

MALLARD EXPLORATION

WELD COUNTY

SEC 27-T9N-R60W

BASHOR FED 27-3-2HN

ORIGINAL WELLBORE

Plan: PROPOSAL 1

Standard Planning Report

17 July, 2020



Project: WELD COUNTY
Site: SEC 27-T9N-R60W
Well: BASHOR FED 27-3-2HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL 1

PROJECT DETAILS: WELD COUNTY

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone

System Datum: Mean Sea Level



Azimuths to True North
Magnetic North: 7.60°

Magnetic Field
Strength: 52291.7nT
Dip Angle: 67.05°
Date: 7/6/2020
Model: IGRF2020

WELL DETAILS: BASHOR FED 27-3-2HN

+N/-S	+E/-W	Northing	Easting	4994.00	Latitude	Longitude	Slot
0.00	0.00	1510900.57	3395078.87		40.727095°N	104.074518°W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	1663.61	29.27	284.42	1600.77	91.12	-354.29	2.00	284.42	-18.72	
4	6481.66	29.27	284.42	5803.57	677.93	-2635.87	0.00	0.00	-139.25	
5	7456.18	90.00	179.04	6373.00	104.75	-2934.07	10.00	-103.49	481.85	BASHOR FED 27-3-2HN - LP
6	20890.81	90.00	179.04	6373.00	-13328.01	-2709.39	0.00	0.00	13600.61	BASHOR FED 27-3-2HN - PBHL

FORMATION TOP DETAILS

TVDPth	MDPath	Formation
610.00	611.41	Base Fox Hills
1544.00	1598.94	Pierre Shale Top
3431.00	3761.77	Richard Sandstone
3541.00	3887.87	Parkman Sandstone
4228.00	4675.44	Sussex Sandstone
4721.00	5240.61	Shannon Sandstone
5543.00	6182.94	TeePee Buttes
6179.00	6935.78	Sharon Springs
6216.00	6991.31	Niobrara Top
6361.00	7330.90	Niobrara B2 Chalk Top
6368.00	7375.00	Niobrara B2 Chalk Target Top
6373.00	7456.18	Niobrara B2 Chalk Target LP

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	Start Build 2.00
1663.61	29.27	284.42	1600.77	91.12	-354.29	-18.72	365.82	Start 4818.04 hold at 1663.61 MD
6481.66	29.27	284.42	5803.57	677.93	-2635.87	-139.25	2721.85	Start DLS 10.00 TFO -103.49
7456.18	90.00	179.04	6373.00	104.75	-2934.07	481.85	3442.84	Start 13434.64 hold at 7456.18 MD
20890.81	90.00	179.04	6373.00	-13328.01	-2709.39	13600.61	16877.48	TD at 20890.81

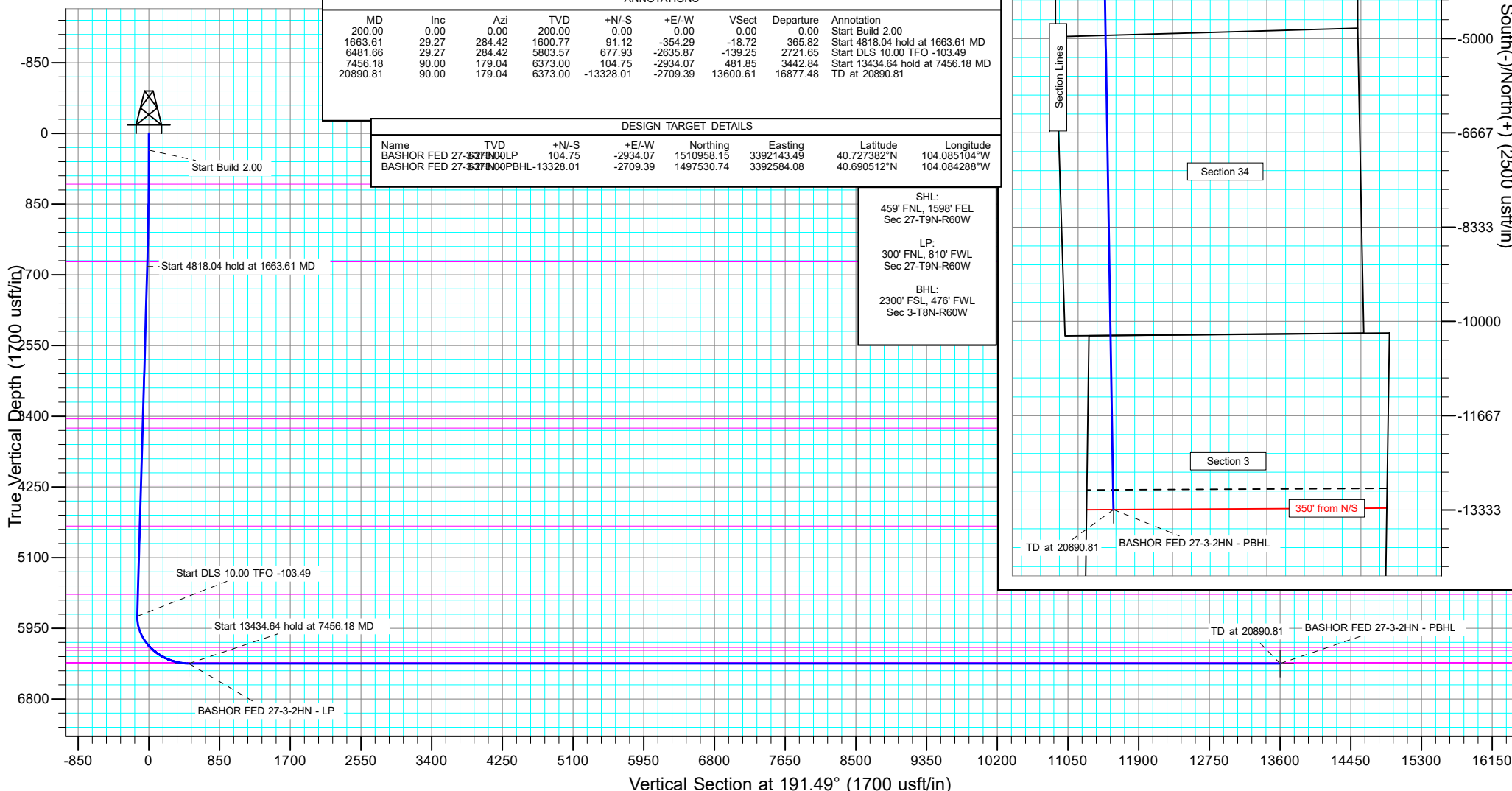
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BASHOR FED 27-3-2HN-LP	6373.00	104.75	-2934.07	1510958.15	3392143.49	40.727382°N	104.085104°W
BASHOR FED 27-3-2HN-PBHL	6373.00	-13328.01	-2709.39	1497530.74	3392584.08	40.690512°N	104.084288°W

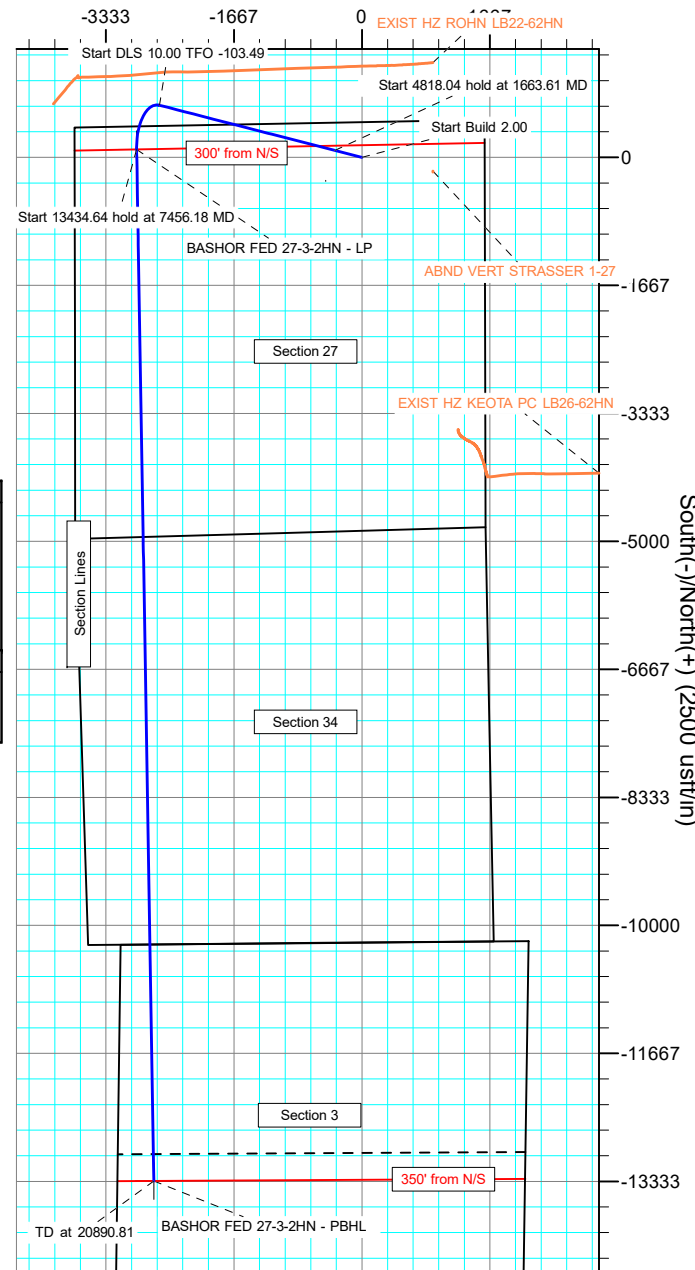
SHL:
459' FNL, 1598' FEL
Sec 27-T9N-R60W

LP:
300' FNL, 810' FWL
Sec 27-T9N-R60W

BHL:
2300' FSL, 476' FWL
Sec 3-T8N-R60W



West(-)/East(+) (2500 usft/in)



Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well BASHOR FED 27-3-2HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 5021.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 5021.00usft
Site:	SEC 27-T9N-R60W	North Reference:	True
Well:	BASHOR FED 27-3-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Project	WELD COUNTY		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		SEC 27-T9N-R60W				
Site Position:		Northing:	1,511,414.81	usft	Latitude:	40.728436°N
From:	Lat/Long	Easting:	3,396,667.25	usft	Longitude:	104.068758°W
Position Uncertainty:		0.00	usft	Slot Radius:	13.200	in

Well		BASHOR FED 27-3-2HN				
Well Position	+N/-S	0.00 usft	Northing:	1,510,900.58 usft	Latitude:	40.727095°N
	+E/-W	0.00 usft	Easting:	3,395,078.86 usft	Longitude:	104.074518°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,994.00 usft
Grid Convergence:		0.92 °				

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	7/6/2020	7.60	67.05	52,291.67851998

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 (°)	
	0.00	0.00	0.00	191.49	

Plan Survey Tool Program	Date	7/17/2020			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	20,890.81	PROPOSAL 1 (ORIGINAL WELL	MWD	
			OWSG MWD - Standard		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,663.61	29.27	284.42	1,600.77	91.12	-354.29	2.00	2.00	0.00	284.42	
6,481.66	29.27	284.42	5,803.58	677.93	-2,635.87	0.00	0.00	0.00	0.00	
7,456.18	90.00	179.04	6,373.00	104.75	-2,934.07	10.00	6.23	-10.81	-103.49	BASHOR FED 27-3-2
20,890.81	90.00	179.04	6,373.00	-13,328.01	-2,709.39	0.00	0.00	0.00	0.00	BASHOR FED 27-3-2

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well BASHOR FED 27-3-2HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 5021.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 5021.00usft
Site:	SEC 27-T9N-R60W	North Reference:	True
Well:	BASHOR FED 27-3-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
300.00	2.00	284.42	299.98	0.43	-1.69	-0.09	2.00	2.00	0.00
400.00	4.00	284.42	399.84	1.74	-6.76	-0.36	2.00	2.00	0.00
500.00	6.00	284.42	499.45	3.91	-15.20	-0.80	2.00	2.00	0.00
600.00	8.00	284.42	598.70	6.94	-27.00	-1.43	2.00	2.00	0.00
611.41	8.23	284.42	610.00	7.35	-28.56	-1.51	2.00	2.00	0.00
Base Fox Hills									
700.00	10.00	284.42	697.47	10.84	-42.15	-2.23	2.00	2.00	0.00
800.00	12.00	284.42	795.62	15.59	-60.63	-3.20	2.00	2.00	0.00
900.00	14.00	284.42	893.06	21.20	-82.41	-4.35	2.00	2.00	0.00
1,000.00	16.00	284.42	989.64	27.64	-107.48	-5.68	2.00	2.00	0.00
1,100.00	18.00	284.42	1,085.27	34.93	-135.79	-7.17	2.00	2.00	0.00
1,200.00	20.00	284.42	1,179.82	43.03	-167.32	-8.84	2.00	2.00	0.00
1,300.00	22.00	284.42	1,273.17	51.96	-202.03	-10.67	2.00	2.00	0.00
1,400.00	24.00	284.42	1,365.21	61.69	-239.87	-12.67	2.00	2.00	0.00
1,500.00	26.00	284.42	1,455.84	72.22	-280.80	-14.83	2.00	2.00	0.00
1,598.94	27.98	284.42	1,544.00	83.40	-324.28	-17.13	2.00	2.00	0.00
Pierre Shale Top									
1,600.00	28.00	284.42	1,544.94	83.53	-324.76	-17.16	2.00	2.00	0.00
1,663.61	29.27	284.42	1,600.77	91.12	-354.29	-18.72	2.00	2.00	0.00
Start 4818.04 hold at 1663.61 MD									
1,700.00	29.27	284.42	1,632.51	95.55	-371.52	-19.63	0.00	0.00	0.00
1,800.00	29.27	284.42	1,719.74	107.73	-418.87	-22.13	0.00	0.00	0.00
1,900.00	29.27	284.42	1,806.97	119.91	-466.23	-24.63	0.00	0.00	0.00
2,000.00	29.27	284.42	1,894.20	132.09	-513.58	-27.13	0.00	0.00	0.00
2,100.00	29.27	284.42	1,981.43	144.27	-560.94	-29.63	0.00	0.00	0.00
2,200.00	29.27	284.42	2,068.66	156.45	-608.29	-32.14	0.00	0.00	0.00
2,300.00	29.27	284.42	2,155.89	168.63	-655.65	-34.64	0.00	0.00	0.00
2,400.00	29.27	284.42	2,243.12	180.81	-703.00	-37.14	0.00	0.00	0.00
2,500.00	29.27	284.42	2,330.35	192.99	-750.36	-39.64	0.00	0.00	0.00
2,600.00	29.27	284.42	2,417.58	205.17	-797.71	-42.14	0.00	0.00	0.00
2,700.00	29.27	284.42	2,504.81	217.35	-845.07	-44.65	0.00	0.00	0.00
2,800.00	29.27	284.42	2,592.04	229.53	-892.42	-47.15	0.00	0.00	0.00
2,900.00	29.27	284.42	2,679.28	241.71	-939.78	-49.65	0.00	0.00	0.00
3,000.00	29.27	284.42	2,766.51	253.89	-987.13	-52.15	0.00	0.00	0.00
3,100.00	29.27	284.42	2,853.74	266.07	-1,034.49	-54.65	0.00	0.00	0.00
3,200.00	29.27	284.42	2,940.97	278.25	-1,081.84	-57.15	0.00	0.00	0.00
3,300.00	29.27	284.42	3,028.20	290.42	-1,129.20	-59.66	0.00	0.00	0.00
3,400.00	29.27	284.42	3,115.43	302.60	-1,176.55	-62.16	0.00	0.00	0.00
3,500.00	29.27	284.42	3,202.66	314.78	-1,223.91	-64.66	0.00	0.00	0.00
3,600.00	29.27	284.42	3,289.89	326.96	-1,271.26	-67.16	0.00	0.00	0.00
3,700.00	29.27	284.42	3,377.12	339.14	-1,318.62	-69.66	0.00	0.00	0.00
3,761.77	29.27	284.42	3,431.00	346.67	-1,347.87	-71.21	0.00	0.00	0.00
Richard Sandstone									
3,800.00	29.27	284.42	3,464.35	351.32	-1,365.97	-72.16	0.00	0.00	0.00
3,887.87	29.27	284.42	3,541.00	362.02	-1,407.58	-74.36	0.00	0.00	0.00
Parkman Sandstone									
3,900.00	29.27	284.42	3,551.58	363.50	-1,413.33	-74.67	0.00	0.00	0.00
4,000.00	29.27	284.42	3,638.81	375.68	-1,460.68	-77.17	0.00	0.00	0.00
4,100.00	29.27	284.42	3,726.04	387.86	-1,508.03	-79.67	0.00	0.00	0.00

Planning Report

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Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 5021.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 5021.00usft
Site:	SEC 27-T9N-R60W	North Reference:	True
Well:	BASHOR FED 27-3-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,200.00	29.27	284.42	3,813.27	400.04	-1,555.39	-82.17	0.00	0.00	0.00
4,300.00	29.27	284.42	3,900.50	412.22	-1,602.74	-84.67	0.00	0.00	0.00
4,400.00	29.27	284.42	3,987.73	424.40	-1,650.10	-87.18	0.00	0.00	0.00
4,500.00	29.27	284.42	4,074.96	436.58	-1,697.45	-89.68	0.00	0.00	0.00
4,600.00	29.27	284.42	4,162.20	448.76	-1,744.81	-92.18	0.00	0.00	0.00
4,675.44	29.27	284.42	4,228.00	457.95	-1,780.53	-94.07	0.00	0.00	0.00
Sussex Sandstone									
4,700.00	29.27	284.42	4,249.43	460.94	-1,792.16	-94.68	0.00	0.00	0.00
4,800.00	29.27	284.42	4,336.66	473.12	-1,839.52	-97.18	0.00	0.00	0.00
4,900.00	29.27	284.42	4,423.89	485.30	-1,886.87	-99.68	0.00	0.00	0.00
5,000.00	29.27	284.42	4,511.12	497.48	-1,934.23	-102.19	0.00	0.00	0.00
5,100.00	29.27	284.42	4,598.35	509.66	-1,981.58	-104.69	0.00	0.00	0.00
5,200.00	29.27	284.42	4,685.58	521.83	-2,028.94	-107.19	0.00	0.00	0.00
5,240.61	29.27	284.42	4,721.00	526.78	-2,048.17	-108.21	0.00	0.00	0.00
Shannon Sandstone									
5,300.00	29.27	284.42	4,772.81	534.01	-2,076.29	-109.69	0.00	0.00	0.00
5,400.00	29.27	284.42	4,860.04	546.19	-2,123.65	-112.19	0.00	0.00	0.00
5,500.00	29.27	284.42	4,947.27	558.37	-2,171.00	-114.69	0.00	0.00	0.00
5,600.00	29.27	284.42	5,034.50	570.55	-2,218.36	-117.20	0.00	0.00	0.00
5,700.00	29.27	284.42	5,121.73	582.73	-2,265.71	-119.70	0.00	0.00	0.00
5,800.00	29.27	284.42	5,208.96	594.91	-2,313.07	-122.20	0.00	0.00	0.00
5,900.00	29.27	284.42	5,296.19	607.09	-2,360.42	-124.70	0.00	0.00	0.00
6,000.00	29.27	284.42	5,383.42	619.27	-2,407.78	-127.20	0.00	0.00	0.00
6,100.00	29.27	284.42	5,470.65	631.45	-2,455.13	-129.71	0.00	0.00	0.00
6,182.94	29.27	284.42	5,543.00	641.55	-2,494.41	-131.78	0.00	0.00	0.00
TeePee Buttes									
6,200.00	29.27	284.42	5,557.88	643.63	-2,502.49	-132.21	0.00	0.00	0.00
6,300.00	29.27	284.42	5,645.11	655.81	-2,549.84	-134.71	0.00	0.00	0.00
6,400.00	29.27	284.42	5,732.35	667.99	-2,597.20	-137.21	0.00	0.00	0.00
6,481.66	29.27	284.42	5,803.58	677.93	-2,635.87	-139.25	0.00	0.00	0.00
Start DLS 10.00 TFO -103.49									
6,500.00	28.89	280.73	5,819.61	679.88	-2,644.56	-139.42	10.00	-2.06	-20.13
6,550.00	28.40	270.34	5,863.51	682.20	-2,668.34	-136.96	10.00	-1.00	-20.78
6,600.00	28.70	259.89	5,907.46	680.16	-2,692.06	-130.24	10.00	0.60	-20.91
6,650.00	29.78	249.88	5,951.12	673.78	-2,715.55	-119.30	10.00	2.16	-20.01
6,700.00	31.55	240.70	5,994.15	663.10	-2,738.63	-104.24	10.00	3.55	-18.35
6,750.00	33.91	232.54	6,036.23	648.20	-2,761.13	-85.16	10.00	4.72	-16.32
6,800.00	36.75	225.41	6,077.03	629.21	-2,782.86	-62.22	10.00	5.67	-14.26
6,850.00	39.95	219.22	6,116.25	606.26	-2,803.68	-35.58	10.00	6.41	-12.38
6,900.00	43.44	213.84	6,153.59	579.52	-2,823.42	-5.45	10.00	6.98	-10.77
6,935.78	46.08	210.40	6,179.00	558.18	-2,836.79	18.13	10.00	7.37	-9.60
Sharon Springs									
6,950.00	47.16	209.12	6,188.77	549.21	-2,841.92	27.94	10.00	7.56	-9.00
6,991.31	50.36	205.64	6,216.00	521.63	-2,856.18	57.81	10.00	7.74	-8.42
Niobrara Top									
7,000.00	51.04	204.95	6,221.50	515.55	-2,859.05	64.34	10.00	7.89	-7.94
7,050.00	55.06	201.23	6,251.56	478.79	-2,874.69	103.47	10.00	8.03	-7.45
7,100.00	59.18	197.85	6,278.70	439.23	-2,888.70	145.03	10.00	8.24	-6.75
7,150.00	63.38	194.76	6,302.73	397.15	-2,900.98	188.71	10.00	8.40	-6.19
7,200.00	67.64	191.88	6,323.45	352.89	-2,911.44	234.17	10.00	8.53	-5.75
7,250.00	71.95	189.18	6,340.72	306.77	-2,920.00	281.08	10.00	8.62	-5.40
7,300.00	76.30	186.61	6,354.39	259.15	-2,926.60	329.06	10.00	8.69	-5.14
7,330.90	79.00	185.07	6,361.00	229.12	-2,929.67	359.10	10.00	8.74	-4.98

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well BASHOR FED 27-3-2HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 5021.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 5021.00usft
Site:	SEC 27-T9N-R60W	North Reference:	True
Well:	BASHOR FED 27-3-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
Niobrara B2 Chalk Top									
7,350.00	80.67	184.14	6,364.37	210.38	-2,931.17	377.76	10.00	8.76	-4.91
7,375.41	82.90	182.90	6,368.00	185.29	-2,932.72	402.66	10.00	8.77	-4.85
Niobrara B2 Chalk Target Top									
7,400.00	85.06	181.72	6,370.58	160.85	-2,933.70	426.80	10.00	8.78	-4.81
7,450.00	89.46	179.34	6,372.97	110.92	-2,934.16	475.81	10.00	8.79	-4.77
7,456.10	89.99	179.05	6,373.00	104.83	-2,934.07	481.77	10.00	8.80	-4.75
Niobrara B2 Chalk Target LP									
7,456.18	90.00	179.04	6,373.00	104.75	-2,934.07	481.85	10.00	8.80	-4.75
Start 13434.64 hold at 7456.18 MD									
7,500.00	90.00	179.04	6,373.00	60.93	-2,933.34	524.64	0.00	0.00	0.00
7,600.00	90.00	179.04	6,373.00	-39.05	-2,931.67	622.29	0.00	0.00	0.00
7,700.00	90.00	179.04	6,373.00	-139.04	-2,929.99	719.94	0.00	0.00	0.00
7,800.00	90.00	179.04	6,373.00	-239.03	-2,928.32	817.59	0.00	0.00	0.00
7,900.00	90.00	179.04	6,373.00	-339.01	-2,926.65	915.24	0.00	0.00	0.00
8,000.00	90.00	179.04	6,373.00	-439.00	-2,924.98	1,012.89	0.00	0.00	0.00
8,100.00	90.00	179.04	6,373.00	-538.98	-2,923.30	1,110.53	0.00	0.00	0.00
8,200.00	90.00	179.04	6,373.00	-638.97	-2,921.63	1,208.18	0.00	0.00	0.00
8,300.00	90.00	179.04	6,373.00	-738.96	-2,919.96	1,305.83	0.00	0.00	0.00
8,400.00	90.00	179.04	6,373.00	-838.94	-2,918.29	1,403.48	0.00	0.00	0.00
8,500.00	90.00	179.04	6,373.00	-938.93	-2,916.61	1,501.13	0.00	0.00	0.00
8,600.00	90.00	179.04	6,373.00	-1,038.91	-2,914.94	1,598.78	0.00	0.00	0.00
8,700.00	90.00	179.04	6,373.00	-1,138.90	-2,913.27	1,696.43	0.00	0.00	0.00
8,800.00	90.00	179.04	6,373.00	-1,238.89	-2,911.60	1,794.08	0.00	0.00	0.00
8,900.00	90.00	179.04	6,373.00	-1,338.87	-2,909.93	1,891.73	0.00	0.00	0.00
9,000.00	90.00	179.04	6,373.00	-1,438.86	-2,908.25	1,989.37	0.00	0.00	0.00
9,100.00	90.00	179.04	6,373.00	-1,538.84	-2,906.58	2,087.02	0.00	0.00	0.00
9,200.00	90.00	179.04	6,373.00	-1,638.83	-2,904.91	2,184.67	0.00	0.00	0.00
9,300.00	90.00	179.04	6,373.00	-1,738.82	-2,903.24	2,282.32	0.00	0.00	0.00
9,400.00	90.00	179.04	6,373.00	-1,838.80	-2,901.56	2,379.97	0.00	0.00	0.00
9,500.00	90.00	179.04	6,373.00	-1,938.79	-2,899.89	2,477.62	0.00	0.00	0.00
9,600.00	90.00	179.04	6,373.00	-2,038.77	-2,898.22	2,575.27	0.00	0.00	0.00
9,700.00	90.00	179.04	6,373.00	-2,138.76	-2,896.55	2,672.92	0.00	0.00	0.00
9,800.00	90.00	179.04	6,373.00	-2,238.75	-2,894.87	2,770.56	0.00	0.00	0.00
9,900.00	90.00	179.04	6,373.00	-2,338.73	-2,893.20	2,868.21	0.00	0.00	0.00
10,000.00	90.00	179.04	6,373.00	-2,438.72	-2,891.53	2,965.86	0.00	0.00	0.00
10,100.00	90.00	179.04	6,373.00	-2,538.70	-2,889.86	3,063.51	0.00	0.00	0.00
10,200.00	90.00	179.04	6,373.00	-2,638.69	-2,888.18	3,161.16	0.00	0.00	0.00
10,300.00	90.00	179.04	6,373.00	-2,738.68	-2,886.51	3,258.81	0.00	0.00	0.00
10,400.00	90.00	179.04	6,373.00	-2,838.66	-2,884.84	3,356.46	0.00	0.00	0.00
10,500.00	90.00	179.04	6,373.00	-2,938.65	-2,883.17	3,454.11	0.00	0.00	0.00
10,600.00	90.00	179.04	6,373.00	-3,038.63	-2,881.49	3,551.75	0.00	0.00	0.00
10,700.00	90.00	179.04	6,373.00	-3,138.62	-2,879.82	3,649.40	0.00	0.00	0.00
10,800.00	90.00	179.04	6,373.00	-3,238.61	-2,878.15	3,747.05	0.00	0.00	0.00
10,900.00	90.00	179.04	6,373.00	-3,338.59	-2,876.48	3,844.70	0.00	0.00	0.00
11,000.00	90.00	179.04	6,373.00	-3,438.58	-2,874.80	3,942.35	0.00	0.00	0.00
11,100.00	90.00	179.04	6,373.00	-3,538.56	-2,873.13	4,040.00	0.00	0.00	0.00
11,200.00	90.00	179.04	6,373.00	-3,638.55	-2,871.46	4,137.65	0.00	0.00	0.00
11,300.00	90.00	179.04	6,373.00	-3,738.54	-2,869.79	4,235.30	0.00	0.00	0.00
11,400.00	90.00	179.04	6,373.00	-3,838.52	-2,868.11	4,332.95	0.00	0.00	0.00
11,500.00	90.00	179.04	6,373.00	-3,938.51	-2,866.44	4,430.59	0.00	0.00	0.00
11,600.00	90.00	179.04	6,373.00	-4,038.50	-2,864.77	4,528.24	0.00	0.00	0.00
11,700.00	90.00	179.04	6,373.00	-4,138.48	-2,863.10	4,625.89	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well BASHOR FED 27-3-2HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 5021.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 5021.00usft
Site:	SEC 27-T9N-R60W	North Reference:	True
Well:	BASHOR FED 27-3-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,800.00	90.00	179.04	6,373.00	-4,238.47	-2,861.42	4,723.54	0.00	0.00	0.00
11,900.00	90.00	179.04	6,373.00	-4,338.45	-2,859.75	4,821.19	0.00	0.00	0.00
12,000.00	90.00	179.04	6,373.00	-4,438.44	-2,858.08	4,918.84	0.00	0.00	0.00
12,100.00	90.00	179.04	6,373.00	-4,538.43	-2,856.41	5,016.49	0.00	0.00	0.00
12,200.00	90.00	179.04	6,373.00	-4,638.41	-2,854.73	5,114.14	0.00	0.00	0.00
12,300.00	90.00	179.04	6,373.00	-4,738.40	-2,853.06	5,211.78	0.00	0.00	0.00
12,400.00	90.00	179.04	6,373.00	-4,838.38	-2,851.39	5,309.43	0.00	0.00	0.00
12,500.00	90.00	179.04	6,373.00	-4,938.37	-2,849.72	5,407.08	0.00	0.00	0.00
12,600.00	90.00	179.04	6,373.00	-5,038.36	-2,848.04	5,504.73	0.00	0.00	0.00
12,700.00	90.00	179.04	6,373.00	-5,138.34	-2,846.37	5,602.38	0.00	0.00	0.00
12,800.00	90.00	179.04	6,373.00	-5,238.33	-2,844.70	5,700.03	0.00	0.00	0.00
12,900.00	90.00	179.04	6,373.00	-5,338.31	-2,843.03	5,797.68	0.00	0.00	0.00
13,000.00	90.00	179.04	6,373.00	-5,438.30	-2,841.35	5,895.33	0.00	0.00	0.00
13,100.00	90.00	179.04	6,373.00	-5,538.29	-2,839.68	5,992.97	0.00	0.00	0.00
13,200.00	90.00	179.04	6,373.00	-5,638.27	-2,838.01	6,090.62	0.00	0.00	0.00
13,300.00	90.00	179.04	6,373.00	-5,738.26	-2,836.34	6,188.27	0.00	0.00	0.00
13,400.00	90.00	179.04	6,373.00	-5,838.24	-2,834.67	6,285.92	0.00	0.00	0.00
13,500.00	90.00	179.04	6,373.00	-5,938.23	-2,832.99	6,383.57	0.00	0.00	0.00
13,600.00	90.00	179.04	6,373.00	-6,038.22	-2,831.32	6,481.22	0.00	0.00	0.00
13,700.00	90.00	179.04	6,373.00	-6,138.20	-2,829.65	6,578.87	0.00	0.00	0.00
13,800.00	90.00	179.04	6,373.00	-6,238.19	-2,827.98	6,676.52	0.00	0.00	0.00
13,900.00	90.00	179.04	6,373.00	-6,338.17	-2,826.30	6,774.17	0.00	0.00	0.00
14,000.00	90.00	179.04	6,373.00	-6,438.16	-2,824.63	6,871.81	0.00	0.00	0.00
14,100.00	90.00	179.04	6,373.00	-6,538.15	-2,822.96	6,969.46	0.00	0.00	0.00
14,200.00	90.00	179.04	6,373.00	-6,638.13	-2,821.29	7,067.11	0.00	0.00	0.00
14,300.00	90.00	179.04	6,373.00	-6,738.12	-2,819.61	7,164.76	0.00	0.00	0.00
14,400.00	90.00	179.04	6,373.00	-6,838.10	-2,817.94	7,262.41	0.00	0.00	0.00
14,500.00	90.00	179.04	6,373.00	-6,938.09	-2,816.27	7,360.06	0.00	0.00	0.00
14,600.00	90.00	179.04	6,373.00	-7,038.08	-2,814.60	7,457.71	0.00	0.00	0.00
14,700.00	90.00	179.04	6,373.00	-7,138.06	-2,812.92	7,555.36	0.00	0.00	0.00
14,800.00	90.00	179.04	6,373.00	-7,238.05	-2,811.25	7,653.00	0.00	0.00	0.00
14,900.00	90.00	179.04	6,373.00	-7,338.03	-2,809.58	7,750.65	0.00	0.00	0.00
15,000.00	90.00	179.04	6,373.00	-7,438.02	-2,807.91	7,848.30	0.00	0.00	0.00
15,100.00	90.00	179.04	6,373.00	-7,538.01	-2,806.23	7,945.95	0.00	0.00	0.00
15,200.00	90.00	179.04	6,373.00	-7,637.99	-2,804.56	8,043.60	0.00	0.00	0.00
15,300.00	90.00	179.04	6,373.00	-7,737.98	-2,802.89	8,141.25	0.00	0.00	0.00
15,400.00	90.00	179.04	6,373.00	-7,837.96	-2,801.22	8,238.90	0.00	0.00	0.00
15,500.00	90.00	179.04	6,373.00	-7,937.95	-2,799.54	8,336.55	0.00	0.00	0.00
15,600.00	90.00	179.04	6,373.00	-8,037.94	-2,797.87	8,434.19	0.00	0.00	0.00
15,700.00	90.00	179.04	6,373.00	-8,137.92	-2,796.20	8,531.84	0.00	0.00	0.00
15,800.00	90.00	179.04	6,373.00	-8,237.91	-2,794.53	8,629.49	0.00	0.00	0.00
15,900.00	90.00	179.04	6,373.00	-8,337.89	-2,792.85	8,727.14	0.00	0.00	0.00
16,000.00	90.00	179.04	6,373.00	-8,437.88	-2,791.18	8,824.79	0.00	0.00	0.00
16,100.00	90.00	179.04	6,373.00	-8,537.87	-2,789.51	8,922.44	0.00	0.00	0.00
16,200.00	90.00	179.04	6,373.00	-8,637.85	-2,787.84	9,020.09	0.00	0.00	0.00
16,300.00	90.00	179.04	6,373.00	-8,737.84	-2,786.16	9,117.74	0.00	0.00	0.00
16,400.00	90.00	179.04	6,373.00	-8,837.82	-2,784.49	9,215.38	0.00	0.00	0.00
16,500.00	90.00	179.04	6,373.00	-8,937.81	-2,782.82	9,313.03	0.00	0.00	0.00
16,600.00	90.00	179.04	6,373.00	-9,037.80	-2,781.15	9,410.68	0.00	0.00	0.00
16,700.00	90.00	179.04	6,373.00	-9,137.78	-2,779.47	9,508.33	0.00	0.00	0.00
16,800.00	90.00	179.04	6,373.00	-9,237.77	-2,777.80	9,605.98	0.00	0.00	0.00
16,900.00	90.00	179.04	6,373.00	-9,337.75	-2,776.13	9,703.63	0.00	0.00	0.00
17,000.00	90.00	179.04	6,373.00	-9,437.74	-2,774.46	9,801.28	0.00	0.00	0.00
17,100.00	90.00	179.04	6,373.00	-9,537.73	-2,772.78	9,898.93	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well BASHOR FED 27-3-2HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 5021.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 5021.00usft
Site:	SEC 27-T9N-R60W	North Reference:	True
Well:	BASHOR FED 27-3-2HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
17,200.00	90.00	179.04	6,373.00	-9,637.71	-2,771.11	9,996.58	0.00	0.00	0.00	
17,300.00	90.00	179.04	6,373.00	-9,737.70	-2,769.44	10,094.22	0.00	0.00	0.00	
17,400.00	90.00	179.04	6,373.00	-9,837.68	-2,767.77	10,191.87	0.00	0.00	0.00	
17,500.00	90.00	179.04	6,373.00	-9,937.67	-2,766.09	10,289.52	0.00	0.00	0.00	
17,600.00	90.00	179.04	6,373.00	-10,037.66	-2,764.42	10,387.17	0.00	0.00	0.00	
17,700.00	90.00	179.04	6,373.00	-10,137.64	-2,762.75	10,484.82	0.00	0.00	0.00	
17,800.00	90.00	179.04	6,373.00	-10,237.63	-2,761.08	10,582.47	0.00	0.00	0.00	
20,890.81	90.00	179.04	6,373.00	-13,328.01	-2,709.39	13,600.61	0.00	0.00	0.00	
TD at 20890.81										

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BASHOR FED 27-3-2HN - plan hits target center - Point	0.00	0.00	6,373.00	-13,328.01	-2,709.39	1,497,530.74	3,392,584.07	40.690512°N	104.084288°W
BASHOR FED 27-3-2HN - plan hits target center - Point	0.00	0.00	6,373.00	104.75	-2,934.07	1,510,958.15	3,392,143.49	40.727382°N	104.085104°W

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
611.41	610.00	Base Fox Hills				
1,598.94	1,544.00	Pierre Shale Top				
3,761.77	3,431.00	Richard Sandstone				
3,887.87	3,541.00	Parkman Sandstone				
4,675.44	4,228.00	Sussex Sandstone				
5,240.61	4,721.00	Shannon Sandstone				
6,182.94	5,543.00	TeePee Buttes				
6,935.78	6,179.00	Sharon Springs				
6,991.31	6,216.00	Niobrara Top				
7,330.90	6,361.00	Niobrara B2 Chalk Top				
7,375.41	6,368.00	Niobrara B2 Chalk Target Top				
7,456.10	6,373.00	Niobrara B2 Chalk Target LP				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
200.00	200.00	0.00	0.00	Start Build 2.00	
1,663.61	1,600.77	91.12	-354.29	Start 4818.04 hold at 1663.61 MD	
6,481.66	5,803.58	677.93	-2,635.87	Start DLS 10.00 TFO -103.49	
7,456.18	6,373.00	104.75	-2,934.07	Start 13434.64 hold at 7456.18 MD	
20,890.81	6,373.00	-13,328.01	-2,709.39	TD at 20890.81	