



MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

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

SHOVELER HUNT FED 19-24-16HN

ORIGINAL WELLBORE

18 November, 2019

Plan: PROPOSAL #3





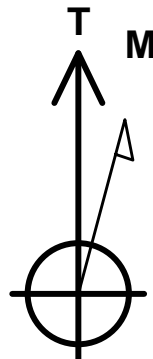
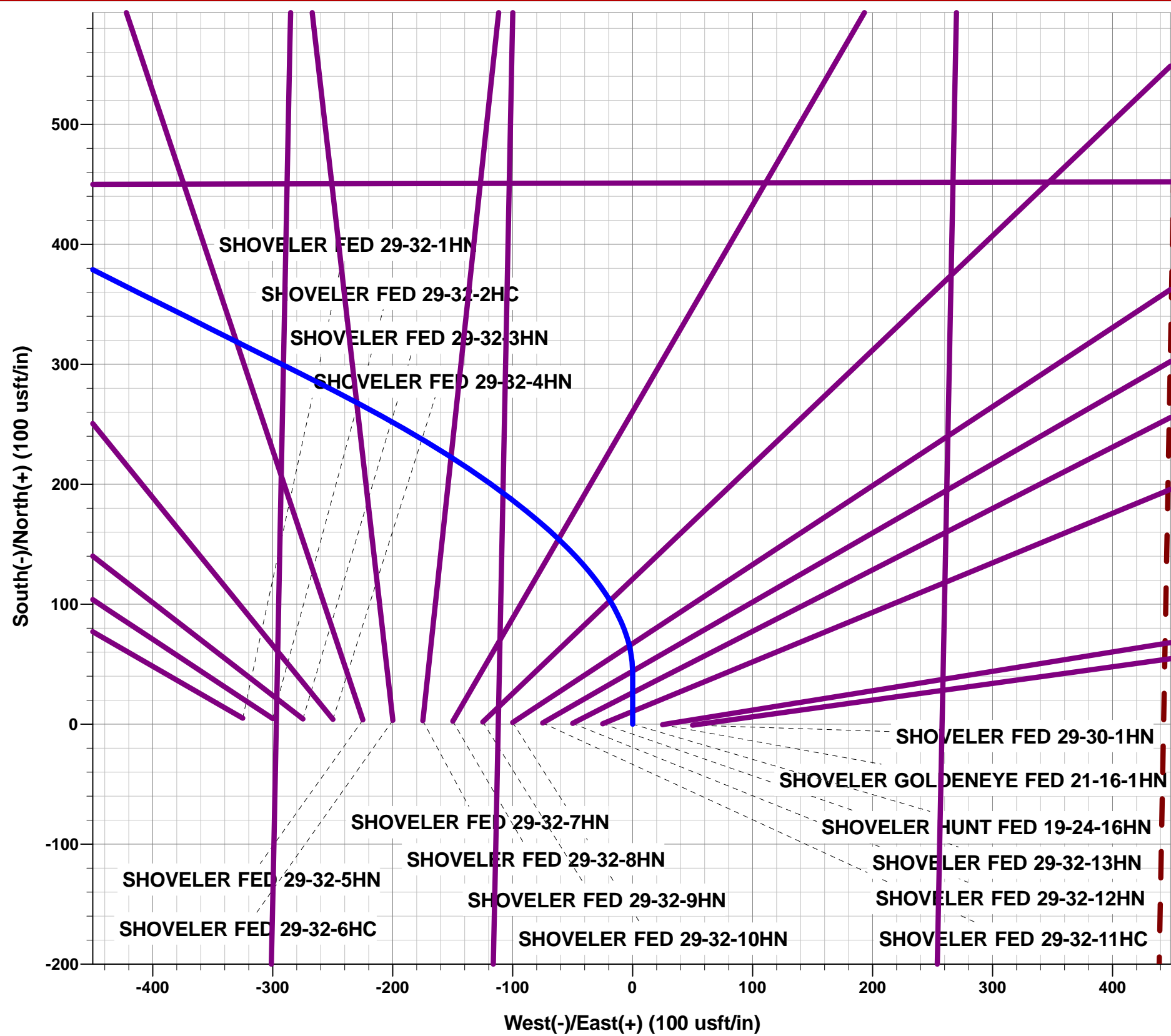
Project: WELD COUNTY, COLORADO (NAD 83)
Site: NE NW SEC. 29 T8N R60W 6th P.M.
Well: SHOVELER HUNT FED 19-24-16HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #3

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 757ft FNL & 2197ft FWL of Sec 29
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
600.00	10.00	0.00	597.47	43.52	0.00	4.77	43.52	EOB TO 10° INC
1849.34	27.94	296.57	1783.36	286.77	-266.01	295.87	418.30	EOB & T TO 27.94° INC & 296.57° AZ
6585.00	27.94	296.57	5967.00	1279.22	-2250.61	2377.36	2637.21	KOP (10°/100ft DGLG)
7237.46	90.00	269.90	6291.00	1355.46	-2771.05	2903.02	3166.66	LP: 605ft FSL & 600ft FEL of Sec 19
16604.93	90.00	269.90	6291.00	1339.72	-12138.50	12212.21	12534.13	BHL: 605ft FSL & 600ft FWL of Sec 24

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
LP - SHOVELER HUNT FED 19-24-16HN (P3)	6291.00	1355.46	-2771.05	40.642158	-104.127447
BHL - SHOVELER HUNT FED 19-24-16HN (P3)	6291.00	1339.72	-12138.50	40.642107	-104.161201



Azimuths to True North
Magnetic North: 7.62°

Magnetic Field
Strength: 52303.2nT
Dip Angle: 67.08°
Date: 2019-11-18
Model: IGRF2015

FORMATION TOP DETAILS

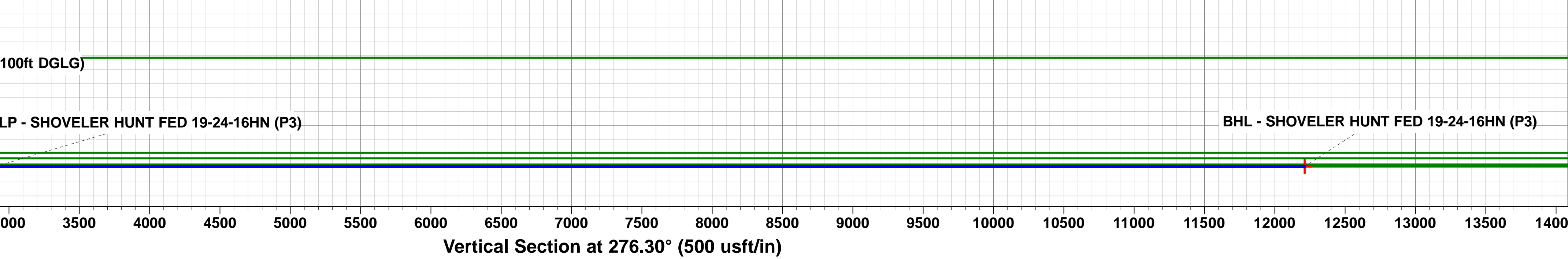
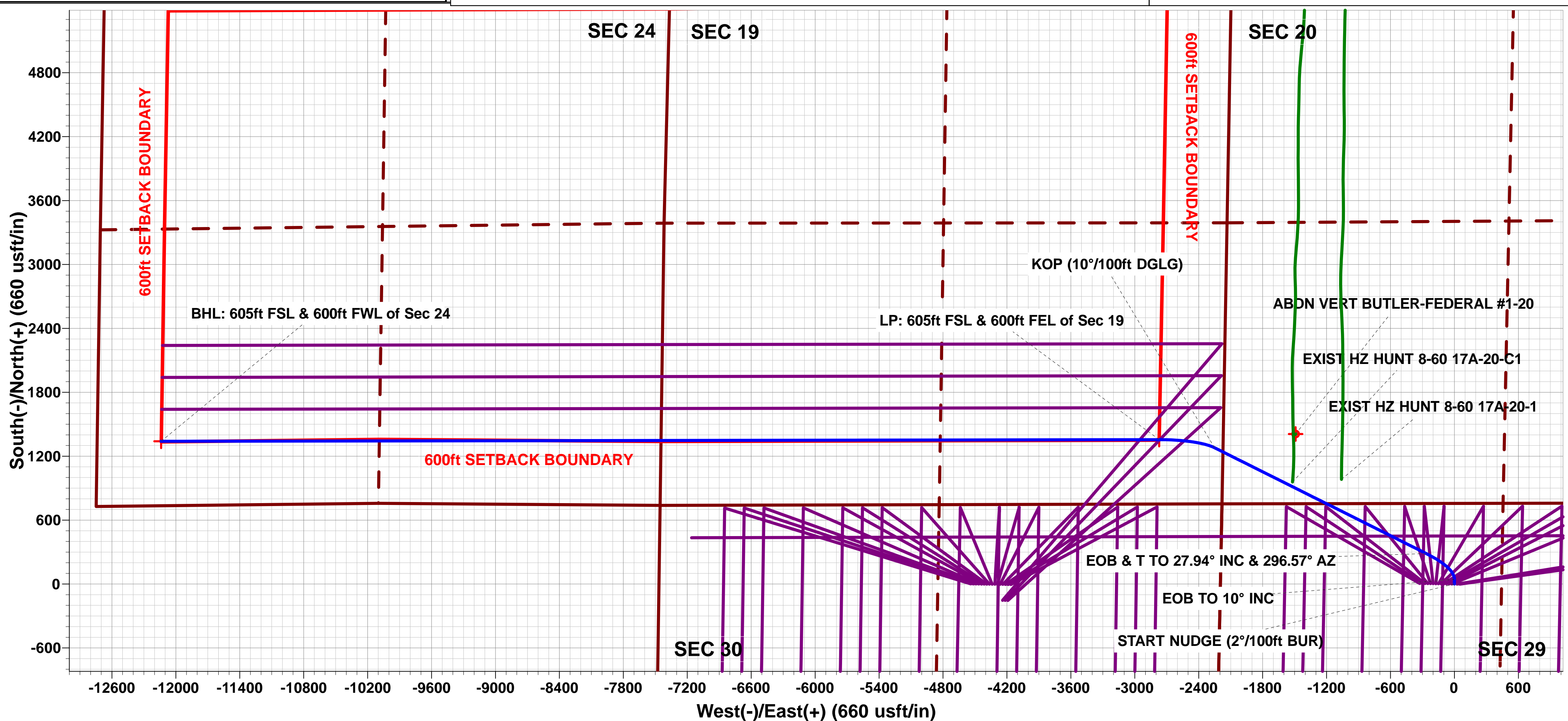
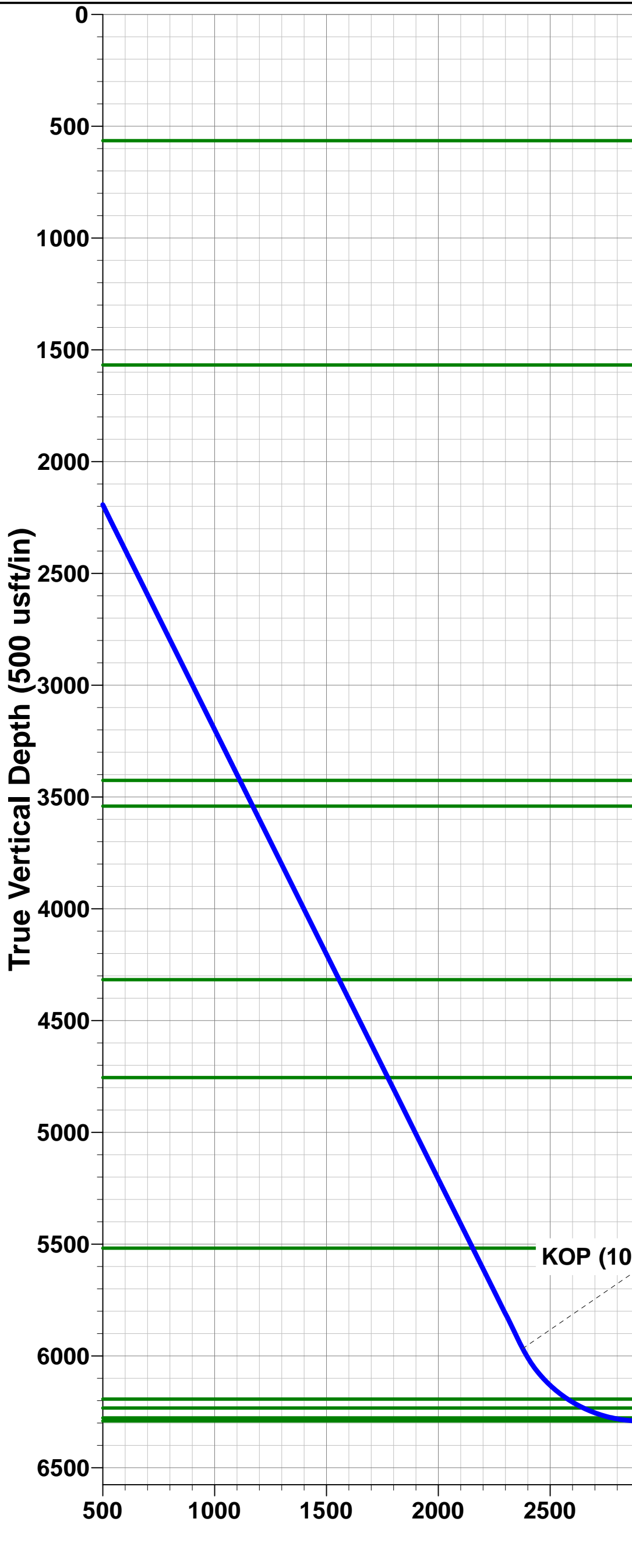
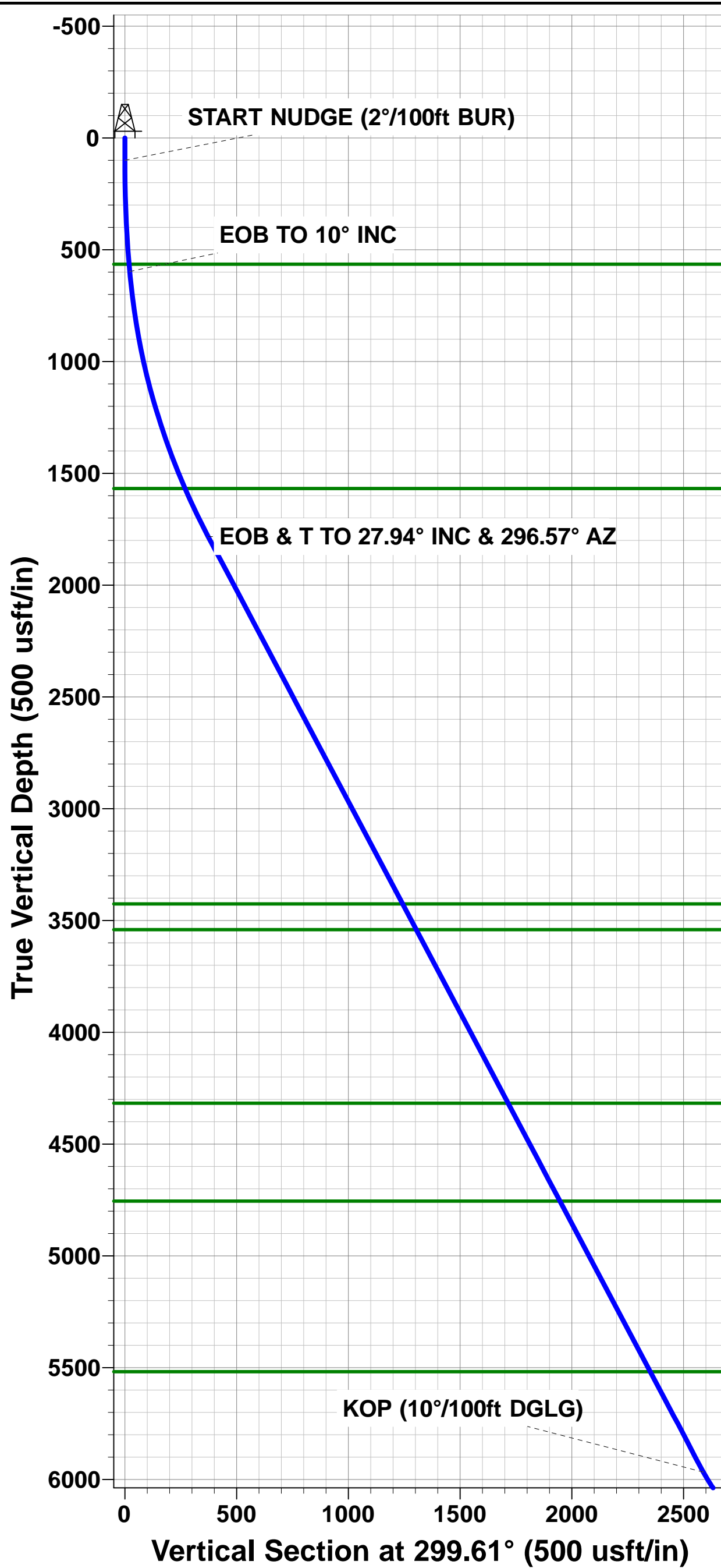
TVDPath	MDPath	Formation
565.00	567.07	Fox Hills Base
1568.00	1610.21	Pierre Shale Top
3426.00	3708.72	Richard Sandstone
3541.00	3838.90	Parkman Sandstone
4317.00	4717.29	Sussex Sandstone
4755.00	5213.08	Shannon Sandstone
5518.00	6076.75	TeePee Buttes
6193.00	6892.51	Sharon Springs
6233.00	6973.76	Niobrara Top
6277.00	7108.77	Niobrara B2 Chalk Target Top
6291.00	7237.40	Niobrara B2 Chalk Target Center

PROPOSED LOCAL COORDINATES:

SHL: 757ft FNL & 2197ft FWL of Sec 29

HZ LP: 605ft FSL & 600ft FEL of Sec 19

BHL: 605ft FSL & 600ft FWL of Sec 24



Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well SHOVELER HUNT FED 19-24-16HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 25' @ 4973.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4973.00usft
Site:	NE NW SEC. 29 T8N R60W 6th P.M.	North Reference:	True
Well:	SHOVELER HUNT FED 19-24-16HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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

Site	NE NW SEC. 29 T8N R60W 6th P.M.		
Site Position:		Northing:	1,478,416.23 usft
From:	Lat/Long	Easting:	3,383,356.26 usft
Position Uncertainty:	0.00 usft	Slot Radius:	1.10 ft
		Latitude:	40.638452
		Longitude:	-104.118633
		Grid Convergence:	0.89 °

Well		SHOVELER HUNT FED 19-24-16HN				
Well Position	+N-S	-5.11 usft	Northing:	1,478,416.19 usfi	Latitude:	40.638438
	+E-W	325.00 usft	Easting:	3,383,681.29 usfi	Longitude:	-104.117462
Position Uncertainty		0.00 usft	Wellhead Elevation:	usfi	Ground Level:	4,948.00 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2019-11-18	7.62	67.08	52,303.24496881

Design	PROPOSAL #3			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	6,291.00	0.00	0.00	276.30

Plan Sections											
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	-4,973.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	-4,873.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	10.00	0.00	597.47	-4,375.53	43.52	0.00	2.00	2.00	0.00	0.00	
1,849.34	27.94	296.57	1,783.36	-3,189.64	286.77	-266.01	2.00	1.44	-5.08	-82.80	
6,585.00	27.94	296.57	5,967.00	994.00	1,279.22	-2,250.61	0.00	0.00	0.00	0.00	
7,237.46	90.00	269.90	6,291.00	1,318.00	1,355.46	-2,771.05	10.00	9.51	-4.09	-29.62	LP - SHOVELER H
16,604.93	90.00	269.90	6,291.00	1,318.00	1,339.72	-12,138.5C	0.00	0.00	0.00	0.00	BHL - SHOVELER

Planning Report

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Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4973.00usft
Site:	NE NW SEC. 29 T8N R60W 6th P.M.	North Reference:	True
Well:	SHOVELER HUNT FED 19-24-16HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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)
SHL: 757ft FNL & 2197ft FWL of Sec 29										
0.00	0.00	0.00	0.00	4,973.00	0.00	0.00	0.00	0.00	0.00	0.00
START NUDGE (2°/100ft BUR)										
100.00	0.00	0.00	100.00	4,873.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	2.00	0.00	199.98	4,773.02	1.75	0.00	0.19	2.00	2.00	0.00
300.00	4.00	0.00	299.84	4,673.16	6.98	0.00	0.77	2.00	2.00	0.00
400.00	6.00	0.00	399.45	4,573.55	15.69	0.00	1.72	2.00	2.00	0.00
500.00	8.00	0.00	498.70	4,474.30	27.88	0.00	3.06	2.00	2.00	0.00
Fox Hills Base										
567.07	9.34	0.00	565.00	4,408.00	37.99	0.00	4.17	2.00	2.00	0.00
EOB TO 10° INC										
600.00	10.00	0.00	597.47	4,375.53	43.52	0.00	4.77	2.00	2.00	0.00
700.00	10.44	348.98	695.89	4,277.11	61.10	-1.73	8.42	2.00	0.44	-11.02
800.00	11.22	339.16	794.11	4,178.89	79.09	-6.92	15.56	2.00	0.78	-9.82
900.00	12.28	330.81	892.03	4,080.97	97.46	-15.57	26.17	2.00	1.06	-8.36
1,000.00	13.54	323.87	989.50	3,983.50	116.20	-27.66	40.24	2.00	1.27	-6.94
1,100.00	14.97	318.17	1,086.43	3,886.57	135.28	-43.18	57.76	2.00	1.43	-5.70
1,200.00	16.51	313.47	1,182.68	3,790.32	154.68	-62.11	78.70	2.00	1.54	-4.70
1,300.00	18.14	309.57	1,278.14	3,694.86	174.38	-84.42	103.05	2.00	1.63	-3.90
1,400.00	19.84	306.31	1,372.69	3,600.31	194.35	-110.10	130.76	2.00	1.70	-3.26
1,500.00	21.58	303.55	1,466.23	3,506.77	214.57	-139.11	161.80	2.00	1.75	-2.76
1,600.00	23.37	301.19	1,558.63	3,414.37	235.00	-171.40	196.15	2.00	1.79	-2.36
Pierre Shale Top										
1,610.21	23.55	300.97	1,568.00	3,405.00	237.10	-174.89	199.84	2.00	1.80	-2.17
1,700.00	25.18	299.15	1,649.79	3,323.21	255.64	-206.96	233.75	2.00	1.82	-2.03
1,800.00	27.02	297.37	1,739.58	3,233.42	276.45	-245.72	274.56	2.00	1.84	-1.78
EOB & T TO 27.94° INC & 296.57° AZ										
1,849.34	27.94	296.57	1,783.36	3,189.64	286.77	-266.01	295.87	2.00	1.86	-1.62
1,900.00	27.94	296.57	1,828.11	3,144.89	297.39	-287.24	318.13	0.00	0.00	0.00
2,000.00	27.94	296.57	1,916.45	3,056.55	318.35	-329.15	362.09	0.00	0.00	0.00
2,100.00	27.94	296.57	2,004.80	2,968.20	339.30	-371.06	406.04	0.00	0.00	0.00
2,200.00	27.94	296.57	2,093.14	2,879.86	360.26	-412.97	449.99	0.00	0.00	0.00
2,300.00	27.94	296.57	2,181.48	2,791.52	381.22	-454.87	493.95	0.00	0.00	0.00
2,400.00	27.94	296.57	2,269.83	2,703.17	402.17	-496.78	537.90	0.00	0.00	0.00
2,500.00	27.94	296.57	2,358.17	2,614.83	423.13	-538.69	581.86	0.00	0.00	0.00
2,600.00	27.94	296.57	2,446.51	2,526.49	444.09	-580.60	625.81	0.00	0.00	0.00
2,700.00	27.94	296.57	2,534.86	2,438.14	465.05	-622.50	669.76	0.00	0.00	0.00
2,800.00	27.94	296.57	2,623.20	2,349.80	486.00	-664.41	713.72	0.00	0.00	0.00
2,900.00	27.94	296.57	2,711.55	2,261.45	506.96	-706.32	757.67	0.00	0.00	0.00
3,000.00	27.94	296.57	2,799.89	2,173.11	527.92	-748.23	801.62	0.00	0.00	0.00
3,100.00	27.94	296.57	2,888.23	2,084.77	548.87	-790.13	845.58	0.00	0.00	0.00
3,200.00	27.94	296.57	2,976.58	1,996.42	569.83	-832.04	889.53	0.00	0.00	0.00
3,300.00	27.94	296.57	3,064.92	1,908.08	590.79	-873.95	933.48	0.00	0.00	0.00
3,400.00	27.94	296.57	3,153.26	1,819.74	611.74	-915.86	977.44	0.00	0.00	0.00
3,500.00	27.94	296.57	3,241.61	1,731.39	632.70	-957.76	1,021.39	0.00	0.00	0.00
3,600.00	27.94	296.57	3,329.95	1,643.05	653.66	-999.67	1,065.34	0.00	0.00	0.00
3,700.00	27.94	296.57	3,418.29	1,554.71	674.61	-1,041.58	1,109.30	0.00	0.00	0.00
Richard Sandstone										
3,708.72	27.94	296.57	3,426.00	1,547.00	676.44	-1,045.23	1,113.13	0.00	0.00	0.00
3,800.00	27.94	296.57	3,506.64	1,466.36	695.57	-1,083.48	1,153.25	0.00	0.00	0.00
Parkman Sandstone										
3,838.90	27.94	296.57	3,541.00	1,432.00	703.72	-1,099.79	1,170.35	0.00	0.00	0.00
3,900.00	27.94	296.57	3,594.98	1,378.02	716.53	-1,125.39	1,197.21	0.00	0.00	0.00

Planning Report

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Well:	SHOVELER HUNT FED 19-24-16HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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)
4,000.00	27.94	296.57	3,683.32	1,289.68	737.48	-1,167.30	1,241.16	0.00	0.00	0.00
4,100.00	27.94	296.57	3,771.67	1,201.33	758.44	-1,209.21	1,285.11	0.00	0.00	0.00
4,200.00	27.94	296.57	3,860.01	1,112.99	779.40	-1,251.11	1,329.07	0.00	0.00	0.00
4,300.00	27.94	296.57	3,948.35	1,024.65	800.35	-1,293.02	1,373.02	0.00	0.00	0.00
4,400.00	27.94	296.57	4,036.70	936.30	821.31	-1,334.93	1,416.97	0.00	0.00	0.00
4,500.00	27.94	296.57	4,125.04	847.96	842.27	-1,376.84	1,460.93	0.00	0.00	0.00
4,600.00	27.94	296.57	4,213.38	759.62	863.22	-1,418.74	1,504.88	0.00	0.00	0.00
4,700.00	27.94	296.57	4,301.73	671.27	884.18	-1,460.65	1,548.83	0.00	0.00	0.00
Sussex Sandstone										
4,717.29	27.94	296.57	4,317.00	656.00	887.80	-1,467.90	1,556.43	0.00	0.00	0.00
4,800.00	27.94	296.57	4,390.07	582.93	905.14	-1,502.56	1,592.79	0.00	0.00	0.00
4,900.00	27.94	296.57	4,478.42	494.58	926.09	-1,544.47	1,636.74	0.00	0.00	0.00
5,000.00	27.94	296.57	4,566.76	406.24	947.05	-1,586.37	1,680.69	0.00	0.00	0.00
5,100.00	27.94	296.57	4,655.10	317.90	968.01	-1,628.28	1,724.65	0.00	0.00	0.00
5,200.00	27.94	296.57	4,743.45	229.55	988.97	-1,670.19	1,768.60	0.00	0.00	0.00
Shannon Sandstone										
5,213.08	27.94	296.57	4,755.00	218.00	991.71	-1,675.67	1,774.35	0.00	0.00	0.00
5,300.00	27.94	296.57	4,831.79	141.21	1,009.92	-1,712.10	1,812.56	0.00	0.00	0.00
5,400.00	27.94	296.57	4,920.13	52.87	1,030.88	-1,754.00	1,856.51	0.00	0.00	0.00
5,500.00	27.94	296.57	5,008.48	-35.48	1,051.84	-1,795.91	1,900.46	0.00	0.00	0.00
5,600.00	27.94	296.57	5,096.82	-123.82	1,072.79	-1,837.82	1,944.42	0.00	0.00	0.00
5,700.00	27.94	296.57	5,185.16	-212.16	1,093.75	-1,879.73	1,988.37	0.00	0.00	0.00
5,800.00	27.94	296.57	5,273.51	-300.51	1,114.71	-1,921.63	2,032.32	0.00	0.00	0.00
5,900.00	27.94	296.57	5,361.85	-388.85	1,135.66	-1,963.54	2,076.28	0.00	0.00	0.00
6,000.00	27.94	296.57	5,450.19	-477.19	1,156.62	-2,005.45	2,120.23	0.00	0.00	0.00
TeePee Buttes										
6,076.75	27.94	296.57	5,518.00	-545.00	1,172.70	-2,037.61	2,153.97	0.00	0.00	0.00
6,100.00	27.94	296.57	5,538.54	-565.54	1,177.58	-2,047.36	2,164.18	0.00	0.00	0.00
6,200.00	27.94	296.57	5,626.88	-653.88	1,198.53	-2,089.26	2,208.14	0.00	0.00	0.00
6,300.00	27.94	296.57	5,715.22	-742.22	1,219.49	-2,131.17	2,252.09	0.00	0.00	0.00
6,400.00	27.94	296.57	5,803.57	-830.57	1,240.45	-2,173.08	2,296.04	0.00	0.00	0.00
6,500.00	27.94	296.57	5,891.91	-918.91	1,261.40	-2,214.99	2,340.00	0.00	0.00	0.00
KOP (10°/100ft DGLG)										
6,585.00	27.94	296.57	5,967.00	-994.00	1,279.22	-2,250.61	2,377.36	0.00	0.00	0.00
6,600.00	29.25	295.05	5,980.17	-1,007.17	1,282.34	-2,257.07	2,384.13	10.00	8.75	-10.11
6,700.00	38.33	287.43	6,063.23	-1,090.23	1,302.02	-2,308.92	2,437.82	10.00	9.07	-7.62
6,800.00	47.73	282.40	6,136.28	-1,163.28	1,319.30	-2,374.81	2,505.21	10.00	9.40	-5.03
Sharon Springs										
6,892.51	56.57	278.94	6,193.00	-1,220.00	1,332.68	-2,446.53	2,577.96	10.00	9.56	-3.74
6,900.00	57.29	278.70	6,197.08	-1,224.08	1,333.64	-2,452.73	2,584.23	10.00	9.61	-3.30
Niobrara Top										
6,973.76	64.40	276.45	6,233.00	-1,260.00	1,342.08	-2,516.54	2,648.58	10.00	9.64	-3.04
7,000.00	66.94	275.72	6,243.81	-1,270.81	1,344.62	-2,540.31	2,672.49	10.00	9.67	-2.79
7,100.00	76.63	273.15	6,275.04	-1,302.04	1,351.89	-2,634.90	2,767.30	10.00	9.70	-2.57
Niobrara B2 Chalk Target Top										
7,108.77	77.49	272.93	6,277.00	-1,304.00	1,352.34	-2,643.43	2,775.84	10.00	9.71	-2.44
7,200.00	86.36	270.77	6,289.81	-1,316.81	1,355.24	-2,733.61	2,865.79	10.00	9.72	-2.37
LP: 605ft FSL & 600ft FEL of Sec 19 - Niobrara B2 Chalk Target Center										
7,237.46	90.00	269.90	6,291.00	-1,318.00	1,355.46	-2,771.05	2,903.02	10.00	9.73	-2.32
7,300.00	90.00	269.90	6,291.00	-1,318.00	1,355.35	-2,833.59	2,965.17	0.00	0.00	0.00
7,400.00	90.00	269.90	6,291.00	-1,318.00	1,355.19	-2,933.59	3,064.55	0.00	0.00	0.00
7,500.00	90.00	269.90	6,291.00	-1,318.00	1,355.02	-3,033.59	3,163.93	0.00	0.00	0.00
7,600.00	90.00	269.90	6,291.00	-1,318.00	1,354.85	-3,133.59	3,263.31	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well SHOVELER HUNT FED 19-24-16HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 25' @ 4973.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4973.00usft
Site:	NE NW SEC. 29 T8N R60W 6th P.M.	North Reference:	True
Well:	SHOVELER HUNT FED 19-24-16HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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)
7,700.00	90.00	269.90	6,291.00	-1,318.00	1,354.68	-3,233.59	3,362.68	0.00	0.00	0.00
7,800.00	90.00	269.90	6,291.00	-1,318.00	1,354.51	-3,333.59	3,462.06	0.00	0.00	0.00
7,900.00	90.00	269.90	6,291.00	-1,318.00	1,354.35	-3,433.59	3,561.44	0.00	0.00	0.00
8,000.00	90.00	269.90	6,291.00	-1,318.00	1,354.18	-3,533.59	3,660.82	0.00	0.00	0.00
8,100.00	90.00	269.90	6,291.00	-1,318.00	1,354.01	-3,633.59	3,760.19	0.00	0.00	0.00
8,200.00	90.00	269.90	6,291.00	-1,318.00	1,353.84	-3,733.59	3,859.57	0.00	0.00	0.00
8,300.00	90.00	269.90	6,291.00	-1,318.00	1,353.67	-3,833.59	3,958.95	0.00	0.00	0.00
8,400.00	90.00	269.90	6,291.00	-1,318.00	1,353.51	-3,933.59	4,058.33	0.00	0.00	0.00
8,500.00	90.00	269.90	6,291.00	-1,318.00	1,353.34	-4,033.59	4,157.71	0.00	0.00	0.00
8,600.00	90.00	269.90	6,291.00	-1,318.00	1,353.17	-4,133.59	4,257.08	0.00	0.00	0.00
8,700.00	90.00	269.90	6,291.00	-1,318.00	1,353.00	-4,233.59	4,356.46	0.00	0.00	0.00
8,800.00	90.00	269.90	6,291.00	-1,318.00	1,352.83	-4,333.59	4,455.84	0.00	0.00	0.00
8,900.00	90.00	269.90	6,291.00	-1,318.00	1,352.67	-4,433.59	4,555.22	0.00	0.00	0.00
9,000.00	90.00	269.90	6,291.00	-1,318.00	1,352.50	-4,533.59	4,654.60	0.00	0.00	0.00
9,100.00	90.00	269.90	6,291.00	-1,318.00	1,352.33	-4,633.59	4,753.97	0.00	0.00	0.00
9,200.00	90.00	269.90	6,291.00	-1,318.00	1,352.16	-4,733.59	4,853.35	0.00	0.00	0.00
9,300.00	90.00	269.90	6,291.00	-1,318.00	1,351.99	-4,833.59	4,952.73	0.00	0.00	0.00
9,400.00	90.00	269.90	6,291.00	-1,318.00	1,351.82	-4,933.58	5,052.11	0.00	0.00	0.00
9,500.00	90.00	269.90	6,291.00	-1,318.00	1,351.66	-5,033.58	5,151.48	0.00	0.00	0.00
9,600.00	90.00	269.90	6,291.00	-1,318.00	1,351.49	-5,133.58	5,250.86	0.00	0.00	0.00
9,700.00	90.00	269.90	6,291.00	-1,318.00	1,351.32	-5,233.58	5,350.24	0.00	0.00	0.00
9,800.00	90.00	269.90	6,291.00	-1,318.00	1,351.15	-5,333.58	5,449.62	0.00	0.00	0.00
9,900.00	90.00	269.90	6,291.00	-1,318.00	1,350.98	-5,433.58	5,549.00	0.00	0.00	0.00
10,000.00	90.00	269.90	6,291.00	-1,318.00	1,350.82	-5,533.58	5,648.37	0.00	0.00	0.00
10,100.00	90.00	269.90	6,291.00	-1,318.00	1,350.65	-5,633.58	5,747.75	0.00	0.00	0.00
10,200.00	90.00	269.90	6,291.00	-1,318.00	1,350.48	-5,733.58	5,847.13	0.00	0.00	0.00
10,300.00	90.00	269.90	6,291.00	-1,318.00	1,350.31	-5,833.58	5,946.51	0.00	0.00	0.00
10,400.00	90.00	269.90	6,291.00	-1,318.00	1,350.14	-5,933.58	6,045.89	0.00	0.00	0.00
10,500.00	90.00	269.90	6,291.00	-1,318.00	1,349.98	-6,033.58	6,145.26	0.00	0.00	0.00
10,600.00	90.00	269.90	6,291.00	-1,318.00	1,349.81	-6,133.58	6,244.64	0.00	0.00	0.00
10,700.00	90.00	269.90	6,291.00	-1,318.00	1,349.64	-6,233.58	6,344.02	0.00	0.00	0.00
10,800.00	90.00	269.90	6,291.00	-1,318.00	1,349.47	-6,333.58	6,443.40	0.00	0.00	0.00
10,900.00	90.00	269.90	6,291.00	-1,318.00	1,349.30	-6,433.58	6,542.78	0.00	0.00	0.00
11,000.00	90.00	269.90	6,291.00	-1,318.00	1,349.14	-6,533.58	6,642.15	0.00	0.00	0.00
11,100.00	90.00	269.90	6,291.00	-1,318.00	1,348.97	-6,633.58	6,741.53	0.00	0.00	0.00
11,200.00	90.00	269.90	6,291.00	-1,318.00	1,348.80	-6,733.58	6,840.91	0.00	0.00	0.00
11,300.00	90.00	269.90	6,291.00	-1,318.00	1,348.63	-6,833.58	6,940.29	0.00	0.00	0.00
11,400.00	90.00	269.90	6,291.00	-1,318.00	1,348.46	-6,933.58	7,039.66	0.00	0.00	0.00
11,500.00	90.00	269.90	6,291.00	-1,318.00	1,348.30	-7,033.58	7,139.04	0.00	0.00	0.00
11,600.00	90.00	269.90	6,291.00	-1,318.00	1,348.13	-7,133.58	7,238.42	0.00	0.00	0.00
11,700.00	90.00	269.90	6,291.00	-1,318.00	1,347.96	-7,233.58	7,337.80	0.00	0.00	0.00
11,800.00	90.00	269.90	6,291.00	-1,318.00	1,347.79	-7,333.58	7,437.18	0.00	0.00	0.00
11,900.00	90.00	269.90	6,291.00	-1,318.00	1,347.62	-7,433.58	7,536.55	0.00	0.00	0.00
12,000.00	90.00	269.90	6,291.00	-1,318.00	1,347.46	-7,533.58	7,635.93	0.00	0.00	0.00
12,100.00	90.00	269.90	6,291.00	-1,318.00	1,347.29	-7,633.58	7,735.31	0.00	0.00	0.00
12,200.00	90.00	269.90	6,291.00	-1,318.00	1,347.12	-7,733.58	7,834.69	0.00	0.00	0.00
12,300.00	90.00	269.90	6,291.00	-1,318.00	1,346.95	-7,833.58	7,934.07	0.00	0.00	0.00
12,400.00	90.00	269.90	6,291.00	-1,318.00	1,346.78	-7,933.58	8,033.44	0.00	0.00	0.00
12,500.00	90.00	269.90	6,291.00	-1,318.00	1,346.61	-8,033.58	8,132.82	0.00	0.00	0.00
12,600.00	90.00	269.90	6,291.00	-1,318.00	1,346.45	-8,133.58	8,232.20	0.00	0.00	0.00
12,700.00	90.00	269.90	6,291.00	-1,318.00	1,346.28	-8,233.58	8,331.58	0.00	0.00	0.00
12,800.00	90.00	269.90	6,291.00	-1,318.00	1,346.11	-8,333.58	8,430.95	0.00	0.00	0.00
12,900.00	90.00	269.90	6,291.00	-1,318.00	1,345.94	-8,433.58	8,530.33	0.00	0.00	0.00
13,000.00	90.00	269.90	6,291.00	-1,318.00	1,345.77	-8,533.58	8,629.71	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well SHOVELER HUNT FED 19-24-16HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 25' @ 4973.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4973.00usft
Site:	NE NW SEC. 29 T8N R60W 6th P.M.	North Reference:	True
Well:	SHOVELER HUNT FED 19-24-16HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

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)
13,100.00	90.00	269.90	6,291.00	-1,318.00	1,345.61	-8,633.58	8,729.09	0.00	0.00	0.00
13,200.00	90.00	269.90	6,291.00	-1,318.00	1,345.44	-8,733.58	8,828.47	0.00	0.00	0.00
13,300.00	90.00	269.90	6,291.00	-1,318.00	1,345.27	-8,833.58	8,927.84	0.00	0.00	0.00
13,400.00	90.00	269.90	6,291.00	-1,318.00	1,345.10	-8,933.58	9,027.22	0.00	0.00	0.00
13,500.00	90.00	269.90	6,291.00	-1,318.00	1,344.93	-9,033.58	9,126.60	0.00	0.00	0.00
13,600.00	90.00	269.90	6,291.00	-1,318.00	1,344.77	-9,133.58	9,225.98	0.00	0.00	0.00
13,700.00	90.00	269.90	6,291.00	-1,318.00	1,344.60	-9,233.58	9,325.36	0.00	0.00	0.00
13,800.00	90.00	269.90	6,291.00	-1,318.00	1,344.43	-9,333.58	9,424.73	0.00	0.00	0.00
13,900.00	90.00	269.90	6,291.00	-1,318.00	1,344.26	-9,433.58	9,524.11	0.00	0.00	0.00
14,000.00	90.00	269.90	6,291.00	-1,318.00	1,344.09	-9,533.58	9,623.49	0.00	0.00	0.00
14,100.00	90.00	269.90	6,291.00	-1,318.00	1,343.93	-9,633.58	9,722.87	0.00	0.00	0.00
14,200.00	90.00	269.90	6,291.00	-1,318.00	1,343.76	-9,733.58	9,822.24	0.00	0.00	0.00
14,300.00	90.00	269.90	6,291.00	-1,318.00	1,343.59	-9,833.58	9,921.62	0.00	0.00	0.00
14,400.00	90.00	269.90	6,291.00	-1,318.00	1,343.42	-9,933.58	10,021.00	0.00	0.00	0.00
14,500.00	90.00	269.90	6,291.00	-1,318.00	1,343.25	-10,033.58	10,120.38	0.00	0.00	0.00
14,600.00	90.00	269.90	6,291.00	-1,318.00	1,343.09	-10,133.58	10,219.76	0.00	0.00	0.00
14,700.00	90.00	269.90	6,291.00	-1,318.00	1,342.92	-10,233.58	10,319.13	0.00	0.00	0.00
14,800.00	90.00	269.90	6,291.00	-1,318.00	1,342.75	-10,333.58	10,418.51	0.00	0.00	0.00
14,900.00	90.00	269.90	6,291.00	-1,318.00	1,342.58	-10,433.58	10,517.89	0.00	0.00	0.00
15,000.00	90.00	269.90	6,291.00	-1,318.00	1,342.41	-10,533.58	10,617.27	0.00	0.00	0.00
15,100.00	90.00	269.90	6,291.00	-1,318.00	1,342.25	-10,633.58	10,716.65	0.00	0.00	0.00
15,200.00	90.00	269.90	6,291.00	-1,318.00	1,342.08	-10,733.58	10,816.02	0.00	0.00	0.00
15,300.00	90.00	269.90	6,291.00	-1,318.00	1,341.91	-10,833.58	10,915.40	0.00	0.00	0.00
15,400.00	90.00	269.90	6,291.00	-1,318.00	1,341.74	-10,933.58	11,014.78	0.00	0.00	0.00
15,500.00	90.00	269.90	6,291.00	-1,318.00	1,341.57	-11,033.58	11,114.16	0.00	0.00	0.00
15,600.00	90.00	269.90	6,291.00	-1,318.00	1,341.41	-11,133.58	11,213.53	0.00	0.00	0.00
15,700.00	90.00	269.90	6,291.00	-1,318.00	1,341.24	-11,233.58	11,312.91	0.00	0.00	0.00
15,800.00	90.00	269.90	6,291.00	-1,318.00	1,341.07	-11,333.58	11,412.29	0.00	0.00	0.00
15,900.00	90.00	269.90	6,291.00	-1,318.00	1,340.90	-11,433.58	11,511.67	0.00	0.00	0.00
16,000.00	90.00	269.90	6,291.00	-1,318.00	1,340.73	-11,533.58	11,611.05	0.00	0.00	0.00
16,100.00	90.00	269.90	6,291.00	-1,318.00	1,340.56	-11,633.58	11,710.42	0.00	0.00	0.00
16,200.00	90.00	269.90	6,291.00	-1,318.00	1,340.40	-11,733.58	11,809.80	0.00	0.00	0.00
16,300.00	90.00	269.90	6,291.00	-1,318.00	1,340.23	-11,833.58	11,909.18	0.00	0.00	0.00
16,400.00	90.00	269.90	6,291.00	-1,318.00	1,340.06	-11,933.58	12,008.56	0.00	0.00	0.00
16,500.00	90.00	269.90	6,291.00	-1,318.00	1,339.89	-12,033.57	12,107.94	0.00	0.00	0.00
16,600.00	90.00	269.90	6,291.00	-1,318.00	1,339.72	-12,133.57	12,207.31	0.00	0.00	0.00
BHL: 605ft FSL & 600ft FWL of Sec 24										
16,604.93	90.00	269.90	6,291.00	-1,318.00	1,339.72	-12,138.50	12,212.21	0.00	0.00	0.00

Planning Report

Database:	Database 1	Local Co-ordinate Reference:	Well SHOVELER HUNT FED 19-24-16HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB 25' @ 4973.00usft
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB 25' @ 4973.00usft
Site:	NE NW SEC. 29 T8N R60W 6th P.M.	North Reference:	True
Well:	SHOVELER HUNT FED 19-24-16HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #3		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
567.07	565.00	Fox Hills Base			
1,610.21	1,568.00	Pierre Shale Top			
3,708.72	3,426.00	Richard Sandstone			
3,838.90	3,541.00	Parkman Sandstone			
4,717.29	4,317.00	Sussex Sandstone			
5,213.08	4,755.00	Shannon Sandstone			
6,076.75	5,518.00	TeePee Buttes			
6,892.51	6,193.00	Sharon Springs			
6,973.76	6,233.00	Niobrara Top			
7,108.77	6,277.00	Niobrara B2 Chalk Target Top			
7,237.46	6,291.00	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: 757ft FNL & 2197ft FWL of Sec 29
100.00	100.00	0.00	0.00	START NUDGE (2°/100ft BUR)
600.00	597.47	43.52	0.00	EOB TO 10° INC
1,849.34	1,783.36	286.77	-266.01	EOB & T TO 27.94° INC & 296.57° AZ
6,585.00	5,967.00	1,279.22	-2,250.61	KOP (10°/100ft DGLG)
7,237.46	6,291.00	1,355.46	-2,771.05	LP: 605ft FSL & 600ft FEL of Sec 19
16,604.93	6,291.00	1,339.72	-12,138.50	BHL: 605ft FSL & 600ft FWL of Sec 24