

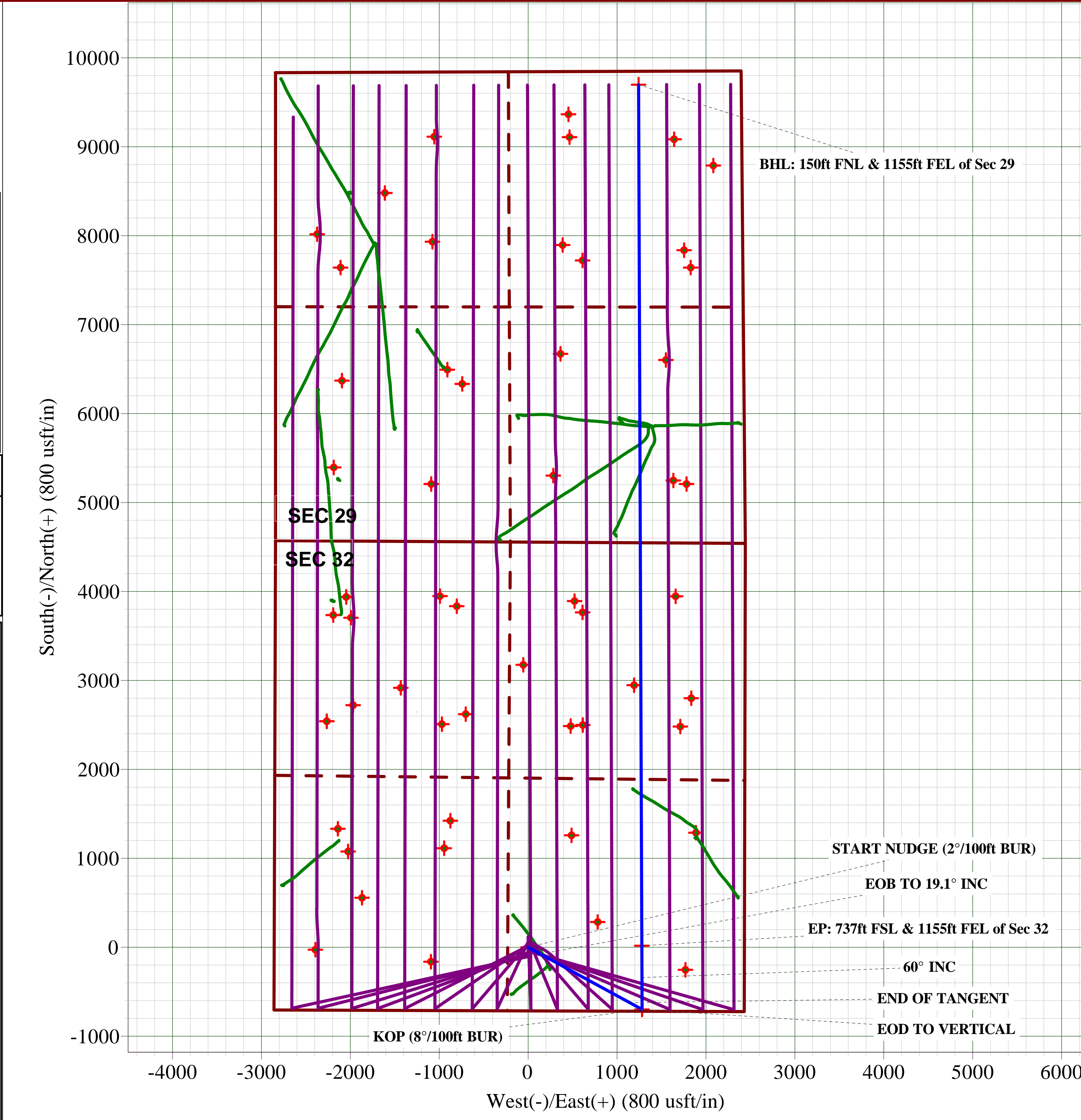
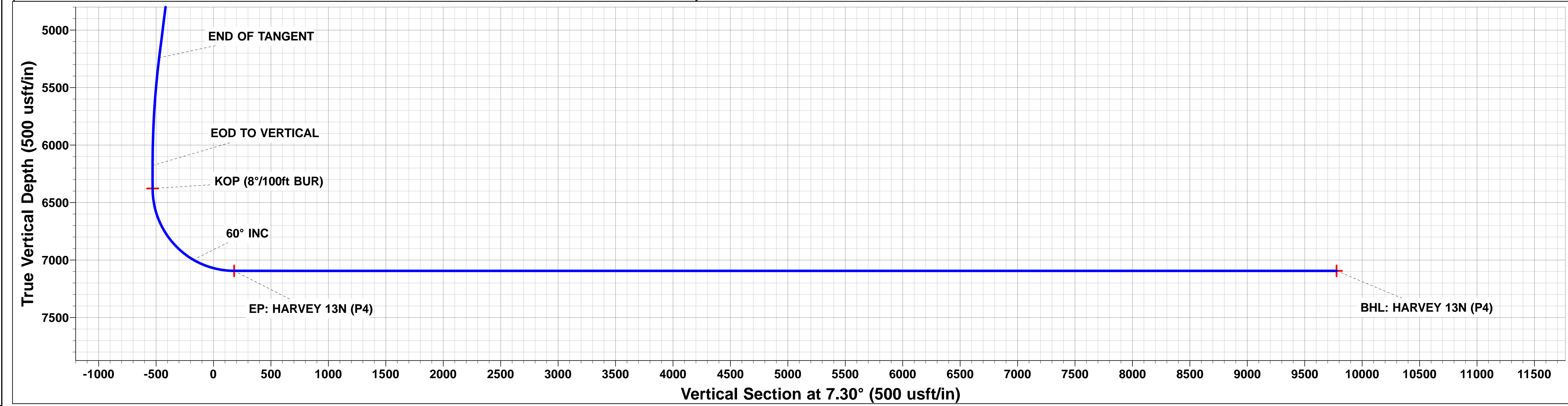
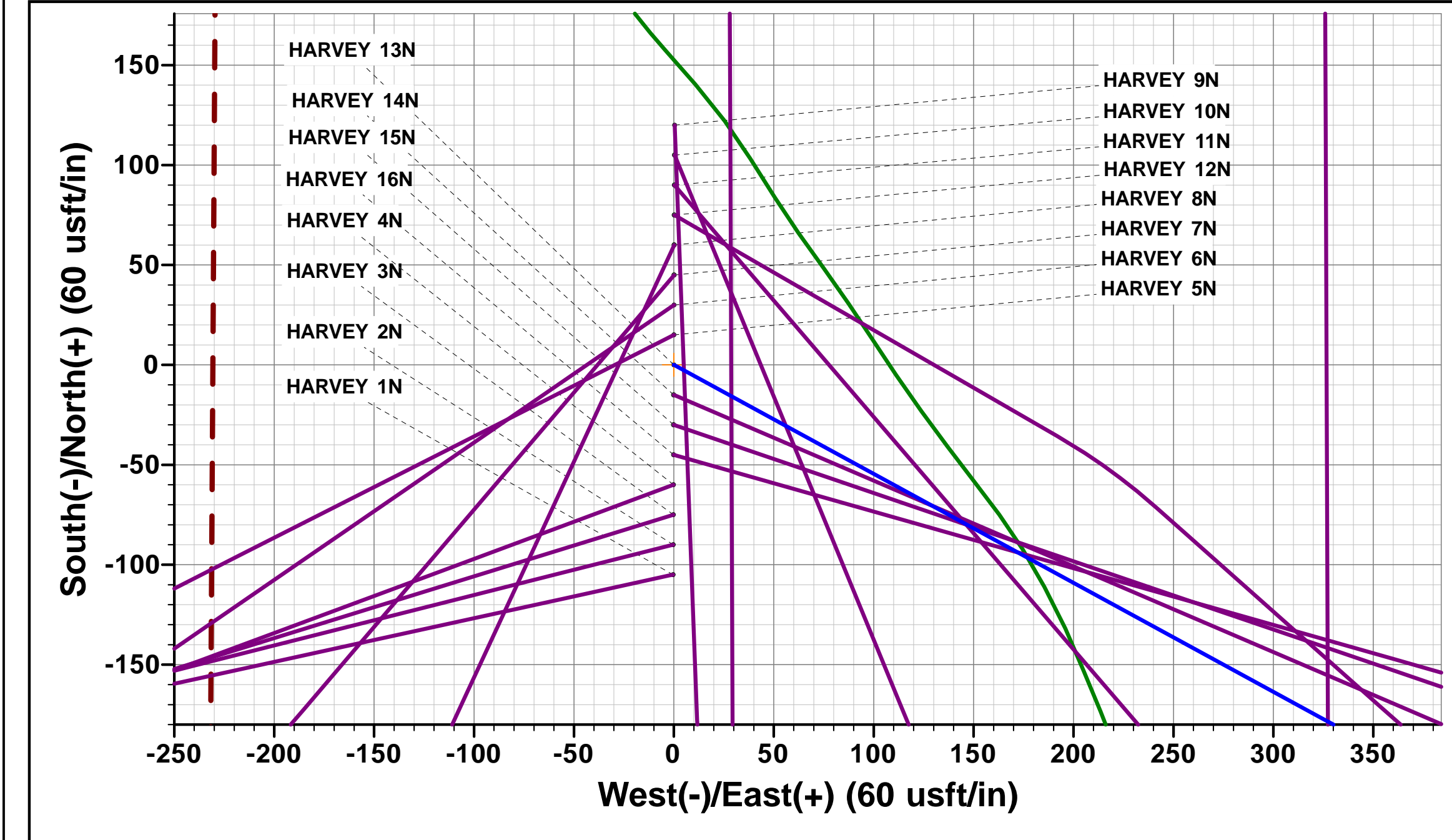
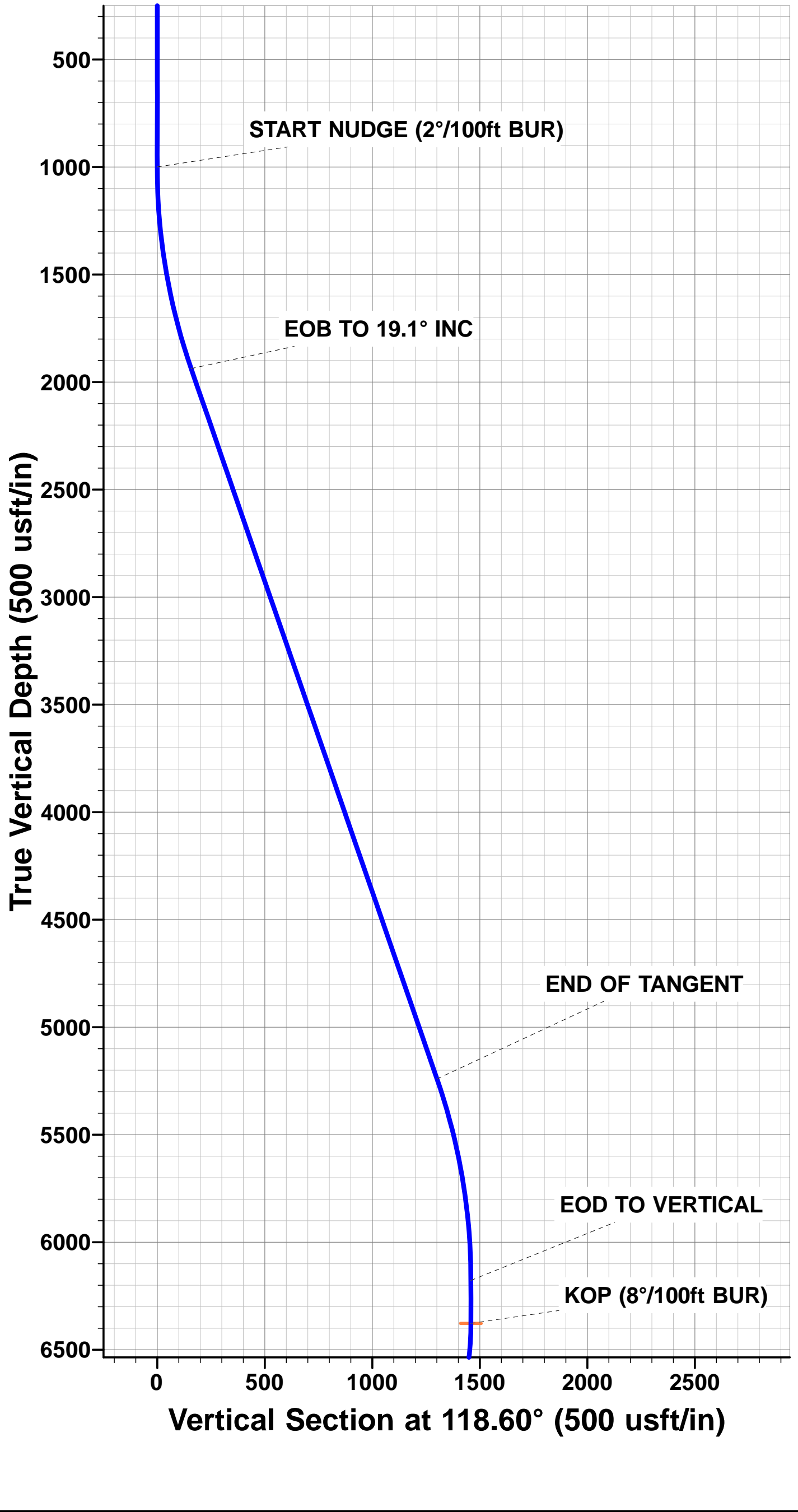


Project: WELD COUNTY, COLORADO (TRUE)
Site: SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)
Well: HARVEY 13N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #4

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: 715ft FSL & 2434ft FEL of Sec 32	
1000.00	1000.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
1937.25	1954.83	19.10	118.60	-75.48	138.41	-57.28	157.65	EOB TO 19.1° INC	
5240.55	5450.50	19.10	118.60	-623.00	1142.49	-472.82	1301.31	END OF TANGENT	
6177.80	6405.34	0.00	0.00	-698.48	1280.90	-530.10	1458.97	EOD TO VERTICAL	
6377.80	6605.34	0.00	0.00	-698.48	1280.90	-530.10	1458.97	KOP (8°/100ft BUR)	
6998.05	7355.34	60.00	359.79	-340.38	1279.59	-175.07	1817.15	60° INC	
7094.00	7730.34	90.00	359.79	17.72	1278.28	179.96	2175.17	EP: 737ft FSL & 1155ft FEL of Sec 32	
7094.00	17410.79	90.00	359.78	9698.10	1242.07	9777.31	11855.61	BHL: 150ft FNL & 1155ft FEL of Sec 29	

PROPOSED LOCAL COORDINATES:	
SHL: 715ft FSL & 2434ft FEL Sec 32	
EP : 737ft FSL & 1155ft FEL Sec 32	
BHL: 150ft FNL & 1155ft FEL Sec 29	

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: HARVEY 13N (P4)	6377.80	-698.48	1280.90	40.261716	-104.681835
EP: HARVEY 13N (P4)	7094.00	17.71	1278.28	40.263682	-104.681844
BHL: HARVEY 13N (P4)	7094.00	9698.10	1242.07	40.290254	-104.681972
SHL: HARVEY 13N	0.00	0.00	0.00	40.263634	-104.686424



PDC ENERGY

**WELD COUNTY, COLORADO (TRUE)
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)
HARVEY 13N**

**ORIGINAL WELLBORE
PROPOSAL #4**

Anticollision Report

02 September, 2018



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well HARVEY 13N
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 13N	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	17,410.79	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	1,000.00	1,000.00	3,404.21	3,399.99	806.903	CC, ES
EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Desig	13,600.00	7,094.01	4,857.27	4,723.89	36.415	SF
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	15,547.84	4,856.00	2,294.20	2,215.14	29.016	CC, ES
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	16,100.00	4,856.00	2,359.71	2,276.10	28.220	SF
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	16,824.10	4,736.00	2,483.49	2,390.29	26.647	CC, ES
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	17,410.79	4,736.00	2,551.85	2,453.27	25.888	SF
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	11,664.02	7,094.01	3,310.17	3,213.22	34.143	CC
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	11,700.00	7,094.01	3,310.36	3,212.74	33.911	ES
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	13,800.00	7,094.01	3,939.46	3,802.28	28.718	SF
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	16,192.74	7,000.00	3,261.62	3,093.18	19.364	CC
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	16,300.00	7,000.00	3,263.39	3,092.90	19.142	ES
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	17,400.00	7,000.00	3,477.87	3,286.37	18.161	SF
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	11,616.58	4,521.19	4,308.42	4,240.37	63.313	CC
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	11,700.00	4,521.19	4,309.23	4,239.87	62.133	ES
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	16,000.00	4,521.19	6,146.19	6,008.68	44.697	SF
ABDN VERT NGL C3 - Wellbore #1 - Design #1	11,460.56	7,094.01	3,456.88	3,363.72	37.105	CC
ABDN VERT NGL C3 - Wellbore #1 - Design #1	11,500.00	7,094.01	3,457.10	3,363.21	36.818	ES
ABDN VERT NGL C3 - Wellbore #1 - Design #1	13,900.00	7,094.01	4,230.90	4,091.83	30.422	SF
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	12,973.19	7,100.00	3,378.06	3,270.65	31.451	CC
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	13,000.00	7,100.00	3,378.17	3,270.25	31.304	ES
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	15,000.00	7,100.00	3,939.42	3,793.55	27.007	SF
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	13,511.62	7,342.00	3,587.14	3,432.35	23.174	CC
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	13,600.00	7,342.00	3,588.23	3,431.76	22.933	ES
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	15,400.00	8,170.91	4,002.09	3,807.60	20.577	SF
EXIST DD RAY 23-32 - Wellbore #1 - Wellbore #1	2,253.40	2,227.62	32.03	20.85	2.864	CC, ES, SF
EXIST DD RAY 24-32 - Wellbore #1 - Wellbore #1	9,486.56	7,195.81	92.20	33.31	1.566	CC, ES, SF
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	2,207.23	2,158.66	130.38	120.07	12.639	CC, ES
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	2,300.00	2,241.13	136.25	124.99	12.099	SF
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	0.00	15.12	2,441.79			
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	1,012.85	1,039.84	2,443.91	2,439.86	603.169	ES
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	17,000.00	7,269.36	9,471.67	9,271.54	47.327	SF
EXIST DD SPAYD 19-29 - Wellbore #1 - Wellbore #1	13,564.67	7,502.70	2,753.56	2,597.10	17.599	CC
EXIST DD SPAYD 19-29 - Wellbore #1 - Wellbore #1	13,600.00	7,502.60	2,753.79	2,596.66	17.526	ES
EXIST DD SPAYD 19-29 - Wellbore #1 - Wellbore #1	14,500.00	7,500.10	2,908.07	2,733.86	16.693	SF

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 13N
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 13N	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
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
EXIST DD SPAYD 20-29 - Wellbore #1 - Wellbore #1	13,627.77	7,130.35	214.08	80.95	1.608	CC, ES, SF
EXIST DD SPAYD 22-29 - Wellbore #1 - Wellbore #1	14,654.03	7,088.28	2,501.71	2,348.08	16.284	CC
EXIST DD SPAYD 22-29 - Wellbore #1 - Wellbore #1	14,700.00	7,087.44	2,502.13	2,347.63	16.195	ES
EXIST DD SPAYD 22-29 - Wellbore #1 - Wellbore #1	15,400.00	7,073.96	2,610.52	2,442.74	15.559	SF
EXIST DD SPAYD 23-29 - Wellbore #1 - Wellbore #1	13,664.84	7,364.00	1,365.78	1,229.03	9.987	CC
EXIST DD SPAYD 23-29 - Wellbore #1 - Wellbore #1	13,700.00	7,363.57	1,366.23	1,228.81	9.942	ES
EXIST DD SPAYD 23-29 - Wellbore #1 - Wellbore #1	13,900.00	7,361.05	1,385.88	1,244.67	9.814	SF
EXIST DD SPAYD 30-29 - Wellbore #1 - Wellbore #1	17,410.79	7,487.32	4,023.74	3,795.90	17.660	CC, ES, SF
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	13,597.79	7,595.82	3,998.46	3,840.96	25.386	CC
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	13,700.00	7,594.79	3,999.77	3,840.33	25.086	ES
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	15,500.00	7,577.32	4,427.81	4,234.16	22.865	SF
EXIST DD SPAYD 36-29 - Wellbore #1 - Wellbore #1	12,309.48	7,525.73	1,588.79	1,465.98	12.937	CC, ES
EXIST DD SPAYD 36-29 - Wellbore #1 - Wellbore #1	12,700.00	7,520.21	1,636.08	1,505.92	12.570	SF
EXIST DD SPAYD 37-29 - Wellbore #1 - Wellbore #1	12,353.21	7,274.32	281.30	161.17	2.342	CC, ES, SF
EXIST VERT BOHLENDER 29-13 - Wellbore #1 - Design	15,436.98	7,094.01	637.39	469.08	3.787	CC, ES
EXIST VERT BOHLENDER 29-13 - Wellbore #1 - Design	15,500.00	7,094.01	640.50	470.98	3.778	SF
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,352.30	7,091.01	578.72	412.03	3.472	CC, ES
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,400.00	7,091.01	580.69	413.09	3.465	SF
EXIST VERT BOHLENDER 32-29 #1 - Wellbore #1 - Des	15,611.25	7,094.01	860.77	689.13	5.015	CC, ES
EXIST VERT BOHLENDER 32-29 #1 - Wellbore #1 - Des	15,700.00	7,094.01	865.33	692.01	4.993	SF
EXIST VERT CLYDE MARSHALL 1 - Wellbore #1 - Desi	1,000.00	1,000.00	1,460.50	1,456.28	346.183	CC, ES
EXIST VERT CLYDE MARSHALL 1 - Wellbore #1 - Desi	14,300.00	4,765.00	6,341.27	6,237.16	60.907	SF
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	16,795.61	7,094.00	397.18	202.94	2.045	CC
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	16,800.00	7,094.00	397.21	202.88	2.044	ES, SF
EXIST VERT CPC BOHLENDER 29-2 - Wellbore #1 - De	17,080.61	7,094.00	790.20	590.51	3.957	CC
EXIST VERT CPC BOHLENDER 29-2 - Wellbore #1 - De	17,100.00	7,094.00	790.44	590.38	3.951	ES, SF
EXIST VERT HAMBERT G 32-4X - Wellbore #1 - Design	11,430.29	7,094.01	3,257.20	3,164.60	35.174	CC
EXIST VERT HAMBERT G 32-4X - Wellbore #1 - Design	11,500.00	7,094.01	3,257.95	3,164.05	34.697	ES
EXIST VERT HAMBERT G 32-4X - Wellbore #1 - Design	13,600.00	7,094.01	3,913.66	3,780.27	29.341	SF
EXIST VERT HAMBERT R G 32-1 - Wellbore #1 - Desig	11,657.48	7,094.01	394.63	297.80	4.076	CC, ES
EXIST VERT HAMBERT R G 32-1 - Wellbore #1 - Desig	11,700.00	7,094.01	396.91	299.29	4.066	SF
EXIST VERT HAMBERT R G 32-2 - Wellbore #1 - Desig	11,480.63	7,094.01	652.15	558.61	6.972	CC
EXIST VERT HAMBERT R G 32-2 - Wellbore #1 - Desig	11,500.00	7,094.01	652.44	558.54	6.948	ES
EXIST VERT HAMBERT R G 32-2 - Wellbore #1 - Desig	11,600.00	7,094.01	662.98	567.23	6.924	SF
EXIST VERT HAMBERT R G 32-3 - Wellbore #1 - Desig	11,555.12	7,094.01	2,066.61	1,971.69	21.772	CC
EXIST VERT HAMBERT R G 32-3 - Wellbore #1 - Desig	11,600.00	7,094.01	2,067.10	1,971.34	21.587	ES
EXIST VERT HAMBERT R G 32-3 - Wellbore #1 - Desig	12,400.00	7,094.01	2,232.64	2,121.91	20.163	SF
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	10,229.65	7,094.01	2,239.01	2,168.37	31.696	CC
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	10,300.00	7,094.01	2,240.12	2,168.21	31.155	ES
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	11,600.00	7,094.01	2,625.06	2,529.31	27.414	SF
EXIST VERT HAMBERT R G 32-7 - Wellbore #1 - Desig	10,202.42	7,094.01	790.81	720.66	11.273	CC, ES
EXIST VERT HAMBERT R G 32-7 - Wellbore #1 - Desig	10,400.00	7,094.01	815.12	741.42	11.060	SF
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	10,510.76	7,094.01	566.80	491.10	7.487	CC, ES
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	10,600.00	7,094.01	573.79	496.46	7.420	SF
EXIST VERT HSR-CARTER 11-29 - Wellbore #1 - Desig	14,054.09	7,094.01	1,995.79	1,853.79	14.055	CC
EXIST VERT HSR-CARTER 11-29 - Wellbore #1 - Desig	14,100.00	7,094.01	1,996.32	1,853.45	13.973	ES
EXIST VERT HSR-CARTER 11-29 - Wellbore #1 - Desig	14,600.00	7,094.01	2,069.11	1,916.73	13.579	SF
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	15,367.60	7,094.01	3,359.56	3,192.57	20.119	CC
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	15,400.00	7,094.01	3,359.72	3,192.11	20.045	ES
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	16,700.00	7,094.00	3,614.12	3,421.70	18.783	SF
EXIST VERT HSR-DICERSON 14-29A - Wellbore #1 - D	12,929.68	7,094.01	2,348.83	2,228.13	19.459	CC
EXIST VERT HSR-DICERSON 14-29A - Wellbore #1 - D	13,000.00	7,094.01	2,349.88	2,227.85	19.256	ES

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 13N
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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
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
EXIST VERT HSR-DICERSON 14-29A - Wellbore #1 - D	13,800.00	7,094.01	2,504.88	2,367.71	18.260	SF
EXIST VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	12,959.58	7,094.01	374.57	253.30	3.089	CC, ES
EXIST VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	13,000.00	7,094.01	376.74	254.71	3.087	SF
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	14,095.68	7,094.01	3,348.85	3,206.06	23.453	CC
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	14,200.00	7,094.01	3,350.47	3,205.70	23.144	ES
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	15,600.00	7,094.01	3,671.18	3,499.77	21.416	SF
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	8,998.73	7,094.00	614.08	564.37	12.353	CC
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	9,000.00	7,094.00	614.08	564.35	12.348	ES
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	9,100.00	7,094.00	622.37	571.07	12.131	SF
EXIST VERT HSR-MUNDS 13.29 - Wellbore #1 - Design	13,120.39	7,094.01	3,444.95	3,320.64	27.713	CC
EXIST VERT HSR-MUNDS 13.29 - Wellbore #1 - Design	13,200.00	7,094.01	3,445.87	3,320.06	27.389	ES
EXIST VERT HSR-MUNDS 13.29 - Wellbore #1 - Design	14,900.00	7,094.01	3,877.44	3,719.36	24.528	SF
EXIST VERT HSR-NICHOLS 15-32 - Wellbore #1 - Desig	7,998.72	7,094.00	495.24	457.86	13.249	CC
EXIST VERT HSR-NICHOLS 15-32 - Wellbore #1 - Desig	8,000.00	7,094.00	495.24	457.85	13.246	ES
EXIST VERT HSR-NICHOLS 15-32 - Wellbore #1 - Desig	8,100.00	7,094.00	505.49	467.30	13.236	SF
EXIST VERT HSR-RAY 3-29 - Wellbore #1 - Design #1	16,835.01	7,094.00	2,299.86	2,104.87	11.795	CC
EXIST VERT HSR-RAY 3-29 - Wellbore #1 - Design #1	16,900.00	7,094.00	2,300.78	2,104.55	11.725	ES
EXIST VERT HSR-RAY 3-29 - Wellbore #1 - Design #1	17,400.00	7,094.00	2,368.24	2,162.45	11.508	SF
EXIST VERT HSR-SALISBURY 6-29 - Wellbore #1 - Des	15,653.98	7,094.01	2,325.33	2,152.88	13.484	CC
EXIST VERT HSR-SALISBURY 6-29 - Wellbore #1 - Des	15,700.00	7,094.01	2,325.79	2,152.46	13.419	ES
EXIST VERT HSR-SALISBURY 6-29 - Wellbore #1 - Des	16,300.00	7,094.00	2,413.40	2,228.62	13.061	SF
EXIST VERT HSR-TEAGLE 10-29A - Wellbore #1 - Desi	14,387.62	7,094.01	889.37	741.04	5.996	CC
EXIST VERT HSR-TEAGLE 10-29A - Wellbore #1 - Desi	14,400.00	7,094.01	889.46	740.89	5.987	ES
EXIST VERT HSR-TEAGLE 10-29A - Wellbore #1 - Desi	14,500.00	7,094.01	896.44	745.97	5.958	SF
EXIST VERT HSR-WILLIAM 10-32A - Wellbore #1 - Des	8,974.31	7,094.00	785.55	736.21	15.923	CC, ES
EXIST VERT HSR-WILLIAM 10-32A - Wellbore #1 - Des	9,200.00	7,094.00	817.33	764.42	15.448	SF
EXIST VERT HSR-WRIGHT 9-29A - Wellbore #1 - Desig	14,314.35	7,094.01	295.59	148.65	2.012	CC, ES, SF
EXIST VERT MARSHALL 32-11G - Wellbore #1 - Design	1,000.00	1,000.00	1,670.61	1,666.39	395.987	CC, ES
EXIST VERT MARSHALL 32-11G - Wellbore #1 - Design	10,800.00	7,094.01	2,712.58	2,631.61	33.499	SF
EXIST VERT MARSHALL 32-12G - Wellbore #1 - Design	1,000.00	1,000.00	2,293.49	2,289.28	543.629	CC, ES
EXIST VERT MARSHALL 32-12G - Wellbore #1 - Design	13,700.00	7,094.01	5,905.55	5,770.27	43.654	SF
EXIST VERT MARSHALL 32-14G - Wellbore #1 - Design	1,000.00	1,000.00	1,104.70	1,100.48	261.847	CC, ES
EXIST VERT MARSHALL 32-14G - Wellbore #1 - Design	13,100.00	7,094.01	6,026.53	5,902.60	48.631	SF
EXIST VERT MARSHALL G 32-13JI - Wellbore #1 - Des	1,000.00	1,000.00	2,393.48	2,389.26	567.329	CC, ES
EXIST VERT MARSHALL G 32-13JI - Wellbore #1 - Des	17,000.00	7,094.00	9,998.95	9,800.80	50.462	SF
EXIST VERT MEL SMOOKLER GAS UNIT 1 - Wellbore	1,000.00	1,000.00	1,949.28	1,945.06	462.040	CC, ES
EXIST VERT MEL SMOOKLER GAS UNIT 1 - Wellbore	14,100.00	7,094.01	6,614.06	6,471.19	46.294	SF
EXIST VERT MUSICK 1-32 - Wellbore #1 - Design #1	10,640.15	7,094.01	2,700.14	2,622.08	34.592	CC
EXIST VERT MUSICK 1-32 - Wellbore #1 - Design #1	10,700.00	7,094.01	2,700.80	2,621.66	34.124	ES
EXIST VERT MUSICK 1-32 - Wellbore #1 - Design #1	12,400.00	7,094.01	3,223.00	3,112.27	29.107	SF
EXIST VERT MUSICK GAS UNIT 1 - Wellbore #1 - Desi	10,659.51	7,094.01	76.15	-2.26	0.971	Level 1, CC, ES, SF
EXIST VERT MUSICK MCCLINTOCK 2 - Wellbore #1 - D	1,000.00	1,000.00	2,713.73	2,709.51	643.238	CC, ES
EXIST VERT MUSICK MCCLINTOCK 2 - Wellbore #1 - D	13,100.00	4,755.00	4,119.02	4,035.89	49.549	SF
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	10,192.80	4,750.00	2,385.37	2,350.83	69.065	CC
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	10,200.00	4,750.00	2,385.38	2,350.79	68.956	ES
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	11,500.00	4,750.00	2,720.07	2,675.45	60.963	SF
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	1,000.00	1,000.00	3,359.50	3,355.28	796.305	CC, ES
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	15,000.00	4,750.00	6,058.19	5,929.48	47.068	SF
EXIST VERT MUSICK MCCLINTOCK 7 - Wellbore #1 - D	10,213.57	4,739.00	2,444.29	2,411.94	75.563	CC, ES
EXIST VERT MUSICK MCCLINTOCK 7 - Wellbore #1 - D	11,800.00	4,739.00	2,913.98	2,868.23	63.688	SF
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	11,607.75	4,803.00	2,408.20	2,362.64	52.860	CC, ES
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	12,800.00	4,803.00	2,687.17	2,630.90	47.761	SF

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 13N
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 13N	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 5 - Wellbore #1 - D	11,669.14	4,752.00	3,251.61	3,184.29	48.303	CC
EXIST VERT MUSICK-MCCLINTOCK 5 - Wellbore #1 - D	11,700.00	4,752.00	3,251.76	3,184.01	47.997	ES
EXIST VERT MUSICK-MCCLINTOCK 5 - Wellbore #1 - D	13,900.00	4,752.00	3,943.29	3,844.45	39.898	SF
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,498.89	7,094.00	836.87	648.30	4.438	CC
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,500.00	7,094.00	836.87	648.28	4.437	ES
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,600.00	7,094.00	842.96	652.45	4.425	SF
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	1,000.00	1,000.00	3,404.21	3,399.99	806.903	CC, ES
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	13,600.00	7,094.01	4,857.27	4,723.89	36.415	SF
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	15,743.51	7,094.00	3,621.47	3,447.32	20.794	CC
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	15,800.00	7,094.00	3,621.91	3,446.68	20.669	ES
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	17,200.00	7,094.00	3,903.37	3,701.40	19.326	SF
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	14,215.02	4,730.00	3,203.95	3,102.67	31.634	CC
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	14,300.00	4,730.00	3,205.08	3,102.61	31.279	ES
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	15,600.00	4,730.00	3,490.47	3,369.87	28.941	SF
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	12,918.96	7,094.01	522.30	401.80	4.334	CC, ES
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	13,000.00	7,094.01	528.55	406.52	4.331	SF
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	16,203.62	4,660.00	3,754.03	3,613.15	26.646	CC
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	16,300.00	4,660.00	3,755.27	3,612.91	26.379	ES
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	17,410.79	4,660.00	3,943.34	3,783.98	24.745	SF
EXIST VERT UPRR PAN AM "J"1 - Wellbore #1 - Design	13,019.23	7,094.01	975.69	853.29	7.971	CC, ES
EXIST VERT UPRR PAN AM "J"1 - Wellbore #1 - Design	13,200.00	7,094.01	992.30	866.48	7.887	SF
EXIST VERT VERN MARSHALL 1 - Wellbore #1 - Desig	1,000.00	1,000.00	2,520.09	2,515.87	597.340	CC, ES
EXIST VERT VERN MARSHALL 1 - Wellbore #1 - Desig	17,300.00	4,785.00	9,215.00	9,046.30	54.623	SF
EXIST VERT WEINMASTER G 32-18 - Wellbore #1 - De	10,892.93	7,094.01	1,321.25	1,238.57	15.980	CC
EXIST VERT WEINMASTER G 32-18 - Wellbore #1 - De	10,900.00	7,094.01	1,321.27	1,238.46	15.956	ES
EXIST VERT WEINMASTER G 32-18 - Wellbore #1 - De	11,300.00	7,094.01	1,382.53	1,292.35	15.330	SF
HARVEY 10N - ORIGINAL WELLBORE - PROPOSAL #	1,000.00	1,000.00	105.00	100.78	24.887	CC, ES
HARVEY 10N - ORIGINAL WELLBORE - PROPOSAL #	17,410.79	17,389.28	955.82	578.93	2.536	SF
HARVEY 11N - ORIGINAL WELLBORE - PROPOSAL #4	1,000.00	1,000.00	89.99	85.77	21.330	CC, ES
HARVEY 11N - ORIGINAL WELLBORE - PROPOSAL #4	17,410.79	17,360.95	604.64	226.63	1.600	SF
HARVEY 12N - ORIGINAL WELLBORE - PROPOSAL #	1,000.00	1,000.00	74.98	70.76	17.772	CC
HARVEY 12N - ORIGINAL WELLBORE - PROPOSAL #	17,410.79	17,458.19	346.60	-23.12	0.937	Level 1, ES, SF
HARVEY 14N - ORIGINAL WELLBORE - PROPOSAL #	900.00	900.00	15.01	11.24	3.981	CC
HARVEY 14N - ORIGINAL WELLBORE - PROPOSAL #	17,410.79	17,590.04	327.77	-37.13	0.898	Level 1, ES, SF
HARVEY 15N - ORIGINAL WELLBORE - PROPOSAL #	800.00	800.00	29.98	26.66	9.030	CC, ES
HARVEY 15N - ORIGINAL WELLBORE - PROPOSAL #	17,410.79	17,644.01	685.09	304.30	1.799	SF
HARVEY 16N - ORIGINAL WELLBORE - PROPOSAL #	700.00	700.00	44.99	42.12	15.674	CC, ES
HARVEY 16N - ORIGINAL WELLBORE - PROPOSAL #	17,410.79	17,858.49	1,038.92	657.30	2.722	SF
HARVEY 1N - ORIGINAL WELLBORE - PROPOSAL #6	300.00	300.00	104.95	103.88	97.891	CC, ES
HARVEY 1N - ORIGINAL WELLBORE - PROPOSAL #6	17,410.79	17,504.15	3,900.68	3,531.03	10.552	SF
HARVEY 2N - ORIGINAL WELLBORE - PROPOSAL #5	400.00	400.00	89.98	88.46	59.132	CC, ES
HARVEY 2N - ORIGINAL WELLBORE - PROPOSAL #5	17,410.79	17,835.26	3,604.77	3,227.90	9.565	SF
HARVEY 3N - ORIGINAL WELLBORE - PROPOSAL #5	500.00	500.00	74.97	73.00	38.033	CC, ES
HARVEY 3N - ORIGINAL WELLBORE - PROPOSAL #5	17,410.79	17,603.66	3,208.22	2,829.54	8.472	SF
HARVEY 4N - ORIGINAL WELLBORE - PROPOSAL #5	600.00	600.00	59.96	57.54	24.770	CC, ES
HARVEY 4N - ORIGINAL WELLBORE - PROPOSAL #5	17,410.79	17,589.00	2,920.30	2,545.24	7.786	SF
HARVEY 5N - ORIGINAL WELLBORE - PROPOSAL #4	1,000.00	1,000.00	15.01	10.79	3.559	CC, ES
HARVEY 5N - ORIGINAL WELLBORE - PROPOSAL #4	1,100.00	1,099.98	15.92	11.27	3.424	SF
HARVEY 6N - ORIGINAL WELLBORE - PROPOSAL #4	1,000.00	1,000.00	29.99	25.77	7.108	CC, ES
HARVEY 6N - ORIGINAL WELLBORE - PROPOSAL #4	17,410.79	17,432.88	2,275.15	1,897.55	6.025	SF
HARVEY 7N - ORIGINAL WELLBORE - PROPOSAL #4	1,000.00	1,000.00	45.00	40.78	10.665	CC, ES
HARVEY 7N - ORIGINAL WELLBORE - PROPOSAL #4	17,410.79	17,273.90	1,853.45	1,476.44	4.916	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 13N
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 13N	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 8N - ORIGINAL WELLBORE - PROPOSAL #4	1,000.00	1,000.00	60.01	55.79	14.223	CC, ES
HARVEY 8N - ORIGINAL WELLBORE - PROPOSAL #4	17,410.79	17,346.05	1,576.11	1,198.60	4.175	SF
HARVEY 9N - ORIGINAL WELLBORE - PROPOSAL #4	1,000.00	1,000.00	119.97	115.75	28.437	CC, ES
HARVEY 9N - ORIGINAL WELLBORE - PROPOSAL #4	17,410.79	17,290.30	1,249.53	873.52	3.323	SF
SW SW SEC. 33 T4N R65W 6th P.M. (CRAWFORD)						
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	8,276.87	7,169.62	1,081.45	1,038.54	25.201	CC, ES
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	8,700.00	7,171.89	1,161.28	1,113.05	24.075	SF
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,606.06	7,149.67	1,111.43	977.63	8.307	CC, ES
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,800.00	7,149.37	1,128.22	990.75	8.207	SF
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	7,400.00	6,991.16	492.07	456.30	13.755	SF
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	7,450.00	7,011.83	489.93	454.48	13.819	ES
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	7,450.38	7,011.97	489.93	454.48	13.820	CC

Offset Design												Offset Site Error:	0.00 usft
SE SW SEC. 32 T4N R65W 6th P.M. - EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Design #1												Offset Well Error:	0.00 usft
Survey Program: 0-MWD													
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-41.70	2,541.59	-2,264.72	3,404.21				
100.00	100.00	100.00	100.00	0.09	0.09	-41.70	2,541.59	-2,264.72	3,404.21	3,404.04	0.17	N/A	
200.00	200.00	200.00	200.00	0.31	0.31	-41.70	2,541.59	-2,264.72	3,404.21	3,403.59	0.62	5,467.715	
300.00	300.00	300.00	300.00	0.54	0.54	-41.70	2,541.59	-2,264.72	3,404.21	3,403.14	1.07	3,175.172	
400.00	400.00	400.00	400.00	0.76	0.76	-41.70	2,541.59	-2,264.72	3,404.21	3,402.69	1.52	2,237.160	
500.00	500.00	500.00	500.00	0.99	0.99	-41.70	2,541.59	-2,264.72	3,404.21	3,402.24	1.97	1,726.975	
600.00	600.00	600.00	600.00	1.21	1.21	-41.70	2,541.59	-2,264.72	3,404.21	3,401.79	2.42	1,406.274	
700.00	700.00	700.00	700.00	1.44	1.44	-41.70	2,541.59	-2,264.72	3,404.21	3,401.34	2.87	1,186.028	
800.00	800.00	800.00	800.00	1.66	1.66	-41.70	2,541.59	-2,264.72	3,404.21	3,400.89	3.32	1,025.428	
900.00	900.00	900.00	900.00	1.88	1.88	-41.70	2,541.59	-2,264.72	3,404.21	3,400.44	3.77	903.135	
1,000.00	1,000.00	1,000.00	1,000.00	2.11	2.11	-41.70	2,541.59	-2,264.72	3,404.21	3,399.99	4.22	806.903	CC, ES
1,100.00	1,099.98	1,099.98	1,099.98	2.31	2.33	-160.31	2,541.59	-2,264.72	3,405.85	3,401.21	4.65	732.871	
1,200.00	1,199.84	1,199.84	1,199.84	2.51	2.56	-160.30	2,541.59	-2,264.72	3,410.78	3,405.72	5.06	674.348	
1,300.00	1,299.45	1,299.45	1,299.45	2.72	2.78	-160.30	2,541.59	-2,264.72	3,418.99	3,413.52	5.47	624.919	
1,400.00	1,398.70	1,398.70	1,398.70	2.95	3.01	-160.29	2,541.59	-2,264.72	3,430.47	3,424.59	5.89	582.796	
1,500.00	1,497.47	1,497.47	1,497.47	3.22	3.23	-160.27	2,541.59	-2,264.72	3,445.22	3,438.92	6.30	546.550	
1,600.00	1,595.62	1,595.62	1,595.62	3.53	3.45	-160.26	2,541.59	-2,264.72	3,463.22	3,456.49	6.72	515.053	
1,700.00	1,693.06	1,693.06	1,693.06	3.89	3.67	-160.23	2,541.59	-2,264.72	3,484.45	3,477.30	7.15	487.416	
1,800.00	1,789.64	1,789.64	1,789.64	4.32	3.88	-160.21	2,541.59	-2,264.72	3,508.90	3,501.32	7.58	462.940	
1,900.00	1,885.27	1,885.27	1,885.27	4.81	4.10	-160.17	2,541.59	-2,264.72	3,536.54	3,528.52	8.02	441.069	
1,954.83	1,937.25	1,937.25	1,937.25	5.11	4.22	-160.15	2,541.59	-2,264.72	3,553.04	3,544.78	8.26	430.024	
2,000.00	1,979.93	1,979.93	1,979.93	5.37	4.31	-160.23	2,541.59	-2,264.72	3,567.03	3,558.54	8.49	420.193	
2,100.00	2,074.43	2,074.43	2,074.43	5.97	4.52	-160.41	2,541.59	-2,264.72	3,598.02	3,589.03	9.00	399.860	
2,200.00	2,168.93	2,168.93	2,168.93	6.59	4.74	-160.58	2,541.59	-2,264.72	3,629.05	3,619.53	9.52	381.371	
2,300.00	2,263.42	2,263.42	2,263.42	7.22	4.95	-160.75	2,541.59	-2,264.72	3,660.10	3,650.06	10.04	364.553	
2,400.00	2,357.92	2,357.92	2,357.92	7.87	5.16	-160.91	2,541.59	-2,264.72	3,691.18	3,680.61	10.57	349.237	
2,500.00	2,452.42	2,452.42	2,452.42	8.52	5.37	-161.08	2,541.59	-2,264.72	3,722.29	3,711.19	11.10	335.262	
2,600.00	2,546.91	2,546.91	2,546.91	9.19	5.59	-161.24	2,541.59	-2,264.72	3,753.43	3,741.79	11.64	322.483	
2,700.00	2,641.41	2,641.41	2,641.41	9.85	5.80	-161.40	2,541.59	-2,264.72	3,784.60	3,772.42	12.18	310.770	
2,800.00	2,735.91	2,735.91	2,735.91	10.53	6.01	-161.55	2,541.59	-2,264.72	3,815.79	3,803.07	12.72	300.006	

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