

MALLARD EXPLORATION

WELD COUNTY

SEC 30-T8N-R60W

GADWALL FED 30-31-5HN

OWB

Plan: PROPOSAL 1

Standard Planning Report

19 May, 2022



Project: WELD COUNTY
Site: SEC 30-T8N-R60W
Well: GADWALL FED 30-31-5HN
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 30-31-5HN

+N/-S	+E/-W	Northing	Easting	4950.00	Latitude	Longitude	Slot
0.00	0.00	1478346.74	3379343.21		40.638432°N	104.133095°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	900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	
3	1160.80	5.22	342.57	1160.44	11.32	-3.55	2.00	342.57	-11.18	
4	5854.73	5.22	342.57	5834.94	418.44	-131.41	0.00	0.00	-413.35	
5	6804.16	90.00	181.15	6457.00	-151.90	-160.97	10.00	-161.34	157.70	LP-GADWELL FED 5HN
6	16179.58	90.00	181.15	6457.00	-9525.43	-349.27	0.00	0.00	9531.83	PBHL-GADWELL FED 5HN

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
165.00	165.00	*Laramie Base
610.00	610.00	*Laramie Fox Hills Base
915.00	915.00	*Pierre Shale Base
1700.00	1702.60	*Upper Pierre Shale Base (SFC min depth)
3402.00	3411.68	Richard Sandstone
3522.00	3532.18	Parkman Sandstone
3882.00	3893.68	Parkman Sandstone Base
6187.00	6223.25	Sharon Springs
6227.00	6271.72	Niobrara Top
6367.00	6478.59	Niobrara B2 Chalk Top
6427.00	6617.89	Niobrara C Chalk Top
6452.00	6728.40	Niobrara C Chalk Target Top
6457.00	6804.16	Niobrara C Chalk Landing Point

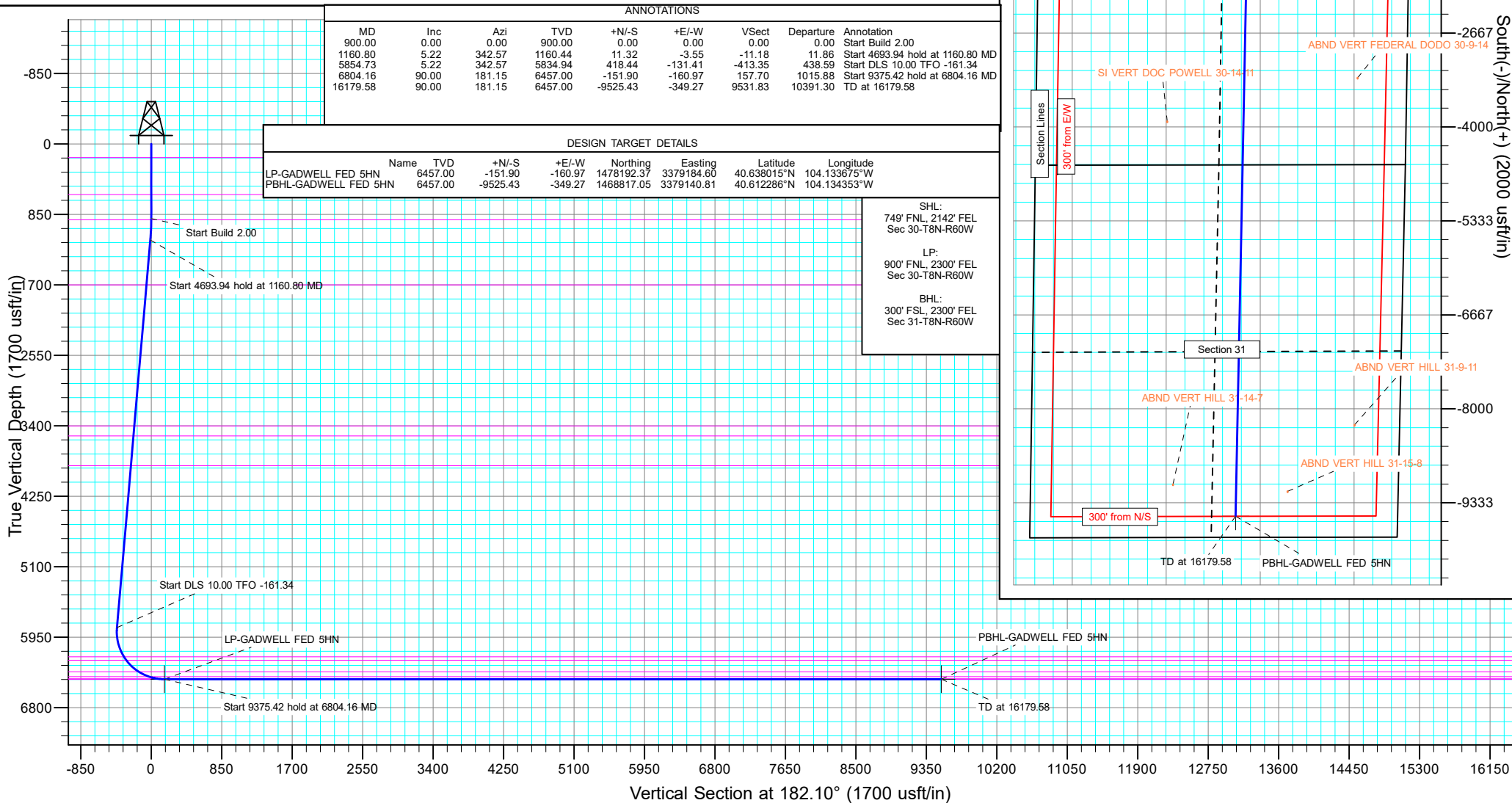
ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	Start Build 2.00
1160.80	5.22	342.57	1160.44	11.32	-3.55	-11.18	11.86	Start 4693.94 hold at 1160.80 MD
5854.73	5.22	342.57	5834.94	418.44	-131.41	-413.35	438.59	Start DLS 10.00 TFO -161.34
6804.16	90.00	181.15	6457.00	-151.90	-160.97	157.70	1015.88	Start 9375.42 hold at 6804.16 MD
16179.58	90.00	181.15	6457.00	-9525.43	-349.27	9531.83	10391.30	TD at 16179.58

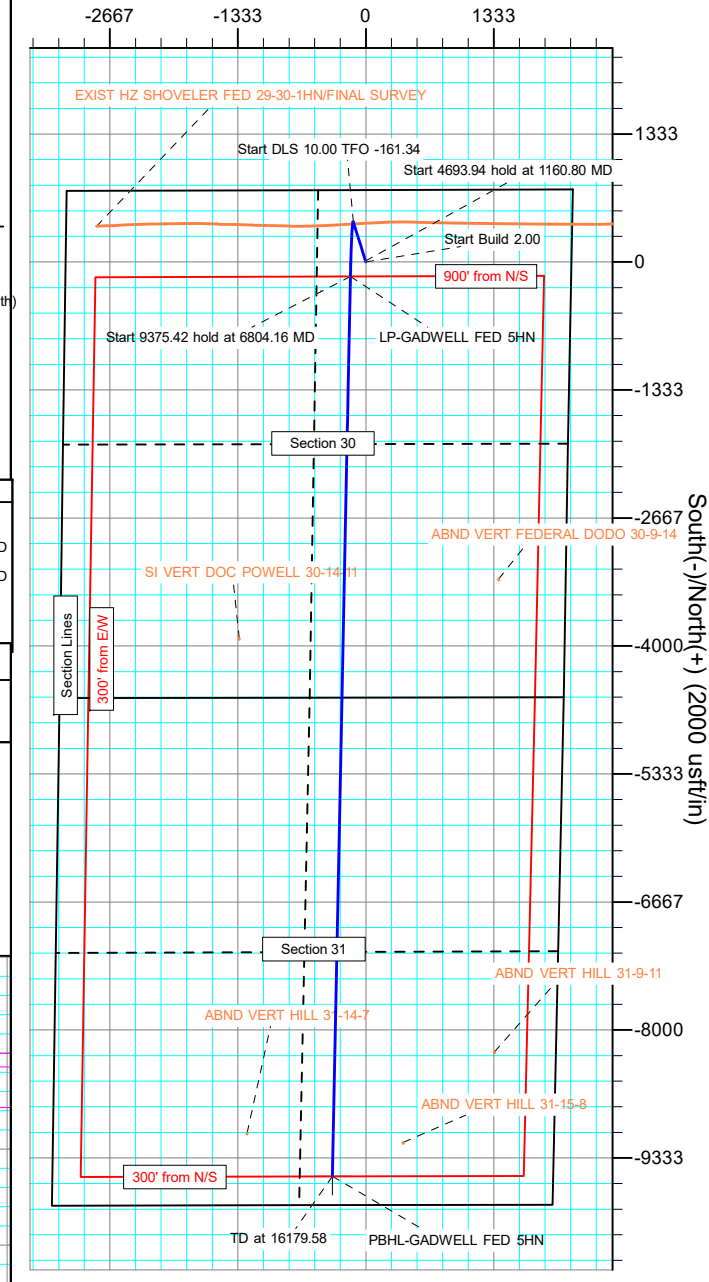
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
LP-GADWELL FED 5HN	6457.00	-151.90	-160.97	1478192.37	3379184.60	40.638015°N	104.133675°W
PBHL-GADWELL FED 5HN	6457.00	-9525.43	-349.27	1468817.05	3379140.81	40.612286°N	104.134353°W

SHL:
749' FNL, 2142' FEL
Sec 30-T8N-R60W
LP:
900' FNL, 2300' FEL
Sec 30-T8N-R60W
BHL:
300' FSL, 2300' FEL
Sec 31-T8N-R60W



West(-)/East(+) (2000 usft/in)



Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-5HN
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 30-31-5HN	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 30-31-5HN				
Well Position	+N/-S	0.00 usft	Northing:	1,478,346.74 usft	Latitude:	40.638432°N
	+E/-W	0.00 usft	Easting:	3,379,343.20 usft	Longitude:	104.133095°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	52,043.75124150

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	182.10	

Plan Survey Tool Program	Date	5/19/2022			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	16,179.58 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	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,160.80	5.22	342.57	1,160.44	11.32	-3.55	2.00	2.00	0.00	342.57	
5,854.73	5.22	342.57	5,834.94	418.44	-131.41	0.00	0.00	0.00	0.00	
6,804.16	90.00	181.15	6,457.00	-151.90	-160.97	10.00	8.93	-17.00	-161.34	LP-GADWELL FED 5
16,179.58	90.00	181.15	6,457.00	-9,525.43	-349.27	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 30-31-5HN	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									
610.00	0.00	0.00	610.00	0.00	0.00	0.00	0.00	0.00	0.00
*Laramie Fox Hills Base									
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
915.00	0.30	342.57	915.00	0.04	-0.01	-0.04	2.00	2.00	0.00
*Pierre Shale Base									
1,000.00	2.00	342.57	999.98	1.66	-0.52	-1.64	2.00	2.00	0.00
1,100.00	4.00	342.57	1,099.84	6.66	-2.09	-6.58	2.00	2.00	0.00
1,160.80	5.22	342.57	1,160.44	11.32	-3.55	-11.18	2.00	2.00	0.00
Start 4693.94 hold at 1160.80 MD									
1,200.00	5.22	342.57	1,199.48	14.72	-4.62	-14.54	0.00	0.00	0.00
1,300.00	5.22	342.57	1,299.06	23.39	-7.35	-23.11	0.00	0.00	0.00
1,400.00	5.22	342.57	1,398.65	32.06	-10.07	-31.67	0.00	0.00	0.00
1,500.00	5.22	342.57	1,498.24	40.74	-12.79	-40.24	0.00	0.00	0.00
1,600.00	5.22	342.57	1,597.82	49.41	-15.52	-48.81	0.00	0.00	0.00
1,700.00	5.22	342.57	1,697.41	58.09	-18.24	-57.38	0.00	0.00	0.00
1,702.60	5.22	342.57	1,700.00	58.31	-18.31	-57.60	0.00	0.00	0.00
*Upper Pierre Shale Base (SFC min depth)									
1,800.00	5.22	342.57	1,796.99	66.76	-20.96	-65.95	0.00	0.00	0.00
1,900.00	5.22	342.57	1,896.58	75.43	-23.69	-74.51	0.00	0.00	0.00
2,000.00	5.22	342.57	1,996.16	84.11	-26.41	-83.08	0.00	0.00	0.00
2,100.00	5.22	342.57	2,095.75	92.78	-29.14	-91.65	0.00	0.00	0.00
2,200.00	5.22	342.57	2,195.34	101.45	-31.86	-100.22	0.00	0.00	0.00
2,300.00	5.22	342.57	2,294.92	110.13	-34.58	-108.78	0.00	0.00	0.00
2,400.00	5.22	342.57	2,394.51	118.80	-37.31	-117.35	0.00	0.00	0.00
2,500.00	5.22	342.57	2,494.09	127.47	-40.03	-125.92	0.00	0.00	0.00
2,600.00	5.22	342.57	2,593.68	136.15	-42.76	-134.49	0.00	0.00	0.00
2,700.00	5.22	342.57	2,693.27	144.82	-45.48	-143.06	0.00	0.00	0.00
2,800.00	5.22	342.57	2,792.85	153.49	-48.20	-151.62	0.00	0.00	0.00
2,900.00	5.22	342.57	2,892.44	162.17	-50.93	-160.19	0.00	0.00	0.00
3,000.00	5.22	342.57	2,992.02	170.84	-53.65	-168.76	0.00	0.00	0.00
3,100.00	5.22	342.57	3,091.61	179.51	-56.37	-177.33	0.00	0.00	0.00
3,200.00	5.22	342.57	3,191.20	188.19	-59.10	-185.89	0.00	0.00	0.00
3,300.00	5.22	342.57	3,290.78	196.86	-61.82	-194.46	0.00	0.00	0.00
3,400.00	5.22	342.57	3,390.37	205.53	-64.55	-203.03	0.00	0.00	0.00
3,411.68	5.22	342.57	3,402.00	206.55	-64.86	-204.03	0.00	0.00	0.00
Richard Sandstone									
3,500.00	5.22	342.57	3,489.95	214.21	-67.27	-211.60	0.00	0.00	0.00
3,532.18	5.22	342.57	3,522.00	217.00	-68.15	-214.35	0.00	0.00	0.00
Parkman Sandstone									
3,600.00	5.22	342.57	3,589.54	222.88	-69.99	-220.17	0.00	0.00	0.00
3,700.00	5.22	342.57	3,689.13	231.55	-72.72	-228.73	0.00	0.00	0.00
3,800.00	5.22	342.57	3,788.71	240.23	-75.44	-237.30	0.00	0.00	0.00
3,893.68	5.22	342.57	3,882.00	248.35	-77.99	-245.33	0.00	0.00	0.00
Parkman Sandstone Base									
3,900.00	5.22	342.57	3,888.30	248.90	-78.17	-245.87	0.00	0.00	0.00
4,000.00	5.22	342.57	3,987.88	257.57	-80.89	-254.44	0.00	0.00	0.00
4,100.00	5.22	342.57	4,087.47	266.25	-83.61	-263.00	0.00	0.00	0.00
4,200.00	5.22	342.57	4,187.05	274.92	-86.34	-271.57	0.00	0.00	0.00
4,300.00	5.22	342.57	4,286.64	283.59	-89.06	-280.14	0.00	0.00	0.00

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 30-31-5HN	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)
4,400.00	5.22	342.57	4,386.23	292.27	-91.78	-288.71	0.00	0.00	0.00
4,500.00	5.22	342.57	4,485.81	300.94	-94.51	-297.28	0.00	0.00	0.00
4,600.00	5.22	342.57	4,585.40	309.61	-97.23	-305.84	0.00	0.00	0.00
4,700.00	5.22	342.57	4,684.98	318.29	-99.96	-314.41	0.00	0.00	0.00
4,800.00	5.22	342.57	4,784.57	326.96	-102.68	-322.98	0.00	0.00	0.00
4,900.00	5.22	342.57	4,884.16	335.63	-105.40	-331.55	0.00	0.00	0.00
5,000.00	5.22	342.57	4,983.74	344.31	-108.13	-340.11	0.00	0.00	0.00
5,100.00	5.22	342.57	5,083.33	352.98	-110.85	-348.68	0.00	0.00	0.00
5,200.00	5.22	342.57	5,182.91	361.65	-113.57	-357.25	0.00	0.00	0.00
5,300.00	5.22	342.57	5,282.50	370.33	-116.30	-365.82	0.00	0.00	0.00
5,400.00	5.22	342.57	5,382.09	379.00	-119.02	-374.39	0.00	0.00	0.00
5,500.00	5.22	342.57	5,481.67	387.67	-121.75	-382.95	0.00	0.00	0.00
5,600.00	5.22	342.57	5,581.26	396.35	-124.47	-391.52	0.00	0.00	0.00
5,700.00	5.22	342.57	5,680.84	405.02	-127.19	-400.09	0.00	0.00	0.00
5,800.00	5.22	342.57	5,780.43	413.70	-129.92	-408.66	0.00	0.00	0.00
5,854.73	5.22	342.57	5,834.94	418.44	-131.41	-413.35	0.00	0.00	0.00
Start DLS 10.00 TFO -161.34									
5,900.00	1.72	285.19	5,880.12	420.58	-132.68	-415.44	10.00	-7.73	-126.76
6,000.00	9.73	190.92	5,979.63	412.66	-135.74	-407.41	10.00	8.01	-94.26
6,100.00	19.65	185.82	6,076.25	387.58	-139.05	-382.22	10.00	9.93	-5.10
6,200.00	29.63	184.08	6,167.03	346.09	-142.53	-340.63	10.00	9.97	-1.74
6,223.25	31.95	183.83	6,187.00	334.22	-143.35	-328.74	10.00	9.98	-1.11
Sharon Springs									
6,271.72	36.79	183.38	6,227.00	306.92	-145.06	-301.40	10.00	9.99	-0.92
Niobrara Top									
6,300.00	39.61	183.17	6,249.22	289.46	-146.06	-283.91	10.00	9.99	-0.76
6,400.00	49.60	182.57	6,320.32	219.41	-149.53	-213.78	10.00	9.99	-0.60
6,478.59	57.46	182.21	6,367.00	156.31	-152.16	-150.63	10.00	9.99	-0.45
Niobrara B2 Chalk Top									
6,500.00	59.60	182.13	6,378.18	138.07	-152.85	-132.37	10.00	9.99	-0.40
6,600.00	69.59	181.77	6,421.02	47.90	-155.91	-42.16	10.00	9.99	-0.36
6,617.89	71.38	181.71	6,427.00	31.05	-156.42	-25.29	10.00	10.00	-0.33
Niobrara C Chalk Top									
6,700.00	79.59	181.46	6,447.56	-48.34	-158.61	54.12	10.00	10.00	-0.31
6,728.40	82.43	181.37	6,452.00	-76.38	-159.31	82.16	10.00	10.00	-0.30
Niobrara C Chalk Target Top									
6,800.00	89.58	181.16	6,456.99	-147.74	-160.88	153.54	10.00	10.00	-0.29
6,804.16	90.00	181.15	6,457.00	-151.90	-160.97	157.70	10.00	10.00	-0.29
Start 9375.42 hold at 6804.16 MD - Niobrara C Chalk Landing Point									
6,900.00	90.00	181.15	6,457.00	-247.72	-162.89	253.52	0.00	0.00	0.00
7,000.00	90.00	181.15	6,457.00	-347.70	-164.90	353.51	0.00	0.00	0.00
7,100.00	90.00	181.15	6,457.00	-447.68	-166.91	453.50	0.00	0.00	0.00
7,200.00	90.00	181.15	6,457.00	-547.66	-168.92	553.48	0.00	0.00	0.00
7,300.00	90.00	181.15	6,457.00	-647.64	-170.93	653.47	0.00	0.00	0.00
7,400.00	90.00	181.15	6,457.00	-747.62	-172.94	753.46	0.00	0.00	0.00
7,500.00	90.00	181.15	6,457.00	-847.60	-174.94	853.44	0.00	0.00	0.00
7,600.00	90.00	181.15	6,457.00	-947.58	-176.95	953.43	0.00	0.00	0.00
7,700.00	90.00	181.15	6,457.00	-1,047.56	-178.96	1,053.41	0.00	0.00	0.00
7,800.00	90.00	181.15	6,457.00	-1,147.54	-180.97	1,153.40	0.00	0.00	0.00
7,900.00	90.00	181.15	6,457.00	-1,247.52	-182.98	1,253.39	0.00	0.00	0.00
8,000.00	90.00	181.15	6,457.00	-1,347.50	-184.99	1,353.37	0.00	0.00	0.00
8,100.00	90.00	181.15	6,457.00	-1,447.48	-187.00	1,453.36	0.00	0.00	0.00
8,200.00	90.00	181.15	6,457.00	-1,547.46	-189.00	1,553.35	0.00	0.00	0.00

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-5HN
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 30-31-5HN	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)	
8,300.00	90.00	181.15	6,457.00	-1,647.44	-191.01	1,653.33	0.00	0.00	0.00	
8,400.00	90.00	181.15	6,457.00	-1,747.42	-193.02	1,753.32	0.00	0.00	0.00	
8,500.00	90.00	181.15	6,457.00	-1,847.40	-195.03	1,853.30	0.00	0.00	0.00	
8,600.00	90.00	181.15	6,457.00	-1,947.38	-197.04	1,953.29	0.00	0.00	0.00	
8,700.00	90.00	181.15	6,457.00	-2,047.36	-199.05	2,053.28	0.00	0.00	0.00	
8,800.00	90.00	181.15	6,457.00	-2,147.34	-201.05	2,153.26	0.00	0.00	0.00	
8,900.00	90.00	181.15	6,457.00	-2,247.32	-203.06	2,253.25	0.00	0.00	0.00	
9,000.00	90.00	181.15	6,457.00	-2,347.30	-205.07	2,353.24	0.00	0.00	0.00	
9,100.00	90.00	181.15	6,457.00	-2,447.28	-207.08	2,453.22	0.00	0.00	0.00	
9,200.00	90.00	181.15	6,457.00	-2,547.26	-209.09	2,553.21	0.00	0.00	0.00	
9,300.00	90.00	181.15	6,457.00	-2,647.24	-211.10	2,653.19	0.00	0.00	0.00	
9,400.00	90.00	181.15	6,457.00	-2,747.22	-213.10	2,753.18	0.00	0.00	0.00	
9,500.00	90.00	181.15	6,457.00	-2,847.20	-215.11	2,853.17	0.00	0.00	0.00	
9,600.00	90.00	181.15	6,457.00	-2,947.18	-217.12	2,953.15	0.00	0.00	0.00	
9,700.00	90.00	181.15	6,457.00	-3,047.16	-219.13	3,053.14	0.00	0.00	0.00	
9,800.00	90.00	181.15	6,457.00	-3,147.14	-221.14	3,153.13	0.00	0.00	0.00	
9,900.00	90.00	181.15	6,457.00	-3,247.12	-223.15	3,253.11	0.00	0.00	0.00	
10,000.00	90.00	181.15	6,457.00	-3,347.10	-225.16	3,353.10	0.00	0.00	0.00	
10,100.00	90.00	181.15	6,457.00	-3,447.08	-227.16	3,453.09	0.00	0.00	0.00	
10,200.00	90.00	181.15	6,457.00	-3,547.06	-229.17	3,553.07	0.00	0.00	0.00	
10,300.00	90.00	181.15	6,457.00	-3,647.04	-231.18	3,653.06	0.00	0.00	0.00	
10,400.00	90.00	181.15	6,457.00	-3,747.02	-233.19	3,753.04	0.00	0.00	0.00	
10,500.00	90.00	181.15	6,457.00	-3,847.00	-235.20	3,853.03	0.00	0.00	0.00	
10,600.00	90.00	181.15	6,457.00	-3,946.98	-237.21	3,953.02	0.00	0.00	0.00	
10,700.00	90.00	181.15	6,457.00	-4,046.96	-239.21	4,053.00	0.00	0.00	0.00	
10,800.00	90.00	181.15	6,457.00	-4,146.93	-241.22	4,152.99	0.00	0.00	0.00	
10,900.00	90.00	181.15	6,457.00	-4,246.91	-243.23	4,252.98	0.00	0.00	0.00	
11,000.00	90.00	181.15	6,457.00	-4,346.89	-245.24	4,352.96	0.00	0.00	0.00	
11,100.00	90.00	181.15	6,457.00	-4,446.87	-247.25	4,452.95	0.00	0.00	0.00	
11,200.00	90.00	181.15	6,457.00	-4,546.85	-249.26	4,552.93	0.00	0.00	0.00	
11,300.00	90.00	181.15	6,457.00	-4,646.83	-251.27	4,652.92	0.00	0.00	0.00	
11,400.00	90.00	181.15	6,457.00	-4,746.81	-253.27	4,752.91	0.00	0.00	0.00	
11,500.00	90.00	181.15	6,457.00	-4,846.79	-255.28	4,852.89	0.00	0.00	0.00	
11,600.00	90.00	181.15	6,457.00	-4,946.77	-257.29	4,952.88	0.00	0.00	0.00	
11,700.00	90.00	181.15	6,457.00	-5,046.75	-259.30	5,052.87	0.00	0.00	0.00	
11,800.00	90.00	181.15	6,457.00	-5,146.73	-261.31	5,152.85	0.00	0.00	0.00	
11,900.00	90.00	181.15	6,457.00	-5,246.71	-263.32	5,252.84	0.00	0.00	0.00	
12,000.00	90.00	181.15	6,457.00	-5,346.69	-265.32	5,352.82	0.00	0.00	0.00	
12,100.00	90.00	181.15	6,457.00	-5,446.67	-267.33	5,452.81	0.00	0.00	0.00	
12,200.00	90.00	181.15	6,457.00	-5,546.65	-269.34	5,552.80	0.00	0.00	0.00	
12,300.00	90.00	181.15	6,457.00	-5,646.63	-271.35	5,652.78	0.00	0.00	0.00	
12,400.00	90.00	181.15	6,457.00	-5,746.61	-273.36	5,752.77	0.00	0.00	0.00	
12,500.00	90.00	181.15	6,457.00	-5,846.59	-275.37	5,852.76	0.00	0.00	0.00	
12,600.00	90.00	181.15	6,457.00	-5,946.57	-277.37	5,952.74	0.00	0.00	0.00	
12,700.00	90.00	181.15	6,457.00	-6,046.55	-279.38	6,052.73	0.00	0.00	0.00	
12,800.00	90.00	181.15	6,457.00	-6,146.53	-281.39	6,152.71	0.00	0.00	0.00	
12,900.00	90.00	181.15	6,457.00	-6,246.51	-283.40	6,252.70	0.00	0.00	0.00	
13,000.00	90.00	181.15	6,457.00	-6,346.49	-285.41	6,352.69	0.00	0.00	0.00	
13,100.00	90.00	181.15	6,457.00	-6,446.47	-287.42	6,452.67	0.00	0.00	0.00	
13,200.00	90.00	181.15	6,457.00	-6,546.45	-289.43	6,552.66	0.00	0.00	0.00	
13,300.00	90.00	181.15	6,457.00	-6,646.43	-291.43	6,652.65	0.00	0.00	0.00	
13,400.00	90.00	181.15	6,457.00	-6,746.41	-293.44	6,752.63	0.00	0.00	0.00	
13,500.00	90.00	181.15	6,457.00	-6,846.39	-295.45	6,852.62	0.00	0.00	0.00	
13,600.00	90.00	181.15	6,457.00	-6,946.37	-297.46	6,952.60	0.00	0.00	0.00	

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-5HN
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 30-31-5HN	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)	
13,700.00	90.00	181.15	6,457.00	-7,046.35	-299.47	7,052.59	0.00	0.00	0.00	
13,800.00	90.00	181.15	6,457.00	-7,146.33	-301.48	7,152.58	0.00	0.00	0.00	
13,900.00	90.00	181.15	6,457.00	-7,246.31	-303.48	7,252.56	0.00	0.00	0.00	
14,000.00	90.00	181.15	6,457.00	-7,346.29	-305.49	7,352.55	0.00	0.00	0.00	
14,100.00	90.00	181.15	6,457.00	-7,446.27	-307.50	7,452.54	0.00	0.00	0.00	
14,200.00	90.00	181.15	6,457.00	-7,546.25	-309.51	7,552.52	0.00	0.00	0.00	
14,300.00	90.00	181.15	6,457.00	-7,646.23	-311.52	7,652.51	0.00	0.00	0.00	
14,400.00	90.00	181.15	6,457.00	-7,746.21	-313.53	7,752.50	0.00	0.00	0.00	
14,500.00	90.00	181.15	6,457.00	-7,846.19	-315.54	7,852.48	0.00	0.00	0.00	
14,600.00	90.00	181.15	6,457.00	-7,946.17	-317.54	7,952.47	0.00	0.00	0.00	
14,700.00	90.00	181.15	6,457.00	-8,046.15	-319.55	8,052.45	0.00	0.00	0.00	
14,800.00	90.00	181.15	6,457.00	-8,146.13	-321.56	8,152.44	0.00	0.00	0.00	
14,900.00	90.00	181.15	6,457.00	-8,246.11	-323.57	8,252.43	0.00	0.00	0.00	
15,000.00	90.00	181.15	6,457.00	-8,346.09	-325.58	8,352.41	0.00	0.00	0.00	
15,100.00	90.00	181.15	6,457.00	-8,446.07	-327.59	8,452.40	0.00	0.00	0.00	
15,200.00	90.00	181.15	6,457.00	-8,546.05	-329.59	8,552.39	0.00	0.00	0.00	
15,300.00	90.00	181.15	6,457.00	-8,646.03	-331.60	8,652.37	0.00	0.00	0.00	
15,400.00	90.00	181.15	6,457.00	-8,746.01	-333.61	8,752.36	0.00	0.00	0.00	
15,500.00	90.00	181.15	6,457.00	-8,845.99	-335.62	8,852.34	0.00	0.00	0.00	
15,600.00	90.00	181.15	6,457.00	-8,945.97	-337.63	8,952.33	0.00	0.00	0.00	
15,700.00	90.00	181.15	6,457.00	-9,045.95	-339.64	9,052.32	0.00	0.00	0.00	
15,800.00	90.00	181.15	6,457.00	-9,145.93	-341.65	9,152.30	0.00	0.00	0.00	
15,900.00	90.00	181.15	6,457.00	-9,245.91	-343.65	9,252.29	0.00	0.00	0.00	
16,000.00	90.00	181.15	6,457.00	-9,345.89	-345.66	9,352.28	0.00	0.00	0.00	
16,100.00	90.00	181.15	6,457.00	-9,445.87	-347.67	9,452.26	0.00	0.00	0.00	
16,179.58	90.00	181.15	6,457.00	-9,525.43	-349.27	9,531.83	0.00	0.00	0.00	
TD at 16179.58										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LP-GADWELL FED 5HN - hit/miss target - Shape - Point	0.00	0.00	6,457.00	-151.90	-160.97	1,478,192.37	3,379,184.59	40.638015°N	104.133675°W
PBHL-GADWELL FED 5 - plan hits target center - Point	0.00	0.00	6,457.00	-9,525.43	-349.27	1,468,817.06	3,379,140.80	40.612286°N	104.134353°W

Planning Report

Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well GADWALL FED 30-31-5HN
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 30-31-5HN	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				
915.00	915.00	*Pierre Shale Base				
1,702.60	1,700.00	*Upper Pierre Shale Base (SFC min dep:				
3,411.68	3,402.00	Richard Sandstone				
3,532.18	3,522.00	Parkman Sandstone				
3,893.68	3,882.00	Parkman Sandstone Base				
6,223.25	6,187.00	Sharon Springs				
6,271.72	6,227.00	Niobrara Top				
6,478.59	6,367.00	Niobrara B2 Chalk Top				
6,617.89	6,427.00	Niobrara C Chalk Top				
6,728.40	6,452.00	Niobrara C Chalk Target Top				
6,804.16	6,457.00	Niobrara C Chalk Landing Point				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
900.00	900.00	0.00	0.00	Start Build 2.00	
1,160.80	1,160.44	11.32	-3.55	Start 4693.94 hold at 1160.80 MD	
5,854.73	5,834.94	418.44	-131.41	Start DLS 10.00 TFO -161.34	
6,804.16	6,457.00	-151.90	-160.97	Start 9375.42 hold at 6804.16 MD	
16,179.58	6,457.00	-9,525.43	-349.27	TD at 16179.58	