25	-1,326.25	-9,637.40	-108.36	9,638.01	0.00	0.00	0.00
15,700.00	90.00	180.96	6,260.25	-1,326.25	-9,737.39	-110.03	9,738.01	0.00	0.00	0.00
15,800.00	90.00	180.96	6,260.25	-1,326.25	-9,837.37	-111.70	9,838.01	0.00	0.00	0.00
15,900.00	90.00	180.96	6,260.25	-1,326.25	-9,937.36	-113.36	9,938.00	0.00	0.00	0.00
16,000.00	90.00	180.96	6,260.25	-1,326.25	-10,037.34	-115.03	10,038.00	0.00	0.00	0.00
16,100.00	90.00	180.96	6,260.25	-1,326.25	-10,137.33	-116.70	10,138.00	0.00	0.00	0.00
16,200.00	90.00	180.96	6,260.25	-1,326.25	-10,237.32	-118.37	10,238.00	0.00	0.00	0.00
16,300.00	90.00	180.96	6,260.25	-1,326.25	-10,337.30	-120.04	10,338.00	0.00	0.00	0.00
16,400.00	90.00	180.96	6,260.25	-1,326.25	-10,437.29	-121.71	10,438.00	0.00	0.00	0.00
16,500.00	90.00	180.96	6,260.25	-1,326.25	-10,537.27	-123.37	10,538.00	0.00	0.00	0.00
16,600.00	90.00	180.96	6,260.25	-1,326.25	-10,637.26	-125.04	10,638.00	0.00	0.00	0.00
BHL: 300ft FSL & 1005ft FWL Of Sec 11										
16,690.04	90.00	180.96	6,260.25	-1,326.25	-10,727.29	-126.54	10,728.03	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well PINTAIL FED 2-11-2HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4934.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4934.00usft
Site:	SE SW SEC. 35 T9N R60W 6TH P.M.	North Reference:	True
Well:	PINTAIL FED 2-11-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #4		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,518.75	1,518.75	FOX HILLS BASE			
3,321.25	3,321.25	RICHARD SANDSTONE			
4,182.75	4,182.75	SUSSEX SANDSTONE			
4,670.75	4,670.75	SHANNON SANDSTONE			
6,148.41	6,095.25	SHARON SPRINGS			
6,251.78	6,160.75	NIOBRARA A CHALK			
6,286.21	6,179.25	NIOBRARA A CHALK BASE			
6,357.21	6,211.75	NIOBRARA B1 CHALK TOP			
6,431.84	6,237.25	NIOBRARA B1 CHALK BASE			
6,594.91	6,260.25	NIOBRARA B2 CHALK TOP			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 334ft FSL & 1417ft FWL of Sec 35
1,555.00	1,555.00	0.00	0.00	SURFACE CASING
5,390.00	5,390.00	0.00	0.00	KOP #1 (10°/100ft BUR)
5,510.00	5,509.12	-11.99	3.61	EOB TO 12° INC
5,809.13	5,801.72	-71.54	21.56	KOP #2 (10°/100ft DGLG)
6,594.91	6,260.25	-633.56	41.87	HZ LP: 300ft FNL & 1005ft FWL of Sec 2
16,690.04	6,260.25	-10,727.29	-126.54	BHL: 300ft FSL & 1005ft FWL Of Sec 11