

MALLARD EXPLORATION

WELD COUNTY, COLORADO (NAD 83)

NW SW SEC. 6 T7N R60W 6th P.M.

SHELDUCK 6-5-9HN

ORIGINAL WELLBORE

29 December, 2017

Plan: PROPOSAL #1





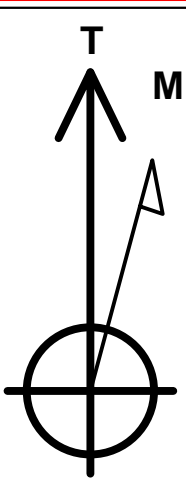
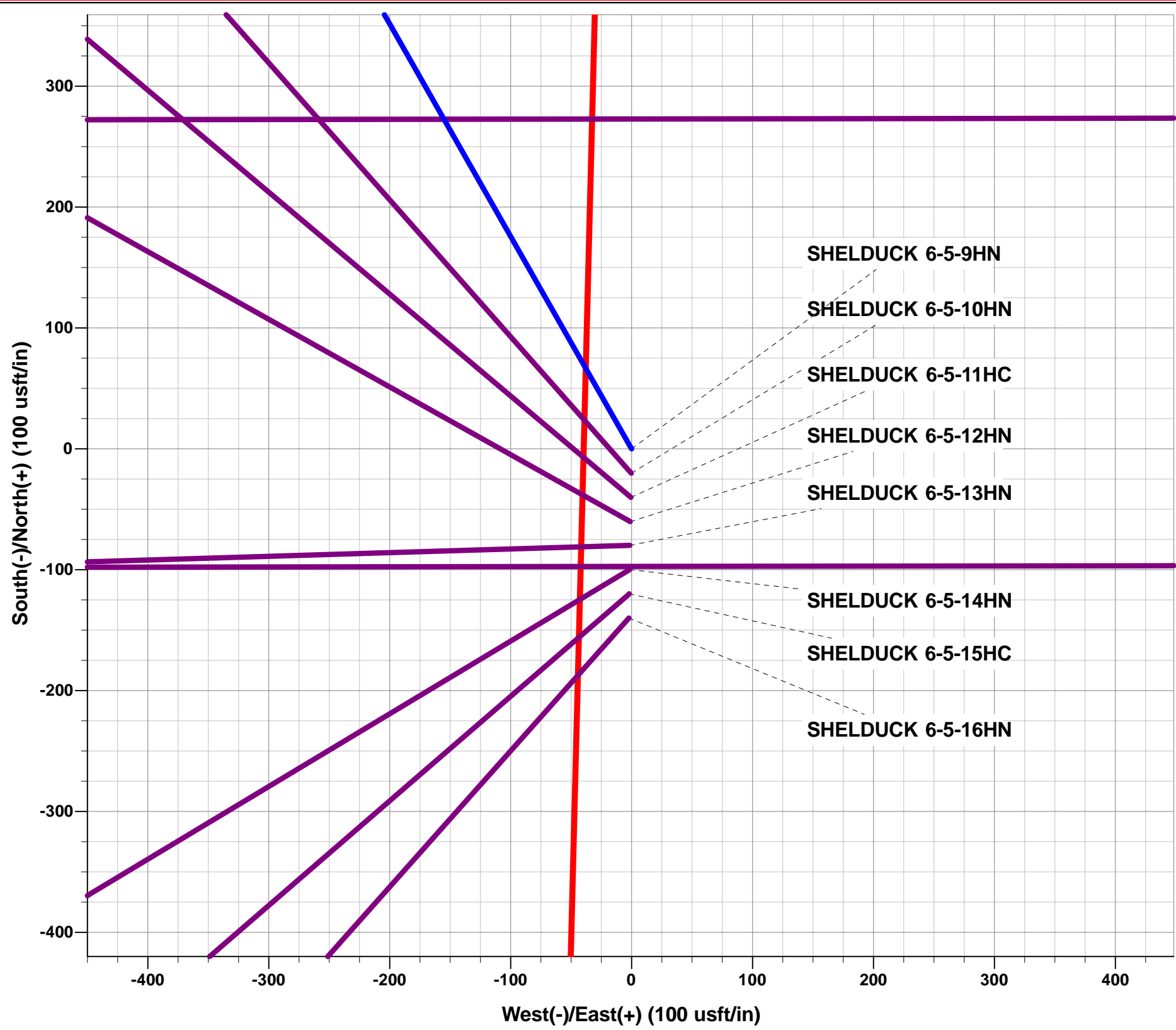
Project: WELD COUNTY, COLORADO (NAD 83)
Site: NW SW SEC. 6 T7N R60W 6th P.M.
Well: SHELDUCK 6-5-9HN
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 1442ft FSL & 628ft FWL of Sec 6
100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
761.96	768.00	13.36	330.37	67.39	-38.33	-30.73	77.53	EOB TO 13.36° INC
5010.08	5134.28	13.36	330.37	944.37	-537.13	-430.64	1086.44	END OF TANGENT
5672.04	5802.28	0.00	0.00	1011.76	-575.46	-461.37	1163.96	EOD TO VERTICAL
5772.04	5902.28	0.00	0.00	1011.76	-575.46	-461.37	1163.96	KOP (10°/100ft BUR)
6345.00	6802.28	90.00	89.93	1012.46	-2.50	108.24	1736.93	HZ LP: 2455ft FSL & 600ft FWL of Sec 6
6345.00	16112.91	90.00	89.93	1024.05	9308.12	9364.28	11047.55	BHL: 2455ft FSL & 600ft FEL of Sec 5

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - SHELDUCK 6-5-9HN	5772.04	1011.76	-575.46	40.603672	-104.145039
HZ LP - SHELDUCK 6-5-9HN	6345.00	1012.46	-2.50	40.603674	-104.142976
BHL - SHELDUCK 6-5-9HN	6345.00	1024.05	9308.12	40.603701	-104.109446



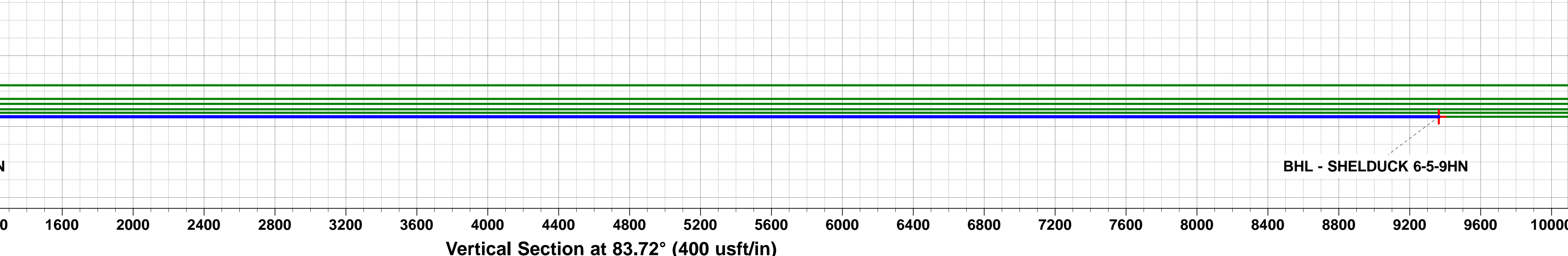
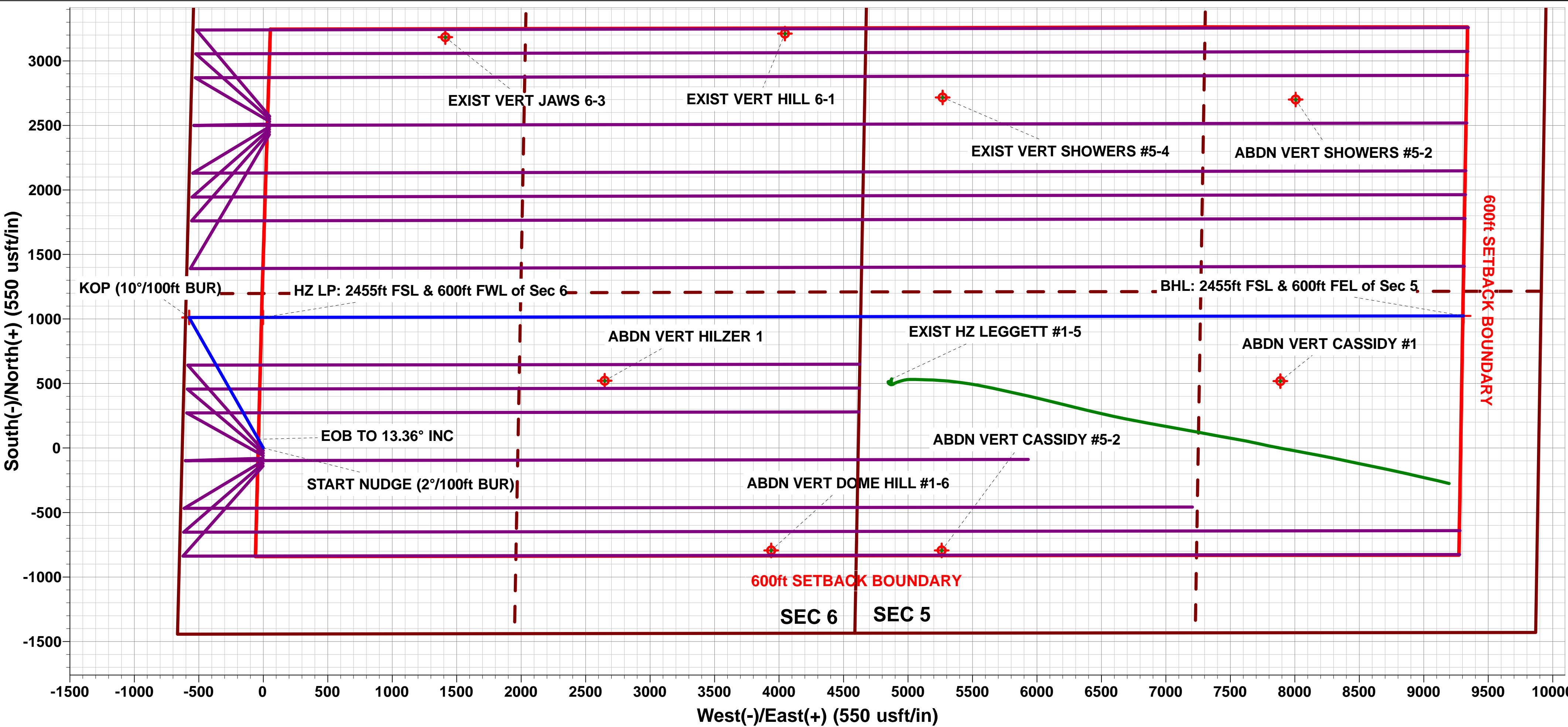
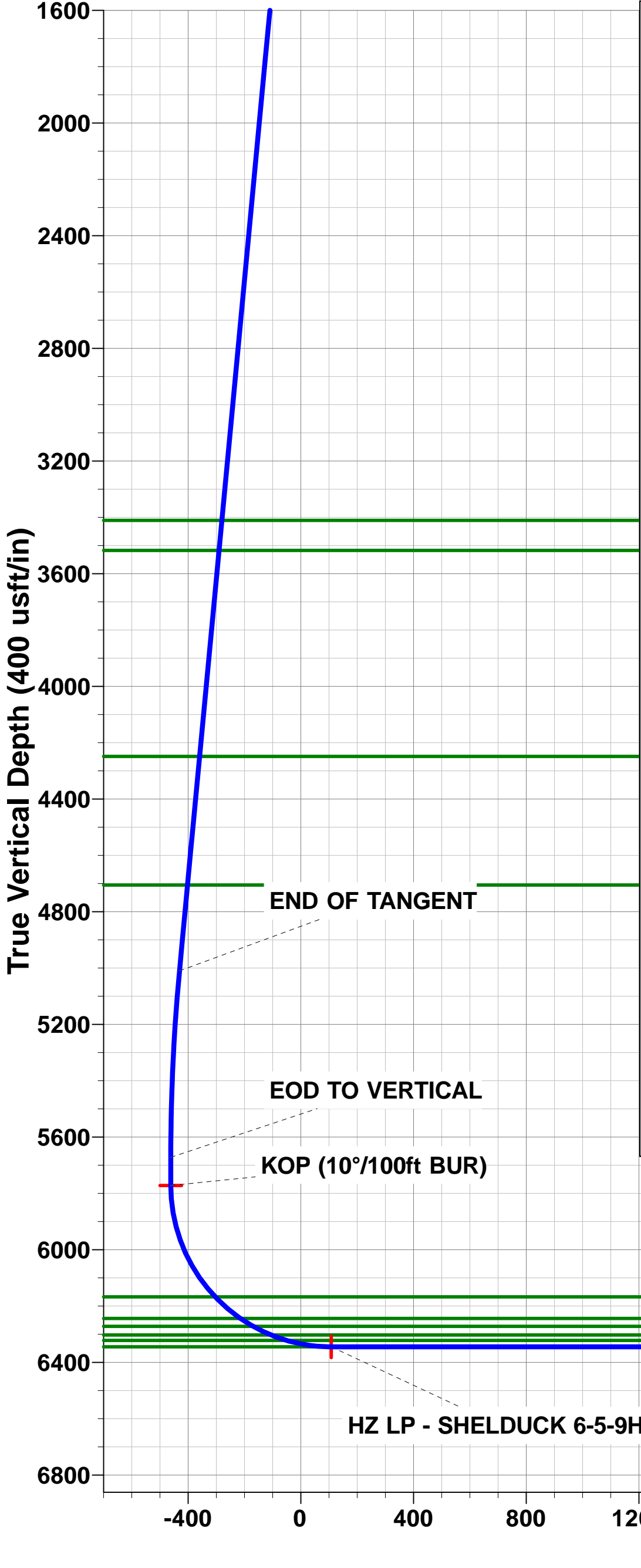
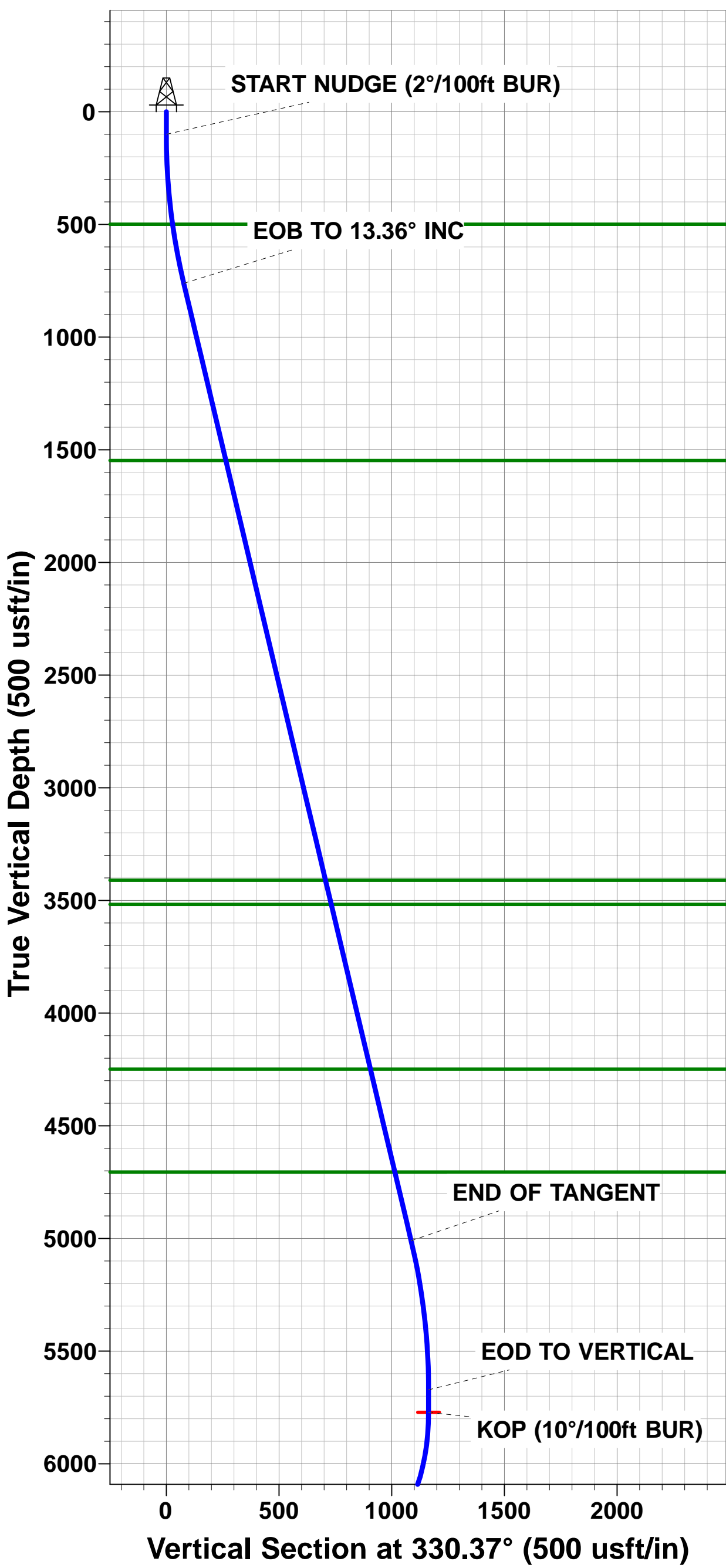
Azimuths to True North
Magnetic North: 7.83°
Magnetic Field
Strength: 52497.7snT
Dip Angle: 67.09°
Date: 29/12/2017
Model: IGRF2015

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
500.00	501.31	Fox Hills Base
1548.00	1575.90	Pierre Shale Top
3411.00	3490.72	Richard Sandstone
3518.00	3600.70	Parkman Sandstone
4249.00	4352.03	Sussex Sandstone
4706.00	4821.74	Shannon Sandstone
6168.00	6339.43	Sharon Springs
6244.00	6456.87	Niobrara A Chalk
6272.00	6509.89	Niobrara A Chalk Base
6303.00	6581.53	Niobrara B1 Chalk Top
6322.00	6639.39	Niobrara B1 Chalk Base
6345.00	6802.28	Niobrara B2 Chalk Top (Target)

PROPOSED LOCAL COORDINATES:

SHL: 1442ft FSL & 628ft FWL of Sec 6
HZ LP: 2455ft FSL & 600ft FWL of Sec 6
BHL: 2455ft FSL & 600ft FEL of Sec 5



Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well SHELDUCK 6-5-9HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Site:	NW SW SEC. 6 T7N R60W 6th P.M.	North Reference:	True
Well:	SHELDUCK 6-5-9HN	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 SW SEC. 6 T7N R60W 6th P.M.				
Site Position:		Northing:	1,464,630.90 usft	Latitude:	40.600895
From:	Lat/Long	Easting:	3,376,813.02 usft	Longitude:	-104.142967
Position Uncertainty:	0.00 usft	Slot Radius:	1.10000ft	Grid Convergence:	0.88 °

Well	SHELDUCK 6-5-9HN					
Well Position	+N-S	0.00 usft	Northing:	1,464,630.90 usft	Latitude:	40.600895
	+E-W	0.00 usft	Easting:	3,376,813.02 usft	Longitude:	-104.142967
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,954.00 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	29/12/2017	7.83	67.09	52,498

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 (°)
	6,345.00	0.00	0.00	83.72

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	-4,974.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	-4,874.00	0.00	0.00	0.00	0.00	0.00	0.00	
768.00	13.36	330.37	761.96	-4,212.04	67.39	-38.33	2.00	2.00	0.00	330.37	
5,134.28	13.36	330.37	5,010.08	36.08	944.37	-537.13	0.00	0.00	0.00	0.00	
5,802.28	0.00	0.00	5,672.04	698.04	1,011.76	-575.46	2.00	-2.00	0.00	180.00	
5,902.28	0.00	0.00	5,772.04	798.04	1,011.76	-575.46	0.00	0.00	0.00	0.00	KOP - SHELDUCK
6,802.28	90.00	89.93	6,345.00	1,371.00	1,012.46	-2.50	10.00	10.00	9.99	89.93	HZ LP - SHELDUCI
16,112.91	90.00	89.93	6,345.00	1,371.00	1,024.05	9,308.12	0.00	0.00	0.00	-94.48	BHL - SHELDUCK

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well SHELDUCK 6-5-9HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Site:	NW SW SEC. 6 T7N R60W 6th P.M.	North Reference:	True
Well:	SHELDUCK 6-5-9HN	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: 1442ft FSL & 628ft FWL of Sec 6										
0.00	0.00	0.00	0.00	4,974.00	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	4,874.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	2.00	330.37	199.98	4,774.02	1.52	-0.86	-0.69	2.00	2.00	0.00
300.00	4.00	330.37	299.84	4,674.16	6.07	-3.45	-2.77	2.00	2.00	0.00
400.00	6.00	330.37	399.45	4,574.55	13.64	-7.76	-6.22	2.00	2.00	0.00
500.00	8.00	330.37	498.70	4,475.30	24.23	-13.78	-11.05	2.00	2.00	0.00
Fox Hills Base										
501.31	8.03	330.37	500.00	4,474.00	24.39	-13.87	-11.12	2.00	2.00	0.00
600.00	10.00	330.37	597.47	4,376.53	37.83	-21.52	-17.25	2.00	2.00	0.00
700.00	12.00	330.37	695.62	4,278.38	54.42	-30.95	-24.81	2.00	2.00	0.00
EOB TO 13.36° INC										
768.00	13.36	330.37	761.96	4,212.04	67.39	-38.33	-30.73	2.00	2.00	0.00
800.00	13.36	330.37	793.10	4,180.90	73.82	-41.99	-33.66	0.00	0.00	0.00
900.00	13.36	330.37	890.39	4,083.61	93.90	-53.41	-42.82	0.00	0.00	0.00
1,000.00	13.36	330.37	987.68	3,986.32	113.99	-64.83	-51.98	0.00	0.00	0.00
1,100.00	13.36	330.37	1,084.98	3,889.02	134.07	-76.26	-61.14	0.00	0.00	0.00
1,200.00	13.36	330.37	1,182.27	3,791.73	154.16	-87.68	-70.30	0.00	0.00	0.00
1,300.00	13.36	330.37	1,279.57	3,694.43	174.24	-99.11	-79.46	0.00	0.00	0.00
1,400.00	13.36	330.37	1,376.86	3,597.14	194.33	-110.53	-88.61	0.00	0.00	0.00
1,500.00	13.36	330.37	1,474.15	3,499.85	214.41	-121.95	-97.77	0.00	0.00	0.00
Pierre Shale Top										
1,575.90	13.36	330.37	1,548.00	3,426.00	229.66	-130.62	-104.73	0.00	0.00	0.00
1,600.00	13.36	330.37	1,571.45	3,402.55	234.50	-133.38	-106.93	0.00	0.00	0.00
1,700.00	13.36	330.37	1,668.74	3,305.26	254.59	-144.80	-116.09	0.00	0.00	0.00
1,800.00	13.36	330.37	1,766.03	3,207.97	274.67	-156.22	-125.25	0.00	0.00	0.00
1,900.00	13.36	330.37	1,863.33	3,110.67	294.76	-167.65	-134.41	0.00	0.00	0.00
2,000.00	13.36	330.37	1,960.62	3,013.38	314.84	-179.07	-143.57	0.00	0.00	0.00
2,100.00	13.36	330.37	2,057.92	2,916.08	334.93	-190.50	-152.73	0.00	0.00	0.00
2,200.00	13.36	330.37	2,155.21	2,818.79	355.01	-201.92	-161.89	0.00	0.00	0.00
2,300.00	13.36	330.37	2,252.50	2,721.50	375.10	-213.34	-171.05	0.00	0.00	0.00
2,400.00	13.36	330.37	2,349.80	2,624.20	395.18	-224.77	-180.20	0.00	0.00	0.00
2,500.00	13.36	330.37	2,447.09	2,526.91	415.27	-236.19	-189.36	0.00	0.00	0.00
2,600.00	13.36	330.37	2,544.38	2,429.62	435.35	-247.62	-198.52	0.00	0.00	0.00
2,700.00	13.36	330.37	2,641.68	2,332.32	455.44	-259.04	-207.68	0.00	0.00	0.00
2,800.00	13.36	330.37	2,738.97	2,235.03	475.52	-270.46	-216.84	0.00	0.00	0.00
2,900.00	13.36	330.37	2,836.27	2,137.73	495.61	-281.89	-226.00	0.00	0.00	0.00
3,000.00	13.36	330.37	2,933.56	2,040.44	515.69	-293.31	-235.16	0.00	0.00	0.00
3,100.00	13.36	330.37	3,030.85	1,943.15	535.78	-304.74	-244.32	0.00	0.00	0.00
3,200.00	13.36	330.37	3,128.15	1,845.85	555.86	-316.16	-253.48	0.00	0.00	0.00
3,300.00	13.36	330.37	3,225.44	1,748.56	575.95	-327.58	-262.63	0.00	0.00	0.00
3,400.00	13.36	330.37	3,322.73	1,651.27	596.04	-339.01	-271.79	0.00	0.00	0.00
Richard Sandstone										
3,490.72	13.36	330.37	3,411.00	1,563.00	614.26	-349.37	-280.10	0.00	0.00	0.00
3,500.00	13.36	330.37	3,420.03	1,553.97	616.12	-350.43	-280.95	0.00	0.00	0.00
3,600.00	13.36	330.37	3,517.32	1,456.68	636.21	-361.86	-290.11	0.00	0.00	0.00
Parkman Sandstone										
3,600.70	13.36	330.37	3,518.00	1,456.00	636.35	-361.94	-290.18	0.00	0.00	0.00
3,700.00	13.36	330.37	3,614.62	1,359.38	656.29	-373.28	-299.27	0.00	0.00	0.00
3,800.00	13.36	330.37	3,711.91	1,262.09	676.38	-384.70	-308.43	0.00	0.00	0.00
3,900.00	13.36	330.37	3,809.20	1,164.80	696.46	-396.13	-317.59	0.00	0.00	0.00
4,000.00	13.36	330.37	3,906.50	1,067.50	716.55	-407.55	-326.75	0.00	0.00	0.00

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Well:	SHELDUCK 6-5-9HN	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)
4,100.00	13.36	330.37	4,003.79	970.21	736.63	-418.98	-335.91	0.00	0.00	0.00
4,200.00	13.36	330.37	4,101.08	872.92	756.72	-430.40	-345.07	0.00	0.00	0.00
4,300.00	13.36	330.37	4,198.38	775.62	776.80	-441.82	-354.22	0.00	0.00	0.00
Sussex Sandstone										
4,352.03	13.36	330.37	4,249.00	725.00	787.25	-447.77	-358.99	0.00	0.00	0.00
4,400.00	13.36	330.37	4,295.67	678.33	796.89	-453.25	-363.38	0.00	0.00	0.00
4,500.00	13.36	330.37	4,392.97	581.03	816.97	-464.67	-372.54	0.00	0.00	0.00
4,600.00	13.36	330.37	4,490.26	483.74	837.06	-476.09	-381.70	0.00	0.00	0.00
4,700.00	13.36	330.37	4,587.55	386.45	857.14	-487.52	-390.86	0.00	0.00	0.00
4,800.00	13.36	330.37	4,684.85	289.15	877.23	-498.94	-400.02	0.00	0.00	0.00
Shannon Sandstone										
4,821.74	13.36	330.37	4,706.00	268.00	881.60	-501.43	-402.01	0.00	0.00	0.00
4,900.00	13.36	330.37	4,782.14	191.86	897.31	-510.37	-409.18	0.00	0.00	0.00
5,000.00	13.36	330.37	4,879.43	94.57	917.40	-521.79	-418.34	0.00	0.00	0.00
5,100.00	13.36	330.37	4,976.73	-2.73	937.48	-533.21	-427.50	0.00	0.00	0.00
END OF TANGENT										
5,134.28	13.36	330.37	5,010.08	-36.08	944.37	-537.13	-430.64	0.00	0.00	0.00
5,200.00	12.05	330.37	5,074.19	-100.19	956.93	-544.28	-436.36	2.00	-2.00	0.00
5,300.00	10.05	330.37	5,172.33	-198.33	973.58	-553.75	-443.96	2.00	-2.00	0.00
5,400.00	8.05	330.37	5,271.08	-297.08	987.25	-561.52	-450.19	2.00	-2.00	0.00
5,500.00	6.05	330.37	5,370.32	-396.32	997.91	-567.58	-455.05	2.00	-2.00	0.00
5,600.00	4.05	330.37	5,469.93	-495.93	1,005.56	-571.93	-458.54	2.00	-2.00	0.00
5,700.00	2.05	330.37	5,569.79	-595.79	1,010.17	-574.56	-460.64	2.00	-2.00	0.00
5,800.00	0.05	330.37	5,669.76	-695.76	1,011.76	-575.46	-461.37	2.00	-2.00	0.00
EOD TO VERTICAL										
5,802.28	0.00	0.00	5,672.04	-698.04	1,011.76	-575.46	-461.37	2.00	-2.00	0.00
5,900.00	0.00	0.00	5,769.76	-795.76	1,011.76	-575.46	-461.37	0.00	0.00	0.00
KOP (10°/100ft BUR)										
5,902.28	0.00	0.00	5,772.04	-798.04	1,011.76	-575.46	-461.37	0.00	0.00	0.00
6,000.00	9.77	89.93	5,869.29	-895.29	1,011.77	-567.15	-453.10	10.00	10.00	0.00
6,100.00	19.77	89.93	5,965.86	-991.86	1,011.80	-541.68	-427.78	10.00	10.00	0.00
6,200.00	29.77	89.93	6,056.55	-1,082.55	1,011.85	-499.83	-386.18	10.00	10.00	0.00
6,300.00	39.77	89.93	6,138.58	-1,164.58	1,011.92	-442.87	-329.56	10.00	10.00	0.00
Sharon Springs										
6,339.43	43.72	89.93	6,168.00	-1,194.00	1,011.95	-416.62	-303.46	10.00	10.00	0.00
6,400.00	49.77	89.93	6,209.49	-1,235.49	1,012.01	-372.53	-259.63	10.00	10.00	0.00
Niobrara A Chalk										
6,456.87	55.46	89.93	6,244.00	-1,270.00	1,012.06	-327.36	-214.72	10.00	10.00	0.00
6,500.00	59.77	89.93	6,267.09	-1,293.09	1,012.11	-290.95	-178.52	10.00	10.00	0.00
Niobrara A Chalk Base										
6,509.89	60.76	89.93	6,272.00	-1,298.00	1,012.12	-282.36	-169.99	10.00	10.00	0.00
Niobrara B1 Chalk Top										
6,581.53	67.93	89.93	6,303.00	-1,329.00	1,012.20	-217.82	-105.83	10.00	10.00	0.00
6,600.00	69.77	89.93	6,309.66	-1,335.66	1,012.22	-200.60	-88.71	10.00	10.00	0.00
Niobrara B1 Chalk Base										
6,639.39	73.71	89.93	6,322.00	-1,348.00	1,012.26	-163.21	-51.53	10.00	10.00	0.00
6,700.00	79.77	89.93	6,335.90	-1,361.90	1,012.33	-104.24	7.09	10.00	10.00	0.00
6,800.00	89.77	89.93	6,345.00	-1,371.00	1,012.45	-4.78	105.97	10.00	10.00	0.00
HZ LP: 2455ft FSL & 600ft FWL of Sec 6 - Niobrara B2 Chalk Top (Target)										
6,802.28	90.00	89.93	6,345.00	-1,371.00	1,012.46	-2.50	108.23	10.00	10.00	0.00
6,900.00	90.00	89.93	6,345.00	-1,371.00	1,012.58	95.22	205.38	0.00	0.00	0.00
7,000.00	90.00	89.93	6,345.00	-1,371.00	1,012.70	195.22	304.80	0.00	0.00	0.00
7,100.00	90.00	89.93	6,345.00	-1,371.00	1,012.82	295.22	404.21	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well SHELDUCK 6-5-9HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Site:	NW SW SEC. 6 T7N R60W 6th P.M.	North Reference:	True
Well:	SHELDUCK 6-5-9HN	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)
7,200.00	90.00	89.93	6,345.00	-1,371.00	1,012.94	395.22	503.62	0.00	0.00	0.00
7,300.00	90.00	89.93	6,345.00	-1,371.00	1,013.06	495.22	603.04	0.00	0.00	0.00
7,400.00	90.00	89.93	6,345.00	-1,371.00	1,013.19	595.22	702.45	0.00	0.00	0.00
7,500.00	90.00	89.93	6,345.00	-1,371.00	1,013.31	695.22	801.86	0.00	0.00	0.00
7,600.00	90.00	89.93	6,345.00	-1,371.00	1,013.43	795.22	901.28	0.00	0.00	0.00
7,700.00	90.00	89.93	6,345.00	-1,371.00	1,013.55	895.22	1,000.69	0.00	0.00	0.00
7,800.00	90.00	89.93	6,345.00	-1,371.00	1,013.67	995.22	1,100.10	0.00	0.00	0.00
7,900.00	90.00	89.93	6,345.00	-1,371.00	1,013.80	1,095.22	1,199.52	0.00	0.00	0.00
8,000.00	90.00	89.93	6,345.00	-1,371.00	1,013.92	1,195.22	1,298.93	0.00	0.00	0.00
8,100.00	90.00	89.93	6,345.00	-1,371.00	1,014.04	1,295.22	1,398.34	0.00	0.00	0.00
8,200.00	90.00	89.93	6,345.00	-1,371.00	1,014.16	1,395.22	1,497.76	0.00	0.00	0.00
8,300.00	90.00	89.93	6,345.00	-1,371.00	1,014.29	1,495.22	1,597.17	0.00	0.00	0.00
8,400.00	90.00	89.93	6,345.00	-1,371.00	1,014.41	1,595.22	1,696.58	0.00	0.00	0.00
8,500.00	90.00	89.93	6,345.00	-1,371.00	1,014.53	1,695.22	1,796.00	0.00	0.00	0.00
8,600.00	90.00	89.93	6,345.00	-1,371.00	1,014.65	1,795.22	1,895.41	0.00	0.00	0.00
8,700.00	90.00	89.93	6,345.00	-1,371.00	1,014.78	1,895.22	1,994.83	0.00	0.00	0.00
8,800.00	90.00	89.93	6,345.00	-1,371.00	1,014.90	1,995.22	2,094.24	0.00	0.00	0.00
8,900.00	90.00	89.93	6,345.00	-1,371.00	1,015.02	2,095.22	2,193.65	0.00	0.00	0.00
9,000.00	90.00	89.93	6,345.00	-1,371.00	1,015.15	2,195.22	2,293.07	0.00	0.00	0.00
9,100.00	90.00	89.93	6,345.00	-1,371.00	1,015.27	2,295.22	2,392.48	0.00	0.00	0.00
9,200.00	90.00	89.93	6,345.00	-1,371.00	1,015.39	2,395.22	2,491.89	0.00	0.00	0.00
9,300.00	90.00	89.93	6,345.00	-1,371.00	1,015.51	2,495.22	2,591.31	0.00	0.00	0.00
9,400.00	90.00	89.93	6,345.00	-1,371.00	1,015.64	2,595.22	2,690.72	0.00	0.00	0.00
9,500.00	90.00	89.93	6,345.00	-1,371.00	1,015.76	2,695.22	2,790.13	0.00	0.00	0.00
9,600.00	90.00	89.93	6,345.00	-1,371.00	1,015.88	2,795.22	2,889.55	0.00	0.00	0.00
9,700.00	90.00	89.93	6,345.00	-1,371.00	1,016.01	2,895.22	2,988.96	0.00	0.00	0.00
9,800.00	90.00	89.93	6,345.00	-1,371.00	1,016.13	2,995.22	3,088.38	0.00	0.00	0.00
9,900.00	90.00	89.93	6,345.00	-1,371.00	1,016.26	3,095.22	3,187.79	0.00	0.00	0.00
10,000.00	90.00	89.93	6,345.00	-1,371.00	1,016.38	3,195.22	3,287.20	0.00	0.00	0.00
10,100.00	90.00	89.93	6,345.00	-1,371.00	1,016.50	3,295.22	3,386.62	0.00	0.00	0.00
10,200.00	90.00	89.93	6,345.00	-1,371.00	1,016.63	3,395.22	3,486.03	0.00	0.00	0.00
10,300.00	90.00	89.93	6,345.00	-1,371.00	1,016.75	3,495.22	3,585.44	0.00	0.00	0.00
10,400.00	90.00	89.93	6,344.99	-1,370.99	1,016.87	3,595.22	3,684.86	0.00	0.00	0.00
10,500.00	90.00	89.93	6,344.99	-1,370.99	1,017.00	3,695.22	3,784.27	0.00	0.00	0.00
10,600.00	90.00	89.93	6,344.99	-1,370.99	1,017.12	3,795.22	3,883.69	0.00	0.00	0.00
10,700.00	90.00	89.93	6,344.99	-1,370.99	1,017.25	3,895.22	3,983.10	0.00	0.00	0.00
10,800.00	90.00	89.93	6,344.99	-1,370.99	1,017.37	3,995.22	4,082.51	0.00	0.00	0.00
10,900.00	90.00	89.93	6,344.99	-1,370.99	1,017.49	4,095.22	4,181.93	0.00	0.00	0.00
11,000.00	90.00	89.93	6,344.99	-1,370.99	1,017.62	4,195.22	4,281.34	0.00	0.00	0.00
11,100.00	90.00	89.93	6,344.99	-1,370.99	1,017.74	4,295.22	4,380.75	0.00	0.00	0.00
11,200.00	90.00	89.93	6,344.99	-1,370.99	1,017.87	4,395.22	4,480.17	0.00	0.00	0.00
11,300.00	90.00	89.93	6,344.99	-1,370.99	1,017.99	4,495.22	4,579.58	0.00	0.00	0.00
11,400.00	90.00	89.93	6,344.99	-1,370.99	1,018.12	4,595.22	4,679.00	0.00	0.00	0.00
11,500.00	90.00	89.93	6,344.99	-1,370.99	1,018.24	4,695.22	4,778.41	0.00	0.00	0.00
11,600.00	90.00	89.93	6,344.99	-1,370.99	1,018.37	4,795.22	4,877.82	0.00	0.00	0.00
11,700.00	90.00	89.93	6,344.99	-1,370.99	1,018.49	4,895.22	4,977.24	0.00	0.00	0.00
11,800.00	90.00	89.93	6,344.99	-1,370.99	1,018.61	4,995.22	5,076.65	0.00	0.00	0.00
11,900.00	90.00	89.93	6,344.99	-1,370.99	1,018.74	5,095.22	5,176.06	0.00	0.00	0.00
12,000.00	90.00	89.93	6,344.99	-1,370.99	1,018.86	5,195.22	5,275.48	0.00	0.00	0.00
12,100.00	90.00	89.93	6,344.99	-1,370.99	1,018.99	5,295.22	5,374.89	0.00	0.00	0.00
12,200.00	90.00	89.93	6,344.99	-1,370.99	1,019.11	5,395.22	5,474.31	0.00	0.00	0.00
12,300.00	90.00	89.93	6,344.99	-1,370.99	1,019.24	5,495.22	5,573.72	0.00	0.00	0.00
12,400.00	90.00	89.93	6,344.99	-1,370.99	1,019.36	5,595.22	5,673.13	0.00	0.00	0.00
12,500.00	90.00	89.93	6,344.99	-1,370.99	1,019.49	5,695.22	5,772.55	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well SHELDUCK 6-5-9HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Site:	NW SW SEC. 6 T7N R60W 6th P.M.	North Reference:	True
Well:	SHELDUCK 6-5-9HN	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)
12,600.00	90.00	89.93	6,345.00	-1,371.00	1,019.61	5,795.22	5,871.96	0.00	0.00	0.00
12,700.00	90.00	89.93	6,345.00	-1,371.00	1,019.74	5,895.22	5,971.38	0.00	0.00	0.00
12,800.00	90.00	89.93	6,345.00	-1,371.00	1,019.87	5,995.22	6,070.79	0.00	0.00	0.00
12,900.00	90.00	89.93	6,345.00	-1,371.00	1,019.99	6,095.22	6,170.20	0.00	0.00	0.00
13,000.00	90.00	89.93	6,345.00	-1,371.00	1,020.12	6,195.22	6,269.62	0.00	0.00	0.00
13,100.00	90.00	89.93	6,345.00	-1,371.00	1,020.24	6,295.22	6,369.03	0.00	0.00	0.00
13,200.00	90.00	89.93	6,345.00	-1,371.00	1,020.37	6,395.22	6,468.44	0.00	0.00	0.00
13,300.00	90.00	89.93	6,345.00	-1,371.00	1,020.49	6,495.22	6,567.86	0.00	0.00	0.00
13,400.00	90.00	89.93	6,345.00	-1,371.00	1,020.62	6,595.22	6,667.27	0.00	0.00	0.00
13,500.00	90.00	89.93	6,345.00	-1,371.00	1,020.74	6,695.22	6,766.69	0.00	0.00	0.00
13,600.00	90.00	89.93	6,345.00	-1,371.00	1,020.87	6,795.22	6,866.10	0.00	0.00	0.00
13,700.00	90.00	89.93	6,345.00	-1,371.00	1,021.00	6,895.22	6,965.51	0.00	0.00	0.00
13,800.00	90.00	89.93	6,345.00	-1,371.00	1,021.12	6,995.22	7,064.93	0.00	0.00	0.00
13,900.00	90.00	89.93	6,345.00	-1,371.00	1,021.25	7,095.21	7,164.34	0.00	0.00	0.00
14,000.00	90.00	89.93	6,345.00	-1,371.00	1,021.37	7,195.21	7,263.76	0.00	0.00	0.00
14,100.00	90.00	89.93	6,345.00	-1,371.00	1,021.50	7,295.21	7,363.17	0.00	0.00	0.00
14,200.00	90.00	89.93	6,345.00	-1,371.00	1,021.63	7,395.21	7,462.58	0.00	0.00	0.00
14,300.00	90.00	89.93	6,345.00	-1,371.00	1,021.75	7,495.21	7,562.00	0.00	0.00	0.00
14,400.00	90.00	89.93	6,345.00	-1,371.00	1,021.88	7,595.21	7,661.41	0.00	0.00	0.00
14,500.00	90.00	89.93	6,345.00	-1,371.00	1,022.01	7,695.21	7,760.83	0.00	0.00	0.00
14,600.00	90.00	89.93	6,345.00	-1,371.00	1,022.13	7,795.21	7,860.24	0.00	0.00	0.00
14,700.00	90.00	89.93	6,345.00	-1,371.00	1,022.26	7,895.21	7,959.65	0.00	0.00	0.00
14,800.00	90.00	89.93	6,345.00	-1,371.00	1,022.39	7,995.21	8,059.07	0.00	0.00	0.00
14,900.00	90.00	89.93	6,345.00	-1,371.00	1,022.51	8,095.21	8,158.48	0.00	0.00	0.00
15,000.00	90.00	89.93	6,345.00	-1,371.00	1,022.64	8,195.21	8,257.90	0.00	0.00	0.00
15,100.00	90.00	89.93	6,345.00	-1,371.00	1,022.77	8,295.21	8,357.31	0.00	0.00	0.00
15,200.00	90.00	89.93	6,345.00	-1,371.00	1,022.89	8,395.21	8,456.72	0.00	0.00	0.00
15,300.00	90.00	89.93	6,345.00	-1,371.00	1,023.02	8,495.21	8,556.14	0.00	0.00	0.00
15,400.00	90.00	89.93	6,345.00	-1,371.00	1,023.15	8,595.21	8,655.55	0.00	0.00	0.00
15,500.00	90.00	89.93	6,345.00	-1,371.00	1,023.27	8,695.21	8,754.97	0.00	0.00	0.00
15,600.00	90.00	89.93	6,345.00	-1,371.00	1,023.40	8,795.21	8,854.38	0.00	0.00	0.00
15,700.00	90.00	89.93	6,345.00	-1,371.00	1,023.53	8,895.21	8,953.79	0.00	0.00	0.00
15,800.00	90.00	89.93	6,345.00	-1,371.00	1,023.65	8,995.21	9,053.21	0.00	0.00	0.00
15,900.00	90.00	89.93	6,345.00	-1,371.00	1,023.78	9,095.21	9,152.62	0.00	0.00	0.00
16,000.00	90.00	89.93	6,345.00	-1,371.00	1,023.91	9,195.21	9,252.04	0.00	0.00	0.00
16,100.00	90.00	89.93	6,345.00	-1,371.00	1,024.04	9,295.21	9,351.45	0.00	0.00	0.00
BHL: 2455ft FSL & 600ft FEL of Sec 5										
16,112.91	90.00	89.93	6,345.00	-1,371.00	1,024.05	9,308.12	9,364.28	0.00	0.00	0.00

Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well SHELDUCK 6-5-9HN
Company:	MALLARD EXPLORATION	TVD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Project:	WELD COUNTY, COLORADO (NAD 83)	MD Reference:	KB-EST @ 4974.00usft (Original Well Elev)
Site:	NW SW SEC. 6 T7N R60W 6th P.M.	North Reference:	True
Well:	SHELDUCK 6-5-9HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL #1		

Formations					
MD (usft)	TVD (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
501.31	500.00	Fox Hills Base			
1,575.90	1,548.00	Pierre Shale Top			
3,490.72	3,411.00	Richard Sandstone			
3,600.70	3,518.00	Parkman Sandstone			
4,352.03	4,249.00	Sussex Sandstone			
4,821.74	4,706.00	Shannon Sandstone			
6,339.43	6,168.00	Sharon Springs			
6,456.87	6,244.00	Niobrara A Chalk			
6,509.89	6,272.00	Niobrara A Chalk Base			
6,581.53	6,303.00	Niobrara B1 Chalk Top			
6,639.39	6,322.00	Niobrara B1 Chalk Base			
6,802.28	6,345.00	Niobrara B2 Chalk Top (Target)			

Plan Annotations				
MD (usft)	TVD (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.00	0.00	0.00	0.00	SHL: 1442ft FSL & 628ft FWL of Sec 6
100.00	100.00	0.00	0.00	START NUDGE (2°/100ft BUR)
768.00	761.96	67.39	-38.33	EOB TO 13.36° INC
5,134.28	5,010.08	944.37	-537.13	END OF TANGENT
5,802.28	5,672.04	1,011.76	-575.46	EOD TO VERTICAL
5,902.28	5,772.04	1,011.76	-575.46	KOP (10°/100ft BUR)
6,802.28	6,345.00	1,012.46	-2.50	HZ LP: 2455ft FSL & 600ft FWL of Sec 6
16,112.91	6,345.00	1,024.05	9,308.12	BHL: 2455ft FSL & 600ft FEL of Sec 5