



MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

SE NE SEC. 19 T8N R60W 6th P.M.

HUNT FED 8-60 19-24-3

ORIGINAL WELLBORE

06 April, 2020

Plan: PROPOSAL #1





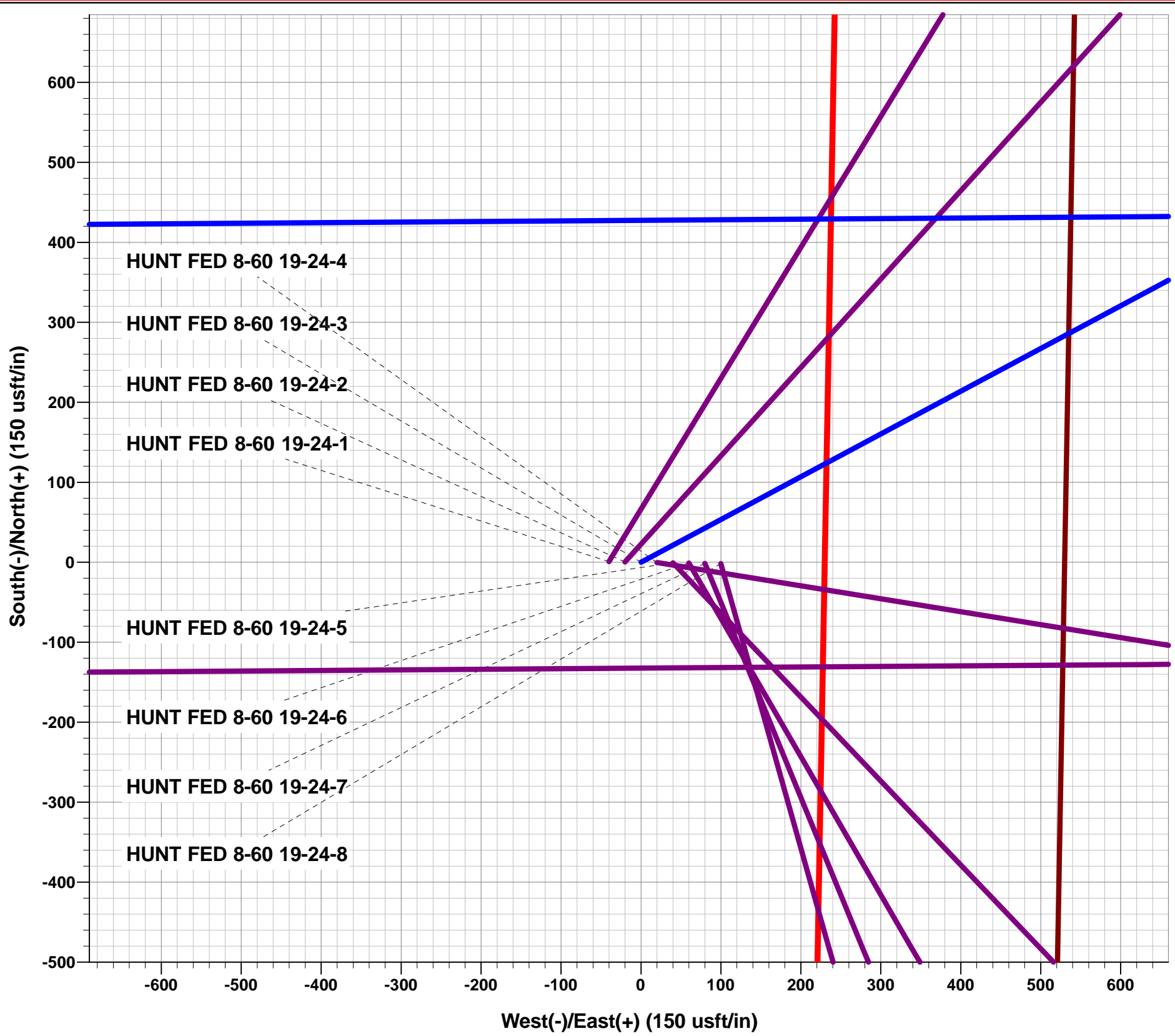
Project: WELD COUNTY, COLORADO (NAD 83)
Site: SE NE SEC. 19 T8N R60W 6th P.M.
Well: HUNT FED 8-60 19-24-3
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 1723ft FNL & 530ft FEL of Sec 19
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1200.00	12.00	61.88	1195.62	29.51	55.21	-54.09	62.60	EOB TO 12° INC
5019.28	12.00	61.88	4931.44	403.78	755.55	-740.19	856.68	END OF TANGENT
5619.28	0.00	0.00	5527.07	433.29	810.76	-794.28	919.28	EOD TO VERTICAL
5883.75	0.00	0.00	5791.54	433.29	810.76	-794.28	919.28	KOP (10°/100ft BUR)
6783.77	90.00	269.59	6364.50	429.19	237.80	-221.86	1492.25	HZ LP: 1295ft FNL & 300ft FEL of Sec 19
16759.27	90.00	269.60	6364.50	358.25	-9737.44	9744.03	11467.75	BHL: 1295ft FNL & 300ft FWL of Sec 24

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - HUNT FED 8-60 19-24-3	5791.54	433.29	810.76	40.651488	-104.124082
HZ LP - HUNT FED 8-60 19-24-3	6364.50	429.19	237.80	40.651477	-104.126147
BHL - HUNT FED 8-60 19-24-3	6364.50	358.25	-9737.44	40.651277	-104.162096



T

M

Azimuths to True North
Magnetic North: 7.65°

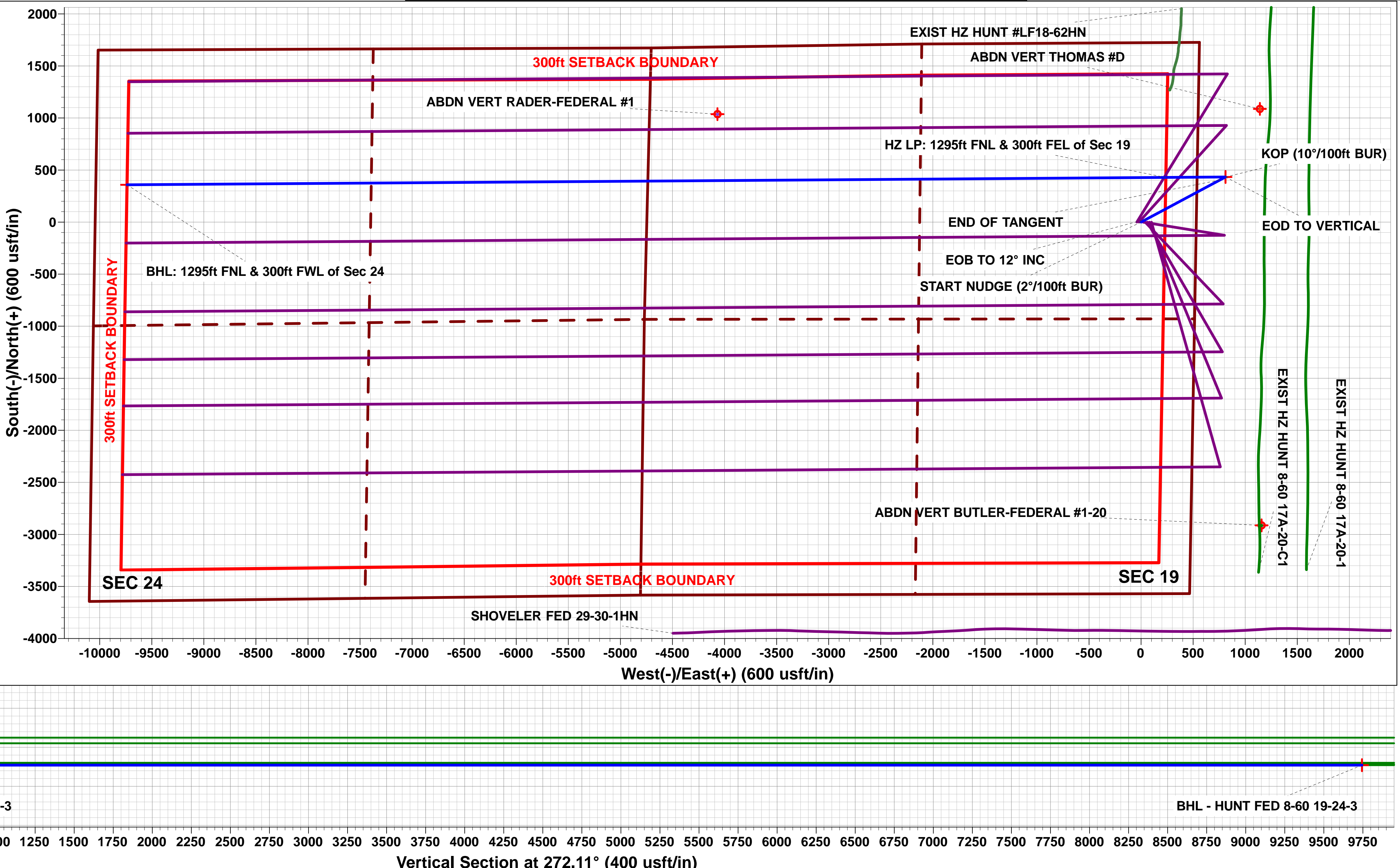
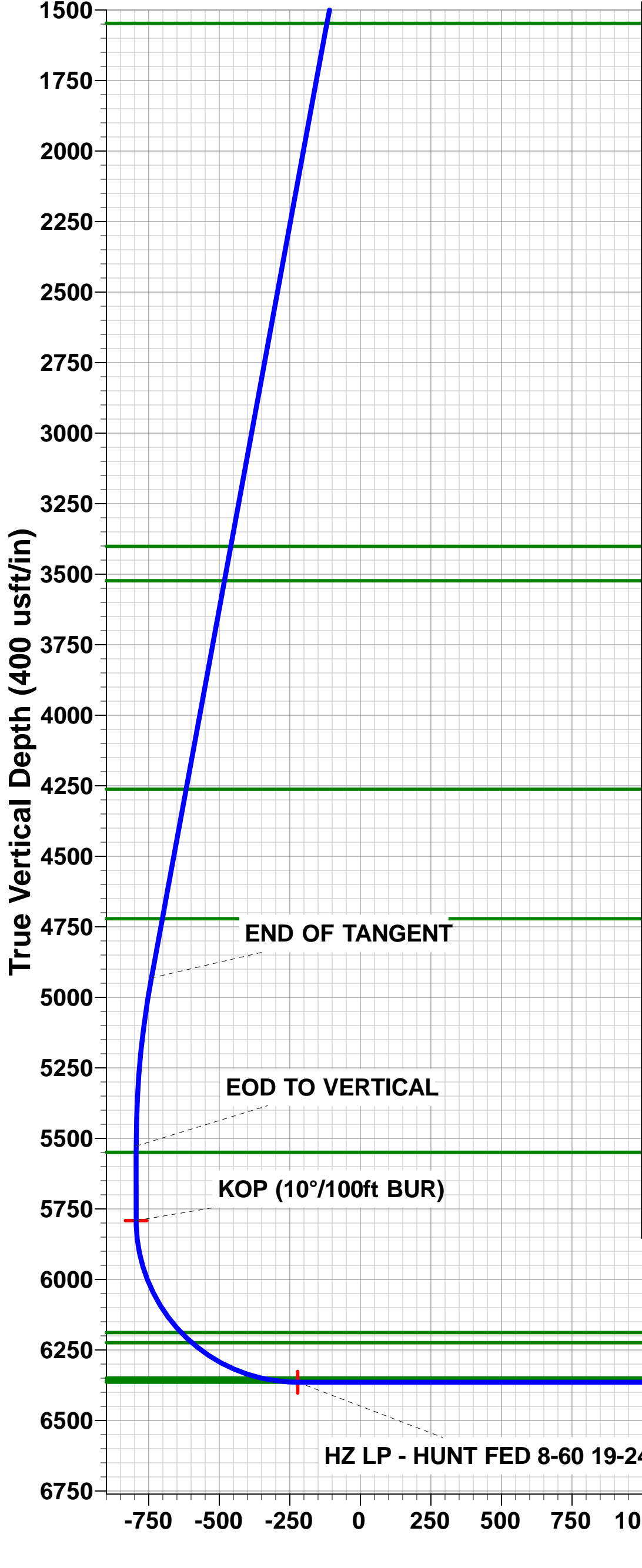
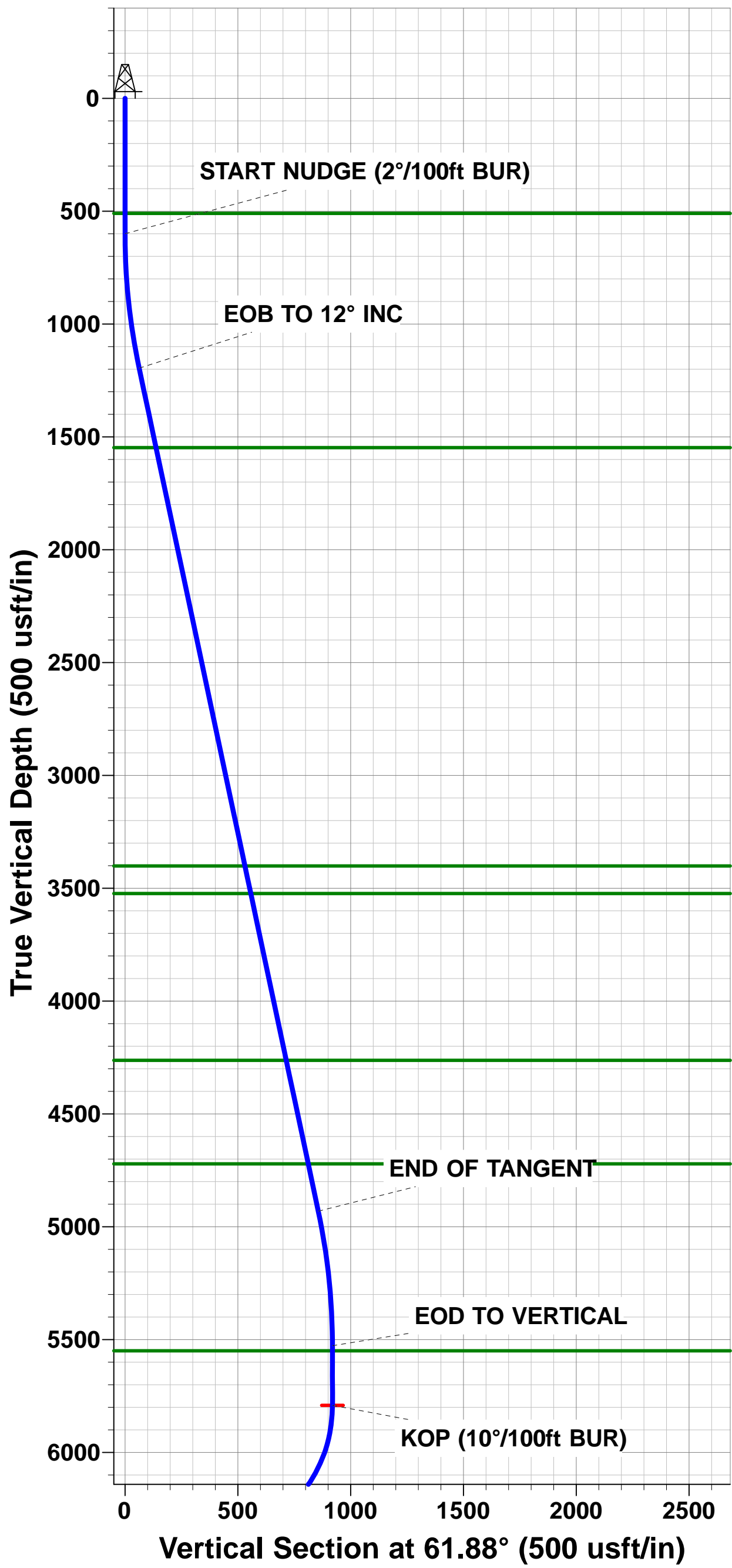
Magnetic Field
Strength: 52273.6nT
Dip Angle: 66.99°
Date: 2020-04-06
Model: IGRF2020

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
509.50	509.50	Fox Hills Base
1547.50	1559.74	Pierre Shale Top
3401.50	3455.16	Richard Sandstone
3523.50	3579.88	Parkman Sandstone
4262.50	4335.39	Sussex Sandstone
4721.50	4804.65	Shannon Sandstone
5549.50	5641.71	TeePee Buttes
6188.50	6322.30	Sharon Springs
6224.50	6374.58	Niobrara Top
6349.50	6652.36	Niobrara B2 Chalk Top
6359.50	6708.01	Niobrara B2 Chalk Target Top
6364.50	6783.7	Niobrara B2 Chalk Landing Point

PROPOSED LOCAL COORDINATES:

SHL: 1723ft FNL & 530ft FEL of Sec 19
HZ LP: 1295ft FNL & 300ft FEL of Sec 19
BHL: 1295ft FNL & 300ft FWL of Sec 24



Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well HUNT FED 8-60 19-24-3
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4959.50usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.50usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-3	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 NE SEC. 19 T8N R60W 6th P.M.		
Site Position:		Northing:	1,482,695.84 usft
From:	Lat/Long	Easting:	3,380,926.54 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10 ft
		Latitude:	40.650301
		Longitude:	-104.127148
		Grid Convergence:	0.89 °

Well	HUNT FED 8-60 19-24-3		
Well Position	+N/-S	-0.74 usft	Northing:
	+E/-W	39.96 usft	Easting:
Position Uncertainty	0.00 usft		Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	2020-04-06	7.65	66.99	52,273.62477533

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 (°)
	6,364.50	0.00	0.00	272.11

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	-4,959.50	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	-4,359.50	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	12.00	61.88	1,195.62	-3,763.88	29.51	55.21	2.00	2.00	0.00	61.88	
5,019.28	12.00	61.88	4,931.44	-28.06	403.78	755.55	0.00	0.00	0.00	0.00	
5,619.28	0.00	0.00	5,527.07	567.57	433.29	810.76	2.00	-2.00	0.00	180.00	
5,883.75	0.00	0.00	5,791.54	832.04	433.29	810.76	0.00	0.00	0.00	0.00	KOP - HUNT FED 8
6,783.77	90.00	269.59	6,364.50	1,405.00	429.19	237.80	10.00	10.00	-10.05	269.59	HZ LP - HUNT FED 8
16,759.27	90.00	269.60	6,364.50	1,405.00	358.25	-9,737.44	0.00	0.00	0.00	113.12	BHL - HUNT FED 8

Planning Report

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Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-3	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: 1723ft FNL & 530ft FEL of Sec 19										
0.00	0.00	0.00	0.00	4,959.50	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,859.50	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,759.50	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,659.50	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,559.50	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4,459.50	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base										
509.50	0.00	0.00	509.50	4,450.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
600.00	0.00	0.00	600.00	4,359.50	0.00	0.00	0.00	0.00	0.00	0.00
700.00	2.00	61.88	699.98	4,259.52	0.82	1.54	-1.51	2.00	2.00	0.00
800.00	4.00	61.88	799.84	4,159.66	3.29	6.15	-6.03	2.00	2.00	0.00
900.00	6.00	61.88	899.45	4,060.05	7.40	13.84	-13.56	2.00	2.00	0.00
1,000.00	8.00	61.88	998.70	3,960.80	13.14	24.59	-24.09	2.00	2.00	0.00
1,100.00	10.00	61.88	1,097.47	3,862.03	20.51	38.38	-37.60	2.00	2.00	0.00
EOB TO 12° INC										
1,200.00	12.00	61.88	1,195.62	3,763.88	29.51	55.21	-54.09	2.00	2.00	0.00
1,300.00	12.00	61.88	1,293.44	3,666.06	39.31	73.55	-72.05	0.00	0.00	0.00
1,400.00	12.00	61.88	1,391.25	3,568.25	49.11	91.89	-90.02	0.00	0.00	0.00
1,500.00	12.00	61.88	1,489.07	3,470.43	58.91	110.22	-107.98	0.00	0.00	0.00
Pierre Shale Top										
1,559.74	12.00	61.88	1,547.50	3,412.00	64.76	121.18	-118.71	0.00	0.00	0.00
1,600.00	12.00	61.88	1,586.88	3,372.62	68.71	128.56	-125.95	0.00	0.00	0.00
1,700.00	12.00	61.88	1,684.70	3,274.80	78.51	146.90	-143.91	0.00	0.00	0.00
1,800.00	12.00	61.88	1,782.51	3,176.99	88.30	165.23	-161.88	0.00	0.00	0.00
1,900.00	12.00	61.88	1,880.33	3,079.17	98.10	183.57	-179.84	0.00	0.00	0.00
2,000.00	12.00	61.88	1,978.14	2,981.36	107.90	201.91	-197.80	0.00	0.00	0.00
2,100.00	12.00	61.88	2,075.96	2,883.54	117.70	220.24	-215.77	0.00	0.00	0.00
2,200.00	12.00	61.88	2,173.77	2,785.73	127.50	238.58	-233.73	0.00	0.00	0.00
2,300.00	12.00	61.88	2,271.59	2,687.91	137.30	256.92	-251.70	0.00	0.00	0.00
2,400.00	12.00	61.88	2,369.40	2,590.10	147.10	275.25	-269.66	0.00	0.00	0.00
2,500.00	12.00	61.88	2,467.22	2,492.28	156.90	293.59	-287.62	0.00	0.00	0.00
2,600.00	12.00	61.88	2,565.03	2,394.47	166.70	311.93	-305.59	0.00	0.00	0.00
2,700.00	12.00	61.88	2,662.84	2,296.66	176.50	330.26	-323.55	0.00	0.00	0.00
2,800.00	12.00	61.88	2,760.66	2,198.84	186.30	348.60	-341.52	0.00	0.00	0.00
2,900.00	12.00	61.88	2,858.47	2,101.03	196.10	366.94	-359.48	0.00	0.00	0.00
3,000.00	12.00	61.88	2,956.29	2,003.21	205.90	385.28	-377.44	0.00	0.00	0.00
3,100.00	12.00	61.88	3,054.10	1,905.40	215.70	403.61	-395.41	0.00	0.00	0.00
3,200.00	12.00	61.88	3,151.92	1,807.58	225.50	421.95	-413.37	0.00	0.00	0.00
3,300.00	12.00	61.88	3,249.73	1,709.77	235.30	440.29	-431.34	0.00	0.00	0.00
3,400.00	12.00	61.88	3,347.55	1,611.95	245.10	458.62	-449.30	0.00	0.00	0.00
Richard Sandstone										
3,455.16	12.00	61.88	3,401.50	1,558.00	250.50	468.74	-459.21	0.00	0.00	0.00
3,500.00	12.00	61.88	3,445.36	1,514.14	254.90	476.96	-467.27	0.00	0.00	0.00
Parkman Sandstone										
3,579.88	12.00	61.88	3,523.50	1,436.00	262.73	491.61	-481.62	0.00	0.00	0.00
3,600.00	12.00	61.88	3,543.18	1,416.32	264.70	495.30	-485.23	0.00	0.00	0.00
3,700.00	12.00	61.88	3,640.99	1,318.51	274.50	513.63	-503.19	0.00	0.00	0.00
3,800.00	12.00	61.88	3,738.81	1,220.69	284.30	531.97	-521.16	0.00	0.00	0.00
3,900.00	12.00	61.88	3,836.62	1,122.88	294.10	550.31	-539.12	0.00	0.00	0.00
4,000.00	12.00	61.88	3,934.44	1,025.06	303.90	568.64	-557.09	0.00	0.00	0.00
4,100.00	12.00	61.88	4,032.25	927.25	313.70	586.98	-575.05	0.00	0.00	0.00

Planning Report

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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.50usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-3	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)
4,200.00	12.00	61.88	4,130.07	829.43	323.50	605.32	-593.01	0.00	0.00	0.00
4,300.00	12.00	61.88	4,227.88	731.62	333.30	623.65	-610.98	0.00	0.00	0.00
Sussex Sandstone										
4,335.39	12.00	61.88	4,262.50	697.00	336.76	630.14	-617.34	0.00	0.00	0.00
4,400.00	12.00	61.88	4,325.70	633.80	343.10	641.99	-628.94	0.00	0.00	0.00
4,500.00	12.00	61.88	4,423.51	535.99	352.90	660.33	-646.91	0.00	0.00	0.00
4,600.00	12.00	61.88	4,521.32	438.18	362.70	678.66	-664.87	0.00	0.00	0.00
4,700.00	12.00	61.88	4,619.14	340.36	372.49	697.00	-682.84	0.00	0.00	0.00
4,800.00	12.00	61.88	4,716.95	242.55	382.29	715.34	-700.80	0.00	0.00	0.00
Shannon Sandstone										
4,804.65	12.00	61.88	4,721.50	238.00	382.75	716.19	-701.63	0.00	0.00	0.00
4,900.00	12.00	61.88	4,814.77	144.73	392.09	733.68	-718.76	0.00	0.00	0.00
5,000.00	12.00	61.88	4,912.58	46.92	401.89	752.01	-736.73	0.00	0.00	0.00
END OF TANGENT										
5,019.28	12.00	61.88	4,931.44	28.06	403.78	755.55	-740.19	0.00	0.00	0.00
5,100.00	10.39	61.88	5,010.62	-51.12	411.17	769.37	-753.73	2.00	-2.00	0.00
5,200.00	8.39	61.88	5,109.28	-149.78	418.85	783.75	-767.82	2.00	-2.00	0.00
5,300.00	6.39	61.88	5,208.45	-248.95	424.91	795.08	-778.92	2.00	-2.00	0.00
5,400.00	4.39	61.88	5,308.00	-348.50	429.34	803.36	-787.03	2.00	-2.00	0.00
5,500.00	2.39	61.88	5,407.82	-448.32	432.12	808.57	-792.14	2.00	-2.00	0.00
5,600.00	0.39	61.88	5,507.79	-548.29	433.26	810.70	-794.23	2.00	-2.00	0.00
EOD TO VERTICAL										
5,619.28	0.00	0.00	5,527.07	-567.57	433.29	810.76	-794.28	2.00	-2.00	0.00
TeePee Buttes										
5,641.71	0.00	0.00	5,549.50	-590.00	433.29	810.76	-794.28	0.00	0.00	0.00
5,700.00	0.00	0.00	5,607.79	-648.29	433.29	810.76	-794.28	0.00	0.00	0.00
5,800.00	0.00	0.00	5,707.79	-748.29	433.29	810.76	-794.28	0.00	0.00	0.00
KOP (10°/100ft BUR)										
5,883.75	0.00	0.00	5,791.54	-832.04	433.29	810.76	-794.28	0.00	0.00	0.00
5,900.00	1.62	269.59	5,807.78	-848.28	433.29	810.53	-794.05	10.00	10.00	0.00
6,000.00	11.62	269.59	5,906.99	-947.49	433.21	799.01	-782.54	10.00	10.00	0.00
6,100.00	21.62	269.59	6,002.69	-1,043.19	433.00	770.44	-754.00	10.00	10.00	0.00
6,200.00	31.62	269.59	6,091.97	-1,132.47	432.68	725.68	-709.28	10.00	10.00	0.00
6,300.00	41.62	269.59	6,172.13	-1,212.63	432.25	666.10	-649.76	10.00	10.00	0.00
Sharon Springs										
6,322.30	43.85	269.59	6,188.50	-1,229.00	432.15	650.97	-634.64	10.00	10.00	0.00
Niobrara Top										
6,374.58	49.08	269.59	6,224.50	-1,265.00	431.87	613.08	-596.78	10.00	10.00	0.00
6,400.00	51.62	269.59	6,240.72	-1,281.22	431.73	593.51	-577.23	10.00	10.00	0.00
6,500.00	61.62	269.59	6,295.66	-1,336.16	431.14	510.11	-493.91	10.00	10.00	0.00
6,600.00	71.62	269.59	6,335.28	-1,375.78	430.48	418.43	-402.32	10.00	10.00	0.00
Niobrara B2 Chalk Top										
6,652.36	76.86	269.59	6,349.50	-1,390.00	430.12	368.06	-351.99	10.00	10.00	0.00
6,700.00	81.62	269.59	6,358.39	-1,398.89	429.78	321.27	-305.25	10.00	10.00	0.00
Niobrara B2 Chalk Target Top										
6,708.01	82.43	269.59	6,359.50	-1,400.00	429.73	313.34	-297.33	10.00	10.00	0.00
HZ LP: 1295ft FNL & 300ft FEL of Sec 19 - Niobrara B2 Chalk Landing Point										
6,783.77	90.00	269.59	6,364.50	-1,405.00	429.19	237.80	-221.86	10.00	10.00	0.00
6,800.00	90.00	269.59	6,364.50	-1,405.00	429.07	221.57	-205.65	0.00	0.00	0.00
6,900.00	90.00	269.59	6,364.50	-1,405.00	428.35	121.58	-105.74	0.00	0.00	0.00
7,000.00	90.00	269.59	6,364.50	-1,405.00	427.64	21.58	-5.84	0.00	0.00	0.00
7,100.00	90.00	269.59	6,364.49	-1,404.99	426.92	-78.42	94.06	0.00	0.00	0.00
7,200.00	90.00	269.59	6,364.49	-1,404.99	426.21	-178.42	193.97	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well HUNT FED 8-60 19-24-3
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4959.50usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.50usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-3	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)
7,300.00	90.00	269.59	6,364.49	-1,404.99	425.49	-278.41	293.87	0.00	0.00	0.00
7,400.00	90.00	269.59	6,364.49	-1,404.99	424.78	-378.41	393.77	0.00	0.00	0.00
7,500.00	90.00	269.59	6,364.49	-1,404.99	424.06	-478.41	493.68	0.00	0.00	0.00
7,600.00	90.00	269.59	6,364.48	-1,404.98	423.34	-578.41	593.58	0.00	0.00	0.00
7,700.00	90.00	269.59	6,364.48	-1,404.98	422.63	-678.40	693.48	0.00	0.00	0.00
7,800.00	90.00	269.59	6,364.48	-1,404.98	421.91	-778.40	793.39	0.00	0.00	0.00
7,900.00	90.00	269.59	6,364.48	-1,404.98	421.20	-878.40	893.29	0.00	0.00	0.00
8,000.00	90.00	269.59	6,364.48	-1,404.98	420.48	-978.40	993.19	0.00	0.00	0.00
8,100.00	90.00	269.59	6,364.48	-1,404.98	419.77	-1,078.39	1,093.10	0.00	0.00	0.00
8,200.00	90.00	269.59	6,364.47	-1,404.97	419.05	-1,178.39	1,193.00	0.00	0.00	0.00
8,300.00	90.00	269.59	6,364.47	-1,404.97	418.34	-1,278.39	1,292.91	0.00	0.00	0.00
8,400.00	90.00	269.59	6,364.47	-1,404.97	417.63	-1,378.39	1,392.81	0.00	0.00	0.00
8,500.00	90.00	269.59	6,364.47	-1,404.97	416.91	-1,478.38	1,492.71	0.00	0.00	0.00
8,600.00	90.00	269.59	6,364.47	-1,404.97	416.20	-1,578.38	1,592.62	0.00	0.00	0.00
8,700.00	90.00	269.59	6,364.47	-1,404.97	415.48	-1,678.38	1,692.52	0.00	0.00	0.00
8,800.00	90.00	269.59	6,364.47	-1,404.97	414.77	-1,778.38	1,792.42	0.00	0.00	0.00
8,900.00	90.00	269.59	6,364.46	-1,404.96	414.05	-1,878.37	1,892.33	0.00	0.00	0.00
9,000.00	90.00	269.59	6,364.46	-1,404.96	413.34	-1,978.37	1,992.23	0.00	0.00	0.00
9,100.00	90.00	269.59	6,364.46	-1,404.96	412.63	-2,078.37	2,092.13	0.00	0.00	0.00
9,200.00	90.00	269.59	6,364.46	-1,404.96	411.91	-2,178.37	2,192.04	0.00	0.00	0.00
9,300.00	90.00	269.59	6,364.46	-1,404.96	411.20	-2,278.36	2,291.94	0.00	0.00	0.00
9,400.00	90.00	269.59	6,364.46	-1,404.96	410.48	-2,378.36	2,391.84	0.00	0.00	0.00
9,500.00	90.00	269.59	6,364.46	-1,404.96	409.77	-2,478.36	2,491.75	0.00	0.00	0.00
9,600.00	90.00	269.59	6,364.46	-1,404.96	409.06	-2,578.36	2,591.65	0.00	0.00	0.00
9,700.00	90.00	269.59	6,364.46	-1,404.96	408.34	-2,678.35	2,691.56	0.00	0.00	0.00
9,800.00	90.00	269.59	6,364.46	-1,404.96	407.63	-2,778.35	2,791.46	0.00	0.00	0.00
9,900.00	90.00	269.59	6,364.45	-1,404.95	406.92	-2,878.35	2,891.36	0.00	0.00	0.00
10,000.00	90.00	269.59	6,364.45	-1,404.95	406.21	-2,978.35	2,991.27	0.00	0.00	0.00
10,100.00	90.00	269.59	6,364.45	-1,404.95	405.49	-3,078.34	3,091.17	0.00	0.00	0.00
10,200.00	90.00	269.59	6,364.45	-1,404.95	404.78	-3,178.34	3,191.07	0.00	0.00	0.00
10,300.00	90.00	269.59	6,364.45	-1,404.95	404.07	-3,278.34	3,290.98	0.00	0.00	0.00
10,400.00	90.00	269.59	6,364.45	-1,404.95	403.35	-3,378.34	3,390.88	0.00	0.00	0.00
10,500.00	90.00	269.59	6,364.45	-1,404.95	402.64	-3,478.33	3,490.78	0.00	0.00	0.00
10,600.00	90.00	269.59	6,364.45	-1,404.95	401.93	-3,578.33	3,590.69	0.00	0.00	0.00
10,700.00	90.00	269.59	6,364.45	-1,404.95	401.22	-3,678.33	3,690.59	0.00	0.00	0.00
10,800.00	90.00	269.59	6,364.45	-1,404.95	400.51	-3,778.33	3,790.50	0.00	0.00	0.00
10,900.00	90.00	269.59	6,364.45	-1,404.95	399.79	-3,878.32	3,890.40	0.00	0.00	0.00
11,000.00	90.00	269.59	6,364.45	-1,404.95	399.08	-3,978.32	3,990.30	0.00	0.00	0.00
11,100.00	90.00	269.59	6,364.45	-1,404.95	398.37	-4,078.32	4,090.21	0.00	0.00	0.00
11,200.00	90.00	269.59	6,364.45	-1,404.95	397.66	-4,178.32	4,190.11	0.00	0.00	0.00
11,300.00	90.00	269.59	6,364.45	-1,404.95	396.95	-4,278.31	4,290.01	0.00	0.00	0.00
11,400.00	90.00	269.59	6,364.45	-1,404.95	396.23	-4,378.31	4,389.92	0.00	0.00	0.00
11,500.00	90.00	269.59	6,364.45	-1,404.95	395.52	-4,478.31	4,489.82	0.00	0.00	0.00
11,600.00	90.00	269.59	6,364.45	-1,404.95	394.81	-4,578.30	4,589.73	0.00	0.00	0.00
11,700.00	90.00	269.59	6,364.45	-1,404.95	394.10	-4,678.30	4,689.63	0.00	0.00	0.00
11,800.00	90.00	269.59	6,364.45	-1,404.95	393.39	-4,778.30	4,789.53	0.00	0.00	0.00
11,900.00	90.00	269.59	6,364.45	-1,404.95	392.68	-4,878.30	4,889.44	0.00	0.00	0.00
12,000.00	90.00	269.59	6,364.45	-1,404.95	391.97	-4,978.29	4,989.34	0.00	0.00	0.00
12,100.00	90.00	269.59	6,364.45	-1,404.95	391.26	-5,078.29	5,089.24	0.00	0.00	0.00
12,200.00	90.00	269.59	6,364.45	-1,404.95	390.55	-5,178.29	5,189.15	0.00	0.00	0.00
12,300.00	90.00	269.59	6,364.45	-1,404.95	389.84	-5,278.29	5,289.05	0.00	0.00	0.00
12,400.00	90.00	269.59	6,364.45	-1,404.95	389.12	-5,378.28	5,388.96	0.00	0.00	0.00
12,500.00	90.00	269.59	6,364.45	-1,404.95	388.41	-5,478.28	5,488.86	0.00	0.00	0.00
12,600.00	90.00	269.59	6,364.45	-1,404.95	387.70	-5,578.28	5,588.76	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well HUNT FED 8-60 19-24-3
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4959.50usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.50usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-3	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)
12,700.00	90.00	269.59	6,364.45	-1,404.95	386.99	-5,678.28	5,688.67	0.00	0.00	0.00
12,800.00	90.00	269.59	6,364.45	-1,404.95	386.28	-5,778.27	5,788.57	0.00	0.00	0.00
12,900.00	90.00	269.59	6,364.45	-1,404.95	385.57	-5,878.27	5,888.47	0.00	0.00	0.00
13,000.00	90.00	269.59	6,364.45	-1,404.95	384.86	-5,978.27	5,988.38	0.00	0.00	0.00
13,100.00	90.00	269.59	6,364.45	-1,404.95	384.15	-6,078.27	6,088.28	0.00	0.00	0.00
13,200.00	90.00	269.59	6,364.45	-1,404.95	383.44	-6,178.26	6,188.19	0.00	0.00	0.00
13,300.00	90.00	269.59	6,364.45	-1,404.95	382.73	-6,278.26	6,288.09	0.00	0.00	0.00
13,400.00	90.00	269.59	6,364.45	-1,404.95	382.02	-6,378.26	6,387.99	0.00	0.00	0.00
13,500.00	90.00	269.59	6,364.45	-1,404.95	381.31	-6,478.26	6,487.90	0.00	0.00	0.00
13,600.00	90.00	269.59	6,364.45	-1,404.95	380.61	-6,578.25	6,587.80	0.00	0.00	0.00
13,700.00	90.00	269.59	6,364.45	-1,404.95	379.90	-6,678.25	6,687.70	0.00	0.00	0.00
13,800.00	90.00	269.59	6,364.46	-1,404.96	379.19	-6,778.25	6,787.61	0.00	0.00	0.00
13,900.00	90.00	269.59	6,364.46	-1,404.96	378.48	-6,878.25	6,887.51	0.00	0.00	0.00
14,000.00	90.00	269.59	6,364.46	-1,404.96	377.77	-6,978.24	6,987.42	0.00	0.00	0.00
14,100.00	90.00	269.59	6,364.46	-1,404.96	377.06	-7,078.24	7,087.32	0.00	0.00	0.00
14,200.00	90.00	269.59	6,364.46	-1,404.96	376.35	-7,178.24	7,187.22	0.00	0.00	0.00
14,300.00	90.00	269.59	6,364.46	-1,404.96	375.64	-7,278.24	7,287.13	0.00	0.00	0.00
14,400.00	90.00	269.59	6,364.46	-1,404.96	374.93	-7,378.23	7,387.03	0.00	0.00	0.00
14,500.00	90.00	269.59	6,364.46	-1,404.96	374.23	-7,478.23	7,486.93	0.00	0.00	0.00
14,600.00	90.00	269.59	6,364.46	-1,404.96	373.52	-7,578.23	7,586.84	0.00	0.00	0.00
14,700.00	90.00	269.59	6,364.47	-1,404.97	372.81	-7,678.23	7,686.74	0.00	0.00	0.00
14,800.00	90.00	269.59	6,364.47	-1,404.97	372.10	-7,778.22	7,786.65	0.00	0.00	0.00
14,900.00	90.00	269.59	6,364.47	-1,404.97	371.39	-7,878.22	7,886.55	0.00	0.00	0.00
15,000.00	90.00	269.59	6,364.47	-1,404.97	370.69	-7,978.22	7,986.45	0.00	0.00	0.00
15,100.00	90.00	269.59	6,364.47	-1,404.97	369.98	-8,078.22	8,086.36	0.00	0.00	0.00
15,200.00	90.00	269.59	6,364.47	-1,404.97	369.27	-8,178.21	8,186.26	0.00	0.00	0.00
15,300.00	90.00	269.59	6,364.47	-1,404.97	368.56	-8,278.21	8,286.17	0.00	0.00	0.00
15,400.00	90.00	269.59	6,364.47	-1,404.97	367.85	-8,378.21	8,386.07	0.00	0.00	0.00
15,500.00	90.00	269.59	6,364.48	-1,404.98	367.15	-8,478.21	8,485.97	0.00	0.00	0.00
15,600.00	90.00	269.59	6,364.48	-1,404.98	366.44	-8,578.20	8,585.88	0.00	0.00	0.00
15,700.00	90.00	269.59	6,364.48	-1,404.98	365.73	-8,678.20	8,685.78	0.00	0.00	0.00
15,800.00	90.00	269.59	6,364.48	-1,404.98	365.03	-8,778.20	8,785.68	0.00	0.00	0.00
15,900.00	90.00	269.59	6,364.48	-1,404.98	364.32	-8,878.20	8,885.59	0.00	0.00	0.00
16,000.00	90.00	269.59	6,364.49	-1,404.99	363.61	-8,978.19	8,985.49	0.00	0.00	0.00
16,100.00	90.00	269.60	6,364.49	-1,404.99	362.90	-9,078.19	9,085.40	0.00	0.00	0.00
16,200.00	90.00	269.60	6,364.49	-1,404.99	362.20	-9,178.19	9,185.30	0.00	0.00	0.00
16,300.00	90.00	269.60	6,364.49	-1,404.99	361.49	-9,278.19	9,285.20	0.00	0.00	0.00
16,400.00	90.00	269.60	6,364.49	-1,404.99	360.78	-9,378.18	9,385.11	0.00	0.00	0.00
16,500.00	90.00	269.60	6,364.49	-1,404.99	360.08	-9,478.18	9,485.01	0.00	0.00	0.00
16,600.00	90.00	269.60	6,364.50	-1,405.00	359.37	-9,578.18	9,584.92	0.00	0.00	0.00
16,700.00	90.00	269.60	6,364.50	-1,405.00	358.67	-9,678.18	9,684.82	0.00	0.00	0.00
BHL: 1295ft FNL & 300ft FWL of Sec 24										
16,759.27	90.00	269.60	6,364.50	-1,405.00	358.25	-9,737.44	9,744.03	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well HUNT FED 8-60 19-24-3
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4959.50usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 27' @ 4959.50usft
Site:	SE NE SEC. 19 T8N R60W 6th P.M.	North Reference:	True
Well:	HUNT FED 8-60 19-24-3	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
509.50	509.50	Fox Hills Base		0.00	
1,559.74	1,547.50	Pierre Shale Top		0.00	
3,455.16	3,401.50	Richard Sandstone		0.00	
3,579.88	3,523.50	Parkman Sandstone		0.00	
4,335.39	4,262.50	Sussex Sandstone		0.00	
4,804.65	4,721.50	Shannon Sandstone		0.00	
5,641.71	5,549.50	TeePee Buttes		0.00	
6,322.30	6,188.50	Sharon Springs		0.00	
6,374.58	6,224.50	Niobrara Top		0.00	
6,652.36	6,349.50	Niobrara B2 Chalk Top		0.00	
6,708.01	6,359.50	Niobrara B2 Chalk Target Top		0.00	
6,783.77	6,364.50	Niobrara B2 Chalk Landing Point		0.00	

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 1723ft FNL & 530ft FEL of Sec 19
600.00	600.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,200.00	1,195.62	29.51	55.21	EOB TO 12° INC
5,019.28	4,931.44	403.78	755.55	END OF TANGENT
5,619.28	5,527.07	433.29	810.76	EOD TO VERTICAL
5,883.75	5,791.54	433.29	810.76	KOP (10°/100ft BUR)
6,783.77	6,364.50	429.19	237.80	HZ LP: 1295ft FNL & 300ft FEL of Sec 19
16,759.27	6,364.50	358.25	-9,737.44	BHL: 1295ft FNL & 300ft FWL of Sec 24