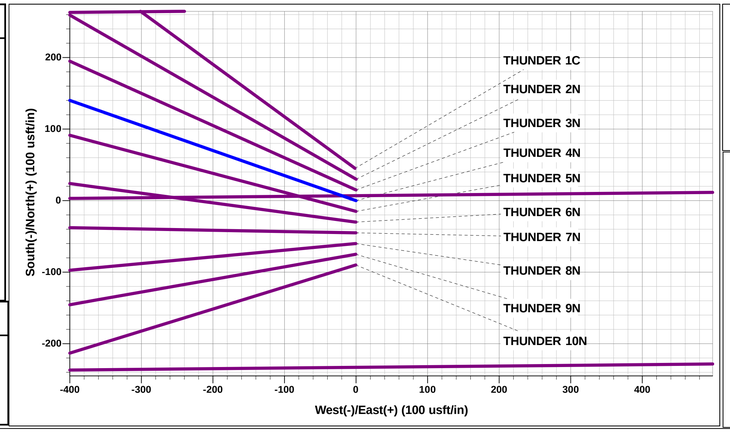
Project: WELD COUNTY, COLORADO (TRUE)
Site: SE NW SEC. 3 T5N R64W 6th P.M. (THUNDER)
Well: THUNDER 4N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #2

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 1712ft FNL & 1591ft FWL of Sec 3
600.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2.25°/100ft BUR)
1853.48	1910.58	29.49	289.30	109.02	-311.34	-280.74	329.87	EOB TO 29.49° INC
4480.70	4928.77	29.49	289.30	600.01	-1713.54	-1545.16	1815.55	END OF TANGENT
5890.86	6403.17	0.00	0.00	722.66	-2063.79	-1861.00	2186.66	EOD TO VERTICAL
5990.86	6503.17	0.00	0.00	722.66	-2063.79	-1861.00	2186.66	KOP (8°/100ft BUR)
6707.00	7636.92	90.70	89.47	729.37	-1338.87	-1151.48	2911.61	EP: 970ft FNL & 250ft FWL of Sec 3
6647.76	12508.32	90.69	89.46	774.83	3531.96	3615.95	7782.65	BHL: 970ft FNL & 150ft FEL of Sec 3

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - THUNDER 4N	5990.86	722.66	-2063.79	40.432808	-104.547461
EP - THUNDER 4N	6707.00	729.37	-1338.87	40.432826	-104.544857
BHL - THUNDER 4N (P2)	6647.76	774.83	3531.96	40.432950	-104.527360

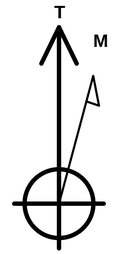


PROPOSED LOCAL COORDINATES:

SHL: 1712ft FNL & 1591ft FWL of Sec 3

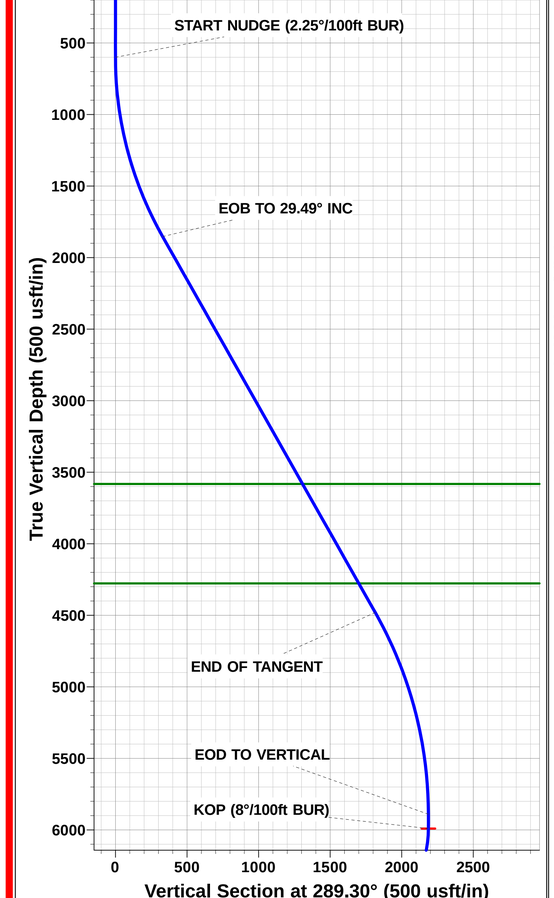
EP: 970ft FNL & 250ft FWL of Sec 3

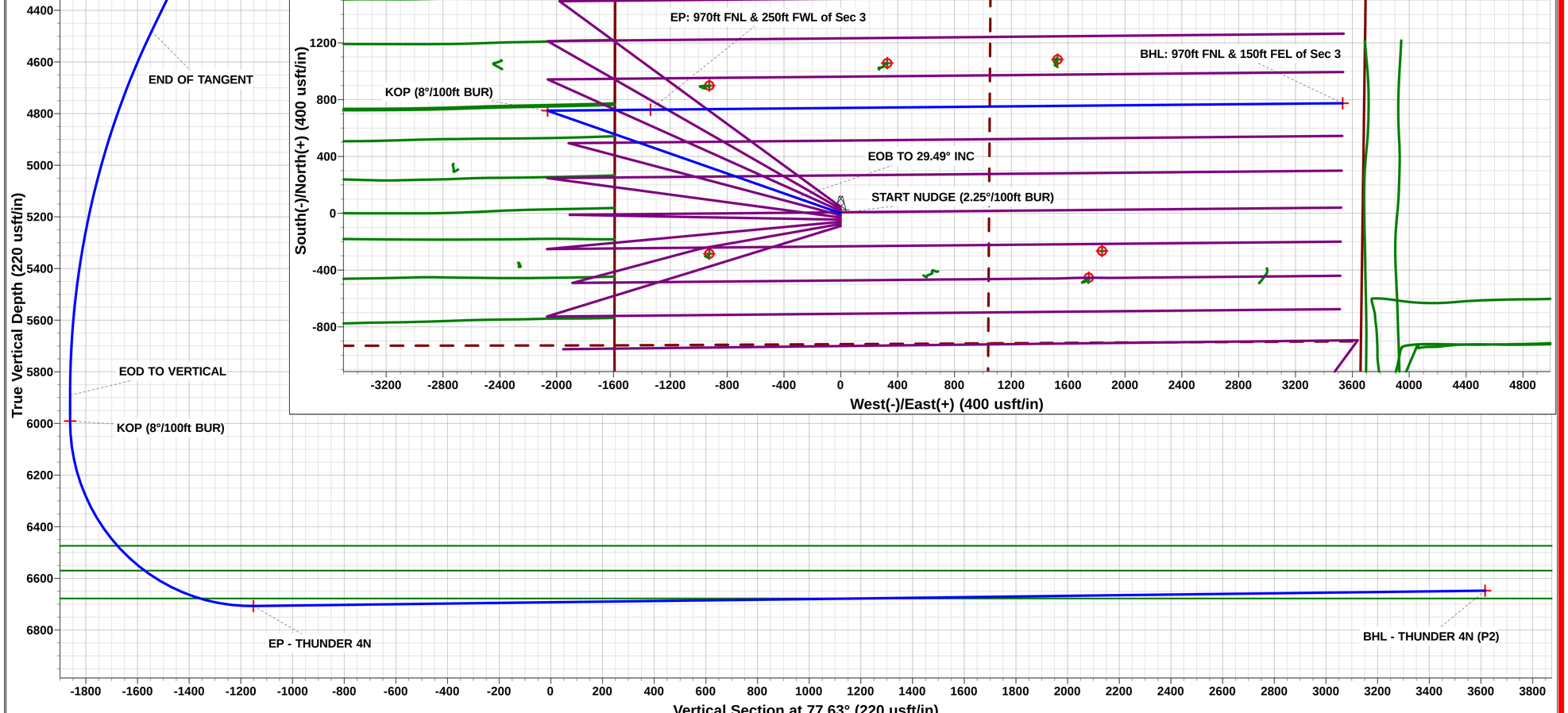
BHL: 970ft FNL & 150ft FEL of Sec 3



Azimuths to True North
Magnetic North: 7.99°

Magnetic Field
Strength: 52322.8snT
Dip Angle: 66.89°
Date: 04/06/2018
Model: IGRF2015





PDC ENERGY

WELD COUNTY, COLORADO (TRUE)
SE NW SEC. 3 T5N R64W 6th P.M. (THUNDER)
THUNDER 4N

ORIGINAL WELLBORE
PROPOSAL #2

Anticollision Report

04 July, 2018

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well THUNDER 4N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB-EST @ 4682.00usft
Reference Site:	SE NW SEC. 3 T5N R64W 6th P.M. (THUNDER)	**MD Reference:**	KB-EST @ 4682.00usft
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	THUNDER 4N	**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 #2	**Offset TVD Reference:**	Offset Datum

Reference	PROPOSAL #2		
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** 04/07/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	12,508.32	PROPOSAL #2 (ORIGINAL WELLBORE)	MWD	MWD - Standard

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
NW NE SEC. 5 T5N R64W 6th P.M.						
EXIST VERT FRENCH 41-4 - Wellbore #1 - Wellbore #1	6,386.47	5,814.41	481.61	452.03	16.280	CC
EXIST VERT FRENCH 41-4 - Wellbore #1 - Wellbore #1	6,403.17	5,831.60	481.65	437.65	10.947	ES
EXIST VERT FRENCH 41-4 - Wellbore #1 - Wellbore #1	6,503.17	5,933.70	481.78	437.70	10.929	SF
EXIST VERT FRENCH 5 - Wellbore #1 - Wellbore #1	6,512.05	5,947.01	767.22	727.91	19.516	CC, ES, SF
SNOWMASS 10N - ORIGINAL WELLBORE - ORIGINAL	7,395.44	15,405.00	1,466.67	1,198.84	5.476	CC, ES, SF
SNOWMASS 1C - ORIGINAL WELLBORE - ORIGINAL	7,438.01	14,808.00	814.25	557.17	3.167	CC, ES
SNOWMASS 1C - ORIGINAL WELLBORE - ORIGINAL	7,450.00	14,808.00	814.36	557.19	3.167	SF
SNOWMASS 2N - ORIGINAL WELLBORE - ORIGINAL	7,412.07	14,712.00	499.65	240.36	1.927	CC, ES, SF
SNOWMASS 3N - ORIGINAL WELLBORE - ORIGINAL	7,399.47	15,107.00	99.89	-35.87	0.736	Level 1, CC
SNOWMASS 3N - ORIGINAL WELLBORE - ORIGINAL	7,400.00	15,107.00	99.89	-35.89	0.736	Level 1, ES, SF
SNOWMASS 4N - ORIGINAL WELLBORE - ORIGINAL	7,409.08	15,107.00	92.38	-28.30	0.766	Level 1, CC, ES, SF
SNOWMASS 5N - ORIGINAL WELLBORE - ORIGINAL	7,384.27	15,255.00	186.35	-84.01	0.689	Level 1, CC, ES, SF
SNOWMASS 6N - ORIGINAL WELLBORE - ORIGINAL	7,400.00	15,131.00	466.76	201.51	1.760	ES, SF
SNOWMASS 6N - ORIGINAL WELLBORE - ORIGINAL	7,400.50	15,131.00	466.76	201.51	1.760	CC
SNOWMASS 7N - ORIGINAL WELLBORE - ORIGINAL	7,381.31	15,340.00	689.85	417.16	2.530	CC, ES, SF
SNOWMASS 8N - ORIGINAL WELLBORE - ORIGINAL	7,397.43	15,247.00	914.13	645.95	3.409	CC, ES, SF
SNOWMASS 9N - ORIGINAL WELLBORE - ORIGINAL	7,373.92	15,323.00	1,172.75	902.45	4.339	CC, ES, SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well THUNDER 4N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB-EST @ 4682.00usft
Reference Site:	SE NW SEC. 3 T5N R64W 6th P.M. (THUNDER)	**MD Reference:**	KB-EST @ 4682.00usft
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	THUNDER 4N	**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 #2	**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
SE NW SEC. 3 T5N R64W 6th P.M. (THUNDER)						
ABDN VERT FRENCH #1 - Wellbore #1 - Wellbore #1	5,384.83	4,827.25	1,092.12	1,046.66	24.027	CC
ABDN VERT FRENCH #1 - Wellbore #1 - Wellbore #1	5,400.00	4,840.99	1,092.13	1,046.58	23.973	ES
ABDN VERT FRENCH #1 - Wellbore #1 - Wellbore #1	6,550.00	5,966.65	1,118.04	1,069.47	23.016	SF
EXIST HZ LUCCI STATE #B03-69HNL - Wellbore #1 - W	7,900.00	16,997.18	897.78	554.49	2.615	SF
EXIST HZ LUCCI STATE #B03-69HNL - Wellbore #1 - W	8,100.00	16,811.25	893.13	552.66	2.623	ES
EXIST HZ LUCCI STATE #B03-69HNL - Wellbore #1 - W	8,257.50	16,666.00	891.78	553.12	2.633	CC
EXIST VERT CLEMONS #2-3 - Wellbore #1 - Wellbore #	10,502.71	6,643.34	275.16	172.39	2.677	CC, ES, SF
EXIST VERT GRANADOS #4-3 - Wellbore #1 - Wellbore	8,020.30	6,657.42	146.03	95.27	2.877	CC, ES, SF
EXIST VERT STOUT #3-3 - Wellbore #1 - Wellbore #1	9,249.81	6,640.74	269.85	196.96	3.702	CC, ES, SF
THUNDER 10N - ORIGINAL WELLBORE - PROPOSAL	300.00	300.00	89.99	88.91	83.932	CC, ES
THUNDER 10N - ORIGINAL WELLBORE - PROPOSAL	12,508.32	12,456.15	1,450.08	1,145.35	4.759	SF
THUNDER 1C - ORIGINAL WELLBORE - PROPOSAL #	300.00	300.00	45.17	44.10	42.133	CC, ES
THUNDER 1C - ORIGINAL WELLBORE - PROPOSAL #	12,200.00	12,319.26	791.06	512.88	2.844	SF
THUNDER 2N - ORIGINAL WELLBORE - PROPOSAL #	400.00	400.00	29.98	28.46	19.704	CC, ES
THUNDER 2N - ORIGINAL WELLBORE - PROPOSAL #	12,508.32	12,564.57	489.91	182.88	1.596	SF
THUNDER 3N - ORIGINAL WELLBORE - PROPOSAL #	500.00	500.00	14.97	13.00	7.596	CC
THUNDER 3N - ORIGINAL WELLBORE - PROPOSAL #	12,508.32	12,593.19	230.93	-61.61	0.789	Level 1, ES, SF
THUNDER 5N - ORIGINAL WELLBORE - PROPOSAL #	600.00	600.00	15.01	12.59	6.201	CC
THUNDER 5N - ORIGINAL WELLBORE - PROPOSAL #	12,508.32	12,339.97	238.87	-54.12	0.815	Level 1, ES, SF
THUNDER 6N - ORIGINAL WELLBORE - PROPOSAL #	600.00	600.00	29.98	27.56	12.386	CC, ES
THUNDER 6N - ORIGINAL WELLBORE - PROPOSAL #	12,508.32	12,476.90	475.07	167.61	1.545	SF
THUNDER 7N - ORIGINAL WELLBORE - PROPOSAL #	600.00	600.00	44.99	42.57	18.587	CC, ES
THUNDER 7N - ORIGINAL WELLBORE - PROPOSAL #	12,508.32	12,312.28	737.85	437.27	2.455	SF
THUNDER 8N - ORIGINAL WELLBORE - PROPOSAL #	500.00	500.00	60.00	58.03	30.440	CC
THUNDER 8N - ORIGINAL WELLBORE - PROPOSAL #	600.00	599.76	60.20	57.79	25.011	ES
THUNDER 8N - ORIGINAL WELLBORE - PROPOSAL #	12,508.32	12,443.17	975.04	669.02	3.186	SF
THUNDER 9N - ORIGINAL WELLBORE - PROPOSAL #	400.00	400.00	74.98	73.45	49.273	CC
THUNDER 9N - ORIGINAL WELLBORE - PROPOSAL #	500.00	499.50	75.31	73.35	38.494	ES
THUNDER 9N - ORIGINAL WELLBORE - PROPOSAL #	12,508.32	12,254.54	1,217.04	918.33	4.074	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well THUNDER 4N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB-EST @ 4682.00usft
Reference Site:	SE NW SEC. 3 T5N R64W 6th P.M. (THUNDER)	**MD Reference:**	KB-EST @ 4682.00usft
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	THUNDER 4N	**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 #2	**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 3 T5N R64W 6th P.M. (LIGHTNING)						
ABDN VERT ANNIE #B 3-09 - Wellbore #1 - Wellbore #1	12,033.53	6,600.00	2,561.04	2,418.16	17.925	CC
ABDN VERT ANNIE #B 3-09 - Wellbore #1 - Wellbore #1	12,100.00	6,600.00	2,561.90	2,417.25	17.711	ES
ABDN VERT ANNIE #B 3-09 - Wellbore #1 - Wellbore #1	12,508.32	6,600.00	2,604.68	2,449.07	16.738	SF
ABDN VERT BUCKLEN B #2-12 - Wellbore #1 - Wellbor	12,508.32	6,500.00	2,494.78	2,339.32	16.047	CC, ES, SF
ABDN VERT CLEMONS #32-3 - Wellbore #1 - Design #1	10,804.97	6,626.40	1,024.55	783.04	4.242	CC, ES
ABDN VERT CLEMONS #32-3 - Wellbore #1 - Design #1	10,900.00	6,625.25	1,028.94	785.02	4.218	SF
EXIST HZ JENKINS #B11-79-1HCM - Wellbore #1 - Wel	12,508.32	13,722.00	436.20	333.81	4.260	CC, ES, SF
EXIST HZ LEEROY #B11-79HNM - Wellbore #1 - Wellbo	12,508.32	13,655.61	205.26	104.39	2.035	CC, ES, SF
EXIST HZ LONEWOLF B02-65HC - ORIGINAL WELLBO	12,508.32	6,511.32	1,785.06	1,618.36	10.709	CC, ES, SF
EXIST HZ LONEWOLF B02-65HC - SIDETRACK - SIDE	12,508.32	6,511.32	1,785.05	1,618.35	10.708	CC, ES, SF
EXIST HZ WOLFPACK B02-62-1HN - Wellbore #1 - Wel	12,508.32	5,955.00	3,806.96	3,642.51	23.150	CC, ES, SF
EXIST HZ WOLFPACK B02-63-1HN - Wellbore #1 - Wel	12,508.32	6,448.00	3,368.22	3,201.32	20.182	CC, ES, SF
EXIST HZ WOLFPACK B02-64-1HN - Wellbore #1 - Wel	12,508.32	6,428.45	2,710.56	2,544.33	16.306	CC, ES, SF
EXIST HZ WOLFPACK B02-65-1HN - Wellbore #1 - Wel	12,508.32	6,298.00	2,110.15	1,945.85	12.843	CC, ES, SF
EXIST HZ WOLFPACK B02-65HN - Wellbore #1 - Wellb	12,508.32	6,359.06	1,862.33	1,697.72	11.314	CC, ES, SF
EXIST HZ WOLFPACK B02-66-1HN - Wellbore #1 - Wel	12,508.32	6,450.39	1,440.08	1,275.74	8.763	CC, ES, SF
EXIST VERT ANNIE #B 3-10 - Wellbore #1 - Design #1	600.00	545.00	2,064.61	2,053.02	178.162	CC
EXIST VERT ANNIE #B 3-10 - Wellbore #1 - Design #1	10,500.00	6,617.10	2,174.86	1,941.28	9.311	ES
EXIST VERT ANNIE #B 3-10 - Wellbore #1 - Design #1	11,000.00	6,611.03	2,241.48	1,995.23	9.102	SF
EXIST VERT ANNIE B #03-23 - Wellbore #1 - Wellbore #	11,103.10	6,650.00	2,906.96	2,788.59	24.557	CC
EXIST VERT ANNIE B #03-23 - Wellbore #1 - Wellbore #	11,200.00	6,650.00	2,908.58	2,787.68	24.057	ES
EXIST VERT ANNIE B #03-23 - Wellbore #1 - Wellbore #	12,508.32	6,599.42	3,228.28	3,072.65	20.742	SF
EXIST VERT BUCKLEN #1-2 - Wellbore #1 - Wellbore #	12,508.32	6,585.28	3,842.02	3,686.53	24.709	CC, ES, SF
EXIST VERT CLEMONS #32-3 - Wellbore #1 - Wellbore	10,703.73	6,621.45	1,243.92	1,135.81	11.506	CC, ES
EXIST VERT CLEMONS #32-3 - Wellbore #1 - Wellbore	11,100.00	6,620.26	1,305.51	1,187.18	11.033	SF
EXIST VERT CLEMONS #42-3 - Wellbore #1 - Wellbore	11,910.97	6,593.37	1,257.93	1,118.29	9.009	CC, ES
EXIST VERT CLEMONS #42-3 - Wellbore #1 - Wellbore	12,200.00	6,586.92	1,290.69	1,143.36	8.760	SF
EXIST VERT FLACK #5-3 - Wellbore #1 - Wellbore #1	2,800.87	2,566.20	580.82	562.63	31.924	CC, ES
EXIST VERT FLACK #5-3 - Wellbore #1 - Wellbore #1	8,400.00	6,641.19	1,105.21	1,049.13	19.708	SF
EXIST VERT MILLAGE #23-3 - Wellbore #1 - Design #1	600.00	545.00	1,454.02	1,442.43	125.472	CC
EXIST VERT MILLAGE #23-3 - Wellbore #1 - Design #1	700.00	644.97	1,454.97	1,441.15	105.250	ES
EXIST VERT MILLAGE #23-3 - Wellbore #1 - Design #1	9,800.00	6,625.62	2,258.46	2,041.98	10.432	SF
EXIST VERT MILLAGE PM B#3-14 - Wellbore #1 - Wellb	100.00	25.37	3,194.31	3,194.21	10,000.000	CC
EXIST VERT MILLAGE PM B#3-14 - Wellbore #1 - Wellb	605.38	542.74	3,195.65	3,194.02	1,953.285	ES
EXIST VERT MILLAGE PM B#3-14 - Wellbore #1 - Wellb	12,508.32	6,601.58	4,930.22	4,774.78	31.718	SF
EXIST VERT SCHOENLEBER #16-3 - Wellbore #1 - We	11,959.50	6,485.62	3,542.54	3,401.38	25.096	CC
EXIST VERT SCHOENLEBER #16-3 - Wellbore #1 - We	12,100.00	6,488.06	3,545.32	3,400.41	24.465	ES
EXIST VERT SCHOENLEBER #16-3 - Wellbore #1 - We	12,508.32	6,495.19	3,584.79	3,428.91	22.997	SF
EXIST VERT SITZMAN #3-1 - Wellbore #1 - Wellbore #1	606.53	538.00	3,328.67	3,327.09	2,115.996	CC, ES
EXIST VERT SITZMAN #3-1 - Wellbore #1 - Wellbore #1	12,508.32	6,613.04	4,119.81	3,964.56	26.538	SF
EXIST VERT STOUT #6-3 - Wellbore #1 - Wellbore #1	100.00	37.81	727.98	727.86	5,932.008	CC
EXIST VERT STOUT #6-3 - Wellbore #1 - Wellbore #1	300.00	237.21	728.05	727.27	927.765	ES
EXIST VERT STOUT #6-3 - Wellbore #1 - Wellbore #1	10,100.00	6,628.01	1,242.64	1,149.90	13.400	SF
LIGHTNING 10N - ORIGINAL WELLBORE - PROPOSA	431.97	382.97	3,770.56	3,769.00	2,424.384	CC
LIGHTNING 10N - ORIGINAL WELLBORE - PROPOSA	500.00	428.68	3,770.71	3,768.90	2,086.263	ES
LIGHTNING 10N - ORIGINAL WELLBORE - PROPOSA	6,850.00	12,159.52	4,011.02	3,818.39	20.822	SF
LIGHTNING 11N - ORIGINAL WELLBORE - PROPOSAL	331.97	282.97	3,783.10	3,781.99	3,421.358	CC
LIGHTNING 11N - ORIGINAL WELLBORE - PROPOSAL	400.00	326.69	3,783.26	3,781.91	2,795.393	ES
LIGHTNING 11N - ORIGINAL WELLBORE - PROPOSAL	12,508.32	6,706.74	4,200.43	4,015.51	22.715	SF
LIGHTNING 1N - ORIGINAL WELLBORE - PROPOSAL	6,950.00	12,592.26	1,715.26	1,524.00	8.968	SF
LIGHTNING 1N - ORIGINAL WELLBORE - PROPOSAL	12,258.32	7,364.75	1,670.37	1,489.94	9.257	CC
LIGHTNING 1N - ORIGINAL WELLBORE - PROPOSAL	12,400.00	7,256.10	1,672.42	1,488.31	9.084	ES

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well THUNDER 4N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB-EST @ 4682.00usft
Reference Site:	SE NW SEC. 3 T5N R64W 6th P.M. (THUNDER)	**MD Reference:**	KB-EST @ 4682.00usft
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	THUNDER 4N	**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 #2	**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 3 T5N R64W 6th P.M. (LIGHTNING)						
LIGHTNING 2N - ORIGINAL WELLBORE - PROPOSAL	6,900.00	12,482.45	1,935.35	1,743.12	10.068	SF
LIGHTNING 2N - ORIGINAL WELLBORE - PROPOSAL	12,115.92	7,385.63	1,898.56	1,722.47	10.782	CC
LIGHTNING 2N - ORIGINAL WELLBORE - PROPOSAL	12,300.00	7,229.57	1,900.29	1,719.56	10.515	ES
LIGHTNING 3N - ORIGINAL WELLBORE - PROPOSAL	6,850.00	12,504.58	2,200.62	2,007.63	11.403	SF
LIGHTNING 3N - ORIGINAL WELLBORE - PROPOSAL	12,270.76	7,217.53	2,126.61	1,946.66	11.818	CC
LIGHTNING 3N - ORIGINAL WELLBORE - PROPOSAL	12,400.00	7,122.38	2,128.11	1,944.71	11.604	ES
LIGHTNING 4N - ORIGINAL WELLBORE - PROPOSAL	6,850.00	12,370.24	2,425.10	2,232.36	12.583	SF
LIGHTNING 4N - ORIGINAL WELLBORE - PROPOSAL	12,179.94	7,194.24	2,355.62	2,178.58	13.305	CC
LIGHTNING 4N - ORIGINAL WELLBORE - PROPOSAL	12,400.00	7,030.47	2,358.95	2,176.18	12.907	ES
LIGHTNING 5N - ORIGINAL WELLBORE - PROPOSAL	6,800.00	12,384.40	2,680.74	2,487.59	13.879	SF
LIGHTNING 5N - ORIGINAL WELLBORE - PROPOSAL	12,286.02	7,071.51	2,588.66	2,408.74	14.388	CC
LIGHTNING 5N - ORIGINAL WELLBORE - PROPOSAL	12,400.00	6,991.74	2,589.74	2,406.74	14.151	ES
LIGHTNING 6N - ORIGINAL WELLBORE - PROPOSAL	6,800.00	12,281.94	2,910.64	2,717.09	15.038	SF
LIGHTNING 6N - ORIGINAL WELLBORE - PROPOSAL	12,186.94	7,085.01	2,836.17	2,659.40	16.044	CC
LIGHTNING 6N - ORIGINAL WELLBORE - PROPOSAL	12,400.00	6,930.64	2,838.98	2,656.61	15.567	ES
LIGHTNING 7N - ORIGINAL WELLBORE - PROPOSAL	6,800.00	12,288.37	3,146.75	2,953.01	16.242	SF
LIGHTNING 7N - ORIGINAL WELLBORE - PROPOSAL	12,244.87	7,022.23	3,082.52	2,904.16	17.283	CC
LIGHTNING 7N - ORIGINAL WELLBORE - PROPOSAL	12,400.00	6,910.81	3,084.06	2,901.51	16.894	ES
LIGHTNING 8N - ORIGINAL WELLBORE - PROPOSAL	6,850.00	12,220.69	3,583.75	3,389.99	18.496	SF
LIGHTNING 8N - ORIGINAL WELLBORE - PROPOSAL	7,200.00	11,989.95	3,562.42	3,375.85	19.095	ES
LIGHTNING 8N - ORIGINAL WELLBORE - PROPOSAL	11,417.48	7,798.14	3,551.62	3,388.67	21.795	CC
LIGHTNING 9N - ORIGINAL WELLBORE - PROPOSAL	600.00	551.00	3,758.05	3,755.74	1,626.443	CC
LIGHTNING 9N - ORIGINAL WELLBORE - PROPOSAL	6,850.00	12,147.17	3,790.25	3,596.04	19.516	SF
LIGHTNING 9N - ORIGINAL WELLBORE - PROPOSAL	12,400.00	6,819.39	3,767.74	3,585.31	20.653	ES

Offset Design NW NE SEC. 5 T5N R64W 6th P.M. - EXIST VERT FRENCH 41-4 - Wellbore #1 - Wellbore #1

Survey Program: 100-GYD_CT

Offset Site Error: 0.00 usft

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	-66.93	1,015.32	-2,383.93	2,591.83				
100.00	100.00	25.82	25.82	0.09	0.02	-66.93	1,015.33	-2,384.00	2,591.25	2,591.14	0.11	N/A	
200.00	200.00	100.00	99.99	0.31	0.09	-66.94	1,015.49	-2,385.01	2,592.51	2,592.11	0.39	6,589.238	
300.00	300.00	183.71	183.68	0.54	0.21	-66.94	1,015.94	-2,386.77	2,594.60	2,593.87	0.74	3,516.796	
400.00	400.00	261.64	261.59	0.76	0.29	-66.94	1,016.79	-2,388.53	2,597.13	2,596.10	1.04	2,502.087	
500.00	500.00	335.87	335.77	0.99	0.35	-66.93	1,018.25	-2,390.75	2,600.65	2,599.33	1.32	1,970.108	
600.00	600.00	413.14	412.96	1.21	0.41	-66.92	1,020.15	-2,393.72	2,605.14	2,603.54	1.60	1,631.441	
700.00	699.97	507.01	506.71	1.43	0.47	3.80	1,022.66	-2,397.75	2,608.18	2,606.30	1.88	1,385.274	
800.00	799.79	606.37	605.94	1.65	0.53	3.83	1,025.40	-2,402.12	2,607.43	2,605.28	2.15	1,211.417	
900.00	899.31	711.64	711.07	1.89	0.58	3.87	1,028.29	-2,406.64	2,602.67	2,600.23	2.44	1,067.833	
1,000.00	998.36	812.35	811.65	2.16	0.63	3.92	1,030.82	-2,410.91	2,593.86	2,591.13	2.73	950.070	
1,100.00	1,096.79	906.85	906.04	2.48	0.67	3.97	1,033.01	-2,415.10	2,581.25	2,578.22	3.03	852.476	
1,200.00	1,194.46	1,006.85	1,005.91	2.85	0.72	4.04	1,035.30	-2,419.61	2,564.82	2,561.49	3.34	768.575	
1,300.00	1,291.22	1,112.39	1,111.32	3.30	0.77	4.12	1,037.73	-2,424.16	2,544.39	2,540.72	3.66	694.935	
1,400.00	1,386.91	1,220.93	1,219.75	3.82	0.81	4.23	1,040.03	-2,428.42	2,519.71	2,515.71	4.00	629.844	
1,500.00	1,481.38	1,319.68	1,318.41	4.42	0.86	4.35	1,042.03	-2,432.10	2,491.05	2,486.71	4.35	573.047	
1,600.00	1,574.50	1,429.00	1,427.66	5.11	0.90	4.50	1,044.35	-2,435.71	2,458.34	2,453.63	4.71	521.681	
1,700.00	1,666.11	1,536.93	1,535.52	5.89	0.94	4.68	1,046.35	-2,438.54	2,421.27	2,416.17	5.10	475.193	
1,800.00	1,756.08	1,630.71	1,629.26	6.75	0.98	4.86	1,047.73	-2,440.85	2,380.34	2,374.85	5.49	433.930	

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