

MALLARD EXPLORATION

WELD COUNTY

SEC 30-T8N-R60W

GADWALL FED 30-31-6HN

OWB

Plan: PROPOSAL 1

Standard Planning Report

19 May, 2022



Project: WELD COUNTY
Site: SEC 30-T8N-R60W
Well: GADWALL FED 30-31-6HN
Wellbore: OWB
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: 7.44°
Magnetic Field
Strength: 52043.8nT
Dip Angle: 66.89°
Date: 5/16/2022
Model: IGRF2020

WELL DETAILS: GADWALL FED 30-31-6HN

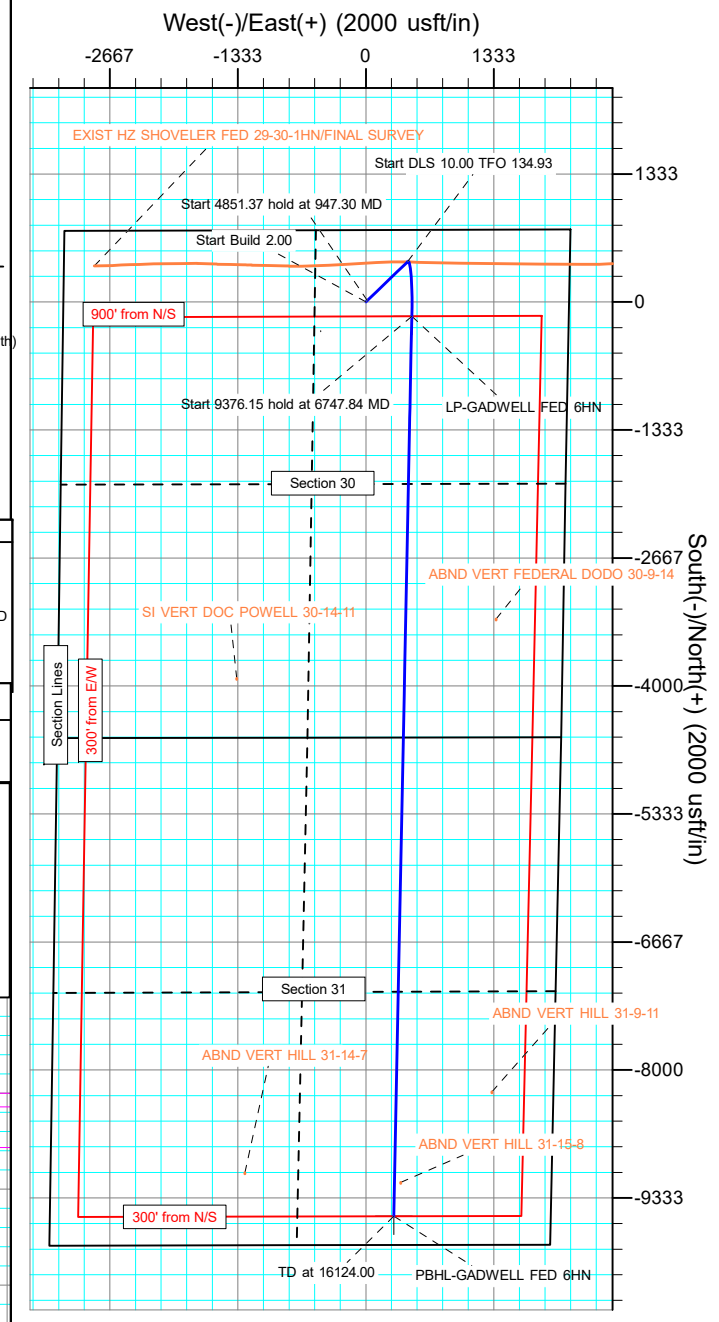
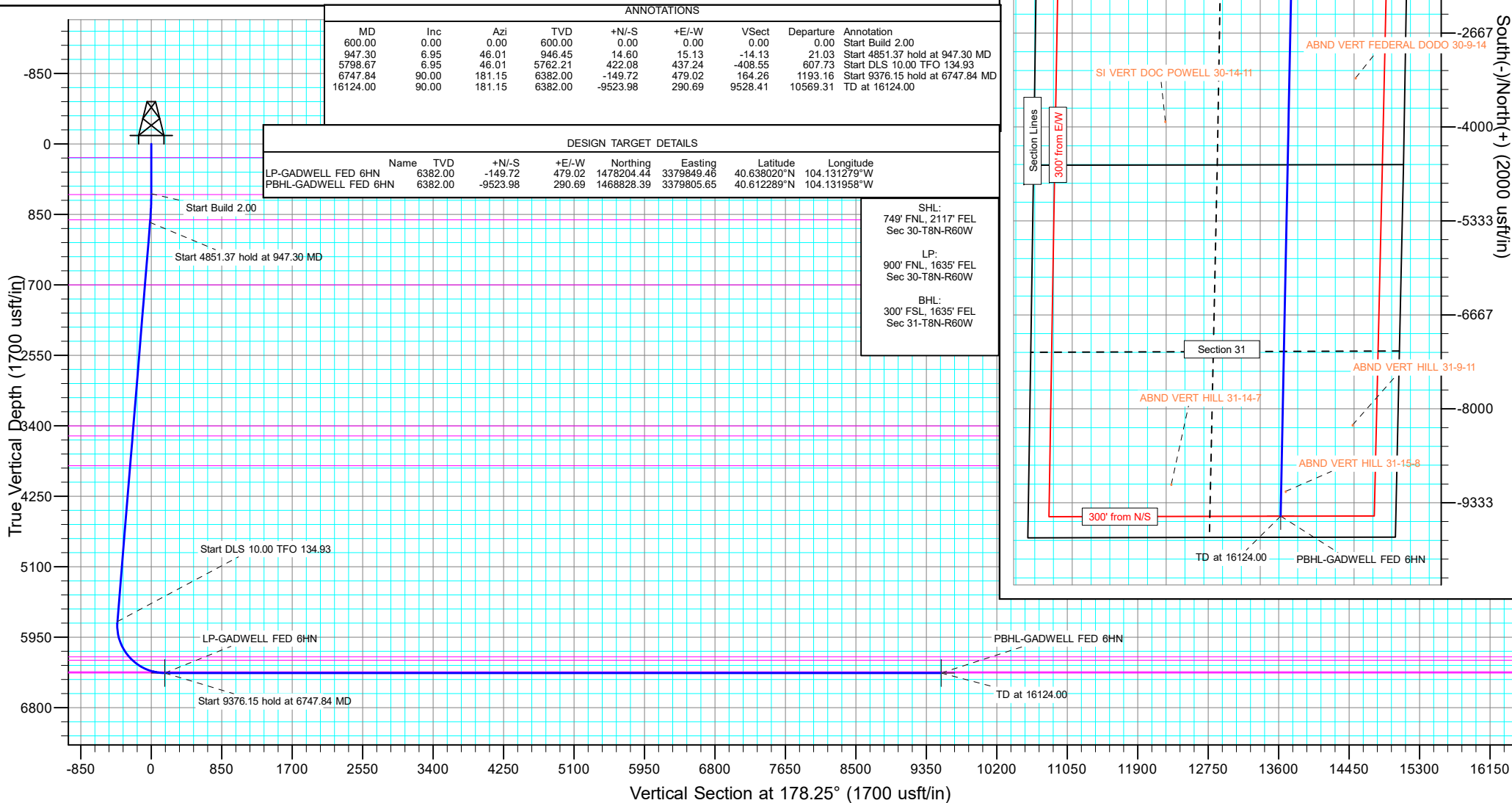
+N/-S	+E/-W	Northing	Easting	4950.00	Latitude	Longitude	Slot
0.00	0.00	1478346.76	3379368.19		40.638431°N	104.133005°W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	
3	947.30	6.95	46.01	946.45	14.60	15.13	2.00	46.01	-14.14	
4	5798.67	6.95	46.01	5762.21	422.08	437.24	0.00	0.00	-408.55	
5	6747.84	90.00	181.15	6382.00	-149.72	479.02	10.00	134.93	164.26	LP-GADWELL FED 6HN
6	16124.00	90.00	181.15	6382.00	-9523.98	290.69	0.00	0.00	9528.41	PBHL-GADWELL FED 6HN

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
165.00	165.00	*Laramie Base
610.00	610.00	*Laramie Fox Hills Base
915.00	915.64	*Pierre Shale Base
1700.00	1706.42	*Upper Pierre Shale Base (SFC min depth)
3402.00	3421.01	Richard Sandstone
3522.00	3541.89	Parkman Sandstone
3882.00	3904.56	Parkman Sandstone Base
6187.00	6259.63	Sharon Springs
6227.00	6315.43	Niobrara Top
6367.00	6616.21	Niobrara B2 Chalk Top
6377.00	6671.95	Niobrara B2 Chalk Target Top
6382.00	6747.84	Niobrara B2 Chalk Landing Point



Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4977.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4977.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
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 30-T8N-R60W				
Site Position:		Northing:	1,479,134.50	usft	Latitude:	40.640503°N
From:	Lat/Long	Easting:	3,381,487.66	usft	Longitude:	104.125325°W
Position Uncertainty:		0.00	usft	Slot Radius:	13.200	in

Well		GADWALL FED 30-31-6HN				
Well Position	+N/-S	0.00 usft	Northing:	1,478,346.76 usft	Latitude:	40.638431°N
	+E/-W	0.00 usft	Easting:	3,379,368.18 usft	Longitude:	104.133005°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,950.00 usft
Grid Convergence:		0.88 °				

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	5/16/2022	7.44	66.89	52,043.75961940

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	178.25	

Plan Survey Tool Program	Date	5/19/2022			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	16,124.00	PROPOSAL 1 (OWB)	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	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
947.30	6.95	46.01	946.45	14.60	15.13	2.00	2.00	0.00	46.01	
5,798.67	6.95	46.01	5,762.21	422.08	437.24	0.00	0.00	0.00	0.00	
6,747.84	90.00	181.15	6,382.00	-149.72	479.02	10.00	8.75	14.24	134.93	LP-GADWELL FED 6
16,124.00	90.00	181.15	6,382.00	-9,523.98	290.69	0.00	0.00	0.00	0.00	PBHL-GADWELL FEI

Planning Report

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Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4977.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4977.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
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
165.00	0.00	0.00	165.00	0.00	0.00	0.00	0.00	0.00	0.00
*Laramie Base									
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
610.00	0.20	46.01	610.00	0.01	0.01	-0.01	2.00	2.00	0.00
*Laramie Fox Hills Base									
700.00	2.00	46.01	699.98	1.21	1.26	-1.17	2.00	2.00	0.00
800.00	4.00	46.01	799.84	4.85	5.02	-4.69	2.00	2.00	0.00
900.00	6.00	46.01	899.45	10.90	11.29	-10.55	2.00	2.00	0.00
915.64	6.31	46.01	915.00	12.06	12.50	-11.68	2.00	2.00	0.00
*Pierre Shale Base									
947.30	6.95	46.01	946.45	14.60	15.13	-14.13	2.00	2.00	0.00
Start 4851.37 hold at 947.30 MD									
1,000.00	6.95	46.01	998.76	19.03	19.71	-18.42	0.00	0.00	0.00
1,100.00	6.95	46.01	1,098.03	27.43	28.41	-26.55	0.00	0.00	0.00
1,200.00	6.95	46.01	1,197.30	35.83	37.11	-34.68	0.00	0.00	0.00
1,300.00	6.95	46.01	1,296.56	44.23	45.82	-42.81	0.00	0.00	0.00
1,400.00	6.95	46.01	1,395.83	52.63	54.52	-50.94	0.00	0.00	0.00
1,500.00	6.95	46.01	1,495.09	61.03	63.22	-59.07	0.00	0.00	0.00
1,600.00	6.95	46.01	1,594.36	69.43	71.92	-67.20	0.00	0.00	0.00
1,700.00	6.95	46.01	1,693.63	77.82	80.62	-75.33	0.00	0.00	0.00
1,706.42	6.95	46.01	1,700.00	78.36	81.18	-75.85	0.00	0.00	0.00
*Upper Pierre Shale Base (SFC min depth)									
1,800.00	6.95	46.01	1,792.89	86.22	89.32	-83.46	0.00	0.00	0.00
1,900.00	6.95	46.01	1,892.16	94.62	98.02	-91.59	0.00	0.00	0.00
2,000.00	6.95	46.01	1,991.42	103.02	106.72	-99.72	0.00	0.00	0.00
2,100.00	6.95	46.01	2,090.69	111.42	115.42	-107.85	0.00	0.00	0.00
2,200.00	6.95	46.01	2,189.96	119.82	124.12	-115.98	0.00	0.00	0.00
2,300.00	6.95	46.01	2,289.22	128.22	132.82	-124.11	0.00	0.00	0.00
2,400.00	6.95	46.01	2,388.49	136.62	141.52	-132.24	0.00	0.00	0.00
2,500.00	6.95	46.01	2,487.75	145.02	150.23	-140.37	0.00	0.00	0.00
2,600.00	6.95	46.01	2,587.02	153.42	158.93	-148.50	0.00	0.00	0.00
2,700.00	6.95	46.01	2,686.29	161.82	167.63	-156.63	0.00	0.00	0.00
2,800.00	6.95	46.01	2,785.55	170.22	176.33	-164.76	0.00	0.00	0.00
2,900.00	6.95	46.01	2,884.82	178.62	185.03	-172.89	0.00	0.00	0.00
3,000.00	6.95	46.01	2,984.08	187.02	193.73	-181.02	0.00	0.00	0.00
3,100.00	6.95	46.01	3,083.35	195.41	202.43	-189.15	0.00	0.00	0.00
3,200.00	6.95	46.01	3,182.62	203.81	211.13	-197.28	0.00	0.00	0.00
3,300.00	6.95	46.01	3,281.88	212.21	219.83	-205.41	0.00	0.00	0.00
3,400.00	6.95	46.01	3,381.15	220.61	228.53	-213.54	0.00	0.00	0.00
3,421.01	6.95	46.01	3,402.00	222.38	230.36	-215.25	0.00	0.00	0.00
Richard Sandstone									
3,500.00	6.95	46.01	3,480.41	229.01	237.23	-221.67	0.00	0.00	0.00
3,541.89	6.95	46.01	3,522.00	232.53	240.88	-225.07	0.00	0.00	0.00
Parkman Sandstone									
3,600.00	6.95	46.01	3,579.68	237.41	245.93	-229.80	0.00	0.00	0.00
3,700.00	6.95	46.01	3,678.95	245.81	254.64	-237.93	0.00	0.00	0.00
3,800.00	6.95	46.01	3,778.21	254.21	263.34	-246.06	0.00	0.00	0.00
3,900.00	6.95	46.01	3,877.48	262.61	272.04	-254.19	0.00	0.00	0.00
3,904.56	6.95	46.01	3,882.00	262.99	272.43	-254.56	0.00	0.00	0.00
Parkman Sandstone Base									
4,000.00	6.95	46.01	3,976.74	271.01	280.74	-262.32	0.00	0.00	0.00

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Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4977.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4977.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
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)
4,100.00	6.95	46.01	4,076.01	279.41	289.44	-270.45	0.00	0.00	0.00
4,200.00	6.95	46.01	4,175.28	287.81	298.14	-278.58	0.00	0.00	0.00
4,300.00	6.95	46.01	4,274.54	296.21	306.84	-286.71	0.00	0.00	0.00
4,400.00	6.95	46.01	4,373.81	304.61	315.54	-294.84	0.00	0.00	0.00
4,500.00	6.95	46.01	4,473.07	313.00	324.24	-302.97	0.00	0.00	0.00
4,600.00	6.95	46.01	4,572.34	321.40	332.94	-311.10	0.00	0.00	0.00
4,700.00	6.95	46.01	4,671.61	329.80	341.64	-319.23	0.00	0.00	0.00
4,800.00	6.95	46.01	4,770.87	338.20	350.34	-327.36	0.00	0.00	0.00
4,900.00	6.95	46.01	4,870.14	346.60	359.05	-335.49	0.00	0.00	0.00
5,000.00	6.95	46.01	4,969.40	355.00	367.75	-343.62	0.00	0.00	0.00
5,100.00	6.95	46.01	5,068.67	363.40	376.45	-351.75	0.00	0.00	0.00
5,200.00	6.95	46.01	5,167.94	371.80	385.15	-359.88	0.00	0.00	0.00
5,300.00	6.95	46.01	5,267.20	380.20	393.85	-368.01	0.00	0.00	0.00
5,400.00	6.95	46.01	5,366.47	388.60	402.55	-376.14	0.00	0.00	0.00
5,500.00	6.95	46.01	5,465.74	397.00	411.25	-384.27	0.00	0.00	0.00
5,600.00	6.95	46.01	5,565.00	405.40	419.95	-392.40	0.00	0.00	0.00
5,700.00	6.95	46.01	5,664.27	413.80	428.65	-400.53	0.00	0.00	0.00
5,798.67	6.95	46.01	5,762.21	422.08	437.24	-408.55	0.00	0.00	0.00
Start DLS 10.00 TFO 134.93									
5,800.00	6.85	46.80	5,763.53	422.19	437.35	-408.66	10.00	-7.01	59.34
5,900.00	7.16	137.98	5,863.04	421.65	445.89	-407.85	10.00	0.31	91.18
6,000.00	15.97	163.68	5,960.97	403.77	453.95	-389.73	10.00	8.81	25.69
6,100.00	25.66	170.85	6,054.34	369.10	461.28	-354.86	10.00	9.69	7.17
6,200.00	35.51	174.23	6,140.33	318.70	467.66	-304.29	10.00	9.85	3.39
6,259.63	41.42	175.56	6,187.00	281.77	470.93	-267.28	10.00	9.90	2.22
Sharon Springs									
6,300.00	45.42	176.29	6,216.32	254.10	472.89	-239.56	10.00	9.92	1.82
6,315.43	46.96	176.55	6,227.00	242.99	473.59	-228.43	10.00	9.93	1.64
Niobrara Top									
6,400.00	55.36	177.75	6,279.99	177.26	476.82	-162.63	10.00	9.94	1.42
6,500.00	65.31	178.89	6,329.42	90.51	479.33	-75.85	10.00	9.95	1.14
6,600.00	75.27	179.86	6,363.10	-3.51	480.33	18.16	10.00	9.96	0.97
6,616.21	76.89	180.00	6,367.00	-19.24	480.35	33.88	10.00	9.96	0.91
Niobrara B2 Chalk Top									
6,671.95	82.44	180.50	6,377.00	-74.06	480.11	88.67	10.00	9.96	0.89
Niobrara B2 Chalk Target Top									
6,700.00	85.23	180.74	6,380.01	-101.94	479.81	116.53	10.00	9.96	0.87
6,747.84	90.00	181.15	6,382.00	-149.72	479.02	164.26	10.00	9.96	0.86
Start 9376.15 hold at 6747.84 MD - Niobrara B2 Chalk Landing Point									
6,800.00	90.00	181.15	6,382.00	-201.86	477.97	216.35	0.00	0.00	0.00
6,900.00	90.00	181.15	6,382.00	-301.84	475.96	316.22	0.00	0.00	0.00
7,000.00	90.00	181.15	6,382.00	-401.82	473.96	416.09	0.00	0.00	0.00
7,100.00	90.00	181.15	6,382.00	-501.80	471.95	515.97	0.00	0.00	0.00
7,200.00	90.00	181.15	6,382.00	-601.78	469.94	615.84	0.00	0.00	0.00
7,300.00	90.00	181.15	6,382.00	-701.76	467.93	715.71	0.00	0.00	0.00
7,400.00	90.00	181.15	6,382.00	-801.74	465.92	815.58	0.00	0.00	0.00
7,500.00	90.00	181.15	6,382.00	-901.72	463.91	915.45	0.00	0.00	0.00
7,600.00	90.00	181.15	6,382.00	-1,001.70	461.90	1,015.33	0.00	0.00	0.00
7,700.00	90.00	181.15	6,382.00	-1,101.68	459.90	1,115.20	0.00	0.00	0.00
7,800.00	90.00	181.15	6,382.00	-1,201.66	457.89	1,215.07	0.00	0.00	0.00
7,900.00	90.00	181.15	6,382.00	-1,301.64	455.88	1,314.94	0.00	0.00	0.00
8,000.00	90.00	181.15	6,382.00	-1,401.62	453.87	1,414.81	0.00	0.00	0.00
8,100.00	90.00	181.15	6,382.00	-1,501.60	451.86	1,514.69	0.00	0.00	0.00

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Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4977.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4977.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
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)	
8,200.00	90.00	181.15	6,382.00	-1,601.58	449.85	1,614.56	0.00	0.00	0.00	
8,300.00	90.00	181.15	6,382.00	-1,701.56	447.84	1,714.43	0.00	0.00	0.00	
8,400.00	90.00	181.15	6,382.00	-1,801.54	445.84	1,814.30	0.00	0.00	0.00	
8,500.00	90.00	181.15	6,382.00	-1,901.52	443.83	1,914.18	0.00	0.00	0.00	
8,600.00	90.00	181.15	6,382.00	-2,001.50	441.82	2,014.05	0.00	0.00	0.00	
8,700.00	90.00	181.15	6,382.00	-2,101.48	439.81	2,113.92	0.00	0.00	0.00	
8,800.00	90.00	181.15	6,382.00	-2,201.46	437.80	2,213.79	0.00	0.00	0.00	
8,900.00	90.00	181.15	6,382.00	-2,301.44	435.79	2,313.66	0.00	0.00	0.00	
9,000.00	90.00	181.15	6,382.00	-2,401.42	433.78	2,413.54	0.00	0.00	0.00	
9,100.00	90.00	181.15	6,382.00	-2,501.40	431.77	2,513.41	0.00	0.00	0.00	
9,200.00	90.00	181.15	6,382.00	-2,601.38	429.77	2,613.28	0.00	0.00	0.00	
9,300.00	90.00	181.15	6,382.00	-2,701.36	427.76	2,713.15	0.00	0.00	0.00	
9,400.00	90.00	181.15	6,382.00	-2,801.34	425.75	2,813.02	0.00	0.00	0.00	
9,500.00	90.00	181.15	6,382.00	-2,901.32	423.74	2,912.90	0.00	0.00	0.00	
9,600.00	90.00	181.15	6,382.00	-3,001.30	421.73	3,012.77	0.00	0.00	0.00	
9,700.00	90.00	181.15	6,382.00	-3,101.28	419.72	3,112.64	0.00	0.00	0.00	
9,800.00	90.00	181.15	6,382.00	-3,201.26	417.71	3,212.51	0.00	0.00	0.00	
9,900.00	90.00	181.15	6,382.00	-3,301.24	415.71	3,312.38	0.00	0.00	0.00	
10,000.00	90.00	181.15	6,382.00	-3,401.22	413.70	3,412.26	0.00	0.00	0.00	
10,100.00	90.00	181.15	6,382.00	-3,501.20	411.69	3,512.13	0.00	0.00	0.00	
10,200.00	90.00	181.15	6,382.00	-3,601.18	409.68	3,612.00	0.00	0.00	0.00	
10,300.00	90.00	181.15	6,382.00	-3,701.16	407.67	3,711.87	0.00	0.00	0.00	
10,400.00	90.00	181.15	6,382.00	-3,801.14	405.66	3,811.74	0.00	0.00	0.00	
10,500.00	90.00	181.15	6,382.00	-3,901.12	403.65	3,911.62	0.00	0.00	0.00	
10,600.00	90.00	181.15	6,382.00	-4,001.10	401.64	4,011.49	0.00	0.00	0.00	
10,700.00	90.00	181.15	6,382.00	-4,101.08	399.64	4,111.36	0.00	0.00	0.00	
10,800.00	90.00	181.15	6,382.00	-4,201.06	397.63	4,211.23	0.00	0.00	0.00	
10,900.00	90.00	181.15	6,382.00	-4,301.04	395.62	4,311.10	0.00	0.00	0.00	
11,000.00	90.00	181.15	6,382.00	-4,401.02	393.61	4,410.98	0.00	0.00	0.00	
11,100.00	90.00	181.15	6,382.00	-4,501.00	391.60	4,510.85	0.00	0.00	0.00	
11,200.00	90.00	181.15	6,382.00	-4,600.98	389.59	4,610.72	0.00	0.00	0.00	
11,300.00	90.00	181.15	6,382.00	-4,700.96	387.58	4,710.59	0.00	0.00	0.00	
11,400.00	90.00	181.15	6,382.00	-4,800.94	385.58	4,810.46	0.00	0.00	0.00	
11,500.00	90.00	181.15	6,382.00	-4,900.92	383.57	4,910.34	0.00	0.00	0.00	
11,600.00	90.00	181.15	6,382.00	-5,000.90	381.56	5,010.21	0.00	0.00	0.00	
11,700.00	90.00	181.15	6,382.00	-5,100.88	379.55	5,110.08	0.00	0.00	0.00	
11,800.00	90.00	181.15	6,382.00	-5,200.86	377.54	5,209.95	0.00	0.00	0.00	
11,900.00	90.00	181.15	6,382.00	-5,300.84	375.53	5,309.82	0.00	0.00	0.00	
12,000.00	90.00	181.15	6,382.00	-5,400.82	373.52	5,409.70	0.00	0.00	0.00	
12,100.00	90.00	181.15	6,382.00	-5,500.80	371.52	5,509.57	0.00	0.00	0.00	
12,200.00	90.00	181.15	6,382.00	-5,600.78	369.51	5,609.44	0.00	0.00	0.00	
12,300.00	90.00	181.15	6,382.00	-5,700.76	367.50	5,709.31	0.00	0.00	0.00	
12,400.00	90.00	181.15	6,382.00	-5,800.73	365.49	5,809.18	0.00	0.00	0.00	
12,500.00	90.00	181.15	6,382.00	-5,900.71	363.48	5,909.06	0.00	0.00	0.00	
12,600.00	90.00	181.15	6,382.00	-6,000.69	361.47	6,008.93	0.00	0.00	0.00	
12,700.00	90.00	181.15	6,382.00	-6,100.67	359.46	6,108.80	0.00	0.00	0.00	
12,800.00	90.00	181.15	6,382.00	-6,200.65	357.45	6,208.67	0.00	0.00	0.00	
12,900.00	90.00	181.15	6,382.00	-6,300.63	355.45	6,308.54	0.00	0.00	0.00	
13,000.00	90.00	181.15	6,382.00	-6,400.61	353.44	6,408.42	0.00	0.00	0.00	
13,100.00	90.00	181.15	6,382.00	-6,500.59	351.43	6,508.29	0.00	0.00	0.00	
13,200.00	90.00	181.15	6,382.00	-6,600.57	349.42	6,608.16	0.00	0.00	0.00	
13,300.00	90.00	181.15	6,382.00	-6,700.55	347.41	6,708.03	0.00	0.00	0.00	
13,400.00	90.00	181.15	6,382.00	-6,800.53	345.40	6,807.90	0.00	0.00	0.00	
13,500.00	90.00	181.15	6,382.00	-6,900.51	343.39	6,907.78	0.00	0.00	0.00	

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4977.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4977.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
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)	
13,600.00	90.00	181.15	6,382.00	-7,000.49	341.39	7,007.65	0.00	0.00	0.00	
13,700.00	90.00	181.15	6,382.00	-7,100.47	339.38	7,107.52	0.00	0.00	0.00	
13,800.00	90.00	181.15	6,382.00	-7,200.45	337.37	7,207.39	0.00	0.00	0.00	
13,900.00	90.00	181.15	6,382.00	-7,300.43	335.36	7,307.26	0.00	0.00	0.00	
14,000.00	90.00	181.15	6,382.00	-7,400.41	333.35	7,407.14	0.00	0.00	0.00	
14,100.00	90.00	181.15	6,382.00	-7,500.39	331.34	7,507.01	0.00	0.00	0.00	
14,200.00	90.00	181.15	6,382.00	-7,600.37	329.33	7,606.88	0.00	0.00	0.00	
14,300.00	90.00	181.15	6,382.00	-7,700.35	327.32	7,706.75	0.00	0.00	0.00	
14,400.00	90.00	181.15	6,382.00	-7,800.33	325.32	7,806.62	0.00	0.00	0.00	
14,500.00	90.00	181.15	6,382.00	-7,900.31	323.31	7,906.50	0.00	0.00	0.00	
14,600.00	90.00	181.15	6,382.00	-8,000.29	321.30	8,006.37	0.00	0.00	0.00	
14,700.00	90.00	181.15	6,382.00	-8,100.27	319.29	8,106.24	0.00	0.00	0.00	
14,800.00	90.00	181.15	6,382.00	-8,200.25	317.28	8,206.11	0.00	0.00	0.00	
14,900.00	90.00	181.15	6,382.00	-8,300.23	315.27	8,305.99	0.00	0.00	0.00	
15,000.00	90.00	181.15	6,382.00	-8,400.21	313.26	8,405.86	0.00	0.00	0.00	
15,100.00	90.00	181.15	6,382.00	-8,500.19	311.26	8,505.73	0.00	0.00	0.00	
15,200.00	90.00	181.15	6,382.00	-8,600.17	309.25	8,605.60	0.00	0.00	0.00	
15,300.00	90.00	181.15	6,382.00	-8,700.15	307.24	8,705.47	0.00	0.00	0.00	
15,400.00	90.00	181.15	6,382.00	-8,800.13	305.23	8,805.35	0.00	0.00	0.00	
15,500.00	90.00	181.15	6,382.00	-8,900.11	303.22	8,905.22	0.00	0.00	0.00	
15,600.00	90.00	181.15	6,382.00	-9,000.09	301.21	9,005.09	0.00	0.00	0.00	
15,700.00	90.00	181.15	6,382.00	-9,100.07	299.20	9,104.96	0.00	0.00	0.00	
15,800.00	90.00	181.15	6,382.00	-9,200.05	297.20	9,204.83	0.00	0.00	0.00	
15,900.00	90.00	181.15	6,382.00	-9,300.03	295.19	9,304.71	0.00	0.00	0.00	
16,000.00	90.00	181.15	6,382.00	-9,400.01	293.18	9,404.58	0.00	0.00	0.00	
16,100.00	90.00	181.15	6,382.00	-9,499.99	291.17	9,504.45	0.00	0.00	0.00	
16,124.00	90.00	181.15	6,382.00	-9,523.98	290.69	9,528.41	0.00	0.00	0.00	
TD at 16124.00										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
LP-GADWELL FED 6HN	0.00	0.00	6,382.00	-149.72	479.02	1,478,204.45	3,379,849.45	40.638020°N	104.131279°W
- plan hits target center									
- Point									
PBHL-GADWELL FED 6	0.00	0.00	6,382.00	-9,523.98	290.69	1,468,828.40	3,379,805.65	40.612289°N	104.131958°W
- plan hits target center									
- Point									

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-6HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 27' @ 4977.00usft
Project:	WELD COUNTY	MD Reference:	KB 27' @ 4977.00usft
Site:	SEC 30-T8N-R60W	North Reference:	True
Well:	GADWALL FED 30-31-6HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PROPOSAL 1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
165.00	165.00	*Laramie Base				
610.00	610.00	*Laramie Fox Hills Base				
915.64	915.00	*Pierre Shale Base				
1,706.42	1,700.00	*Upper Pierre Shale Base (SFC min dep:				
3,421.01	3,402.00	Richard Sandstone				
3,541.89	3,522.00	Parkman Sandstone				
3,904.56	3,882.00	Parkman Sandstone Base				
6,259.63	6,187.00	Sharon Springs				
6,315.43	6,227.00	Niobrara Top				
6,616.21	6,367.00	Niobrara B2 Chalk Top				
6,671.95	6,377.00	Niobrara B2 Chalk Target Top				
6,747.84	6,382.00	Niobrara B2 Chalk Landing Point				

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
600.00	600.00	0.00	0.00	Start Build 2.00
947.30	946.45	14.60	15.13	Start 4851.37 hold at 947.30 MD
5,798.67	5,762.21	422.08	437.24	Start DLS 10.00 TFO 134.93
6,747.84	6,382.00	-149.72	479.02	Start 9376.15 hold at 6747.84 MD
16,124.00	6,382.00	-9,523.98	290.69	TD at 16124.00