



Project: WELD COUNTY, COLORADO (TRUE)
Site: NE NW SEC. 18 T7N R66W 6th P.M. (STOUT - OPT 1)
Well: STOUT 10N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 288ft FNL & 2544ft FWL of Sec 18
2000.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
2595.62	2600.00	12.00	81.85	8.88	61.97	-4.97	62.60	EOB TO 12° INC
5621.73	5693.71	12.00	81.85	100.08	698.69	-55.99	705.82	END OF TANGENT
6217.36	6293.71	0.00	0.00	108.96	760.66	-60.96	768.42	EOD TO VERTICAL
6686.81	6763.17	0.00	0.00	108.96	760.66	-60.96	768.42	KOP (8°/100ft BUR)
7378.60	7700.66	75.00	180.70	-421.83	754.17	468.37	1299.25	EP: 737ft FNL & 2305ft FEL of Sec 18
7403.00	7888.16	90.00	180.70	-607.18	751.90	653.22	1484.62	HZ LANDING POINT
7403.00	17385.80	90.00	180.70	-10104.11	636.00	10124.11	10982.26	BHL: 150ft FSL & 2266ft FEL of Sec 19

PROPOSED LOCAL COORDINATES:

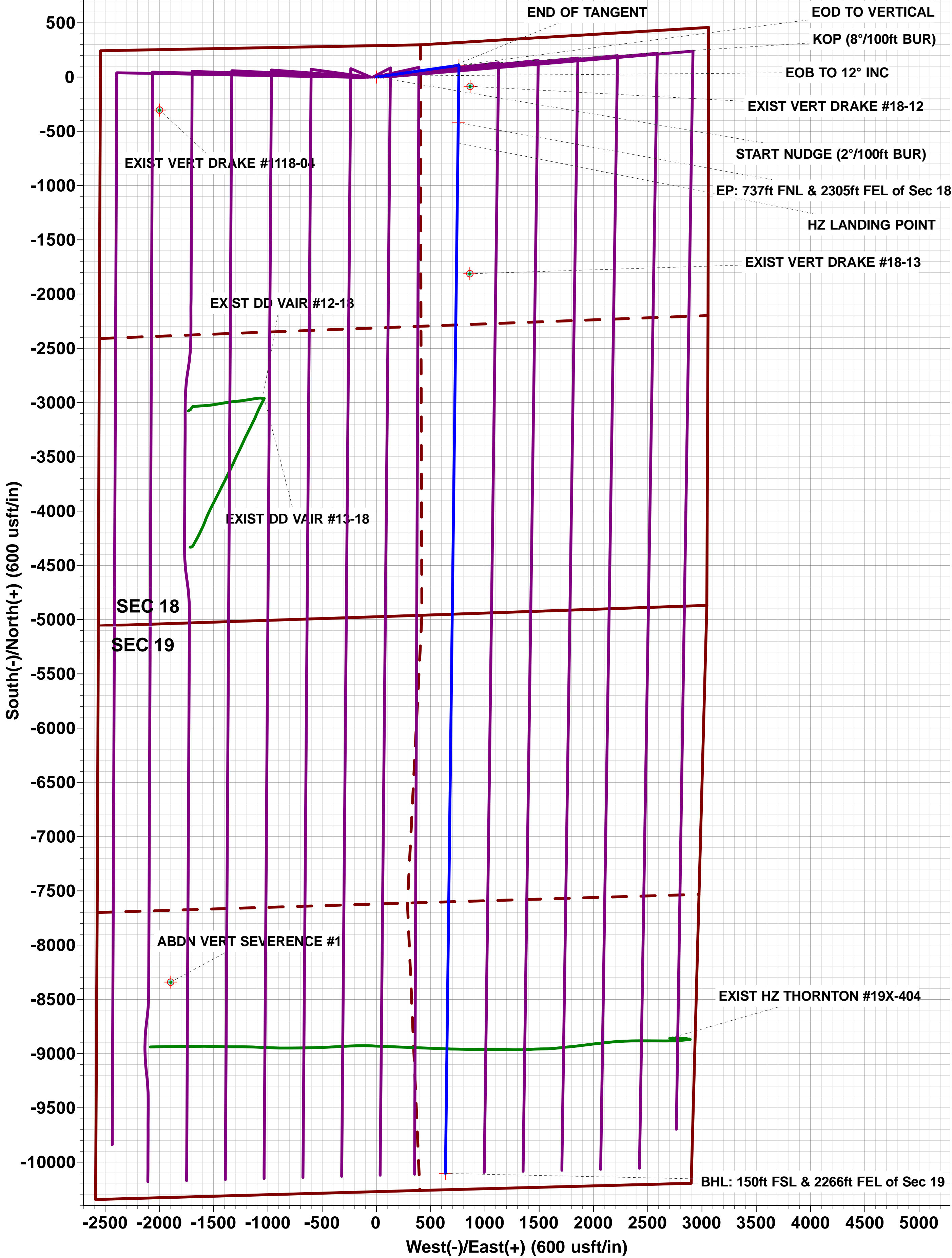
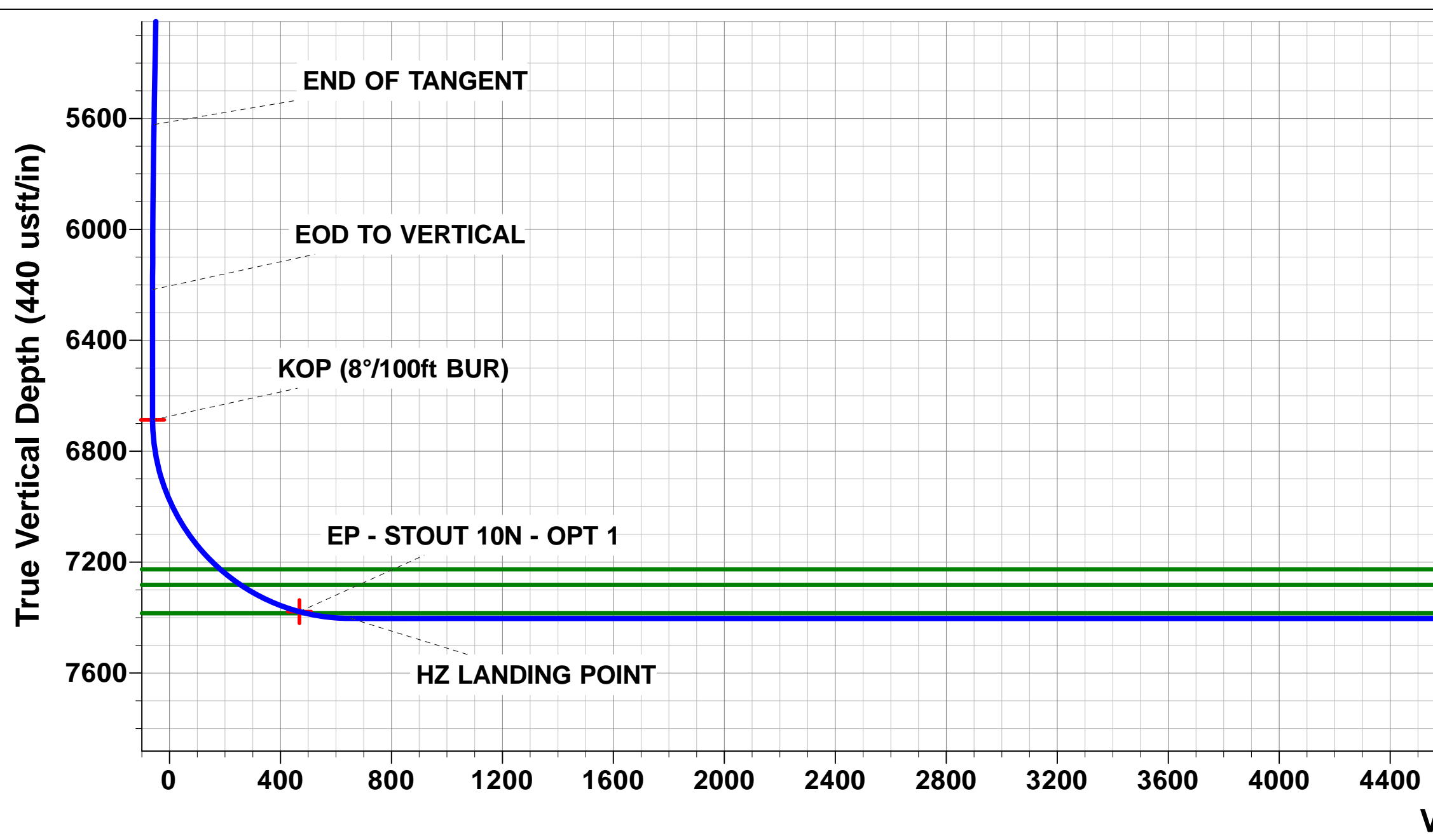
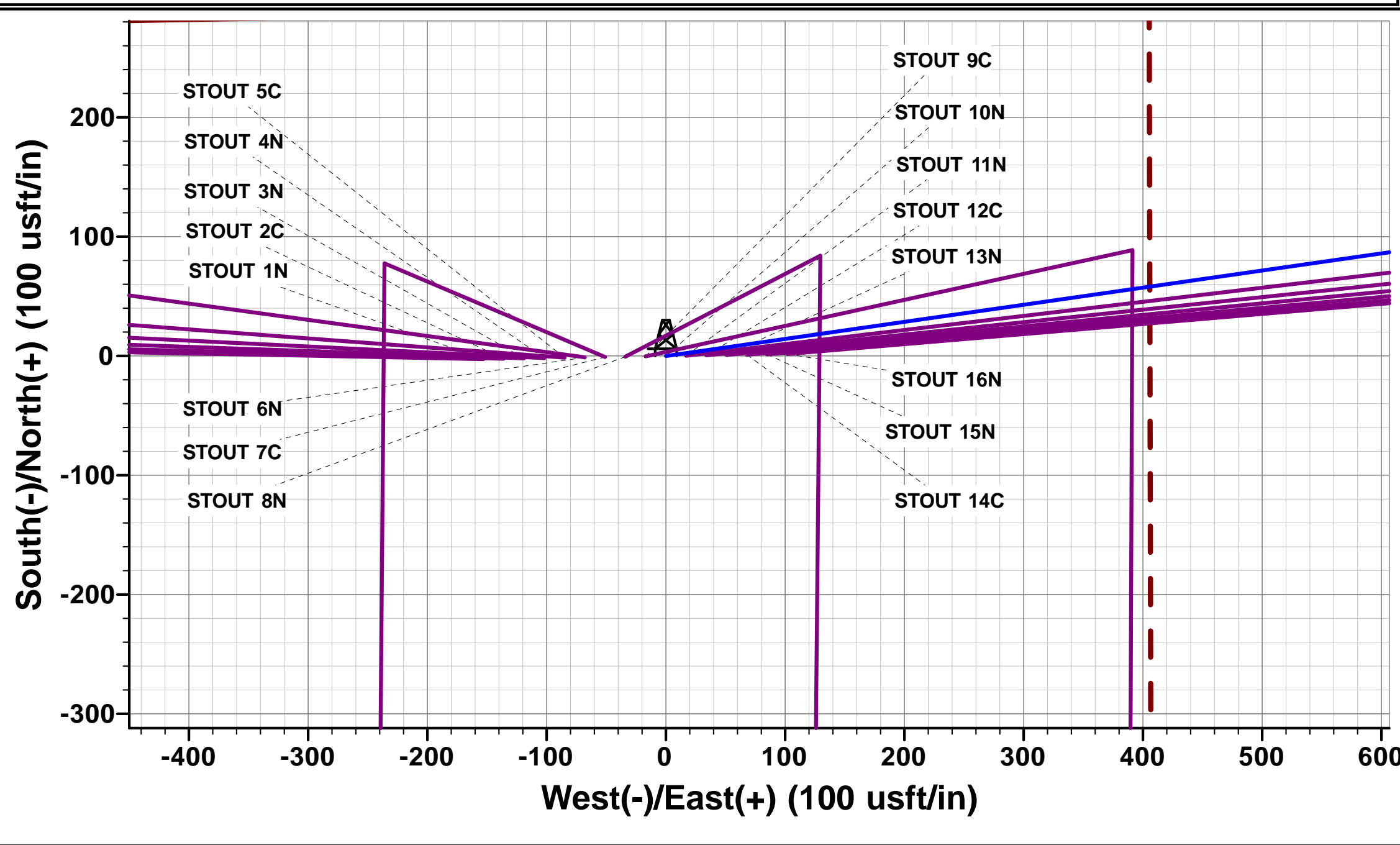
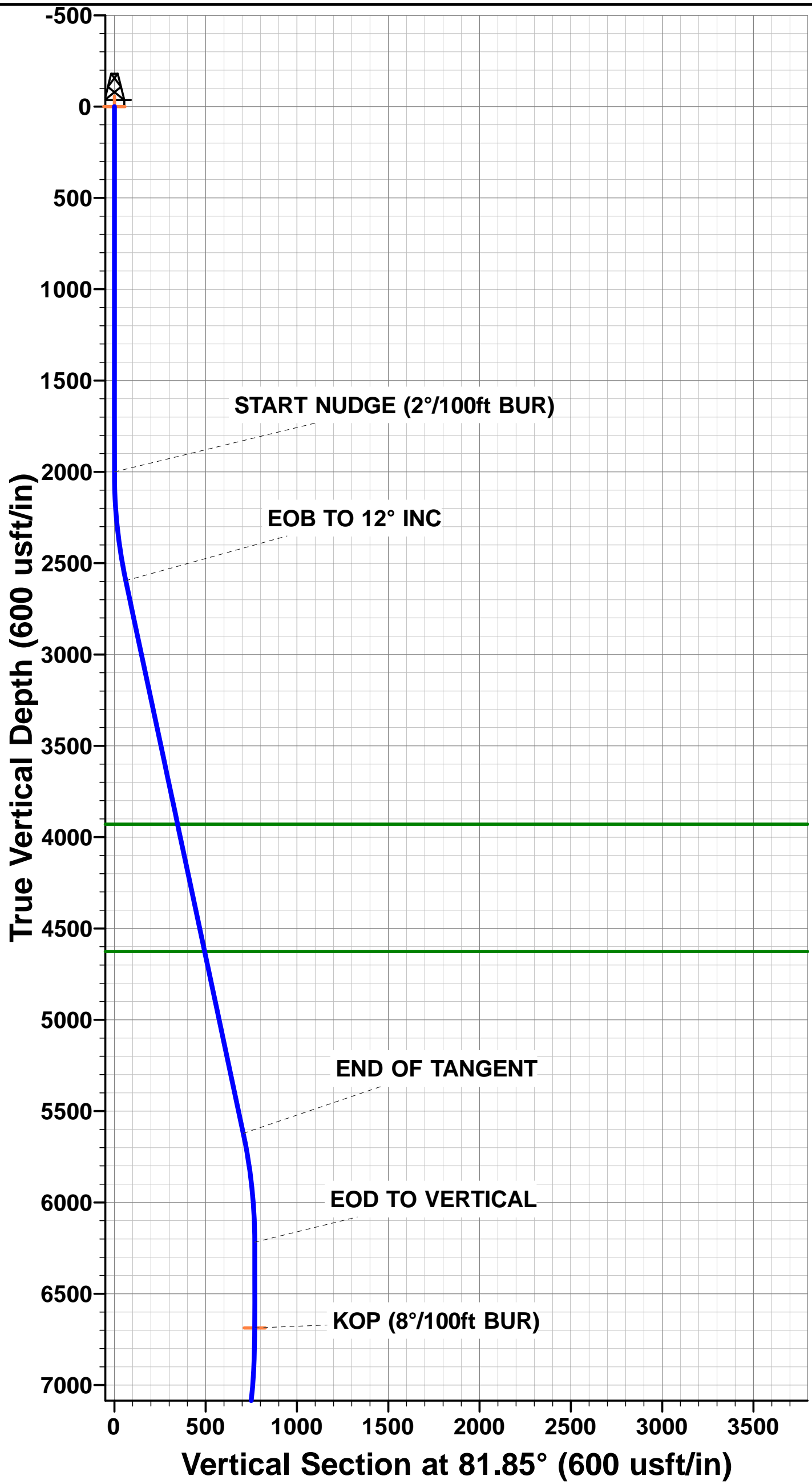
SHL: 288ft FNL & 2544ft FWL Sec 18

EP : 737ft FNL & 2305ft FEL Sec 18

BHL: 150ft FSL & 2266ft FEL of Sec 19

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - STOUT 10N - OPT 1	6686.81	108.96	760.66	40.581194	-104.819910
EP - STOUT 10N - OPT 1	7378.60	-421.83	754.17	40.579737	-104.819934
BHL - STOUT 10N - OPT 1	7403.00	-10104.11	636.00	40.553161	-104.820360
SHL - STOUT 10N - OPT 1	0.00	0.00	0.00	40.580895	-104.822649



PDC ENERGY

WELD COUNTY, COLORADO (TRUE)

NE NW SEC. 18 T7N R66W 6th P.M. (STOUT - OPT 1)

STOUT 10N

ORIGINAL WELLBORE

PROPOSAL #1

Anticollision Report

28 February, 2019



Anticollision Report



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well STOUT 10N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB 23' @ 5103.00usft (Original Well Elev)
Reference Site:	NE NW SEC. 18 T7N R66W 6th P.M. (STOUT - OPT 1)	MD Reference:	KB 23' @ 5103.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	STOUT 10N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	Database 1
Reference Design:	PROPOSAL #1	Offset TVD Reference:	Offset Datum

Reference	PROPOSAL #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD + Stations Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	28/02/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,385.80	PROPOSAL #1 (ORIGINAL WELLBORE)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
NE NW SEC. 18 T7N R66W 6th P.M. (STOUT - OPT 1)						
ABDN VERT SEVERENCE #1 - Wellbore #1 - Design #1	15,653.68	7,314.00	2,552.70	2,244.62	8.286	CC
ABDN VERT SEVERENCE #1 - Wellbore #1 - Design #1	15,700.00	7,314.00	2,553.12	2,244.15	8.263	ES
ABDN VERT SEVERENCE #1 - Wellbore #1 - Design #1	16,100.00	7,314.00	2,591.42	2,274.81	8.185	SF
EXIST DD VAIR #12-18 - Wellbore #1 - Wellbore #1	10,385.71	7,408.82	2,450.51	2,372.95	31.596	CC
EXIST DD VAIR #12-18 - Wellbore #1 - Wellbore #1	10,400.00	7,408.97	2,450.55	2,372.73	31.489	ES
EXIST DD VAIR #12-18 - Wellbore #1 - Wellbore #1	11,900.00	7,424.47	2,880.60	2,774.64	27.184	SF
EXIST DD VAIR #13-18 - Wellbore #1 - Wellbore #1	11,642.66	7,614.74	2,420.48	2,306.17	21.175	CC
EXIST DD VAIR #13-18 - Wellbore #1 - Wellbore #1	11,700.00	7,614.93	2,421.16	2,305.77	20.982	ES
EXIST DD VAIR #13-18 - Wellbore #1 - Wellbore #1	12,600.00	7,617.82	2,602.92	2,470.50	19.657	SF
EXIST HZ THORNTON #19X-404 - Wellbore #1 - Wellbo	16,237.23	9,304.53	165.65	80.89	1.954	CC, ES, SF
EXIST VERT DRAKE #1118-04 - ORIGINAL WELLBORE	2,000.00	2,022.00	2,022.21	1,977.71	45.440	CC
EXIST VERT DRAKE #1118-04 - ORIGINAL WELLBORE	2,100.00	2,121.98	2,023.96	1,977.26	43.341	ES
EXIST VERT DRAKE #1118-04 - ORIGINAL WELLBORE	8,200.00	7,425.00	2,815.30	2,642.46	16.288	SF
EXIST VERT DRAKE #18-12 - Wellbore #1 - Design #1	7,301.86	7,156.12	105.26	-53.71	0.662	Level 1, CC, ES, SF
EXIST VERT DRAKE #18-13 - Wellbore #1 - Design #1	9,091.97	7,378.00	123.65	-61.92	0.666	Level 1, CC, ES, SF
STOUT 11N - ORIGINAL WELLBORE - PROPOSAL #1	800.00	800.00	17.00	13.68	5.121	CC
STOUT 11N - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,370.50	364.23	-17.84	0.953	Level 1, ES, SF
STOUT 12C - ORIGINAL WELLBORE - PROPOSAL #1	700.00	700.00	34.00	31.13	11.847	CC, ES
STOUT 12C - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,655.17	726.71	343.81	1.898	SF
STOUT 13N - ORIGINAL WELLBORE - PROPOSAL #1	600.00	600.00	51.01	48.59	21.071	CC, ES
STOUT 13N - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,671.92	1,073.50	686.68	2.775	SF
STOUT 14C - ORIGINAL WELLBORE - PROPOSAL #1	500.00	500.00	68.01	66.04	34.501	CC, ES
STOUT 14C - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,914.93	1,437.10	1,050.37	3.716	SF
STOUT 15N - ORIGINAL WELLBORE - PROPOSAL #1	400.00	400.00	84.98	83.46	55.848	CC, ES
STOUT 15N - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,905.58	1,788.88	1,401.91	4.623	SF
STOUT 16N - ORIGINAL WELLBORE - PROPOSAL #1	300.00	300.00	101.98	100.91	95.123	CC, ES
STOUT 16N - ORIGINAL WELLBORE - PROPOSAL #1	17,200.00	17,771.74	2,137.00	1,760.93	5.682	SF
STOUT 1N - ORIGINAL WELLBORE - PROPOSAL #1	300.00	300.00	152.96	151.89	142.672	CC, ES
STOUT 1N - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,316.07	3,083.77	2,698.43	8.003	SF
STOUT 2C - ORIGINAL WELLBORE - PROPOSAL #1	400.00	400.00	135.96	134.44	89.351	CC, ES
STOUT 2C - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,635.45	2,742.46	2,354.75	7.073	SF
STOUT 3N - ORIGINAL WELLBORE - PROPOSAL #1	500.00	500.00	118.96	116.99	60.349	CC, ES
STOUT 3N - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,451.02	2,384.65	1,997.57	6.161	SF
STOUT 4N - ORIGINAL WELLBORE - PROPOSAL #1	600.00	600.00	101.96	99.54	42.119	CC, ES
STOUT 4N - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,281.93	2,030.34	1,643.04	5.242	SF
STOUT 5C - ORIGINAL WELLBORE - PROPOSAL #1	700.00	700.00	84.96	82.09	29.598	CC, ES

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well STOUT 10N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB 23' @ 5103.00usft (Original Well Elev)
Reference Site:	NE NW SEC. 18 T7N R66W 6th P.M. (STOUT - OPT 1)	MD Reference:	KB 23' @ 5103.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	STOUT 10N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	Database 1
Reference Design:	PROPOSAL #1	Offset TVD Reference:	Offset Datum

Summary

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
NE NW SEC. 18 T7N R66W 6th P.M. (STOUT - OPT 1)						
STOUT 5C - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,422.18	1,672.57	1,283.70	4.301	SF
STOUT 6N - ORIGINAL WELLBORE - PROPOSAL #1	2,000.00	2,000.00	67.98	59.27	7.801	CC, ES
STOUT 6N - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,303.68	1,312.78	925.33	3.388	SF
STOUT 7C - ORIGINAL WELLBORE - PROPOSAL #1	2,000.00	2,000.00	50.98	42.27	5.850	CC, ES
STOUT 7C - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,381.62	960.53	573.07	2.479	SF
STOUT 8N - ORIGINAL WELLBORE - PROPOSAL #1	2,000.00	2,000.00	33.98	25.26	3.899	CC, ES
STOUT 8N - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,223.67	605.98	221.08	1.574	SF
STOUT 9C - ORIGINAL WELLBORE - PROPOSAL #1	2,000.00	2,000.00	16.97	8.26	1.948	CC
STOUT 9C - ORIGINAL WELLBORE - PROPOSAL #1	17,385.80	17,432.01	303.00	-66.92	0.819	Level 1, ES, SF

Offset Design NE NW SEC. 18 T7N R66W 6th P.M. (STOUT - OPT 1) - ABDN VERT SEVERENCE #1 - Wellbore #1												Offset Site Error:	0.00 usft
Survey Program: 0-INC												Offset Well Error:	0.00 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-167.20	-8,341.00	-1,895.40	8,554.11				
100.00	100.00	11.00	11.00	0.09	0.13	-167.20	-8,341.00	-1,895.40	8,553.64	8,553.43	0.21	N/A	
200.00	200.00	111.00	111.00	0.31	1.40	-167.20	-8,341.00	-1,895.40	8,553.64	8,551.93	1.71	5,003.760	
300.00	300.00	211.00	211.00	0.54	3.68	-167.20	-8,341.00	-1,895.40	8,553.64	8,549.43	4.21	2,031.101	
400.00	400.00	311.00	311.00	0.76	5.75	-167.20	-8,341.00	-1,895.40	8,553.64	8,547.13	6.51	1,313.666	
500.00	500.00	411.00	411.00	0.99	7.79	-167.20	-8,341.00	-1,895.40	8,553.64	8,544.87	8.78	974.553	
600.00	600.00	511.00	511.00	1.21	9.82	-167.20	-8,341.00	-1,895.40	8,553.64	8,542.61	11.03	775.476	
700.00	700.00	611.00	611.00	1.44	11.84	-167.20	-8,341.00	-1,895.40	8,553.64	8,540.37	13.28	644.227	
800.00	800.00	711.00	711.00	1.66	13.86	-167.20	-8,341.00	-1,895.40	8,553.64	8,538.12	15.52	551.094	
900.00	900.00	811.00	811.00	1.88	15.88	-167.20	-8,341.00	-1,895.40	8,553.64	8,535.88	17.76	481.544	
1,000.00	1,000.00	911.00	911.00	2.11	17.89	-167.20	-8,341.00	-1,895.40	8,553.64	8,533.64	20.00	427.611	
1,100.00	1,100.00	1,011.00	1,011.00	2.33	19.91	-167.20	-8,341.00	-1,895.40	8,553.64	8,531.40	22.24	384.558	
1,200.00	1,200.00	1,111.00	1,111.00	2.56	21.92	-167.20	-8,341.00	-1,895.40	8,553.64	8,529.16	24.48	349.392	
1,300.00	1,300.00	1,211.00	1,211.00	2.78	23.94	-167.20	-8,341.00	-1,895.40	8,553.64	8,526.92	26.72	320.124	
1,400.00	1,400.00	1,311.00	1,311.00	3.01	25.95	-167.20	-8,341.00	-1,895.40	8,553.64	8,524.68	28.96	295.385	
1,500.00	1,500.00	1,411.00	1,411.00	3.23	27.96	-167.20	-8,341.00	-1,895.40	8,553.64	8,522.45	31.20	274.198	
1,600.00	1,600.00	1,511.00	1,511.00	3.46	29.97	-167.20	-8,341.00	-1,895.40	8,553.64	8,520.21	33.43	255.849	
1,700.00	1,700.00	1,611.00	1,611.00	3.68	31.99	-167.20	-8,341.00	-1,895.40	8,553.64	8,517.97	35.67	239.803	
1,800.00	1,800.00	1,711.00	1,711.00	3.91	34.00	-167.20	-8,341.00	-1,895.40	8,553.64	8,515.74	37.91	225.651	
1,900.00	1,900.00	1,811.00	1,811.00	4.13	36.01	-167.20	-8,341.00	-1,895.40	8,553.64	8,513.50	40.14	213.078	
2,000.00	2,000.00	1,911.00	1,911.00	4.36	38.02	-167.20	-8,341.00	-1,895.40	8,553.64	8,511.26	42.38	201.833	
2,100.00	2,099.98	2,010.98	2,010.98	4.57	40.03	110.95	-8,341.00	-1,895.40	8,554.27	8,509.67	44.60	191.794	
2,200.00	2,199.84	2,110.84	2,110.84	4.78	42.04	110.95	-8,341.00	-1,895.40	8,556.14	8,509.34	46.81	182.802	
2,300.00	2,299.45	2,210.45	2,210.45	4.99	44.05	110.95	-8,341.00	-1,895.40	8,559.27	8,510.26	49.00	174.664	
2,400.00	2,398.70	2,309.70	2,309.70	5.22	46.04	110.94	-8,341.00	-1,895.40	8,563.65	8,512.45	51.20	167.262	
2,500.00	2,497.47	2,408.47	2,408.47	5.47	48.03	110.93	-8,341.00	-1,895.40	8,569.30	8,515.91	53.39	160.496	
2,600.00	2,595.62	2,506.62	2,506.62	5.74	50.00	110.92	-8,341.00	-1,895.40	8,576.23	8,520.64	55.59	154.279	
2,700.00	2,693.44	2,604.44	2,604.44	6.05	51.97	111.05	-8,341.00	-1,895.40	8,583.82	8,525.97	57.84	148.394	
2,800.00	2,791.25	2,702.25	2,702.25	6.37	53.94	111.17	-8,341.00	-1,895.40	8,591.45	8,531.34	60.12	142.912	
2,900.00	2,889.07	2,800.07	2,800.07	6.71	55.91	111.30	-8,341.00	-1,895.40	8,599.13	8,536.72	62.40	137.798	
3,000.00	2,986.88	2,897.88	2,897.88	7.06	57.87	111.43	-8,341.00	-1,895.40	8,606.85	8,542.15	64.70	133.021	
3,100.00	3,084.70	2,995.70	2,995.70	7.42	59.84	111.55	-8,341.00	-1,895.40	8,614.61	8,547.60	67.01	128.552	
3,200.00	3,182.51	3,093.51	3,093.51	7.80	61.81	111.68	-8,341.00	-1,895.40	8,622.42	8,553.09	69.33	124.366	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation