

PDC ENERGY

**WELD COUNTY, COLORADO
NW SW SEC. 17 T5N R64W 6th P.M.
CECIL'S KERSEY FARM 17K-404**

**ORIGINAL WELLBORE
PROPOSAL #2**

Anticollision Report

16 September, 2015



Anticollision Report



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well CECIL'S KERSEY FARM 17K-404
Project:	WELD COUNTY, COLORADO	TVD Reference:	KB-EST @ 4636.0usft (Original Well Elev)
Reference Site:	NW SW SEC. 17 T5N R64W 6th P.M.	MD Reference:	KB-EST @ 4636.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	CECIL'S KERSEY FARM 17K-404	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 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 98.4usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 us	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	16/09/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	13,080.1	PROPOSAL #2 (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
NW SW SEC. 17 T5N R64W 6th P.M.						
CECIL'S KERSEY FARM 17B-212 - ORIGINAL WELLBC	1,050.0	1,050.0	105.0	100.6	23.515	CC, ES
CECIL'S KERSEY FARM 17B-212 - ORIGINAL WELLBC	1,300.0	1,299.3	115.0	109.4	20.656	SF
CECIL'S KERSEY FARM 17B-214 - ORIGINAL WELLBC	1,050.0	1,050.0	90.0	85.6	20.156	CC, ES
CECIL'S KERSEY FARM 17B-214 - ORIGINAL WELLBC	13,080.8	12,875.2	1,030.8	689.5	3.020	SF
CECIL'S KERSEY FARM 17B-302 - ORIGINAL WELLBC	1,050.0	1,050.0	135.0	130.6	30.233	CC, ES
CECIL'S KERSEY FARM 17B-302 - ORIGINAL WELLBC	8,900.0	6,500.0	1,668.8	1,595.8	22.858	SF
CECIL'S KERSEY FARM 17B-304 - ORIGINAL WELLBC	1,050.0	1,050.0	120.0	115.6	26.874	CC, ES
CECIL'S KERSEY FARM 17B-304 - ORIGINAL WELLBC	13,080.8	12,960.4	1,229.7	884.5	3.562	SF
CECIL'S KERSEY FARM 17K-204 - ORIGINAL WELLBC	1,050.0	1,050.0	30.0	25.5	6.720	CC
CECIL'S KERSEY FARM 17K-204 - ORIGINAL WELLBC	13,080.8	12,914.0	299.8	19.6	1.070	Level 2, ES, SF
CECIL'S KERSEY FARM 17K-232 - ORIGINAL WELLBC	1,050.0	1,050.0	45.0	40.5	10.079	CC, ES
CECIL'S KERSEY FARM 17K-232 - ORIGINAL WELLBC	6,800.0	7,736.6	352.4	300.8	6.829	SF
CECIL'S KERSEY FARM 17K-332 - ORIGINAL WELLBC	1,050.0	1,050.0	75.0	70.5	16.797	CC, ES
CECIL'S KERSEY FARM 17K-332 - ORIGINAL WELLBC	6,750.0	7,827.7	629.4	576.9	11.988	SF
CECIL'S KERSEY FARM 17K-334 - ORIGINAL WELLBC	1,050.0	1,050.0	60.0	55.5	13.438	CC, ES
CECIL'S KERSEY FARM 17K-334 - ORIGINAL WELLBC	13,080.8	12,972.8	502.2	164.6	1.488	Level 3, SF
CECIL'S KERSEY FARM 17K-402 - ORIGINAL WELLBC	1,050.0	1,050.0	15.0	10.5	3.361	CC, ES
CECIL'S KERSEY FARM 17K-402 - ORIGINAL WELLBC	7,283.4	7,499.0	116.8	70.8	2.536	SF
EXIST VERT B&H #1 - Wellbore #1 - Design #1	12,717.6	6,886.0	979.7	678.9	3.256	CC, ES
EXIST VERT B&H #1 - Wellbore #1 - Design #1	12,800.0	6,886.4	983.2	680.0	3.243	SF
EXIST VERT BRIGHT #2 - Wellbore #1 - Design #1	12,547.4	6,885.0	518.7	222.6	1.752	CC, ES
EXIST VERT BRIGHT #2 - Wellbore #1 - Design #1	12,598.4	6,885.3	521.2	223.6	1.752	SF
EXIST VERT DUNN #22-18 - Wellbore #1 - Design #1	11,363.7	6,875.3	737.0	474.1	2.803	CC
EXIST VERT DUNN #22-18 - Wellbore #1 - Design #1	11,400.0	6,875.5	737.9	474.0	2.796	ES
EXIST VERT DUNN #22-18 - Wellbore #1 - Design #1	11,417.3	6,875.6	739.0	474.5	2.794	SF
EXIST VERT DUNN/MILLER #1 - Wellbore #1 - Design #	1,810.0	1,798.2	269.6	229.6	6.726	CC
EXIST VERT DUNN/MILLER #1 - Wellbore #1 - Design #	1,900.0	1,885.4	270.6	228.4	6.413	ES
EXIST VERT DUNN/MILLER #1 - Wellbore #1 - Design #	7,480.3	6,852.5	729.3	568.3	4.530	SF
EXIST VERT DUNN/MILLER #17B - Wellbore #1 - Desig	1,050.0	1,040.0	555.6	532.8	24.332	CC
EXIST VERT DUNN/MILLER #17B - Wellbore #1 - Desig	1,600.0	1,586.6	558.8	523.6	15.889	ES
EXIST VERT DUNN/MILLER #17B - Wellbore #1 - Desig	6,900.0	6,679.6	1,255.0	1,102.8	8.245	SF
EXIST VERT DUNN/MILLER #23-17 - Wellbore #1 - Des	5,001.7	4,880.8	771.1	653.3	6.545	CC
EXIST VERT DUNN/MILLER #23-17 - Wellbore #1 - Des	5,300.0	5,169.7	774.7	649.6	6.193	ES
EXIST VERT DUNN/MILLER #23-17 - Wellbore #1 - Des	6,350.0	6,205.1	804.6	656.4	5.430	SF
EXIST VERT GUNTHER #18-2 - Wellbore #1 - Design #	8,777.6	6,856.8	630.0	438.2	3.284	CC
EXIST VERT GUNTHER #18-2 - Wellbore #1 - Design #	8,800.0	6,856.9	630.4	438.0	3.276	ES
EXIST VERT GUNTHER #18-2 - Wellbore #1 - Design #	8,858.2	6,857.2	635.1	441.2	3.275	SF

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

Anticollision Report



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Reference Site:	NW SW SEC. 17 T5N R64W 6th P.M.	MD Reference:	KB-EST @ 4636.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	CECIL'S KERSEY FARM 17K-404	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 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	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
NW SW SEC. 17 T5N R64W 6th P.M.						
EXIST VERT GUNTHER-PM B #18-7 - Wellbore #1 - We	10,095.4	6,750.0	724.1	632.7	7.920	CC
EXIST VERT GUNTHER-PM B #18-7 - Wellbore #1 - We	10,100.0	6,750.0	724.1	632.5	7.910	ES
EXIST VERT GUNTHER-PM B #18-7 - Wellbore #1 - We	10,236.2	6,750.0	737.6	642.4	7.744	SF
EXIST VERT H&S #1 - Wellbore #1 - Design #1	6,271.6	6,130.8	2,264.5	2,125.9	16.339	CC
EXIST VERT H&S #1 - Wellbore #1 - Design #1	6,299.2	6,158.4	2,265.0	2,117.2	15.325	ES
EXIST VERT H&S #1 - Wellbore #1 - Design #1	6,350.0	6,209.1	2,268.5	2,120.3	15.308	SF
EXIST VERT HETTINGER #1 - Wellbore #1 - Design #1	8,765.2	6,860.7	698.6	507.1	3.648	CC
EXIST VERT HETTINGER #1 - Wellbore #1 - Design #1	8,800.0	6,860.9	699.5	507.1	3.635	ES
EXIST VERT HETTINGER #1 - Wellbore #1 - Design #1	8,858.2	6,861.2	704.8	510.8	3.633	SF
EXIST VERT HETTINGER #33-18 - Wellbore #1 - Desig	10,089.6	6,862.1	816.6	589.1	3.590	CC
EXIST VERT HETTINGER #33-18 - Wellbore #1 - Desig	10,100.0	6,862.2	816.6	588.9	3.585	ES
EXIST VERT HETTINGER #33-18 - Wellbore #1 - Desig	10,200.0	6,862.8	824.0	593.5	3.574	SF
EXIST VERT HETTINGER #34-18 - Wellbore #1 - Desig	10,071.6	6,867.0	2,042.8	1,815.8	8.998	CC
EXIST VERT HETTINGER #34-18 - Wellbore #1 - Desig	10,137.8	6,867.4	2,043.9	1,815.0	8.931	ES
EXIST VERT HETTINGER #34-18 - Wellbore #1 - Desig	10,600.0	6,870.0	2,110.1	1,868.4	8.731	SF
EXIST VERT HETTINGER #44-18 - Wellbore #1 - Desig	1,050.0	1,043.0	1,832.6	1,809.8	80.145	CC
EXIST VERT HETTINGER #44-18 - Wellbore #1 - Desig	1,100.0	1,093.0	1,833.0	1,809.1	76.435	ES
EXIST VERT HETTINGER #44-18 - Wellbore #1 - Desig	9,350.4	6,859.0	2,101.8	1,894.6	10.143	SF
EXIST VERT HOSHIKO #32-17 - Wellbore #1 - Design #	6,271.6	6,128.8	1,984.1	1,839.9	13.757	CC, ES, SF
EXIST VERT HOSHIKO #42-17 - Wellbore #1 - Design #	6,271.6	6,128.8	3,272.3	3,129.2	22.866	CC
EXIST VERT HOSHIKO #42-17 - Wellbore #1 - Design #	6,299.2	6,156.4	3,272.8	3,128.7	22.707	ES
EXIST VERT HOSHIKO #42-17 - Wellbore #1 - Design #	6,350.0	6,207.1	3,276.5	3,132.1	22.692	SF
EXIST VERT HOSHIKO/SOLIS #1 - Wellbore #1 - Wellb	0.0	0.0	2,727.9			
EXIST VERT HOSHIKO/SOLIS #1 - Wellbore #1 - Wellb	200.0	187.0	2,728.0	2,727.5	5,119.231	ES
EXIST VERT HOSHIKO/SOLIS #1 - Wellbore #1 - Wellb	13,080.1	6,700.0	8,589.9	8,415.4	49.205	SF
EXIST VERT HOWARD #14-18 - Wellbore #1 - Design #	12,748.5	6,884.1	2,133.5	1,831.8	7.071	CC
EXIST VERT HOWARD #14-18 - Wellbore #1 - Design #	12,800.0	6,884.4	2,134.1	1,831.0	7.040	ES
EXIST VERT HOWARD #14-18 - Wellbore #1 - Design #	13,080.1	6,886.0	2,159.1	1,848.1	6.942	SF
EXIST VERT HOWARD #24-18 - Wellbore #1 - Design #	11,202.6	6,877.4	2,184.8	1,926.3	8.452	CC
EXIST VERT HOWARD #24-18 - Wellbore #1 - Design #	11,300.0	6,878.0	2,186.9	1,925.7	8.373	ES
EXIST VERT HOWARD #24-18 - Wellbore #1 - Design #	11,712.6	6,880.3	2,243.5	1,970.8	8.226	SF
EXIST VERT MASON #1 - Wellbore #1 - Design #1	11,394.6	6,875.5	927.9	664.1	3.517	CC
EXIST VERT MASON #1 - Wellbore #1 - Design #1	11,417.3	6,875.6	928.1	663.7	3.510	ES
EXIST VERT MASON #1 - Wellbore #1 - Design #1	11,500.0	6,876.1	933.8	667.1	3.501	SF
EXIST VERT MILLER #1 - Wellbore #1 - Wellbore #1	0.0	0.0	1,132.5			
EXIST VERT MILLER #1 - Wellbore #1 - Wellbore #1	13,080.1	6,800.0	5,969.6	5,795.2	34.216	SF
EXIST VERT MILLER #2 - Wellbore #1 - Wellbore #1	1,107.1	1,107.5	1,565.1	1,562.0	513.731	CC
EXIST VERT MILLER #2 - Wellbore #1 - Wellbore #1	1,181.1	1,182.1	1,565.2	1,562.0	483.167	ES
EXIST VERT MILLER #2 - Wellbore #1 - Wellbore #1	13,080.1	6,757.0	7,270.5	7,096.0	41.658	SF
EXIST VERT SCHAUMBERG #12-17 - Wellbore #1 - De	7,294.1	6,839.7	598.3	440.3	3.788	CC
EXIST VERT SCHAUMBERG #12-17 - Wellbore #1 - De	7,300.0	6,840.5	598.3	440.3	3.786	ES
EXIST VERT SCHAUMBERG #12-17 - Wellbore #1 - De	7,350.0	6,845.5	600.8	442.0	3.783	SF
EXIST VERT SOLIS #43-17 - Wellbore #1 - Design #1	6,271.6	6,140.8	3,312.1	3,172.7	23.762	CC
EXIST VERT SOLIS #43-17 - Wellbore #1 - Design #1	6,299.2	6,168.4	3,312.7	3,165.2	22.471	ES
EXIST VERT SOLIS #43-17 - Wellbore #1 - Design #1	6,350.0	6,219.1	3,316.3	3,168.5	22.446	SF
EXIST VERT SOLIS #44-17 - Wellbore #1 - Wellbore #1	4,684.0	4,444.1	3,857.4	3,837.7	195.531	CC
EXIST VERT SOLIS #44-17 - Wellbore #1 - Wellbore #1	5,808.0	5,639.8	3,860.6	3,835.4	153.230	ES
EXIST VERT SOLIS #44-17 - Wellbore #1 - Wellbore #1	13,080.8	6,632.8	9,995.8	9,822.3	57.611	SF
EXIST VERT STEINMETZ #1 - Wellbore #1 - Design #1	6,271.6	6,131.8	824.9	677.6	5.601	CC, ES, SF

Anticollision Report



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Reference Site:	NW SW SEC. 17 T5N R64W 6th P.M.	MD Reference:	KB-EST @ 4636.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	CECIL'S KERSEY FARM 17K-404	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 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	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. 18 T5N R64W 6th P.M.						
GILLHAM 18X-102 - ORIGINAL WELLBORE - PROPOS	6,450.0	8,713.8	1,561.4	1,480.3	19.263	SF
GILLHAM 18X-102 - ORIGINAL WELLBORE - PROPOS	6,700.0	8,609.7	1,538.8	1,461.2	19.816	ES
GILLHAM 18X-102 - ORIGINAL WELLBORE - PROPOS	6,752.3	8,578.4	1,538.2	1,461.6	20.079	CC
GILLHAM 18X-104 - ORIGINAL WELLBORE - PROPOS	8,340.6	7,119.9	1,457.5	1,393.1	22.614	CC
GILLHAM 18X-104 - ORIGINAL WELLBORE - PROPOS	13,080.8	11,858.3	1,463.2	1,151.4	4.692	ES, SF
GILLHAM 18X-232 - ORIGINAL WELLBORE - PROPOS	1,032.6	1,034.6	1,605.8	1,601.4	365.564	CC
GILLHAM 18X-232 - ORIGINAL WELLBORE - PROPOS	1,050.0	1,050.0	1,605.8	1,601.3	359.544	ES
GILLHAM 18X-232 - ORIGINAL WELLBORE - PROPOS	10,300.0	6,350.0	2,436.6	2,329.9	22.845	SF
GILLHAM 18X-234 - ORIGINAL WELLBORE - PROPOS	1,535.3	1,776.6	1,484.1	1,476.9	205.754	CC, ES
GILLHAM 18X-234 - ORIGINAL WELLBORE - PROPOS	13,080.8	11,943.0	1,871.8	1,554.8	5.906	SF
GILLHAM 18X-332 - ORIGINAL WELLBORE - PROPOS	1,050.0	1,052.0	1,593.4	1,589.0	356.428	CC, ES
GILLHAM 18X-332 - ORIGINAL WELLBORE - PROPOS	10,000.0	6,450.0	2,081.9	1,982.3	20.916	SF
GILLHAM 18X-334 - ORIGINAL WELLBORE - PROPOS	1,628.9	1,916.2	1,500.1	1,492.4	195.524	CC
GILLHAM 18X-334 - ORIGINAL WELLBORE - PROPOS	13,080.8	12,031.7	1,648.2	1,330.7	5.190	ES, SF
GILLHAM 18Y-202 - ORIGINAL WELLBORE - PROPOS	1,050.0	1,052.0	1,556.5	1,552.0	348.153	CC, ES
GILLHAM 18Y-202 - ORIGINAL WELLBORE - PROPOS	11,220.4	6,300.0	3,392.4	3,259.0	25.433	SF
GILLHAM 18Y-214 - ORIGINAL WELLBORE - PROPOS	1,050.0	1,052.0	1,544.1	1,539.6	345.388	CC, ES
GILLHAM 18Y-214 - ORIGINAL WELLBORE - PROPOS	13,080.8	12,001.8	2,401.8	2,083.9	7.556	SF
GILLHAM 18Y-312 - ORIGINAL WELLBORE - PROPOS	1,050.0	1,052.0	1,568.7	1,564.2	350.887	CC, ES
GILLHAM 18Y-312 - ORIGINAL WELLBORE - PROPOS	11,023.6	6,350.0	3,092.8	2,965.0	24.192	SF
GILLHAM 18Y-314 - ORIGINAL WELLBORE - PROPOS	1,050.0	1,052.0	1,531.8	1,527.3	342.633	CC, ES
GILLHAM 18Y-314 - ORIGINAL WELLBORE - PROPOS	13,080.8	12,054.0	2,197.5	1,879.3	6.906	SF

Offset Design

Survey Program: 0-MWD

NW SW SEC. 17 T5N R64W 6th P.M. - CECIL'S KERSEY FARM 17B-212 - ORIGINAL WELLBORE - P

Offset Site Error: 0.0 usft

Offset Well Error: 0.0 usft

Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	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
0.0	0.0	0.0	0.0	0.0	0.0	-174.67	-104.6	-9.7	105.0				
98.4	98.4	98.4	98.4	0.1	0.1	-174.67	-104.6	-9.7	105.0	104.8	0.19	546.300	
100.0	100.0	100.0	100.0	0.1	0.1	-174.67	-104.6	-9.7	105.0	104.8	0.20	537.053	
196.8	196.8	196.8	196.8	0.3	0.3	-174.67	-104.6	-9.7	105.0	104.4	0.63	166.454	
200.0	200.0	200.0	200.0	0.3	0.3	-174.67	-104.6	-9.7	105.0	104.4	0.65	162.800	
295.3	295.3	295.3	295.3	0.5	0.5	-174.67	-104.6	-9.7	105.0	103.9	1.07	97.840	
300.0	300.0	300.0	300.0	0.5	0.5	-174.67	-104.6	-9.7	105.0	103.9	1.09	95.942	
393.7	393.7	393.7	393.7	0.8	0.8	-174.67	-104.6	-9.7	105.0	103.5	1.52	69.282	
400.0	400.0	400.0	400.0	0.8	0.8	-174.67	-104.6	-9.7	105.0	103.5	1.54	68.011	
492.1	492.1	492.1	492.1	1.0	1.0	-174.67	-104.6	-9.7	105.0	103.1	1.96	53.628	
500.0	500.0	500.0	500.0	1.0	1.0	-174.67	-104.6	-9.7	105.0	103.0	1.99	52.676	
590.5	590.5	590.5	590.5	1.2	1.2	-174.67	-104.6	-9.7	105.0	102.6	2.40	43.745	
600.0	600.0	600.0	600.0	1.2	1.2	-174.67	-104.6	-9.7	105.0	102.6	2.44	42.984	
689.0	689.0	689.0	689.0	1.4	1.4	-174.67	-104.6	-9.7	105.0	102.2	2.84	36.937	
700.0	700.0	700.0	700.0	1.4	1.4	-174.67	-104.6	-9.7	105.0	102.1	2.89	36.304	
787.4	787.4	787.4	787.4	1.6	1.6	-174.67	-104.6	-9.7	105.0	101.7	3.29	31.963	
800.0	800.0	800.0	800.0	1.7	1.7	-174.67	-104.6	-9.7	105.0	101.7	3.34	31.421	
885.8	885.8	885.8	885.8	1.9	1.9	-174.67	-104.6	-9.7	105.0	101.3	3.73	28.170	
900.0	900.0	900.0	900.0	1.9	1.9	-174.67	-104.6	-9.7	105.0	101.2	3.79	27.696	
984.2	984.2	984.2	984.2	2.1	2.1	-174.67	-104.6	-9.7	105.0	100.8	4.17	25.181	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-174.67	-104.6	-9.7	105.0	100.8	4.24	24.761	

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