

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

SE SW SEC. 35 T8N R60W 6th P.M.

CINNAMON TEAL 35-14HN

ORIGINAL WELLBORE

28 November, 2018

Plan: PROPOSAL #2





Project: WELD COUNTY, COLORADO (NAD 83)
Site: SE SW SEC. 35 T8N R60W 6th P.M.
Well: CINNAMON TEAL 35-14HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #2

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 & 2180ft FWL of Sec 35		
300.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2.5"/100ft BUR)		
1511.09	1576.00	31.90	113.00	-135.24	318.62	28.61	346.13	EOB TO 31.9° INC		
3804.08	4276.90	31.90	113.00	-692.92	1632.41	146.57	1773.39	END OF TANGENT		
3990.79	4496.59	31.90	100.51	-726.22	1743.04	168.59	1889.21	EOT TO 100.51° AZ		
4216.02	4761.89	31.90	100.51	-751.80	1880.89	210.12	2029.41	END OF TANGENT		
5427.15	6037.93	0.00	0.00	-814.94	2221.23	312.66	2375.56	EOD TO VERTICAL		
5703.04	6313.82	0.00	0.00	-814.94	2221.23	312.66	2375.56	KOP (10"/100ft BUR)		
6276.00	7213.82	90.00	1.38	-242.15	2235.04	826.04	2948.52	HZ LP: 300ft FSL & 855ft FEL of Sec 35		
6276.05	11922.64	90.00	1.38	4465.31	2348.47	5045.22	7657.34	BHL: 300ft FNL & 855ft FEL of Sec 35		

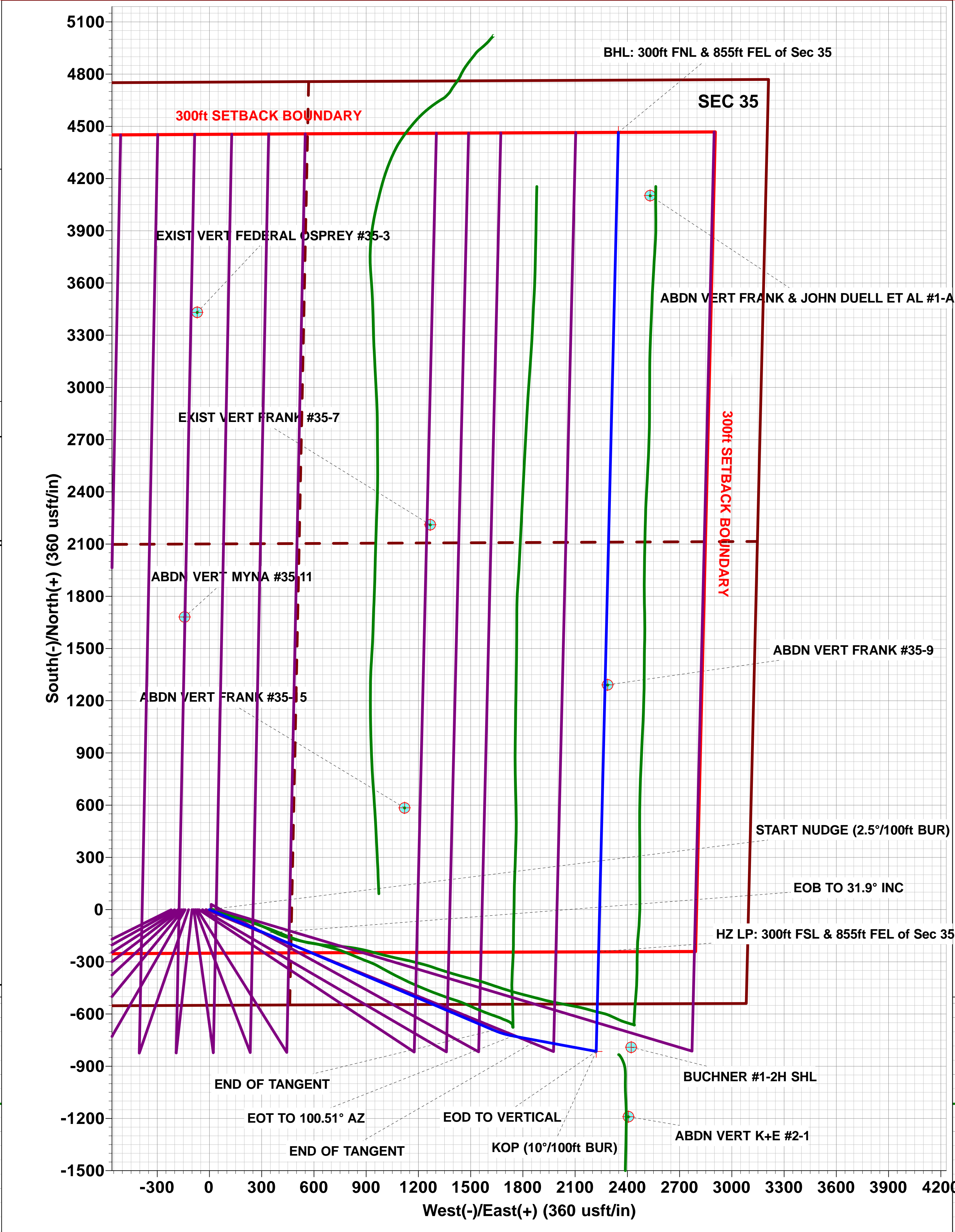
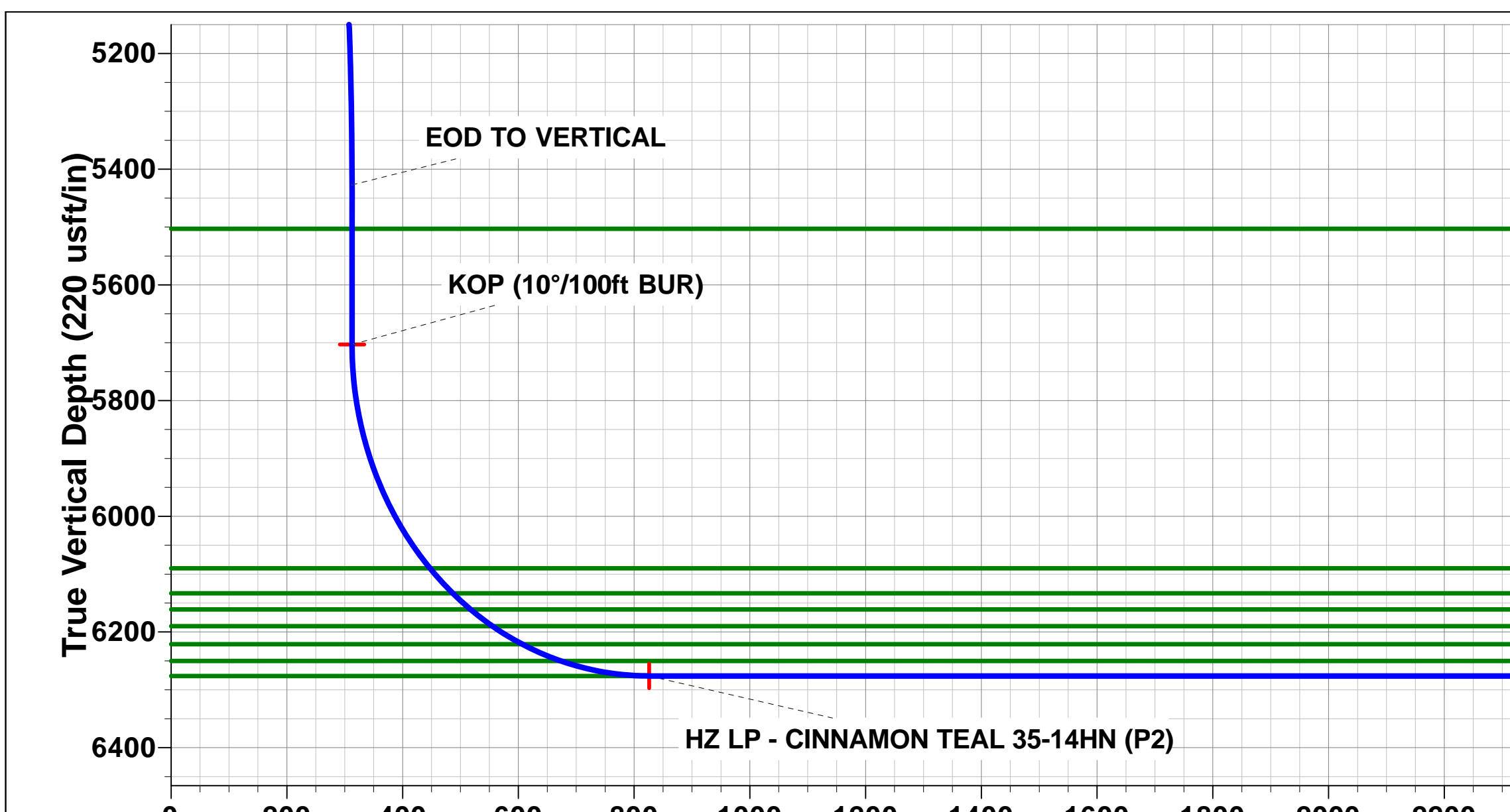
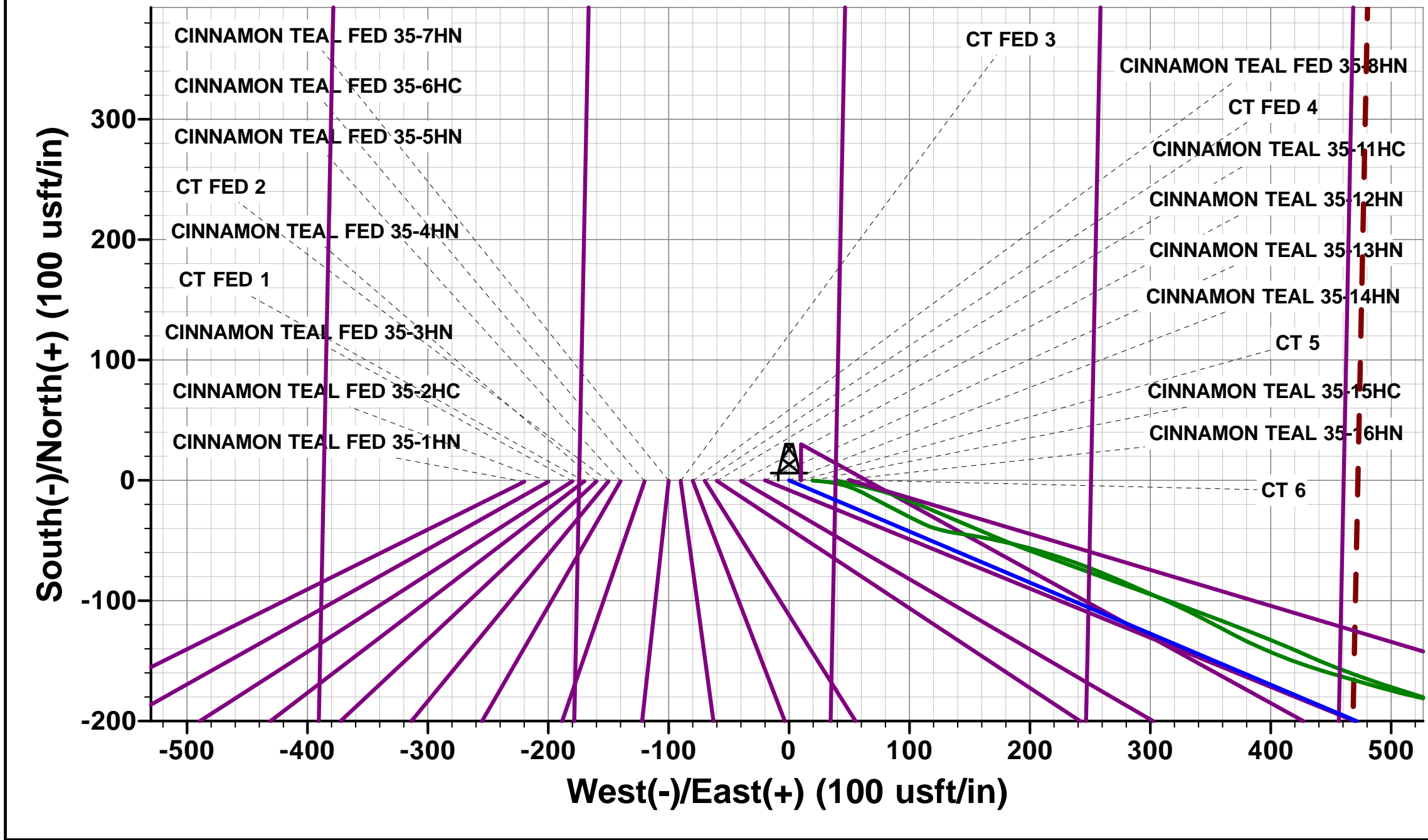
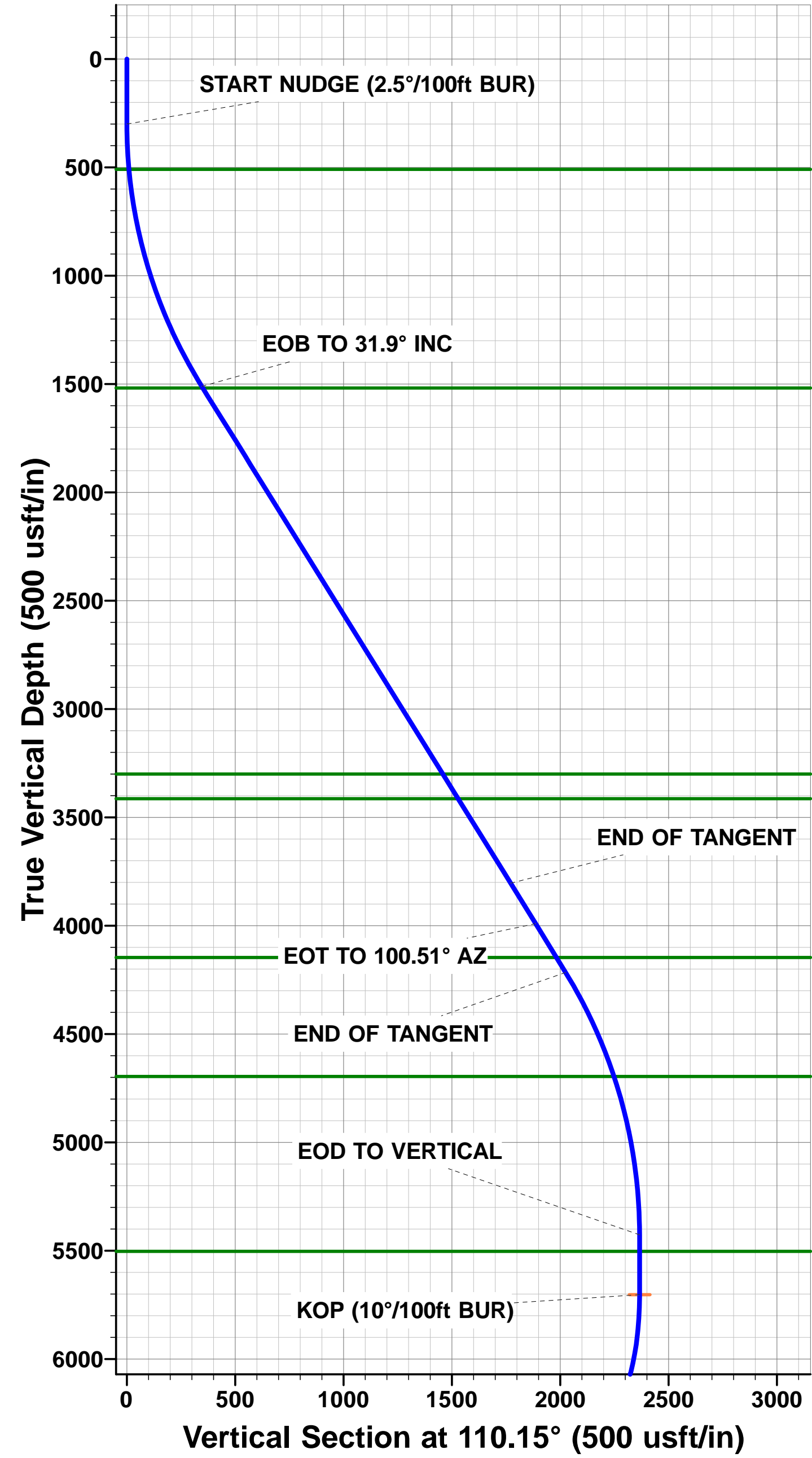
PROPOSED LOCAL COORDINATES:

SHL: 550ft FSL & 2180ft FWL Sec 35

HZ LP: 300ft FSL & 855ft FEL Sec 35

BHL: 300ft FNL & 855ft FEL of Sec 35

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - CINNAMON TEAL 35-14HN (P2)	5703.04	-814.94	2221.23	40.610824	-104.053017
HZ LP - CINNAMON TEAL 35-14HN (P2)	6276.00	-242.15	2235.04	40.612396	-104.052967
BHL - CINNAMON TEAL 35-14HN (P2)	6276.00	4465.31	2348.42	40.625317	-104.052557



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CINNAMON TEAL 35-14HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 25' @ 4949.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4949.00usft
Site:	SE SW SEC. 35 T8N R60W 6th P.M.	North Reference:	True
Well:	CINNAMON TEAL 35-14HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #2		

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 T8N R60W 6th P.M.				
Site Position:		Northing:	1,469,416.68 usft	Latitude:	40.613058
From:	Lat/Long	Easting:	3,399,274.71 usft	Longitude:	-104.061809
Position Uncertainty:	0.00 usft	Slot Radius:	1.10000ft	Grid Convergence:	0.93 °

Well	CINNAMON TEAL 35-14HN					
Well Position	+N/-S	1.07 usft	Northing:	1,469,421.31 usft	Latitude:	40.613061
	+E/-W	219.89 usft	Easting:	3,399,494.55 usft	Longitude:	-104.061017
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,924.00 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	28/11/2018	7.69	67.09	52,407

Design	PROPOSAL #2			
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	27.74

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	-4,949.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	-4,649.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,576.00	31.90	113.00	1,511.09	-3,437.91	-135.24	318.62	2.50	2.50	0.00	113.00	
4,276.90	31.90	113.00	3,804.08	-1,144.92	-692.92	1,632.41	0.00	0.00	0.00	0.00	
4,496.59	31.90	100.51	3,990.80	-958.20	-726.23	1,743.04	3.00	0.00	-5.69	-95.30	
4,761.89	31.90	100.51	4,216.03	-732.97	-751.80	1,880.89	0.00	0.00	0.00	0.00	
6,037.93	0.00	0.00	5,427.15	478.15	-814.94	2,221.23	2.50	-2.50	0.00	180.00	
6,313.82	0.00	0.00	5,703.04	754.04	-814.94	2,221.23	0.00	0.00	0.00	0.00	KOP - CINNAMON
7,213.82	90.00	1.38	6,276.00	1,327.00	-242.15	2,235.04	10.00	10.00	0.15	1.38	HZ LP - CINNAMON
11,922.64	90.00	1.38	6,276.00	1,327.00	4,465.31	2,348.42	0.00	0.00	0.00	0.00	BHL - CINNAMON

Planning Report



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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4949.00usft
Site:	SE SW SEC. 35 T8N R60W 6th P.M.	North Reference:	True
Well:	CINNAMON TEAL 35-14HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
SHL: 550ft FSL & 2180ft FWL of Sec 35										
0.00	0.00	0.00	0.00	4,949.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,849.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,749.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2.5°/100ft BUR)										
300.00	0.00	0.00	300.00	4,649.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	2.50	113.00	399.97	4,549.03	-0.85	2.01	0.18	2.50	2.50	0.00
500.00	5.00	113.00	499.75	4,449.25	-3.41	8.03	0.72	2.50	2.50	0.00
Fox Hills Base										
510.29	5.26	113.00	510.00	4,439.00	-3.77	8.87	0.80	2.50	2.50	0.00
600.00	7.50	113.00	599.14	4,349.86	-7.66	18.05	1.62	2.50	2.50	0.00
700.00	10.00	113.00	697.97	4,251.03	-13.60	32.05	2.88	2.50	2.50	0.00
800.00	12.50	113.00	796.04	4,152.96	-21.23	50.01	4.49	2.50	2.50	0.00
900.00	15.00	113.00	893.17	4,055.83	-30.51	71.88	6.45	2.50	2.50	0.00
1,000.00	17.50	113.00	989.17	3,959.83	-41.45	97.64	8.77	2.50	2.50	0.00
1,100.00	20.00	113.00	1,083.85	3,865.15	-54.00	127.23	11.42	2.50	2.50	0.00
1,200.00	22.50	113.00	1,177.05	3,771.95	-68.17	160.59	14.42	2.50	2.50	0.00
1,300.00	25.00	113.00	1,268.57	3,680.43	-83.90	197.66	17.75	2.50	2.50	0.00
1,400.00	27.50	113.00	1,358.25	3,590.75	-101.18	238.37	21.40	2.50	2.50	0.00
1,500.00	30.00	113.00	1,445.92	3,503.08	-119.97	282.64	25.38	2.50	2.50	0.00
EOB TO 31.9° INC										
1,576.00	31.90	113.00	1,511.09	3,437.91	-135.24	318.62	28.61	2.50	2.50	0.00
Pierre Shale Top										
1,585.32	31.90	113.00	1,519.00	3,430.00	-137.17	323.15	29.02	0.00	0.00	0.00
1,600.00	31.90	113.00	1,531.47	3,417.53	-140.20	330.29	29.66	0.00	0.00	0.00
1,700.00	31.90	113.00	1,616.36	3,332.64	-160.85	378.93	34.02	0.00	0.00	0.00
1,800.00	31.90	113.00	1,701.26	3,247.74	-181.50	427.58	38.39	0.00	0.00	0.00
1,900.00	31.90	113.00	1,786.16	3,162.84	-202.14	476.22	42.76	0.00	0.00	0.00
2,000.00	31.90	113.00	1,871.06	3,077.94	-222.79	524.86	47.13	0.00	0.00	0.00
2,100.00	31.90	113.00	1,955.95	2,993.05	-243.44	573.50	51.50	0.00	0.00	0.00
2,200.00	31.90	113.00	2,040.85	2,908.15	-264.09	622.15	55.86	0.00	0.00	0.00
2,300.00	31.90	113.00	2,125.75	2,823.25	-284.73	670.79	60.23	0.00	0.00	0.00
2,400.00	31.90	113.00	2,210.64	2,738.36	-305.38	719.43	64.60	0.00	0.00	0.00
2,500.00	31.90	113.00	2,295.54	2,653.46	-326.03	768.08	68.97	0.00	0.00	0.00
2,600.00	31.90	113.00	2,380.44	2,568.56	-346.68	816.72	73.33	0.00	0.00	0.00
2,700.00	31.90	113.00	2,465.34	2,483.66	-367.32	865.36	77.70	0.00	0.00	0.00
2,800.00	31.90	113.00	2,550.23	2,398.77	-387.97	914.01	82.07	0.00	0.00	0.00
2,900.00	31.90	113.00	2,635.13	2,313.87	-408.62	962.65	86.44	0.00	0.00	0.00
3,000.00	31.90	113.00	2,720.03	2,228.97	-429.27	1,011.29	90.80	0.00	0.00	0.00
3,100.00	31.90	113.00	2,804.92	2,144.08	-449.92	1,059.94	95.17	0.00	0.00	0.00
3,200.00	31.90	113.00	2,889.82	2,059.18	-470.56	1,108.58	99.54	0.00	0.00	0.00
3,300.00	31.90	113.00	2,974.72	1,974.28	-491.21	1,157.22	103.91	0.00	0.00	0.00
3,400.00	31.90	113.00	3,059.62	1,889.38	-511.86	1,205.86	108.27	0.00	0.00	0.00
3,500.00	31.90	113.00	3,144.51	1,804.49	-532.51	1,254.51	112.64	0.00	0.00	0.00
3,600.00	31.90	113.00	3,229.41	1,719.59	-553.15	1,303.15	117.01	0.00	0.00	0.00
Richard Sandstone										
3,683.15	31.90	113.00	3,300.00	1,649.00	-570.32	1,343.60	120.64	0.00	0.00	0.00
3,700.00	31.90	113.00	3,314.31	1,634.69	-573.80	1,351.79	121.38	0.00	0.00	0.00
3,800.00	31.90	113.00	3,399.20	1,549.80	-594.45	1,400.44	125.75	0.00	0.00	0.00
Parkman Sandstone										
3,817.43	31.90	113.00	3,414.00	1,535.00	-598.05	1,408.91	126.51	0.00	0.00	0.00
3,900.00	31.90	113.00	3,484.10	1,464.90	-615.10	1,449.08	130.11	0.00	0.00	0.00
4,000.00	31.90	113.00	3,569.00	1,380.00	-635.75	1,497.72	134.48	0.00	0.00	0.00

Planning Report



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Company:	MALLARD EXPLORATION	TVD Reference:	KB 25' @ 4949.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4949.00usft
Site:	SE SW SEC. 35 T8N R60W 6th P.M.	North Reference:	True
Well:	CINNAMON TEAL 35-14HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
4,100.00	31.90	113.00	3,653.90	1,295.10	-656.39	1,546.37	138.85	0.00	0.00	0.00
4,200.00	31.90	113.00	3,738.79	1,210.21	-677.04	1,595.01	143.22	0.00	0.00	0.00
END OF TANGENT										
4,276.90	31.90	113.00	3,804.08	1,144.92	-692.92	1,632.41	146.57	0.00	0.00	0.00
4,300.00	31.84	111.69	3,823.70	1,125.30	-697.56	1,643.70	147.72	3.00	-0.25	-5.66
4,400.00	31.75	106.00	3,908.71	1,040.29	-714.56	1,693.51	155.86	3.00	-0.09	-5.69
EOT TO 100.51° AZ										
4,496.59	31.90	100.51	3,990.79	958.21	-726.22	1,743.04	168.59	3.00	0.16	-5.68
4,500.00	31.90	100.51	3,993.69	955.31	-726.55	1,744.81	169.13	0.00	0.00	-0.01
4,600.00	31.90	100.51	4,078.59	870.41	-736.19	1,796.77	184.78	0.00	0.00	0.00
Sussex Sandstone										
4,680.59	31.90	100.51	4,147.00	802.00	-743.96	1,838.64	197.39	0.00	0.00	0.00
4,700.00	31.90	100.51	4,163.48	785.52	-745.83	1,848.73	200.43	0.00	0.00	0.00
END OF TANGENT										
4,761.89	31.90	100.51	4,216.02	732.98	-751.80	1,880.89	210.12	0.00	0.00	0.00
4,800.00	30.95	100.51	4,248.54	700.46	-755.42	1,900.42	216.01	2.50	-2.50	0.00
4,900.00	28.45	100.51	4,335.40	613.60	-764.46	1,949.13	230.68	2.50	-2.50	0.00
5,000.00	25.95	100.51	4,424.34	524.66	-772.80	1,994.07	244.22	2.50	-2.50	0.00
5,100.00	23.45	100.51	4,515.18	433.82	-780.42	2,035.15	256.60	2.50	-2.50	0.00
5,200.00	20.95	100.51	4,607.76	341.24	-787.31	2,072.29	267.79	2.50	-2.50	0.00
Shannon Sandstone										
5,293.77	18.60	100.51	4,696.00	253.00	-793.09	2,103.49	277.19	2.50	-2.50	0.00
5,300.00	18.45	100.51	4,701.90	247.10	-793.46	2,105.43	277.77	2.50	-2.50	0.00
5,400.00	15.95	100.51	4,797.43	151.57	-798.85	2,134.50	286.53	2.50	-2.50	0.00
5,500.00	13.45	100.51	4,894.15	54.85	-803.48	2,159.45	294.05	2.50	-2.50	0.00
5,600.00	10.95	100.51	4,991.88	-42.88	-807.33	2,180.22	300.30	2.50	-2.50	0.00
5,700.00	8.45	100.51	5,090.44	-141.44	-810.40	2,196.78	305.29	2.50	-2.50	0.00
5,800.00	5.95	100.51	5,189.65	-240.65	-812.69	2,209.10	309.01	2.50	-2.50	0.00
5,900.00	3.45	100.51	5,289.30	-340.30	-814.18	2,217.15	311.43	2.50	-2.50	0.00
6,000.00	0.95	100.51	5,389.22	-440.22	-814.88	2,220.93	312.57	2.50	-2.50	0.00
EOD TO VERTICAL										
6,037.93	0.00	0.00	5,427.15	-478.15	-814.94	2,221.23	312.66	2.50	-2.50	-264.99
6,100.00	0.00	0.00	5,489.22	-540.22	-814.94	2,221.23	312.66	0.00	0.00	0.00
TeePee Buttes										
6,113.78	0.00	0.00	5,503.00	-554.00	-814.94	2,221.23	312.66	0.00	0.00	0.00
6,200.00	0.00	0.00	5,589.22	-640.22	-814.94	2,221.23	312.66	0.00	0.00	0.00
6,300.00	0.00	0.00	5,689.22	-740.22	-814.94	2,221.23	312.66	0.00	0.00	0.00
KOP (10°/100ft BUR)										
6,313.82	0.00	0.00	5,703.04	-754.04	-814.94	2,221.23	312.66	0.00	0.00	0.00
6,400.00	8.62	1.38	5,788.90	-839.90	-808.47	2,221.39	318.46	10.00	10.00	0.00
6,500.00	18.62	1.38	5,885.96	-936.96	-784.96	2,221.96	339.53	10.00	10.00	0.00
6,600.00	28.62	1.38	5,977.47	-1,028.47	-744.96	2,222.92	375.38	10.00	10.00	0.00
6,700.00	38.62	1.38	6,060.64	-1,111.64	-689.68	2,224.25	424.92	10.00	10.00	0.00
Sharon Springs										
6,738.65	42.48	1.38	6,090.00	-1,141.00	-664.57	2,224.86	447.43	10.00	10.00	0.00
6,800.00	48.62	1.38	6,132.94	-1,183.94	-620.81	2,225.91	486.66	10.00	10.00	0.00
Niobrara Top										
6,800.09	48.62	1.38	6,133.00	-1,184.00	-620.74	2,225.91	486.72	0.00	0.00	0.00
Niobrara A Chalk										
6,844.44	53.06	1.38	6,161.00	-1,212.00	-586.36	2,226.74	517.53	10.02	10.02	0.00
Niobrara A Chalk Base										
6,895.83	58.20	1.38	6,190.00	-1,241.00	-543.97	2,227.76	555.52	10.00	10.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CINNAMON TEAL 35-14HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 25' @ 4949.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4949.00usft
Site:	SE SW SEC. 35 T8N R60W 6th P.M.	North Reference:	True
Well:	CINNAMON TEAL 35-14HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
6,900.00	58.62	1.38	6,192.18	-1,243.18	-540.42	2,227.85	558.70	10.00	10.00	0.00
Niobrara B1 Chalk Top										
6,960.72	64.69	1.38	6,221.00	-1,272.00	-487.02	2,229.14	606.56	10.00	10.00	0.00
7,000.00	68.62	1.38	6,236.56	-1,287.56	-450.98	2,230.00	638.87	10.00	10.00	0.00
Niobrara B1 Chalk Base										
7,040.55	72.67	1.38	6,250.00	-1,301.00	-412.74	2,230.93	673.15	10.00	10.00	0.00
7,100.00	78.62	1.38	6,264.73	-1,315.73	-355.19	2,232.31	724.72	10.00	10.00	0.00
7,200.00	88.62	1.38	6,275.83	-1,326.83	-255.96	2,234.70	813.66	10.00	10.00	0.00
HZ LP: 300ft FSL & 855ft FEL of Sec 35 - Niobrara B2 Chalk Top (Target)										
7,213.82	90.00	1.38	6,276.00	-1,327.00	-242.15	2,235.04	826.04	10.00	10.00	0.00
7,300.00	90.00	1.38	6,276.00	-1,327.00	-155.99	2,237.11	903.26	0.00	0.00	0.00
7,400.00	90.00	1.38	6,276.00	-1,327.00	-56.02	2,239.52	992.86	0.00	0.00	0.00
7,500.00	90.00	1.38	6,276.00	-1,327.00	43.95	2,241.93	1,082.46	0.00	0.00	0.00
7,600.00	90.00	1.38	6,276.00	-1,327.00	143.92	2,244.34	1,172.06	0.00	0.00	0.00
7,700.00	90.00	1.38	6,276.00	-1,327.00	243.89	2,246.75	1,261.67	0.00	0.00	0.00
7,800.00	90.00	1.38	6,276.01	-1,327.01	343.86	2,249.16	1,351.27	0.00	0.00	0.00
7,900.00	90.00	1.38	6,276.01	-1,327.01	443.83	2,251.57	1,440.87	0.00	0.00	0.00
8,000.00	90.00	1.38	6,276.01	-1,327.01	543.80	2,253.97	1,530.47	0.00	0.00	0.00
8,100.00	90.00	1.38	6,276.01	-1,327.01	643.77	2,256.38	1,620.07	0.00	0.00	0.00
8,200.00	90.00	1.38	6,276.01	-1,327.01	743.75	2,258.79	1,709.67	0.00	0.00	0.00
8,300.00	90.00	1.38	6,276.01	-1,327.01	843.72	2,261.20	1,799.28	0.00	0.00	0.00
8,400.00	90.00	1.38	6,276.01	-1,327.01	943.69	2,263.61	1,888.88	0.00	0.00	0.00
8,500.00	90.00	1.38	6,276.01	-1,327.01	1,043.66	2,266.02	1,978.48	0.00	0.00	0.00
8,600.00	90.00	1.38	6,276.01	-1,327.01	1,143.63	2,268.43	2,068.08	0.00	0.00	0.00
8,700.00	90.00	1.38	6,276.01	-1,327.01	1,243.60	2,270.84	2,157.68	0.00	0.00	0.00
8,800.00	90.00	1.38	6,276.02	-1,327.02	1,343.57	2,273.25	2,247.28	0.00	0.00	0.00
8,900.00	90.00	1.38	6,276.02	-1,327.02	1,443.54	2,275.65	2,336.89	0.00	0.00	0.00
9,000.00	90.00	1.38	6,276.02	-1,327.02	1,543.51	2,278.06	2,426.49	0.00	0.00	0.00
9,100.00	90.00	1.38	6,276.02	-1,327.02	1,643.48	2,280.47	2,516.09	0.00	0.00	0.00
9,200.00	90.00	1.38	6,276.02	-1,327.02	1,743.46	2,282.88	2,605.69	0.00	0.00	0.00
9,300.00	90.00	1.38	6,276.02	-1,327.02	1,843.43	2,285.29	2,695.29	0.00	0.00	0.00
9,400.00	90.00	1.38	6,276.02	-1,327.02	1,943.40	2,287.70	2,784.89	0.00	0.00	0.00
9,500.00	90.00	1.38	6,276.02	-1,327.02	2,043.37	2,290.11	2,874.50	0.00	0.00	0.00
9,600.00	90.00	1.38	6,276.02	-1,327.02	2,143.34	2,292.52	2,964.10	0.00	0.00	0.00
9,700.00	90.00	1.38	6,276.02	-1,327.02	2,243.31	2,294.93	3,053.70	0.00	0.00	0.00
9,800.00	90.00	1.38	6,276.03	-1,327.03	2,343.28	2,297.34	3,143.30	0.00	0.00	0.00
9,900.00	90.00	1.38	6,276.03	-1,327.03	2,443.25	2,299.74	3,232.90	0.00	0.00	0.00
10,000.00	90.00	1.38	6,276.03	-1,327.03	2,543.22	2,302.15	3,322.50	0.00	0.00	0.00
10,100.00	90.00	1.38	6,276.03	-1,327.03	2,643.19	2,304.56	3,412.11	0.00	0.00	0.00
10,200.00	90.00	1.38	6,276.03	-1,327.03	2,743.17	2,306.97	3,501.71	0.00	0.00	0.00
10,300.00	90.00	1.38	6,276.03	-1,327.03	2,843.14	2,309.38	3,591.31	0.00	0.00	0.00
10,400.00	90.00	1.38	6,276.03	-1,327.03	2,943.11	2,311.79	3,680.91	0.00	0.00	0.00
10,500.00	90.00	1.38	6,276.03	-1,327.03	3,043.08	2,314.20	3,770.51	0.00	0.00	0.00
10,600.00	90.00	1.38	6,276.03	-1,327.03	3,143.05	2,316.61	3,860.11	0.00	0.00	0.00
10,700.00	90.00	1.38	6,276.03	-1,327.03	3,243.02	2,319.02	3,949.72	0.00	0.00	0.00
10,800.00	90.00	1.38	6,276.04	-1,327.04	3,342.99	2,321.42	4,039.32	0.00	0.00	0.00
10,900.00	90.00	1.38	6,276.04	-1,327.04	3,442.96	2,323.83	4,128.92	0.00	0.00	0.00
11,000.00	90.00	1.38	6,276.04	-1,327.04	3,542.93	2,326.24	4,218.52	0.00	0.00	0.00
11,100.00	90.00	1.38	6,276.04	-1,327.04	3,642.90	2,328.65	4,308.12	0.00	0.00	0.00
11,200.00	90.00	1.38	6,276.04	-1,327.04	3,742.88	2,331.06	4,397.72	0.00	0.00	0.00
11,300.00	90.00	1.38	6,276.04	-1,327.04	3,842.85	2,333.47	4,487.33	0.00	0.00	0.00
11,400.00	90.00	1.38	6,276.04	-1,327.04	3,942.82	2,335.88	4,576.93	0.00	0.00	0.00
11,500.00	90.00	1.38	6,276.04	-1,327.04	4,042.79	2,338.29	4,666.53	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CINNAMON TEAL 35-14HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 25' @ 4949.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4949.00usft
Site:	SE SW SEC. 35 T8N R60W 6th P.M.	North Reference:	True
Well:	CINNAMON TEAL 35-14HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
11,600.00	90.00	1.38	6,276.04	-1,327.04	4,142.76	2,340.70	4,756.13	0.00	0.00	0.00
11,700.00	90.00	1.38	6,276.04	-1,327.04	4,242.73	2,343.10	4,845.73	0.00	0.00	0.00
11,800.00	90.00	1.38	6,276.05	-1,327.05	4,342.70	2,345.51	4,935.33	0.00	0.00	0.00
11,900.00	90.00	1.38	6,276.05	-1,327.05	4,442.67	2,347.92	5,024.94	0.00	0.00	0.00
BHL: 300ft FNL & 855ft FEL of Sec 35										
11,922.64	90.00	1.38	6,276.05	-1,327.05	4,465.31	2,348.47	5,045.22	0.00	0.00	0.00

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
510.29	510.00	Fox Hills Base				
1,585.32	1,519.00	Pierre Shale Top				
3,683.15	3,300.00	Richard Sandstone				
3,817.43	3,414.00	Parkman Sandstone				
4,680.59	4,147.00	Sussex Sandstone				
5,293.77	4,696.00	Shannon Sandstone				
6,113.78	5,503.00	TeePee Buttes				
6,738.65	6,090.00	Sharon Springs				
6,800.09	6,133.00	Niobrara Top				
6,844.44	6,161.00	Niobrara A Chalk				
6,895.83	6,190.00	Niobrara A Chalk Base				
6,960.72	6,221.00	Niobrara B1 Chalk Top				
7,040.55	6,250.00	Niobrara B1 Chalk Base				
7,213.82	6,276.00	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 & 2180ft FWL of Sec 35
300.00	300.00	0.00	0.00	START NUDGE (2.5°/100ft BUR)
1,576.00	1,511.09	-135.24	318.62	EOB TO 31.9° INC
4,276.90	3,804.08	-692.92	1,632.41	END OF TANGENT
4,496.59	3,990.79	-726.22	1,743.04	EOT TO 100.51° AZ
4,761.89	4,216.02	-751.80	1,880.89	END OF TANGENT
6,037.93	5,427.15	-814.94	2,221.23	EOD TO VERTICAL
6,313.82	5,703.04	-814.94	2,221.23	KOP (10°/100ft BUR)
7,213.82	6,276.00	-242.15	2,235.04	HZ LP: 300ft FSL & 855ft FEL of Sec 35
11,922.64	6,276.05	4,465.31	2,348.47	BHL: 300ft FNL & 855ft FEL of Sec 35