

# **MALLARD EXPLORATION**

**WELD COUNTY, COLORADO (NAD 83)**

**SE SW SEC. 31 T9N R59W 6th P.M.**

**ANDERSON FED 6-5-9HN**

**ORIGINAL WELLBORE**

**25 July, 2019**

**Plan: PROPOSAL #2**





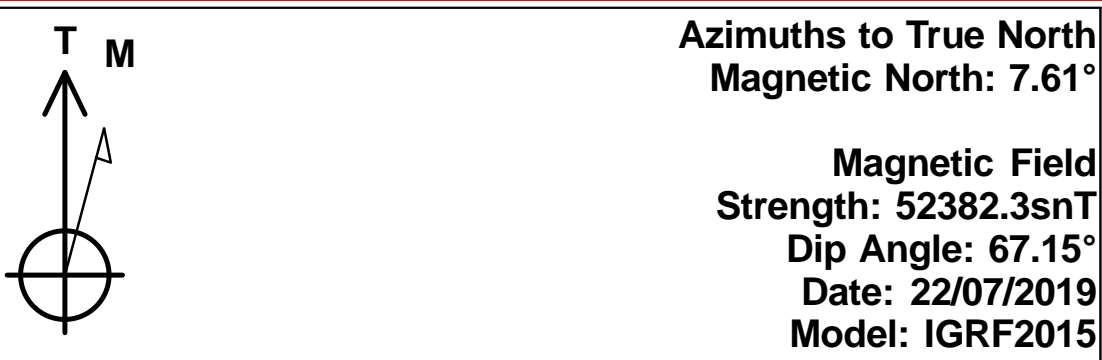
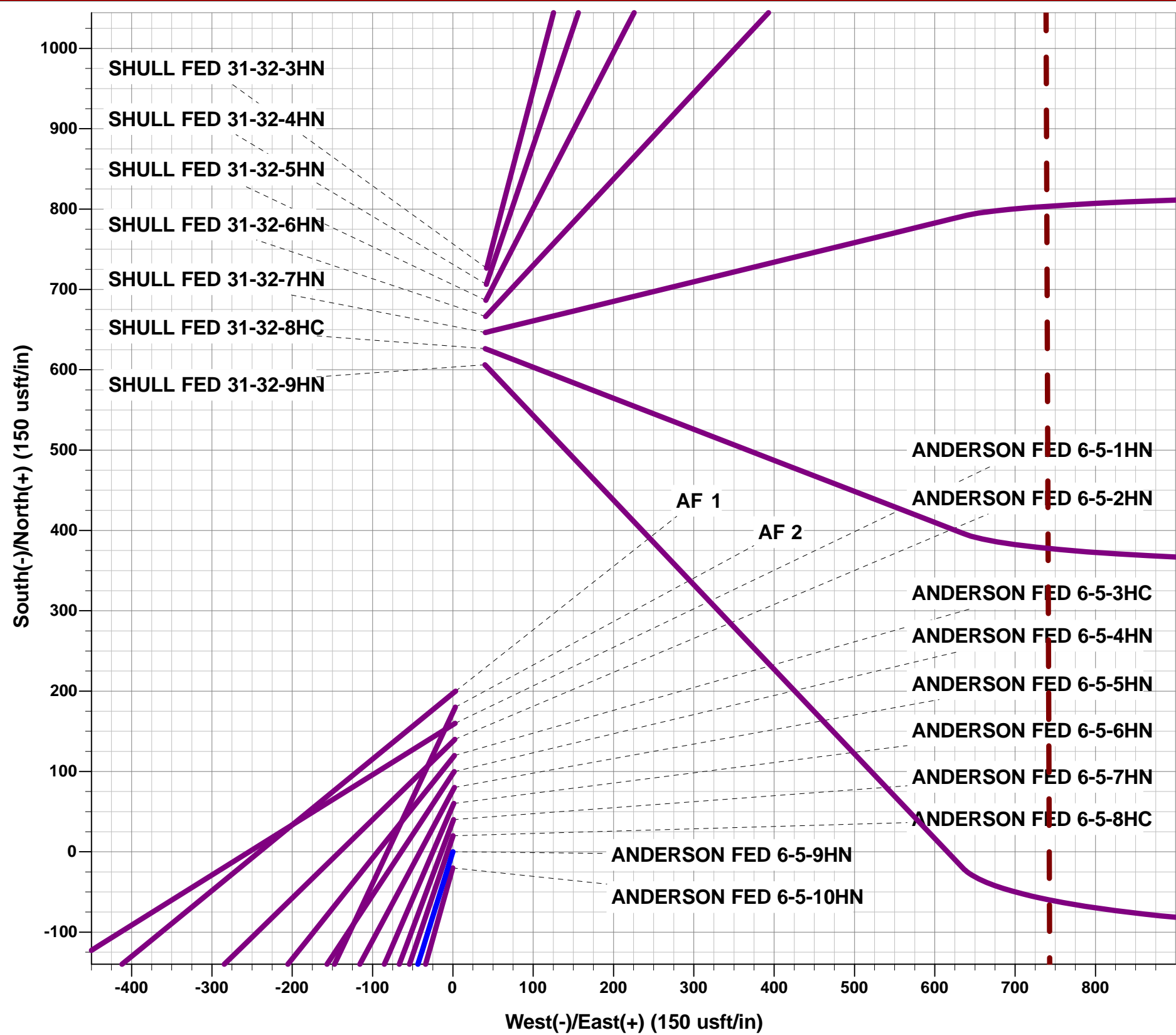
Project: WELD COUNTY, COLORADO (NAD 83)  
Site: SE SW SEC. 31 T9N R59W 6th P.M.  
Well: ANDERSON FED 6-5-9HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #2

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 542ft FSL & 1909ft FWL of Sec 31
200.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (3°/100ft BUR)
1570.05	1727.89	45.84	197.26	-553.17	-171.84	133.24	579.25	EOB TO 45.84° INC
5663.40	7603.19	45.84	197.26	-4578.13	-1422.18	1102.75	4793.94	KOP (10°/100ft DGLG)
6155.00	8621.65	90.00	90.63	-5069.25	-866.77	1830.70	5649.85	LP *NEW*: 875ft FSL & 600ft FWL of Sec 6
6155.00	18254.50	90.00	90.63	-5174.82	8765.50	10179.03	15282.70	BHL: 875ft FSL & 300ft FEL of Sec 5

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
LP *NEW* - ANDERSON FED 6-5-9HN (P2)	6155.00	-5069.25	-866.77	40.686833	-104.026556
BHL - ANDERSON FED 6-5-9HN (P2)	6155.00	-5174.82	8765.50	40.686539	-103.991825

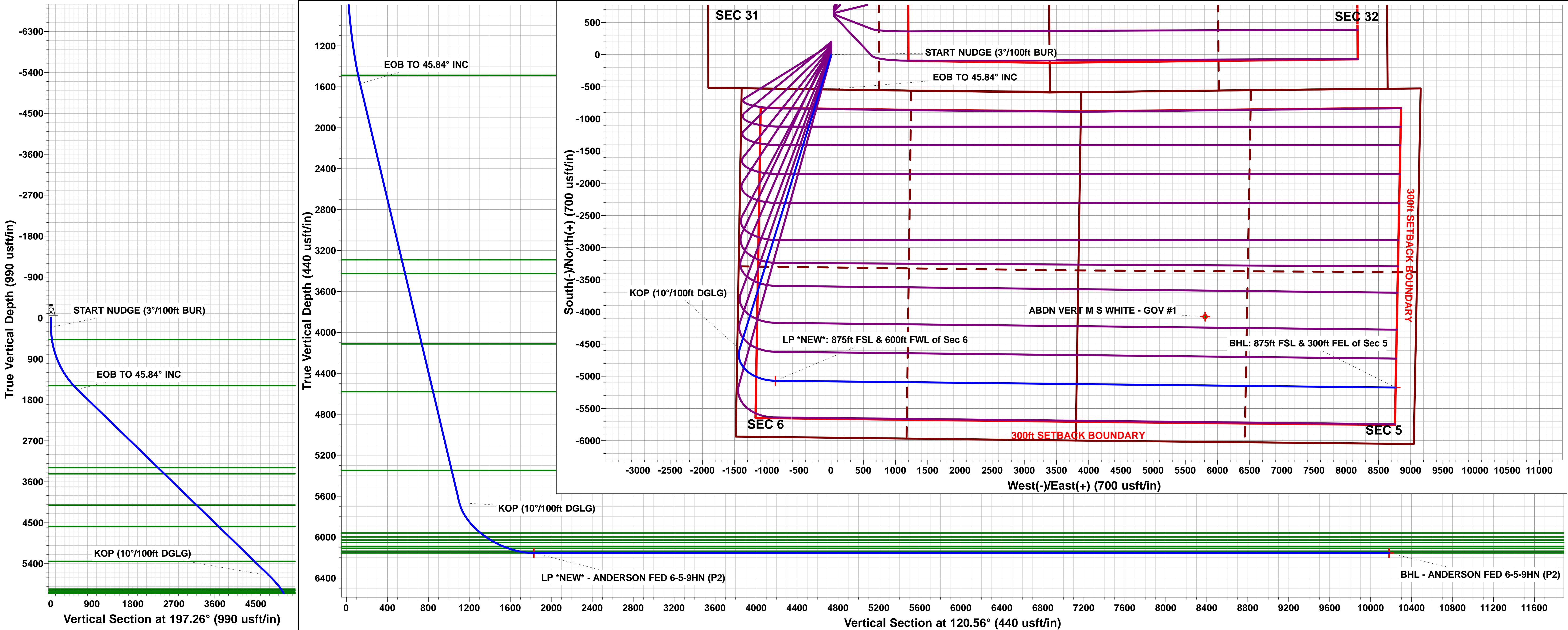


FORMATION TOP DETAILS

TVDPath	MDPath	Formation
470.00	470.91	Fox Hills Base
1487.00	1612.22	Pierre Shale Top
3290.00	4196.58	Richard Sandstone
3425.00	4390.35	Parkman Sandstone
4112.00	5376.42	Sussex Sandstone
4579.00	6046.72	Shannon Sandstone
5348.00	7150.49	TeePee Buttes
5959.00	8034.61	Sharon Springs
5998.00	8101.22	Niobrara Top
6028.00	8156.87	Niobrara A Chalk
6052.00	8205.37	Niobrara A Chalk Base
6090.00	8293.72	Niobrara B1 Chalk Top
6109.00	8346.91	Niobrara B1 Chalk Base
6137.00	8450.80	Niobrara B2 Chalk Target Top
6155.00	8621.65	Niobrara B2 Chalk Target Center

PROPOSED LOCAL COORDINATES:

SHL: 542ft FSL & 1909ft FWL of Sec 31  
HZ LP \*NEW\*: 875ft FSL & 600ft FWL of Sec 6  
BHL: 875ft FSL & 300ft FEL of Sec 5



# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-9HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-9HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

<b>Project</b>	WELD COUNTY, COLORADO (NAD 83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	SE SW SEC. 31 T9N R59W 6th P.M.		
<b>Site Position:</b>		<b>Northing:</b>	1,501,513.53 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,409,242.57 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	1.10 ft
		<b>Latitude:</b>	40.700697
		<b>Longitude:</b>	-104.023987
		<b>Grid Convergence:</b>	0.95 °

<b>Well</b>	ANDERSON FED 6-5-9HN		
<b>Well Position</b>	<b>+N-S</b>	18.21 usft	<b>Northing:</b>
	<b>+E-W</b>	154.17 usft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	usft
		<b>Latitude:</b>	40.700747
		<b>Longitude:</b>	-104.023431
		<b>Ground Level:</b>	4,878.00 usft

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	22/07/2019	7.61	67.15	52,382

<b>Design</b>	PROPOSAL #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>
	6,155.00	0.00	0.00	120.56

<b>Plan Sections</b>											
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	-4,903.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	-4,703.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,727.89	45.84	197.26	1,570.05	-3,332.95	-553.17	-171.84	3.00	3.00	0.00	197.26	
7,603.19	45.84	197.26	5,663.40	760.40	-4,578.13	-1,422.18	0.00	0.00	0.00	0.00	
8,621.65	90.00	90.63	6,155.00	1,252.00	-5,069.25	-866.77	10.00	4.34	-10.47	-101.75	LP *NEW* - ANDEF
18,254.50	90.00	90.63	6,155.00	1,252.00	-5,174.82	8,765.50	0.00	0.00	0.00	0.00	BHL - ANDERSON

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-9HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-9HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

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)
<b>SHL: 542ft FSL &amp; 1909ft FWL of Sec 31</b>										
0.00	0.00	0.00	0.00	4,903.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	4,803.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>START NUDGE (3°/100ft BUR)</b>										
200.00	0.00	0.00	200.00	4,703.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	3.00	197.26	299.95	4,603.05	-2.50	-0.78	0.60	3.00	3.00	0.00
400.00	6.00	197.26	399.63	4,503.37	-9.99	-3.10	2.41	3.00	3.00	0.00
<b>Fox Hills Base</b>										
470.91	8.13	197.26	470.00	4,433.00	-18.32	-5.69	4.41	3.00	3.00	0.00
500.00	9.00	197.26	498.77	4,404.23	-22.46	-6.98	5.41	3.00	3.00	0.00
600.00	12.00	197.26	597.08	4,305.92	-39.86	-12.38	9.60	3.00	3.00	0.00
700.00	15.00	197.26	694.31	4,208.69	-62.15	-19.31	14.97	3.00	3.00	0.00
800.00	18.00	197.26	790.18	4,112.82	-89.27	-27.73	21.50	3.00	3.00	0.00
900.00	21.00	197.26	884.43	4,018.57	-121.14	-37.63	29.18	3.00	3.00	0.00
1,000.00	24.00	197.26	976.81	3,926.19	-157.68	-48.98	37.98	3.00	3.00	0.00
1,100.00	27.00	197.26	1,067.06	3,835.94	-198.79	-61.75	47.88	3.00	3.00	0.00
1,200.00	30.00	197.26	1,154.93	3,748.07	-244.35	-75.91	58.86	3.00	3.00	0.00
1,300.00	33.00	197.26	1,240.18	3,662.82	-294.25	-91.41	70.88	3.00	3.00	0.00
1,400.00	36.00	197.26	1,322.59	3,580.41	-348.33	-108.21	83.90	3.00	3.00	0.00
1,500.00	39.00	197.26	1,401.91	3,501.09	-406.46	-126.26	97.91	3.00	3.00	0.00
1,600.00	42.00	197.26	1,477.95	3,425.05	-468.47	-145.53	112.84	3.00	3.00	0.00
<b>Pierre Shale Top</b>										
1,612.22	42.37	197.26	1,487.00	3,416.00	-476.31	-147.96	114.73	3.00	3.00	0.00
1,700.00	45.00	197.26	1,550.47	3,352.53	-534.20	-165.95	128.68	3.00	3.00	0.00
<b>EOB TO 45.84° INC</b>										
1,727.89	45.84	197.26	1,570.05	3,332.95	-553.17	-171.84	133.24	3.00	3.00	0.00
1,800.00	45.84	197.26	1,620.29	3,282.71	-602.57	-187.19	145.14	0.00	0.00	0.00
1,900.00	45.84	197.26	1,689.96	3,213.04	-671.08	-208.47	161.65	0.00	0.00	0.00
2,000.00	45.84	197.26	1,759.63	3,143.37	-739.59	-229.75	178.15	0.00	0.00	0.00
2,100.00	45.84	197.26	1,829.30	3,073.70	-808.09	-251.03	194.65	0.00	0.00	0.00
2,200.00	45.84	197.26	1,898.97	3,004.03	-876.60	-272.31	211.15	0.00	0.00	0.00
2,300.00	45.84	197.26	1,968.64	2,934.36	-945.11	-293.59	227.65	0.00	0.00	0.00
2,400.00	45.84	197.26	2,038.31	2,864.69	-1,013.61	-314.87	244.15	0.00	0.00	0.00
2,500.00	45.84	197.26	2,107.98	2,795.02	-1,082.12	-336.16	260.65	0.00	0.00	0.00
2,600.00	45.84	197.26	2,177.65	2,725.35	-1,150.62	-357.44	277.15	0.00	0.00	0.00
2,700.00	45.84	197.26	2,247.32	2,655.68	-1,219.13	-378.72	293.66	0.00	0.00	0.00
2,800.00	45.84	197.26	2,317.00	2,586.00	-1,287.64	-400.00	310.16	0.00	0.00	0.00
2,900.00	45.84	197.26	2,386.67	2,516.33	-1,356.14	-421.28	326.66	0.00	0.00	0.00
3,000.00	45.84	197.26	2,456.34	2,446.66	-1,424.65	-442.56	343.16	0.00	0.00	0.00
3,100.00	45.84	197.26	2,526.01	2,376.99	-1,493.16	-463.84	359.66	0.00	0.00	0.00
3,200.00	45.84	197.26	2,595.68	2,307.32	-1,561.66	-485.12	376.16	0.00	0.00	0.00
3,300.00	45.84	197.26	2,665.35	2,237.65	-1,630.17	-506.40	392.66	0.00	0.00	0.00
3,400.00	45.84	197.26	2,735.02	2,167.98	-1,698.68	-527.69	409.17	0.00	0.00	0.00
3,500.00	45.84	197.26	2,804.69	2,098.31	-1,767.18	-548.97	425.67	0.00	0.00	0.00
3,600.00	45.84	197.26	2,874.36	2,028.64	-1,835.69	-570.25	442.17	0.00	0.00	0.00
3,700.00	45.84	197.26	2,944.03	1,958.97	-1,904.20	-591.53	458.67	0.00	0.00	0.00
3,800.00	45.84	197.26	3,013.70	1,889.30	-1,972.70	-612.81	475.17	0.00	0.00	0.00
3,900.00	45.84	197.26	3,083.37	1,819.63	-2,041.21	-634.09	491.67	0.00	0.00	0.00
4,000.00	45.84	197.26	3,153.04	1,749.96	-2,109.71	-655.37	508.17	0.00	0.00	0.00
4,100.00	45.84	197.26	3,222.71	1,680.29	-2,178.22	-676.65	524.68	0.00	0.00	0.00
<b>Richard Sandstone</b>										
4,196.58	45.84	197.26	3,290.00	1,613.00	-2,244.39	-697.21	540.61	0.00	0.00	0.00
4,200.00	45.84	197.26	3,292.38	1,610.62	-2,246.73	-697.94	541.18	0.00	0.00	0.00



# Planning Report



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<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-9HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

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)
4,300.00	45.84	197.26	3,362.05	1,540.95	-2,315.23	-719.22	557.68	0.00	0.00	0.00
<b>Parkman Sandstone</b>										
<b>4,390.35</b>	<b>45.84</b>	<b>197.26</b>	<b>3,425.00</b>	<b>1,478.00</b>	<b>-2,377.13</b>	<b>-738.44</b>	<b>572.59</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
4,400.00	45.84	197.26	3,431.72	1,471.28	-2,383.74	-740.50	574.18	0.00	0.00	0.00
4,500.00	45.84	197.26	3,501.39	1,401.61	-2,452.25	-761.78	590.68	0.00	0.00	0.00
4,600.00	45.84	197.26	3,571.06	1,331.94	-2,520.75	-783.06	607.18	0.00	0.00	0.00
4,700.00	45.84	197.26	3,640.73	1,262.27	-2,589.26	-804.34	623.68	0.00	0.00	0.00
4,800.00	45.84	197.26	3,710.41	1,192.59	-2,657.77	-825.62	640.18	0.00	0.00	0.00
4,900.00	45.84	197.26	3,780.08	1,122.92	-2,726.27	-846.90	656.69	0.00	0.00	0.00
5,000.00	45.84	197.26	3,849.75	1,053.25	-2,794.78	-868.19	673.19	0.00	0.00	0.00
5,100.00	45.84	197.26	3,919.42	983.58	-2,863.29	-889.47	689.69	0.00	0.00	0.00
5,200.00	45.84	197.26	3,989.09	913.91	-2,931.79	-910.75	706.19	0.00	0.00	0.00
5,300.00	45.84	197.26	4,058.76	844.24	-3,000.30	-932.03	722.69	0.00	0.00	0.00
<b>Sussex Sandstone</b>										
<b>5,376.42</b>	<b>45.84</b>	<b>197.26</b>	<b>4,112.00</b>	<b>791.00</b>	<b>-3,052.65</b>	<b>-948.29</b>	<b>735.30</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
5,400.00	45.84	197.26	4,128.43	774.57	-3,068.80	-953.31	739.19	0.00	0.00	0.00
5,500.00	45.84	197.26	4,198.10	704.90	-3,137.31	-974.59	755.69	0.00	0.00	0.00
5,600.00	45.84	197.26	4,267.77	635.23	-3,205.82	-995.87	772.20	0.00	0.00	0.00
5,700.00	45.84	197.26	4,337.44	565.56	-3,274.32	-1,017.15	788.70	0.00	0.00	0.00
5,800.00	45.84	197.26	4,407.11	495.89	-3,342.83	-1,038.44	805.20	0.00	0.00	0.00
5,900.00	45.84	197.26	4,476.78	426.22	-3,411.34	-1,059.72	821.70	0.00	0.00	0.00
6,000.00	45.84	197.26	4,546.45	356.55	-3,479.84	-1,081.00	838.20	0.00	0.00	0.00
<b>Shannon Sandstone</b>										
<b>6,046.72</b>	<b>45.84</b>	<b>197.26</b>	<b>4,579.00</b>	<b>324.00</b>	<b>-3,511.85</b>	<b>-1,090.94</b>	<b>845.91</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
6,100.00	45.84	197.26	4,616.12	286.88	-3,548.35	-1,102.28	854.70	0.00	0.00	0.00
6,200.00	45.84	197.26	4,685.79	217.21	-3,616.86	-1,123.56	871.20	0.00	0.00	0.00
6,300.00	45.84	197.26	4,755.46	147.54	-3,685.36	-1,144.84	887.71	0.00	0.00	0.00
6,400.00	45.84	197.26	4,825.13	77.87	-3,753.87	-1,166.12	904.21	0.00	0.00	0.00
6,500.00	45.84	197.26	4,894.80	8.20	-3,822.38	-1,187.40	920.71	0.00	0.00	0.00
6,600.00	45.84	197.26	4,964.47	-61.47	-3,890.88	-1,208.69	937.21	0.00	0.00	0.00
6,700.00	45.84	197.26	5,034.14	-131.14	-3,959.39	-1,229.97	953.71	0.00	0.00	0.00
6,800.00	45.84	197.26	5,103.82	-200.82	-4,027.90	-1,251.25	970.21	0.00	0.00	0.00
6,900.00	45.84	197.26	5,173.49	-270.49	-4,096.40	-1,272.53	986.71	0.00	0.00	0.00
7,000.00	45.84	197.26	5,243.16	-340.16	-4,164.91	-1,293.81	1,003.22	0.00	0.00	0.00
7,100.00	45.84	197.26	5,312.83	-409.83	-4,233.41	-1,315.09	1,019.72	0.00	0.00	0.00
<b>TeePee Buttes</b>										
<b>7,150.49</b>	<b>45.84</b>	<b>197.26</b>	<b>5,348.00</b>	<b>-445.00</b>	<b>-4,268.00</b>	<b>-1,325.84</b>	<b>1,028.05</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
7,200.00	45.84	197.26	5,382.50	-479.50	-4,301.92	-1,336.37	1,036.22	0.00	0.00	0.00
7,300.00	45.84	197.26	5,452.17	-549.17	-4,370.43	-1,357.65	1,052.72	0.00	0.00	0.00
7,400.00	45.84	197.26	5,521.84	-618.84	-4,438.93	-1,378.93	1,069.22	0.00	0.00	0.00
7,500.00	45.84	197.26	5,591.51	-688.51	-4,507.44	-1,400.22	1,085.72	0.00	0.00	0.00
7,600.00	45.84	197.26	5,661.18	-758.18	-4,575.95	-1,421.50	1,102.22	0.00	0.00	0.00
<b>KOP (10°/100ft DGLG)</b>										
<b>7,603.19</b>	<b>45.84</b>	<b>197.26</b>	<b>5,663.40</b>	<b>-760.40</b>	<b>-4,578.13</b>	<b>-1,422.18</b>	<b>1,102.75</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
7,700.00	44.65	183.71	5,731.72	-828.72	-4,645.40	-1,434.71	1,126.16	10.00	-1.22	-13.99
7,800.00	45.15	169.54	5,802.73	-899.73	-4,715.51	-1,430.54	1,165.39	10.00	0.50	-14.17
7,900.00	47.34	156.01	5,872.05	-969.05	-4,784.14	-1,409.10	1,218.74	10.00	2.19	-13.53
8,000.00	50.99	143.69	5,937.58	-1,034.58	-4,849.20	-1,371.05	1,284.58	10.00	3.65	-12.32
<b>Sharon Springs</b>										
<b>8,034.61</b>	<b>52.53</b>	<b>139.75</b>	<b>5,959.00</b>	<b>-1,056.00</b>	<b>-4,870.53</b>	<b>-1,354.21</b>	<b>1,309.92</b>	<b>10.00</b>	<b>4.47</b>	<b>-11.39</b>
8,100.00	55.79	132.75	5,997.31	-1,094.31	-4,908.73	-1,317.55	1,360.92	10.00	4.98	-10.70
<b>Niobrara Top</b>										
<b>8,101.22</b>	<b>55.86</b>	<b>132.62</b>	<b>5,998.00</b>	<b>-1,095.00</b>	<b>-4,909.42</b>	<b>-1,316.81</b>	<b>1,361.91</b>	<b>10.00</b>	<b>5.29</b>	<b>-10.26</b>

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-9HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-9HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

## 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)
<b>Niobrara A Chalk</b>										
8,156.87	58.92	127.11	6,028.00	-1,125.00	-4,939.41	-1,280.83	1,408.13	10.00	5.51	-9.91
8,200.00	61.45	123.09	6,049.45	-1,146.45	-4,960.91	-1,250.21	1,445.43	10.00	5.87	-9.33
<b>Niobrara A Chalk Base</b>										
8,205.37	61.78	122.60	6,052.00	-1,149.00	-4,963.47	-1,246.25	1,450.14	10.00	6.02	-9.07
<b>Niobrara B1 Chalk Top</b>										
8,293.72	67.32	114.97	6,090.00	-1,187.00	-5,001.73	-1,176.36	1,529.77	10.00	6.27	-8.63
8,300.00	67.73	114.46	6,092.40	-1,189.40	-5,004.15	-1,171.09	1,535.54	10.00	6.50	-8.23
<b>Niobrara B1 Chalk Base</b>										
8,346.91	70.83	110.69	6,109.00	-1,206.00	-5,020.97	-1,130.59	1,578.98	10.00	6.60	-8.03
8,400.00	74.42	106.59	6,124.86	-1,221.86	-5,037.15	-1,082.59	1,628.53	10.00	6.77	-7.71
<b>Niobrara B2 Chalk Target Top</b>										
8,450.80	77.93	102.81	6,137.00	-1,234.00	-5,049.65	-1,034.90	1,675.96	10.00	6.90	-7.45
8,500.00	81.37	99.24	6,145.84	-1,242.84	-5,058.89	-987.40	1,721.56	10.00	7.00	-7.26
8,600.00	88.46	92.15	6,154.71	-1,251.71	-5,068.73	-888.41	1,811.80	10.00	7.09	-7.09
<b>LP *NEW*: 875ft FSL &amp; 600ft FWL of Sec 6 - Niobrara B2 Chalk Target Center</b>										
8,621.65	90.00	90.63	6,155.00	-1,252.00	-5,069.25	-866.77	1,830.70	10.00	7.12	-7.02
8,700.00	90.00	90.63	6,155.00	-1,252.00	-5,070.11	-788.43	1,898.60	0.00	0.00	0.00
8,800.00	90.00	90.63	6,155.00	-1,252.00	-5,071.20	-688.43	1,985.27	0.00	0.00	0.00
8,900.00	90.00	90.63	6,155.00	-1,252.00	-5,072.30	-588.44	2,071.93	0.00	0.00	0.00
9,000.00	90.00	90.63	6,155.00	-1,252.00	-5,073.40	-488.44	2,158.60	0.00	0.00	0.00
9,100.00	90.00	90.63	6,155.00	-1,252.00	-5,074.49	-388.45	2,245.27	0.00	0.00	0.00
9,200.00	90.00	90.63	6,155.00	-1,252.00	-5,075.59	-288.46	2,331.93	0.00	0.00	0.00
9,300.00	90.00	90.63	6,155.00	-1,252.00	-5,076.68	-188.46	2,418.60	0.00	0.00	0.00
9,400.00	90.00	90.63	6,155.00	-1,252.00	-5,077.78	-88.47	2,505.26	0.00	0.00	0.00
9,500.00	90.00	90.63	6,155.00	-1,252.00	-5,078.88	11.53	2,591.93	0.00	0.00	0.00
9,600.00	90.00	90.63	6,155.00	-1,252.00	-5,079.97	111.52	2,678.59	0.00	0.00	0.00
9,700.00	90.00	90.63	6,155.00	-1,252.00	-5,081.07	211.51	2,765.26	0.00	0.00	0.00
9,800.00	90.00	90.63	6,155.00	-1,252.00	-5,082.16	311.51	2,851.92	0.00	0.00	0.00
9,900.00	90.00	90.63	6,155.00	-1,252.00	-5,083.26	411.50	2,938.59	0.00	0.00	0.00
10,000.00	90.00	90.63	6,155.00	-1,252.00	-5,084.36	511.50	3,025.25	0.00	0.00	0.00
10,100.00	90.00	90.63	6,155.00	-1,252.00	-5,085.45	611.49	3,111.92	0.00	0.00	0.00
10,200.00	90.00	90.63	6,155.00	-1,252.00	-5,086.55	711.48	3,198.58	0.00	0.00	0.00
10,300.00	90.00	90.63	6,155.00	-1,252.00	-5,087.64	811.48	3,285.25	0.00	0.00	0.00
10,400.00	90.00	90.63	6,155.00	-1,252.00	-5,088.74	911.47	3,371.91	0.00	0.00	0.00
10,500.00	90.00	90.63	6,155.00	-1,252.00	-5,089.84	1,011.47	3,458.58	0.00	0.00	0.00
10,600.00	90.00	90.63	6,155.00	-1,252.00	-5,090.93	1,111.46	3,545.24	0.00	0.00	0.00
10,700.00	90.00	90.63	6,155.00	-1,252.00	-5,092.03	1,211.45	3,631.91	0.00	0.00	0.00
10,800.00	90.00	90.63	6,155.00	-1,252.00	-5,093.12	1,311.45	3,718.57	0.00	0.00	0.00
10,900.00	90.00	90.63	6,155.00	-1,252.00	-5,094.22	1,411.44	3,805.24	0.00	0.00	0.00
11,000.00	90.00	90.63	6,155.00	-1,252.00	-5,095.32	1,511.44	3,891.91	0.00	0.00	0.00
11,100.00	90.00	90.63	6,155.00	-1,252.00	-5,096.41	1,611.43	3,978.57	0.00	0.00	0.00
11,200.00	90.00	90.63	6,155.00	-1,252.00	-5,097.51	1,711.42	4,065.24	0.00	0.00	0.00
11,300.00	90.00	90.63	6,155.00	-1,252.00	-5,098.60	1,811.42	4,151.90	0.00	0.00	0.00
11,400.00	90.00	90.63	6,155.00	-1,252.00	-5,099.70	1,911.41	4,238.57	0.00	0.00	0.00
11,500.00	90.00	90.63	6,155.00	-1,252.00	-5,100.80	2,011.41	4,325.23	0.00	0.00	0.00
11,600.00	90.00	90.63	6,155.00	-1,252.00	-5,101.89	2,111.40	4,411.90	0.00	0.00	0.00
11,700.00	90.00	90.63	6,155.00	-1,252.00	-5,102.99	2,211.39	4,498.56	0.00	0.00	0.00
11,800.00	90.00	90.63	6,155.00	-1,252.00	-5,104.08	2,311.39	4,585.23	0.00	0.00	0.00
11,900.00	90.00	90.63	6,155.00	-1,252.00	-5,105.18	2,411.38	4,671.89	0.00	0.00	0.00
12,000.00	90.00	90.63	6,155.00	-1,252.00	-5,106.27	2,511.38	4,758.56	0.00	0.00	0.00
12,100.00	90.00	90.63	6,155.00	-1,252.00	-5,107.37	2,611.37	4,845.22	0.00	0.00	0.00
12,200.00	90.00	90.63	6,155.00	-1,252.00	-5,108.47	2,711.36	4,931.89	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-9HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-9HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

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)
12,300.00	90.00	90.63	6,155.00	-1,252.00	-5,109.56	2,811.36	5,018.55	0.00	0.00	0.00
12,400.00	90.00	90.63	6,155.00	-1,252.00	-5,110.66	2,911.35	5,105.22	0.00	0.00	0.00
12,500.00	90.00	90.63	6,155.00	-1,252.00	-5,111.75	3,011.35	5,191.88	0.00	0.00	0.00
12,600.00	90.00	90.63	6,155.00	-1,252.00	-5,112.85	3,111.34	5,278.55	0.00	0.00	0.00
12,700.00	90.00	90.63	6,155.00	-1,252.00	-5,113.95	3,211.33	5,365.21	0.00	0.00	0.00
12,800.00	90.00	90.63	6,155.00	-1,252.00	-5,115.04	3,311.33	5,451.88	0.00	0.00	0.00
12,900.00	90.00	90.63	6,155.00	-1,252.00	-5,116.14	3,411.32	5,538.55	0.00	0.00	0.00
13,000.00	90.00	90.63	6,155.00	-1,252.00	-5,117.23	3,511.32	5,625.21	0.00	0.00	0.00
13,100.00	90.00	90.63	6,155.00	-1,252.00	-5,118.33	3,611.31	5,711.88	0.00	0.00	0.00
13,200.00	90.00	90.63	6,155.00	-1,252.00	-5,119.43	3,711.30	5,798.54	0.00	0.00	0.00
13,300.00	90.00	90.63	6,155.00	-1,252.00	-5,120.52	3,811.30	5,885.21	0.00	0.00	0.00
13,400.00	90.00	90.63	6,155.00	-1,252.00	-5,121.62	3,911.29	5,971.87	0.00	0.00	0.00
13,500.00	90.00	90.63	6,155.00	-1,252.00	-5,122.71	4,011.29	6,058.54	0.00	0.00	0.00
13,600.00	90.00	90.63	6,155.00	-1,252.00	-5,123.81	4,111.28	6,145.20	0.00	0.00	0.00
13,700.00	90.00	90.63	6,155.00	-1,252.00	-5,124.91	4,211.27	6,231.87	0.00	0.00	0.00
13,800.00	90.00	90.63	6,155.00	-1,252.00	-5,126.00	4,311.27	6,318.53	0.00	0.00	0.00
13,900.00	90.00	90.63	6,155.00	-1,252.00	-5,127.10	4,411.26	6,405.20	0.00	0.00	0.00
14,000.00	90.00	90.63	6,155.00	-1,252.00	-5,128.19	4,511.26	6,491.86	0.00	0.00	0.00
14,100.00	90.00	90.63	6,155.00	-1,252.00	-5,129.29	4,611.25	6,578.53	0.00	0.00	0.00
14,200.00	90.00	90.63	6,155.00	-1,252.00	-5,130.39	4,711.24	6,665.19	0.00	0.00	0.00
14,300.00	90.00	90.63	6,155.00	-1,252.00	-5,131.48	4,811.24	6,751.86	0.00	0.00	0.00
14,400.00	90.00	90.63	6,155.00	-1,252.00	-5,132.58	4,911.23	6,838.52	0.00	0.00	0.00
14,500.00	90.00	90.63	6,155.00	-1,252.00	-5,133.67	5,011.23	6,925.19	0.00	0.00	0.00
14,600.00	90.00	90.63	6,155.00	-1,252.00	-5,134.77	5,111.22	7,011.85	0.00	0.00	0.00
14,700.00	90.00	90.63	6,155.00	-1,252.00	-5,135.87	5,211.21	7,098.52	0.00	0.00	0.00
14,800.00	90.00	90.63	6,155.00	-1,252.00	-5,136.96	5,311.21	7,185.18	0.00	0.00	0.00
14,900.00	90.00	90.63	6,155.00	-1,252.00	-5,138.06	5,411.20	7,271.85	0.00	0.00	0.00
15,000.00	90.00	90.63	6,155.00	-1,252.00	-5,139.15	5,511.20	7,358.52	0.00	0.00	0.00
15,100.00	90.00	90.63	6,155.00	-1,252.00	-5,140.25	5,611.19	7,445.18	0.00	0.00	0.00
15,200.00	90.00	90.63	6,155.00	-1,252.00	-5,141.35	5,711.18	7,531.85	0.00	0.00	0.00
15,300.00	90.00	90.63	6,155.00	-1,252.00	-5,142.44	5,811.18	7,618.51	0.00	0.00	0.00
15,400.00	90.00	90.63	6,155.00	-1,252.00	-5,143.54	5,911.17	7,705.18	0.00	0.00	0.00
15,500.00	90.00	90.63	6,155.00	-1,252.00	-5,144.63	6,011.17	7,791.84	0.00	0.00	0.00
15,600.00	90.00	90.63	6,155.00	-1,252.00	-5,145.73	6,111.16	7,878.51	0.00	0.00	0.00
15,700.00	90.00	90.63	6,155.00	-1,252.00	-5,146.82	6,211.15	7,965.17	0.00	0.00	0.00
15,800.00	90.00	90.63	6,155.00	-1,252.00	-5,147.92	6,311.15	8,051.84	0.00	0.00	0.00
15,900.00	90.00	90.63	6,155.00	-1,252.00	-5,149.02	6,411.14	8,138.50	0.00	0.00	0.00
16,000.00	90.00	90.63	6,155.00	-1,252.00	-5,150.11	6,511.14	8,225.17	0.00	0.00	0.00
16,100.00	90.00	90.63	6,155.00	-1,252.00	-5,151.21	6,611.13	8,311.83	0.00	0.00	0.00
16,200.00	90.00	90.63	6,155.00	-1,252.00	-5,152.30	6,711.12	8,398.50	0.00	0.00	0.00
16,300.00	90.00	90.63	6,155.00	-1,252.00	-5,153.40	6,811.12	8,485.16	0.00	0.00	0.00
16,400.00	90.00	90.63	6,155.00	-1,252.00	-5,154.50	6,911.11	8,571.83	0.00	0.00	0.00
16,500.00	90.00	90.63	6,155.00	-1,252.00	-5,155.59	7,011.11	8,658.49	0.00	0.00	0.00
16,600.00	90.00	90.63	6,155.00	-1,252.00	-5,156.69	7,111.10	8,745.16	0.00	0.00	0.00
16,700.00	90.00	90.63	6,155.00	-1,252.00	-5,157.78	7,211.09	8,831.82	0.00	0.00	0.00
16,800.00	90.00	90.63	6,155.00	-1,252.00	-5,158.88	7,311.09	8,918.49	0.00	0.00	0.00
16,900.00	90.00	90.63	6,155.00	-1,252.00	-5,159.98	7,411.08	9,005.16	0.00	0.00	0.00
17,000.00	90.00	90.63	6,155.00	-1,252.00	-5,161.07	7,511.08	9,091.82	0.00	0.00	0.00
17,100.00	90.00	90.63	6,155.00	-1,252.00	-5,162.17	7,611.07	9,178.49	0.00	0.00	0.00
17,200.00	90.00	90.63	6,155.00	-1,252.00	-5,163.26	7,711.06	9,265.15	0.00	0.00	0.00
17,300.00	90.00	90.63	6,155.00	-1,252.00	-5,164.36	7,811.06	9,351.82	0.00	0.00	0.00
17,400.00	90.00	90.63	6,155.00	-1,252.00	-5,165.46	7,911.05	9,438.48	0.00	0.00	0.00
17,500.00	90.00	90.63	6,155.00	-1,252.00	-5,166.55	8,011.05	9,525.15	0.00	0.00	0.00
17,600.00	90.00	90.63	6,155.00	-1,252.00	-5,167.65	8,111.04	9,611.81	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	Database 1	<b>Local Co-ordinate Reference:</b>	Well ANDERSON FED 6-5-9HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 4903.00usft
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB 25' @ 4903.00usft
<b>Site:</b>	SE SW SEC. 31 T9N R59W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	ANDERSON FED 6-5-9HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #2		

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)
17,700.00	90.00	90.63	6,155.00	-1,252.00	-5,168.74	8,211.03	9,698.48	0.00	0.00	0.00
17,800.00	90.00	90.63	6,155.00	-1,252.00	-5,169.84	8,311.03	9,785.14	0.00	0.00	0.00
17,900.00	90.00	90.63	6,155.00	-1,252.00	-5,170.94	8,411.02	9,871.81	0.00	0.00	0.00
18,000.00	90.00	90.63	6,155.00	-1,252.00	-5,172.03	8,511.02	9,958.47	0.00	0.00	0.00
18,100.00	90.00	90.63	6,155.00	-1,252.00	-5,173.13	8,611.01	10,045.14	0.00	0.00	0.00
18,200.00	90.00	90.63	6,155.00	-1,252.00	-5,174.22	8,711.00	10,131.80	0.00	0.00	0.00
<b>BHL: 875ft FSL &amp; 300ft FEL of Sec 5</b>										
<b>18,254.50</b>	<b>90.00</b>	<b>90.63</b>	<b>6,155.00</b>	<b>-1,252.00</b>	<b>-5,174.82</b>	<b>8,765.50</b>	<b>10,179.03</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Formations						
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
470.91	470.00	Fox Hills Base				
1,612.22	1,487.00	Pierre Shale Top				
4,196.58	3,290.00	Richard Sandstone				
4,390.35	3,425.00	Parkman Sandstone				
5,376.42	4,112.00	Sussex Sandstone				
6,046.72	4,579.00	Shannon Sandstone				
7,150.49	5,348.00	TeePee Buttes				
8,034.61	5,959.00	Sharon Springs				
8,101.22	5,998.00	Niobrara Top				
8,156.87	6,028.00	Niobrara A Chalk				
8,205.37	6,052.00	Niobrara A Chalk Base				
8,293.72	6,090.00	Niobrara B1 Chalk Top				
8,346.91	6,109.00	Niobrara B1 Chalk Base				
8,450.80	6,137.00	Niobrara B2 Chalk Target Top				
8,621.65	6,155.00	Niobrara B2 Chalk Target Center				

Plan Annotations					
MD (usft)	TVD (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
0.00	0.00	0.00	0.00	SHL: 542ft FSL & 1909ft FWL of Sec 31	
200.00	200.00	0.00	0.00	START NUDGE (3°/100ft BUR)	
1,727.89	1,570.05	-553.17	-171.84	EOB TO 45.84° INC	
7,603.19	5,663.40	-4,578.13	-1,422.18	KOP (10°/100ft DGLG)	
8,621.65	6,155.00	-5,069.25	-866.77	LP *NEW*: 875ft FSL & 600ft FWL of Sec 6	
18,254.50	6,155.00	-5,174.82	8,765.50	BHL: 875ft FSL & 300ft FEL of Sec 5	