

# **MALLARD EXPLORATION**

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

**NW NW SEC. 29 T8N R60W 6th P.M.**

**SHOVELER FED 29-32-16HN**

**ORIGINAL WELLBORE**

**29 August, 2017**

**Plan: PROPOSAL #1**



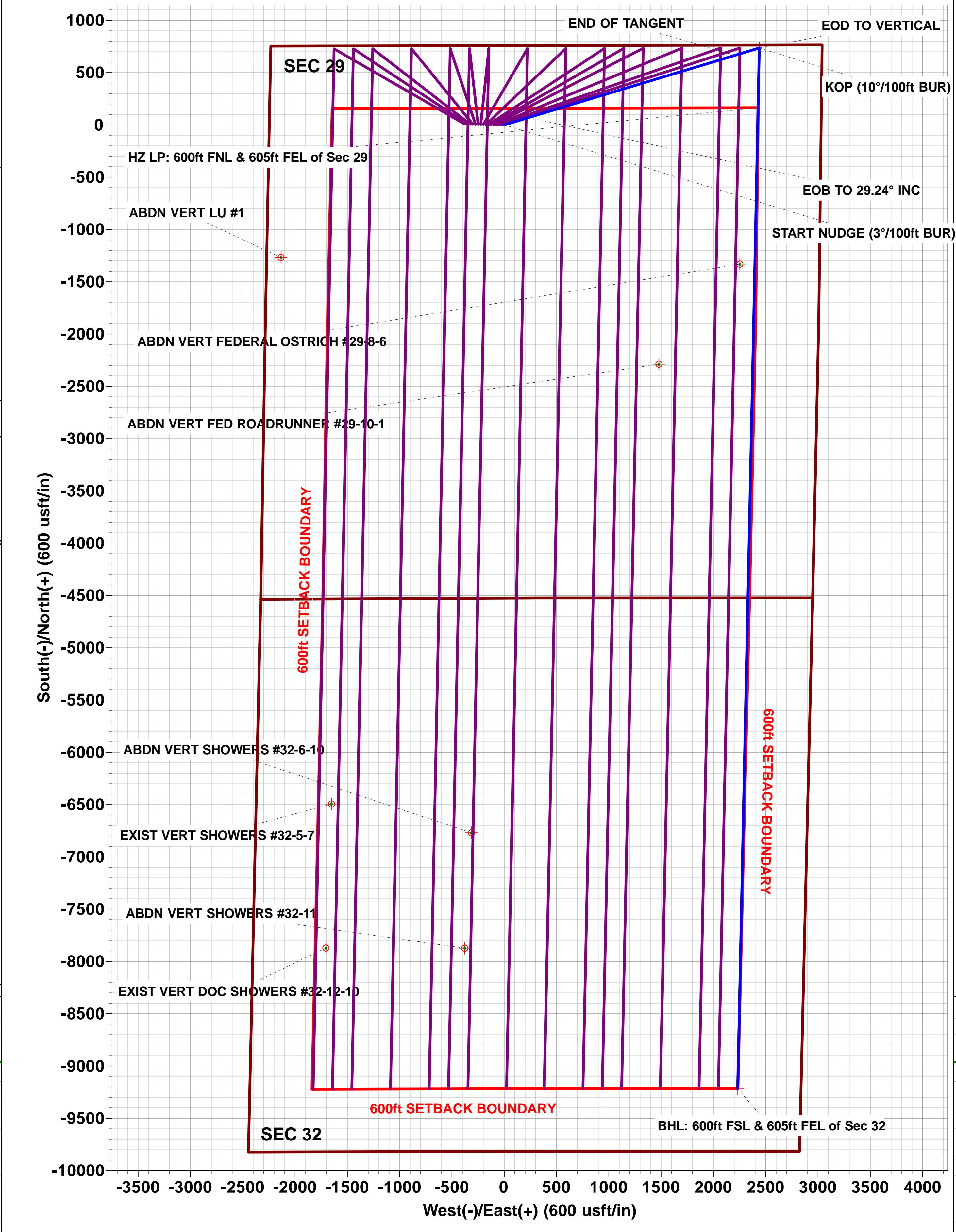
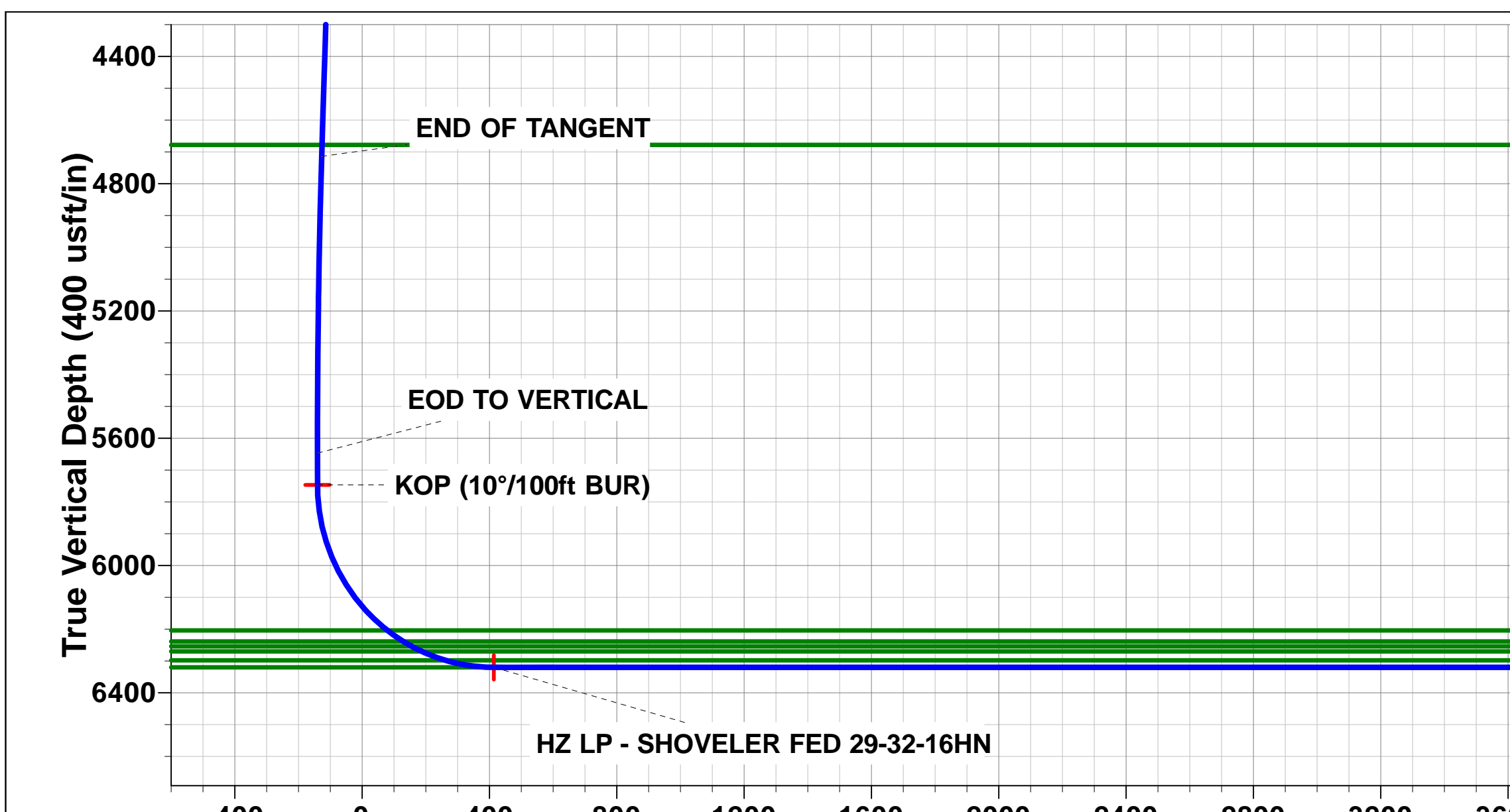
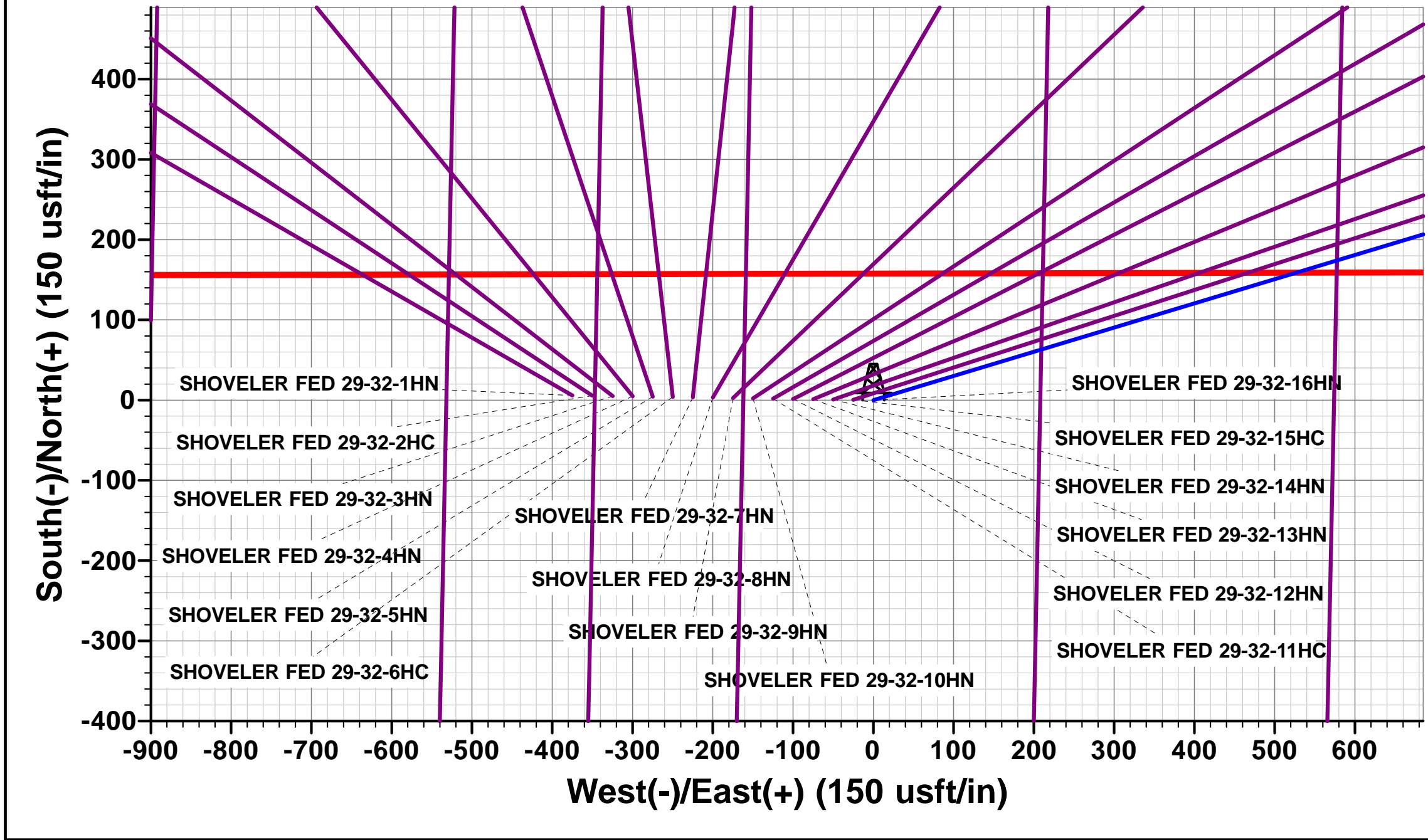
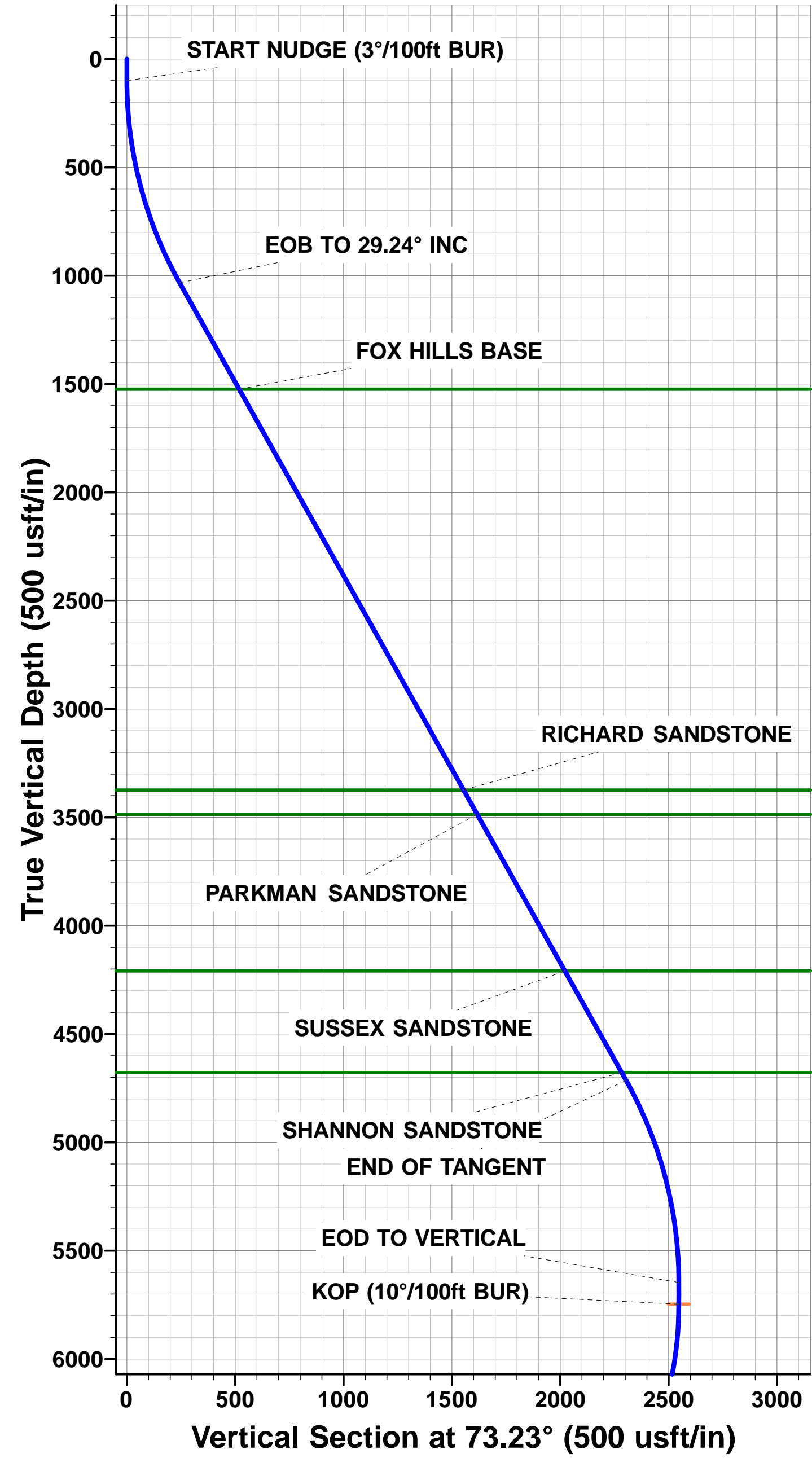


Project: WELD COUNTY, COLORADO (NAD 83)  
Site: NW NW SEC. 29 T8N R60W 6th P.M.  
Well: SHOVELER FED 29-32-16HN  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #1

ANNOTATIONS										
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation		
0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0	SHL: 757ft FNL & 2247ft FWL of Sec 29		
100.0	100.0	0.00	0.00	0.0	0.0	0.0	0.0	START NUDGE (3°/100ft BUR)		
1032.9	1074.6	29.24	73.23	70.2	233.0	-13.4	243.3	EOB TO 29.24° INC		
4714.1	5293.4	29.24	73.23	664.9	2205.9	-126.9	2304.0	END OF TANGENT		
5647.0	6268.0	0.00	0.00	735.1	2438.9	-140.3	2547.3	EOD TO VERTICAL		
5747.0	6368.0	0.00	0.00	735.1	2438.9	-140.3	2547.3	KOP (10°/100ft BUR)		
6320.0	7268.0	90.00	181.19	162.3	2427.0	413.7	3120.2	HZ LP: 600ft FNL & 605ft FEL of Sec 29		
6320.0	16648.2	90.00	181.19	-9215.9	2232.2	9482.3	12500.4	BHL: 600ft FSL & 605ft FEL of Sec 32		

PROPOSED LOCAL COORDINATES:  
  
SHL: 757ft FNL & 2247ft FWL Sec 29  
  
HZ LP: 600ft FNL & 605ft FEL Sec 29  
  
BHL: 600ft FSL & 605ft FEL of Sec 32

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - SHOVELER FED 29-32-16HN	5747.0	735.1	2438.9	40.640453	-104.108494
HZ LP - SHOVELER FED 29-32-16HN	6320.0	162.3	2427.0	40.638881	-104.108537
BHL - SHOVELER FED 29-32-16HN	6320.0	-9215.9	2232.2	40.613140	-104.109242



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-16HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-16HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

<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>	NW NW SEC. 29 T8N R60W 6th P.M.		
<b>Site Position:</b>		<b>Northing:</b>	1,478,416.23 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,383,356.26 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	1.10000 ft
		<b>Latitude:</b>	40.638452
		<b>Longitude:</b>	-104.118633
		<b>Grid Convergence:</b>	0.89 °

<b>Well</b>	SHOVELER FED 29-32-16HN		
<b>Well Position</b>	<b>+N-S</b>	-5.8 usft	<b>Northing:</b>
	<b>+E-W</b>	375.0 usft	<b>Easting:</b>
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

<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	29/08/2017	7.86	67.14	52,558

<b>Design</b>	PROPOSAL #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>
	6,320.0	0.0	0.0	166.38

<b>Plan Sections</b>											
MD (usft)	Inc (°)	Azi (°)	Vertical Depth	SS (usft)	+N-S (usft)	+E-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	-4,963.0	0.0	0.0	0.00	0.00	0.00	0.00	
100.0	0.00	0.00	100.0	-4,863.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,074.6	29.24	73.23	1,032.9	-3,930.1	70.2	233.0	3.00	3.00	0.00	73.23	
5,293.4	29.24	73.23	4,714.1	-248.9	664.9	2,205.9	0.00	0.00	0.00	0.00	
6,268.0	0.00	0.00	5,647.0	684.0	735.1	2,438.9	3.00	-3.00	0.00	180.00	
6,368.0	0.00	0.00	5,747.0	784.0	735.1	2,438.9	0.00	0.00	0.00	0.00	KOP - SHOVELER
7,268.0	90.00	181.19	6,320.0	1,357.0	162.3	2,427.0	10.00	10.00	-19.87	181.19	HZ LP - SHOVELER
16,648.2	90.00	181.19	6,320.0	1,357.0	-9,215.9	2,232.2	0.00	0.00	0.00	52.71	BHL - SHOVELER

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-16HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-16HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>SHL: 757ft FNL &amp; 2247ft FWL of Sec 29</b>										
0.0	0.00	0.00	0.0	4,963.00	0.0	0.0	0.0	0.00	0.00	0.00
<b>START NUDGE (3°/100ft BUR)</b>										
100.0	0.00	0.00	100.0	4,863.00	0.0	0.0	0.0	0.00	0.00	0.00
200.0	3.00	73.23	200.0	4,763.05	0.8	2.5	-0.1	3.00	3.00	0.00
300.0	6.00	73.23	299.6	4,663.37	3.0	10.0	-0.6	3.00	3.00	0.00
400.0	9.00	73.23	398.8	4,564.23	6.8	22.5	-1.3	3.00	3.00	0.00
500.0	12.00	73.23	497.1	4,465.92	12.0	40.0	-2.3	3.00	3.00	0.00
600.0	15.00	73.23	594.3	4,368.69	18.8	62.3	-3.6	3.00	3.00	0.00
700.0	18.00	73.23	690.2	4,272.82	27.0	89.5	-5.1	3.00	3.00	0.00
800.0	21.00	73.23	784.4	4,178.57	36.6	121.5	-7.0	3.00	3.00	0.00
900.0	24.00	73.23	876.8	4,086.19	47.6	158.1	-9.1	3.00	3.00	0.00
1,000.0	27.00	73.23	967.1	3,995.94	60.1	199.3	-11.5	3.00	3.00	0.00
<b>EOB TO 29.24° INC</b>										
1,074.6	29.24	73.23	1,032.9	3,930.14	70.2	233.0	-13.4	3.00	3.00	0.00
1,100.0	29.24	73.23	1,055.0	3,907.99	73.8	244.8	-14.1	0.00	0.00	0.00
1,200.0	29.24	73.23	1,142.3	3,820.73	87.9	291.6	-16.8	0.00	0.00	0.00
1,300.0	29.24	73.23	1,229.5	3,733.47	102.0	338.4	-19.5	0.00	0.00	0.00
1,400.0	29.24	73.23	1,316.8	3,646.21	116.1	385.1	-22.2	0.00	0.00	0.00
1,500.0	29.24	73.23	1,404.1	3,558.95	130.2	431.9	-24.8	0.00	0.00	0.00
1,600.0	29.24	73.23	1,491.3	3,471.69	144.3	478.7	-27.5	0.00	0.00	0.00
<b>FOX HILLS BASE</b>										
1,637.5	29.24	73.23	1,524.0	3,439.00	149.6	496.2	-28.5	0.00	0.00	0.00
1,700.0	29.24	73.23	1,578.6	3,384.43	158.4	525.4	-30.2	0.00	0.00	0.00
1,800.0	29.24	73.23	1,665.8	3,297.17	172.5	572.2	-32.9	0.00	0.00	0.00
1,900.0	29.24	73.23	1,753.1	3,209.91	186.6	619.0	-35.6	0.00	0.00	0.00
2,000.0	29.24	73.23	1,840.3	3,122.65	200.7	665.7	-38.3	0.00	0.00	0.00
2,100.0	29.24	73.23	1,927.6	3,035.39	214.8	712.5	-41.0	0.00	0.00	0.00
2,200.0	29.24	73.23	2,014.9	2,948.13	228.8	759.3	-43.7	0.00	0.00	0.00
2,300.0	29.24	73.23	2,102.1	2,860.87	242.9	806.0	-46.4	0.00	0.00	0.00
2,400.0	29.24	73.23	2,189.4	2,773.61	257.0	852.8	-49.1	0.00	0.00	0.00
2,500.0	29.24	73.23	2,276.6	2,686.35	271.1	899.6	-51.7	0.00	0.00	0.00
2,600.0	29.24	73.23	2,363.9	2,599.09	285.2	946.3	-54.4	0.00	0.00	0.00
2,700.0	29.24	73.23	2,451.2	2,511.83	299.3	993.1	-57.1	0.00	0.00	0.00
2,800.0	29.24	73.23	2,538.4	2,424.57	313.4	1,039.9	-59.8	0.00	0.00	0.00
2,900.0	29.24	73.23	2,625.7	2,337.31	327.5	1,086.6	-62.5	0.00	0.00	0.00
3,000.0	29.24	73.23	2,712.9	2,250.05	341.6	1,133.4	-65.2	0.00	0.00	0.00
3,100.0	29.24	73.23	2,800.2	2,162.79	355.7	1,180.2	-67.9	0.00	0.00	0.00
3,200.0	29.24	73.23	2,887.5	2,075.53	369.8	1,226.9	-70.6	0.00	0.00	0.00
3,300.0	29.24	73.23	2,974.7	1,988.28	383.9	1,273.7	-73.3	0.00	0.00	0.00
3,400.0	29.24	73.23	3,062.0	1,901.02	398.0	1,320.5	-76.0	0.00	0.00	0.00
3,500.0	29.24	73.23	3,149.2	1,813.76	412.1	1,367.2	-78.7	0.00	0.00	0.00
3,600.0	29.24	73.23	3,236.5	1,726.50	426.2	1,414.0	-81.3	0.00	0.00	0.00
3,700.0	29.24	73.23	3,323.8	1,639.24	440.3	1,460.8	-84.0	0.00	0.00	0.00
<b>RICHARD SANDSTONE</b>										
3,757.6	29.24	73.23	3,374.0	1,589.00	448.4	1,487.7	-85.6	0.00	0.00	0.00
3,800.0	29.24	73.23	3,411.0	1,551.98	454.4	1,507.5	-86.7	0.00	0.00	0.00
<b>PARKMAN SANDSTONE</b>										
3,885.9	29.24	73.23	3,486.0	1,477.00	466.5	1,547.7	-89.0	0.00	0.00	0.00
3,900.0	29.24	73.23	3,498.3	1,464.72	468.5	1,554.3	-89.4	0.00	0.00	0.00
4,000.0	29.24	73.23	3,585.5	1,377.46	482.6	1,601.1	-92.1	0.00	0.00	0.00
4,100.0	29.24	73.23	3,672.8	1,290.20	496.7	1,647.8	-94.8	0.00	0.00	0.00
4,200.0	29.24	73.23	3,760.1	1,202.94	510.8	1,694.6	-97.5	0.00	0.00	0.00



# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-16HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-16HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

## Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,300.0	29.24	73.23	3,847.3	1,115.68	524.9	1,741.4	-100.2	0.00	0.00	0.00
4,400.0	29.24	73.23	3,934.6	1,028.42	539.0	1,788.1	-102.9	0.00	0.00	0.00
4,500.0	29.24	73.23	4,021.8	941.16	553.0	1,834.9	-105.6	0.00	0.00	0.00
4,600.0	29.24	73.23	4,109.1	853.90	567.1	1,881.7	-108.2	0.00	0.00	0.00
4,700.0	29.24	73.23	4,196.4	766.64	581.2	1,928.4	-110.9	0.00	0.00	0.00
<b>SUSSEX SANDSTONE</b>										
4,714.5	29.24	73.23	4,209.0	754.00	583.3	1,935.2	-111.3	0.00	0.00	0.00
4,800.0	29.24	73.23	4,283.6	679.38	595.3	1,975.2	-113.6	0.00	0.00	0.00
4,900.0	29.24	73.23	4,370.9	592.12	609.4	2,022.0	-116.3	0.00	0.00	0.00
5,000.0	29.24	73.23	4,458.1	504.86	623.5	2,068.7	-119.0	0.00	0.00	0.00
5,100.0	29.24	73.23	4,545.4	417.60	637.6	2,115.5	-121.7	0.00	0.00	0.00
5,200.0	29.24	73.23	4,632.7	330.34	651.7	2,162.3	-124.4	0.00	0.00	0.00
<b>SHANNON SANDSTONE</b>										
5,252.0	29.24	73.23	4,678.0	285.00	659.0	2,186.6	-125.8	0.00	0.00	0.00
<b>END OF TANGENT</b>										
5,293.4	29.24	73.23	4,714.1	248.86	664.9	2,205.9	-126.9	0.00	0.00	0.00
5,300.0	29.04	73.23	4,719.9	243.08	665.8	2,209.0	-127.1	3.00	-3.00	0.00
5,400.0	26.04	73.23	4,808.6	154.42	679.2	2,253.3	-129.6	3.00	-3.00	0.00
5,500.0	23.04	73.23	4,899.5	63.46	691.1	2,293.0	-131.9	3.00	-3.00	0.00
5,600.0	20.04	73.23	4,992.5	-29.54	701.7	2,328.2	-133.9	3.00	-3.00	0.00
5,700.0	17.04	73.23	5,087.3	-124.34	710.9	2,358.6	-135.7	3.00	-3.00	0.00
5,800.0	14.04	73.23	5,183.7	-220.68	718.6	2,384.3	-137.2	3.00	-3.00	0.00
5,900.0	11.04	73.23	5,281.3	-318.28	724.9	2,405.1	-138.4	3.00	-3.00	0.00
6,000.0	8.04	73.23	5,379.9	-416.89	729.7	2,420.9	-139.3	3.00	-3.00	0.00
6,100.0	5.04	73.23	5,479.2	-516.22	733.0	2,431.8	-139.9	3.00	-3.00	0.00
6,200.0	2.04	73.23	5,579.0	-616.02	734.8	2,437.7	-140.2	3.00	-3.00	0.00
<b>EOD TO VERTICAL</b>										
6,268.0	0.00	0.00	5,647.0	-684.00	735.1	2,438.9	-140.3	3.00	-3.00	0.00
6,300.0	0.00	0.00	5,679.0	-716.01	735.1	2,438.9	-140.3	0.00	0.00	0.00
<b>KOP (10°/100ft BUR)</b>										
6,368.0	0.00	0.00	5,747.0	-784.00	735.1	2,438.9	-140.3	0.00	0.00	0.00
6,400.0	3.20	181.19	5,779.0	-815.99	734.2	2,438.9	-139.4	10.00	10.00	0.00
6,500.0	13.20	181.19	5,877.8	-914.84	720.0	2,438.6	-125.7	10.00	10.00	0.00
6,600.0	23.20	181.19	5,972.7	-1,009.72	688.8	2,437.9	-95.5	10.00	10.00	0.00
6,700.0	33.20	181.19	6,060.7	-1,097.74	641.6	2,437.0	-49.9	10.00	10.00	0.00
6,800.0	43.20	181.19	6,139.2	-1,176.23	579.8	2,435.7	9.8	10.00	10.00	0.00
<b>SHARON SPRINGS</b>										
6,897.0	52.90	181.19	6,204.0	-1,241.00	507.8	2,434.2	79.5	10.00	10.00	0.00
6,900.0	53.20	181.19	6,205.8	-1,242.80	505.4	2,434.1	81.8	10.00	10.00	0.00
<b>NIOBRARA A CHALK</b>										
6,959.7	59.16	181.19	6,239.0	-1,276.00	455.9	2,433.1	129.7	10.00	10.00	0.00
<b>NIOBRARA A CHALK BASE</b>										
6,990.3	62.23	181.19	6,254.0	-1,291.00	429.1	2,432.6	155.6	10.00	10.00	0.00
7,000.0	63.20	181.19	6,258.4	-1,295.43	420.6	2,432.4	163.9	10.00	10.00	0.00
<b>NIOBRARA B1 CHALK TOP</b>										
7,026.9	65.89	181.19	6,270.0	-1,307.00	396.3	2,431.9	187.4	10.00	10.00	0.00
7,100.0	73.20	181.19	6,295.5	-1,332.53	327.8	2,430.5	253.5	10.00	10.00	0.00
<b>NIOBRARA B1 CHALK BASE</b>										
7,108.8	74.07	181.19	6,298.0	-1,335.00	319.4	2,430.3	261.6	10.00	10.00	0.00
7,200.0	83.19	181.19	6,316.0	-1,352.96	230.1	2,428.4	348.0	10.00	10.00	0.00
<b>HZ LP: 600ft FNL &amp; 605ft FEL of Sec 29 - NIOBRARA B2 CHALK TOP</b>										
7,268.0	90.00	181.19	6,320.0	-1,357.00	162.3	2,427.0	413.7	10.00	10.00	0.00
7,300.0	90.00	181.19	6,320.0	-1,357.00	130.3	2,426.4	444.6	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-16HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-16HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,400.0	90.00	181.19	6,320.0	-1,357.01	30.3	2,424.3	541.2	0.00	0.00	0.00
7,500.0	90.00	181.19	6,320.0	-1,357.01	-69.7	2,422.2	637.9	0.00	0.00	0.00
7,600.0	90.00	181.19	6,320.0	-1,357.02	-169.6	2,420.2	734.6	0.00	0.00	0.00
7,700.0	90.00	181.19	6,320.0	-1,357.02	-269.6	2,418.1	831.3	0.00	0.00	0.00
7,800.0	90.00	181.19	6,320.0	-1,357.03	-369.6	2,416.0	928.0	0.00	0.00	0.00
7,900.0	90.00	181.19	6,320.0	-1,357.03	-469.6	2,414.0	1,024.7	0.00	0.00	0.00
8,000.0	90.00	181.19	6,320.0	-1,357.04	-569.6	2,411.9	1,121.3	0.00	0.00	0.00
8,100.0	90.00	181.19	6,320.0	-1,357.04	-669.5	2,409.8	1,218.0	0.00	0.00	0.00
8,200.0	90.00	181.19	6,320.0	-1,357.04	-769.5	2,407.7	1,314.7	0.00	0.00	0.00
8,300.0	90.00	181.19	6,320.0	-1,357.05	-869.5	2,405.7	1,411.4	0.00	0.00	0.00
8,400.0	90.00	181.19	6,320.1	-1,357.05	-969.5	2,403.6	1,508.1	0.00	0.00	0.00
8,500.0	90.00	181.19	6,320.1	-1,357.06	-1,069.5	2,401.5	1,604.7	0.00	0.00	0.00
8,600.0	90.00	181.19	6,320.1	-1,357.06	-1,169.4	2,399.5	1,701.4	0.00	0.00	0.00
8,700.0	90.00	181.19	6,320.1	-1,357.06	-1,269.4	2,397.4	1,798.1	0.00	0.00	0.00
8,800.0	90.00	181.19	6,320.1	-1,357.07	-1,369.4	2,395.3	1,894.8	0.00	0.00	0.00
8,900.0	90.00	181.19	6,320.1	-1,357.07	-1,469.4	2,393.2	1,991.5	0.00	0.00	0.00
9,000.0	90.00	181.19	6,320.1	-1,357.07	-1,569.3	2,391.2	2,088.1	0.00	0.00	0.00
9,100.0	90.00	181.19	6,320.1	-1,357.08	-1,669.3	2,389.1	2,184.8	0.00	0.00	0.00
9,200.0	90.00	181.19	6,320.1	-1,357.08	-1,769.3	2,387.0	2,281.5	0.00	0.00	0.00
9,300.0	90.00	181.19	6,320.1	-1,357.08	-1,869.3	2,384.9	2,378.2	0.00	0.00	0.00
9,400.0	90.00	181.19	6,320.1	-1,357.09	-1,969.3	2,382.9	2,474.9	0.00	0.00	0.00
9,500.0	90.00	181.19	6,320.1	-1,357.09	-2,069.2	2,380.8	2,571.5	0.00	0.00	0.00
9,600.0	90.00	181.19	6,320.1	-1,357.09	-2,169.2	2,378.7	2,668.2	0.00	0.00	0.00
9,700.0	90.00	181.19	6,320.1	-1,357.09	-2,269.2	2,376.7	2,764.9	0.00	0.00	0.00
9,800.0	90.00	181.19	6,320.1	-1,357.10	-2,369.2	2,374.6	2,861.6	0.00	0.00	0.00
9,900.0	90.00	181.19	6,320.1	-1,357.10	-2,469.2	2,372.5	2,958.3	0.00	0.00	0.00
10,000.0	90.00	181.19	6,320.1	-1,357.10	-2,569.1	2,370.4	3,055.0	0.00	0.00	0.00
10,100.0	90.00	181.19	6,320.1	-1,357.10	-2,669.1	2,368.4	3,151.6	0.00	0.00	0.00
10,200.0	90.00	181.19	6,320.1	-1,357.11	-2,769.1	2,366.3	3,248.3	0.00	0.00	0.00
10,300.0	90.00	181.19	6,320.1	-1,357.11	-2,869.1	2,364.2	3,345.0	0.00	0.00	0.00
10,400.0	90.00	181.19	6,320.1	-1,357.11	-2,969.0	2,362.1	3,441.7	0.00	0.00	0.00
10,500.0	90.00	181.19	6,320.1	-1,357.11	-3,069.0	2,360.1	3,538.4	0.00	0.00	0.00
10,600.0	90.00	181.19	6,320.1	-1,357.11	-3,169.0	2,358.0	3,635.0	0.00	0.00	0.00
10,700.0	90.00	181.19	6,320.1	-1,357.11	-3,269.0	2,355.9	3,731.7	0.00	0.00	0.00
10,800.0	90.00	181.19	6,320.1	-1,357.12	-3,369.0	2,353.8	3,828.4	0.00	0.00	0.00
10,900.0	90.00	181.19	6,320.1	-1,357.12	-3,468.9	2,351.8	3,925.1	0.00	0.00	0.00
11,000.0	90.00	181.19	6,320.1	-1,357.12	-3,568.9	2,349.7	4,021.8	0.00	0.00	0.00
11,100.0	90.00	181.19	6,320.1	-1,357.12	-3,668.9	2,347.6	4,118.4	0.00	0.00	0.00
11,200.0	90.00	181.19	6,320.1	-1,357.12	-3,768.9	2,345.5	4,215.1	0.00	0.00	0.00
11,300.0	90.00	181.19	6,320.1	-1,357.12	-3,868.9	2,343.5	4,311.8	0.00	0.00	0.00
11,400.0	90.00	181.19	6,320.1	-1,357.12	-3,968.8	2,341.4	4,408.5	0.00	0.00	0.00
11,500.0	90.00	181.19	6,320.1	-1,357.12	-4,068.8	2,339.3	4,505.2	0.00	0.00	0.00
11,600.0	90.00	181.19	6,320.1	-1,357.12	-4,168.8	2,337.2	4,601.8	0.00	0.00	0.00
11,700.0	90.00	181.19	6,320.1	-1,357.12	-4,268.8	2,335.2	4,698.5	0.00	0.00	0.00
11,800.0	90.00	181.19	6,320.1	-1,357.12	-4,368.7	2,333.1	4,795.2	0.00	0.00	0.00
11,900.0	90.00	181.19	6,320.1	-1,357.12	-4,468.7	2,331.0	4,891.9	0.00	0.00	0.00
12,000.0	90.00	181.19	6,320.1	-1,357.12	-4,568.7	2,328.9	4,988.6	0.00	0.00	0.00
12,100.0	90.00	181.19	6,320.1	-1,357.12	-4,668.7	2,326.8	5,085.2	0.00	0.00	0.00
12,200.0	90.00	181.19	6,320.1	-1,357.12	-4,768.7	2,324.8	5,181.9	0.00	0.00	0.00
12,300.0	90.00	181.19	6,320.1	-1,357.12	-4,868.6	2,322.7	5,278.6	0.00	0.00	0.00
12,400.0	90.00	181.19	6,320.1	-1,357.12	-4,968.6	2,320.6	5,375.3	0.00	0.00	0.00
12,500.0	90.00	181.19	6,320.1	-1,357.12	-5,068.6	2,318.5	5,472.0	0.00	0.00	0.00
12,600.0	90.00	181.19	6,320.1	-1,357.12	-5,168.6	2,316.5	5,568.6	0.00	0.00	0.00
12,700.0	90.00	181.19	6,320.1	-1,357.12	-5,268.6	2,314.4	5,665.3	0.00	0.00	0.00

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-16HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-16HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	SS (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,800.0	90.00	181.19	6,320.1	-1,357.12	-5,368.5	2,312.3	5,762.0	0.00	0.00	0.00
12,900.0	90.00	181.19	6,320.1	-1,357.12	-5,468.5	2,310.2	5,858.7	0.00	0.00	0.00
13,000.0	90.00	181.19	6,320.1	-1,357.12	-5,568.5	2,308.1	5,955.4	0.00	0.00	0.00
13,100.0	90.00	181.19	6,320.1	-1,357.12	-5,668.5	2,306.1	6,052.0	0.00	0.00	0.00
13,200.0	90.00	181.19	6,320.1	-1,357.11	-5,768.4	2,304.0	6,148.7	0.00	0.00	0.00
13,300.0	90.00	181.19	6,320.1	-1,357.11	-5,868.4	2,301.9	6,245.4	0.00	0.00	0.00
13,400.0	90.00	181.19	6,320.1	-1,357.11	-5,968.4	2,299.8	6,342.1	0.00	0.00	0.00
13,500.0	90.00	181.19	6,320.1	-1,357.11	-6,068.4	2,297.8	6,438.7	0.00	0.00	0.00
13,600.0	90.00	181.19	6,320.1	-1,357.11	-6,168.4	2,295.7	6,535.4	0.00	0.00	0.00
13,700.0	90.00	181.19	6,320.1	-1,357.11	-6,268.3	2,293.6	6,632.1	0.00	0.00	0.00
13,800.0	90.00	181.19	6,320.1	-1,357.10	-6,368.3	2,291.5	6,728.8	0.00	0.00	0.00
13,900.0	90.00	181.19	6,320.1	-1,357.10	-6,468.3	2,289.4	6,825.5	0.00	0.00	0.00
14,000.0	90.00	181.19	6,320.1	-1,357.10	-6,568.3	2,287.4	6,922.1	0.00	0.00	0.00
14,100.0	90.00	181.19	6,320.1	-1,357.10	-6,668.2	2,285.3	7,018.8	0.00	0.00	0.00
14,200.0	90.00	181.19	6,320.1	-1,357.10	-6,768.2	2,283.2	7,115.5	0.00	0.00	0.00
14,300.0	90.00	181.19	6,320.1	-1,357.09	-6,868.2	2,281.1	7,212.2	0.00	0.00	0.00
14,400.0	90.00	181.19	6,320.1	-1,357.09	-6,968.2	2,279.0	7,308.9	0.00	0.00	0.00
14,500.0	90.00	181.19	6,320.1	-1,357.09	-7,068.2	2,277.0	7,405.5	0.00	0.00	0.00
14,600.0	90.00	181.19	6,320.1	-1,357.08	-7,168.1	2,274.9	7,502.2	0.00	0.00	0.00
14,700.0	90.00	181.19	6,320.1	-1,357.08	-7,268.1	2,272.8	7,598.9	0.00	0.00	0.00
14,800.0	90.00	181.19	6,320.1	-1,357.08	-7,368.1	2,270.7	7,695.6	0.00	0.00	0.00
14,900.0	90.00	181.19	6,320.1	-1,357.07	-7,468.1	2,268.6	7,792.3	0.00	0.00	0.00
15,000.0	90.00	181.19	6,320.1	-1,357.07	-7,568.1	2,266.6	7,888.9	0.00	0.00	0.00
15,100.0	90.00	181.19	6,320.1	-1,357.07	-7,668.0	2,264.5	7,985.6	0.00	0.00	0.00
15,200.0	90.00	181.19	6,320.1	-1,357.06	-7,768.0	2,262.4	8,082.3	0.00	0.00	0.00
15,300.0	90.00	181.19	6,320.1	-1,357.06	-7,868.0	2,260.3	8,179.0	0.00	0.00	0.00
15,400.0	90.00	181.19	6,320.1	-1,357.06	-7,968.0	2,258.2	8,275.6	0.00	0.00	0.00
15,500.0	90.00	181.19	6,320.1	-1,357.05	-8,067.9	2,256.1	8,372.3	0.00	0.00	0.00
15,600.0	90.00	181.19	6,320.0	-1,357.05	-8,167.9	2,254.1	8,469.0	0.00	0.00	0.00
15,700.0	90.00	181.19	6,320.0	-1,357.04	-8,267.9	2,252.0	8,565.7	0.00	0.00	0.00
15,800.0	90.00	181.19	6,320.0	-1,357.04	-8,367.9	2,249.9	8,662.4	0.00	0.00	0.00
15,900.0	90.00	181.19	6,320.0	-1,357.04	-8,467.9	2,247.8	8,759.0	0.00	0.00	0.00
16,000.0	90.00	181.19	6,320.0	-1,357.03	-8,567.8	2,245.7	8,855.7	0.00	0.00	0.00
16,100.0	90.00	181.19	6,320.0	-1,357.03	-8,667.8	2,243.6	8,952.4	0.00	0.00	0.00
16,200.0	90.00	181.19	6,320.0	-1,357.02	-8,767.8	2,241.6	9,049.1	0.00	0.00	0.00
16,300.0	90.00	181.19	6,320.0	-1,357.02	-8,867.8	2,239.5	9,145.7	0.00	0.00	0.00
16,400.0	90.00	181.19	6,320.0	-1,357.01	-8,967.7	2,237.4	9,242.4	0.00	0.00	0.00
16,500.0	90.00	181.19	6,320.0	-1,357.01	-9,067.7	2,235.3	9,339.1	0.00	0.00	0.00
16,600.0	90.00	181.19	6,320.0	-1,357.00	-9,167.7	2,233.2	9,435.8	0.00	0.00	0.00
<b>BHL: 600ft FSL &amp; 605ft FEL of Sec 32</b>										
<b>16,648.2</b>	<b>90.00</b>	<b>181.19</b>	<b>6,320.0</b>	<b>-1,357.00</b>	<b>-9,215.9</b>	<b>2,232.2</b>	<b>9,482.3</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well SHOVELER FED 29-32-16HN
<b>Company:</b>	MALLARD EXPLORATION	<b>TVD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>MD Reference:</b>	KB-EST @ 4963.0usft (Original Well Elev)
<b>Site:</b>	NW NW SEC. 29 T8N R60W 6th P.M.	<b>North Reference:</b>	True
<b>Well:</b>	SHOVELER FED 29-32-16HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,637.5	1,524.0	FOX HILLS BASE			
3,757.6	3,374.0	RICHARD SANDSTONE			
3,885.9	3,486.0	PARKMAN SANDSTONE			
4,714.5	4,209.0	SUSSEX SANDSTONE			
5,252.0	4,678.0	SHANNON SANDSTONE			
6,897.0	6,204.0	SHARON SPRINGS			
6,959.7	6,239.0	NIOBRARA A CHALK			
6,990.3	6,254.0	NIOBRARA A CHALK BASE			
7,026.9	6,270.0	NIOBRARA B1 CHALK TOP			
7,108.8	6,298.0	NIOBRARA B1 CHALK BASE			
7,268.0	6,320.0	NIOBRARA B2 CHALK TOP			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.0	0.0	0.0	0.0	SHL: 757ft FNL & 2247ft FWL of Sec 29
100.0	100.0	0.0	0.0	START NUDGE (3°/100ft BUR)
1,074.6	1,032.9	70.2	233.0	EOB TO 29.24° INC
5,293.4	4,714.1	664.9	2,205.9	END OF TANGENT
6,268.0	5,647.0	735.1	2,438.9	EOD TO VERTICAL
6,368.0	5,747.0	735.1	2,438.9	KOP (10°/100ft BUR)
7,268.0	6,320.0	162.3	2,427.0	HZ LP: 600ft FNL & 605ft FEL of Sec 29
16,648.2	6,320.0	-9,215.9	2,232.2	BHL: 600ft FSL & 605ft FEL of Sec 32