

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

SE SW SEC. 34 T8N R60W 6th P.M.

GREEN TEAL FED 34-27-15HC

ORIGINAL WELLBORE

06 September, 2017

Plan: PROPOSAL 1





Project: WELD COUNTY, COLORADO (NAD 83)
Site: SE SW SEC. 34 T8N R60W 6th P.M.
Well: GREEN TEAL FED 34-27-15HC
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL 1

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: 500ft FSL & 1962ft FWL of Sec 34		
200.0	200.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (3°/100ft BUR)		
1136.8	1179.1	29.37	100.43	-44.4	241.5	24.2	245.5	EOB TO 29.37° INC		
4852.2	5442.7	29.37	100.43	-423.0	2298.1	230.3	2336.7	END OF TANGENT		
5789.0	6421.7	0.00	0.00	-467.4	2539.6	254.4	2582.3	EOD TO VERTICAL		
5889.0	6521.7	0.00	0.00	-467.4	2539.6	254.4	2582.3	KOP (10°/100ft BUR)		
6462.0	7421.8	90.00	1.16	105.4	2551.2	808.1	3155.2	HZ LP: 600ft FSL & 790ft FEL of Sec 34		
6462.0	16825.9	90.00	1.15	9507.6	2741.2	9894.9	12559.3	BHL: 600ft FNL & 790ft FEL of Sec 27		

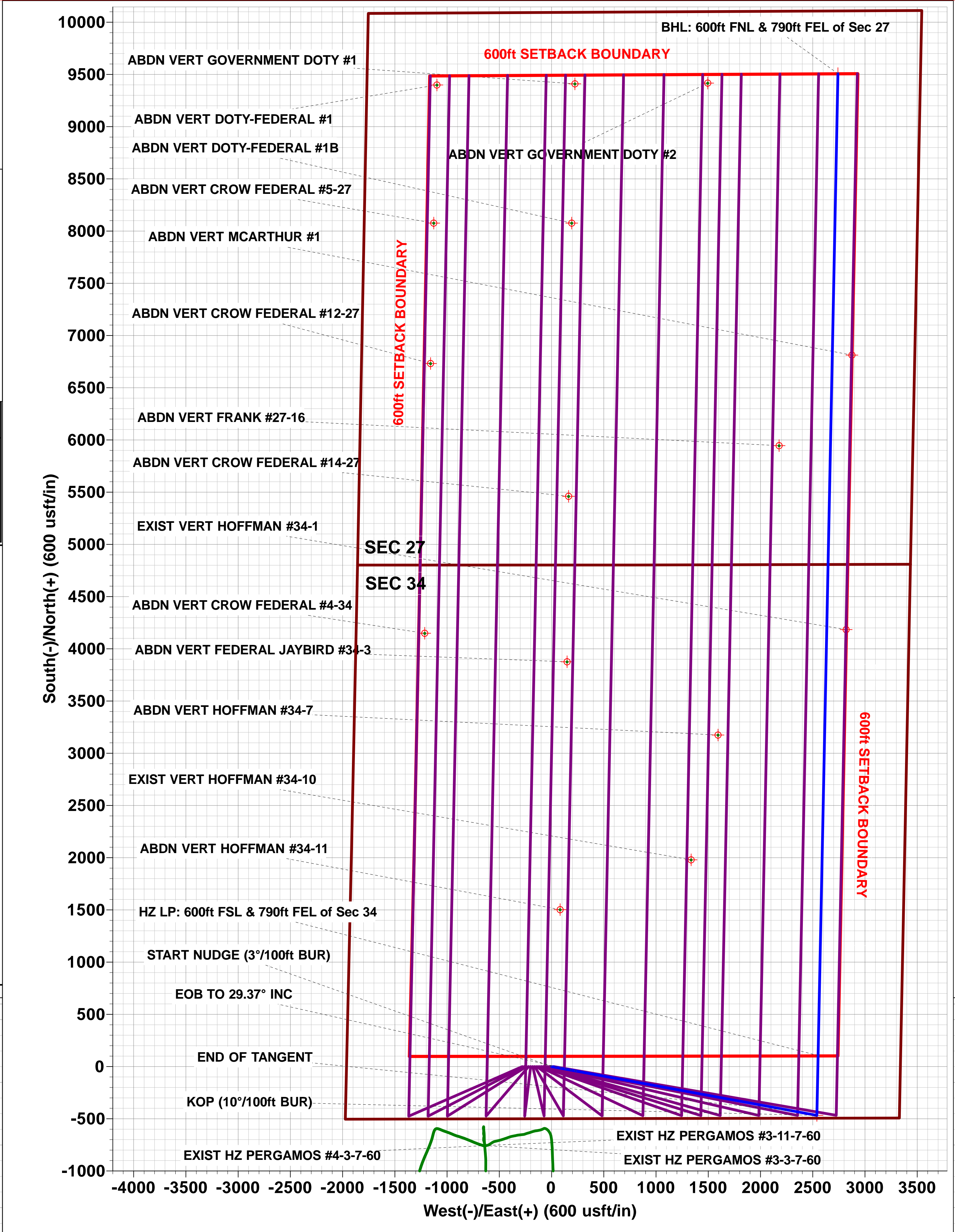
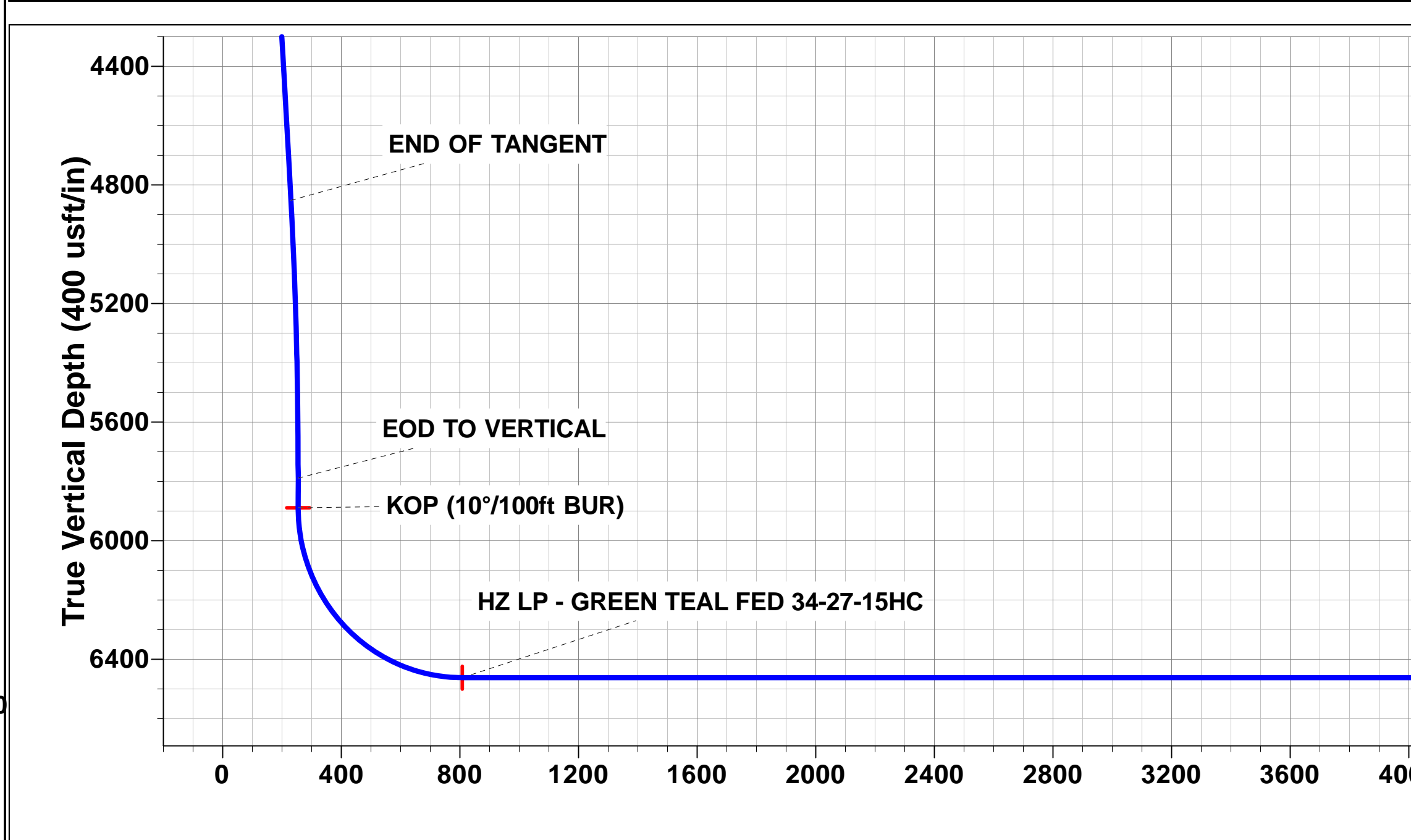
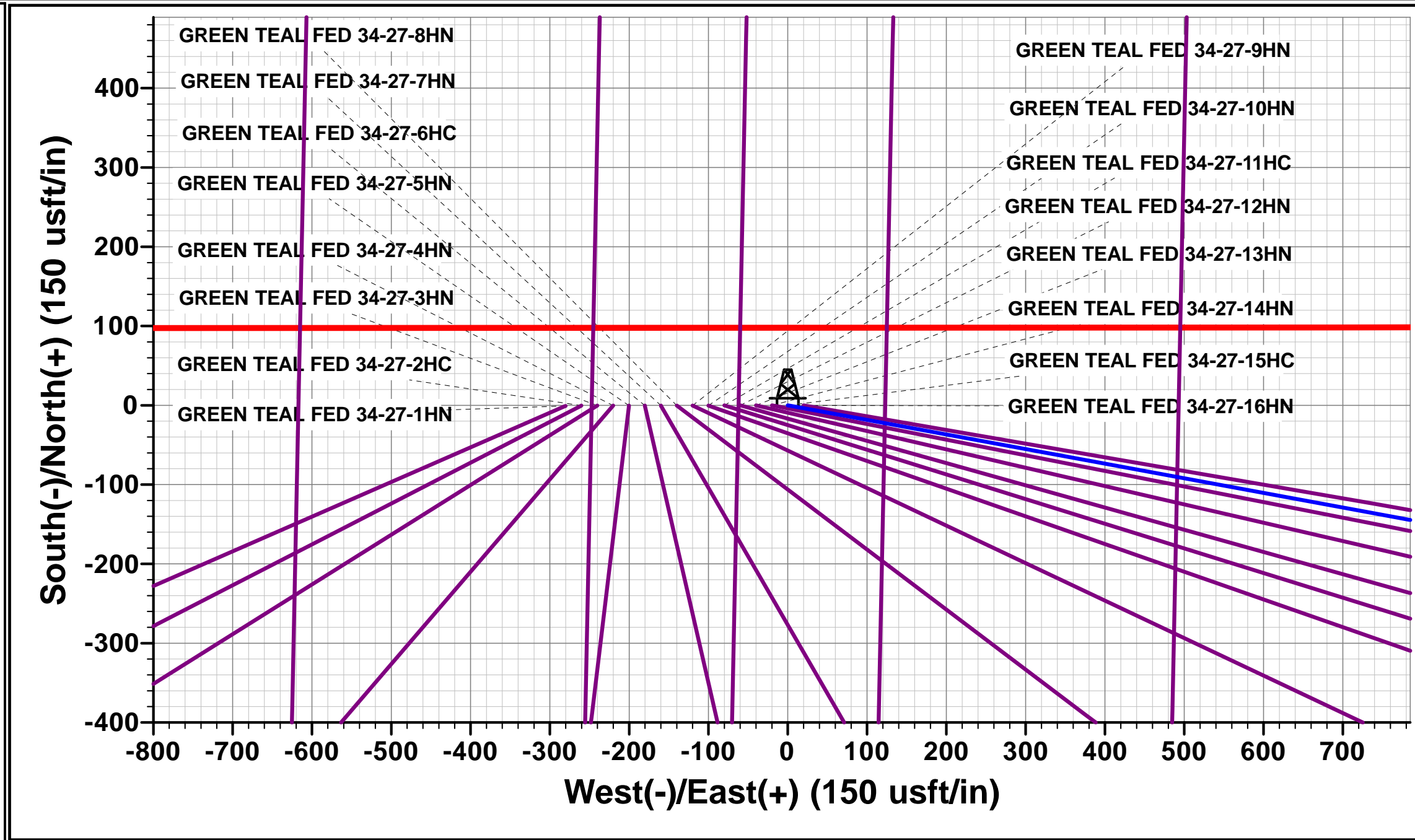
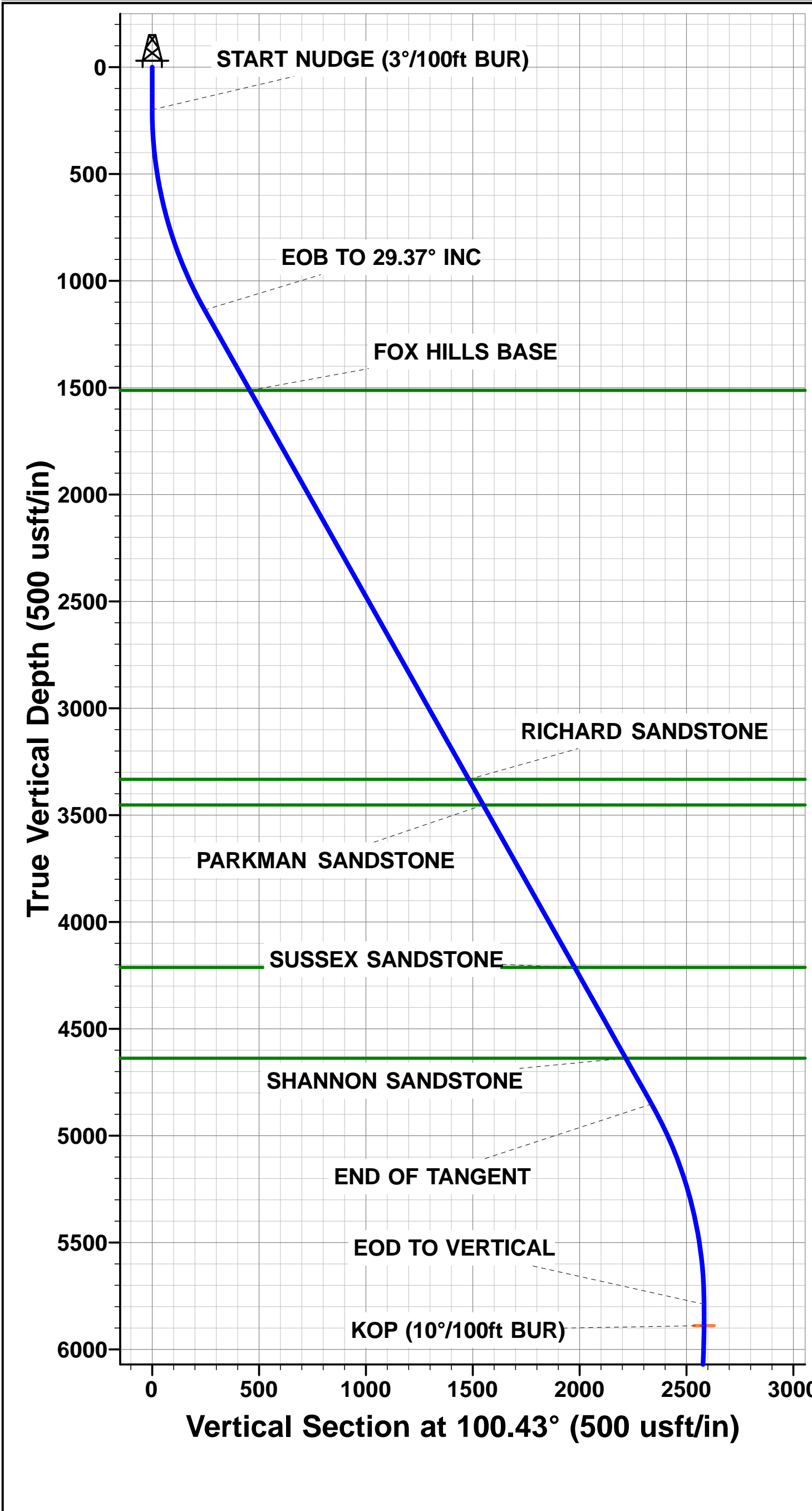
PROPOSED LOCAL COORDINATES:

SHL: 500ft FSL & 1962ft FWL Sec 34

HZ LP: 600ft FSL & 790ft FEL Sec 34

BHL: 600ft FNL & 790ft FEL of Sec 27

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - GREEN TEAL FED 34-27-15HC	5889.0	-467.4	2539.6	40.611594	-104.071751
HZ LP - GREEN TEAL FED 34-27-15HC	6462.0	105.4	2551.2	40.613166	-104.071709
BHL - GREEN TEAL FED 34-27-15HC	6462.0	9507.6	2741.2	40.638973	-104.071021



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GREEN TEAL FED 34-27-15HC
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4939.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4939.0usft (Original Well Elev)
Site:	SE SW SEC. 34 T8N R60W 6th P.M.	North Reference:	True
Well:	GREEN TEAL FED 34-27-15HC	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	SE SW SEC. 34 T8N R60W 6th P.M.		
Site Position:		Northing:	1,469,260.15 usft
From:	Lat/Long	Easting:	3,393,696.59 usft
Position Uncertainty:	0.0 usft	Slot Radius:	1.10000ft
		Latitude:	40.612875
		Longitude:	-104.081907
		Grid Convergence:	0.92 °

Well	GREEN TEAL FED 34-27-15HC		
Well Position	+N-S	0.7 usft	Northing:
	+E-W	280.1 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	06/09/2017	7.83	67.12	52,546

Design	PROPOSAL 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	6,462.0	0.0	0.0	16.08

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	-4,939.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	-4,739.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,179.1	29.37	100.43	1,136.8	-3,802.2	-44.4	241.5	3.00	3.00	0.00	100.43	
5,442.7	29.37	100.43	4,852.2	-86.8	-423.0	2,298.1	0.00	0.00	0.00	0.00	
6,421.7	0.00	0.00	5,789.0	850.0	-467.4	2,539.6	3.00	-3.00	0.00	180.00	
6,521.7	0.00	0.00	5,889.0	950.0	-467.4	2,539.6	0.00	0.00	0.00	0.00	KOP - GREEN TEA
7,421.8	90.00	1.16	6,462.0	1,523.0	105.4	2,551.2	10.00	10.00	0.13	1.16	HZ LP - GREEN TE
16,825.9	90.00	1.15	6,462.0	1,523.0	9,507.6	2,741.2	0.00	0.00	0.00	-60.31	BHL - GREEN TEA

Planning Report



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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4939.0usft (Original Well Elev)
Site:	SE SW SEC. 34 T8N R60W 6th P.M.	North Reference:	True
Well:	GREEN TEAL FED 34-27-15HC	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: 500ft FSL & 1962ft FWL of Sec 34										
0.0	0.00	0.00	0.0	4,939.00	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	4,839.00	0.0	0.0	0.0	0.00	0.00	0.00
START NUDGE (3°/100ft BUR)										
200.0	0.00	0.00	200.0	4,739.00	0.0	0.0	0.0	0.00	0.00	0.00
300.0	3.00	100.43	300.0	4,639.05	-0.5	2.6	0.3	3.00	3.00	0.00
400.0	6.00	100.43	399.6	4,539.37	-1.9	10.3	1.0	3.00	3.00	0.00
500.0	9.00	100.43	498.8	4,440.23	-4.3	23.1	2.3	3.00	3.00	0.00
600.0	12.00	100.43	597.1	4,341.92	-7.6	41.0	4.1	3.00	3.00	0.00
700.0	15.00	100.43	694.3	4,244.69	-11.8	64.0	6.4	3.00	3.00	0.00
800.0	18.00	100.43	790.2	4,148.82	-16.9	91.9	9.2	3.00	3.00	0.00
900.0	21.00	100.43	884.4	4,054.57	-23.0	124.8	12.5	3.00	3.00	0.00
1,000.0	24.00	100.43	976.8	3,962.19	-29.9	162.4	16.3	3.00	3.00	0.00
1,100.0	27.00	100.43	1,067.1	3,871.94	-37.7	204.7	20.5	3.00	3.00	0.00
EOB TO 29.37° INC										
1,179.1	29.37	100.43	1,136.8	3,802.24	-44.4	241.5	24.2	3.00	3.00	0.00
1,200.0	29.37	100.43	1,155.0	3,784.01	-46.3	251.5	25.2	0.00	0.00	0.00
1,300.0	29.37	100.43	1,242.1	3,696.87	-55.2	299.8	30.0	0.00	0.00	0.00
1,400.0	29.37	100.43	1,329.3	3,609.72	-64.1	348.0	34.9	0.00	0.00	0.00
1,500.0	29.37	100.43	1,416.4	3,522.58	-72.9	396.3	39.7	0.00	0.00	0.00
1,600.0	29.37	100.43	1,503.6	3,435.43	-81.8	444.5	44.5	0.00	0.00	0.00
FOX HILLS BASE										
1,610.8	29.37	100.43	1,513.0	3,426.00	-82.8	449.7	45.1	0.00	0.00	0.00
1,700.0	29.37	100.43	1,590.7	3,348.29	-90.7	492.7	49.4	0.00	0.00	0.00
1,800.0	29.37	100.43	1,677.9	3,261.14	-99.6	541.0	54.2	0.00	0.00	0.00
1,900.0	29.37	100.43	1,765.0	3,174.00	-108.4	589.2	59.0	0.00	0.00	0.00
2,000.0	29.37	100.43	1,852.1	3,086.85	-117.3	637.5	63.9	0.00	0.00	0.00
2,100.0	29.37	100.43	1,939.3	2,999.71	-126.2	685.7	68.7	0.00	0.00	0.00
2,200.0	29.37	100.43	2,026.4	2,912.57	-135.1	733.9	73.5	0.00	0.00	0.00
2,300.0	29.37	100.43	2,113.6	2,825.42	-144.0	782.2	78.4	0.00	0.00	0.00
2,400.0	29.37	100.43	2,200.7	2,738.28	-152.8	830.4	83.2	0.00	0.00	0.00
2,500.0	29.37	100.43	2,287.9	2,651.13	-161.7	878.6	88.0	0.00	0.00	0.00
2,600.0	29.37	100.43	2,375.0	2,563.99	-170.6	926.9	92.9	0.00	0.00	0.00
2,700.0	29.37	100.43	2,462.2	2,476.84	-179.5	975.1	97.7	0.00	0.00	0.00
2,800.0	29.37	100.43	2,549.3	2,389.70	-188.3	1,023.4	102.5	0.00	0.00	0.00
2,900.0	29.37	100.43	2,636.4	2,302.55	-197.2	1,071.6	107.4	0.00	0.00	0.00
3,000.0	29.37	100.43	2,723.6	2,215.41	-206.1	1,119.8	112.2	0.00	0.00	0.00
3,100.0	29.37	100.43	2,810.7	2,128.26	-215.0	1,168.1	117.0	0.00	0.00	0.00
3,200.0	29.37	100.43	2,897.9	2,041.12	-223.9	1,216.3	121.9	0.00	0.00	0.00
3,300.0	29.37	100.43	2,985.0	1,953.97	-232.7	1,264.6	126.7	0.00	0.00	0.00
3,400.0	29.37	100.43	3,072.2	1,866.83	-241.6	1,312.8	131.5	0.00	0.00	0.00
3,500.0	29.37	100.43	3,159.3	1,779.68	-250.5	1,361.0	136.4	0.00	0.00	0.00
3,600.0	29.37	100.43	3,246.5	1,692.54	-259.4	1,409.3	141.2	0.00	0.00	0.00
RICHARD SANDSTONE										
3,699.3	29.37	100.43	3,333.0	1,606.00	-268.2	1,457.2	146.0	0.00	0.00	0.00
3,700.0	29.37	100.43	3,333.6	1,605.39	-268.2	1,457.5	146.0	0.00	0.00	0.00
3,800.0	29.37	100.43	3,420.8	1,518.25	-277.1	1,505.7	150.9	0.00	0.00	0.00
PARKMAN SANDSTONE										
3,837.0	29.37	100.43	3,453.0	1,486.00	-280.4	1,523.6	152.7	0.00	0.00	0.00
3,900.0	29.37	100.43	3,507.9	1,431.10	-286.0	1,554.0	155.7	0.00	0.00	0.00
4,000.0	29.37	100.43	3,595.0	1,343.96	-294.9	1,602.2	160.5	0.00	0.00	0.00
4,100.0	29.37	100.43	3,682.2	1,256.81	-303.8	1,650.5	165.4	0.00	0.00	0.00
4,200.0	29.37	100.43	3,769.3	1,169.67	-312.6	1,698.7	170.2	0.00	0.00	0.00

Planning Report



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Well:	GREEN TEAL FED 34-27-15HC	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)
4,300.0	29.37	100.43	3,856.5	1,082.52	-321.5	1,746.9	175.0	0.00	0.00	0.00
4,400.0	29.37	100.43	3,943.6	995.38	-330.4	1,795.2	179.9	0.00	0.00	0.00
4,500.0	29.37	100.43	4,030.8	908.23	-339.3	1,843.4	184.7	0.00	0.00	0.00
4,600.0	29.37	100.43	4,117.9	821.09	-348.1	1,891.7	189.5	0.00	0.00	0.00
4,700.0	29.37	100.43	4,205.1	733.94	-357.0	1,939.9	194.4	0.00	0.00	0.00
SUSSEX SANDSTONE										
4,709.1	29.37	100.43	4,213.0	726.00	-357.8	1,944.3	194.8	0.00	0.00	0.00
4,800.0	29.37	100.43	4,292.2	646.80	-365.9	1,988.1	199.2	0.00	0.00	0.00
4,900.0	29.37	100.43	4,379.3	559.65	-374.8	2,036.4	204.0	0.00	0.00	0.00
5,000.0	29.37	100.43	4,466.5	472.51	-383.7	2,084.6	208.9	0.00	0.00	0.00
5,100.0	29.37	100.43	4,553.6	385.36	-392.5	2,132.9	213.7	0.00	0.00	0.00
SHANNON SANDSTONE										
5,196.8	29.37	100.43	4,638.0	301.00	-401.1	2,179.5	218.4	0.00	0.00	0.00
5,200.0	29.37	100.43	4,640.8	298.22	-401.4	2,181.1	218.5	0.00	0.00	0.00
5,300.0	29.37	100.43	4,727.9	211.07	-410.3	2,229.3	223.4	0.00	0.00	0.00
5,400.0	29.37	100.43	4,815.1	123.93	-419.2	2,277.6	228.2	0.00	0.00	0.00
END OF TANGENT										
5,442.7	29.37	100.43	4,852.2	86.76	-423.0	2,298.1	230.3	0.00	0.00	0.00
5,500.0	27.65	100.43	4,902.6	36.37	-427.9	2,325.1	233.0	3.00	-3.00	0.00
5,600.0	24.65	100.43	4,992.4	-53.38	-435.9	2,368.4	237.3	3.00	-3.00	0.00
5,700.0	21.65	100.43	5,084.3	-145.32	-443.0	2,407.1	241.2	3.00	-3.00	0.00
5,800.0	18.65	100.43	5,178.2	-239.19	-449.2	2,440.9	244.6	3.00	-3.00	0.00
5,900.0	15.65	100.43	5,273.7	-334.73	-454.6	2,469.9	247.5	3.00	-3.00	0.00
6,000.0	12.65	100.43	5,370.7	-431.68	-459.0	2,494.0	249.9	3.00	-3.00	0.00
6,100.0	9.65	100.43	5,468.8	-529.78	-462.5	2,513.0	251.8	3.00	-3.00	0.00
6,200.0	6.65	100.43	5,567.8	-628.76	-465.1	2,527.0	253.2	3.00	-3.00	0.00
6,300.0	3.65	100.43	5,667.3	-728.34	-466.7	2,535.8	254.1	3.00	-3.00	0.00
6,400.0	0.65	100.43	5,767.3	-828.26	-467.4	2,539.5	254.4	3.00	-3.00	0.00
EOD TO VERTICAL										
6,421.7	0.00	0.00	5,789.0	-850.00	-467.4	2,539.6	254.4	3.00	-3.00	0.00
6,500.0	0.00	0.00	5,867.3	-928.26	-467.4	2,539.6	254.4	0.00	0.00	0.00
KOP (10°/100ft BUR)										
6,521.7	0.00	0.00	5,889.0	-950.00	-467.4	2,539.6	254.4	0.00	0.00	0.00
6,600.0	7.83	1.16	5,967.0	-1,028.02	-462.1	2,539.7	259.6	10.00	10.00	0.00
6,700.0	17.82	1.16	6,064.4	-1,125.40	-439.9	2,540.2	281.0	10.00	10.00	0.00
SHARON SPRINGS										
6,738.9	21.71	1.16	6,101.0	-1,162.00	-426.7	2,540.4	293.7	10.00	10.00	0.00
6,800.0	27.82	1.16	6,156.5	-1,217.45	-401.2	2,540.9	318.5	10.00	10.00	0.00
NIOBRARA A CHALK										
6,816.6	29.48	1.16	6,171.0	-1,232.00	-393.2	2,541.1	326.1	10.00	10.00	0.00
NIOBRARA A CHALK BASE										
6,849.3	32.75	1.16	6,199.0	-1,260.00	-376.3	2,541.5	342.5	10.00	10.00	0.00
NIOBRARA B1 CHALK TOP										
6,882.0	36.02	1.16	6,226.0	-1,287.00	-357.8	2,541.8	360.3	10.00	10.00	0.00
6,900.0	37.82	1.16	6,240.4	-1,301.38	-347.0	2,542.0	370.8	10.00	10.00	0.00
NIOBRARA B1 CHALK BASE										
6,916.2	39.44	1.16	6,253.0	-1,314.00	-337.0	2,542.3	380.5	10.00	10.00	0.00
NIOBRARA B2 CHALK TOP										
6,945.3	42.35	1.16	6,275.0	-1,336.00	-317.9	2,542.6	398.9	10.00	10.00	0.00
NIOBRARA B2 CHALK BASE										
6,996.1	47.43	1.16	6,311.0	-1,372.00	-282.1	2,543.4	433.6	10.00	10.00	0.00
7,000.0	47.82	1.16	6,313.6	-1,374.63	-279.2	2,543.4	436.4	10.00	10.00	0.00

Planning Report



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Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4939.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4939.0usft (Original Well Elev)
Site:	SE SW SEC. 34 T8N R60W 6th P.M.	North Reference:	True
Well:	GREEN TEAL FED 34-27-15HC	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)
NIORARA C CHALK TOP										
7,039.3	51.75	1.16	6,339.0	-1,400.00	-249.2	2,544.0	465.4	10.00	10.00	0.00
7,100.0	57.82	1.16	6,374.0	-1,434.99	-199.6	2,545.0	513.3	10.00	10.00	0.00
NIORARA C CHALK BASE										
7,135.6	61.38	1.16	6,392.0	-1,453.00	-168.9	2,545.7	542.9	10.00	10.00	0.00
NIORARA D CHALK TOP										
7,168.7	64.69	1.16	6,407.0	-1,468.00	-139.4	2,546.3	571.4	10.00	10.00	0.00
7,200.0	67.82	1.16	6,419.6	-1,480.60	-110.8	2,546.8	599.1	10.00	10.00	0.00
FT. HAYS										
7,251.9	73.01	1.16	6,437.0	-1,498.00	-61.9	2,547.8	646.4	10.00	10.00	0.00
7,300.0	77.82	1.16	6,449.1	-1,510.10	-15.4	2,548.8	691.3	10.00	10.00	0.00
7,400.0	87.82	1.16	6,461.6	-1,522.59	83.7	2,550.8	787.1	10.00	10.00	0.00
HZ LP: 600ft FSL & 790ft FEL of Sec 34 - CODELL										
7,421.8	90.00	1.16	6,462.0	-1,523.00	105.4	2,551.2	808.1	10.00	10.00	0.00
7,500.0	90.00	1.16	6,462.0	-1,523.01	183.7	2,552.8	883.7	0.00	0.00	0.00
7,600.0	90.00	1.16	6,462.0	-1,523.01	283.6	2,554.9	980.3	0.00	0.00	0.00
7,700.0	90.00	1.16	6,462.0	-1,523.02	383.6	2,556.9	1,076.9	0.00	0.00	0.00
7,800.0	90.00	1.16	6,462.0	-1,523.03	483.6	2,558.9	1,173.6	0.00	0.00	0.00
7,900.0	90.00	1.16	6,462.0	-1,523.03	583.6	2,561.0	1,270.2	0.00	0.00	0.00
8,000.0	90.00	1.16	6,462.0	-1,523.04	683.6	2,563.0	1,366.8	0.00	0.00	0.00
8,100.0	90.00	1.16	6,462.0	-1,523.04	783.5	2,565.0	1,463.5	0.00	0.00	0.00
8,200.0	90.00	1.16	6,462.0	-1,523.05	883.5	2,567.1	1,560.1	0.00	0.00	0.00
8,300.0	90.00	1.16	6,462.1	-1,523.05	983.5	2,569.1	1,656.7	0.00	0.00	0.00
8,400.0	90.00	1.16	6,462.1	-1,523.06	1,083.5	2,571.1	1,753.4	0.00	0.00	0.00
8,500.0	90.00	1.16	6,462.1	-1,523.07	1,183.5	2,573.1	1,850.0	0.00	0.00	0.00
8,600.0	90.00	1.16	6,462.1	-1,523.07	1,283.4	2,575.2	1,946.6	0.00	0.00	0.00
8,700.0	90.00	1.16	6,462.1	-1,523.08	1,383.4	2,577.2	2,043.2	0.00	0.00	0.00
8,800.0	90.00	1.16	6,462.1	-1,523.08	1,483.4	2,579.2	2,139.9	0.00	0.00	0.00
8,900.0	90.00	1.16	6,462.1	-1,523.09	1,583.4	2,581.3	2,236.5	0.00	0.00	0.00
9,000.0	90.00	1.16	6,462.1	-1,523.09	1,683.4	2,583.3	2,333.1	0.00	0.00	0.00
9,100.0	90.00	1.16	6,462.1	-1,523.10	1,783.3	2,585.3	2,429.7	0.00	0.00	0.00
9,200.0	90.00	1.16	6,462.1	-1,523.10	1,883.3	2,587.3	2,526.4	0.00	0.00	0.00
9,300.0	90.00	1.16	6,462.1	-1,523.10	1,983.3	2,589.4	2,623.0	0.00	0.00	0.00
9,400.0	90.00	1.16	6,462.1	-1,523.11	2,083.3	2,591.4	2,719.6	0.00	0.00	0.00
9,500.0	90.00	1.16	6,462.1	-1,523.11	2,183.2	2,593.4	2,816.3	0.00	0.00	0.00
9,600.0	90.00	1.16	6,462.1	-1,523.12	2,283.2	2,595.4	2,912.9	0.00	0.00	0.00
9,700.0	90.00	1.16	6,462.1	-1,523.12	2,383.2	2,597.5	3,009.5	0.00	0.00	0.00
9,800.0	90.00	1.16	6,462.1	-1,523.12	2,483.2	2,599.5	3,106.1	0.00	0.00	0.00
9,900.0	90.00	1.16	6,462.1	-1,523.13	2,583.2	2,601.5	3,202.8	0.00	0.00	0.00
10,000.0	90.00	1.16	6,462.1	-1,523.13	2,683.1	2,603.6	3,299.4	0.00	0.00	0.00
10,100.0	90.00	1.16	6,462.1	-1,523.13	2,783.1	2,605.6	3,396.0	0.00	0.00	0.00
10,200.0	90.00	1.16	6,462.1	-1,523.14	2,883.1	2,607.6	3,492.7	0.00	0.00	0.00
10,300.0	90.00	1.16	6,462.1	-1,523.14	2,983.1	2,609.6	3,589.3	0.00	0.00	0.00
10,400.0	90.00	1.16	6,462.1	-1,523.14	3,083.1	2,611.7	3,685.9	0.00	0.00	0.00
10,500.0	90.00	1.16	6,462.1	-1,523.14	3,183.0	2,613.7	3,782.5	0.00	0.00	0.00
10,600.0	90.00	1.16	6,462.1	-1,523.15	3,283.0	2,615.7	3,879.2	0.00	0.00	0.00
10,700.0	90.00	1.16	6,462.1	-1,523.15	3,383.0	2,617.7	3,975.8	0.00	0.00	0.00
10,800.0	90.00	1.16	6,462.1	-1,523.15	3,483.0	2,619.7	4,072.4	0.00	0.00	0.00
10,900.0	90.00	1.16	6,462.2	-1,523.15	3,583.0	2,621.8	4,169.0	0.00	0.00	0.00
11,000.0	90.00	1.16	6,462.2	-1,523.15	3,682.9	2,623.8	4,265.7	0.00	0.00	0.00
11,100.0	90.00	1.16	6,462.2	-1,523.15	3,782.9	2,625.8	4,362.3	0.00	0.00	0.00
11,200.0	90.00	1.16	6,462.2	-1,523.16	3,882.9	2,627.8	4,458.9	0.00	0.00	0.00
11,300.0	90.00	1.16	6,462.2	-1,523.16	3,982.9	2,629.9	4,555.6	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GREEN TEAL FED 34-27-15HC
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4939.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4939.0usft (Original Well Elev)
Site:	SE SW SEC. 34 T8N R60W 6th P.M.	North Reference:	True
Well:	GREEN TEAL FED 34-27-15HC	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)
11,400.0	90.00	1.16	6,462.2	-1,523.16	4,082.9	2,631.9	4,652.2	0.00	0.00	0.00
11,500.0	90.00	1.16	6,462.2	-1,523.16	4,182.8	2,633.9	4,748.8	0.00	0.00	0.00
11,600.0	90.00	1.16	6,462.2	-1,523.16	4,282.8	2,635.9	4,845.4	0.00	0.00	0.00
11,700.0	90.00	1.16	6,462.2	-1,523.16	4,382.8	2,637.9	4,942.1	0.00	0.00	0.00
11,800.0	90.00	1.16	6,462.2	-1,523.16	4,482.8	2,640.0	5,038.7	0.00	0.00	0.00
11,900.0	90.00	1.16	6,462.2	-1,523.16	4,582.8	2,642.0	5,135.3	0.00	0.00	0.00
12,000.0	90.00	1.16	6,462.2	-1,523.16	4,682.7	2,644.0	5,231.9	0.00	0.00	0.00
12,100.0	90.00	1.16	6,462.2	-1,523.16	4,782.7	2,646.0	5,328.6	0.00	0.00	0.00
12,200.0	90.00	1.16	6,462.2	-1,523.16	4,882.7	2,648.1	5,425.2	0.00	0.00	0.00
12,300.0	90.00	1.16	6,462.2	-1,523.16	4,982.7	2,650.1	5,521.8	0.00	0.00	0.00
12,400.0	90.00	1.16	6,462.2	-1,523.16	5,082.7	2,652.1	5,618.4	0.00	0.00	0.00
12,500.0	90.00	1.16	6,462.2	-1,523.16	5,182.6	2,654.1	5,715.1	0.00	0.00	0.00
12,600.0	90.00	1.16	6,462.2	-1,523.16	5,282.6	2,656.1	5,811.7	0.00	0.00	0.00
12,700.0	90.00	1.16	6,462.2	-1,523.16	5,382.6	2,658.1	5,908.3	0.00	0.00	0.00
12,800.0	90.00	1.16	6,462.2	-1,523.16	5,482.6	2,660.2	6,004.9	0.00	0.00	0.00
12,900.0	90.00	1.16	6,462.2	-1,523.16	5,582.6	2,662.2	6,101.6	0.00	0.00	0.00
13,000.0	90.00	1.16	6,462.2	-1,523.16	5,682.5	2,664.2	6,198.2	0.00	0.00	0.00
13,100.0	90.00	1.16	6,462.2	-1,523.16	5,782.5	2,666.2	6,294.8	0.00	0.00	0.00
13,200.0	90.00	1.16	6,462.2	-1,523.15	5,882.5	2,668.2	6,391.4	0.00	0.00	0.00
13,300.0	90.00	1.16	6,462.2	-1,523.15	5,982.5	2,670.3	6,488.1	0.00	0.00	0.00
13,400.0	90.00	1.16	6,462.2	-1,523.15	6,082.5	2,672.3	6,584.7	0.00	0.00	0.00
13,500.0	90.00	1.16	6,462.1	-1,523.15	6,182.4	2,674.3	6,681.3	0.00	0.00	0.00
13,600.0	90.00	1.16	6,462.1	-1,523.15	6,282.4	2,676.3	6,777.9	0.00	0.00	0.00
13,700.0	90.00	1.16	6,462.1	-1,523.14	6,382.4	2,678.3	6,874.6	0.00	0.00	0.00
13,800.0	90.00	1.16	6,462.1	-1,523.14	6,482.4	2,680.3	6,971.2	0.00	0.00	0.00
13,900.0	90.00	1.15	6,462.1	-1,523.14	6,582.4	2,682.4	7,067.8	0.00	0.00	0.00
14,000.0	90.00	1.15	6,462.1	-1,523.14	6,682.3	2,684.4	7,164.4	0.00	0.00	0.00
14,100.0	90.00	1.15	6,462.1	-1,523.13	6,782.3	2,686.4	7,261.1	0.00	0.00	0.00
14,200.0	90.00	1.15	6,462.1	-1,523.13	6,882.3	2,688.4	7,357.7	0.00	0.00	0.00
14,300.0	90.00	1.15	6,462.1	-1,523.13	6,982.3	2,690.4	7,454.3	0.00	0.00	0.00
14,400.0	90.00	1.15	6,462.1	-1,523.12	7,082.2	2,692.4	7,550.9	0.00	0.00	0.00
14,500.0	90.00	1.15	6,462.1	-1,523.12	7,182.2	2,694.4	7,647.6	0.00	0.00	0.00
14,600.0	90.00	1.15	6,462.1	-1,523.12	7,282.2	2,696.5	7,744.2	0.00	0.00	0.00
14,700.0	90.00	1.15	6,462.1	-1,523.11	7,382.2	2,698.5	7,840.8	0.00	0.00	0.00
14,800.0	90.00	1.15	6,462.1	-1,523.11	7,482.2	2,700.5	7,937.4	0.00	0.00	0.00
14,900.0	90.00	1.15	6,462.1	-1,523.11	7,582.1	2,702.5	8,034.1	0.00	0.00	0.00
15,000.0	90.00	1.15	6,462.1	-1,523.10	7,682.1	2,704.5	8,130.7	0.00	0.00	0.00
15,100.0	90.00	1.15	6,462.1	-1,523.10	7,782.1	2,706.5	8,227.3	0.00	0.00	0.00
15,200.0	90.00	1.15	6,462.1	-1,523.09	7,882.1	2,708.5	8,323.9	0.00	0.00	0.00
15,300.0	90.00	1.15	6,462.1	-1,523.09	7,982.1	2,710.5	8,420.6	0.00	0.00	0.00
15,400.0	90.00	1.15	6,462.1	-1,523.08	8,082.0	2,712.6	8,517.2	0.00	0.00	0.00
15,500.0	90.00	1.15	6,462.1	-1,523.08	8,182.0	2,714.6	8,613.8	0.00	0.00	0.00
15,600.0	90.00	1.15	6,462.1	-1,523.07	8,282.0	2,716.6	8,710.4	0.00	0.00	0.00
15,700.0	90.00	1.15	6,462.1	-1,523.07	8,382.0	2,718.6	8,807.1	0.00	0.00	0.00
15,800.0	90.00	1.15	6,462.1	-1,523.06	8,482.0	2,720.6	8,903.7	0.00	0.00	0.00
15,900.0	90.00	1.15	6,462.1	-1,523.06	8,581.9	2,722.6	9,000.3	0.00	0.00	0.00
16,000.0	90.00	1.15	6,462.1	-1,523.05	8,681.9	2,724.6	9,096.9	0.00	0.00	0.00
16,100.0	90.00	1.15	6,462.0	-1,523.05	8,781.9	2,726.6	9,193.6	0.00	0.00	0.00
16,200.0	90.00	1.15	6,462.0	-1,523.04	8,881.9	2,728.6	9,290.2	0.00	0.00	0.00
16,300.0	90.00	1.15	6,462.0	-1,523.03	8,981.9	2,730.7	9,386.8	0.00	0.00	0.00
16,400.0	90.00	1.15	6,462.0	-1,523.03	9,081.8	2,732.7	9,483.4	0.00	0.00	0.00
16,500.0	90.00	1.15	6,462.0	-1,523.02	9,181.8	2,734.7	9,580.0	0.00	0.00	0.00
16,600.0	90.00	1.15	6,462.0	-1,523.02	9,281.8	2,736.7	9,676.7	0.00	0.00	0.00
16,700.0	90.00	1.15	6,462.0	-1,523.01	9,381.8	2,738.7	9,773.3	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well GREEN TEAL FED 34-27-15HC
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4939.0usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4939.0usft (Original Well Elev)
Site:	SE SW SEC. 34 T8N R60W 6th P.M.	North Reference:	True
Well:	GREEN TEAL FED 34-27-15HC	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)
16,800.0	90.00	1.15	6,462.0	-1,523.00	9,481.8	2,740.7	9,869.9	0.00	0.00	0.00
BHL: 600ft FNL & 790ft FEL of Sec 27										
16,825.9	90.00	1.15	6,462.0	-1,523.00	9,507.6	2,741.2	9,894.9	0.00	0.00	0.00

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,610.8	1,513.0	FOX HILLS BASE				
3,699.3	3,333.0	RICHARD SANDSTONE				
3,837.0	3,453.0	PARKMAN SANDSTONE				
4,709.1	4,213.0	SUSSEX SANDSTONE				
5,196.8	4,638.0	SHANNON SANDSTONE				
6,738.9	6,101.0	SHARON SPRINGS				
6,816.6	6,171.0	NIOBRARA A CHALK				
6,849.3	6,199.0	NIOBRARA A CHALK BASE				
6,882.0	6,226.0	NIOBRARA B1 CHALK TOP				
6,916.2	6,253.0	NIOBRARA B1 CHALK BASE				
6,945.3	6,275.0	NIOBRARA B2 CHALK TOP				
6,996.1	6,311.0	NIOBRARA B2 CHALK BASE				
7,039.3	6,339.0	NIOBRARA C CHALK TOP				
7,135.6	6,392.0	NIOBRARA C CHALK BASE				
7,168.7	6,407.0	NIOBRARA D CHALK TOP				
7,251.9	6,437.0	FT. HAYS				
7,421.8	6,462.0	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: 500ft FSL & 1962ft FWL of Sec 34
200.0	200.0	0.0	0.0	START NUDGE (3°/100ft BUR)
1,179.1	1,136.8	-44.4	241.5	EOB TO 29.37° INC
5,442.7	4,852.2	-423.0	2,298.1	END OF TANGENT
6,421.7	5,789.0	-467.4	2,539.6	EOD TO VERTICAL
6,521.7	5,889.0	-467.4	2,539.6	KOP (10°/100ft BUR)
7,421.8	6,462.0	105.4	2,551.2	HZ LP: 600ft FSL & 790ft FEL of Sec 34
16,825.9	6,462.0	9,507.6	2,741.2	BHL: 600ft FNL & 790ft FEL of Sec 27