

# **MALLARD EXPLORATION**

**WELD COUNTY, COLORADO (NAD 83)**

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

**PINTAIL FED 2-2HC**

**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 2-2HC  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #2

ANNOTATIONS										
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation		
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 892ft FSL & 1104ft FWL of Sec 35		
1555.0	1555.0	0.00	0.00	0.0	0.0	0.0	0.0	SURFACE CASING		
2250.0	2250.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (2°/100ft BUR)		
3019.6	3029.2	15.58	171.73	-104.2	15.1	104.2	105.3	EOB TO 15.58° INC		
6037.2	6161.9	15.58	171.73	-937.1	136.1	937.2	946.9	KOP (10°/100ft DGLG)		
6457.8	6908.1	90.00	180.83	-1489.7	146.7	1489.9	1499.9	HZ LP: 600ft FNL & 790ft FWL of Sec 2		
6457.7	16402.8	90.00	180.83	-10983.4	9.2	10983.4	10994.6	BHL: 600ft FSL & 811ft FWL Of Sec 11		

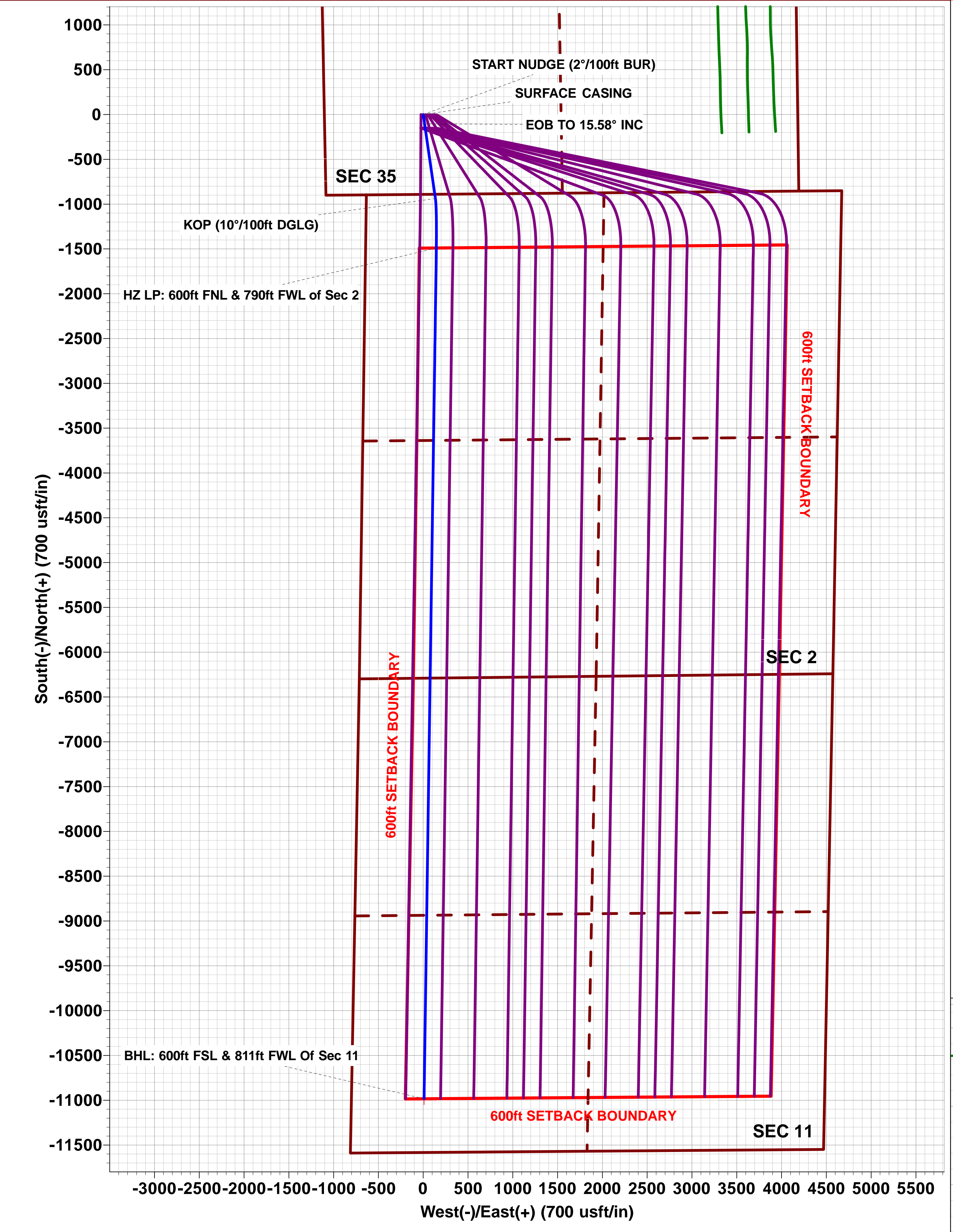
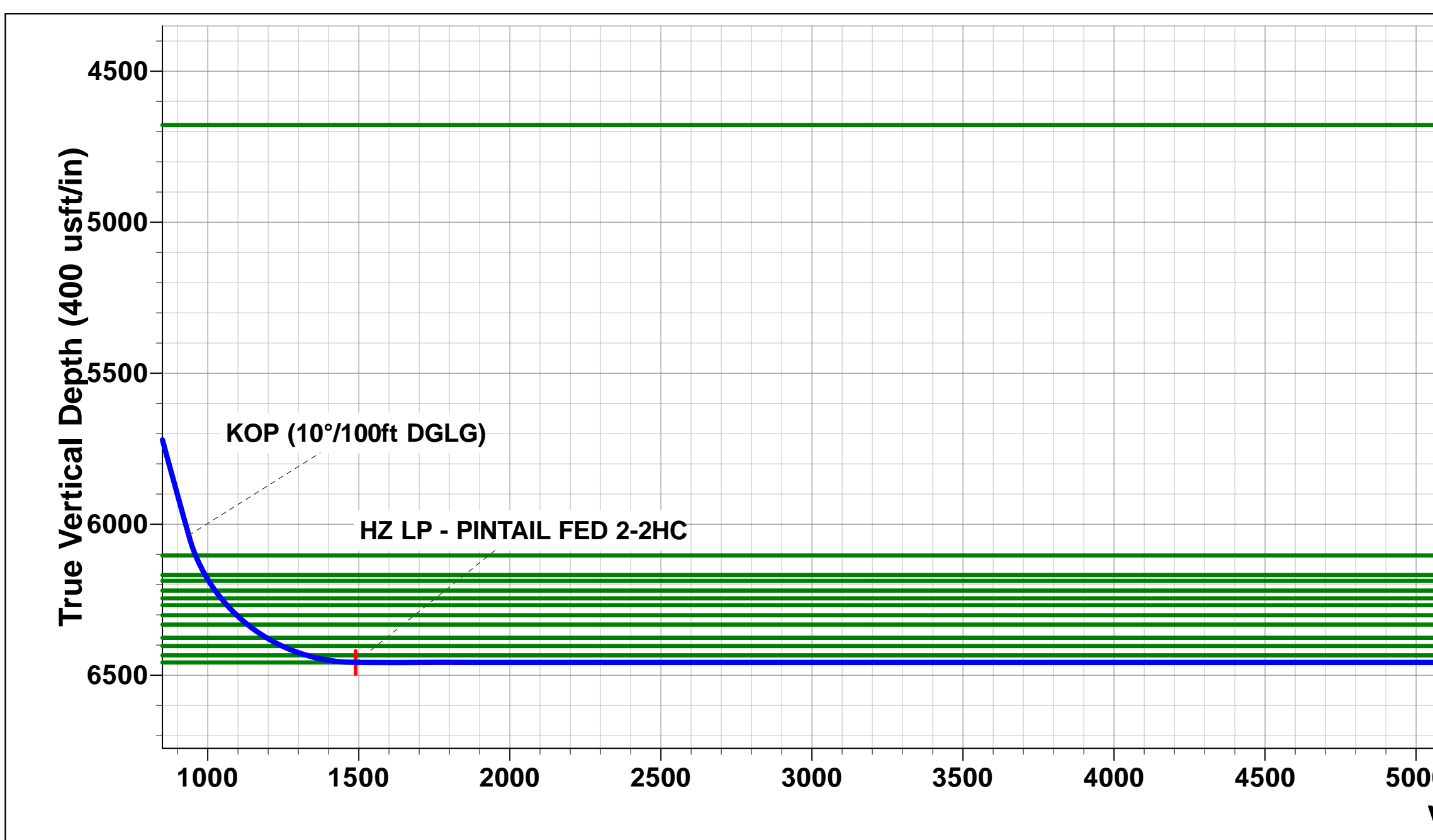
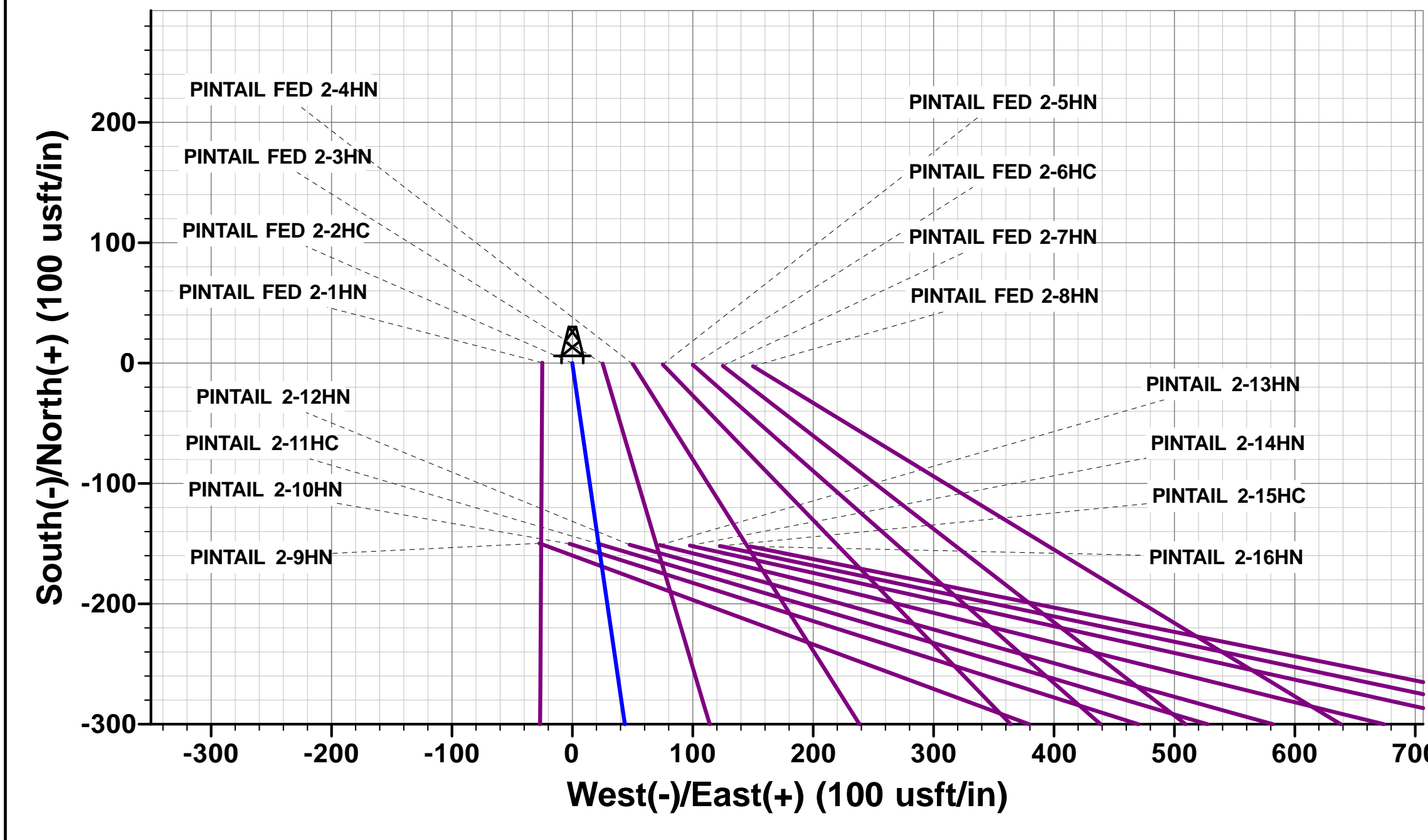
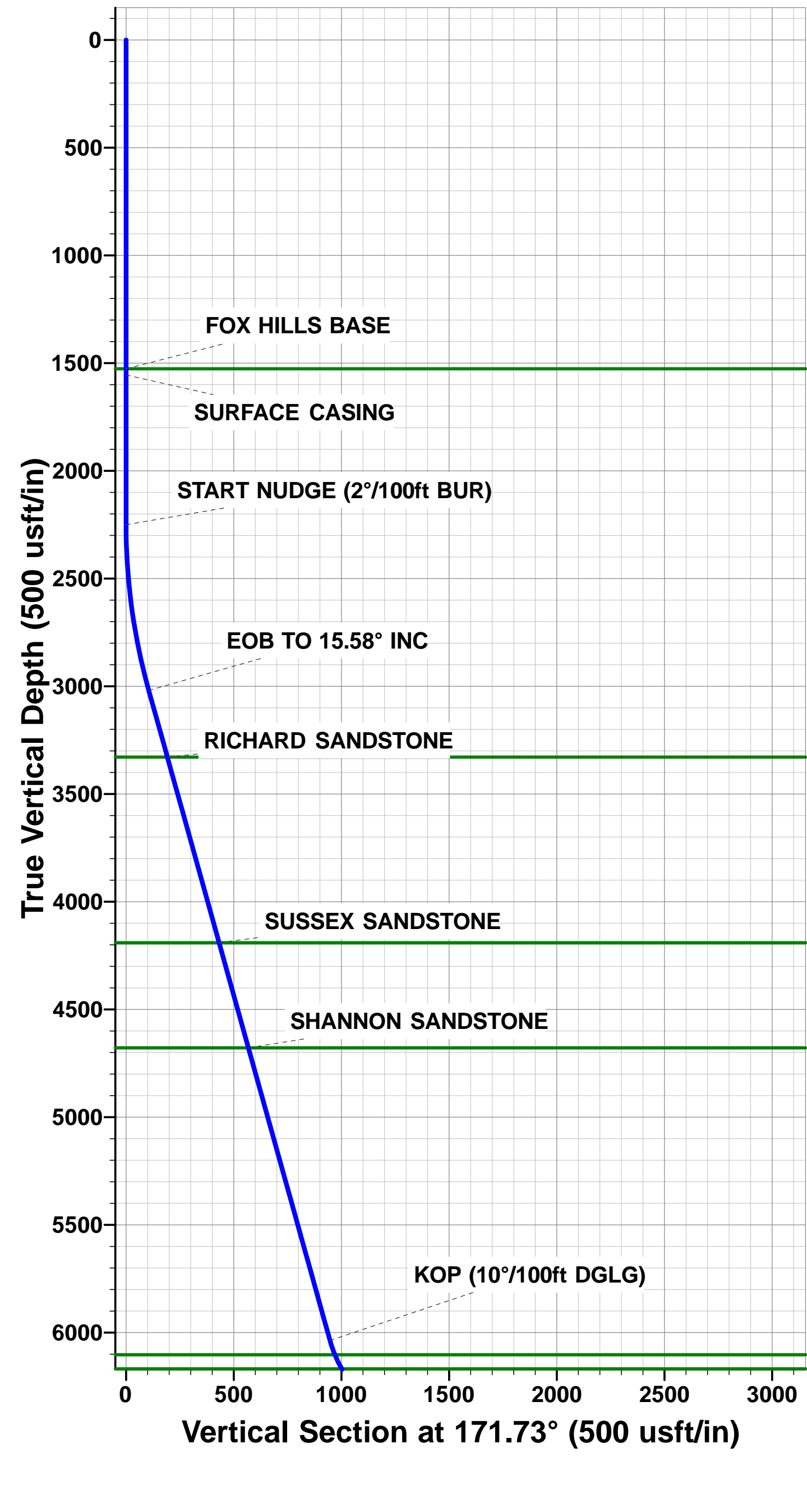
PROPOSED LOCAL COORDINATES:

SHL: 892ft FSL & 1104ft FWL Sec 35

HZ LP: 600ft FNL & 790ft FWL Sec 2

BHL: 600ft FSL & 811ft FWL of Sec 11

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - PINTAIL FED 2-2HC	6457.7	-1489.7	146.7	40.697456	-104.063884
BHL - PINTAIL FED 2-2HC (P2)	6457.7	-10983.4	9.2	40.671398	-104.064380



# Planning Report



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

<b>Project</b>	WELD COUNTY, COLORADO (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	SW SW SEC. 35 T9N R60W 6TH P.M.		
<b>Site Position:</b>		<b>Northing:</b>	1,501,638.38 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,398,005.01 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	1.10000ft
		<b>Latitude:</b>	40.701546
		<b>Longitude:</b>	-104.064503
		<b>Grid Convergence:</b>	0.93 °

<b>Well</b>	PINTAIL FED 2-2HC		
<b>Well Position</b>	<b>+N-S</b>	-0.4 usft	<b>Northing:</b>
	<b>+E-W</b>	25.0 usft	<b>Easting:</b>
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	26/08/2017	7.83	67.20	52,597

<b>Design</b>	PROPOSAL #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>
	6,457.7	0.0	0.0	179.95

<b>Plan Sections</b>											
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	
2,250.0	0.00	0.00	2,250.0	-2,692.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,029.2	15.58	171.73	3,019.6	-1,922.4	-104.2	15.1	2.00	2.00	0.00	171.73	
6,161.9	15.58	171.73	6,037.2	1,095.2	-937.1	136.1	0.00	0.00	0.00	0.00	
6,908.1	90.00	180.83	6,457.7	1,515.7	-1,489.7	146.7	10.00	9.97	1.22	9.44	HZ LP - PINTAIL FI
16,402.8	90.00	180.83	6,457.7	1,515.7	-10,983.4	9.2	0.00	0.00	0.00	0.00	BHL - PINTAIL FEC

## Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-2HC
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4942.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4942.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-2HC	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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)
<b>SHL: 892ft FSL &amp; 1104ft FWL of Sec 35</b>										
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
<b>FOX HILLS BASE</b>										
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
<b>SURFACE CASING</b>										
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
<b>START NUDGE (2°/100ft BUR)</b>										
2,250.0	0.00	0.00	2,250.0	2,692.00	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	1.00	171.73	2,300.0	2,642.00	-0.4	0.1	0.4	2.00	2.00	0.00
2,400.0	3.00	171.73	2,399.9	2,542.07	-3.9	0.6	3.9	2.00	2.00	0.00
2,500.0	5.00	171.73	2,499.7	2,442.32	-10.8	1.6	10.8	2.00	2.00	0.00
2,600.0	7.00	171.73	2,599.1	2,342.87	-21.1	3.1	21.1	2.00	2.00	0.00
2,700.0	9.00	171.73	2,698.2	2,243.85	-34.9	5.1	34.9	2.00	2.00	0.00
2,800.0	11.00	171.73	2,796.6	2,145.37	-52.1	7.6	52.1	2.00	2.00	0.00
2,900.0	13.00	171.73	2,894.4	2,047.56	-72.7	10.6	72.7	2.00	2.00	0.00
3,000.0	15.00	171.73	2,991.5	1,950.54	-96.6	14.0	96.6	2.00	2.00	0.00
<b>EOB TO 15.58° INC</b>										
3,029.2	15.58	171.73	3,019.6	1,922.37	-104.2	15.1	104.2	2.00	2.00	0.00
3,100.0	15.58	171.73	3,087.8	1,854.17	-123.0	17.9	123.1	0.00	0.00	0.00
3,200.0	15.58	171.73	3,184.1	1,757.85	-149.6	21.7	149.6	0.00	0.00	0.00
3,300.0	15.58	171.73	3,280.5	1,661.53	-176.2	25.6	176.2	0.00	0.00	0.00
<b>RICHARD SANDSTONE</b>										
3,350.6	15.58	171.73	3,329.2	1,612.75	-189.7	27.6	189.7	0.00	0.00	0.00
3,400.0	15.58	171.73	3,376.8	1,565.20	-202.8	29.5	202.8	0.00	0.00	0.00
3,500.0	15.58	171.73	3,473.1	1,468.88	-229.4	33.3	229.4	0.00	0.00	0.00
3,600.0	15.58	171.73	3,569.4	1,372.56	-256.0	37.2	256.0	0.00	0.00	0.00
3,700.0	15.58	171.73	3,665.8	1,276.23	-282.6	41.1	282.6	0.00	0.00	0.00
3,800.0	15.58	171.73	3,762.1	1,179.91	-309.1	44.9	309.2	0.00	0.00	0.00
3,900.0	15.58	171.73	3,858.4	1,083.59	-335.7	48.8	335.8	0.00	0.00	0.00
4,000.0	15.58	171.73	3,954.7	987.26	-362.3	52.6	362.4	0.00	0.00	0.00
4,100.0	15.58	171.73	4,051.1	890.94	-388.9	56.5	389.0	0.00	0.00	0.00



# Planning Report



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<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4942.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4942.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-2HC	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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	15.58	171.73	4,147.4	794.61	-415.5	60.4	415.5	0.00	0.00	0.00
<b>SUSSEX SANDSTONE</b>										
<b>4,245.0</b>	<b>15.58</b>	<b>171.73</b>	<b>4,190.7</b>	<b>751.25</b>	<b>-427.5</b>	<b>62.1</b>	<b>427.5</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,300.0	15.58	171.73	4,243.7	698.29	-442.1	64.2	442.1	0.00	0.00	0.00
4,400.0	15.58	171.73	4,340.0	601.97	-468.7	68.1	468.7	0.00	0.00	0.00
4,500.0	15.58	171.73	4,436.4	505.64	-495.3	72.0	495.3	0.00	0.00	0.00
4,600.0	15.58	171.73	4,532.7	409.32	-521.8	75.8	521.9	0.00	0.00	0.00
4,700.0	15.58	171.73	4,629.0	313.00	-548.4	79.7	548.5	0.00	0.00	0.00
<b>SHANNON SANDSTONE</b>										
<b>4,751.6</b>	<b>15.58</b>	<b>171.73</b>	<b>4,678.7</b>	<b>263.25</b>	<b>-562.2</b>	<b>81.7</b>	<b>562.2</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,800.0	15.58	171.73	4,725.3	216.67	-575.0	83.5	575.1	0.00	0.00	0.00
4,900.0	15.58	171.73	4,821.7	120.35	-601.6	87.4	601.7	0.00	0.00	0.00
5,000.0	15.58	171.73	4,918.0	24.02	-628.2	91.3	628.3	0.00	0.00	0.00
5,100.0	15.58	171.73	5,014.3	-72.30	-654.8	95.1	654.8	0.00	0.00	0.00
5,200.0	15.58	171.73	5,110.6	-168.62	-681.4	99.0	681.4	0.00	0.00	0.00
5,300.0	15.58	171.73	5,206.9	-264.95	-707.9	102.9	708.0	0.00	0.00	0.00
5,400.0	15.58	171.73	5,303.3	-361.27	-734.5	106.7	734.6	0.00	0.00	0.00
5,500.0	15.58	171.73	5,399.6	-457.59	-761.1	110.6	761.2	0.00	0.00	0.00
5,600.0	15.58	171.73	5,495.9	-553.92	-787.7	114.4	787.8	0.00	0.00	0.00
5,700.0	15.58	171.73	5,592.2	-650.24	-814.3	118.3	814.4	0.00	0.00	0.00
5,800.0	15.58	171.73	5,688.6	-746.56	-840.9	122.2	841.0	0.00	0.00	0.00
5,900.0	15.58	171.73	5,784.9	-842.89	-867.5	126.0	867.6	0.00	0.00	0.00
6,000.0	15.58	171.73	5,881.2	-939.21	-894.0	129.9	894.2	0.00	0.00	0.00
6,100.0	15.58	171.73	5,977.5	-1,035.54	-920.6	133.8	920.7	0.00	0.00	0.00
<b>KOP (10°/100ft DGLG)</b>										
<b>6,161.9</b>	<b>15.58</b>	<b>171.73</b>	<b>6,037.2</b>	<b>-1,095.19</b>	<b>-937.1</b>	<b>136.1</b>	<b>937.2</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
6,200.0	19.35	173.62	6,073.5	-1,131.50	-948.4	137.6	948.5	10.00	9.89	4.95
<b>SHARON SPRINGS</b>										
<b>6,231.9</b>	<b>22.51</b>	<b>174.72</b>	<b>6,103.2</b>	<b>-1,161.25</b>	<b>-959.7</b>	<b>138.7</b>	<b>959.9</b>	<b>10.00</b>	<b>9.92</b>	<b>3.47</b>
6,300.0	29.29	176.32	6,164.5	-1,222.51	-989.4	141.0	989.5	10.00	9.95	2.35
<b>NIOBRARA A CHALK</b>										
<b>6,304.9</b>	<b>29.77</b>	<b>176.41</b>	<b>6,168.7</b>	<b>-1,226.75</b>	<b>-991.8</b>	<b>141.2</b>	<b>991.9</b>	<b>10.00</b>	<b>9.96</b>	<b>1.81</b>
<b>NIOBRARA A CHALK BASE</b>										
<b>6,326.4</b>	<b>31.92</b>	<b>176.77</b>	<b>6,187.2</b>	<b>-1,245.25</b>	<b>-1,002.8</b>	<b>141.8</b>	<b>1,002.9</b>	<b>10.00</b>	<b>9.96</b>	<b>1.68</b>
<b>NIOBRARA B1 CHALK TOP</b>										
<b>6,365.6</b>	<b>35.82</b>	<b>177.33</b>	<b>6,219.7</b>	<b>-1,277.75</b>	<b>-1,024.6</b>	<b>142.9</b>	<b>1,024.7</b>	<b>10.00</b>	<b>9.97</b>	<b>1.42</b>
<b>NIOBRARA B1 CHALK BASE</b>										
<b>6,397.7</b>	<b>39.03</b>	<b>177.71</b>	<b>6,245.2</b>	<b>-1,303.25</b>	<b>-1,044.1</b>	<b>143.8</b>	<b>1,044.2</b>	<b>10.00</b>	<b>9.97</b>	<b>1.19</b>
6,400.0	39.26	177.74	6,247.0	-1,305.05	-1,045.6	143.8	1,045.7	10.00	9.98	1.11
<b>NIOBRARA B2 CHALK TOP</b>										
<b>6,428.0</b>	<b>42.05</b>	<b>178.03</b>	<b>6,268.2</b>	<b>-1,326.25</b>	<b>-1,063.8</b>	<b>144.5</b>	<b>1,063.9</b>	<b>10.00</b>	<b>9.98</b>	<b>1.04</b>
<b>NIOBRARA B2 CHALK BASE</b>										
<b>6,474.1</b>	<b>46.65</b>	<b>178.44</b>	<b>6,301.2</b>	<b>-1,359.25</b>	<b>-1,096.0</b>	<b>145.5</b>	<b>1,096.1</b>	<b>10.00</b>	<b>9.98</b>	<b>0.90</b>
6,500.0	49.24	178.65	6,318.6	-1,376.59	-1,115.2	146.0	1,115.4	10.00	9.98	0.80
<b>NIOBRARA C CHALK TOP</b>										
<b>6,522.2</b>	<b>51.45</b>	<b>178.82</b>	<b>6,332.7</b>	<b>-1,390.75</b>	<b>-1,132.3</b>	<b>146.4</b>	<b>1,132.4</b>	<b>10.00</b>	<b>9.98</b>	<b>0.74</b>
<b>NIOBRARA C CHALK BASE</b>										
<b>6,598.6</b>	<b>59.08</b>	<b>179.32</b>	<b>6,376.2</b>	<b>-1,434.25</b>	<b>-1,195.1</b>	<b>147.4</b>	<b>1,195.2</b>	<b>10.00</b>	<b>9.99</b>	<b>0.65</b>
6,600.0	59.22	179.33	6,377.0	-1,434.97	-1,196.3	147.4	1,196.4	10.00	9.99	0.60
<b>NIOBRARA D CHALK TOP</b>										
<b>6,656.0</b>	<b>64.82</b>	<b>179.64</b>	<b>6,403.2</b>	<b>-1,461.25</b>	<b>-1,245.7</b>	<b>147.8</b>	<b>1,245.8</b>	<b>10.00</b>	<b>9.99</b>	<b>0.57</b>
6,700.0	69.21	179.87	6,420.4	-1,478.41	-1,286.2	148.0	1,286.3	10.00	9.99	0.52

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-2HC
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4942.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4942.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-2HC	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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)
<b>FT. HAYS</b>										
6,743.4	73.54	180.08	6,434.2	-1,492.25	-1,327.3	148.0	1,327.4	10.00	9.99	0.49
6,800.0	79.20	180.35	6,447.6	-1,505.59	-1,382.3	147.8	1,382.4	10.00	9.99	0.47
6,900.0	89.19	180.79	6,457.7	-1,515.69	-1,481.6	146.8	1,481.8	10.00	9.99	0.45
<b>HZ LP: 600ft FNL &amp; 790ft FWL of Sec 2 - CODELL</b>										
6,908.1	90.00	180.83	6,457.7	-1,515.75	-1,489.7	146.7	1,489.9	10.00	9.99	0.44
7,000.0	90.00	180.83	6,457.7	-1,515.75	-1,581.6	145.4	1,581.7	0.00	0.00	0.00
7,100.0	90.00	180.83	6,457.7	-1,515.75	-1,681.6	143.9	1,681.7	0.00	0.00	0.00
7,200.0	90.00	180.83	6,457.7	-1,515.75	-1,781.6	142.5	1,781.7	0.00	0.00	0.00
7,300.0	90.00	180.83	6,457.7	-1,515.75	-1,881.6	141.0	1,881.7	0.00	0.00	0.00
7,400.0	90.00	180.83	6,457.7	-1,515.75	-1,981.6	139.6	1,981.7	0.00	0.00	0.00
7,500.0	90.00	180.83	6,457.7	-1,515.75	-2,081.6	138.1	2,081.7	0.00	0.00	0.00
7,600.0	90.00	180.83	6,457.7	-1,515.75	-2,181.6	136.7	2,181.7	0.00	0.00	0.00
7,700.0	90.00	180.83	6,457.7	-1,515.75	-2,281.6	135.2	2,281.7	0.00	0.00	0.00
7,800.0	90.00	180.83	6,457.7	-1,515.75	-2,381.5	133.8	2,381.7	0.00	0.00	0.00
7,900.0	90.00	180.83	6,457.7	-1,515.75	-2,481.5	132.3	2,481.6	0.00	0.00	0.00
8,000.0	90.00	180.83	6,457.7	-1,515.75	-2,581.5	130.9	2,581.6	0.00	0.00	0.00
8,100.0	90.00	180.83	6,457.7	-1,515.75	-2,681.5	129.4	2,681.6	0.00	0.00	0.00
8,200.0	90.00	180.83	6,457.7	-1,515.75	-2,781.5	128.0	2,781.6	0.00	0.00	0.00
8,300.0	90.00	180.83	6,457.7	-1,515.75	-2,881.5	126.5	2,881.6	0.00	0.00	0.00
8,400.0	90.00	180.83	6,457.7	-1,515.75	-2,981.5	125.1	2,981.6	0.00	0.00	0.00
8,500.0	90.00	180.83	6,457.7	-1,515.75	-3,081.5	123.6	3,081.6	0.00	0.00	0.00
8,600.0	90.00	180.83	6,457.7	-1,515.75	-3,181.5	122.2	3,181.6	0.00	0.00	0.00
8,700.0	90.00	180.83	6,457.7	-1,515.75	-3,281.4	120.7	3,281.5	0.00	0.00	0.00
8,800.0	90.00	180.83	6,457.7	-1,515.75	-3,381.4	119.3	3,381.5	0.00	0.00	0.00
8,900.0	90.00	180.83	6,457.7	-1,515.75	-3,481.4	117.8	3,481.5	0.00	0.00	0.00
9,000.0	90.00	180.83	6,457.7	-1,515.75	-3,581.4	116.4	3,581.5	0.00	0.00	0.00
9,100.0	90.00	180.83	6,457.7	-1,515.75	-3,681.4	114.9	3,681.5	0.00	0.00	0.00
9,200.0	90.00	180.83	6,457.7	-1,515.75	-3,781.4	113.5	3,781.5	0.00	0.00	0.00
9,300.0	90.00	180.83	6,457.7	-1,515.75	-3,881.4	112.0	3,881.5	0.00	0.00	0.00
9,400.0	90.00	180.83	6,457.7	-1,515.75	-3,981.4	110.6	3,981.5	0.00	0.00	0.00
9,500.0	90.00	180.83	6,457.7	-1,515.75	-4,081.4	109.1	4,081.5	0.00	0.00	0.00
9,600.0	90.00	180.83	6,457.7	-1,515.75	-4,181.4	107.7	4,181.4	0.00	0.00	0.00
9,700.0	90.00	180.83	6,457.7	-1,515.75	-4,281.3	106.2	4,281.4	0.00	0.00	0.00
9,800.0	90.00	180.83	6,457.7	-1,515.75	-4,381.3	104.8	4,381.4	0.00	0.00	0.00
9,900.0	90.00	180.83	6,457.7	-1,515.75	-4,481.3	103.3	4,481.4	0.00	0.00	0.00
10,000.0	90.00	180.83	6,457.7	-1,515.75	-4,581.3	101.9	4,581.4	0.00	0.00	0.00
10,100.0	90.00	180.83	6,457.7	-1,515.75	-4,681.3	100.5	4,681.4	0.00	0.00	0.00
10,200.0	90.00	180.83	6,457.7	-1,515.75	-4,781.3	99.0	4,781.4	0.00	0.00	0.00
10,300.0	90.00	180.83	6,457.7	-1,515.75	-4,881.3	97.6	4,881.4	0.00	0.00	0.00
10,400.0	90.00	180.83	6,457.7	-1,515.75	-4,981.3	96.1	4,981.3	0.00	0.00	0.00
10,500.0	90.00	180.83	6,457.7	-1,515.75	-5,081.3	94.7	5,081.3	0.00	0.00	0.00
10,600.0	90.00	180.83	6,457.7	-1,515.75	-5,181.3	93.2	5,181.3	0.00	0.00	0.00
10,700.0	90.00	180.83	6,457.7	-1,515.75	-5,281.2	91.8	5,281.3	0.00	0.00	0.00
10,800.0	90.00	180.83	6,457.7	-1,515.75	-5,381.2	90.3	5,381.3	0.00	0.00	0.00
10,900.0	90.00	180.83	6,457.7	-1,515.75	-5,481.2	88.9	5,481.3	0.00	0.00	0.00
11,000.0	90.00	180.83	6,457.7	-1,515.75	-5,581.2	87.4	5,581.3	0.00	0.00	0.00
11,100.0	90.00	180.83	6,457.7	-1,515.75	-5,681.2	86.0	5,681.3	0.00	0.00	0.00
11,200.0	90.00	180.83	6,457.7	-1,515.75	-5,781.2	84.5	5,781.3	0.00	0.00	0.00
11,300.0	90.00	180.83	6,457.7	-1,515.75	-5,881.2	83.1	5,881.2	0.00	0.00	0.00
11,400.0	90.00	180.83	6,457.7	-1,515.75	-5,981.2	81.6	5,981.2	0.00	0.00	0.00
11,500.0	90.00	180.83	6,457.7	-1,515.75	-6,081.2	80.2	6,081.2	0.00	0.00	0.00
11,600.0	90.00	180.83	6,457.7	-1,515.75	-6,181.1	78.7	6,181.2	0.00	0.00	0.00
11,700.0	90.00	180.83	6,457.7	-1,515.75	-6,281.1	77.3	6,281.2	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-2HC
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4942.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4942.0usft (Original Well Elev)
<b>Site:</b>	SW SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-2HC	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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)
11,800.0	90.00	180.83	6,457.7	-1,515.75	-6,381.1	75.8	6,381.2	0.00	0.00	0.00
11,900.0	90.00	180.83	6,457.7	-1,515.75	-6,481.1	74.4	6,481.2	0.00	0.00	0.00
12,000.0	90.00	180.83	6,457.7	-1,515.75	-6,581.1	72.9	6,581.2	0.00	0.00	0.00
12,100.0	90.00	180.83	6,457.7	-1,515.75	-6,681.1	71.5	6,681.2	0.00	0.00	0.00
12,200.0	90.00	180.83	6,457.7	-1,515.75	-6,781.1	70.0	6,781.1	0.00	0.00	0.00
12,300.0	90.00	180.83	6,457.7	-1,515.75	-6,881.1	68.6	6,881.1	0.00	0.00	0.00
12,400.0	90.00	180.83	6,457.7	-1,515.75	-6,981.1	67.1	6,981.1	0.00	0.00	0.00
12,500.0	90.00	180.83	6,457.7	-1,515.75	-7,081.1	65.7	7,081.1	0.00	0.00	0.00
12,600.0	90.00	180.83	6,457.7	-1,515.75	-7,181.0	64.2	7,181.1	0.00	0.00	0.00
12,700.0	90.00	180.83	6,457.7	-1,515.75	-7,281.0	62.8	7,281.1	0.00	0.00	0.00
12,800.0	90.00	180.83	6,457.7	-1,515.75	-7,381.0	61.3	7,381.1	0.00	0.00	0.00
12,900.0	90.00	180.83	6,457.7	-1,515.75	-7,481.0	59.9	7,481.1	0.00	0.00	0.00
13,000.0	90.00	180.83	6,457.7	-1,515.75	-7,581.0	58.4	7,581.0	0.00	0.00	0.00
13,100.0	90.00	180.83	6,457.7	-1,515.75	-7,681.0	57.0	7,681.0	0.00	0.00	0.00
13,200.0	90.00	180.83	6,457.7	-1,515.75	-7,781.0	55.5	7,781.0	0.00	0.00	0.00
13,300.0	90.00	180.83	6,457.7	-1,515.75	-7,881.0	54.1	7,881.0	0.00	0.00	0.00
13,400.0	90.00	180.83	6,457.7	-1,515.75	-7,981.0	52.7	7,981.0	0.00	0.00	0.00
13,500.0	90.00	180.83	6,457.7	-1,515.75	-8,080.9	51.2	8,081.0	0.00	0.00	0.00
13,600.0	90.00	180.83	6,457.7	-1,515.75	-8,180.9	49.8	8,181.0	0.00	0.00	0.00
13,700.0	90.00	180.83	6,457.7	-1,515.75	-8,280.9	48.3	8,281.0	0.00	0.00	0.00
13,800.0	90.00	180.83	6,457.7	-1,515.75	-8,380.9	46.9	8,381.0	0.00	0.00	0.00
13,900.0	90.00	180.83	6,457.7	-1,515.75	-8,480.9	45.4	8,480.9	0.00	0.00	0.00
14,000.0	90.00	180.83	6,457.7	-1,515.75	-8,580.9	44.0	8,580.9	0.00	0.00	0.00
14,100.0	90.00	180.83	6,457.7	-1,515.75	-8,680.9	42.5	8,680.9	0.00	0.00	0.00
14,200.0	90.00	180.83	6,457.7	-1,515.75	-8,780.9	41.1	8,780.9	0.00	0.00	0.00
14,300.0	90.00	180.83	6,457.7	-1,515.75	-8,880.9	39.6	8,880.9	0.00	0.00	0.00
14,400.0	90.00	180.83	6,457.7	-1,515.75	-8,980.9	38.2	8,980.9	0.00	0.00	0.00
14,500.0	90.00	180.83	6,457.7	-1,515.75	-9,080.8	36.7	9,080.9	0.00	0.00	0.00
14,600.0	90.00	180.83	6,457.7	-1,515.75	-9,180.8	35.3	9,180.9	0.00	0.00	0.00
14,700.0	90.00	180.83	6,457.7	-1,515.75	-9,280.8	33.8	9,280.8	0.00	0.00	0.00
14,800.0	90.00	180.83	6,457.7	-1,515.75	-9,380.8	32.4	9,380.8	0.00	0.00	0.00
14,900.0	90.00	180.83	6,457.7	-1,515.75	-9,480.8	30.9	9,480.8	0.00	0.00	0.00
15,000.0	90.00	180.83	6,457.7	-1,515.75	-9,580.8	29.5	9,580.8	0.00	0.00	0.00
15,100.0	90.00	180.83	6,457.7	-1,515.75	-9,680.8	28.0	9,680.8	0.00	0.00	0.00
15,200.0	90.00	180.83	6,457.7	-1,515.75	-9,780.8	26.6	9,780.8	0.00	0.00	0.00
15,300.0	90.00	180.83	6,457.7	-1,515.75	-9,880.8	25.1	9,880.8	0.00	0.00	0.00
15,400.0	90.00	180.83	6,457.7	-1,515.75	-9,980.7	23.7	9,980.8	0.00	0.00	0.00
15,500.0	90.00	180.83	6,457.7	-1,515.75	-10,080.7	22.2	10,080.8	0.00	0.00	0.00
15,600.0	90.00	180.83	6,457.7	-1,515.75	-10,180.7	20.8	10,180.7	0.00	0.00	0.00
15,700.0	90.00	180.83	6,457.7	-1,515.75	-10,280.7	19.3	10,280.7	0.00	0.00	0.00
15,800.0	90.00	180.83	6,457.7	-1,515.75	-10,380.7	17.9	10,380.7	0.00	0.00	0.00
15,900.0	90.00	180.83	6,457.7	-1,515.75	-10,480.7	16.4	10,480.7	0.00	0.00	0.00
16,000.0	90.00	180.83	6,457.7	-1,515.75	-10,580.7	15.0	10,580.7	0.00	0.00	0.00
16,100.0	90.00	180.83	6,457.7	-1,515.75	-10,680.7	13.5	10,680.7	0.00	0.00	0.00
16,200.0	90.00	180.83	6,457.7	-1,515.75	-10,780.7	12.1	10,780.7	0.00	0.00	0.00
16,300.0	90.00	180.83	6,457.7	-1,515.75	-10,880.7	10.6	10,880.7	0.00	0.00	0.00
16,400.0	90.00	180.83	6,457.7	-1,515.75	-10,980.6	9.2	10,980.6	0.00	0.00	0.00
<b>BHL: 600ft FSL &amp; 811ft FWL Of Sec 11</b>										
<b>16,402.8</b>	<b>90.00</b>	<b>180.83</b>	<b>6,457.7</b>	<b>-1,515.75</b>	<b>-10,983.4</b>	<b>9.2</b>	<b>10,983.4</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# Planning Report



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

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,526.7	1,526.7	FOX HILLS BASE				
3,350.6	3,329.2	RICHARD SANDSTONE				
4,245.0	4,190.7	SUSSEX SANDSTONE				
4,751.6	4,678.7	SHANNON SANDSTONE				
6,231.9	6,103.2	SHARON SPRINGS				
6,304.9	6,168.7	NIOBRARA A CHALK				
6,326.4	6,187.2	NIOBRARA A CHALK BASE				
6,365.6	6,219.7	NIOBRARA B1 CHALK TOP				
6,397.7	6,245.2	NIOBRARA B1 CHALK BASE				
6,428.0	6,268.2	NIOBRARA B2 CHALK TOP				
6,474.1	6,301.2	NIOBRARA B2 CHALK BASE				
6,522.2	6,332.7	NIOBRARA C CHALK TOP				
6,598.6	6,376.2	NIOBRARA C CHALK BASE				
6,656.0	6,403.2	NIOBRARA D CHALK TOP				
6,743.4	6,434.2	FT. HAYS				
6,908.1	6,457.7	CODELL				

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 & 1104ft FWL of Sec 35	
1,555.0	1,555.0	0.0	0.0	SURFACE CASING	
2,250.0	2,250.0	0.0	0.0	START NUDGE (2°/100ft BUR)	
3,029.2	3,019.6	-104.2	15.1	EOB TO 15.58° INC	
6,161.9	6,037.2	-937.1	136.1	KOP (10°/100ft DGLG)	
6,908.1	6,457.8	-1,489.7	146.7	HZ LP: 600ft FNL & 790ft FWL of Sec 2	
16,402.8	6,457.7	-10,983.4	9.2	BHL: 600ft FSL & 811ft FWL Of Sec 11	