

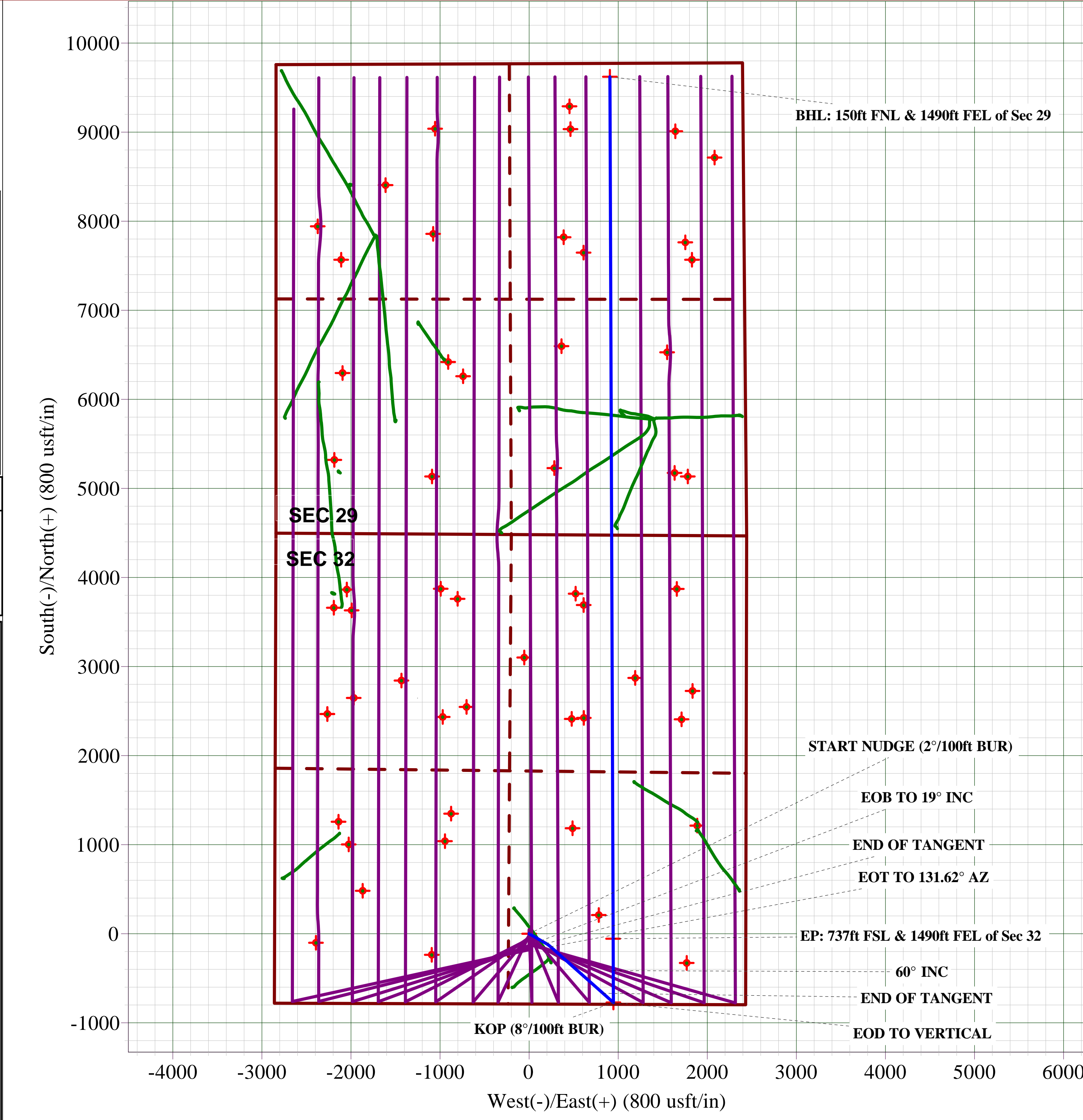
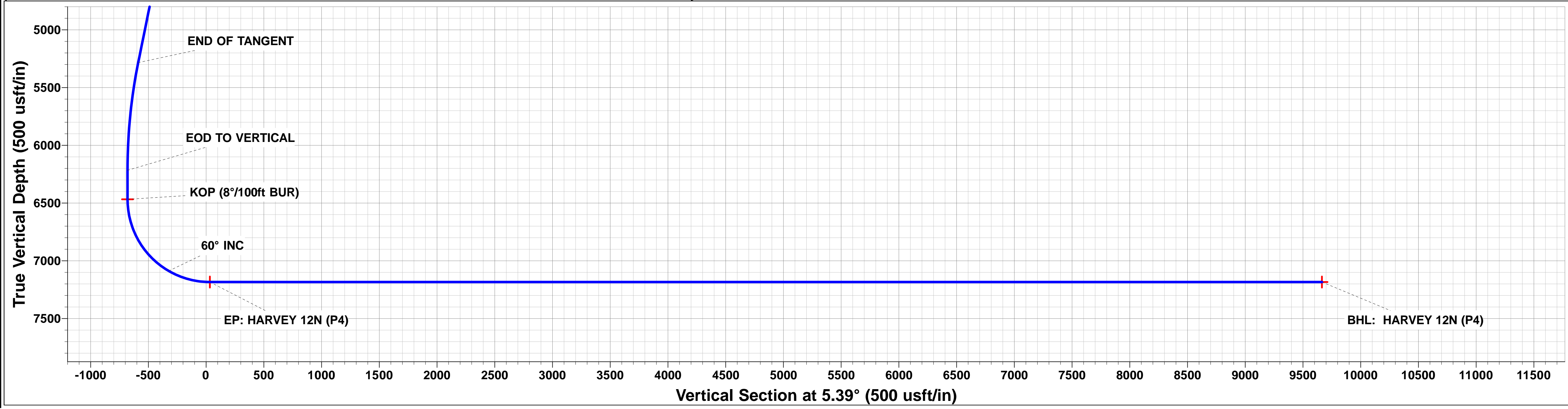
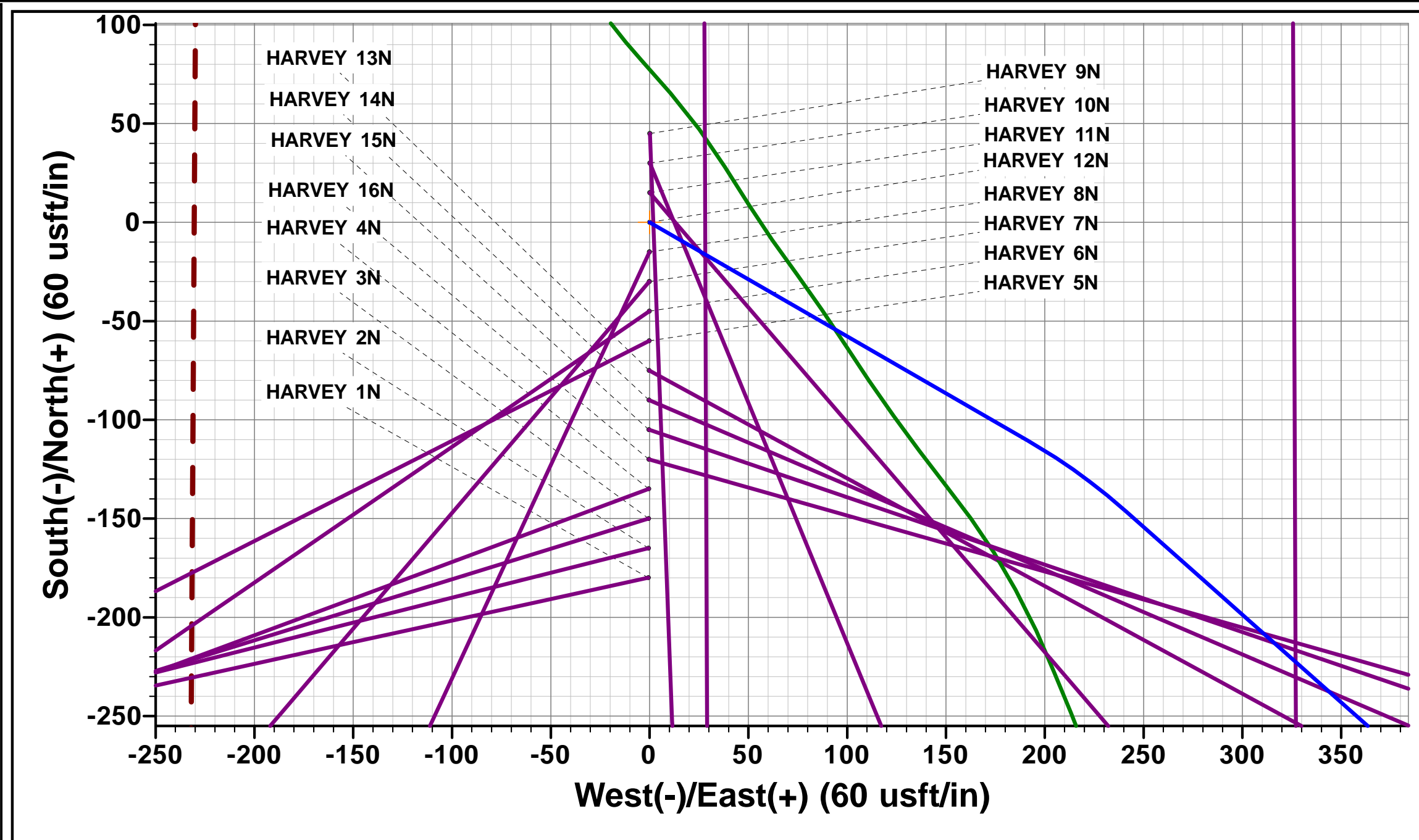
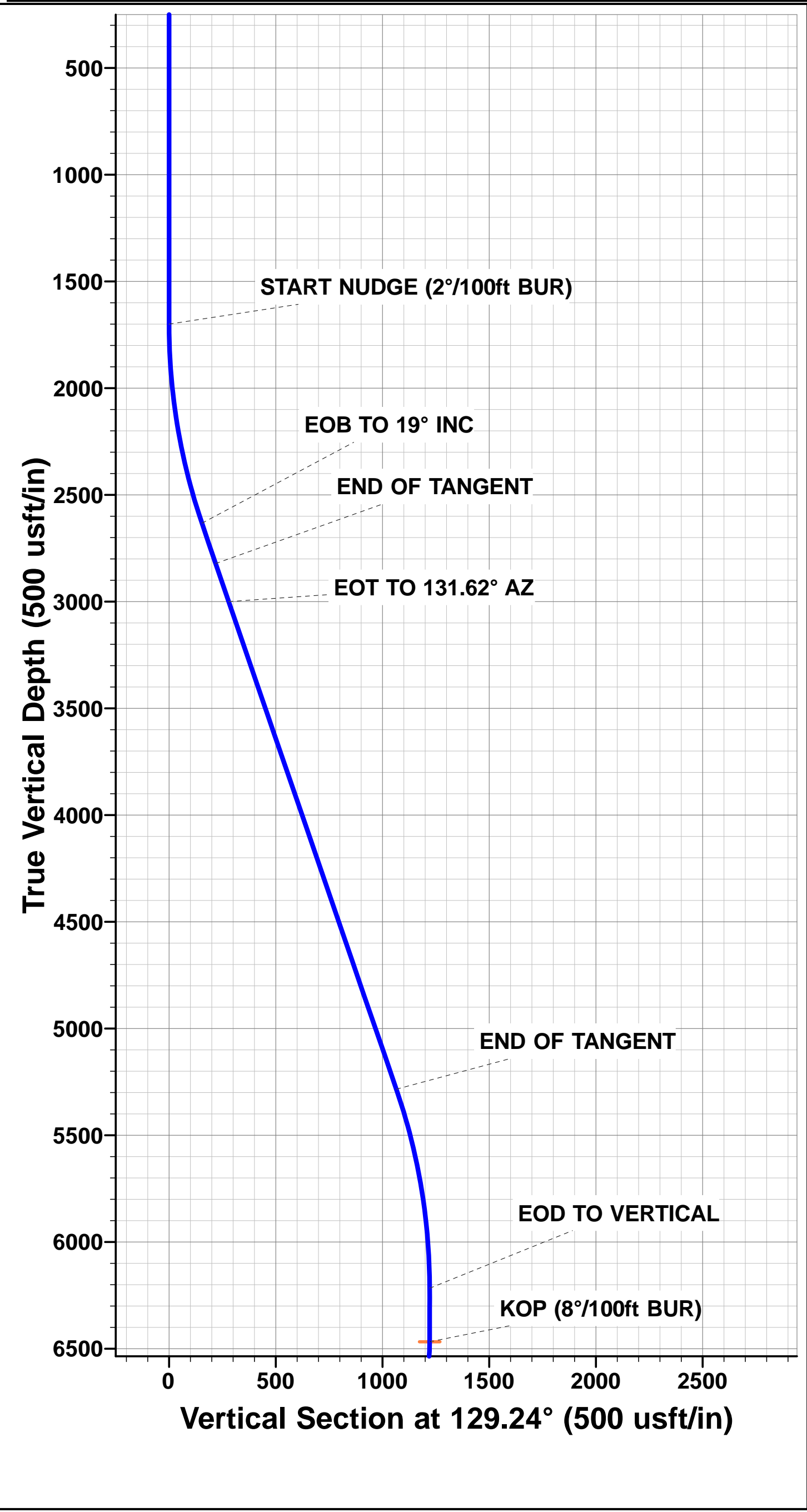


Project: WELD COUNTY, COLORADO (TRUE)
Site: SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)
Well: HARVEY 12N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #4

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: 790ft FSL & 2434ft FEL of Sec 32	
1700.00	1700.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
2632.68	2650.00	19.00	120.00	-78.04	135.17	-65.01	156.08	EOB TO 19° INC	
2821.79	2850.00	19.00	120.00	-110.60	191.56	-92.13	221.19	END OF TANGENT	
3000.42	3038.86	19.00	131.62	-146.40	241.18	-123.12	282.52	EOT TO 131.62° AZ	
5284.18	5454.20	19.00	131.62	-668.68	829.03	-587.92	1068.87	END OF TANGENT	
6216.85	6404.19	0.00	0.00	-772.34	945.70	-680.17	1224.94	EOD TO VERTICAL	
6467.80	6655.14	0.00	0.00	-772.34	945.70	-680.17	1224.94	KOP (8°/100ft BUR)	
7088.05	7405.14	60.00	359.79	-414.25	944.42	-323.78	1583.12	60° INC	
7184.00	7780.14	90.00	359.79	-56.15	943.13	32.62	1941.14	EP: 737ft FSL & 1490ft FEL of Sec 32	
7184.00	17458.28	90.00	359.78	9621.92	907.11	9664.59	11619.28	BHL: 150ft FNL & 1490ft FEL of Sec 29	

PROPOSED LOCAL COORDINATES:	
SHL: 790ft FSL & 2434ft FEL Sec 32	
EP : 737ft FSL & 1490ft FEL Sec 32	
BHL: 150ft FNL & 1490ft FEL Sec 29	

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
EP: HARVEY 12N (P4)	7184.00	-56.15	943.13	40.263685	-104.683044
BHL: HARVEY 12N (P4)	7184.00	9621.92	907.11	40.290251	-104.683172
KOP: HARVEY 12N (P4)	6467.80	-772.34	945.70	40.261719	-104.683035
SHL - HARVEY 12N	0.00	0.00	0.00	40.263839	-104.686423



PDC ENERGY

**WELD COUNTY, COLORADO (TRUE)
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)
HARVEY 12N**

**ORIGINAL WELLBORE
PROPOSAL #4**

Anticollision Report

02 September, 2018



Anticollision Report



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well HARVEY 12N
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 12N	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	17,458.28	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	10,314.63	7,184.01	3,198.93	3,129.17	45.854	CC
EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Desig	10,400.00	7,184.01	3,200.07	3,128.78	44.885	ES
EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Desig	13,100.00	7,184.01	4,241.55	4,120.09	34.921	SF
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	15,595.25	4,856.00	2,474.70	2,387.29	28.311	CC
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	15,600.00	4,856.00	2,474.70	2,387.25	28.297	ES
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	16,300.00	4,856.00	2,573.09	2,479.05	27.362	SF
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	16,871.52	4,736.00	2,488.08	2,405.24	30.038	CC
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	16,900.00	4,736.00	2,488.24	2,405.18	29.958	ES
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	17,458.28	4,736.00	2,556.33	2,468.83	29.217	SF
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	11,711.38	7,184.01	2,975.46	2,880.07	31.194	CC
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	11,800.00	7,184.01	2,976.78	2,879.74	30.677	ES
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	13,500.00	7,184.01	3,471.63	3,342.61	26.906	SF
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	16,240.20	7,000.00	2,931.23	2,764.80	17.612	CC
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	16,300.00	7,000.00	2,931.84	2,764.27	17.496	ES
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	17,200.00	7,000.00	3,084.36	2,899.62	16.696	SF
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	11,663.93	4,521.19	4,102.38	4,037.45	63.183	CC
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	11,700.00	4,521.19	4,102.54	4,037.07	62.664	ES
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	15,700.00	4,521.19	5,754.82	5,628.62	45.600	SF
ABDN VERT NGL C3 - Wellbore #1 - Design #1	11,507.91	7,184.01	3,122.16	3,030.57	34.085	CC
ABDN VERT NGL C3 - Wellbore #1 - Design #1	11,600.00	7,184.01	3,123.52	3,030.21	33.475	ES
ABDN VERT NGL C3 - Wellbore #1 - Design #1	13,500.00	7,184.01	3,703.51	3,574.48	28.703	SF
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	13,020.58	7,100.00	3,044.40	2,938.87	28.848	CC
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	13,100.00	7,100.00	3,045.44	2,938.41	28.454	ES
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	14,700.00	7,100.00	3,476.87	3,339.50	25.311	SF
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	13,576.11	7,395.88	3,256.23	3,102.64	21.201	CC
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	13,600.00	7,400.07	3,256.31	3,102.23	21.134	ES
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	15,100.00	8,146.89	3,552.00	3,365.75	19.071	SF
EXIST DD RAY 23-32 - Wellbore #1 - Wellbore #1	2,740.08	2,739.04	34.03	20.93	2.597	CC, ES, SF
EXIST DD RAY 24-32 - Wellbore #1 - Wellbore #1	9,533.48	7,284.25	243.00	185.70	4.241	CC, ES, SF
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	2,661.51	2,604.82	296.63	285.24	26.044	CC, ES
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	3,000.00	2,907.27	330.36	316.46	23.763	SF
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	0.00	15.14	2,406.14			
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	1,116.44	1,131.41	2,407.88	2,403.40	537.810	ES
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	15,900.00	7,328.51	8,292.52	8,115.98	46.974	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 12N
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 12N	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 SPAYD 19-29 - Wellbore #1 - Wellbore #1	13,611.85	7,605.27	2,418.77	2,263.98	15.626	CC
EXIST DD SPAYD 19-29 - Wellbore #1 - Wellbore #1	13,700.00	7,605.07	2,420.37	2,263.91	15.470	ES
EXIST DD SPAYD 19-29 - Wellbore #1 - Wellbore #1	14,300.00	7,603.70	2,514.75	2,346.91	14.983	SF
EXIST DD SPAYD 20-29 - Wellbore #1 - Wellbore #1	13,671.14	7,193.79	126.87	-4.32	0.967	Level 1, CC, ES, SF
EXIST DD SPAYD 22-29 - Wellbore #1 - Wellbore #1	14,700.08	7,185.10	2,167.53	2,015.52	14.259	CC, ES
EXIST DD SPAYD 22-29 - Wellbore #1 - Wellbore #1	15,300.00	7,177.74	2,249.01	2,085.60	13.763	SF
EXIST DD SPAYD 23-29 - Wellbore #1 - Wellbore #1	13,711.49	7,447.39	1,030.25	895.15	7.626	CC, ES
EXIST DD SPAYD 23-29 - Wellbore #1 - Wellbore #1	13,900.00	7,446.22	1,047.35	908.68	7.553	SF
EXIST DD SPAYD 30-29 - Wellbore #1 - Wellbore #1	17,458.28	7,594.49	3,689.40	3,463.22	16.312	CC, ES, SF
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	13,644.34	7,669.74	3,662.95	3,507.17	23.514	CC
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	13,700.00	7,669.17	3,663.37	3,506.54	23.358	ES
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	15,300.00	7,653.06	4,019.68	3,832.45	21.470	SF
EXIST DD SPAYD 36-29 - Wellbore #1 - Wellbore #1	12,355.69	7,609.89	1,251.48	1,130.40	10.336	CC
EXIST DD SPAYD 36-29 - Wellbore #1 - Wellbore #1	12,400.00	7,609.12	1,252.26	1,130.35	10.272	ES
EXIST DD SPAYD 36-29 - Wellbore #1 - Wellbore #1	12,600.00	7,605.71	1,275.09	1,149.42	10.146	SF
EXIST DD SPAYD 37-29 - Wellbore #1 - Wellbore #1	12,397.75	7,356.93	55.52	-62.91	0.469	Level 1, CC, ES, SF
EXIST VERT BOHLENDER 29-13 - Wellbore #1 - Design	15,484.41	7,184.00	302.72	135.97	1.815	CC, ES
EXIST VERT BOHLENDER 29-13 - Wellbore #1 - Design	15,500.00	7,184.00	303.12	136.08	1.815	SF
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,399.71	7,181.00	913.40	748.27	5.532	CC
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,400.00	7,181.00	913.40	748.27	5.531	ES
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,500.00	7,181.00	918.89	751.85	5.501	SF
EXIST VERT BOHLENDER 32-29 #1 - Wellbore #1 - Des	15,658.66	7,184.00	526.09	356.03	3.094	CC, ES
EXIST VERT BOHLENDER 32-29 #1 - Wellbore #1 - Des	15,700.00	7,184.00	527.71	356.86	3.089	SF
EXIST VERT CLYDE MARSHALL 1 - Wellbore #1 - Desi	1,700.00	1,700.00	1,404.31	1,396.94	190.658	CC, ES
EXIST VERT CLYDE MARSHALL 1 - Wellbore #1 - Desi	13,800.00	4,765.00	5,795.03	5,706.37	65.365	SF
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	16,843.00	7,184.00	731.88	539.21	3.799	CC, ES
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	16,900.00	7,184.00	734.10	540.34	3.789	SF
EXIST VERT CPC BOHLENDER 29-2 - Wellbore #1 - De	17,128.04	7,184.00	455.50	257.38	2.299	CC, ES, SF
EXIST VERT HAMBERT G 32-4X - Wellbore #1 - Design	11,477.64	7,184.01	2,922.48	2,831.45	32.102	CC
EXIST VERT HAMBERT G 32-4X - Wellbore #1 - Design	11,500.00	7,184.01	2,922.57	2,831.12	31.957	ES
EXIST VERT HAMBERT G 32-4X - Wellbore #1 - Design	13,300.00	7,184.01	3,444.07	3,318.83	27.499	SF
EXIST VERT HAMBERT R G 32-1 - Wellbore #1 - Desig	11,704.95	7,184.01	729.33	634.07	7.656	CC, ES
EXIST VERT HAMBERT R G 32-1 - Wellbore #1 - Desig	11,800.00	7,184.01	735.50	638.47	7.580	SF
EXIST VERT HAMBERT R G 32-2 - Wellbore #1 - Desig	11,528.06	7,184.01	317.44	225.46	3.451	CC, ES, SF
EXIST VERT HAMBERT R G 32-3 - Wellbore #1 - Desig	11,602.52	7,184.01	1,731.90	1,638.54	18.551	CC, ES
EXIST VERT HAMBERT R G 32-3 - Wellbore #1 - Desig	12,200.00	7,184.01	1,832.06	1,727.54	17.529	SF
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	10,277.02	7,184.01	1,904.25	1,835.16	27.562	CC
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	10,300.00	7,184.01	1,904.39	1,834.89	27.401	ES
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	11,300.00	7,184.01	2,161.62	2,073.88	24.635	SF
EXIST VERT HAMBERT R G 32-7 - Wellbore #1 - Desig	10,249.85	7,184.01	456.05	387.44	6.647	CC, ES
EXIST VERT HAMBERT R G 32-7 - Wellbore #1 - Desig	10,300.00	7,184.01	458.80	389.30	6.601	SF
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	10,558.24	7,184.01	901.55	827.40	12.158	CC, ES
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	10,800.00	7,184.01	933.40	854.85	11.883	SF
EXIST VERT HSR-CARTER 11-29 - Wellbore #1 - Desig	14,101.51	7,184.01	1,661.12	1,520.69	11.829	CC, ES
EXIST VERT HSR-CARTER 11-29 - Wellbore #1 - Desig	14,500.00	7,184.01	1,708.25	1,560.25	11.542	SF
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	15,415.05	7,184.00	3,024.89	2,859.47	18.286	CC
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	15,500.00	7,184.00	3,026.08	2,859.04	18.116	ES
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	16,500.00	7,184.00	3,213.56	3,027.44	17.266	SF
EXIST VERT HSR-DICERSON 14-29A - Wellbore #1 - D	12,977.08	7,184.01	2,014.15	1,895.01	16.906	CC
EXIST VERT HSR-DICERSON 14-29A - Wellbore #1 - D	13,000.00	7,184.01	2,014.28	1,894.71	16.846	ES
EXIST VERT HSR-DICERSON 14-29A - Wellbore #1 - D	13,600.00	7,184.01	2,108.27	1,977.35	16.103	SF
EXIST VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	13,007.02	7,184.01	709.25	589.54	5.925	CC, 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 12N
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 12N	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 VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	13,100.00	7,184.01	715.32	593.86	5.889	SF
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	14,143.11	7,184.01	3,014.18	2,872.96	21.344	CC
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	14,200.00	7,184.01	3,014.71	2,872.41	21.185	ES
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	15,400.00	7,184.00	3,265.72	3,100.59	19.776	SF
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	9,046.24	7,184.00	948.89	900.62	19.657	CC, ES
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	9,400.00	7,184.00	1,012.69	958.78	18.784	SF
EXIST VERT HSR-MUNDS 13-29 - Wellbore #1 - Design	13,167.77	7,184.01	3,110.27	2,987.53	25.340	CC
EXIST VERT HSR-MUNDS 13-29 - Wellbore #1 - Design	13,200.00	7,184.01	3,110.44	2,987.09	25.216	ES
EXIST VERT HSR-MUNDS 13-29 - Wellbore #1 - Design	14,700.00	7,184.01	3,467.17	3,315.37	22.840	SF
EXIST VERT HSR-NICHOLS 15-32 - Wellbore #1 - Desig	8,046.18	7,184.00	160.36	123.82	4.388	CC, ES, SF
EXIST VERT HSR-RAY 3-29 - Wellbore #1 - Design #1	16,882.47	7,184.00	1,965.17	1,771.75	10.160	CC
EXIST VERT HSR-RAY 3-29 - Wellbore #1 - Design #1	16,900.00	7,184.00	1,965.25	1,771.49	10.143	ES
EXIST VERT HSR-RAY 3-29 - Wellbore #1 - Design #1	17,300.00	7,184.00	2,009.03	1,807.63	9.975	SF
EXIST VERT HSR-SALISBURY 6-29 - Wellbore #1 - Des	15,701.42	7,184.00	1,990.65	1,819.78	11.650	CC, ES
EXIST VERT HSR-SALISBURY 6-29 - Wellbore #1 - Des	16,100.00	7,184.00	2,030.16	1,851.68	11.375	SF
EXIST VERT HSR-TEAGLE 10-29A - Wellbore #1 - Desi	14,435.06	7,184.01	554.70	407.93	3.779	CC, ES
EXIST VERT HSR-TEAGLE 10-29A - Wellbore #1 - Desi	14,500.00	7,184.01	558.49	410.49	3.774	SF
EXIST VERT HSR-WILLIAM 10-32A - Wellbore #1 - Des	9,021.74	7,184.00	450.73	402.83	9.411	CC, ES
EXIST VERT HSR-WILLIAM 10-32A - Wellbore #1 - Des	9,100.00	7,184.00	457.47	408.38	9.318	SF
EXIST VERT HSR-WRIGHT 9-29A - Wellbore #1 - Desig	14,361.79	7,184.01	630.26	484.89	4.335	CC, ES
EXIST VERT HSR-WRIGHT 9-29A - Wellbore #1 - Desig	14,400.00	7,184.01	631.42	485.32	4.322	SF
EXIST VERT MARSHALL 32-11G - Wellbore #1 - Design	1,700.00	1,700.00	1,607.36	1,600.00	218.226	CC, ES
EXIST VERT MARSHALL 32-11G - Wellbore #1 - Design	10,400.00	7,184.01	2,179.43	2,108.13	30.569	SF
EXIST VERT MARSHALL 32-12G - Wellbore #1 - Design	1,700.00	1,700.00	2,259.48	2,252.11	306.762	CC, ES
EXIST VERT MARSHALL 32-12G - Wellbore #1 - Design	12,900.00	7,184.01	5,019.55	4,901.87	42.652	SF
EXIST VERT MARSHALL 32-14G - Wellbore #1 - Design	1,700.00	1,700.00	1,118.37	1,111.01	151.838	CC, ES
EXIST VERT MARSHALL 32-14G - Wellbore #1 - Design	11,700.00	7,184.01	4,571.69	4,476.52	48.036	SF
EXIST VERT MARSHALL G 32-13JI - Wellbore #1 - Des	1,700.00	1,700.00	2,395.74	2,388.38	325.262	CC, ES
EXIST VERT MARSHALL G 32-13JI - Wellbore #1 - Des	17,100.00	7,184.00	9,930.43	9,732.86	50.261	SF
EXIST VERT MEL SMOOKLER GAS UNIT 1 - Wellbore	1,700.00	1,700.00	1,929.44	1,922.08	261.954	CC, ES
EXIST VERT MEL SMOOKLER GAS UNIT 1 - Wellbore	13,100.00	7,184.01	5,537.21	5,415.75	45.588	SF
EXIST VERT MUSICK 1-32 - Wellbore #1 - Design #1	10,687.50	7,184.01	2,365.40	2,288.90	30.921	CC
EXIST VERT MUSICK 1-32 - Wellbore #1 - Design #1	10,700.00	7,184.01	2,365.43	2,288.71	30.830	ES
EXIST VERT MUSICK 1-32 - Wellbore #1 - Design #1	12,100.00	7,184.01	2,755.02	2,652.37	26.840	SF
EXIST VERT MUSICK GAS UNIT 1 - Wellbore #1 - Desi	10,707.00	7,184.01	258.59	181.74	3.365	CC, ES, SF
EXIST VERT MUSICK MCCLINTOCK 2 - Wellbore #1 - D	1,700.00	1,700.00	2,641.45	2,634.08	358.620	CC, ES
EXIST VERT MUSICK MCCLINTOCK 2 - Wellbore #1 - D	12,900.00	4,755.00	3,858.00	3,785.36	53.116	SF
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	10,240.29	4,750.00	2,555.04	2,518.35	69.646	CC, ES
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	11,800.00	4,750.00	2,993.49	2,943.24	59.579	SF
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	1,700.00	1,700.00	3,299.18	3,291.82	447.919	CC, ES
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	14,700.00	4,750.00	5,659.87	5,542.70	48.303	SF
EXIST VERT MUSICK MCCLINTOCK 7 - Wellbore #1 - D	10,261.01	4,739.00	2,465.83	2,435.29	80.730	CC, ES
EXIST VERT MUSICK MCCLINTOCK 7 - Wellbore #1 - D	11,800.00	4,739.00	2,906.68	2,864.72	69.270	SF
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	11,655.18	4,803.00	2,415.61	2,374.05	58.128	CC, ES
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	12,700.00	4,803.00	2,631.88	2,582.22	53.002	SF
EXIST VERT MUSICK-MCCLINTOCK 5 - Wellbore #1 - D	11,716.53	4,752.00	3,099.14	3,037.10	49.954	CC, ES
EXIST VERT MUSICK-MCCLINTOCK 5 - Wellbore #1 - D	13,700.00	4,752.00	3,679.49	3,591.66	41.895	SF
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,546.28	7,184.00	1,171.56	984.56	6.265	CC, ES
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,700.00	7,184.00	1,181.60	991.67	6.221	SF
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	10,314.63	7,184.01	3,198.93	3,129.17	45.854	CC
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	10,400.00	7,184.01	3,200.07	3,128.78	44.885	ES
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	13,100.00	7,184.01	4,241.55	4,120.09	34.921	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 12N
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 12N	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 SPAYD 5-29 - Wellbore #1 - Design #1	15,790.96	7,184.00	3,286.80	3,114.21	19.044	CC
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	15,900.00	7,184.00	3,288.60	3,113.94	18.828	ES
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	17,000.00	7,184.00	3,502.09	3,306.43	17.898	SF
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	14,262.44	4,730.00	3,059.97	2,967.04	32.928	CC
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	14,300.00	4,730.00	3,060.20	2,966.80	32.762	ES
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	15,600.00	4,730.00	3,339.52	3,229.48	30.349	SF
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	12,966.41	7,184.01	856.99	738.05	7.205	CC, ES
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	13,100.00	7,184.01	867.34	745.87	7.141	SF
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	16,251.07	4,660.00	3,569.02	3,436.35	26.902	CC
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	16,300.00	4,660.00	3,569.36	3,435.98	26.761	ES
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	17,458.28	4,660.00	3,767.65	3,617.51	25.095	SF
EXIST VERT UPRR PAN AM "J"1 - Wellbore #1 - Design	13,066.65	7,184.01	641.01	520.18	5.305	CC, ES
EXIST VERT UPRR PAN AM "J"1 - Wellbore #1 - Design	13,100.00	7,184.01	641.88	520.41	5.285	SF
EXIST VERT VERN MARSHALL 1 - Wellbore #1 - Desig	1,700.00	1,700.00	2,481.49	2,474.13	336.904	CC, ES
EXIST VERT VERN MARSHALL 1 - Wellbore #1 - Desig	16,600.00	4,785.00	8,450.16	8,300.46	56.448	SF
EXIST VERT WEINMASTER G 32-18 - Wellbore #1 - De	10,940.34	7,184.01	986.51	905.39	12.161	CC, ES
EXIST VERT WEINMASTER G 32-18 - Wellbore #1 - De	11,200.00	7,184.01	1,020.11	934.22	11.876	SF
HARVEY 10N - ORIGINAL WELLBORE - PROPOSAL #	1,700.00	1,700.00	30.02	22.65	4.076	CC, ES
HARVEY 10N - ORIGINAL WELLBORE - PROPOSAL #	17,458.28	17,389.30	616.86	240.83	1.640	SF
HARVEY 11N - ORIGINAL WELLBORE - PROPOSAL #4	1,700.00	1,700.00	15.01	7.64	2.038	CC
HARVEY 11N - ORIGINAL WELLBORE - PROPOSAL #4	17,458.28	17,361.01	284.54	-74.13	0.793	Level 1, ES, SF
HARVEY 13N - ORIGINAL WELLBORE - PROPOSAL #	1,000.00	1,000.00	74.98	70.76	17.772	CC
HARVEY 13N - ORIGINAL WELLBORE - PROPOSAL #	17,458.28	17,410.79	346.60	-23.13	0.937	Level 1, ES, SF
HARVEY 14N - ORIGINAL WELLBORE - PROPOSAL #	900.00	900.00	89.98	86.21	23.873	CC, ES
HARVEY 14N - ORIGINAL WELLBORE - PROPOSAL #	17,458.28	17,590.07	649.89	272.28	1.721	SF
HARVEY 15N - ORIGINAL WELLBORE - PROPOSAL #	800.00	800.00	104.96	101.64	31.615	CC, ES
HARVEY 15N - ORIGINAL WELLBORE - PROPOSAL #	17,458.28	17,644.07	1,023.76	645.14	2.704	SF
HARVEY 16N - ORIGINAL WELLBORE - PROPOSAL #	700.00	700.00	119.97	117.10	41.796	CC, ES
HARVEY 16N - ORIGINAL WELLBORE - PROPOSAL #	17,458.28	17,858.54	1,369.72	987.72	3.586	SF
HARVEY 1N - ORGINAL WELLBORE - PROPOSAL #6	300.00	300.00	179.93	178.86	167.824	CC, ES
HARVEY 1N - ORGINAL WELLBORE - PROPOSAL #6	17,458.28	17,504.15	3,568.09	3,200.14	9.697	SF
HARVEY 2N - ORIGINAL WELLBORE - PROPOSAL #5	400.00	400.00	164.96	163.44	108.406	CC, ES
HARVEY 2N - ORIGINAL WELLBORE - PROPOSAL #5	17,458.28	17,835.26	3,268.44	2,893.13	8.709	SF
HARVEY 3N - ORIGINAL WELLBORE - PROPOSAL #5	500.00	500.00	149.95	147.98	76.069	CC, ES
HARVEY 3N - ORIGINAL WELLBORE - PROPOSAL #5	17,458.28	17,603.66	2,874.30	2,497.39	7.626	SF
HARVEY 4N - ORIGINAL WELLBORE - PROPOSAL #5	600.00	600.00	134.94	132.52	55.743	CC, ES
HARVEY 4N - ORIGINAL WELLBORE - PROPOSAL #5	17,458.28	17,589.00	2,583.59	2,210.07	6.917	SF
HARVEY 5N - ORIGINAL WELLBORE - PROPOSAL #4	1,100.00	1,100.00	59.96	55.30	12.845	CC, ES
HARVEY 5N - ORIGINAL WELLBORE - PROPOSAL #4	17,458.28	17,431.85	2,280.37	1,904.87	6.073	SF
HARVEY 6N - ORIGINAL WELLBORE - PROPOSAL #4	1,200.00	1,200.00	44.99	39.87	8.791	CC, ES
HARVEY 6N - ORIGINAL WELLBORE - PROPOSAL #4	17,458.28	17,432.88	1,938.66	1,562.62	5.155	SF
HARVEY 7N - ORIGINAL WELLBORE - PROPOSAL #4	1,300.00	1,300.00	29.98	24.41	5.385	CC, ES
HARVEY 7N - ORIGINAL WELLBORE - PROPOSAL #4	17,458.28	17,273.90	1,521.41	1,146.77	4.061	SF
HARVEY 8N - ORIGINAL WELLBORE - PROPOSAL #4	1,400.00	1,400.00	14.97	8.96	2.488	CC, ES, SF
HARVEY 9N - ORIGINAL WELLBORE - PROPOSAL #4	1,700.00	1,700.00	44.99	37.63	6.108	CC, ES
HARVEY 9N - ORIGINAL WELLBORE - PROPOSAL #4	17,458.28	17,290.37	919.23	546.81	2.468	SF

Anticollision Report



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well HARVEY 12N
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 12N	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 SW SEC. 33 T4N R65W 6th P.M. (CRAWFORD)						
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	8,324.87	7,258.31	1,416.37	1,374.65	33.945	CC, ES
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	9,100.00	7,262.15	1,614.60	1,562.59	31.046	SF
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,653.03	7,230.59	1,448.02	1,315.86	10.957	CC
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,700.00	7,230.25	1,448.78	1,315.73	10.889	ES
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	14,000.00	7,228.05	1,489.00	1,350.27	10.733	SF
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	6,850.00	6,632.27	923.21	882.99	22.951	SF
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	7,497.71	7,101.03	824.84	789.68	23.461	CC, ES

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
Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis 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	-42.56	2,466.62	-2,264.97	3,348.77				
100.00	100.00	100.00	100.00	0.09	0.09	-42.56	2,466.62	-2,264.97	3,348.77	3,348.60	0.17	N/A	
200.00	200.00	200.00	200.00	0.31	0.31	-42.56	2,466.62	-2,264.97	3,348.77	3,348.15	0.62	5,378.674	
300.00	300.00	300.00	300.00	0.54	0.54	-42.56	2,466.62	-2,264.97	3,348.77	3,347.70	1.07	3,123.465	
400.00	400.00	400.00	400.00	0.76	0.76	-42.56	2,466.62	-2,264.97	3,348.77	3,347.25	1.52	2,200.728	
500.00	500.00	500.00	500.00	0.99	0.99	-42.56	2,466.62	-2,264.97	3,348.77	3,346.80	1.97	1,698.852	
600.00	600.00	600.00	600.00	1.21	1.21	-42.56	2,466.62	-2,264.97	3,348.77	3,346.35	2.42	1,383.373	
700.00	700.00	700.00	700.00	1.44	1.44	-42.56	2,466.62	-2,264.97	3,348.77	3,345.90	2.87	1,166.713	
800.00	800.00	800.00	800.00	1.66	1.66	-42.56	2,466.62	-2,264.97	3,348.77	3,345.45	3.32	1,008.729	
900.00	900.00	900.00	900.00	1.88	1.88	-42.56	2,466.62	-2,264.97	3,348.77	3,345.00	3.77	888.428	
1,000.00	1,000.00	1,000.00	1,000.00	2.11	2.11	-42.56	2,466.62	-2,264.97	3,348.77	3,344.55	4.22	793.763	
1,100.00	1,100.00	1,100.00	1,100.00	2.33	2.33	-42.56	2,466.62	-2,264.97	3,348.77	3,344.11	4.67	717.329	
1,200.00	1,200.00	1,200.00	1,200.00	2.56	2.56	-42.56	2,466.62	-2,264.97	3,348.77	3,343.66	5.12	654.323	
1,300.00	1,300.00	1,300.00	1,300.00	2.78	2.78	-42.56	2,466.62	-2,264.97	3,348.77	3,343.21	5.57	601.491	
1,400.00	1,400.00	1,400.00	1,400.00	3.01	3.01	-42.56	2,466.62	-2,264.97	3,348.77	3,342.76	6.02	556.553	
1,500.00	1,500.00	1,500.00	1,500.00	3.23	3.23	-42.56	2,466.62	-2,264.97	3,348.77	3,342.31	6.47	517.863	
1,600.00	1,600.00	1,600.00	1,600.00	3.46	3.46	-42.56	2,466.62	-2,264.97	3,348.77	3,341.86	6.92	484.203	
1,700.00	1,700.00	1,700.00	1,700.00	3.68	3.68	-42.56	2,466.62	-2,264.97	3,348.77	3,341.41	7.37	454.652	
1,800.00	1,799.98	1,799.98	1,799.98	3.89	3.91	-162.56	2,466.62	-2,264.97	3,350.44	3,342.65	7.79	430.048	
1,900.00	1,899.84	1,899.84	1,899.84	4.08	4.13	-162.56	2,466.62	-2,264.97	3,355.43	3,347.24	8.19	409.635	
2,000.00	1,999.45	1,999.45	1,999.45	4.28	4.36	-162.55	2,466.62	-2,264.97	3,363.75	3,355.16	8.59	391.681	
2,100.00	2,098.70	2,098.70	2,098.70	4.49	4.58	-162.54	2,466.62	-2,264.97	3,375.38	3,366.40	8.98	375.861	
2,200.00	2,197.47	2,197.47	2,197.47	4.73	4.80	-162.53	2,466.62	-2,264.97	3,390.32	3,380.95	9.37	361.883	
2,300.00	2,295.62	2,295.62	2,295.62	5.01	5.02	-162.52	2,466.62	-2,264.97	3,408.55	3,398.80	9.75	349.490	
2,400.00	2,393.06	2,393.06	2,393.06	5.33	5.24	-162.50	2,466.62	-2,264.97	3,430.05	3,419.92	10.13	338.458	
2,500.00	2,489.64	2,489.64	2,489.64	5.69	5.46	-162.47	2,466.62	-2,264.97	3,454.81	3,444.30	10.51	328.588	
2,600.00	2,585.27	2,585.27	2,585.27	6.12	5.67	-162.44	2,466.62	-2,264.97	3,482.79	3,471.90	10.89	319.709	
2,650.00	2,632.68	2,632.68	2,632.68	6.36	5.78	-162.42	2,466.62	-2,264.97	3,497.99	3,486.91	11.08	315.595	
2,700.00	2,679.96	2,679.96	2,679.96	6.62	5.89	-162.50	2,466.62	-2,264.97	3,513.59	3,502.27	11.32	310.438	
2,800.00	2,774.51	2,774.51	2,774.51	7.15	6.10	-162.66	2,466.62	-2,264.97	3,544.80	3,533.00	11.79	300.552	
2,850.00	2,821.79	2,821.79	2,821.79	7.43	6.20	-162.74	2,466.62	-2,264.97	3,560.41	3,548.38	12.04	295.822	
2,900.00	2,869.07	2,869.07	2,869.07	7.68	6.31	-166.04	2,466.62	-2,264.97	3,576.12	3,563.86	12.26	291.794	
3,000.00	2,963.67	2,963.67	2,963.67	8.17	6.52	-172.62	2,466.62	-2,264.97	3,608.02	3,595.34	12.68	284.533	
3,038.86	3,000.43	3,000.43	3,000.43	8.36	6.61	-175.16	2,466.62	-2,264.97	3,620.59	3,607.74	12.84	281.885	
3,100.00	3,058.23	3,058.23	3,058.23	8.69	6.74	-175.19	2,466.62	-2,264.97	3,640.43	3,627.30	13.13	277.346	

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