

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

SE SE SEC. 28 T7N R63W 6th P.M.

WAHLERT SOUTH 27-26-2HC

ORIGINAL WELLBORE

20 November, 2018

Plan: PROPOSAL #1

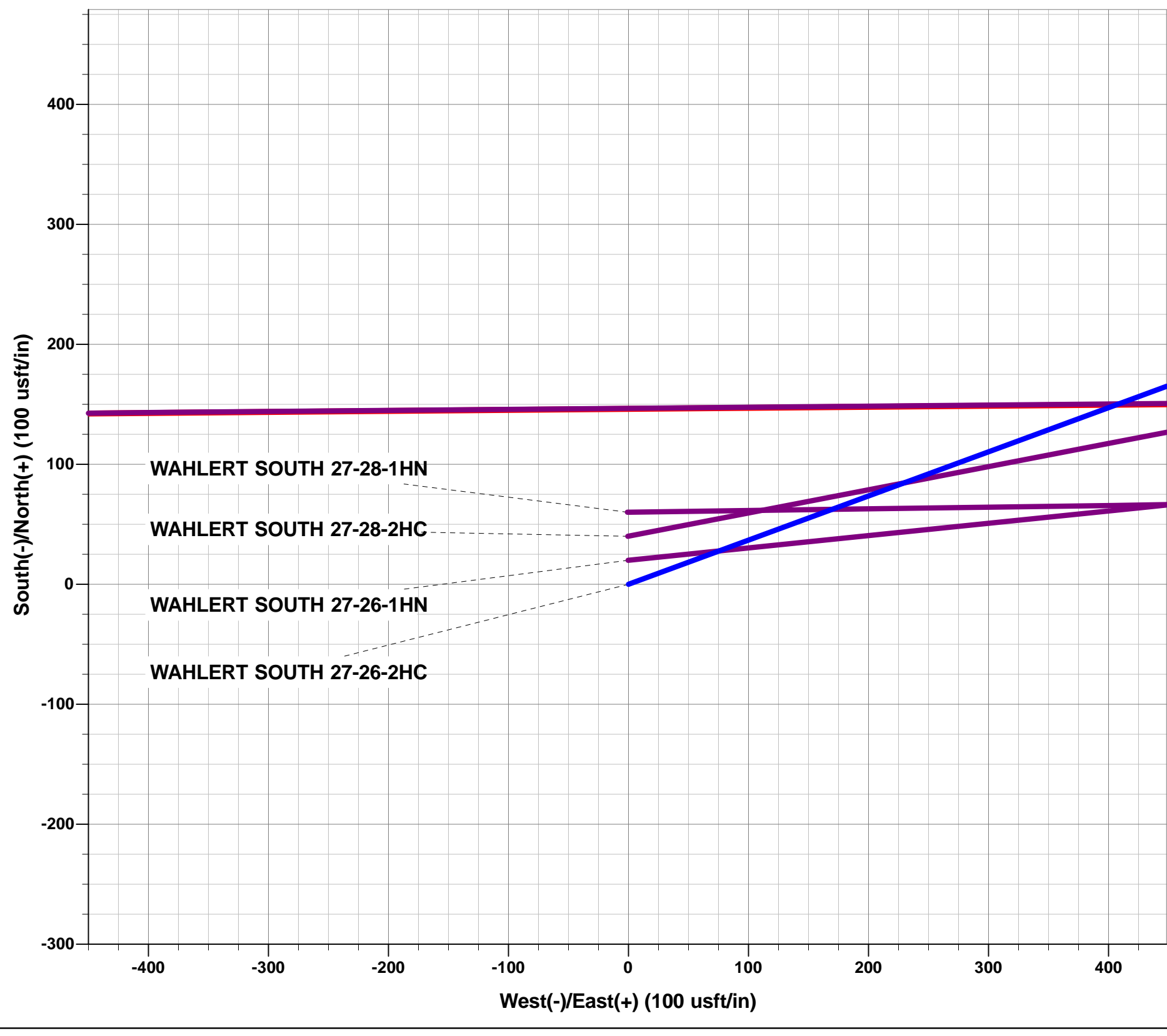




Project: WELD COUNTY, COLORADO (NAD 83)
Site: SE SE SEC. 28 T7N R63W 6th P.M.
Well: WAHLERT SOUTH 27-26-2HC
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 324ft FSL & 904ft FEL of Sec 28		
600.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)		
1505.29	1521.08	18.42	69.79	50.71	137.76	141.04	146.80	EOB TO 18.42° INC		
6439.15	6721.41	18.42	69.79	618.39	1679.93	1719.86	1790.13	KOP (10°/100ft DGLG)		
6840.00	7449.52	90.00	90.53	660.62	2227.71	2269.25	2341.14	HZ LP: 1015ft FSL & 1320ft FWL of Sec 27		
6840.00	13641.25	90.00	90.53	603.67	8419.18	8440.79	8532.87	BHL: 1015ft FSL & 2180ft FWL of Sec 26		

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
HZ LP - WAHLERT SOUTH 27-26-2HC	6840.00	660.62	2227.71	40.540269	-104.427370
BHL - WAHLERT SOUTH 27-26-2HC	6840.00	603.67	8419.18	40.540109	-104.405094



T
M

Azimuths to True North
Magnetic North: 7.89°

Magnetic Field
Strength: 52335.6snT
Dip Angle: 66.98°
Date: 20/11/2018
Model: IGRF2015

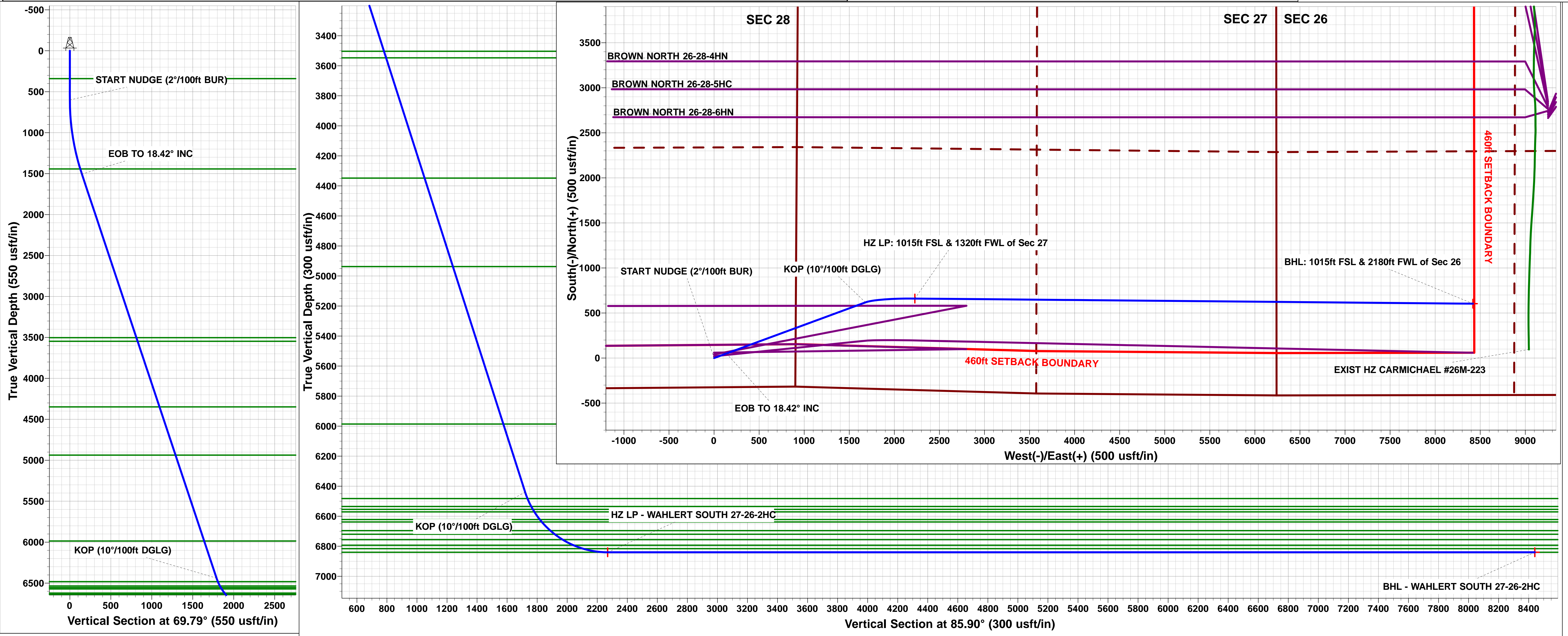
FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
340.00	340.00	Fox Hills Base
1443.00	1455.67	Pierre Shale Top
3503.00	3626.68	Richard Sandstone
3547.00	3673.06	Parkman Sandstone
4348.00	4517.32	Sussex Sandstone
4937.00	5138.13	Shannon Sandstone
5986.00	6243.79	TeePee Buttes
6482.00	6767.19	Sharon Springs
6535.00	6825.96	Niobrara Top
6554.00	6847.78	Niobrara A Chalk
6571.00	6867.72	Niobrara A Chalk Base
6622.00	6930.41	Niobrara B1 Chalk Top
6638.00	6951.18	Niobrara B1 Chalk Base
6696.00	7032.77	Niobrara B2 Chalk Base
6720.00	7070.54	Niobrara C Chalk Top
6756.00	7134.23	Niobrara C Chalk Base
6793.00	7215.01	Niobrara D Chalk Top
6816.00	7282.52	Ft. Hays
6840.00	7449.52	Codell (Target)

PROPOSED LOCAL COORDINATES:

SHL: 324ft FSL & 904ft FEL of Sec 28

HZ LP: 1015ft FSL & 1320ft FWL of Sec 27

BHL: 1015ft FSL & 2180ft FWL of Sec 26



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well WAHLERT SOUTH 27-26-2HC
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4760.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4760.00usft (Original Well Elev)
Site:	SE SE SEC. 28 T7N R63W 6th P.M.	North Reference:	True
Well:	WAHLERT SOUTH 27-26-2HC	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 SE SEC. 28 T7N R63W 6th P.M.		
Site Position:		Northing:	1,440,836.64 usft
From:	Lat/Long	Easting:	3,295,892.07 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10000ft
		Latitude:	40.538621
		Longitude:	-104.435388
		Grid Convergence:	0.69 °

Well	WAHLERT SOUTH 27-26-2HC		
Well Position	+N-S	-60.12 usft	Northing:
	+E-W	0.83 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)
	IGRF2015	20/11/2018	7.89	66.98	52,336

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 (°)
	6,840.00	0.00	0.00	85.90

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	-4,760.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	-4,160.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,521.08	18.42	69.79	1,505.29	-3,254.71	50.71	137.76	2.00	2.00	0.00	69.79	
6,721.41	18.42	69.79	6,439.15	1,679.15	618.39	1,679.93	0.00	0.00	0.00	0.00	
7,449.52	90.00	90.53	6,840.00	2,080.00	660.62	2,227.71	10.00	9.83	2.85	21.75	HZ LP - WAHLERT
13,641.25	90.00	90.53	6,840.00	2,080.00	603.67	8,419.18	0.00	0.00	0.00	0.00	BHL - WAHLERT S

Planning Report



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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4760.00usft (Original Well Elev)
Site:	SE SE SEC. 28 T7N R63W 6th P.M.	North Reference:	True
Well:	WAHLERT SOUTH 27-26-2HC	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: 324ft FSL & 904ft FEL of Sec 28										
0.00	0.00	0.00	0.00	4,760.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,660.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	4,560.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	4,460.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Base										
340.00	0.00	0.00	340.00	4,420.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	4,360.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	4,260.00	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	4,160.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	2.00	69.79	699.98	4,060.02	0.60	1.64	1.68	2.00	2.00	0.00
800.00	4.00	69.79	799.84	3,960.16	2.41	6.55	6.70	2.00	2.00	0.00
900.00	6.00	69.79	899.45	3,860.55	5.42	14.73	15.08	2.00	2.00	0.00
1,000.00	8.00	69.79	998.70	3,761.30	9.63	26.16	26.79	2.00	2.00	0.00
1,100.00	10.00	69.79	1,097.47	3,662.53	15.03	40.84	41.81	2.00	2.00	0.00
1,200.00	12.00	69.79	1,195.62	3,564.38	21.63	58.75	60.14	2.00	2.00	0.00
1,300.00	14.00	69.79	1,293.06	3,466.94	29.40	79.86	81.76	2.00	2.00	0.00
1,400.00	16.00	69.79	1,389.64	3,370.36	38.34	104.15	106.62	2.00	2.00	0.00
Pierre Shale Top										
1,455.67	17.11	69.79	1,443.00	3,317.00	43.82	119.03	121.86	2.00	2.00	0.00
1,500.00	18.00	69.79	1,485.27	3,274.73	48.44	131.58	134.71	2.00	2.00	0.00
EOB TO 18.42° INC										
1,521.08	18.42	69.79	1,505.29	3,254.71	50.71	137.76	141.04	2.00	2.00	0.00
1,600.00	18.42	69.79	1,580.17	3,179.83	59.33	161.17	165.00	0.00	0.00	0.00
1,700.00	18.42	69.79	1,675.04	3,084.96	70.24	190.82	195.36	0.00	0.00	0.00
1,800.00	18.42	69.79	1,769.92	2,990.08	81.16	220.48	225.72	0.00	0.00	0.00
1,900.00	18.42	69.79	1,864.80	2,895.20	92.07	250.13	256.08	0.00	0.00	0.00
2,000.00	18.42	69.79	1,959.67	2,800.33	102.99	279.79	286.44	0.00	0.00	0.00
2,100.00	18.42	69.79	2,054.55	2,705.45	113.91	309.44	316.80	0.00	0.00	0.00
2,200.00	18.42	69.79	2,149.42	2,610.58	124.82	339.10	347.16	0.00	0.00	0.00
2,300.00	18.42	69.79	2,244.30	2,515.70	135.74	368.75	377.52	0.00	0.00	0.00
2,400.00	18.42	69.79	2,339.17	2,420.83	146.66	398.41	407.88	0.00	0.00	0.00
2,500.00	18.42	69.79	2,434.05	2,325.95	157.57	428.06	438.24	0.00	0.00	0.00
2,600.00	18.42	69.79	2,528.93	2,231.07	168.49	457.72	468.60	0.00	0.00	0.00
2,700.00	18.42	69.79	2,623.80	2,136.20	179.40	487.37	498.96	0.00	0.00	0.00
2,800.00	18.42	69.79	2,718.68	2,041.32	190.32	517.03	529.32	0.00	0.00	0.00
2,900.00	18.42	69.79	2,813.55	1,946.45	201.24	546.69	559.68	0.00	0.00	0.00
3,000.00	18.42	69.79	2,908.43	1,851.57	212.15	576.34	590.04	0.00	0.00	0.00
3,100.00	18.42	69.79	3,003.30	1,756.70	223.07	606.00	620.40	0.00	0.00	0.00
3,200.00	18.42	69.79	3,098.18	1,661.82	233.98	635.65	650.76	0.00	0.00	0.00
3,300.00	18.42	69.79	3,193.06	1,566.94	244.90	665.31	681.12	0.00	0.00	0.00
3,400.00	18.42	69.79	3,287.93	1,472.07	255.82	694.96	711.48	0.00	0.00	0.00
3,500.00	18.42	69.79	3,382.81	1,377.19	266.73	724.62	741.84	0.00	0.00	0.00
3,600.00	18.42	69.79	3,477.68	1,282.32	277.65	754.27	772.20	0.00	0.00	0.00
Richard Sandstone										
3,626.68	18.42	69.79	3,503.00	1,257.00	280.56	762.18	780.30	0.00	0.00	0.00
Parkman Sandstone										
3,673.06	18.42	69.79	3,547.00	1,213.00	285.62	775.94	794.38	0.00	0.00	0.00
3,700.00	18.42	69.79	3,572.56	1,187.44	288.56	783.93	802.56	0.00	0.00	0.00
3,800.00	18.42	69.79	3,667.43	1,092.57	299.48	813.58	832.92	0.00	0.00	0.00
3,900.00	18.42	69.79	3,762.31	997.69	310.40	843.24	863.28	0.00	0.00	0.00
4,000.00	18.42	69.79	3,857.19	902.81	321.31	872.89	893.64	0.00	0.00	0.00

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Well:	WAHLERT SOUTH 27-26-2HC	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	18.42	69.79	3,952.06	807.94	332.23	902.55	924.00	0.00	0.00	0.00
4,200.00	18.42	69.79	4,046.94	713.06	343.15	932.20	954.36	0.00	0.00	0.00
4,300.00	18.42	69.79	4,141.81	618.19	354.06	961.86	984.72	0.00	0.00	0.00
4,400.00	18.42	69.79	4,236.69	523.31	364.98	991.51	1,015.08	0.00	0.00	0.00
4,500.00	18.42	69.79	4,331.57	428.43	375.89	1,021.17	1,045.44	0.00	0.00	0.00
Sussex Sandstone										
4,517.32	18.42	69.79	4,348.00	412.00	377.79	1,026.31	1,050.70	0.00	0.00	0.00
4,600.00	18.42	69.79	4,426.44	333.56	386.81	1,050.82	1,075.80	0.00	0.00	0.00
4,700.00	18.42	69.79	4,521.32	238.68	397.73	1,080.48	1,106.16	0.00	0.00	0.00
4,800.00	18.42	69.79	4,616.19	143.81	408.64	1,110.13	1,136.52	0.00	0.00	0.00
4,900.00	18.42	69.79	4,711.07	48.93	419.56	1,139.79	1,166.88	0.00	0.00	0.00
5,000.00	18.42	69.79	4,805.94	-45.94	430.47	1,169.44	1,197.24	0.00	0.00	0.00
5,100.00	18.42	69.79	4,900.82	-140.82	441.39	1,199.10	1,227.60	0.00	0.00	0.00
Shannon Sandstone										
5,138.13	18.42	69.79	4,937.00	-177.00	445.55	1,210.41	1,239.17	0.00	0.00	0.00
5,200.00	18.42	69.79	4,995.70	-235.70	452.31	1,228.75	1,257.96	0.00	0.00	0.00
5,300.00	18.42	69.79	5,090.57	-330.57	463.22	1,258.41	1,288.32	0.00	0.00	0.00
5,400.00	18.42	69.79	5,185.45	-425.45	474.14	1,288.07	1,318.68	0.00	0.00	0.00
5,500.00	18.42	69.79	5,280.32	-520.32	485.06	1,317.72	1,349.04	0.00	0.00	0.00
5,600.00	18.42	69.79	5,375.20	-615.20	495.97	1,347.38	1,379.40	0.00	0.00	0.00
5,700.00	18.42	69.79	5,470.07	-710.07	506.89	1,377.03	1,409.76	0.00	0.00	0.00
5,800.00	18.42	69.79	5,564.95	-804.95	517.80	1,406.69	1,440.12	0.00	0.00	0.00
5,900.00	18.42	69.79	5,659.83	-899.83	528.72	1,436.34	1,470.48	0.00	0.00	0.00
6,000.00	18.42	69.79	5,754.70	-994.70	539.64	1,466.00	1,500.84	0.00	0.00	0.00
6,100.00	18.42	69.79	5,849.58	-1,089.58	550.55	1,495.65	1,531.20	0.00	0.00	0.00
6,200.00	18.42	69.79	5,944.45	-1,184.45	561.47	1,525.31	1,561.56	0.00	0.00	0.00
TeePee Buttes										
6,243.79	18.42	69.79	5,986.00	-1,226.00	566.25	1,538.29	1,574.85	0.00	0.00	0.00
6,300.00	18.42	69.79	6,039.33	-1,279.33	572.38	1,554.96	1,591.92	0.00	0.00	0.00
6,400.00	18.42	69.79	6,134.20	-1,374.20	583.30	1,584.62	1,622.28	0.00	0.00	0.00
6,500.00	18.42	69.79	6,229.08	-1,469.08	594.22	1,614.27	1,652.64	0.00	0.00	0.00
6,600.00	18.42	69.79	6,323.96	-1,563.96	605.13	1,643.93	1,683.00	0.00	0.00	0.00
6,700.00	18.42	69.79	6,418.83	-1,658.83	616.05	1,673.58	1,713.36	0.00	0.00	0.00
KOP (10°/100ft DGLG)										
6,721.41	18.42	69.79	6,439.15	-1,679.15	618.39	1,679.93	1,719.86	0.00	0.00	0.00
Sharon Springs										
6,767.19	22.73	74.18	6,482.00	-1,722.00	623.30	1,695.24	1,735.48	10.00	9.42	9.59
6,800.00	25.88	76.46	6,511.89	-1,751.89	626.70	1,708.30	1,748.75	10.00	9.58	6.94
Niobrara Top										
6,825.96	28.39	77.92	6,535.00	-1,775.00	629.32	1,719.85	1,760.45	10.00	9.66	5.64
Niobrara A Chalk										
6,847.78	30.51	78.98	6,554.00	-1,794.00	631.47	1,730.36	1,771.09	10.00	9.71	4.85
Niobrara A Chalk Base										
6,867.72	32.45	79.84	6,571.00	-1,811.00	633.38	1,740.59	1,781.43	10.00	9.75	4.30
6,900.00	35.61	81.05	6,597.75	-1,837.75	636.37	1,758.40	1,799.41	10.00	9.78	3.75
Niobrara B1 Chalk Top										
6,930.41	38.59	82.03	6,622.00	-1,862.00	639.06	1,776.54	1,817.70	10.00	9.81	3.22
Niobrara B1 Chalk Base										
6,951.18	40.63	82.63	6,638.00	-1,878.00	640.83	1,789.67	1,830.91	10.00	9.83	2.88
7,000.00	45.44	83.86	6,673.68	-1,913.68	644.73	1,822.74	1,864.19	10.00	9.85	2.52
Niobrara B2 Chalk Base										
7,032.77	48.68	84.58	6,696.00	-1,936.00	647.14	1,846.61	1,888.16	10.00	9.87	2.19

Planning Report



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Well:	WAHLERT SOUTH 27-26-2HC	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)
Niobrara C Chalk Top										
7,070.54	52.41	85.32	6,720.00	-1,960.00	649.71	1,875.65	1,917.32	10.00	9.88	1.97
7,100.00	55.32	85.85	6,737.37	-1,977.37	651.54	1,899.37	1,941.10	10.00	9.89	1.80
Niobrara C Chalk Base										
7,134.23	58.71	86.42	6,756.00	-1,996.00	653.47	1,928.02	1,969.81	10.00	9.90	1.67
7,200.00	65.23	87.41	6,786.89	-2,026.89	656.58	1,985.96	2,027.83	10.00	9.91	1.51
Niobrara D Chalk Top										
7,215.01	66.72	87.62	6,793.00	-2,033.00	657.18	1,999.65	2,041.53	10.00	9.92	1.40
Ft. Hays										
7,282.52	73.42	88.51	6,816.00	-2,056.00	659.31	2,063.04	2,104.91	10.00	9.92	1.33
7,300.00	75.15	88.74	6,820.73	-2,060.73	659.71	2,079.87	2,121.72	10.00	9.93	1.26
7,400.00	85.08	89.95	6,837.88	-2,077.88	660.83	2,178.25	2,219.94	10.00	9.93	1.21
HZ LP: 1015ft FSL & 1320ft FWL of Sec 27 - Codell (Target)										
7,449.52	90.00	90.53	6,840.00	-2,080.00	660.62	2,227.71	2,269.25	10.00	9.93	1.17
7,500.00	90.00	90.53	6,840.00	-2,080.00	660.16	2,278.19	2,319.57	0.00	0.00	0.00
7,600.00	90.00	90.53	6,840.00	-2,080.00	659.24	2,378.18	2,419.24	0.00	0.00	0.00
7,700.00	90.00	90.53	6,840.00	-2,080.00	658.32	2,478.18	2,518.92	0.00	0.00	0.00
7,800.00	90.00	90.53	6,840.00	-2,080.00	657.40	2,578.18	2,618.59	0.00	0.00	0.00
7,900.00	90.00	90.53	6,840.00	-2,080.00	656.48	2,678.17	2,718.26	0.00	0.00	0.00
8,000.00	90.00	90.53	6,840.00	-2,080.00	655.56	2,778.17	2,817.94	0.00	0.00	0.00
8,100.00	90.00	90.53	6,840.00	-2,080.00	654.64	2,878.16	2,917.61	0.00	0.00	0.00
8,200.00	90.00	90.53	6,840.00	-2,080.00	653.72	2,978.16	3,017.29	0.00	0.00	0.00
8,300.00	90.00	90.53	6,840.00	-2,080.00	652.80	3,078.16	3,116.96	0.00	0.00	0.00
8,400.00	90.00	90.53	6,840.00	-2,080.00	651.88	3,178.15	3,216.63	0.00	0.00	0.00
8,500.00	90.00	90.53	6,840.00	-2,080.00	650.96	3,278.15	3,316.31	0.00	0.00	0.00
8,600.00	90.00	90.53	6,840.00	-2,080.00	650.04	3,378.14	3,415.98	0.00	0.00	0.00
8,700.00	90.00	90.53	6,840.00	-2,080.00	649.12	3,478.14	3,515.66	0.00	0.00	0.00
8,800.00	90.00	90.53	6,840.00	-2,080.00	648.20	3,578.13	3,615.33	0.00	0.00	0.00
8,900.00	90.00	90.53	6,840.00	-2,080.00	647.28	3,678.13	3,715.00	0.00	0.00	0.00
9,000.00	90.00	90.53	6,840.00	-2,080.00	646.36	3,778.13	3,814.68	0.00	0.00	0.00
9,100.00	90.00	90.53	6,840.00	-2,080.00	645.44	3,878.12	3,914.35	0.00	0.00	0.00
9,200.00	90.00	90.53	6,840.00	-2,080.00	644.52	3,978.12	4,014.03	0.00	0.00	0.00
9,300.00	90.00	90.53	6,840.00	-2,080.00	643.60	4,078.11	4,113.70	0.00	0.00	0.00
9,400.00	90.00	90.53	6,840.00	-2,080.00	642.68	4,178.11	4,213.37	0.00	0.00	0.00
9,500.00	90.00	90.53	6,840.00	-2,080.00	641.76	4,278.10	4,313.05	0.00	0.00	0.00
9,600.00	90.00	90.53	6,840.00	-2,080.00	640.84	4,378.10	4,412.72	0.00	0.00	0.00
9,700.00	90.00	90.53	6,840.00	-2,080.00	639.92	4,478.10	4,512.39	0.00	0.00	0.00
9,800.00	90.00	90.53	6,840.00	-2,080.00	639.00	4,578.09	4,612.07	0.00	0.00	0.00
9,900.00	90.00	90.53	6,840.00	-2,080.00	638.08	4,678.09	4,711.74	0.00	0.00	0.00
10,000.00	90.00	90.53	6,840.00	-2,080.00	637.16	4,778.08	4,811.42	0.00	0.00	0.00
10,100.00	90.00	90.53	6,840.00	-2,080.00	636.24	4,878.08	4,911.09	0.00	0.00	0.00
10,200.00	90.00	90.53	6,840.00	-2,080.00	635.32	4,978.07	5,010.76	0.00	0.00	0.00
10,300.00	90.00	90.53	6,840.00	-2,080.00	634.40	5,078.07	5,110.44	0.00	0.00	0.00
10,400.00	90.00	90.53	6,840.00	-2,080.00	633.48	5,178.07	5,210.11	0.00	0.00	0.00
10,500.00	90.00	90.53	6,840.00	-2,080.00	632.56	5,278.06	5,309.79	0.00	0.00	0.00
10,600.00	90.00	90.53	6,840.00	-2,080.00	631.64	5,378.06	5,409.46	0.00	0.00	0.00
10,700.00	90.00	90.53	6,840.00	-2,080.00	630.72	5,478.05	5,509.13	0.00	0.00	0.00
10,800.00	90.00	90.53	6,840.00	-2,080.00	629.80	5,578.05	5,608.81	0.00	0.00	0.00
10,900.00	90.00	90.53	6,840.00	-2,080.00	628.88	5,678.05	5,708.48	0.00	0.00	0.00
11,000.00	90.00	90.53	6,840.00	-2,080.00	627.96	5,778.04	5,808.16	0.00	0.00	0.00
11,100.00	90.00	90.53	6,840.00	-2,080.00	627.04	5,878.04	5,907.83	0.00	0.00	0.00
11,200.00	90.00	90.53	6,840.00	-2,080.00	626.12	5,978.03	6,007.50	0.00	0.00	0.00
11,300.00	90.00	90.53	6,840.00	-2,080.00	625.20	6,078.03	6,107.18	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well WAHLERT SOUTH 27-26-2HC
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4760.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4760.00usft (Original Well Elev)
Site:	SE SE SEC. 28 T7N R63W 6th P.M.	North Reference:	True
Well:	WAHLERT SOUTH 27-26-2HC	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)
11,400.00	90.00	90.53	6,840.00	-2,080.00	624.28	6,178.02	6,206.85	0.00	0.00	0.00
11,500.00	90.00	90.53	6,840.00	-2,080.00	623.36	6,278.02	6,306.53	0.00	0.00	0.00
11,600.00	90.00	90.53	6,840.00	-2,080.00	622.44	6,378.02	6,406.20	0.00	0.00	0.00
11,700.00	90.00	90.53	6,840.00	-2,080.00	621.52	6,478.01	6,505.87	0.00	0.00	0.00
11,800.00	90.00	90.53	6,840.00	-2,080.00	620.60	6,578.01	6,605.55	0.00	0.00	0.00
11,900.00	90.00	90.53	6,840.00	-2,080.00	619.68	6,678.00	6,705.22	0.00	0.00	0.00
12,000.00	90.00	90.53	6,840.00	-2,080.00	618.76	6,778.00	6,804.90	0.00	0.00	0.00
12,100.00	90.00	90.53	6,840.00	-2,080.00	617.84	6,877.99	6,904.57	0.00	0.00	0.00
12,200.00	90.00	90.53	6,840.00	-2,080.00	616.92	6,977.99	7,004.24	0.00	0.00	0.00
12,300.00	90.00	90.53	6,840.00	-2,080.00	616.00	7,077.99	7,103.92	0.00	0.00	0.00
12,400.00	90.00	90.53	6,840.00	-2,080.00	615.08	7,177.98	7,203.59	0.00	0.00	0.00
12,500.00	90.00	90.53	6,840.00	-2,080.00	614.17	7,277.98	7,303.26	0.00	0.00	0.00
12,600.00	90.00	90.53	6,840.00	-2,080.00	613.25	7,377.97	7,402.94	0.00	0.00	0.00
12,700.00	90.00	90.53	6,840.00	-2,080.00	612.33	7,477.97	7,502.61	0.00	0.00	0.00
12,800.00	90.00	90.53	6,840.00	-2,080.00	611.41	7,577.96	7,602.29	0.00	0.00	0.00
12,900.00	90.00	90.53	6,840.00	-2,080.00	610.49	7,677.96	7,701.96	0.00	0.00	0.00
13,000.00	90.00	90.53	6,840.00	-2,080.00	609.57	7,777.96	7,801.63	0.00	0.00	0.00
13,100.00	90.00	90.53	6,840.00	-2,080.00	608.65	7,877.95	7,901.31	0.00	0.00	0.00
13,200.00	90.00	90.53	6,840.00	-2,080.00	607.73	7,977.95	8,000.98	0.00	0.00	0.00
13,300.00	90.00	90.53	6,840.00	-2,080.00	606.81	8,077.94	8,100.66	0.00	0.00	0.00
13,400.00	90.00	90.53	6,840.00	-2,080.00	605.89	8,177.94	8,200.33	0.00	0.00	0.00
13,500.00	90.00	90.53	6,840.00	-2,080.00	604.97	8,277.94	8,300.00	0.00	0.00	0.00
13,600.00	90.00	90.53	6,840.00	-2,080.00	604.05	8,377.93	8,399.68	0.00	0.00	0.00
BHL: 1015ft FSL & 2180ft FWL of Sec 26										
13,641.25	90.00	90.53	6,840.00	-2,080.00	603.67	8,419.18	8,440.79	0.00	0.00	0.00

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
340.00	340.00	Fox Hills Base				
1,455.67	1,443.00	Pierre Shale Top				
3,626.68	3,503.00	Richard Sandstone				
3,673.06	3,547.00	Parkman Sandstone				
4,517.32	4,348.00	Sussex Sandstone				
5,138.13	4,937.00	Shannon Sandstone				
6,243.79	5,986.00	TeePee Buttes				
6,767.19	6,482.00	Sharon Springs				
6,825.96	6,535.00	Niobrara Top				
6,847.78	6,554.00	Niobrara A Chalk				
6,867.72	6,571.00	Niobrara A Chalk Base				
6,930.41	6,622.00	Niobrara B1 Chalk Top				
6,951.18	6,638.00	Niobrara B1 Chalk Base				
7,032.77	6,696.00	Niobrara B2 Chalk Base				
7,070.54	6,720.00	Niobrara C Chalk Top				
7,134.23	6,756.00	Niobrara C Chalk Base				
7,215.01	6,793.00	Niobrara D Chalk Top				
7,282.52	6,816.00	Ft. Hays				
7,449.52	6,840.00	Codell (Target)				

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well WAHLERT SOUTH 27-26-2HC
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4760.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4760.00usft (Original Well Elev)
Site:	SE SE SEC. 28 T7N R63W 6th P.M.	North Reference:	True
Well:	WAHLERT SOUTH 27-26-2HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Plan Annotations				
Local Coordinates				
MD (usft)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Comment
0.00	0.00	0.00	0.00	SHL: 324ft FSL & 904ft FEL of Sec 28
600.00	600.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1,521.08	1,505.29	50.71	137.76	EOB TO 18.42° INC
6,721.41	6,439.15	618.39	1,679.93	KOP (10°/100ft DGLG)
7,449.52	6,840.00	660.62	2,227.71	HZ LP: 1015ft FSL & 1320ft FWL of Sec 27
13,641.25	6,840.00	603.67	8,419.18	BHL: 1015ft FSL & 2180ft FWL of Sec 26