MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)
NW NW SEC. 33 T9N R60W 6th P.M.
GOLDEN CASCADE FED 33-14HN

ORIGINAL WELLBORE

03 May, 2018

Plan: PROPOSAL #1

MALLARD EXPLORATION

Project: WELD COUNTY, COLORADO (NAD 83)
Site: NW NW SEC. 33 T9N R60W 6th P.M.
Well: GOLDEN CASCADE FED 33-14HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 506ft FNL & 1492ft FWL of Sec 33
100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (3°/100ft BUR)
1261.55	1348.61	37.46	80.49	65.06	388.41	195.85	393.82	EOB TO 37.46° INC
4500.49	5428.94	37.46	80.49	475.04	2835.90	1429.93	2875.41	END OF TANGENT
5662.04	6677.55	0.00	0.00	540.10	3224.31	1625.77	3269.23	EOD TO VERTICAL
5762.04	6777.55	0.00	0.00	540.10	3224.31	1625.77	3269.23	KOP (10°/100ft BUR)
6335.00	7677.55	90.00	178.18	-32.57	3242.51	2080.27	3842.19	HZ LP: 600ft FNL & 605ft FEL of Sec 33
6335.00	11763.02	90.00	178.17	-4115.97	3372.54	5321.20	7927.66	BHL: 600ft FSL & 605ft FEL of Sec 33

PROPOSED LOCAL COORDINATES:

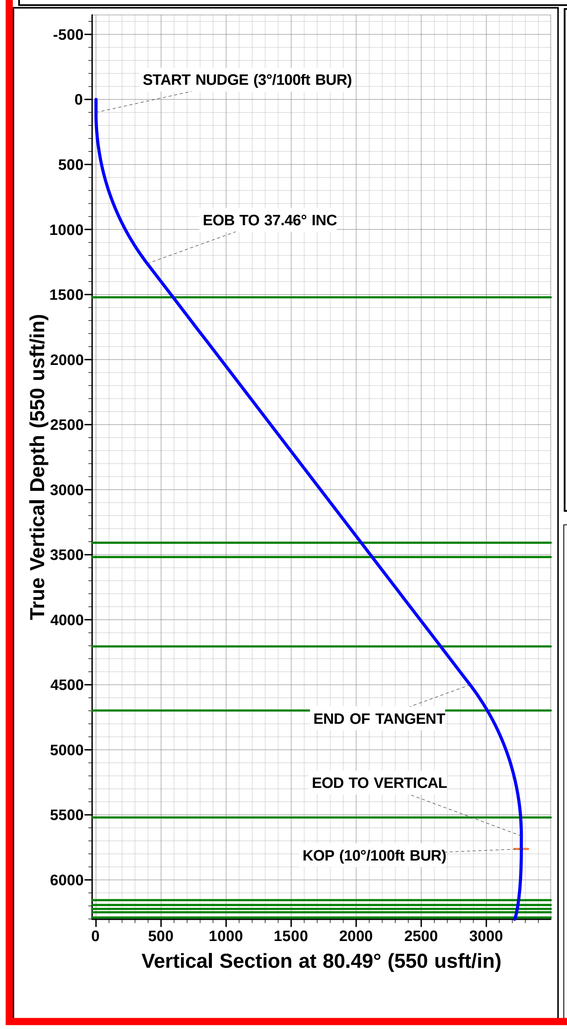
SHL: 506ft FNL & 1492ft FWL Sec 33

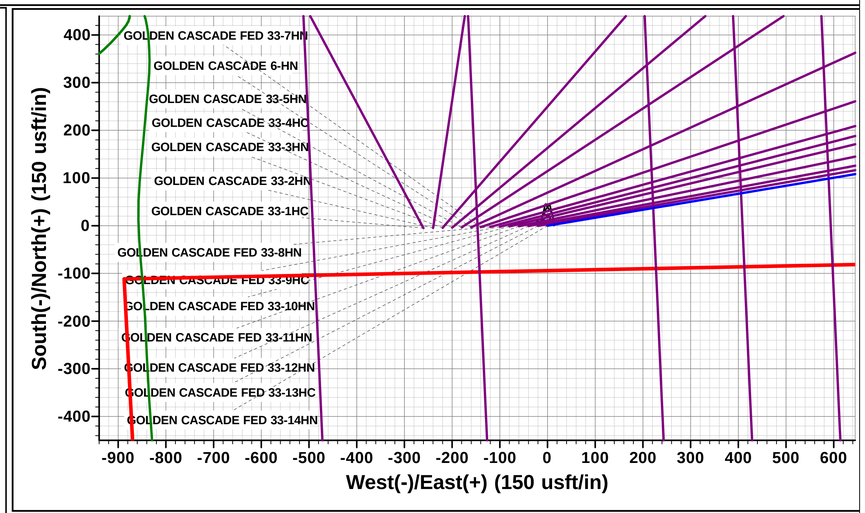
HZ LP: 600ft FNL & 605ft FEL Sec 33

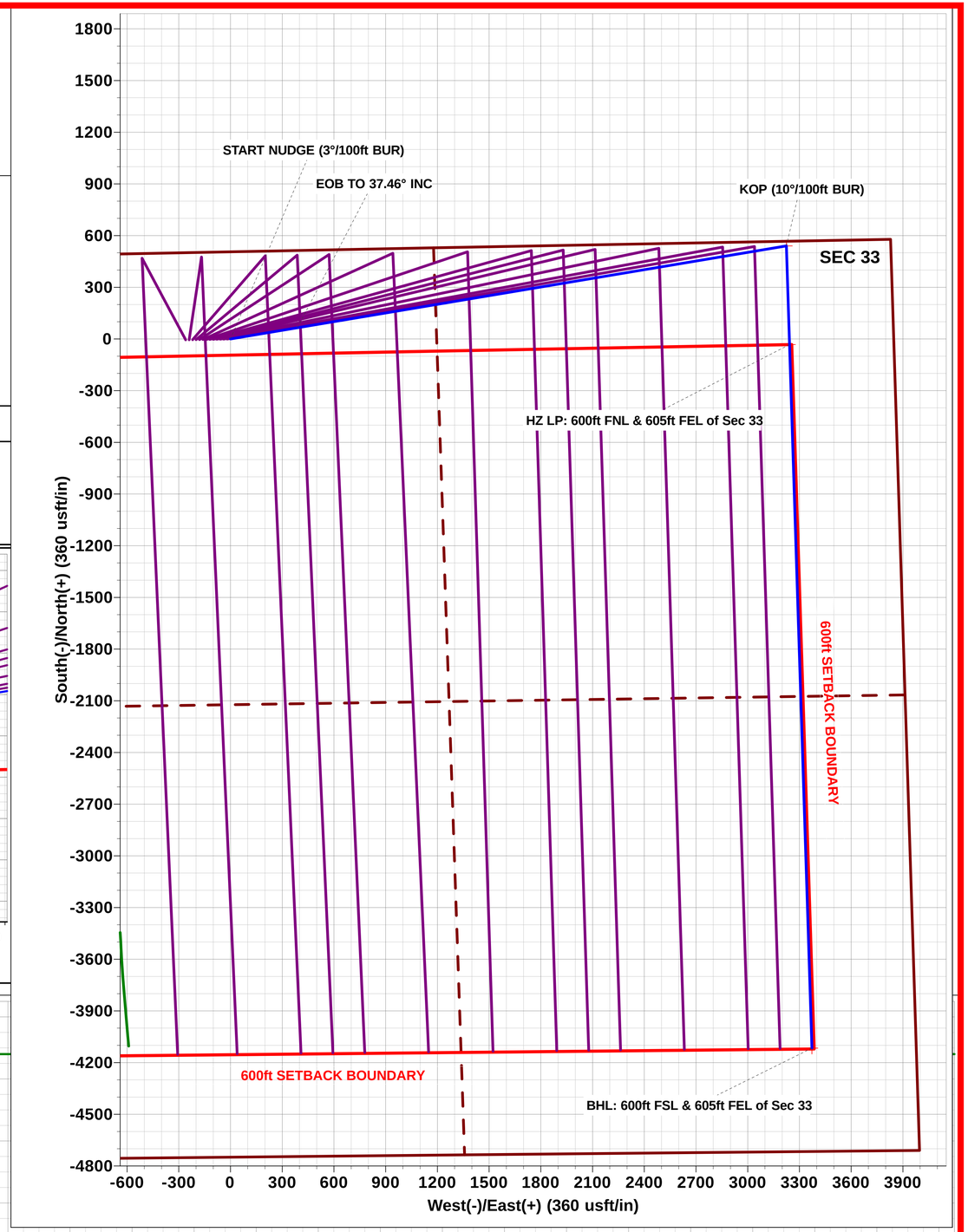
BHL: 600ft FSL & 605ft FEL of Sec 33

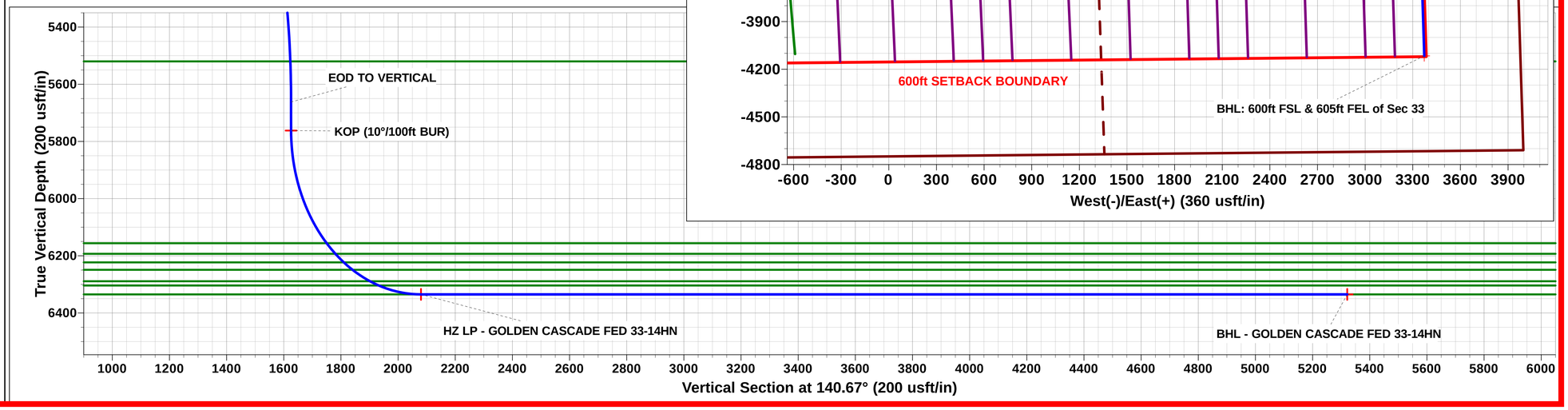
WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - GOLDEN CASCADE FED 33-14HN	5762.04	540.10	3224.31	40.713352	-104.090162
HZ LP - GOLDEN CASCADE FED 33-14HN	6335.00	-32.57	3242.51	40.711780	-104.090097
BHL - GOLDEN CASCADE FED 33-14HN	6335.00	-4115.97	3372.54	40.700572	-104.089630









Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well GOLDEN CASCADE FED 33-14HN
Company:	MALLARD EXPLORATION	**TVD Reference:**	KB-EST @ 4966.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	**MD Reference:**	KB-EST @ 4966.00usft (Original Well Elev)
Site:	NW NW SEC. 33 T9N R60W 6th P.M.	**North Reference:**	True
Well:	GOLDEN CASCADE FED 33-14HN	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

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 NW NW SEC. 33 T9N R60W 6th P.M.

Site Position:		**Northing:**	1,505,224.82 usft	**Latitude:**	40.711856
From:	Lat/Long	**Easting:**	3,387,347.64 usft	**Longitude:**	-104.102731
Position Uncertainty:	0.00 usft	**Slot Radius:**	1.10000 ft	**Grid Convergence:**	0.90 °

Well GOLDEN CASCADE FED 33-14HN

Well Position	**+N/-S**	5.09 usft	**Northing:**	1,505,234.02 usft	**Latitude:**	40.711870
	+E/-W	260.04 usft	**Easting:**	3,387,607.57 usft	**Longitude:**	-104.101793
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	4,946.00 usft

Wellbore ORIGINAL WELLBORE

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	03/05/2018	7.78	67.18	52,520

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 (°)
	6,335.00	0.00	0.00	140.67

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	-4,966.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	-4,866.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,348.61	37.46	80.49	1,261.55	-3,704.45	65.06	388.41	3.00	3.00	0.00	80.49	
5,428.94	37.46	80.49	4,500.49	-465.51	475.04	2,835.90	0.00	0.00	0.00	0.00	
6,677.55	0.00	0.00	5,662.04	696.04	540.10	3,224.31	3.00	-3.00	0.00	180.00	
6,777.55	0.00	0.00	5,762.04	796.04	540.10	3,224.31	0.00	0.00	0.00	0.00	KOP - GOLDEN CA
7,677.55	90.00	178.18	6,335.00	1,369.00	-32.57	3,242.51	10.00	10.00	19.80	178.18	HZ LP - GOLDEN C
11,763.02	90.00	178.17	6,335.00	1,369.00	-4,115.97	3,372.54	0.00	0.00	0.00	-85.33	BHL - GOLDEN CA

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well GOLDEN CASCADE FED 33-14HN
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Project:	WELD COUNTY, COLORADO (NAD 83)	**MD Reference:**	KB-EST @ 4966.00usft (Original Well Elev)
Site:	NW NW SEC. 33 T9N R60W 6th P.M.	**North Reference:**	True
Well:	GOLDEN CASCADE FED 33-14HN	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
SHL: 506ft FNL & 1492ft FWL of Sec 33										
0.00	***0.00***	***0.00***	***0.00***	***4,966.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***
START NUDGE (3°/100ft BUR)										
100.00	***0.00***	***0.00***	***100.00***	***4,866.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***
200.00	3.00	80.49	199.95	4,766.05	0.43	2.58	1.30	3.00	3.00	0.00
300.00	6.00	80.49	299.63	4,666.37	1.73	10.32	5.20	3.00	3.00	0.00
400.00	9.00	80.49	398.77	4,567.23	3.88	23.19	11.69	3.00	3.00	0.00
500.00	12.00	80.49	497.08	4,468.92	6.89	41.16	20.75	3.00	3.00	0.00
600.00	15.00	80.49	594.31	4,371.69	10.75	64.18	32.36	3.00	3.00	0.00
700.00	18.00	80.49	690.18	4,275.82	15.44	92.19	46.48	3.00	3.00	0.00
800.00	21.00	80.49	784.43	4,181.57	20.96	125.11	63.08	3.00	3.00	0.00
900.00	24.00	80.49	876.81	4,089.19	27.28	162.85	82.11	3.00	3.00	0.00
1,000.00	27.00	80.49	967.06	3,998.94	34.39	205.30	103.52	3.00	3.00	0.00
1,100.00	30.00	80.49	1,054.93	3,911.07	42.27	252.36	127.24	3.00	3.00	0.00
1,200.00	33.00	80.49	1,140.18	3,825.82	50.90	303.88	153.22	3.00	3.00	0.00
1,300.00	36.00	80.49	1,222.59	3,743.41	60.26	359.74	181.39	3.00	3.00	0.00
EOB TO 37.46° INC										
1,348.61	***37.46***	***80.49***	***1,261.55***	***3,704.45***	***65.06***	***388.41***	***195.85***	***3.00***	***3.00***	***0.00***
1,400.00	37.46	80.49	1,302.34	3,663.66	70.23	419.23	211.39	0.00	0.00	0.00
1,500.00	37.46	80.49	1,381.72	3,584.28	80.27	479.22	241.63	0.00	0.00	0.00
1,600.00	37.46	80.49	1,461.10	3,504.90	90.32	539.20	271.88	0.00	0.00	0.00
Pierre Shale Top										
1,675.46	***37.46***	***80.49***	***1,521.00***	***3,445.00***	***97.90***	***584.46***	***294.70***	***0.00***	***0.00***	***0.00***
1,700.00	37.46	80.49	1,540.48	3,425.52	100.37	599.18	302.12	0.00	0.00	0.00
1,800.00	37.46	80.49	1,619.86	3,346.14	110.42	659.16	332.37	0.00	0.00	0.00
1,900.00	37.46	80.49	1,699.24	3,266.76	120.46	719.15	362.61	0.00	0.00	0.00
2,000.00	37.46	80.49	1,778.62	3,187.38	130.51	779.13	392.86	0.00	0.00	0.00
2,100.00	37.46	80.49	1,858.00	3,108.00	140.56	839.11	423.10	0.00	0.00	0.00
2,200.00	37.46	80.49	1,937.38	3,028.62	150.61	899.10	453.35	0.00	0.00	0.00
2,300.00	37.46	80.49	2,016.76	2,949.24	160.65	959.08	483.59	0.00	0.00	0.00
2,400.00	37.46	80.49	2,096.13	2,869.87	170.70	1,019.06	513.84	0.00	0.00	0.00
2,500.00	37.46	80.49	2,175.51	2,790.49	180.75	1,079.04	544.08	0.00	0.00	0.00
2,600.00	37.46	80.49	2,254.89	2,711.11	190.80	1,139.03	574.32	0.00	0.00	0.00
2,700.00	37.46	80.49	2,334.27	2,631.73	200.84	1,199.01	604.57	0.00	0.00	0.00
2,800.00	37.46	80.49	2,413.65	2,552.35	210.89	1,258.99	634.81	0.00	0.00	0.00
2,900.00	37.46	80.49	2,493.03	2,472.97	220.94	1,318.97	665.06	0.00	0.00	0.00
3,000.00	37.46	80.49	2,572.41	2,393.59	230.99	1,378.96	695.30	0.00	0.00	0.00
3,100.00	37.46	80.49	2,651.79	2,314.21	241.03	1,438.94	725.55	0.00	0.00	0.00
3,200.00	37.46	80.49	2,731.17	2,234.83	251.08	1,498.92	755.79	0.00	0.00	0.00
3,300.00	37.46	80.49	2,810.55	2,155.45	261.13	1,558.91	786.04	0.00	0.00	0.00
3,400.00	37.46	80.49	2,889.93	2,076.07	271.18	1,618.89	816.28	0.00	0.00	0.00
3,500.00	37.46	80.49	2,969.31	1,996.69	281.23	1,678.87	846.53	0.00	0.00	0.00
3,600.00	37.46	80.49	3,048.69	1,917.31	291.27	1,738.85	876.77	0.00	0.00	0.00
3,700.00	37.46	80.49	3,128.07	1,837.93	301.32	1,798.84	907.02	0.00	0.00	0.00
3,800.00	37.46	80.49	3,207.45	1,758.55	311.37	1,858.82	937.26	0.00	0.00	0.00
3,900.00	37.46	80.49	3,286.83	1,679.17	321.42	1,918.80	967.51	0.00	0.00	0.00
4,000.00	37.46	80.49	3,366.21	1,599.79	331.46	1,978.78	997.75	0.00	0.00	0.00
Richard Sandstone										
4,052.65	***37.46***	***80.49***	***3,408.00***	***1,558.00***	***336.75***	***2,010.36***	***1,013.67***	***0.00***	***0.00***	***0.00***
4,100.00	37.46	80.49	3,445.59	1,520.41	341.51	2,038.77	1,028.00	0.00	0.00	0.00
Parkman Sandstone										
4,191.22	***37.46***	***80.49***	***3,518.00***	***1,448.00***	***350.68***	***2,093.49***	***1,055.59***	***0.00***	***0.00***	***0.00***
4,200.00	37.46	80.49	3,524.97	1,441.03	351.56	2,098.75	1,058.24	0.00	0.00	0.00

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Project:	WELD COUNTY, COLORADO (NAD 83)	**MD Reference:**	KB-EST @ 4966.00usft (Original Well Elev)
Site:	NW NW SEC. 33 T9N R60W 6th P.M.	**North Reference:**	True
Well:	GOLDEN CASCADE FED 33-14HN	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
4,300.00	37.46	80.49	3,604.35	1,361.65	361.61	2,158.73	1,088.48	0.00	0.00	0.00
4,400.00	37.46	80.49	3,683.73	1,282.27	371.65	2,218.72	1,118.73	0.00	0.00	0.00
4,500.00	37.46	80.49	3,763.11	1,202.89	381.70	2,278.70	1,148.97	0.00	0.00	0.00
4,600.00	37.46	80.49	3,842.49	1,123.51	391.75	2,338.68	1,179.22	0.00	0.00	0.00
4,700.00	37.46	80.49	3,921.87	1,044.13	401.80	2,398.66	1,209.46	0.00	0.00	0.00
4,800.00	37.46	80.49	4,001.24	964.76	411.84	2,458.65	1,239.71	0.00	0.00	0.00
4,900.00	37.46	80.49	4,080.62	885.38	421.89	2,518.63	1,269.95	0.00	0.00	0.00
5,000.00	37.46	80.49	4,160.00	806.00	431.94	2,578.61	1,300.20	0.00	0.00	0.00
Sussex Sandstone										
5,056.68	***37.46***	***80.49***	***4,205.00***	***761.00***	***437.64***	***2,612.61***	***1,317.34***	***0.00***	***0.00***	***0.00***
5,100.00	37.46	80.49	4,239.38	726.62	441.99	2,638.59	1,330.44	0.00	0.00	0.00
5,200.00	37.46	80.49	4,318.76	647.24	452.04	2,698.58	1,360.69	0.00	0.00	0.00
5,300.00	37.46	80.49	4,398.14	567.86	462.08	2,758.56	1,390.93	0.00	0.00	0.00
5,400.00	37.46	80.49	4,477.52	488.48	472.13	2,818.54	1,421.18	0.00	0.00	0.00
END OF TANGENT										
5,428.94	***37.46***	***80.49***	***4,500.49***	***465.51***	***475.04***	***2,835.90***	***1,429.93***	***0.00***	***0.00***	***0.00***
5,500.00	35.33	80.49	4,557.69	408.31	482.00	2,877.48	1,450.89	3.00	-3.00	0.00
5,600.00	32.33	80.49	4,640.76	325.24	491.20	2,932.38	1,478.58	3.00	-3.00	0.00
Shannon Sandstone										
5,667.01	***30.32***	***80.49***	***4,698.00***	***268.00***	***496.95***	***2,966.73***	***1,495.90***	***3.00***	***-3.00***	***0.00***
5,700.00	29.33	80.49	4,726.62	239.38	499.66	2,982.91	1,504.06	3.00	-3.00	0.00
5,800.00	26.33	80.49	4,815.04	150.96	507.37	3,028.94	1,527.27	3.00	-3.00	0.00
5,900.00	23.33	80.49	4,905.79	60.21	514.31	3,070.35	1,548.14	3.00	-3.00	0.00
6,000.00	20.33	80.49	4,998.61	-32.61	520.45	3,107.01	1,566.63	3.00	-3.00	0.00
6,100.00	17.33	80.49	5,093.25	-127.25	525.78	3,138.84	1,582.68	3.00	-3.00	0.00
6,200.00	14.33	80.49	5,189.45	-223.45	530.29	3,165.73	1,596.24	3.00	-3.00	0.00
6,300.00	11.33	80.49	5,286.94	-320.94	533.95	3,187.62	1,607.28	3.00	-3.00	0.00
6,400.00	8.33	80.49	5,385.47	-419.47	536.77	3,204.45	1,615.76	3.00	-3.00	0.00
6,500.00	5.33	80.49	5,484.75	-518.75	538.74	3,216.18	1,621.67	3.00	-3.00	0.00
TeePee Buttes										
6,535.38	***4.27***	***80.49***	***5,520.00***	***-554.00***	***539.23***	***3,219.09***	***1,623.14***	***3.00***	***-3.00***	***0.00***
6,600.00	2.33	80.49	5,584.51	-618.51	539.84	3,222.76	1,624.99	3.00	-3.00	0.00
EOD TO VERTICAL										
6,677.55	***0.00***	***0.00***	***5,662.04***	***-696.04***	***540.10***	***3,224.31***	***1,625.77***	***3.00***	***-3.00***	***0.00***
6,700.00	0.00	0.00	5,684.49	-718.49	540.10	3,224.31	1,625.77	0.00	0.00	0.00
KOP (10°/100ft BUR)										
6,777.55	***0.00***	***0.00***	***5,762.04***	***-796.04***	***540.10***	***3,224.31***	***1,625.77***	***0.00***	***0.00***	***0.00***
6,800.00	2.25	178.18	5,784.48	-818.48	539.66	3,224.32	1,626.12	10.00	10.00	0.00
6,900.00	12.24	178.18	5,883.56	-917.56	527.07	3,224.72	1,636.11	10.00	10.00	0.00
7,000.00	22.24	178.18	5,978.94	-1,012.94	497.48	3,225.66	1,659.60	10.00	10.00	0.00
7,100.00	32.24	178.18	6,067.74	-1,101.74	451.78	3,227.12	1,695.87	10.00	10.00	0.00
7,200.00	42.24	178.18	6,147.24	-1,181.24	391.36	3,229.04	1,743.82	10.00	10.00	0.00
Sharon Springs										
7,211.95	***43.44***	***178.18***	***6,156.00***	***-1,190.00***	***383.25***	***3,229.30***	***1,750.26***	***10.00***	***10.00***	***0.00***
Niobrara Top										
7,265.33	***48.78***	***178.18***	***6,193.00***	***-1,227.00***	***344.81***	***3,230.52***	***1,780.77***	***10.00***	***10.00***	***0.00***
7,300.00	52.24	178.18	6,215.04	-1,249.04	318.07	3,231.37	1,801.99	10.00	10.00	0.00
Niobrara A Chalk										
7,313.19	***53.56***	***178.18***	***6,223.00***	***-1,257.00***	***307.55***	***3,231.70***	***1,810.34***	***10.00***	***10.00***	***0.00***
Niobrara A Chalk Base										
7,359.56	***58.20***	***178.18***	***6,249.00***	***-1,283.00***	***269.19***	***3,232.92***	***1,840.78***	***10.00***	***10.00***	***0.00***
7,400.00	62.24	178.18	6,269.08	-1,303.08	234.12	3,234.03	1,868.62	10.00	10.00	0.00
Niobrara B1 Chalk Top										

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well GOLDEN CASCADE FED 33-14HN
Company:	MALLARD EXPLORATION	**TVD Reference:**	KB-EST @ 4966.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	**MD Reference:**	KB-EST @ 4966.00usft (Original Well Elev)
Site:	NW NW SEC. 33 T9N R60W 6th P.M.	**North Reference:**	True
Well:	GOLDEN CASCADE FED 33-14HN	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
7,446.40	***66.88***	***178.18***	***6,289.00***	***-1,323.00***	***192.25***	***3,235.37***	***1,901.84***	***10.00***	***10.00***	***0.00***
Niobrara B1 Chalk Base										
7,488.22	***71.07***	***178.18***	***6,304.00***	***-1,338.00***	***153.25***	***3,236.61***	***1,932.80***	***10.00***	***10.00***	***0.00***
7,500.00	72.24	178.18	6,307.71	-1,341.71	142.07	3,236.96	1,941.67	10.00	10.00	0.00
7,600.00	82.24	178.18	6,329.76	-1,363.76	44.71	3,240.05	2,018.94	10.00	10.00	0.00
HZ LP: 600ft FNL & 605ft FEL of Sec 33 - Niobrara B2 Chalk Top (Target)										
7,677.55	***90.00***	***178.18***	***6,335.00***	***-1,369.00***	***-32.57***	***3,242.51***	***2,080.27***	***10.00***	***10.00***	***0.00***
7,700.00	90.00	178.18	6,335.00	-1,369.00	-55.01	3,243.22	2,098.08	0.00	0.00	0.00
7,800.00	90.00	178.18	6,335.00	-1,369.00	-154.96	3,246.40	2,177.40	0.00	0.00	0.00
7,900.00	90.00	178.18	6,335.00	-1,369.00	-254.91	3,249.58	2,256.73	0.00	0.00	0.00
8,000.00	90.00	178.18	6,335.00	-1,369.00	-354.86	3,252.76	2,336.05	0.00	0.00	0.00
8,100.00	90.00	178.18	6,335.00	-1,369.00	-454.80	3,255.93	2,415.38	0.00	0.00	0.00
8,200.00	90.00	178.18	6,335.00	-1,369.00	-554.75	3,259.11	2,494.70	0.00	0.00	0.00
8,300.00	90.00	178.18	6,335.00	-1,369.00	-654.70	3,262.29	2,574.03	0.00	0.00	0.00
8,400.00	90.00	178.18	6,335.00	-1,369.00	-754.65	3,265.47	2,653.36	0.00	0.00	0.00
8,500.00	90.00	178.18	6,335.00	-1,369.00	-854.60	3,268.65	2,732.68	0.00	0.00	0.00
8,600.00	90.00	178.18	6,335.00	-1,369.00	-954.55	3,271.83	2,812.01	0.00	0.00	0.00
8,700.00	90.00	178.18	6,335.00	-1,369.00	-1,054.50	3,275.01	2,891.33	0.00	0.00	0.00
8,800.00	90.00	178.18	6,335.00	-1,369.00	-1,154.45	3,278.19	2,970.66	0.00	0.00	0.00
8,900.00	90.00	178.18	6,335.00	-1,369.00	-1,254.40	3,281.37	3,049.99	0.00	0.00	0.00
9,000.00	90.00	178.18	6,335.00	-1,369.00	-1,354.35	3,284.55	3,129.31	0.00	0.00	0.00
9,100.00	90.00	178.18	6,335.00	-1,369.00	-1,454.30	3,287.73	3,208.64	0.00	0.00	0.00
9,200.00	90.00	178.18	6,335.00	-1,369.00	-1,554.25	3,290.91	3,287.97	0.00	0.00	0.00
9,300.00	90.00	178.18	6,335.00	-1,369.00	-1,654.20	3,294.09	3,367.30	0.00	0.00	0.00
9,400.00	90.00	178.18	6,335.00	-1,369.00	-1,754.15	3,297.27	3,446.62	0.00	0.00	0.00
9,500.00	90.00	178.18	6,335.01	-1,369.01	-1,854.10	3,300.45	3,525.95	0.00	0.00	0.00
9,600.00	90.00	178.18	6,335.01	-1,369.01	-1,954.05	3,303.63	3,605.28	0.00	0.00	0.00
9,700.00	90.00	178.18	6,335.01	-1,369.01	-2,054.00	3,306.82	3,684.61	0.00	0.00	0.00
9,800.00	90.00	178.18	6,335.01	-1,369.01	-2,153.94	3,310.00	3,763.94	0.00	0.00	0.00
9,900.00	90.00	178.18	6,335.01	-1,369.01	-2,253.89	3,313.18	3,843.26	0.00	0.00	0.00
10,000.00	90.00	178.18	6,335.00	-1,369.00	-2,353.84	3,316.37	3,922.59	0.00	0.00	0.00
10,100.00	90.00	178.18	6,335.00	-1,369.00	-2,453.79	3,319.55	4,001.92	0.00	0.00	0.00
10,200.00	90.00	178.18	6,335.00	-1,369.00	-2,553.74	3,322.73	4,081.25	0.00	0.00	0.00
10,300.00	90.00	178.18	6,335.00	-1,369.00	-2,653.69	3,325.92	4,160.58	0.00	0.00	0.00
10,400.00	90.00	178.17	6,335.00	-1,369.00	-2,753.64	3,329.10	4,239.91	0.00	0.00	0.00
10,500.00	90.00	178.17	6,335.00	-1,369.00	-2,853.59	3,332.29	4,319.24	0.00	0.00	0.00
10,600.00	90.00	178.17	6,335.00	-1,369.00	-2,953.54	3,335.47	4,398.57	0.00	0.00	0.00
10,700.00	90.00	178.17	6,335.00	-1,369.00	-3,053.49	3,338.66	4,477.90	0.00	0.00	0.00
10,800.00	90.00	178.17	6,335.00	-1,369.00	-3,153.44	3,341.84	4,557.23	0.00	0.00	0.00
10,900.00	90.00	178.17	6,335.00	-1,369.00	-3,253.39	3,345.03	4,636.56	0.00	0.00	0.00
11,000.00	90.00	178.17	6,335.00	-1,369.00	-3,353.34	3,348.22	4,715.89	0.00	0.00	0.00
11,100.00	90.00	178.17	6,335.00	-1,369.00	-3,453.29	3,351.40	4,795.22	0.00	0.00	0.00
11,200.00	90.00	178.17	6,335.00	-1,369.00	-3,553.23	3,354.59	4,874.55	0.00	0.00	0.00
11,300.00	90.00	178.17	6,335.00	-1,369.00	-3,653.18	3,357.78	4,953.88	0.00	0.00	0.00
11,400.00	90.00	178.17	6,335.00	-1,369.00	-3,753.13	3,360.96	5,033.21	0.00	0.00	0.00
11,500.00	90.00	178.17	6,335.00	-1,369.00	-3,853.08	3,364.15	5,112.55	0.00	0.00	0.00
11,600.00	90.00	178.17	6,335.00	-1,369.00	-3,953.03	3,367.34	5,191.88	0.00	0.00	0.00
11,700.00	90.00	178.17	6,335.00	-1,369.00	-4,052.98	3,370.53	5,271.21	0.00	0.00	0.00
BHL: 600ft FSL & 605ft FEL of Sec 33										
11,763.02	***90.00***	***178.17***	***6,335.00***	***-1,369.00***	***-4,115.97***	***3,372.54***	***5,321.20***	***0.00***	***0.00***	***0.00***

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well GOLDEN CASCADE FED 33-14HN
Company:	MALLARD EXPLORATION	**TVD Reference:**	KB-EST @ 4966.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	**MD Reference:**	KB-EST @ 4966.00usft (Original Well Elev)
Site:	NW NW SEC. 33 T9N R60W 6th P.M.	**North Reference:**	True
Well:	GOLDEN CASCADE FED 33-14HN	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations

MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,675.46	1,521.00	Pierre Shale Top			
4,052.65	3,408.00	Richard Sandstone			
4,191.22	3,518.00	Parkman Sandstone			
5,056.68	4,205.00	Sussex Sandstone			
5,667.01	4,698.00	Shannon Sandstone			
6,535.38	5,520.00	TeePee Buttes			
7,211.95	6,156.00	Sharon Springs			
7,265.33	6,193.00	Niobrara Top			
7,313.19	6,223.00	Niobrara A Chalk			
7,359.56	6,249.00	Niobrara A Chalk Base			
7,446.40	6,289.00	Niobrara B1 Chalk Top			
7,488.22	6,304.00	Niobrara B1 Chalk Base			
7,677.55	6,335.00	Niobrara B2 Chalk Top (Target)			

Plan Annotations

MD (usft)	TVD (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
0.00	0.00	0.00	0.00	SHL: 506ft FNL & 1492ft FWL of Sec 33
100.00	100.00	0.00	0.00	START NUDGE (3°/100ft BUR)
1,348.61	1,261.55	65.06	388.41	EOB TO 37.46° INC
5,428.94	4,500.49	475.04	2,835.90	END OF TANGENT
6,677.55	5,662.04	540.10	3,224.31	EOD TO VERTICAL
6,777.55	5,762.04	540.10	3,224.31	KOP (10°/100ft BUR)
7,677.55	6,335.00	-32.57	3,242.51	HZ LP: 600ft FNL & 605ft FEL of Sec 33
11,763.02	6,335.00	-4,115.97	3,372.54	BHL: 600ft FSL & 605ft FEL of Sec 33