

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

SW SW SEC. 31 T8N R59W 6th P.M.

MOTTLED SOUTH 6-10HN

ORIGINAL WELLBORE

19 April, 2018

Plan: PROPOSAL #1



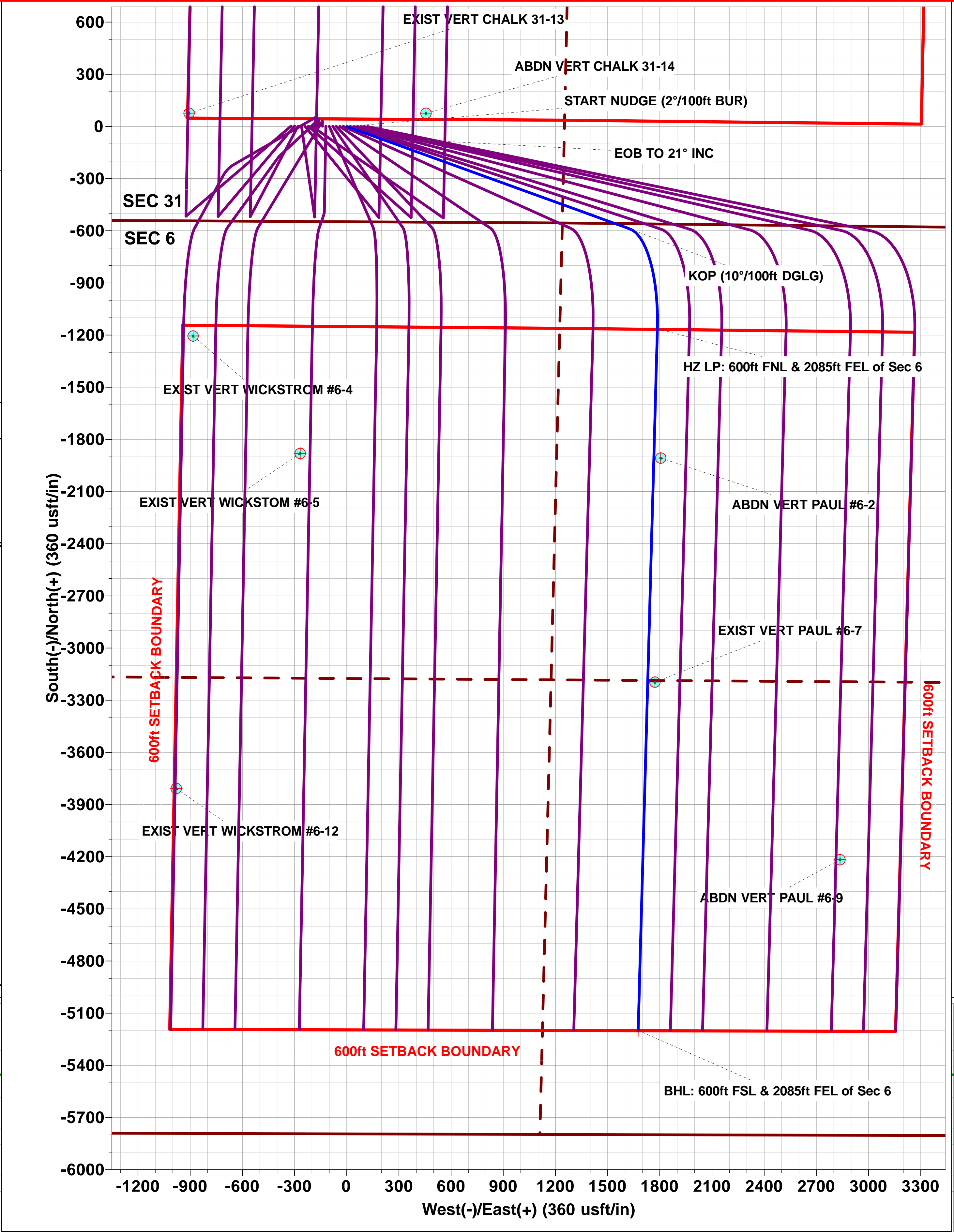
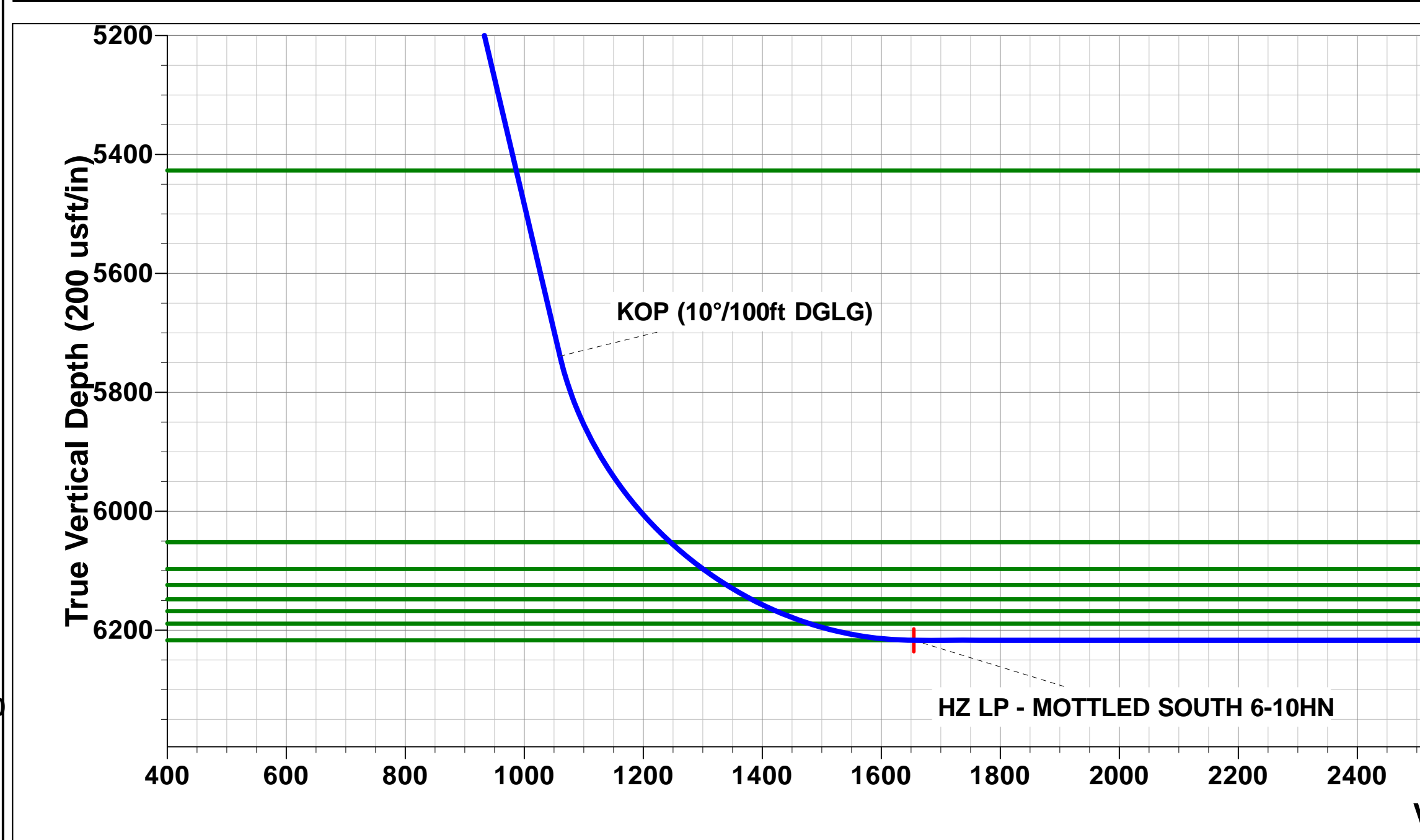
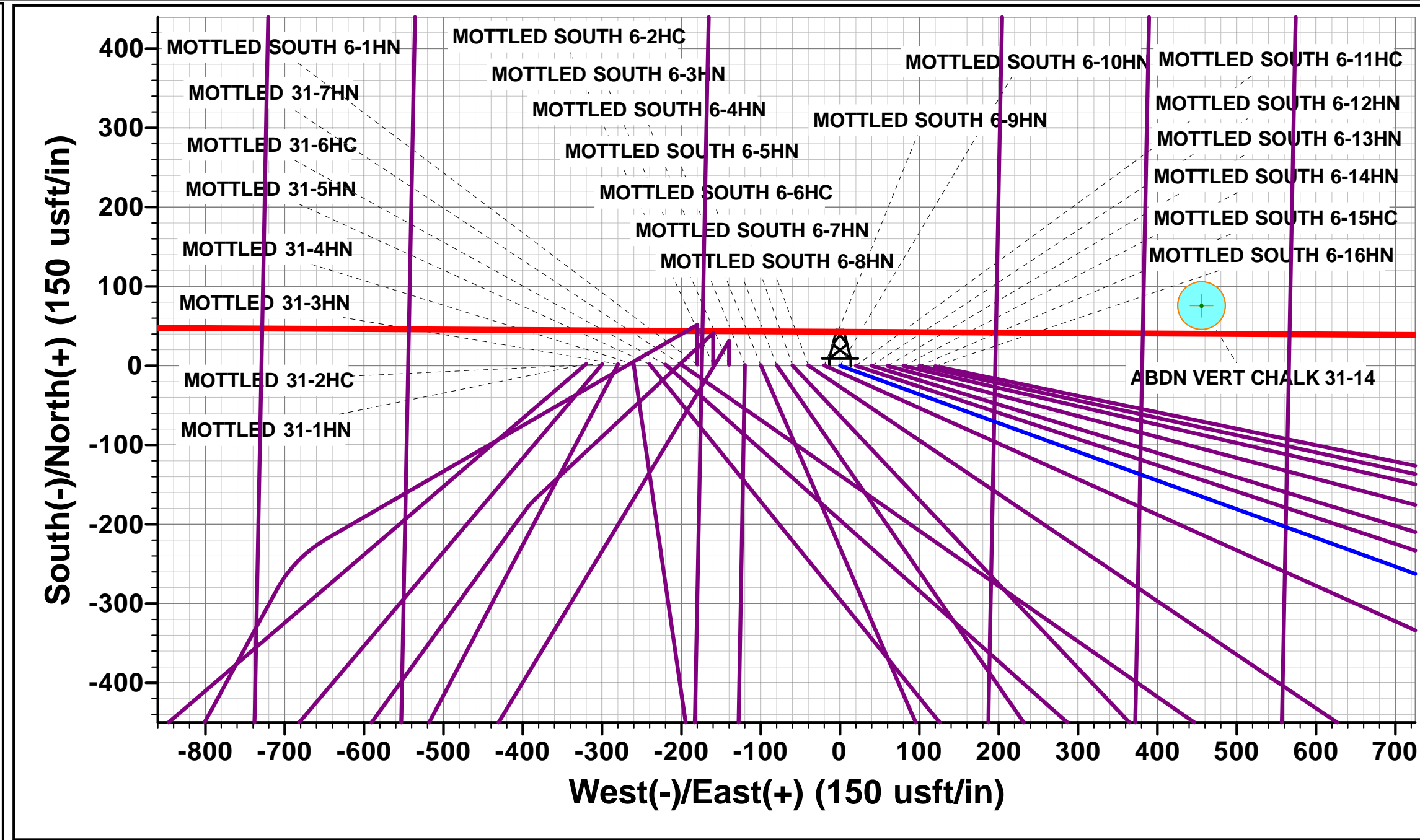
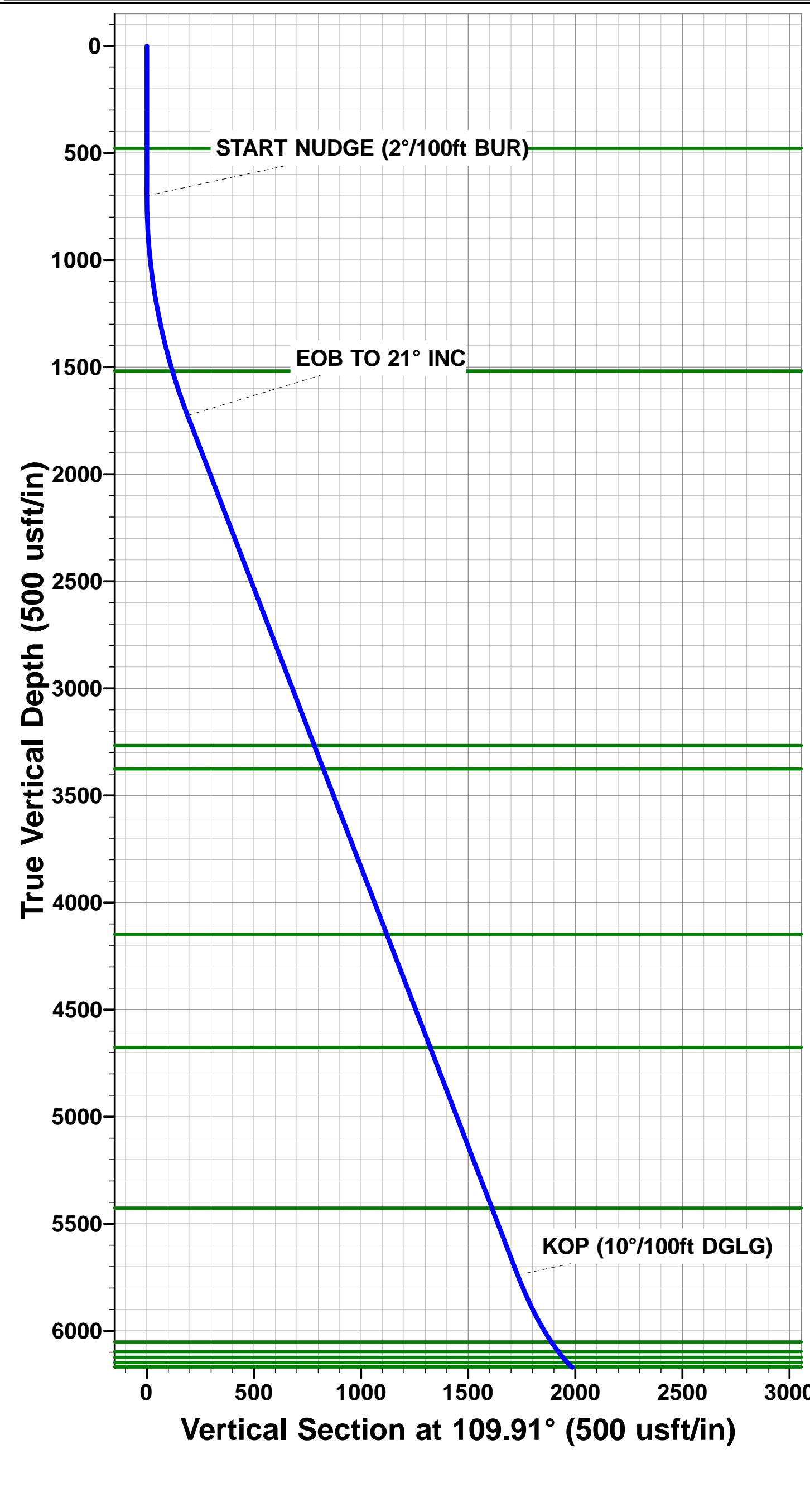


Project: WELD COUNTY, COLORADO (NAD 83)
Site: SW SW SEC. 31 T8N R59W 6th P.M.
Well: MOTTLED SOUTH 6-10HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 550ft FSL & 1519ft FWL of Sec 31	
700.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
1726.78	1750.15	21.00	109.91	-64.81	178.96	116.58	190.33	EOB TO 21° INC	
5739.39	6048.31	21.00	109.91	-589.35	1627.43	1060.16	1730.86	KOP (10°/100ft DGLG)	
6217.00	6883.55	90.00	181.56	-1163.19	1785.87	1654.93	2349.43	HZ LP: 600ft FNL & 2085ft FEL of Sec 6	
6217.00	10921.04	90.00	181.56	-5199.18	1675.64	5462.53	6386.92	BHL: 600ft FSL & 2085ft FEL of Sec 6	

PROPOSED LOCAL COORDINATES:
SHL: 550ft FSL & 1519ft FWL Sec 31
HZ LP: 600ft FNL & 2085ft FEL Sec 6
BHL: 600ft FSL & 2085ft FEL of Sec 6

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - MOTTLED SOUTH 6-10HN	6217.00	-1163.19	1785.87	40.609889	-104.018769
BHL - MOTTLED SOUTH 6-10HN	6217.00	-5199.18	1675.64	40.598811	-104.019167



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well MOTTLED SOUTH 6-10HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4988.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4988.00usft (Original Well Elev)
Site:	SW SW SEC. 31 T8N R59W 6th P.M.	North Reference:	True
Well:	MOTTLED SOUTH 6-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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. 31 T8N R59W 6th P.M.			
Site Position:		Northing:	1,469,589.22 usft	Latitude:	40.613088
From:	Lat/Long	Easting:	3,409,117.03 usft	Longitude:	-104.026353
Position Uncertainty:	0.00 usft	Slot Radius:	1.10000ft	Grid Convergence:	0.95 °

Well	MOTTLED SOUTH 6-10HN					
Well Position	+N/-S	-2.22 usft	Northing:	1,469,592.32 usft	Latitude:	40.613082
	+E/-W	319.84 usft	Easting:	3,409,436.86 usft	Longitude:	-104.025201
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,968.00 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	19/04/2018	7.74	67.11	52,481

Design	PROPOSAL #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	6,217.00	0.00	0.00	162.14

Plan Sections											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	-4,988.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	-4,288.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,750.15	21.00	109.91	1,726.78	-3,261.22	-64.81	178.96	2.00	2.00	0.00	109.91	
6,048.31	21.00	109.91	5,739.39	751.39	-589.35	1,627.43	0.00	0.00	0.00	0.00	
6,883.55	90.00	181.56	6,217.00	1,229.00	-1,163.19	1,785.87	10.00	8.26	8.58	72.80	HZ LP - MOTTLED
10,921.04	90.00	181.56	6,217.00	1,229.00	-5,199.18	1,675.64	0.00	0.00	0.00	0.00	BHL - MOTTLED S

Planning Report



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Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4988.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4988.00usft (Original Well Elev)
Site:	SW SW SEC. 31 T8N R59W 6th P.M.	North Reference:	True
Well:	MOTTLED SOUTH 6-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
SHL: 550ft FSL & 1519ft FWL of Sec 31										
0.00	0.00	0.00	0.00	4,988.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,888.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,788.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,688.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,588.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base										
479.00	0.00	0.00	479.00	4,509.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4,488.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	4,388.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
700.00	0.00	0.00	700.00	4,288.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	2.00	109.91	799.98	4,188.02	-0.59	1.64	1.07	2.00	2.00	0.00
900.00	4.00	109.91	899.84	4,088.16	-2.38	6.56	4.27	2.00	2.00	0.00
1,000.00	6.00	109.91	999.45	3,988.55	-5.34	14.76	9.61	2.00	2.00	0.00
1,100.00	8.00	109.91	1,098.70	3,889.30	-9.49	26.21	17.08	2.00	2.00	0.00
1,200.00	10.00	109.91	1,197.47	3,790.53	-14.82	40.92	26.66	2.00	2.00	0.00
1,300.00	12.00	109.91	1,295.62	3,692.38	-21.32	58.86	38.34	2.00	2.00	0.00
1,400.00	14.00	109.91	1,393.06	3,594.94	-28.98	80.01	52.12	2.00	2.00	0.00
1,500.00	16.00	109.91	1,489.64	3,498.36	-37.79	104.35	67.97	2.00	2.00	0.00
Pierre Shale Top										
1,529.54	16.59	109.91	1,518.00	3,470.00	-40.61	112.14	73.05	2.00	2.00	0.00
1,600.00	18.00	109.91	1,585.27	3,402.73	-47.74	131.83	85.88	2.00	2.00	0.00
1,700.00	20.00	109.91	1,679.82	3,308.18	-58.83	162.44	105.82	2.00	2.00	0.00
EOB TO 21° INC										
1,750.15	21.00	109.91	1,726.78	3,261.22	-64.81	178.96	116.58	2.00	2.00	0.00
1,800.00	21.00	109.91	1,773.33	3,214.67	-70.89	195.76	127.52	0.00	0.00	0.00
1,900.00	21.00	109.91	1,866.68	3,121.32	-83.09	229.46	149.48	0.00	0.00	0.00
2,000.00	21.00	109.91	1,960.04	3,027.96	-95.30	263.16	171.43	0.00	0.00	0.00
2,100.00	21.00	109.91	2,053.40	2,934.60	-107.50	296.86	193.38	0.00	0.00	0.00
2,200.00	21.00	109.91	2,146.75	2,841.25	-119.71	330.56	215.33	0.00	0.00	0.00
2,300.00	21.00	109.91	2,240.11	2,747.89	-131.91	364.26	237.29	0.00	0.00	0.00
2,400.00	21.00	109.91	2,333.46	2,654.54	-144.11	397.96	259.24	0.00	0.00	0.00
2,500.00	21.00	109.91	2,426.82	2,561.18	-156.32	431.66	281.19	0.00	0.00	0.00
2,600.00	21.00	109.91	2,520.18	2,467.82	-168.52	465.36	303.15	0.00	0.00	0.00
2,700.00	21.00	109.91	2,613.53	2,374.47	-180.73	499.06	325.10	0.00	0.00	0.00
2,800.00	21.00	109.91	2,706.89	2,281.11	-192.93	532.76	347.05	0.00	0.00	0.00
2,900.00	21.00	109.91	2,800.25	2,187.75	-205.13	566.46	369.01	0.00	0.00	0.00
3,000.00	21.00	109.91	2,893.60	2,094.40	-217.34	600.16	390.96	0.00	0.00	0.00
3,100.00	21.00	109.91	2,986.96	2,001.04	-229.54	633.86	412.91	0.00	0.00	0.00
3,200.00	21.00	109.91	3,080.31	1,907.69	-241.75	667.56	434.86	0.00	0.00	0.00
3,300.00	21.00	109.91	3,173.67	1,814.33	-253.95	701.26	456.82	0.00	0.00	0.00
Richard Sandstone										
3,399.97	21.00	109.91	3,267.00	1,721.00	-266.15	734.95	478.76	0.00	0.00	0.00
3,400.00	21.00	109.91	3,267.03	1,720.97	-266.15	734.96	478.77	0.00	0.00	0.00
3,500.00	21.00	109.91	3,360.38	1,627.62	-278.36	768.66	500.72	0.00	0.00	0.00
Parkman Sandstone										
3,516.73	21.00	109.91	3,376.00	1,612.00	-280.40	774.29	504.40	0.00	0.00	0.00
3,600.00	21.00	109.91	3,453.74	1,534.26	-290.56	802.36	522.68	0.00	0.00	0.00
3,700.00	21.00	109.91	3,547.09	1,440.91	-302.76	836.06	544.63	0.00	0.00	0.00
3,800.00	21.00	109.91	3,640.45	1,347.55	-314.97	869.76	566.58	0.00	0.00	0.00
3,900.00	21.00	109.91	3,733.81	1,254.19	-327.17	903.46	588.54	0.00	0.00	0.00
4,000.00	21.00	109.91	3,827.16	1,160.84	-339.38	937.15	610.49	0.00	0.00	0.00

Planning Report



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Site:	SW SW SEC. 31 T8N R59W 6th P.M.	North Reference:	True
Well:	MOTTLED SOUTH 6-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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)
4,100.00	21.00	109.91	3,920.52	1,067.48	-351.58	970.85	632.44	0.00	0.00	0.00
4,200.00	21.00	109.91	4,013.88	974.12	-363.78	1,004.55	654.40	0.00	0.00	0.00
4,300.00	21.00	109.91	4,107.23	880.77	-375.99	1,038.25	676.35	0.00	0.00	0.00
Sussex Sandstone										
4,343.67	21.00	109.91	4,148.00	840.00	-381.32	1,052.97	685.93	0.00	0.00	0.00
4,400.00	21.00	109.91	4,200.59	787.41	-388.19	1,071.95	698.30	0.00	0.00	0.00
4,500.00	21.00	109.91	4,293.94	694.06	-400.40	1,105.65	720.25	0.00	0.00	0.00
4,600.00	21.00	109.91	4,387.30	600.70	-412.60	1,139.35	742.21	0.00	0.00	0.00
4,700.00	21.00	109.91	4,480.66	507.34	-424.80	1,173.05	764.16	0.00	0.00	0.00
4,800.00	21.00	109.91	4,574.01	413.99	-437.01	1,206.75	786.11	0.00	0.00	0.00
4,900.00	21.00	109.91	4,667.37	320.63	-449.21	1,240.45	808.07	0.00	0.00	0.00
Shannon Sandstone										
4,909.24	21.00	109.91	4,676.00	312.00	-450.34	1,243.57	810.10	0.00	0.00	0.00
5,000.00	21.00	109.91	4,760.73	227.27	-461.42	1,274.15	830.02	0.00	0.00	0.00
5,100.00	21.00	109.91	4,854.08	133.92	-473.62	1,307.85	851.97	0.00	0.00	0.00
5,200.00	21.00	109.91	4,947.44	40.56	-485.82	1,341.55	873.93	0.00	0.00	0.00
5,300.00	21.00	109.91	5,040.79	-52.79	-498.03	1,375.25	895.88	0.00	0.00	0.00
5,400.00	21.00	109.91	5,134.15	-146.15	-510.23	1,408.95	917.83	0.00	0.00	0.00
5,500.00	21.00	109.91	5,227.51	-239.51	-522.44	1,442.65	939.78	0.00	0.00	0.00
5,600.00	21.00	109.91	5,320.86	-332.86	-534.64	1,476.35	961.74	0.00	0.00	0.00
5,700.00	21.00	109.91	5,414.22	-426.22	-546.84	1,510.05	983.69	0.00	0.00	0.00
TeePee Buttes										
5,713.69	21.00	109.91	5,427.00	-439.00	-548.51	1,514.67	986.70	0.00	0.00	0.00
5,800.00	21.00	109.91	5,507.58	-519.58	-559.05	1,543.75	1,005.64	0.00	0.00	0.00
5,900.00	21.00	109.91	5,600.93	-612.93	-571.25	1,577.45	1,027.60	0.00	0.00	0.00
6,000.00	21.00	109.91	5,694.29	-706.29	-583.45	1,611.15	1,049.55	0.00	0.00	0.00
KOP (10°/100ft DGLG)										
6,048.31	21.00	109.91	5,739.39	-751.39	-589.35	1,627.43	1,060.16	0.00	0.00	0.00
6,100.00	23.04	122.61	5,787.33	-799.33	-597.96	1,644.68	1,073.64	10.00	3.94	24.57
6,200.00	29.15	140.78	5,877.24	-889.24	-627.45	1,676.64	1,111.52	10.00	6.11	18.17
6,300.00	36.88	152.51	5,961.11	-973.11	-673.06	1,705.97	1,163.92	10.00	7.73	11.73
6,400.00	45.40	160.51	6,036.40	-1,048.40	-733.40	1,731.77	1,229.26	10.00	8.52	8.00
Sharon Springs										
6,422.62	47.40	161.98	6,052.00	-1,064.00	-748.91	1,737.04	1,245.64	10.00	8.81	6.53
Niobrara Top										
6,493.50	53.75	166.07	6,097.00	-1,109.00	-801.52	1,752.01	1,300.31	10.00	8.96	5.76
6,500.00	54.34	166.40	6,100.82	-1,112.82	-806.63	1,753.26	1,305.56	10.00	9.06	5.23
Niobrara A Chalk										
6,541.72	58.14	168.47	6,124.00	-1,136.00	-840.47	1,760.78	1,340.08	10.00	9.11	4.96
Niobrara A Chalk Base										
6,590.27	62.60	170.68	6,148.00	-1,160.00	-881.97	1,768.40	1,381.91	10.00	9.19	4.54
6,600.00	63.50	171.10	6,152.41	-1,164.41	-890.53	1,769.78	1,390.48	10.00	9.23	4.31
Niobrara B1 Chalk Top										
6,637.19	66.94	172.64	6,168.00	-1,180.00	-923.96	1,774.54	1,423.76	10.00	9.26	4.16
Niobrara B1 Chalk Base										
6,697.94	72.60	175.01	6,189.00	-1,201.00	-980.60	1,780.65	1,479.55	10.00	9.31	3.89
6,700.00	72.79	175.08	6,189.61	-1,201.61	-982.56	1,780.82	1,481.46	10.00	9.33	3.76
6,800.00	82.15	178.69	6,211.29	-1,223.29	-1,079.91	1,786.07	1,575.73	10.00	9.36	3.60
HZ LP: 600ft FNL & 2085ft FEL of Sec 6 - Niobrara B2 Chalk Top (Target)										
6,883.55	90.00	181.56	6,217.00	-1,229.00	-1,163.19	1,785.87	1,654.93	10.00	9.39	3.45
6,900.00	90.00	181.56	6,217.00	-1,229.00	-1,179.63	1,785.42	1,670.45	0.00	0.00	0.00
7,000.00	90.00	181.56	6,217.00	-1,229.00	-1,279.60	1,782.69	1,764.75	0.00	0.00	0.00
7,100.00	90.00	181.56	6,217.00	-1,229.00	-1,379.56	1,779.96	1,859.06	0.00	0.00	0.00

Planning Report



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Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4988.00usft (Original Well Elev)
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Well:	MOTTLED SOUTH 6-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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)
7,200.00	90.00	181.56	6,217.00	-1,229.00	-1,479.52	1,777.23	1,953.36	0.00	0.00	0.00
7,300.00	90.00	181.56	6,217.00	-1,229.00	-1,579.49	1,774.50	2,047.67	0.00	0.00	0.00
7,400.00	90.00	181.56	6,217.00	-1,229.00	-1,679.45	1,771.77	2,141.98	0.00	0.00	0.00
7,500.00	90.00	181.56	6,217.00	-1,229.00	-1,779.41	1,769.04	2,236.28	0.00	0.00	0.00
7,600.00	90.00	181.56	6,217.00	-1,229.00	-1,879.37	1,766.31	2,330.59	0.00	0.00	0.00
7,700.00	90.00	181.56	6,217.00	-1,229.00	-1,979.34	1,763.58	2,424.89	0.00	0.00	0.00
7,800.00	90.00	181.56	6,217.00	-1,229.00	-2,079.30	1,760.85	2,519.20	0.00	0.00	0.00
7,900.00	90.00	181.56	6,217.00	-1,229.00	-2,179.26	1,758.12	2,613.51	0.00	0.00	0.00
8,000.00	90.00	181.56	6,217.00	-1,229.00	-2,279.22	1,755.39	2,707.81	0.00	0.00	0.00
8,100.00	90.00	181.56	6,217.00	-1,229.00	-2,379.19	1,752.66	2,802.12	0.00	0.00	0.00
8,200.00	90.00	181.56	6,217.00	-1,229.00	-2,479.15	1,749.93	2,896.42	0.00	0.00	0.00
8,300.00	90.00	181.56	6,217.00	-1,229.00	-2,579.11	1,747.20	2,990.73	0.00	0.00	0.00
8,400.00	90.00	181.56	6,217.00	-1,229.00	-2,679.08	1,744.47	3,085.04	0.00	0.00	0.00
8,500.00	90.00	181.56	6,217.00	-1,229.00	-2,779.04	1,741.74	3,179.34	0.00	0.00	0.00
8,600.00	90.00	181.56	6,217.00	-1,229.00	-2,879.00	1,739.01	3,273.65	0.00	0.00	0.00
8,700.00	90.00	181.56	6,217.00	-1,229.00	-2,978.96	1,736.28	3,367.95	0.00	0.00	0.00
8,800.00	90.00	181.56	6,217.00	-1,229.00	-3,078.93	1,733.55	3,462.26	0.00	0.00	0.00
8,900.00	90.00	181.56	6,217.00	-1,229.00	-3,178.89	1,730.82	3,556.57	0.00	0.00	0.00
9,000.00	90.00	181.56	6,217.00	-1,229.00	-3,278.85	1,728.09	3,650.87	0.00	0.00	0.00
9,100.00	90.00	181.56	6,217.00	-1,229.00	-3,378.81	1,725.36	3,745.18	0.00	0.00	0.00
9,200.00	90.00	181.56	6,217.00	-1,229.00	-3,478.78	1,722.63	3,839.48	0.00	0.00	0.00
9,300.00	90.00	181.56	6,217.00	-1,229.00	-3,578.74	1,719.90	3,933.79	0.00	0.00	0.00
9,400.00	90.00	181.56	6,217.00	-1,229.00	-3,678.70	1,717.17	4,028.10	0.00	0.00	0.00
9,500.00	90.00	181.56	6,217.00	-1,229.00	-3,778.67	1,714.44	4,122.40	0.00	0.00	0.00
9,600.00	90.00	181.56	6,217.00	-1,229.00	-3,878.63	1,711.71	4,216.71	0.00	0.00	0.00
9,700.00	90.00	181.56	6,217.00	-1,229.00	-3,978.59	1,708.98	4,311.01	0.00	0.00	0.00
9,800.00	90.00	181.56	6,217.00	-1,229.00	-4,078.55	1,706.25	4,405.32	0.00	0.00	0.00
9,900.00	90.00	181.56	6,217.00	-1,229.00	-4,178.52	1,703.52	4,499.63	0.00	0.00	0.00
10,000.00	90.00	181.56	6,217.00	-1,229.00	-4,278.48	1,700.79	4,593.93	0.00	0.00	0.00
10,100.00	90.00	181.56	6,217.00	-1,229.00	-4,378.44	1,698.06	4,688.24	0.00	0.00	0.00
10,200.00	90.00	181.56	6,217.00	-1,229.00	-4,478.40	1,695.33	4,782.54	0.00	0.00	0.00
10,300.00	90.00	181.56	6,217.00	-1,229.00	-4,578.37	1,692.60	4,876.85	0.00	0.00	0.00
10,400.00	90.00	181.56	6,217.00	-1,229.00	-4,678.33	1,689.87	4,971.16	0.00	0.00	0.00
10,500.00	90.00	181.56	6,217.00	-1,229.00	-4,778.29	1,687.14	5,065.46	0.00	0.00	0.00
10,600.00	90.00	181.56	6,217.00	-1,229.00	-4,878.26	1,684.41	5,159.77	0.00	0.00	0.00
10,700.00	90.00	181.56	6,217.00	-1,229.00	-4,978.22	1,681.68	5,254.07	0.00	0.00	0.00
10,800.00	90.00	181.56	6,217.00	-1,229.00	-5,078.18	1,678.95	5,348.38	0.00	0.00	0.00
10,900.00	90.00	181.56	6,217.00	-1,229.00	-5,178.14	1,676.22	5,442.69	0.00	0.00	0.00
BHL: 600ft FSL & 2085ft FEL of Sec 6										
10,921.04	90.00	181.56	6,217.00	-1,229.00	-5,199.18	1,675.64	5,462.53	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well MOTTLED SOUTH 6-10HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4988.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4988.00usft (Original Well Elev)
Site:	SW SW SEC. 31 T8N R59W 6th P.M.	North Reference:	True
Well:	MOTTLED SOUTH 6-10HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
479.00	479.00	Fox Hills Base			
1,529.54	1,518.00	Pierre Shale Top			
3,399.97	3,267.00	Richard Sandstone			
3,516.73	3,376.00	Parkman Sandstone			
4,343.67	4,148.00	Sussex Sandstone			
4,909.24	4,676.00	Shannon Sandstone			
5,713.69	5,427.00	TeePee Buttes			
6,422.62	6,052.00	Sharon Springs			
6,493.50	6,097.00	Niobrara Top			
6,541.72	6,124.00	Niobrara A Chalk			
6,590.27	6,148.00	Niobrara A Chalk Base			
6,637.19	6,168.00	Niobrara B1 Chalk Top			
6,697.94	6,189.00	Niobrara B1 Chalk Base			
6,883.55	6,217.00	Niobrara B2 Chalk Top (Target)			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 550ft FSL & 1519ft FWL of Sec 31
700.00	700.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,750.15	1,726.78	-64.81	178.96	EOB TO 21° INC
6,048.31	5,739.39	-589.35	1,627.43	KOP (10°/100ft DGLG)
6,883.55	6,217.00	-1,163.19	1,785.87	HZ LP: 600ft FNL & 2085ft FEL of Sec 6
10,921.04	6,217.00	-5,199.18	1,675.64	BHL: 600ft FSL & 2085ft FEL of Sec 6