



Project: WELD COUNTY, COLORADO (TRUE)
Site: SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)
Well: HARVEY 9N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #4

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 835ft FSL & 2434ft FEL of Sec 32	
2800.00	2800.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
3704.11	3719.83	18.40	177.83	-146.30	5.53	-146.31	146.41	EOB TO 18.4° INC	
5273.69	5373.95	18.40	177.83	-667.96	25.27	-667.98	668.43	END OF TANGENT	
6177.80	6293.78	0.00	0.00	-814.26	30.81	-814.28	814.84	EOD TO VERTICAL	
6377.80	6493.78	0.00	0.00	-814.26	30.81	-814.28	814.84	KOP (8°/100ft BUR)	
6998.05	7243.78	60.00	359.79	-456.16	29.50	-456.19	1173.03	60° INC	
7094.00	7618.79	90.00	359.79	-98.06	28.19	-98.08	1531.04	EP: 737ft FSL & 2405ft FEL of Sec 32	
7094.00	17290.40	90.00	359.78	9573.48	-7.84	9573.49	11202.65	BHL: 150ft FNL & 2405ft FEL of Sec 29	

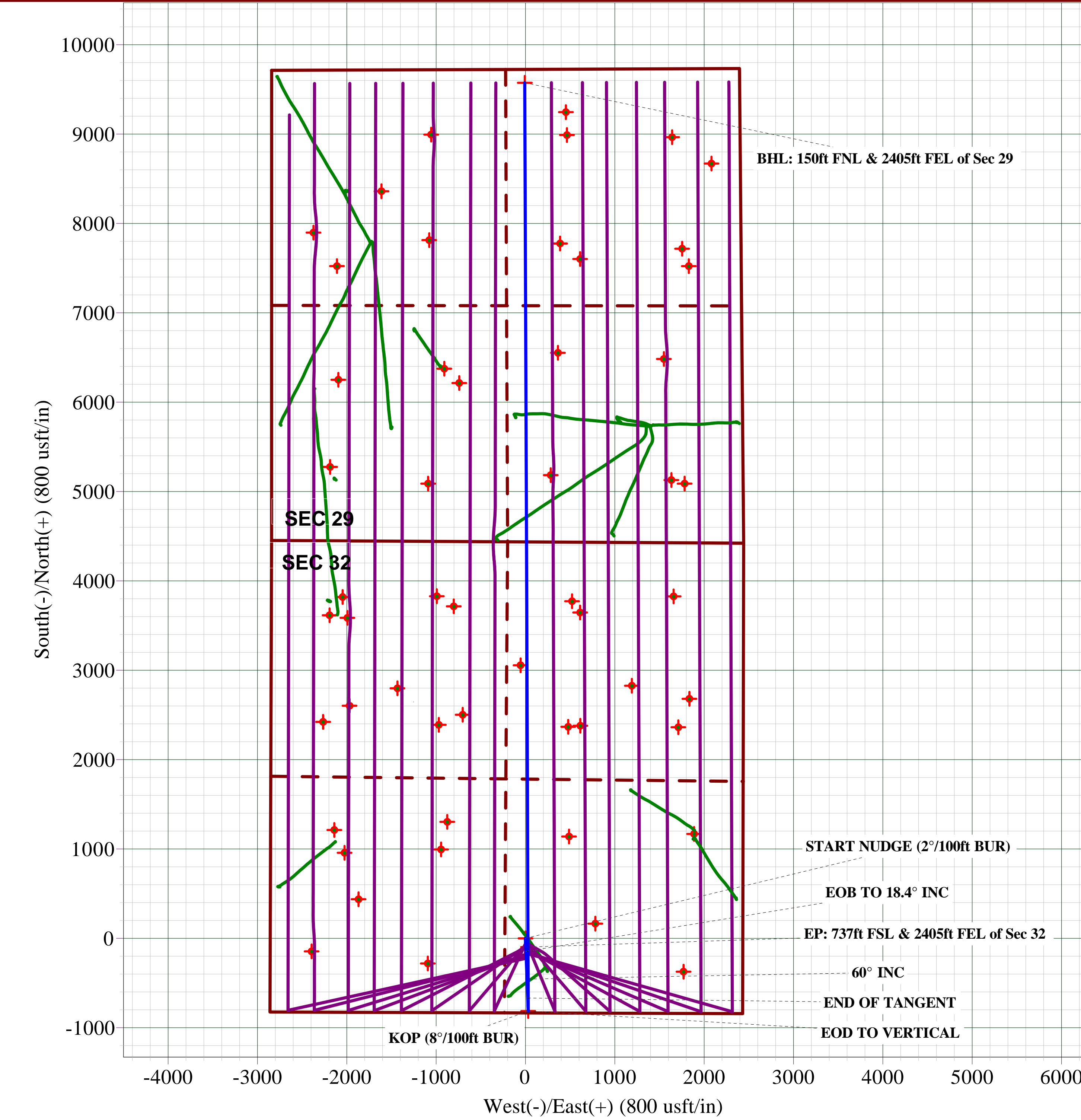
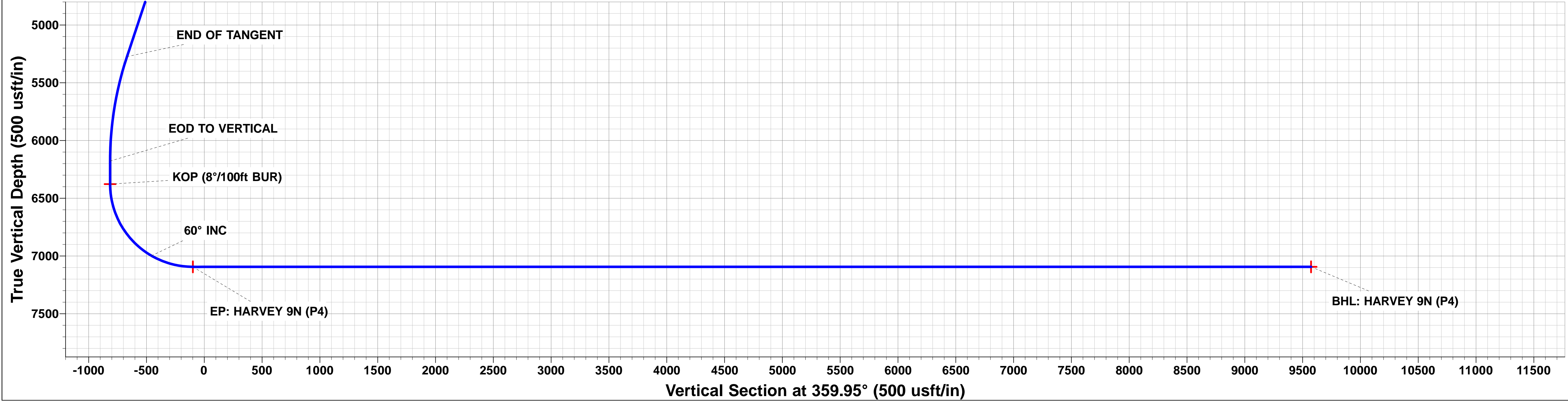
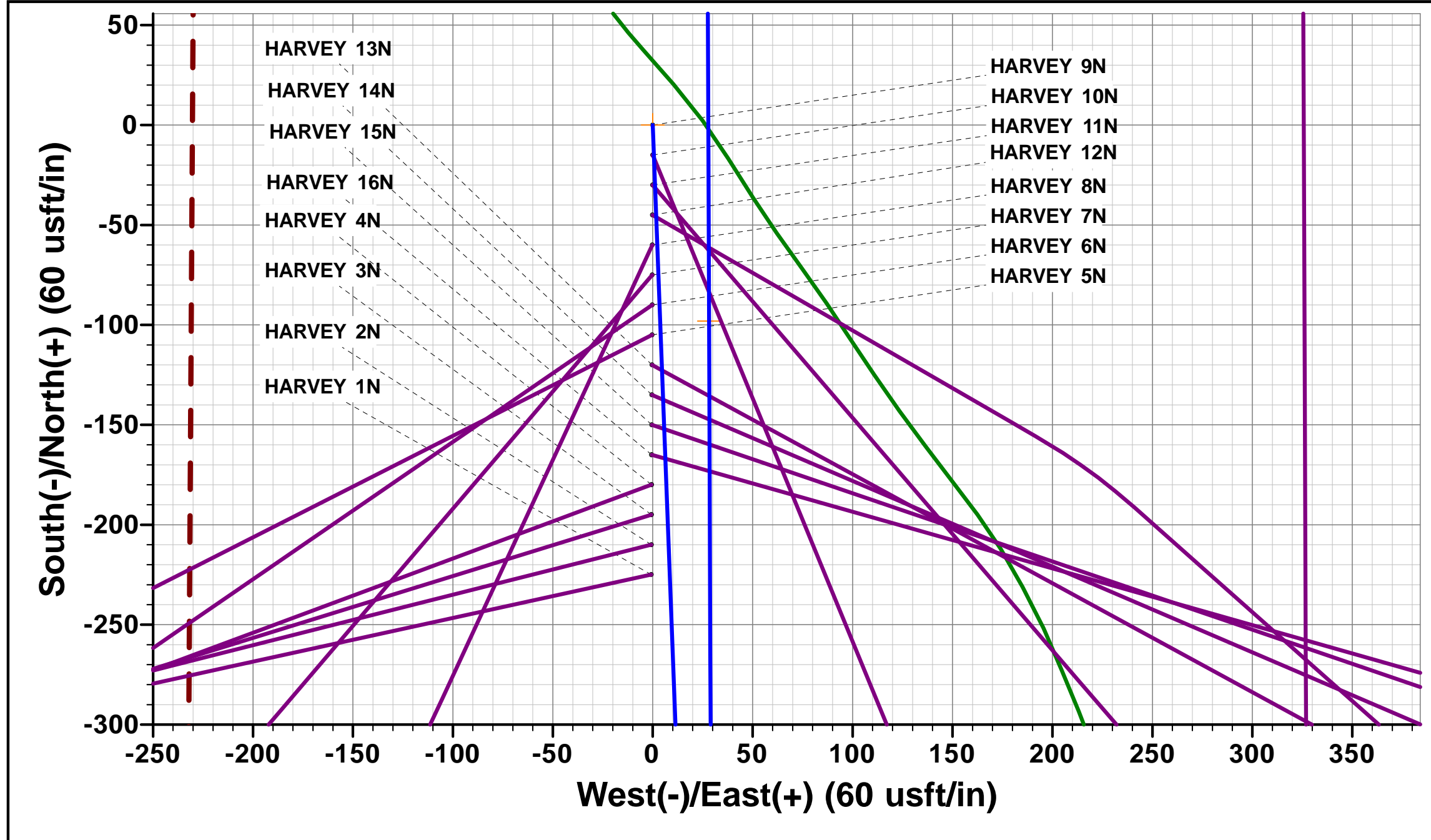
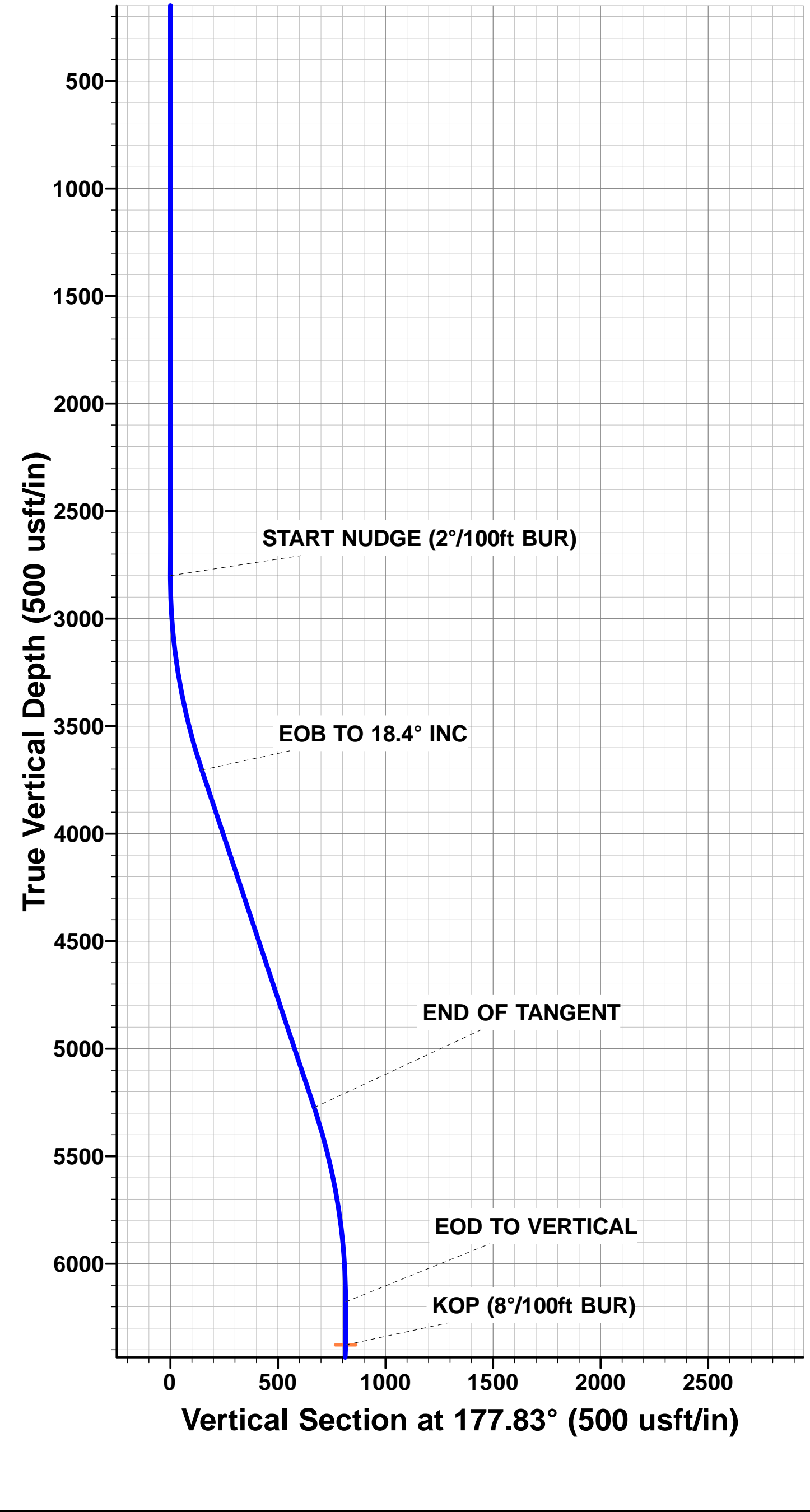
PROPOSED LOCAL COORDINATES:

SHL: 835ft FSL & 2434ft FEL Sec 32

EP : 737ft FSL & 2405ft FEL Sec 32

BHL: 150ft FNL & 2405ft FEL Sec 29

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: HARVEY 9N (P4)	6377.80	-814.26	30.81	40.261728	-104.686313
EP: HARVEY 9N (P4)	7094.00	-98.06	28.19	40.263694	-104.686322
BHL: HARVEY 9N (P4)	7094.00	9573.48	-7.84	40.290242	-104.686451
SHL - HARVEY 9N	0.00	0.00	0.00	40.263963	-104.686423



PDC ENERGY

**WELD COUNTY, COLORADO (TRUE)
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)
HARVEY 9N**

**ORIGINAL WELLBORE
PROPOSAL #4**

Anticollision Report

02 September, 2018



Anticollision Report



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well HARVEY 9N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4919.00usft (Original Well Elev)
Reference Site:	SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)	MD Reference:	KB-EST @ 4919.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	HARVEY 9N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #4	Offset TVD Reference:	Offset Datum

Reference	PROPOSAL #4		
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 10,000.00 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	02/09/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,290.40	PROPOSAL #4 (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
SE SW SEC. 32 T4N R65W 6th P.M.						
EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Desig	10,146.92	7,094.00	2,284.02	2,217.39	34.280	CC
EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Desig	10,200.00	7,094.00	2,284.64	2,217.05	33.803	ES
EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Desig	11,600.00	7,094.00	2,707.05	2,613.60	28.967	SF
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	15,427.40	4,856.00	2,843.60	2,730.57	25.157	CC
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	15,500.00	4,856.00	2,844.53	2,730.54	24.956	ES
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	16,400.00	4,856.00	3,005.34	2,879.56	23.894	SF
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	16,703.60	4,736.00	2,404.40	2,320.34	28.604	CC, ES
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	17,290.40	4,736.00	2,474.97	2,386.18	27.873	SF
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	11,543.60	7,094.00	2,060.52	1,968.12	22.301	CC
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	11,600.00	7,094.00	2,061.29	1,967.84	22.057	ES
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	12,400.00	7,094.00	2,231.40	2,122.90	20.566	SF
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	16,072.19	7,000.00	2,012.83	1,848.73	12.266	CC
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	16,100.00	7,000.00	2,013.03	1,848.39	12.228	ES
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	16,500.00	7,000.00	2,057.79	1,885.53	11.945	SF
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	11,496.15	4,521.19	3,388.11	3,328.97	57.285	CC
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	11,500.00	4,521.19	3,388.11	3,328.92	57.235	ES
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	14,100.00	4,521.19	4,273.07	4,178.88	45.367	SF
ABDN VERT NGL C3 - Wellbore #1 - Design #1	11,340.14	7,094.00	2,207.23	2,118.63	24.914	CC
ABDN VERT NGL C3 - Wellbore #1 - Design #1	11,400.00	7,094.00	2,208.04	2,118.33	24.613	ES
ABDN VERT NGL C3 - Wellbore #1 - Design #1	12,400.00	7,094.00	2,448.50	2,340.00	22.567	SF
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	12,852.73	7,100.00	2,128.44	2,025.52	20.680	CC
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	12,900.00	7,100.00	2,128.97	2,025.15	20.507	ES
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	13,700.00	7,100.00	2,290.88	2,171.88	19.252	SF
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	13,398.87	7,366.93	2,338.27	2,187.53	15.512	CC
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	13,500.00	7,387.02	2,340.32	2,187.50	15.314	ES
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	14,200.00	7,668.90	2,457.19	2,289.70	14.671	SF
EXIST DD RAY 23-32 - Wellbore #1 - Wellbore #1	3,368.30	3,404.50	52.81	36.38	3.214	CC, ES, SF
EXIST DD RAY 24-32 - Wellbore #1 - Wellbore #1	9,366.25	7,190.62	1,157.46	1,103.38	21.400	CC
EXIST DD RAY 24-32 - Wellbore #1 - Wellbore #1	9,400.00	7,190.44	1,157.96	1,103.30	21.185	ES
EXIST DD RAY 24-32 - Wellbore #1 - Wellbore #1	9,800.00	7,188.25	1,236.07	1,174.46	20.063	SF
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	5,265.19	5,214.71	209.80	181.91	7.523	CC
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	5,300.00	5,247.91	210.07	181.79	7.428	ES
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	6,950.00	6,848.72	220.55	186.41	6.460	SF
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	0.00	15.15	2,385.61			

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

Company:	PDC ENERGY	Local Co-ordinate Reference:	Well HARVEY 9N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4919.00usft (Original Well Elev)
Reference Site:	SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)	MD Reference:	KB-EST @ 4919.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	HARVEY 9N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #4	Offset TVD Reference:	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	1,112.49	1,127.83	2,387.30	2,382.84	535.150	ES
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	12,700.00	7,238.00	5,197.90	5,081.84	44.787	SF
EXIST DD SPAYD 19-29 - Wellbore #1 - Wellbore #1	13,444.20	7,505.86	1,503.94	1,351.92	9.893	CC
EXIST DD SPAYD 19-29 - Wellbore #1 - Wellbore #1	13,500.00	7,505.73	1,504.98	1,351.89	9.831	ES
EXIST DD SPAYD 19-29 - Wellbore #1 - Wellbore #1	13,700.00	7,505.23	1,525.54	1,368.66	9.724	SF
EXIST DD SPAYD 20-29 - Wellbore #1 - Wellbore #1	13,510.37	7,063.33	1,033.42	904.95	8.044	CC, ES
EXIST DD SPAYD 20-29 - Wellbore #1 - Wellbore #1	13,700.00	7,057.62	1,050.65	918.63	7.958	SF
EXIST DD SPAYD 22-29 - Wellbore #1 - Wellbore #1	14,533.40	7,096.62	1,252.14	1,102.88	8.389	CC, ES
EXIST DD SPAYD 22-29 - Wellbore #1 - Wellbore #1	14,700.00	7,093.73	1,263.17	1,110.75	8.287	SF
EXIST DD SPAYD 23-29 - Wellbore #1 - Wellbore #1	13,544.58	7,350.17	116.25	-16.00	0.879	Level 1, CC, ES, SF
EXIST DD SPAYD 30-29 - Wellbore #1 - Wellbore #1	17,290.40	7,494.18	2,774.59	2,551.07	12.413	CC, ES, SF
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	13,477.45	7,582.67	2,748.93	2,595.92	17.966	CC
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	13,500.00	7,582.45	2,749.02	2,595.58	17.917	ES
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	14,400.00	7,573.56	2,899.58	2,729.03	17.001	SF
EXIST DD SPAYD 36-29 - Wellbore #1 - Wellbore #1	12,189.48	7,489.36	339.60	221.42	2.874	CC
EXIST DD SPAYD 36-29 - Wellbore #1 - Wellbore #1	12,200.00	7,489.24	339.76	221.39	2.870	ES, SF
EXIST DD SPAYD 37-29 - Wellbore #1 - Wellbore #1	12,233.59	7,249.56	968.08	852.56	8.380	CC, ES
EXIST DD SPAYD 37-29 - Wellbore #1 - Wellbore #1	12,400.00	7,244.72	982.27	863.63	8.280	SF
EXIST VERT BOHLENDER 29-13 - Wellbore #1 - Design	15,316.53	7,094.00	612.19	448.27	3.735	CC, ES
EXIST VERT BOHLENDER 29-13 - Wellbore #1 - Design	15,400.00	7,094.00	617.86	452.35	3.733	SF
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,231.86	7,091.00	1,828.31	1,666.01	11.265	CC
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,300.00	7,091.00	1,829.58	1,665.98	11.183	ES
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,600.00	7,091.00	1,865.00	1,695.68	11.014	SF
EXIST VERT BOHLENDER 32-29 #1 - Wellbore #1 - Des	15,490.77	7,094.00	388.81	221.57	2.325	CC
EXIST VERT BOHLENDER 32-29 #1 - Wellbore #1 - Des	15,500.00	7,094.00	388.92	221.50	2.323	ES, SF
EXIST VERT CLYDE MARSHALL 1 - Wellbore #1 - Desi	2,800.00	2,800.00	1,371.44	1,359.13	111.405	CC, ES
EXIST VERT CLYDE MARSHALL 1 - Wellbore #1 - Desi	11,500.00	4,765.00	3,757.82	3,708.65	76.420	SF
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	16,675.14	7,094.00	1,646.73	1,456.86	8.673	CC
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	16,700.00	7,094.00	1,646.92	1,456.57	8.652	ES
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	16,900.00	7,094.00	1,662.01	1,467.84	8.560	SF
EXIST VERT CPC BOHLENDER 29-2 - Wellbore #1 - De	16,960.11	7,094.00	459.34	264.02	2.352	CC, ES
EXIST VERT CPC BOHLENDER 29-2 - Wellbore #1 - De	17,000.00	7,094.00	461.07	264.99	2.351	SF
EXIST VERT HAMBERT R G 32-4X - Wellbore #1 - Design	11,309.87	7,094.00	2,007.55	1,919.52	22.805	CC, ES
EXIST VERT HAMBERT G 32-4X - Wellbore #1 - Design	12,200.00	7,094.00	2,196.03	2,091.31	20.969	SF
EXIST VERT HAMBERT R G 32-1 - Wellbore #1 - Desig	11,537.10	7,094.00	1,644.27	1,552.00	17.819	CC, ES
EXIST VERT HAMBERT R G 32-1 - Wellbore #1 - Desig	12,100.00	7,094.00	1,737.96	1,635.12	16.899	SF
EXIST VERT HAMBERT R G 32-2 - Wellbore #1 - Desig	11,360.25	7,094.00	597.50	508.53	6.716	CC, ES
EXIST VERT HAMBERT R G 32-2 - Wellbore #1 - Desig	11,400.00	7,094.00	598.82	509.11	6.675	SF
EXIST VERT HAMBERT R G 32-3 - Wellbore #1 - Desig	11,434.71	7,094.00	816.96	726.60	9.041	CC, ES
EXIST VERT HAMBERT R G 32-3 - Wellbore #1 - Desig	11,600.00	7,094.00	833.51	740.06	8.919	SF
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	10,109.27	7,094.00	989.35	923.40	15.002	CC, ES
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	10,400.00	7,094.00	1,031.18	959.96	14.478	SF
EXIST VERT HAMBERT R G 32-7 - Wellbore #1 - Desig	10,082.06	7,094.00	458.86	393.40	7.010	CC, ES
EXIST VERT HAMBERT R G 32-7 - Wellbore #1 - Desig	10,100.00	7,094.00	459.21	393.43	6.981	SF
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	10,390.40	7,094.00	1,816.47	1,745.42	25.567	CC
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	10,400.00	7,094.00	1,816.49	1,745.27	25.505	ES
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	11,300.00	7,094.00	2,031.49	1,943.64	23.126	SF
EXIST VERT HSR-CARTER 11-29 - Wellbore #1 - Desig	13,933.62	7,094.00	746.18	608.61	5.424	CC, ES
EXIST VERT HSR-CARTER 11-29 - Wellbore #1 - Desig	14,000.00	7,094.00	749.13	610.30	5.396	SF
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	15,247.07	7,094.00	2,109.98	1,947.39	12.977	CC
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	15,300.00	7,094.00	2,110.64	1,947.04	12.901	ES
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	15,800.00	7,094.00	2,181.22	2,008.07	12.597	SF

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Reference Well:	HARVEY 9N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #4	Offset TVD Reference:	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
EXIST VERT HSR-DICERSON 14-29A - Wellbore #1 - D	12,809.23	7,094.00	1,099.20	982.97	9.457	CC, ES
EXIST VERT HSR-DICERSON 14-29A - Wellbore #1 - D	13,000.00	7,094.00	1,115.63	995.79	9.309	SF
EXIST VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	12,839.17	7,094.00	1,624.20	1,507.40	13.906	CC
EXIST VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	12,900.00	7,094.00	1,625.34	1,507.39	13.780	ES
EXIST VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	13,300.00	7,094.00	1,688.31	1,562.78	13.449	SF
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	13,975.20	7,094.00	2,099.24	1,960.88	15.172	CC
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	14,000.00	7,094.00	2,099.38	1,960.55	15.122	ES
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	14,600.00	7,094.00	2,190.24	2,039.99	14.577	SF
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	8,878.40	7,094.00	1,863.75	1,818.80	41.460	CC
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	8,900.00	7,094.00	1,863.88	1,818.59	41.160	ES
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	10,300.00	7,094.00	2,344.05	2,274.65	33.775	SF
EXIST VERT HSR-MUNDS 13.29 - Wellbore #1 - Design	13,000.00	7,094.00	2,195.32	2,075.48	18.318	CC, ES
EXIST VERT HSR-MUNDS 13.29 - Wellbore #1 - Design	13,800.00	7,094.00	2,336.57	2,201.54	17.304	SF
EXIST VERT HSR-NICHOLS 15-32 - Wellbore #1 - Desig	7,878.40	7,094.00	754.44	720.72	22.373	CC, ES
EXIST VERT HSR-NICHOLS 15-32 - Wellbore #1 - Desig	8,000.00	7,094.00	764.18	729.79	22.223	SF
EXIST VERT HSR-RAY 3-29 - Wellbore #1 - Design #1	16,714.47	7,094.00	1,050.32	859.70	5.510	CC, ES
EXIST VERT HSR-RAY 3-29 - Wellbore #1 - Design #1	16,800.00	7,094.00	1,053.80	861.54	5.481	SF
EXIST VERT HSR-SALISBURY 6-29 - Wellbore #1 - Des	15,533.47	7,094.00	1,075.75	907.70	6.401	CC, ES
EXIST VERT HSR-SALISBURY 6-29 - Wellbore #1 - Des	15,700.00	7,094.00	1,088.57	917.33	6.357	SF
EXIST VERT HSR-TEAGLE 10-29A - Wellbore #1 - Desi	14,267.18	7,094.00	360.23	216.32	2.503	CC, ES
EXIST VERT HSR-TEAGLE 10-29A - Wellbore #1 - Desi	14,300.00	7,094.00	361.73	217.19	2.503	SF
EXIST VERT HSR-WILLIAM 10-32A - Wellbore #1 - Des	8,853.97	7,094.00	464.13	419.55	10.411	CC, ES
EXIST VERT HSR-WILLIAM 10-32A - Wellbore #1 - Des	8,900.00	7,094.00	466.40	421.12	10.300	SF
EXIST VERT HSR-WRIGHT 9-29A - Wellbore #1 - Desig	14,193.93	7,094.00	1,545.19	1,402.67	10.842	CC
EXIST VERT HSR-WRIGHT 9-29A - Wellbore #1 - Desig	14,200.00	7,094.00	1,545.21	1,402.57	10.833	ES
EXIST VERT HSR-WRIGHT 9-29A - Wellbore #1 - Desig	14,500.00	7,094.00	1,575.22	1,426.87	10.618	SF
EXIST VERT MARSHALL 32-11G - Wellbore #1 - Design	9,023.29	7,094.00	898.50	851.28	19.024	CC, ES
EXIST VERT MARSHALL 32-11G - Wellbore #1 - Design	9,300.00	7,094.00	940.15	888.38	18.159	SF
EXIST VERT MARSHALL 32-12G - Wellbore #1 - Design	8,681.48	7,094.00	2,049.55	2,007.53	48.778	CC
EXIST VERT MARSHALL 32-12G - Wellbore #1 - Design	8,700.00	7,094.00	2,049.63	2,007.35	48.478	ES
EXIST VERT MARSHALL 32-12G - Wellbore #1 - Design	10,600.00	7,094.00	2,807.36	2,732.47	37.490	SF
EXIST VERT MARSHALL 32-14G - Wellbore #1 - Design	4,016.56	3,985.67	1,103.07	1,084.81	60.420	CC
EXIST VERT MARSHALL 32-14G - Wellbore #1 - Design	4,100.00	4,064.85	1,103.38	1,084.57	58.649	ES
EXIST VERT MARSHALL 32-14G - Wellbore #1 - Design	7,400.00	7,060.84	1,122.63	1,089.60	33.990	SF
EXIST VERT MARSHALL G 32-13JI - Wellbore #1 - Des	3,367.87	3,364.15	2,397.56	2,382.92	163.769	CC
EXIST VERT MARSHALL G 32-13JI - Wellbore #1 - Des	3,600.00	3,589.64	2,398.18	2,382.44	152.267	ES
EXIST VERT MARSHALL G 32-13JI - Wellbore #1 - Des	14,300.00	7,094.00	7,144.00	6,999.46	49.426	SF
EXIST VERT MEL SMOOKLER GAS UNIT 1 - Wellbore	8,160.66	7,094.00	1,894.66	1,858.97	53.080	CC, ES
EXIST VERT MEL SMOOKLER GAS UNIT 1 - Wellbore	10,300.00	7,094.00	2,857.69	2,788.29	41.176	SF
EXIST VERT MUSICK 1-32 - Wellbore #1 - Design #1	10,519.75	7,094.00	1,450.48	1,377.07	19.758	CC, ES
EXIST VERT MUSICK 1-32 - Wellbore #1 - Design #1	11,100.00	7,094.00	1,562.23	1,478.11	18.571	SF
EXIST VERT MUSICK GAS UNIT 1 - Wellbore #1 - Desi	10,539.18	7,094.00	1,173.51	1,099.74	15.908	CC, ES
EXIST VERT MUSICK GAS UNIT 1 - Wellbore #1 - Desi	10,900.00	7,094.00	1,227.73	1,147.32	15.268	SF
EXIST VERT MUSICK MCCLINTOCK 2 - Wellbore #1 - D	10,220.84	4,755.00	2,447.70	2,413.34	71.253	CC, ES
EXIST VERT MUSICK MCCLINTOCK 2 - Wellbore #1 - D	11,800.00	4,755.00	2,912.89	2,864.85	60.638	SF
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	10,072.45	4,750.00	2,890.87	2,848.25	67.837	CC
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	10,100.00	4,750.00	2,891.00	2,848.06	67.323	ES
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	12,600.00	4,750.00	3,840.02	3,766.36	52.134	SF
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	10,326.50	4,750.00	3,073.04	3,025.10	64.103	CC
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	10,400.00	4,750.00	3,073.92	3,025.03	62.880	ES
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	13,000.00	4,750.00	4,073.20	3,989.92	48.910	SF
EXIST VERT MUSICK MCCLINTOCK 7 - Wellbore #1 - D	10,093.21	4,739.00	2,429.02	2,396.70	75.150	CC

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

Company:	PDC ENERGY	Local Co-ordinate Reference:	Well HARVEY 9N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4919.00usft (Original Well Elev)
Reference Site:	SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)	MD Reference:	KB-EST @ 4919.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	HARVEY 9N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #4	Offset TVD Reference:	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
EXIST VERT MUSICK MCCLINTOCK 7 - Wellbore #1 - D	10,100.00	4,739.00	2,429.03	2,396.65	75.023	ES
EXIST VERT MUSICK MCCLINTOCK 7 - Wellbore #1 - D	11,600.00	4,739.00	2,858.42	2,813.74	63.975	SF
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	11,487.35	4,803.00	2,346.55	2,303.64	54.679	CC
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	11,500.00	4,803.00	2,346.59	2,303.57	54.551	ES
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	12,500.00	4,803.00	2,555.73	2,504.61	49.998	SF
EXIST VERT MUSICK-MCCLINTOCK 5 - Wellbore #1 - D	11,548.73	4,752.00	2,548.92	2,498.80	50.853	CC, ES
EXIST VERT MUSICK-MCCLINTOCK 5 - Wellbore #1 - D	12,800.00	4,752.00	2,839.49	2,776.96	45.416	SF
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,378.44	7,094.00	2,086.42	1,902.23	11.327	CC
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,400.00	7,094.00	2,086.54	1,901.93	11.302	ES
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,800.00	7,094.00	2,128.59	1,936.33	11.072	SF
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	10,146.92	7,094.00	2,284.02	2,217.39	34.280	CC
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	10,200.00	7,094.00	2,284.64	2,217.05	33.803	ES
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	11,600.00	7,094.00	2,707.05	2,613.60	28.967	SF
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	15,622.97	7,094.00	2,371.90	2,202.13	13.972	CC
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	15,700.00	7,094.00	2,373.15	2,201.91	13.859	ES
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	16,300.00	7,094.00	2,466.63	2,283.93	13.501	SF
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	14,094.55	4,730.00	2,534.17	2,461.35	34.798	CC
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	14,100.00	4,730.00	2,534.18	2,461.30	34.773	ES
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	14,900.00	4,730.00	2,659.09	2,578.52	33.000	SF
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	12,798.56	7,094.00	1,771.93	1,655.90	15.271	CC
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	12,800.00	7,094.00	1,771.93	1,655.88	15.268	ES
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	13,300.00	7,094.00	1,841.52	1,715.99	14.670	SF
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	16,083.07	4,660.00	2,917.46	2,804.62	25.855	CC
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	16,100.00	4,660.00	2,917.51	2,804.46	25.808	ES
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	17,000.00	4,660.00	3,058.15	2,934.17	24.666	SF
EXIST VERT UPRR PAN AM "J"1 - Wellbore #1 - Design	12,898.80	7,094.00	273.94	156.01	2.323	CC
EXIST VERT UPRR PAN AM "J"1 - Wellbore #1 - Design	12,900.00	7,094.00	273.94	155.99	2.323	ES, SF
EXIST VERT VERN MARSHALL 1 - Wellbore #1 - Desig	2,800.00	2,800.00	2,459.13	2,446.82	199.760	CC, ES
EXIST VERT VERN MARSHALL 1 - Wellbore #1 - Desig	13,700.00	4,785.00	5,718.06	5,621.86	59.438	SF
EXIST VERT WEINMASTER G 32-18 - Wellbore #1 - De	10,772.54	7,094.00	71.59	-6.47	0.917	Level 1, CC, ES, SF
HARVEY 10N - ORIGINAL WELLBORE - PROPOSAL #	2,700.00	2,700.00	14.97	3.11	1.262	Level 3, CC
HARVEY 10N - ORIGINAL WELLBORE - PROPOSAL #	17,290.40	17,389.27	311.25	-48.61	0.865	Level 1, ES, SF
HARVEY 11N - ORIGINAL WELLBORE - PROPOSAL #4	2,600.00	2,600.00	29.98	18.57	2.627	CC, ES
HARVEY 11N - ORIGINAL WELLBORE - PROPOSAL #4	17,290.40	17,361.01	644.89	271.23	1.726	SF
HARVEY 12N - ORIGINAL WELLBORE - PROPOSAL #	1,700.00	1,700.00	44.99	37.63	6.108	CC, ES
HARVEY 12N - ORIGINAL WELLBORE - PROPOSAL #	17,290.40	17,458.28	919.23	546.80	2.468	SF
HARVEY 13N - ORIGINAL WELLBORE - PROPOSAL #	1,000.00	1,000.00	119.97	115.75	28.437	CC, ES
HARVEY 13N - ORIGINAL WELLBORE - PROPOSAL #	17,290.40	17,410.79	1,249.53	873.52	3.323	SF
HARVEY 14N - ORIGINAL WELLBORE - PROPOSAL #	900.00	900.00	134.97	131.21	35.809	CC, ES
HARVEY 14N - ORIGINAL WELLBORE - PROPOSAL #	17,290.40	17,589.97	1,567.29	1,193.08	4.188	SF
HARVEY 15N - ORIGINAL WELLBORE - PROPOSAL #	800.00	800.00	149.95	146.63	45.168	CC, ES
HARVEY 15N - ORIGINAL WELLBORE - PROPOSAL #	17,290.40	17,644.07	1,934.62	1,558.18	5.139	SF
HARVEY 16N - ORIGINAL WELLBORE - PROPOSAL #	700.00	700.00	164.96	162.09	57.471	CC, ES
HARVEY 16N - ORIGINAL WELLBORE - PROPOSAL #	17,290.40	17,858.54	2,286.31	1,907.42	6.034	SF
HARVEY 1N - ORGNAL WELLBORE - PROPOSAL #6	300.00	300.00	224.92	223.85	209.789	CC, ES
HARVEY 1N - ORGNAL WELLBORE - PROPOSAL #6	17,290.40	17,504.15	2,658.59	2,293.33	7.279	SF
HARVEY 2N - ORIGINAL WELLBORE - PROPOSAL #5	400.00	400.00	209.95	208.43	137.973	CC, ES
HARVEY 2N - ORIGINAL WELLBORE - PROPOSAL #5	17,290.40	17,835.26	2,356.13	1,984.02	6.332	SF
HARVEY 3N - ORIGINAL WELLBORE - PROPOSAL #5	500.00	500.00	194.94	192.97	98.894	CC, ES
HARVEY 3N - ORIGINAL WELLBORE - PROPOSAL #5	17,290.40	17,603.66	1,958.73	1,584.46	5.233	SF
HARVEY 4N - ORIGINAL WELLBORE - PROPOSAL #5	600.00	600.00	179.93	177.51	74.329	CC, ES
HARVEY 4N - ORIGINAL WELLBORE - PROPOSAL #5	17,290.40	17,589.00	1,672.32	1,302.33	4.520	SF

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 HARVEY 9N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4919.00usft (Original Well Elev)
Reference Site:	SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)	MD Reference:	KB-EST @ 4919.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	HARVEY 9N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #4	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
Offset Well - Wellbore - Design						
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
HARVEY 5N - ORIGINAL WELLBORE - PROPOSAL #4	1,100.00	1,100.00	104.96	100.29	22.482	CC, ES
HARVEY 5N - ORIGINAL WELLBORE - PROPOSAL #4	17,290.40	17,431.85	1,363.78	990.67	3.655	SF
HARVEY 6N - ORIGINAL WELLBORE - PROPOSAL #4	1,200.00	1,200.00	89.98	84.87	17.582	CC, ES
HARVEY 6N - ORIGINAL WELLBORE - PROPOSAL #4	17,290.40	17,432.88	1,027.79	655.77	2.763	SF
HARVEY 7N - ORIGINAL WELLBORE - PROPOSAL #4	1,300.00	1,300.00	74.97	69.41	13.466	CC, ES
HARVEY 7N - ORIGINAL WELLBORE - PROPOSAL #4	17,290.40	17,273.90	603.92	231.26	1.621	SF
HARVEY 8N - ORIGINAL WELLBORE - PROPOSAL #4	1,400.00	1,400.00	59.96	53.95	9.966	CC
HARVEY 8N - ORIGINAL WELLBORE - PROPOSAL #4	17,290.40	17,346.05	336.28	-25.75	0.929	Level 1, ES, SF
SW SW SEC. 33 T4N R65W 6th P.M. (CRAWFORD)						
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	100.00	66.93	2,180.05	2,179.89	10,000.000	CC, ES
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	11,300.00	7,185.66	3,913.51	3,822.66	43.080	SF
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,485.66	7,127.90	2,360.81	2,231.58	18.269	CC
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,500.00	7,127.91	2,360.85	2,231.35	18.231	ES
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	14,300.00	7,128.68	2,497.31	2,352.61	17.258	SF
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	7,329.33	7,008.30	1,739.61	1,706.52	52.570	CC, ES
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	11,500.00	7,066.00	4,511.77	4,420.24	49.296	SF

Offset Design SE SW SEC. 32 T4N R65W 6th P.M. - EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Design #1												Offset Site Error:	0.00 usft
Survey Program: 0-MWD												Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-43.09	2,421.63	-2,265.11	3,315.87				
100.00	100.00	100.00	100.00	0.09	0.09	-43.09	2,421.63	-2,265.11	3,315.87	3,315.70	0.17	N/A	
200.00	200.00	200.00	200.00	0.31	0.31	-43.09	2,421.63	-2,265.11	3,315.87	3,315.25	0.62	5,325.824	
300.00	300.00	300.00	300.00	0.54	0.54	-43.09	2,421.63	-2,265.11	3,315.87	3,314.80	1.07	3,092.774	
400.00	400.00	400.00	400.00	0.76	0.76	-43.09	2,421.63	-2,265.11	3,315.87	3,314.35	1.52	2,179.104	
500.00	500.00	500.00	500.00	0.99	0.99	-43.09	2,421.63	-2,265.11	3,315.87	3,313.90	1.97	1,682.159	
600.00	600.00	600.00	600.00	1.21	1.21	-43.09	2,421.63	-2,265.11	3,315.87	3,313.45	2.42	1,369.780	
700.00	700.00	700.00	700.00	1.44	1.44	-43.09	2,421.63	-2,265.11	3,315.87	3,313.00	2.87	1,155.249	
800.00	800.00	800.00	800.00	1.66	1.66	-43.09	2,421.63	-2,265.11	3,315.87	3,312.55	3.32	998.818	
900.00	900.00	900.00	900.00	1.88	1.88	-43.09	2,421.63	-2,265.11	3,315.87	3,312.10	3.77	879.698	
1,000.00	1,000.00	1,000.00	1,000.00	2.11	2.11	-43.09	2,421.63	-2,265.11	3,315.87	3,311.65	4.22	785.964	
1,100.00	1,100.00	1,100.00	1,100.00	2.33	2.33	-43.09	2,421.63	-2,265.11	3,315.87	3,311.20	4.67	710.281	
1,200.00	1,200.00	1,200.00	1,200.00	2.56	2.56	-43.09	2,421.63	-2,265.11	3,315.87	3,310.75	5.12	647.894	
1,300.00	1,300.00	1,300.00	1,300.00	2.78	2.78	-43.09	2,421.63	-2,265.11	3,315.87	3,310.30	5.57	595.581	
1,400.00	1,400.00	1,400.00	1,400.00	3.01	3.01	-43.09	2,421.63	-2,265.11	3,315.87	3,309.85	6.02	551.085	
1,500.00	1,500.00	1,500.00	1,500.00	3.23	3.23	-43.09	2,421.63	-2,265.11	3,315.87	3,309.40	6.47	512.775	
1,600.00	1,600.00	1,600.00	1,600.00	3.46	3.46	-43.09	2,421.63	-2,265.11	3,315.87	3,308.95	6.92	479.445	
1,700.00	1,700.00	1,700.00	1,700.00	3.68	3.68	-43.09	2,421.63	-2,265.11	3,315.87	3,308.50	7.37	450.184	
1,800.00	1,800.00	1,800.00	1,800.00	3.91	3.91	-43.09	2,421.63	-2,265.11	3,315.87	3,308.05	7.82	424.289	
1,900.00	1,900.00	1,900.00	1,900.00	4.13	4.13	-43.09	2,421.63	-2,265.11	3,315.87	3,307.60	8.26	401.211	
2,000.00	2,000.00	2,000.00	2,000.00	4.36	4.36	-43.09	2,421.63	-2,265.11	3,315.87	3,307.16	8.71	380.514	
2,100.00	2,100.00	2,100.00	2,100.00	4.58	4.58	-43.09	2,421.63	-2,265.11	3,315.87	3,306.71	9.16	361.848	
2,200.00	2,200.00	2,200.00	2,200.00	4.81	4.81	-43.09	2,421.63	-2,265.11	3,315.87	3,306.26	9.61	344.927	
2,300.00	2,300.00	2,300.00	2,300.00	5.03	5.03	-43.09	2,421.63	-2,265.11	3,315.87	3,305.81	10.06	329.518	
2,400.00	2,400.00	2,400.00	2,400.00	5.26	5.26	-43.09	2,421.63	-2,265.11	3,315.87	3,305.36	10.51	315.427	
2,500.00	2,500.00	2,500.00	2,500.00	5.48	5.48	-43.09	2,421.63	-2,265.11	3,315.87	3,304.91	10.96	302.492	

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