

# **MALLARD EXPLORATION**

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

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

**PINTAIL FED 2-11-1HN**

**ORIGINAL WELLBORE**

**04 December, 2018**

**Plan: PROPOSAL #4**



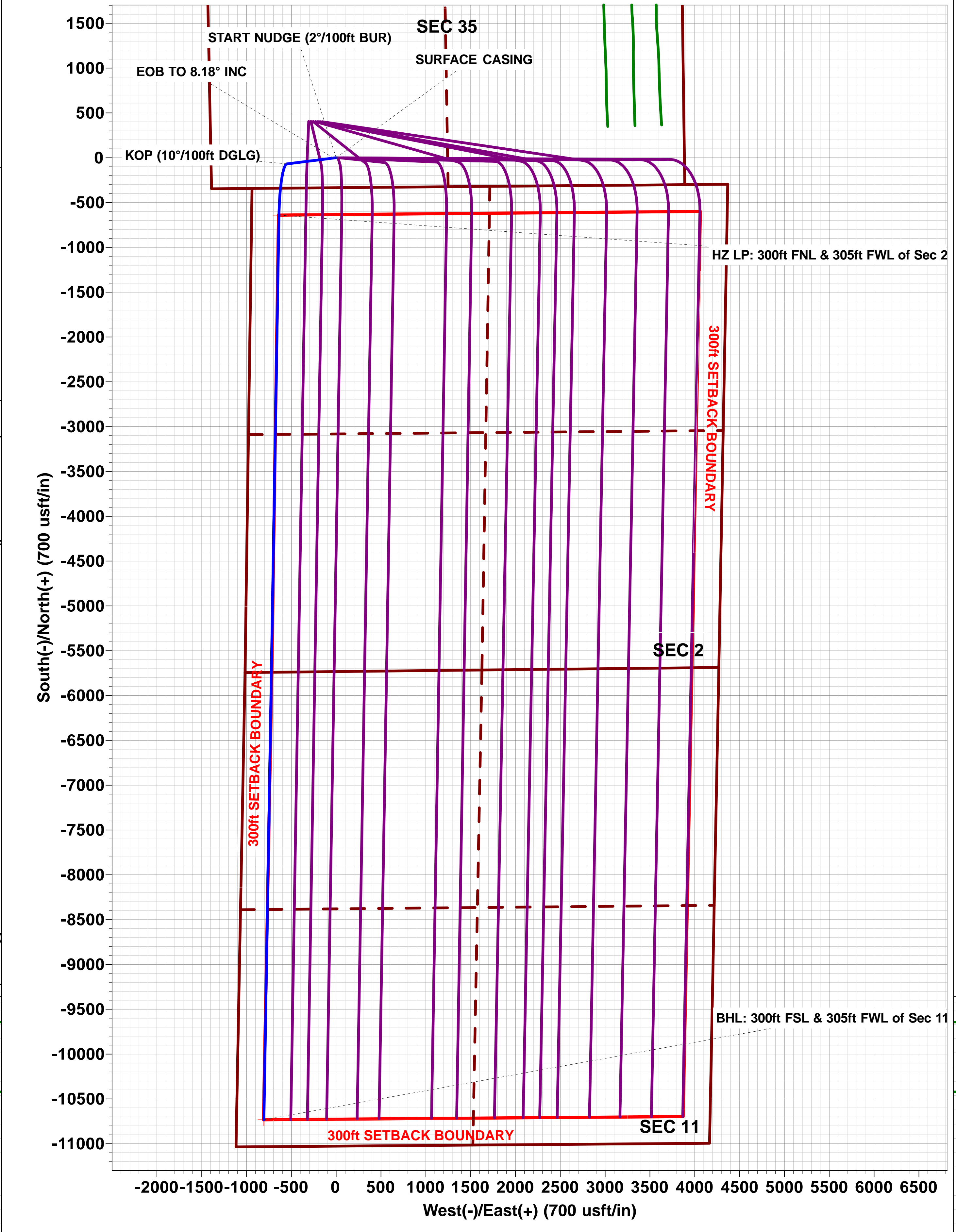
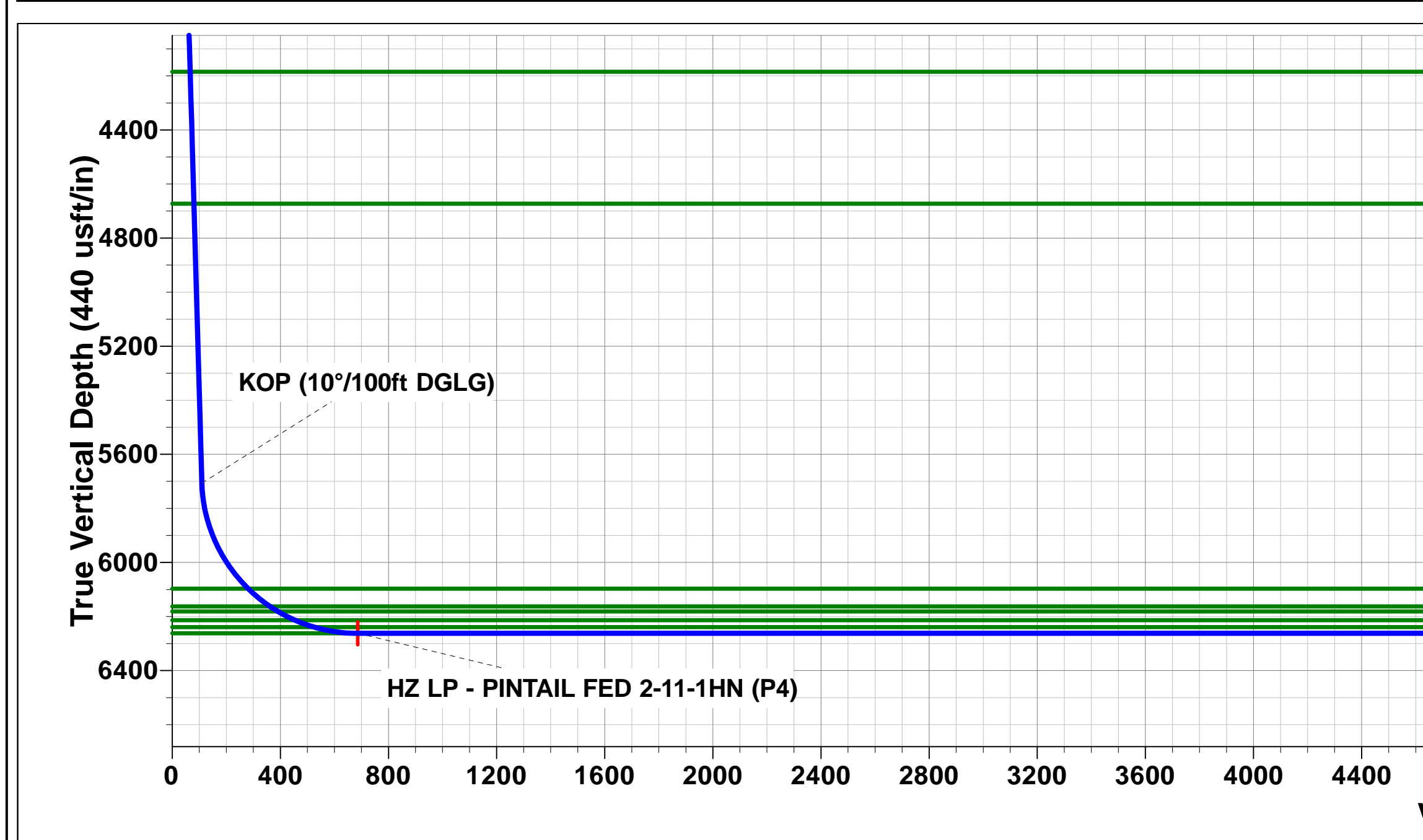
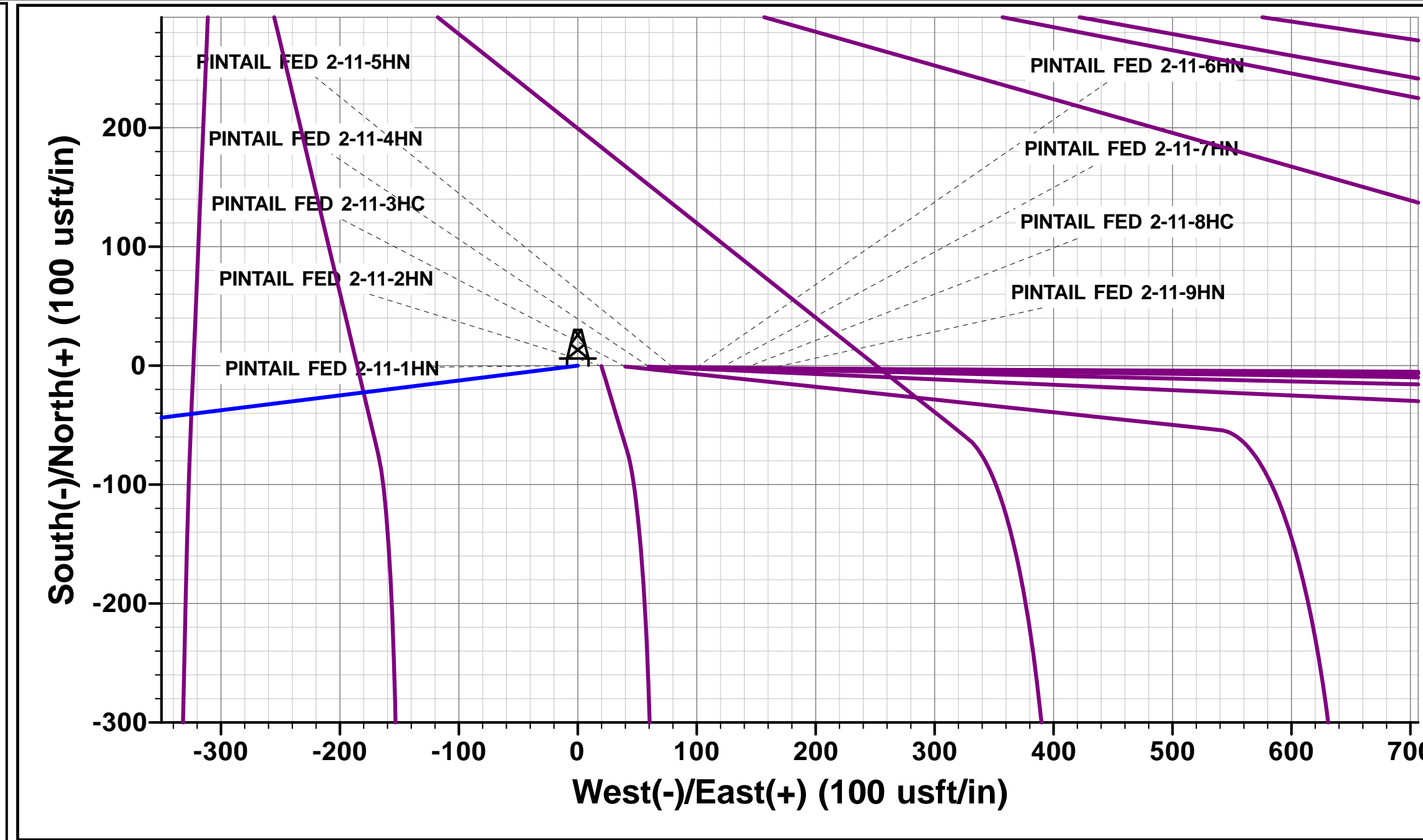
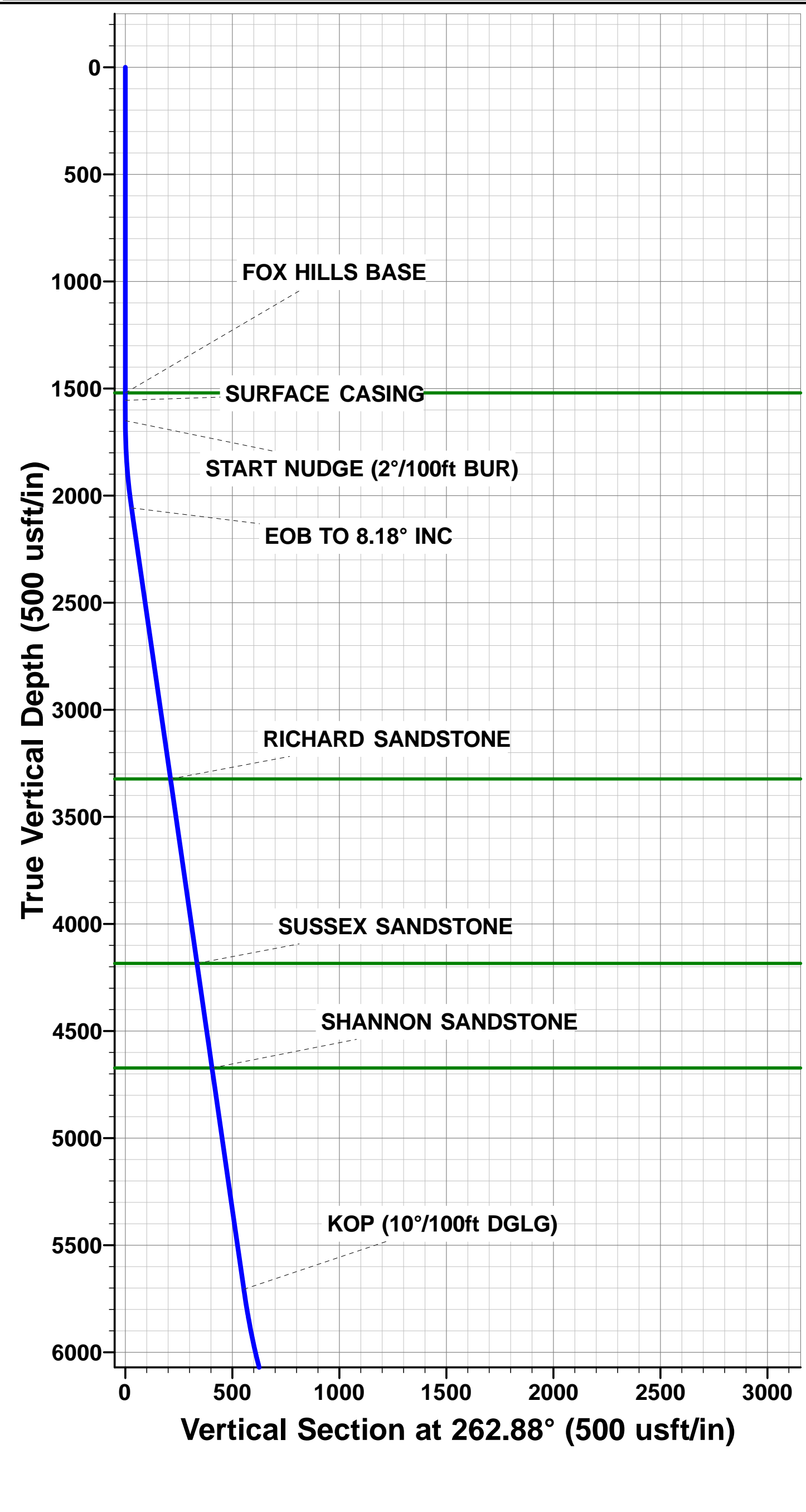


Project: WELD COUNTY, COLORADO (NAD 83)  
Site: SE SW SEC. 35 T9N R60W 6TH P.M.  
Well: PINTAIL FED 2-11-1HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #4

ANNOTATIONS										
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 335ft FSL & 1397ft FWL of Sec 35		
1555.00	1555.00	0.00	0.00	0.00	0.00	0.00	0.00	SURFACE CASING		
1650.00	1650.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)		
2057.62	2059.01	8.18	262.88	-3.62	-28.92	5.77	29.15	EOB TO 8.18° INC		
5706.36	5745.25	8.18	262.88	-68.67	-549.38	109.64	553.66	KOP (10°/100ft DGLG)		
6262.25	6633.79	90.00	180.96	-640.11	-638.04	686.12	1141.56	HZ LP: 300ft FNL & 305ft FWL of Sec 2		
6262.25	16728.18	90.00	180.96	-10733.10	-806.41	10763.35	11235.95	BHL: 300ft FSL & 305ft FWL of Sec 11		

PROPOSED LOCAL COORDINATES:  
SHL: 335ft FSL & 1397ft FWL Sec 35  
HZ LP: 300ft FNL & 305ft FWL Sec 2  
BHL: 300ft FSL & 305ft FWL of Sec 11

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - PINTAIL FED 2-11-1HN (P4)	6262.25	-640.11	-638.04	40.698267	-104.065617
BHL - PINTAIL FED 2-11-1HN (P4)	6262.25	-10733.10	-806.41	40.670564	-104.066223



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well PINTAIL FED 2-11-1HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4936.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4936.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #4		

<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>	SE 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>	0.00 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 2-11-1HN		
<b>Well Position</b>	<b>+N-S</b>	-554.52 usft	<b>Northing:</b> 1,501,089.27 usfi
	<b>+E-W</b>	329.13 usft	<b>Easting:</b> 3,398,343.07 usfi
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	usfi
		<b>Latitude:</b>	40.700024
		<b>Longitude:</b>	-104.063316
		<b>Ground Level:</b>	4,920.00 usft

<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	04/12/2018	7.70	67.16	52,450

<b>Design</b>	PROPOSAL #4			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	184.30

<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
0.00	0.00	0.00	0.00	-4,936.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,650.00	0.00	0.00	1,650.00	-3,286.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,059.01	8.18	262.88	2,057.62	-2,878.38	-3.62	-28.92	2.00	2.00	0.00	262.88	
5,745.25	8.18	262.88	5,706.35	770.35	-68.67	-549.38	0.00	0.00	0.00	0.00	
6,633.79	90.00	180.96	6,262.25	1,326.25	-640.11	-638.04	10.00	9.21	-9.22	-82.00	HZ LP - PINTAIL FI
16,728.18	90.00	180.96	6,262.25	1,326.25	-10,733.1C	-806.41	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 2-11-1HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4936.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4936.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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)
<b>SHL: 335ft FSL &amp; 1397ft FWL of Sec 35</b>										
0.00	0.00	0.00	0.00	4,936.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,836.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,736.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,636.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,536.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4,436.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	4,336.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	4,236.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	4,136.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	4,036.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	3,936.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	3,836.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	3,736.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	3,636.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	3,536.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	3,436.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>FOX HILLS BASE</b>										
1,520.75	0.00	0.00	1,520.75	3,415.25	0.00	0.00	0.00	0.00	0.00	0.00
<b>SURFACE CASING</b>										
1,555.00	0.00	0.00	1,555.00	3,381.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	3,336.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>START NUDGE (2°/100ft BUR)</b>										
1,650.00	0.00	0.00	1,650.00	3,286.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	1.00	262.88	1,700.00	3,236.00	-0.05	-0.43	0.09	2.00	2.00	0.00
1,800.00	3.00	262.88	1,799.93	3,136.07	-0.49	-3.90	0.78	2.00	2.00	0.00
1,900.00	5.00	262.88	1,899.68	3,036.32	-1.35	-10.82	2.16	2.00	2.00	0.00
2,000.00	7.00	262.88	1,999.13	2,936.87	-2.65	-21.19	4.23	2.00	2.00	0.00
<b>EOB TO 8.18° INC</b>										
2,059.01	8.18	262.88	2,057.62	2,878.38	-3.62	-28.92	5.77	2.00	2.00	0.00
2,100.00	8.18	262.88	2,098.19	2,837.81	-4.34	-34.71	6.93	0.00	0.00	0.00
2,200.00	8.18	262.88	2,197.18	2,738.82	-6.10	-48.83	9.74	0.00	0.00	0.00
2,300.00	8.18	262.88	2,296.16	2,639.84	-7.87	-62.95	12.56	0.00	0.00	0.00
2,400.00	8.18	262.88	2,395.14	2,540.86	-9.63	-77.07	15.38	0.00	0.00	0.00
2,500.00	8.18	262.88	2,494.12	2,441.88	-11.40	-91.19	18.20	0.00	0.00	0.00
2,600.00	8.18	262.88	2,593.11	2,342.89	-13.16	-105.30	21.01	0.00	0.00	0.00
2,700.00	8.18	262.88	2,692.09	2,243.91	-14.93	-119.42	23.83	0.00	0.00	0.00
2,800.00	8.18	262.88	2,791.07	2,144.93	-16.69	-133.54	26.65	0.00	0.00	0.00
2,900.00	8.18	262.88	2,890.06	2,045.94	-18.46	-147.66	29.47	0.00	0.00	0.00
3,000.00	8.18	262.88	2,989.04	1,946.96	-20.22	-161.78	32.29	0.00	0.00	0.00
3,100.00	8.18	262.88	3,088.02	1,847.98	-21.99	-175.90	35.10	0.00	0.00	0.00
3,200.00	8.18	262.88	3,187.00	1,749.00	-23.75	-190.02	37.92	0.00	0.00	0.00
3,300.00	8.18	262.88	3,285.99	1,650.01	-25.52	-204.14	40.74	0.00	0.00	0.00
<b>RICHARD SANDSTONE</b>										
3,337.65	8.18	262.88	3,323.25	1,612.75	-26.18	-209.45	41.80	0.00	0.00	0.00
3,400.00	8.18	262.88	3,384.97	1,551.03	-27.28	-218.26	43.56	0.00	0.00	0.00
3,500.00	8.18	262.88	3,483.95	1,452.05	-29.05	-232.38	46.37	0.00	0.00	0.00
3,600.00	8.18	262.88	3,582.93	1,353.07	-30.81	-246.49	49.19	0.00	0.00	0.00
3,700.00	8.18	262.88	3,681.92	1,254.08	-32.57	-260.61	52.01	0.00	0.00	0.00
3,800.00	8.18	262.88	3,780.90	1,155.10	-34.34	-274.73	54.83	0.00	0.00	0.00
3,900.00	8.18	262.88	3,879.88	1,056.12	-36.10	-288.85	57.64	0.00	0.00	0.00
4,000.00	8.18	262.88	3,978.86	957.14	-37.87	-302.97	60.46	0.00	0.00	0.00
4,100.00	8.18	262.88	4,077.85	858.15	-39.63	-317.09	63.28	0.00	0.00	0.00

# Planning Report



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<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4936.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4936.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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)
4,200.00	8.18	262.88	4,176.83	759.17	-41.40	-331.21	66.10	0.00	0.00	0.00
<b>SUSSEX SANDSTONE</b>										
<b>4,208.00</b>	<b>8.18</b>	<b>262.88</b>	<b>4,184.75</b>	<b>751.25</b>	<b>-41.54</b>	<b>-332.34</b>	<b>66.32</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,300.00	8.18	262.88	4,275.81	660.19	-43.16	-345.33	68.91	0.00	0.00	0.00
4,400.00	8.18	262.88	4,374.79	561.21	-44.93	-359.45	71.73	0.00	0.00	0.00
4,500.00	8.18	262.88	4,473.78	462.22	-46.69	-373.56	74.55	0.00	0.00	0.00
4,600.00	8.18	262.88	4,572.76	363.24	-48.46	-387.68	77.37	0.00	0.00	0.00
4,700.00	8.18	262.88	4,671.74	264.26	-50.22	-401.80	80.18	0.00	0.00	0.00
<b>SHANNON SANDSTONE</b>										
<b>4,701.02</b>	<b>8.18</b>	<b>262.88</b>	<b>4,672.75</b>	<b>263.25</b>	<b>-50.24</b>	<b>-401.95</b>	<b>80.21</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,800.00	8.18	262.88	4,770.72	165.28	-51.99	-415.92	83.00	0.00	0.00	0.00
4,900.00	8.18	262.88	4,869.71	66.29	-53.75	-430.04	85.82	0.00	0.00	0.00
5,000.00	8.18	262.88	4,968.69	-32.69	-55.52	-444.16	88.64	0.00	0.00	0.00
5,100.00	8.18	262.88	5,067.67	-131.67	-57.28	-458.28	91.46	0.00	0.00	0.00
5,200.00	8.18	262.88	5,166.65	-230.65	-59.05	-472.40	94.27	0.00	0.00	0.00
5,300.00	8.18	262.88	5,265.64	-329.64	-60.81	-486.52	97.09	0.00	0.00	0.00
5,400.00	8.18	262.88	5,364.62	-428.62	-62.58	-500.63	99.91	0.00	0.00	0.00
5,500.00	8.18	262.88	5,463.60	-527.60	-64.34	-514.75	102.73	0.00	0.00	0.00
5,600.00	8.18	262.88	5,562.58	-626.58	-66.10	-528.87	105.54	0.00	0.00	0.00
5,700.00	8.18	262.88	5,661.57	-725.57	-67.87	-542.99	108.36	0.00	0.00	0.00
<b>KOP (10°/100ft DGLG)</b>										
<b>5,745.25</b>	<b>8.18</b>	<b>262.88</b>	<b>5,706.36</b>	<b>-770.36</b>	<b>-68.67</b>	<b>-549.38</b>	<b>109.64</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,800.00	10.45	231.47	5,760.41	-824.41	-72.25	-557.13	113.78	10.00	4.14	-57.36
5,900.00	18.44	206.22	5,857.26	-921.26	-92.13	-571.25	134.67	10.00	7.99	-25.25
6,000.00	27.74	196.66	5,949.18	-1,013.18	-128.71	-584.95	172.17	10.00	9.30	-9.57
6,100.00	37.38	191.69	6,033.38	-1,097.38	-180.87	-597.80	225.15	10.00	9.64	-4.97
<b>SHARON SPRINGS</b>										
<b>6,185.42</b>	<b>45.73</b>	<b>188.93</b>	<b>6,097.25</b>	<b>-1,161.25</b>	<b>-236.57</b>	<b>-607.82</b>	<b>281.45</b>	<b>10.00</b>	<b>9.77</b>	<b>-3.23</b>
6,200.00	47.16	188.54	6,107.30	-1,171.30	-247.02	-609.43	291.98	10.00	9.81	-2.68
<b>NIOBRARA A CHALK</b>										
<b>6,289.26</b>	<b>55.94</b>	<b>186.48</b>	<b>6,162.75</b>	<b>-1,226.75</b>	<b>-316.25</b>	<b>-618.48</b>	<b>361.70</b>	<b>10.00</b>	<b>9.84</b>	<b>-2.31</b>
6,300.00	57.00	186.26	6,168.68	-1,232.68	-325.15	-619.47	370.65	10.00	9.86	-2.03
<b>NIOBRARA A CHALK BASE</b>										
<b>6,323.83</b>	<b>59.35</b>	<b>185.79</b>	<b>6,181.25</b>	<b>-1,245.25</b>	<b>-345.28</b>	<b>-621.59</b>	<b>390.89</b>	<b>10.00</b>	<b>9.86</b>	<b>-1.95</b>
<b>NIOBRARA B1 CHALK TOP</b>										
<b>6,395.13</b>	<b>66.39</b>	<b>184.52</b>	<b>6,213.75</b>	<b>-1,277.75</b>	<b>-408.45</b>	<b>-627.27</b>	<b>454.30</b>	<b>10.00</b>	<b>9.87</b>	<b>-1.78</b>
6,400.00	66.87	184.44	6,215.68	-1,279.68	-412.90	-627.62	458.76	10.00	9.88	-1.67
<b>NIOBRARA B1 CHALK BASE</b>										
<b>6,470.07</b>	<b>73.80</b>	<b>183.33</b>	<b>6,239.25</b>	<b>-1,303.25</b>	<b>-478.69</b>	<b>-632.07</b>	<b>524.70</b>	<b>10.00</b>	<b>9.89</b>	<b>-1.59</b>
6,500.00	76.76	182.88	6,246.86	-1,310.86	-507.59	-633.64	553.64	10.00	9.89	-1.51
6,600.00	86.65	181.43	6,261.26	-1,325.26	-606.35	-637.34	652.40	10.00	9.90	-1.44
<b>HZ LP: 300ft FNL &amp; 305ft FWL of Sec 2 - NIOBRARA B2 CHALK TOP</b>										
<b>6,633.79</b>	<b>90.00</b>	<b>180.96</b>	<b>6,262.25</b>	<b>-1,326.25</b>	<b>-640.11</b>	<b>-638.04</b>	<b>686.12</b>	<b>10.00</b>	<b>9.90</b>	<b>-1.41</b>
6,700.00	90.00	180.96	6,262.25	-1,326.25	-706.32	-639.15	752.22	0.00	0.00	0.00
6,800.00	90.00	180.96	6,262.25	-1,326.25	-806.30	-640.81	852.05	0.00	0.00	0.00
6,900.00	90.00	180.96	6,262.25	-1,326.25	-906.29	-642.48	951.88	0.00	0.00	0.00
7,000.00	90.00	180.96	6,262.25	-1,326.25	-1,006.27	-644.15	1,051.71	0.00	0.00	0.00
7,100.00	90.00	180.96	6,262.25	-1,326.25	-1,106.26	-645.82	1,151.54	0.00	0.00	0.00
7,200.00	90.00	180.96	6,262.25	-1,326.25	-1,206.25	-647.48	1,251.37	0.00	0.00	0.00
7,300.00	90.00	180.96	6,262.25	-1,326.25	-1,306.23	-649.15	1,351.20	0.00	0.00	0.00
7,400.00	90.00	180.96	6,262.25	-1,326.25	-1,406.22	-650.82	1,451.03	0.00	0.00	0.00
7,500.00	90.00	180.96	6,262.25	-1,326.25	-1,506.20	-652.49	1,550.86	0.00	0.00	0.00
7,600.00	90.00	180.96	6,262.25	-1,326.25	-1,606.19	-654.16	1,650.69	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 2-11-1HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4936.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4936.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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	6,262.25	-1,326.25	-1,706.18	-655.82	1,750.52	0.00	0.00	0.00
7,800.00	90.00	180.96	6,262.25	-1,326.25	-1,806.16	-657.49	1,850.35	0.00	0.00	0.00
7,900.00	90.00	180.96	6,262.25	-1,326.25	-1,906.15	-659.16	1,950.18	0.00	0.00	0.00
8,000.00	90.00	180.96	6,262.25	-1,326.25	-2,006.13	-660.83	2,050.01	0.00	0.00	0.00
8,100.00	90.00	180.96	6,262.25	-1,326.25	-2,106.12	-662.50	2,149.84	0.00	0.00	0.00
8,200.00	90.00	180.96	6,262.25	-1,326.25	-2,206.11	-664.16	2,249.67	0.00	0.00	0.00
8,300.00	90.00	180.96	6,262.25	-1,326.25	-2,306.09	-665.83	2,349.50	0.00	0.00	0.00
8,400.00	90.00	180.96	6,262.25	-1,326.25	-2,406.08	-667.50	2,449.33	0.00	0.00	0.00
8,500.00	90.00	180.96	6,262.25	-1,326.25	-2,506.06	-669.17	2,549.16	0.00	0.00	0.00
8,600.00	90.00	180.96	6,262.25	-1,326.25	-2,606.05	-670.84	2,648.99	0.00	0.00	0.00
8,700.00	90.00	180.96	6,262.25	-1,326.25	-2,706.04	-672.50	2,748.82	0.00	0.00	0.00
8,800.00	90.00	180.96	6,262.25	-1,326.25	-2,806.02	-674.17	2,848.65	0.00	0.00	0.00
8,900.00	90.00	180.96	6,262.25	-1,326.25	-2,906.01	-675.84	2,948.48	0.00	0.00	0.00
9,000.00	90.00	180.96	6,262.25	-1,326.25	-3,006.00	-677.51	3,048.31	0.00	0.00	0.00
9,100.00	90.00	180.96	6,262.25	-1,326.25	-3,105.98	-679.18	3,148.14	0.00	0.00	0.00
9,200.00	90.00	180.96	6,262.25	-1,326.25	-3,205.97	-680.84	3,247.97	0.00	0.00	0.00
9,300.00	90.00	180.96	6,262.25	-1,326.25	-3,305.95	-682.51	3,347.80	0.00	0.00	0.00
9,400.00	90.00	180.96	6,262.25	-1,326.25	-3,405.94	-684.18	3,447.63	0.00	0.00	0.00
9,500.00	90.00	180.96	6,262.25	-1,326.25	-3,505.93	-685.85	3,547.46	0.00	0.00	0.00
9,600.00	90.00	180.96	6,262.25	-1,326.25	-3,605.91	-687.52	3,647.29	0.00	0.00	0.00
9,700.00	90.00	180.96	6,262.25	-1,326.25	-3,705.90	-689.18	3,747.12	0.00	0.00	0.00
9,800.00	90.00	180.96	6,262.25	-1,326.25	-3,805.88	-690.85	3,846.95	0.00	0.00	0.00
9,900.00	90.00	180.96	6,262.25	-1,326.25	-3,905.87	-692.52	3,946.78	0.00	0.00	0.00
10,000.00	90.00	180.96	6,262.25	-1,326.25	-4,005.86	-694.19	4,046.61	0.00	0.00	0.00
10,100.00	90.00	180.96	6,262.25	-1,326.25	-4,105.84	-695.85	4,146.44	0.00	0.00	0.00
10,200.00	90.00	180.96	6,262.25	-1,326.25	-4,205.83	-697.52	4,246.27	0.00	0.00	0.00
10,300.00	90.00	180.96	6,262.25	-1,326.25	-4,305.81	-699.19	4,346.10	0.00	0.00	0.00
10,400.00	90.00	180.96	6,262.25	-1,326.25	-4,405.80	-700.86	4,445.93	0.00	0.00	0.00
10,500.00	90.00	180.96	6,262.25	-1,326.25	-4,505.79	-702.53	4,545.76	0.00	0.00	0.00
10,600.00	90.00	180.96	6,262.25	-1,326.25	-4,605.77	-704.19	4,645.59	0.00	0.00	0.00
10,700.00	90.00	180.96	6,262.25	-1,326.25	-4,705.76	-705.86	4,745.42	0.00	0.00	0.00
10,800.00	90.00	180.96	6,262.25	-1,326.25	-4,805.74	-707.53	4,845.25	0.00	0.00	0.00
10,900.00	90.00	180.96	6,262.25	-1,326.25	-4,905.73	-709.20	4,945.08	0.00	0.00	0.00
11,000.00	90.00	180.96	6,262.25	-1,326.25	-5,005.72	-710.87	5,044.91	0.00	0.00	0.00
11,100.00	90.00	180.96	6,262.25	-1,326.25	-5,105.70	-712.53	5,144.74	0.00	0.00	0.00
11,200.00	90.00	180.96	6,262.25	-1,326.25	-5,205.69	-714.20	5,244.57	0.00	0.00	0.00
11,300.00	90.00	180.96	6,262.25	-1,326.25	-5,305.68	-715.87	5,344.40	0.00	0.00	0.00
11,400.00	90.00	180.96	6,262.25	-1,326.25	-5,405.66	-717.54	5,444.23	0.00	0.00	0.00
11,500.00	90.00	180.96	6,262.25	-1,326.25	-5,505.65	-719.21	5,544.06	0.00	0.00	0.00
11,600.00	90.00	180.96	6,262.25	-1,326.25	-5,605.63	-720.87	5,643.89	0.00	0.00	0.00
11,700.00	90.00	180.96	6,262.25	-1,326.25	-5,705.62	-722.54	5,743.72	0.00	0.00	0.00
11,800.00	90.00	180.96	6,262.25	-1,326.25	-5,805.61	-724.21	5,843.55	0.00	0.00	0.00
11,900.00	90.00	180.96	6,262.25	-1,326.25	-5,905.59	-725.88	5,943.38	0.00	0.00	0.00
12,000.00	90.00	180.96	6,262.25	-1,326.25	-6,005.58	-727.55	6,043.21	0.00	0.00	0.00
12,100.00	90.00	180.96	6,262.25	-1,326.25	-6,105.56	-729.21	6,143.04	0.00	0.00	0.00
12,200.00	90.00	180.96	6,262.25	-1,326.25	-6,205.55	-730.88	6,242.87	0.00	0.00	0.00
12,300.00	90.00	180.96	6,262.25	-1,326.25	-6,305.54	-732.55	6,342.70	0.00	0.00	0.00
12,400.00	90.00	180.96	6,262.25	-1,326.25	-6,405.52	-734.22	6,442.53	0.00	0.00	0.00
12,500.00	90.00	180.96	6,262.25	-1,326.25	-6,505.51	-735.89	6,542.36	0.00	0.00	0.00
12,600.00	90.00	180.96	6,262.25	-1,326.25	-6,605.49	-737.55	6,642.19	0.00	0.00	0.00
12,700.00	90.00	180.96	6,262.25	-1,326.25	-6,705.48	-739.22	6,742.02	0.00	0.00	0.00
12,800.00	90.00	180.96	6,262.25	-1,326.25	-6,805.47	-740.89	6,841.85	0.00	0.00	0.00
12,900.00	90.00	180.96	6,262.25	-1,326.25	-6,905.45	-742.56	6,941.68	0.00	0.00	0.00
13,000.00	90.00	180.96	6,262.25	-1,326.25	-7,005.44	-744.22	7,041.51	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 2-11-1HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4936.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4936.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	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	6,262.25	-1,326.25	-7,105.42	-745.89	7,141.34	0.00	0.00	0.00
13,200.00	90.00	180.96	6,262.25	-1,326.25	-7,205.41	-747.56	7,241.17	0.00	0.00	0.00
13,300.00	90.00	180.96	6,262.25	-1,326.25	-7,305.40	-749.23	7,341.00	0.00	0.00	0.00
13,400.00	90.00	180.96	6,262.25	-1,326.25	-7,405.38	-750.90	7,440.83	0.00	0.00	0.00
13,500.00	90.00	180.96	6,262.25	-1,326.25	-7,505.37	-752.56	7,540.66	0.00	0.00	0.00
13,600.00	90.00	180.96	6,262.25	-1,326.25	-7,605.36	-754.23	7,640.49	0.00	0.00	0.00
13,700.00	90.00	180.96	6,262.25	-1,326.25	-7,705.34	-755.90	7,740.32	0.00	0.00	0.00
13,800.00	90.00	180.96	6,262.25	-1,326.25	-7,805.33	-757.57	7,840.15	0.00	0.00	0.00
13,900.00	90.00	180.96	6,262.25	-1,326.25	-7,905.31	-759.24	7,939.98	0.00	0.00	0.00
14,000.00	90.00	180.96	6,262.25	-1,326.25	-8,005.30	-760.90	8,039.81	0.00	0.00	0.00
14,100.00	90.00	180.96	6,262.25	-1,326.25	-8,105.29	-762.57	8,139.64	0.00	0.00	0.00
14,200.00	90.00	180.96	6,262.25	-1,326.25	-8,205.27	-764.24	8,239.47	0.00	0.00	0.00
14,300.00	90.00	180.96	6,262.25	-1,326.25	-8,305.26	-765.91	8,339.30	0.00	0.00	0.00
14,400.00	90.00	180.96	6,262.25	-1,326.25	-8,405.24	-767.58	8,439.13	0.00	0.00	0.00
14,500.00	90.00	180.96	6,262.25	-1,326.25	-8,505.23	-769.24	8,538.96	0.00	0.00	0.00
14,600.00	90.00	180.96	6,262.25	-1,326.25	-8,605.22	-770.91	8,638.79	0.00	0.00	0.00
14,700.00	90.00	180.96	6,262.25	-1,326.25	-8,705.20	-772.58	8,738.62	0.00	0.00	0.00
14,800.00	90.00	180.96	6,262.25	-1,326.25	-8,805.19	-774.25	8,838.45	0.00	0.00	0.00
14,900.00	90.00	180.96	6,262.25	-1,326.25	-8,905.17	-775.92	8,938.28	0.00	0.00	0.00
15,000.00	90.00	180.96	6,262.25	-1,326.25	-9,005.16	-777.58	9,038.11	0.00	0.00	0.00
15,100.00	90.00	180.96	6,262.25	-1,326.25	-9,105.15	-779.25	9,137.94	0.00	0.00	0.00
15,200.00	90.00	180.96	6,262.25	-1,326.25	-9,205.13	-780.92	9,237.77	0.00	0.00	0.00
15,300.00	90.00	180.96	6,262.25	-1,326.25	-9,305.12	-782.59	9,337.60	0.00	0.00	0.00
15,400.00	90.00	180.96	6,262.25	-1,326.25	-9,405.10	-784.26	9,437.43	0.00	0.00	0.00
15,500.00	90.00	180.96	6,262.25	-1,326.25	-9,505.09	-785.92	9,537.26	0.00	0.00	0.00
15,600.00	90.00	180.96	6,262.25	-1,326.25	-9,605.08	-787.59	9,637.09	0.00	0.00	0.00
15,700.00	90.00	180.96	6,262.25	-1,326.25	-9,705.06	-789.26	9,736.92	0.00	0.00	0.00
15,800.00	90.00	180.96	6,262.25	-1,326.25	-9,805.05	-790.93	9,836.75	0.00	0.00	0.00
15,900.00	90.00	180.96	6,262.25	-1,326.25	-9,905.04	-792.59	9,936.58	0.00	0.00	0.00
16,000.00	90.00	180.96	6,262.25	-1,326.25	-10,005.02	-794.26	10,036.41	0.00	0.00	0.00
16,100.00	90.00	180.96	6,262.25	-1,326.25	-10,105.01	-795.93	10,136.24	0.00	0.00	0.00
16,200.00	90.00	180.96	6,262.25	-1,326.25	-10,204.99	-797.60	10,236.07	0.00	0.00	0.00
16,300.00	90.00	180.96	6,262.25	-1,326.25	-10,304.98	-799.27	10,335.90	0.00	0.00	0.00
16,400.00	90.00	180.96	6,262.25	-1,326.25	-10,404.97	-800.93	10,435.73	0.00	0.00	0.00
16,500.00	90.00	180.96	6,262.25	-1,326.25	-10,504.95	-802.60	10,535.56	0.00	0.00	0.00
16,600.00	90.00	180.96	6,262.25	-1,326.25	-10,604.94	-804.27	10,635.39	0.00	0.00	0.00
16,700.00	90.00	180.96	6,262.25	-1,326.25	-10,704.92	-805.94	10,735.22	0.00	0.00	0.00
<b>BHL: 300ft FSL &amp; 305ft FWL of Sec 11</b>										
<b>16,728.18</b>	<b>90.00</b>	<b>180.96</b>	<b>6,262.25</b>	<b>-1,326.25</b>	<b>-10,733.10</b>	<b>-806.41</b>	<b>10,763.35</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 2-11-1HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4936.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4936.00usft
<b>Site:</b>	SE SW SEC. 35 T9N R60W 6TH P.M.	<b>North Reference:</b>	True
<b>Well:</b>	PINTAIL FED 2-11-1HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #4		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,520.75	1,520.75	FOX HILLS BASE			
3,337.65	3,323.25	RICHARD SANDSTONE			
4,208.00	4,184.75	SUSSEX SANDSTONE			
4,701.02	4,672.75	SHANNON SANDSTONE			
6,185.42	6,097.25	SHARON SPRINGS			
6,289.26	6,162.75	NIOBRARA A CHALK			
6,323.83	6,181.25	NIOBRARA A CHALK BASE			
6,395.13	6,213.75	NIOBRARA B1 CHALK TOP			
6,470.07	6,239.25	NIOBRARA B1 CHALK BASE			
6,633.79	6,262.25	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: 335ft FSL & 1397ft FWL of Sec 35
1,555.00	1,555.00	0.00	0.00	SURFACE CASING
1,650.00	1,650.00	0.00	0.00	START NUDGE (2°/100ft BUR)
2,059.01	2,057.62	-3.62	-28.92	EOB TO 8.18° INC
5,745.25	5,706.36	-68.67	-549.38	KOP (10°/100ft DGLG)
6,633.79	6,262.25	-640.11	-638.04	HZ LP: 300ft FNL & 305ft FWL of Sec 2
16,728.18	6,262.25	-10,733.10	-806.41	BHL: 300ft FSL & 305ft FWL of Sec 11