

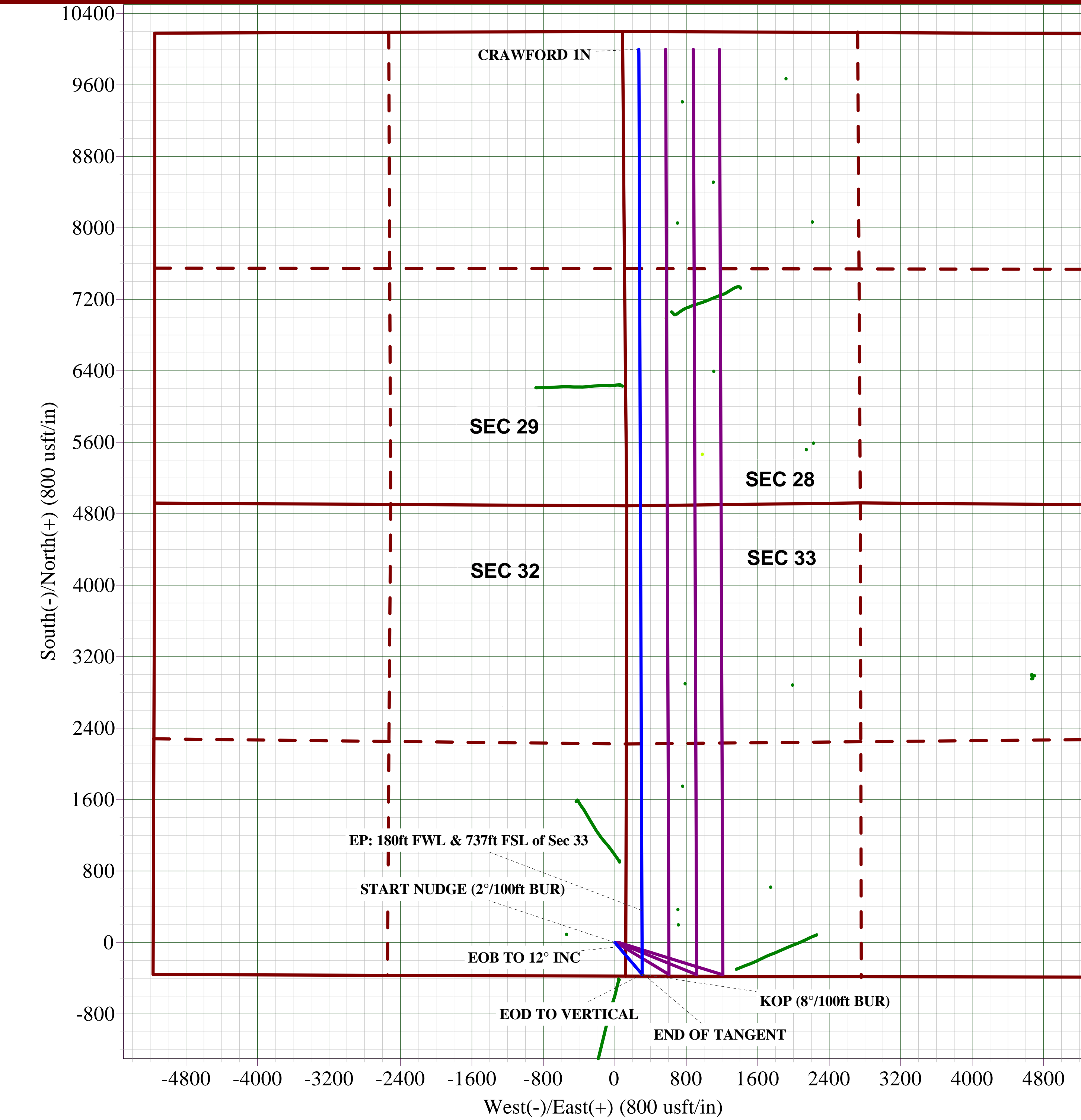
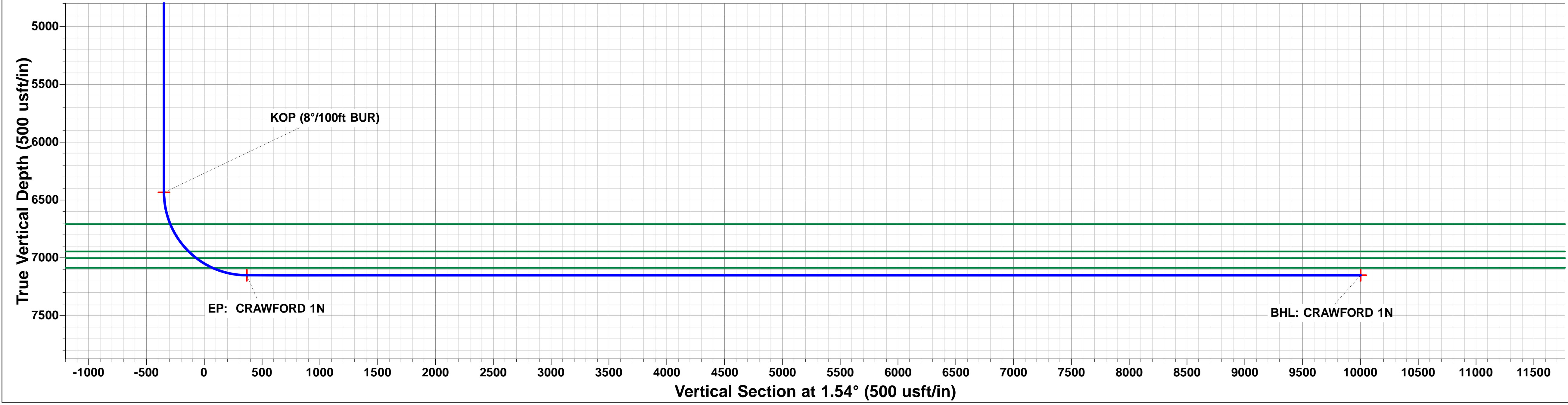
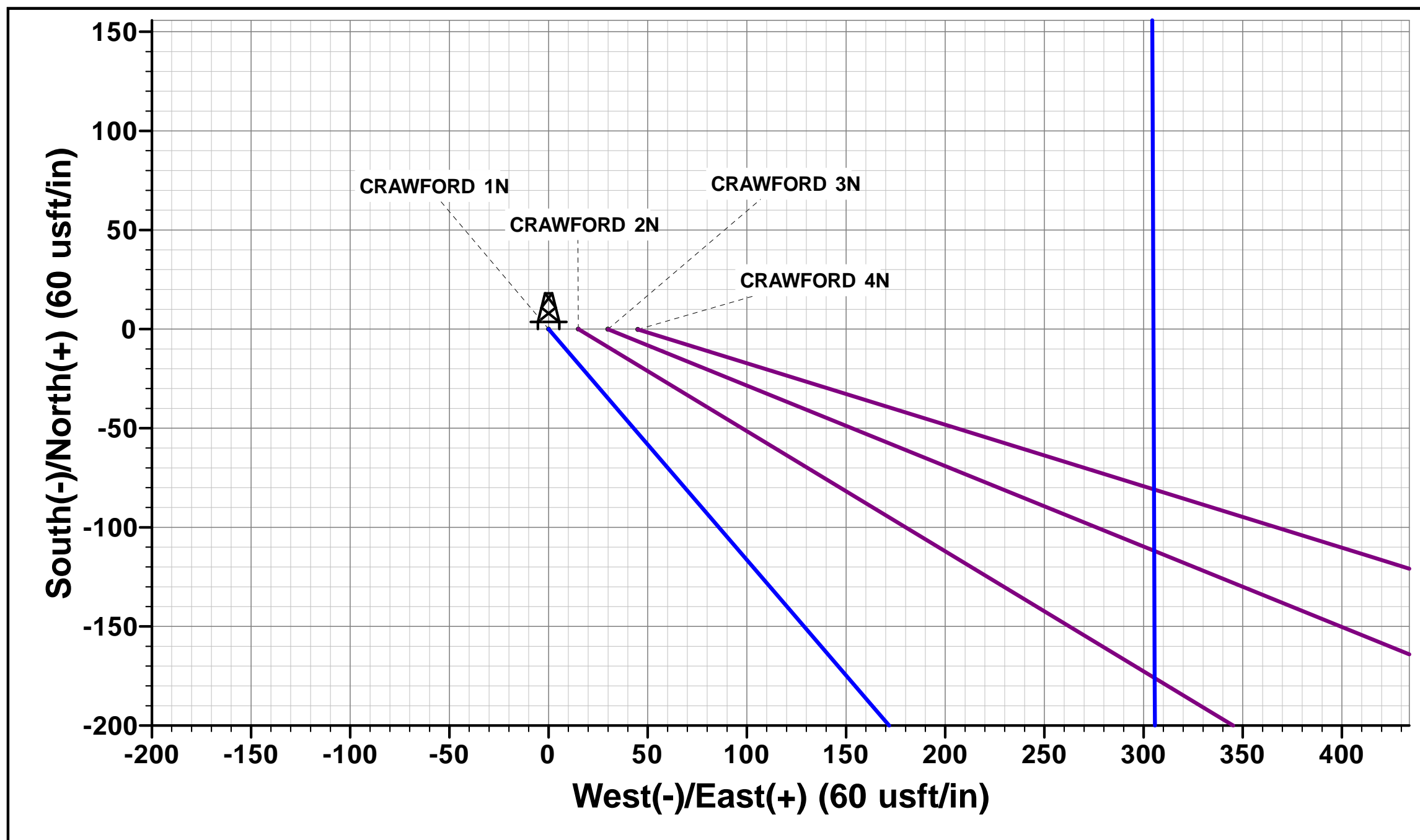
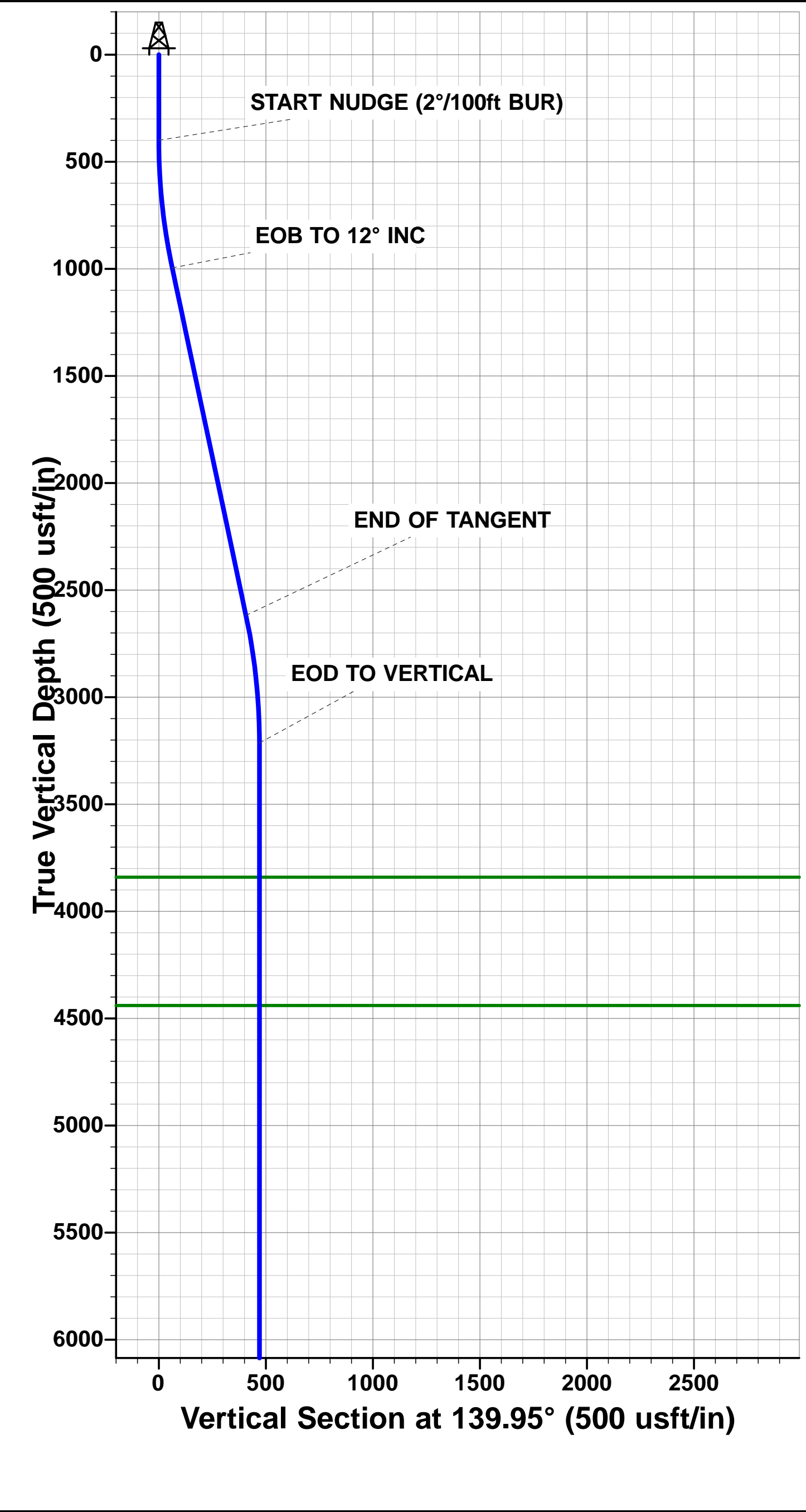


Project: WELD COUNTY, COLORADO  
Site: SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)  
Well: CRAWFORD 1N  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #1

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: 123ft FEL & 376ft FSL of Sec 32
400.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
995.64	1000.02	12.00	139.35	-47.50	40.79	-46.38	62.61	EOB TO 12° INC
2618.16	2658.79	12.00	139.35	-309.15	265.47	-301.91	407.49	END OF TANGENT
3213.80	3258.80	0.00	0.00	-356.65	306.26	-348.29	470.10	EOD TO VERTICAL
6434.80	6479.80	0.00	0.00	-356.65	306.26	-348.29	470.10	KOP (8°/100ft BUR)
7151.00	7604.81	90.00	359.79	359.54	303.64	367.57	1186.30	EP: 180ft FWL & 737ft FSL of Sec 33
7151.00	17244.02	90.00	359.79	9998.69	268.74	10002.30	10825.51	BHL: 180ft FWL & 200ft FNL of Sec 28

PROPOSED LOCAL COORDINATES:  
  
SHL: 123ft FEL & 376ft FSL of Sec 32  
  
EP: 180ft FWL & 737ft FSL of Sec 33  
  
BHL: 180ft FWL & 200ft FNL of Sec 28

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: CRAWFORD 1N	6434.80	-356.65	306.26	40.261703	-104.677052
EP: CRAWFORD 1N	7151.00	359.54	303.64	40.263669	-104.677061
BHL: CRAWFORD 1N	7151.00	9998.69	268.74	40.290128	-104.677186



# **PDC ENERGY**

**WELD COUNTY, COLORADO**

**SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)**

**CRAWFORD 1N**

**ORIGINAL WELLBORE**

**PROPOSAL #1**

## **Anticollision Report**

**06 December, 2017**



<b>Company:</b>	PDC ENERGY	<b>Local Co-ordinate Reference:</b>	Well CRAWFORD 1N
<b>Project:</b>	WELD COUNTY, COLORADO	<b>TVD Reference:</b>	WELL @ 4896.00usft (Original Well Elev)
<b>Reference Site:</b>	SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)	<b>MD Reference:</b>	WELL @ 4896.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	CRAWFORD 1N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PROPOSAL #1	<b>Offset TVD Reference:</b>	Offset Datum

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

<b>Survey Tool Program</b>	<b>Date</b>	05/12/2017		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	17,243.56	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						
SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)						
CRAWFORD 2N - ORIGINAL WELLBORE - PROPOSAL	300.00	300.00	14.99	13.91	13.979	CC
CRAWFORD 2N - ORIGINAL WELLBORE - PROPOSAL	17,244.02	17,173.04	314.64	-58.69	0.843	Level 1, ES, SF
CRAWFORD 3N - ORIGINAL WELLBORE - PROPOSAL	200.00	200.00	29.97	29.35	48.143	CC, ES
CRAWFORD 3N - ORIGINAL WELLBORE - PROPOSAL	17,244.02	17,296.77	610.16	224.90	1.584	SF
CRAWFORD 4N - ORIGINAL WELLBORE - PROPOSAL	100.00	100.00	44.99	44.82	259.947	CC, ES
CRAWFORD 4N - ORIGINAL WELLBORE - PROPOSAL	17,244.02	17,234.63	907.86	522.91	2.358	SF
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	8,161.45	7,250.15	253.13	209.85	5.848	CC, ES
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	8,200.00	7,250.35	256.05	212.20	5.839	SF
EXIST DD REI 26-5 - Wellbore #1 - Wellbore #1	5,872.22	6,217.88	268.63	219.89	5.511	CC
EXIST DD REI 26-5 - Wellbore #1 - Wellbore #1	5,900.00	6,244.47	268.71	219.86	5.500	ES
EXIST DD REI 26-5 - Wellbore #1 - Wellbore #1	6,500.00	6,846.01	271.75	221.36	5.393	SF
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,489.66	7,256.95	221.06	82.69	1.598	CC, ES
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,500.00	7,256.88	221.30	82.74	1.597	SF
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	400.00	395.00	548.17	546.65	361.578	CC, ES
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	7,500.00	7,138.34	859.56	826.70	26.162	SF
EXIST VERT KRAUSE 12-28 - Wellbore #1 - Design #1	14,234.54	7,146.00	295.06	142.80	1.938	CC, ES, SF
EXIST VERT KRAUSE 2-28 - WELL - Design #1	12,710.30	7,146.00	694.17	570.95	5.634	CC, ES
EXIST VERT KRAUSE 2-28 - WELL - Design #1	12,800.00	7,146.00	699.94	575.02	5.603	SF
EXIST VERT OGG 11-28 - Wellbore #1 - Design #1	16,656.50	7,146.00	485.06	286.49	2.443	CC, ES
EXIST VERT OGG 11-28 - Wellbore #1 - Design #1	16,700.00	7,146.00	487.00	287.60	2.442	SF
EXIST VERT OGG 5-28 - Wellbore #1 - Design #1	15,300.41	7,146.00	425.54	252.92	2.465	CC, ES, SF

## Anticollision Report



<b>Company:</b>	PDC ENERGY	<b>Local Co-ordinate Reference:</b>	Well CRAWFORD 1N
<b>Project:</b>	WELD COUNTY, COLORADO	<b>TVD Reference:</b>	WELL @ 4896.00usft (Original Well Elev)
<b>Reference Site:</b>	SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)	<b>MD Reference:</b>	WELL @ 4896.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	CRAWFORD 1N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PROPOSAL #1	<b>Offset TVD Reference:</b>	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. 33 T4N R65W 6th P.M. (LORY)						
ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 -	10,180.70	7,050.00	4,370.64	4,309.00	70.908	CC
ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 -	10,300.00	7,050.00	4,372.27	4,308.42	68.473	ES
ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 -	16,200.00	7,050.00	7,438.64	7,262.73	42.285	SF
ABDN VERT KRAUSE 1 - Wellbore #1 - Design #1	12,759.35	4,662.00	3,062.55	2,980.54	37.344	CC
ABDN VERT KRAUSE 1 - Wellbore #1 - Design #1	12,800.00	4,662.00	3,062.82	2,980.29	37.110	ES
ABDN VERT KRAUSE 1 - Wellbore #1 - Design #1	14,200.00	4,662.00	3,384.47	3,283.86	33.638	SF
EXIST DD ANDERSEN 35-33 - Wellbore #1 - Wellbore #	6,773.46	6,778.09	1,054.66	1,022.97	33.280	CC, ES
EXIST DD ANDERSEN 35-33 - Wellbore #1 - Wellbore #	6,850.00	6,820.00	1,055.60	1,023.80	33.200	SF
EXIST DD KRAUSE 22-28 - Wellbore #1 - Wellbore #1	14,582.28	7,111.65	1,117.10	958.61	7.048	CC
EXIST DD KRAUSE 22-28 - Wellbore #1 - Wellbore #1	14,600.00	7,111.33	1,117.24	958.41	7.034	ES
EXIST DD KRAUSE 22-28 - Wellbore #1 - Wellbore #1	14,700.00	7,109.60	1,123.29	962.56	6.989	SF
EXIST VERT BOHLENDER 33-5 - Wellbore #1 - Design	10,142.67	7,096.00	492.41	417.69	6.590	CC, ES
EXIST VERT BOHLENDER 33-5 - Wellbore #1 - Design	10,200.00	7,096.00	495.74	419.95	6.541	SF
EXIST VERT BOHLENDER 33-7 - Wellbore #1 - Design	10,123.79	7,096.00	1,695.07	1,620.70	22.791	CC, ES
EXIST VERT BOHLENDER 33-7 - Wellbore #1 - Design	10,800.00	7,096.00	1,824.97	1,737.99	20.981	SF
EXIST VERT HSR KRAUSE 14-28A - Wellbore #1 - Des	12,829.74	7,096.00	1,939.05	1,813.68	15.467	CC
EXIST VERT HSR KRAUSE 14-28A - Wellbore #1 - Des	12,900.00	7,096.00	1,940.32	1,813.62	15.314	ES
EXIST VERT HSR KRAUSE 14-28A - Wellbore #1 - Des	13,400.00	7,096.00	2,021.17	1,884.94	14.837	SF
EXIST VERT HSR MONTALI 14-33 - Wellbore #1 - Desig	7,862.33	7,096.00	1,441.42	1,405.26	39.869	CC, ES
EXIST VERT HSR MONTALI 14-33 - Wellbore #1 - Desig	8,900.00	7,096.00	1,776.07	1,723.83	33.996	SF
EXIST VERT HSR-HART 12-33 - Wellbore #1 - Design #	8,995.21	7,096.00	460.36	406.45	8.540	CC
EXIST VERT HSR-HART 12-33 - Wellbore #1 - Design #	9,000.00	7,096.00	460.38	406.39	8.527	ES
EXIST VERT HSR-HART 12-33 - Wellbore #1 - Design #	9,100.00	7,096.00	472.14	416.38	8.468	SF
EXIST VERT HSR-LEE 13-33 - Wellbore #1 - Design #1	7,614.70	7,096.00	402.34	368.64	11.941	CC, ES
EXIST VERT HSR-LEE 13-33 - Wellbore #1 - Design #1	7,700.00	7,096.00	411.28	376.76	11.914	SF
EXIST VERT KRAUSE 1-J - Wellbore #1 - Design #1	13,638.81	7,096.00	825.84	685.06	5.866	CC, ES
EXIST VERT KRAUSE 1-J - Wellbore #1 - Design #1	13,700.00	7,096.00	828.10	686.16	5.834	SF
EXIST VERT OGG 21-28 - Wellbore #1 - Design #1	16,911.06	7,096.00	1,646.52	1,443.19	8.098	CC, ES
EXIST VERT OGG 21-28 - Wellbore #1 - Design #1	17,200.00	7,096.00	1,671.68	1,462.82	8.004	SF
EXIST VERT OGG 22-28 - Wellbore #1 - Design #1	15,306.34	7,096.00	1,936.05	1,763.43	11.216	CC, ES
EXIST VERT OGG 22-28 - Wellbore #1 - Design #1	15,700.00	7,096.00	1,975.67	1,795.52	10.967	SF
EXIST VERT PEARSON 1 - Wellbore #1 - Design #1	15,755.44	7,096.00	827.80	646.59	4.568	CC, ES
EXIST VERT PEARSON 1 - Wellbore #1 - Design #1	15,800.00	7,096.00	828.99	646.94	4.553	SF
EXIST VERT UPRR 36 PAN AM C #1 - Wellbore #1 - De	2,199.72	2,114.12	669.90	657.62	54.515	CC
EXIST VERT UPRR 36 PAN AM C #1 - Wellbore #1 - De	2,300.00	2,212.21	670.23	657.26	51.690	ES
EXIST VERT UPRR 36 PAN AM C #1 - Wellbore #1 - De	4,800.00	4,700.00	688.30	664.67	29.130	SF

Offset Design													SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD) - CRAWFORD 2N - ORIGINAL WELLBORE - PRO	Offset Site Error:	0.00 usft
Survey Program:													0-MWD	Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	(usft)				
0.00	0.00	0.00	0.00	0.00	0.00	89.98	0.00	14.99	14.99						
100.00	100.00	100.00	100.00	0.09	0.09	89.98	0.00	14.99	14.99	14.81	0.17	86.595			
200.00	200.00	200.00	200.00	0.31	0.31	89.98	0.00	14.99	14.99	14.36	0.62	24.071			
300.00	300.00	300.00	300.00	0.54	0.54	89.98	0.00	14.99	14.99	13.91	1.07	13.979	CC		
400.00	400.00	399.51	399.49	0.76	0.74	93.10	-0.89	16.47	16.50	14.99	1.50	10.972			
500.00	499.98	498.88	498.72	0.96	0.95	-42.79	-3.57	20.89	19.92	18.01	1.91	10.442			
600.00	599.84	598.11	597.57	1.16	1.19	-42.58	-8.03	28.24	23.96	21.64	2.32	10.334			

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