

# **PDC ENERGY**

**WELD COUNTY, COLORADO  
NW SW SEC. 17 T5N R64W 6th P.M.  
CECIL'S KERSEY FARM 17K-332**

**ORIGINAL WELLBORE  
PROPOSAL #2**

## **Anticollision Report**

**16 September, 2015**



# Anticollision Report



<b>Company:</b>	PDC ENERGY	<b>Local Co-ordinate Reference:</b>	Well CECIL'S KERSEY FARM 17K-332
<b>Project:</b>	WELD COUNTY, COLORADO	<b>TVD Reference:</b>	KB-EST @ 4636.0usft (Original Well Elev)
<b>Reference Site:</b>	NW SW SEC. 17 T5N R64W 6th P.M.	<b>MD Reference:</b>	KB-EST @ 4636.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	CECIL'S KERSEY FARM 17K-332	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 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 #2	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	PROPOSAL #2		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD + Stations Interval 98.4usft	<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 10,000.0 us	<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>	16/09/2015		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	11,351.6	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
Offset Well - Wellbore - Design						
NW SW SEC. 17 T5N R64W 6th P.M.						
CECIL'S KERSEY FARM 17B-212 - ORIGINAL WELLBC	1,237.8	1,237.8	30.0	24.7	5.650	CC
CECIL'S KERSEY FARM 17B-212 - ORIGINAL WELLBC	1,300.0	1,299.9	30.1	24.5	5.387	ES
CECIL'S KERSEY FARM 17B-212 - ORIGINAL WELLBC	11,352.0	11,236.6	504.7	251.8	1.995	SF
CECIL'S KERSEY FARM 17B-214 - ORIGINAL WELLBC	1,550.0	1,550.0	15.0	8.3	2.234	CC
CECIL'S KERSEY FARM 17B-214 - ORIGINAL WELLBC	1,574.8	1,574.8	15.0	8.2	2.205	ES
CECIL'S KERSEY FARM 17B-214 - ORIGINAL WELLBC	1,600.0	1,600.0	15.2	8.2	2.188	SF
CECIL'S KERSEY FARM 17B-302 - ORIGINAL WELLBC	1,037.2	1,037.2	60.0	55.6	13.611	CC
CECIL'S KERSEY FARM 17B-302 - ORIGINAL WELLBC	1,082.7	1,082.4	60.1	55.5	13.041	ES
CECIL'S KERSEY FARM 17B-302 - ORIGINAL WELLBC	11,352.0	11,326.4	722.1	468.3	2.846	SF
CECIL'S KERSEY FARM 17B-304 - ORIGINAL WELLBC	1,137.6	1,137.6	45.0	40.1	9.261	CC
CECIL'S KERSEY FARM 17B-304 - ORIGINAL WELLBC	1,200.0	1,199.9	45.1	39.9	8.784	ES
CECIL'S KERSEY FARM 17B-304 - ORIGINAL WELLBC	1,400.0	1,398.8	47.9	41.9	8.017	SF
CECIL'S KERSEY FARM 17K-204 - ORIGINAL WELLBC	1,237.4	1,237.4	45.0	39.7	8.478	CC
CECIL'S KERSEY FARM 17K-204 - ORIGINAL WELLBC	1,279.5	1,279.1	45.1	39.6	8.211	ES
CECIL'S KERSEY FARM 17K-204 - ORIGINAL WELLBC	6,900.0	7,573.1	361.4	313.4	7.523	SF
CECIL'S KERSEY FARM 17K-232 - ORIGINAL WELLBC	1,337.5	1,337.5	30.0	24.2	5.210	CC
CECIL'S KERSEY FARM 17K-232 - ORIGINAL WELLBC	11,352.0	11,293.7	260.6	10.2	1.041	Level 2, ES, SF
CECIL'S KERSEY FARM 17K-334 - ORIGINAL WELLBC	1,437.5	1,437.5	15.0	8.8	2.416	CC
CECIL'S KERSEY FARM 17K-334 - ORIGINAL WELLBC	1,476.4	1,476.3	15.1	8.7	2.365	ES
CECIL'S KERSEY FARM 17K-334 - ORIGINAL WELLBC	1,500.0	1,499.8	15.3	8.8	2.362	SF
CECIL'S KERSEY FARM 17K-402 - ORIGINAL WELLBC	1,137.3	1,137.3	60.0	55.1	12.351	CC
CECIL'S KERSEY FARM 17K-402 - ORIGINAL WELLBC	1,181.1	1,180.7	60.1	55.1	11.896	ES
CECIL'S KERSEY FARM 17K-402 - ORIGINAL WELLBC	11,352.0	11,472.7	492.0	242.8	1.974	SF
CECIL'S KERSEY FARM 17K-404 - ORIGINAL WELLBC	1,037.1	1,037.1	75.0	70.6	17.017	CC
CECIL'S KERSEY FARM 17K-404 - ORIGINAL WELLBC	1,082.7	1,081.9	75.2	70.6	16.306	ES
CECIL'S KERSEY FARM 17K-404 - ORIGINAL WELLBC	7,900.0	6,832.9	626.7	573.9	11.858	SF
EXIST VERT B&H #1 - Wellbore #1 - Design #1	6,170.2	6,066.9	4,652.7	4,510.8	32.791	CC, ES, SF
EXIST VERT BRIGHT #2 - Wellbore #1 - Design #1	6,170.2	6,066.9	4,604.7	4,461.3	32.125	CC, ES, SF
EXIST VERT DUNN #22-18 - Wellbore #1 - Design #1	6,170.2	6,063.9	3,544.7	3,401.1	24.692	CC, ES, SF
EXIST VERT DUNN/MILLER #1 - Wellbore #1 - Design #	7,225.5	6,775.7	128.5	-30.1	0.810	Level 1, CC, ES, SF
EXIST VERT DUNN/MILLER #17B - Wellbore #1 - Desig	1,550.0	1,540.0	526.5	492.5	15.475	CC
EXIST VERT DUNN/MILLER #17B - Wellbore #1 - Desig	7,900.0	6,763.9	646.2	475.4	3.782	ES, SF
EXIST VERT DUNN/MILLER #23-17 - Wellbore #1 - Des	8,526.5	6,753.4	13.6	-172.4	0.073	Level 1, CC, ES, SF
EXIST VERT GUNTHER #18-2 - Wellbore #1 - Design #	6,170.2	6,059.9	1,413.2	1,271.7	9.987	CC, ES, SF
EXIST VERT GUNTHER-PM B #18-7 - Wellbore #1 - We	6,170.2	6,098.4	2,413.5	2,390.0	102.506	ES
EXIST VERT GUNTHER-PM B #18-7 - Wellbore #1 - We	6,183.6	6,111.7	2,413.4	2,397.2	148.549	CC
EXIST VERT GUNTHER-PM B #18-7 - Wellbore #1 - We	11,351.6	6,728.1	6,913.9	6,785.1	53.685	SF

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

# Anticollision Report



<b>Company:</b>	PDC ENERGY	<b>Local Co-ordinate Reference:</b>	Well CECIL'S KERSEY FARM 17K-332
<b>Project:</b>	WELD COUNTY, COLORADO	<b>TVD Reference:</b>	KB-EST @ 4636.0usft (Original Well Elev)
<b>Reference Site:</b>	NW SW SEC. 17 T5N R64W 6th P.M.	<b>MD Reference:</b>	KB-EST @ 4636.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	CECIL'S KERSEY FARM 17K-332	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 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 #2	<b>Offset TVD Reference:</b>	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
NW SW SEC. 17 T5N R64W 6th P.M.						
EXIST VERT H&S #1 - Wellbore #1 - Design #1	10,066.1	6,736.5	279.9	53.1	1.234	Level 2, CC, ES, SF
EXIST VERT HETTINGER #1 - Wellbore #1 - Design #1	6,170.2	6,063.9	691.9	550.4	4.890	CC, ES, SF
EXIST VERT HETTINGER #33-18 - Wellbore #1 - Desig	6,170.2	6,057.9	2,020.8	1,879.2	14.267	CC, ES, SF
EXIST VERT HETTINGER #34-18 - Wellbore #1 - Desig	6,170.2	6,062.9	2,459.4	2,321.4	17.825	CC
EXIST VERT HETTINGER #34-18 - Wellbore #1 - Desig	6,200.0	6,092.7	2,459.9	2,317.1	17.234	ES
EXIST VERT HETTINGER #34-18 - Wellbore #1 - Desig	6,250.0	6,142.6	2,463.0	2,319.7	17.191	SF
EXIST VERT HOSHIKO #32-17 - Wellbore #1 - Design #	5,538.4	5,431.5	1,563.1	1,433.6	12.070	CC
EXIST VERT HETTINGER #44-18 - Wellbore #1 - Desig	6,200.8	6,089.5	1,564.6	1,420.4	10.853	ES
EXIST VERT HETTINGER #44-18 - Wellbore #1 - Desig	6,350.0	6,236.8	1,574.1	1,427.7	10.758	SF
EXIST VERT HOSHIKO #32-17 - Wellbore #1 - Design #	9,857.9	6,737.3	1,237.8	1,016.6	5.597	CC
EXIST VERT HOSHIKO #32-17 - Wellbore #1 - Design #	9,900.0	6,736.7	1,238.5	1,016.2	5.571	ES
EXIST VERT HOSHIKO #32-17 - Wellbore #1 - Design #	10,039.3	6,734.8	1,251.0	1,024.9	5.534	SF
EXIST VERT HOSHIKO #42-17 - Wellbore #1 - Design #	11,186.5	6,719.2	1,248.9	991.5	4.852	CC
EXIST VERT HOSHIKO #42-17 - Wellbore #1 - Design #	11,220.4	6,718.8	1,249.3	991.0	4.837	ES
EXIST VERT HOSHIKO #42-17 - Wellbore #1 - Design #	11,351.6	6,717.0	1,259.7	997.8	4.810	SF
EXIST VERT HOSHIKO/SOLIS #1 - Wellbore #1 - Wellb	9,869.4	6,700.0	1,646.8	1,558.5	18.652	CC
EXIST VERT HOSHIKO/SOLIS #1 - Wellbore #1 - Wellb	9,900.0	6,700.0	1,647.0	1,557.9	18.481	ES
EXIST VERT HOSHIKO/SOLIS #1 - Wellbore #1 - Wellb	10,728.3	6,700.0	1,857.3	1,745.4	16.603	SF
EXIST VERT HOWARD #14-18 - Wellbore #1 - Design #	6,170.2	6,064.9	4,913.7	4,773.4	35.029	CC, ES
EXIST VERT HOWARD #14-18 - Wellbore #1 - Design #	6,250.0	6,144.6	4,917.9	4,776.9	34.879	SF
EXIST VERT HOWARD #24-18 - Wellbore #1 - Design #	6,170.2	6,066.9	3,501.6	3,362.4	25.163	CC
EXIST VERT HOWARD #24-18 - Wellbore #1 - Design #	6,200.0	6,096.7	3,502.1	3,360.4	24.700	ES
EXIST VERT HOWARD #24-18 - Wellbore #1 - Design #	6,250.0	6,146.6	3,505.6	3,363.3	24.650	SF
EXIST VERT MASON #1 - Wellbore #1 - Design #1	6,170.2	6,063.9	3,330.3	3,188.6	23.493	CC, ES, SF
EXIST VERT MILLER #1 - Wellbore #1 - Wellbore #1	0.0	0.0	1,057.7			
EXIST VERT MILLER #1 - Wellbore #1 - Wellbore #1	1,550.0	1,548.3	1,060.7	1,056.5	253.340	ES
EXIST VERT MILLER #1 - Wellbore #1 - Wellbore #1	11,351.6	6,728.2	4,422.6	4,294.0	34.373	SF
EXIST VERT MILLER #2 - Wellbore #1 - Wellbore #1	8,546.5	6,743.0	1,476.1	1,423.3	27.960	CC
EXIST VERT MILLER #2 - Wellbore #1 - Wellbore #1	8,600.0	6,742.9	1,477.0	1,422.9	27.267	ES
EXIST VERT MILLER #2 - Wellbore #1 - Wellbore #1	9,700.0	6,741.3	1,873.3	1,789.8	22.439	SF
EXIST VERT SCHAUMBERG #12-17 - Wellbore #1 - De	7,364.9	6,773.2	1,197.6	1,037.0	7.460	CC
EXIST VERT SCHAUMBERG #12-17 - Wellbore #1 - De	7,381.9	6,773.0	1,197.7	1,036.9	7.449	ES
EXIST VERT SCHAUMBERG #12-17 - Wellbore #1 - De	7,500.0	6,771.3	1,205.2	1,042.4	7.406	SF
EXIST VERT SOLIS #43-17 - Wellbore #1 - Design #1	11,181.2	6,731.3	248.5	-8.9	0.966	Level 1, CC, ES, SF
EXIST VERT SOLIS #44-17 - Wellbore #1 - Wellbore #1	11,352.0	6,687.0	1,216.7	1,088.0	9.453	CC, ES, SF
EXIST VERT STEINMETZ #1 - Wellbore #1 - Design #1	8,526.7	6,758.4	1,216.2	1,030.1	6.537	CC
EXIST VERT STEINMETZ #1 - Wellbore #1 - Design #1	8,563.0	6,757.9	1,216.7	1,029.7	6.507	ES
EXIST VERT STEINMETZ #1 - Wellbore #1 - Design #1	8,759.8	6,755.2	1,238.3	1,046.3	6.448	SF

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<b>Project:</b>	WELD COUNTY, COLORADO	<b>TVD Reference:</b>	KB-EST @ 4636.0usft (Original Well Elev)
<b>Reference Site:</b>	NW SW SEC. 17 T5N R64W 6th P.M.	<b>MD Reference:</b>	KB-EST @ 4636.0usft (Original Well Elev)
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	CECIL'S KERSEY FARM 17K-332	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 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 #2	<b>Offset TVD Reference:</b>	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 SE SEC. 18 T5N R64W 6th P.M.						
GILLHAM 18X-102 - ORIGINAL WELLBORE - PROPOS	6,761.2	7,564.1	938.9	886.5	17.909	CC
GILLHAM 18X-102 - ORIGINAL WELLBORE - PROPOS	11,352.0	12,105.1	954.6	676.0	3.426	ES, SF
GILLHAM 18X-104 - ORIGINAL WELLBORE - PROPOS	4,551.3	4,649.0	801.0	769.8	25.665	CC
GILLHAM 18X-104 - ORIGINAL WELLBORE - PROPOS	4,600.0	4,693.4	801.3	769.6	25.324	ES
GILLHAM 18X-104 - ORIGINAL WELLBORE - PROPOS	6,594.5	6,699.6	836.2	795.8	20.698	SF
GILLHAM 18X-232 - ORIGINAL WELLBORE - PROPOS	6,928.6	7,787.1	1,373.9	1,318.0	24.549	CC
GILLHAM 18X-232 - ORIGINAL WELLBORE - PROPOS	11,352.0	12,193.8	1,376.3	1,093.3	4.864	ES, SF
GILLHAM 18X-234 - ORIGINAL WELLBORE - PROPOS	3,777.8	3,834.6	1,072.9	1,048.2	43.430	CC
GILLHAM 18X-234 - ORIGINAL WELLBORE - PROPOS	3,838.6	3,889.7	1,073.2	1,047.9	42.513	ES
GILLHAM 18X-234 - ORIGINAL WELLBORE - PROPOS	8,400.0	6,350.0	1,965.8	1,903.3	31.458	SF
GILLHAM 18X-332 - ORIGINAL WELLBORE - PROPOS	7,170.7	8,102.7	1,156.8	1,093.2	18.162	CC
GILLHAM 18X-332 - ORIGINAL WELLBORE - PROPOS	11,352.0	12,283.2	1,157.1	873.5	4.081	ES, SF
GILLHAM 18X-334 - ORIGINAL WELLBORE - PROPOS	4,230.1	4,301.8	948.9	920.7	33.734	CC
GILLHAM 18X-334 - ORIGINAL WELLBORE - PROPOS	4,300.0	4,365.6	949.3	920.6	33.034	ES
GILLHAM 18X-334 - ORIGINAL WELLBORE - PROPOS	6,767.4	6,744.5	1,045.8	1,005.6	25.989	SF
GILLHAM 18Y-202 - ORIGINAL WELLBORE - PROPOS	1,435.9	1,437.9	1,509.5	1,503.3	243.265	CC
GILLHAM 18Y-202 - ORIGINAL WELLBORE - PROPOS	1,476.4	1,469.0	1,509.6	1,503.2	237.315	ES
GILLHAM 18Y-202 - ORIGINAL WELLBORE - PROPOS	11,352.0	12,229.0	1,899.6	1,617.5	6.734	SF
GILLHAM 18Y-214 - ORIGINAL WELLBORE - PROPOS	3,216.4	3,218.3	1,328.9	1,309.5	68.760	CC
GILLHAM 18Y-214 - ORIGINAL WELLBORE - PROPOS	3,248.0	3,245.8	1,329.0	1,309.3	67.709	ES
GILLHAM 18Y-214 - ORIGINAL WELLBORE - PROPOS	9,940.9	6,300.0	3,480.4	3,375.9	33.313	SF
GILLHAM 18Y-312 - ORIGINAL WELLBORE - PROPOS	1,335.8	1,337.8	1,522.1	1,516.3	264.468	CC
GILLHAM 18Y-312 - ORIGINAL WELLBORE - PROPOS	11,352.0	12,299.7	1,690.0	1,407.5	5.983	ES, SF
GILLHAM 18Y-314 - ORIGINAL WELLBORE - PROPOS	3,470.0	3,490.3	1,254.4	1,232.9	58.302	CC
GILLHAM 18Y-314 - ORIGINAL WELLBORE - PROPOS	3,543.3	3,555.6	1,254.8	1,232.6	56.566	ES
GILLHAM 18Y-314 - ORIGINAL WELLBORE - PROPOS	9,547.2	6,350.0	3,033.4	2,939.3	32.253	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)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+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	-29.9	-2.8	30.0				
98.4	98.4	98.4	98.4	0.1	0.1	-174.67	-29.9	-2.8	30.0	29.8	0.19	156.074	
100.0	100.0	100.0	100.0	0.1	0.1	-174.67	-29.9	-2.8	30.0	29.8	0.20	153.432	
196.8	196.8	196.8	196.8	0.3	0.3	-174.67	-29.9	-2.8	30.0	29.4	0.63	47.555	
200.0	200.0	200.0	200.0	0.3	0.3	-174.67	-29.9	-2.8	30.0	29.4	0.65	46.511	
295.3	295.3	295.3	295.3	0.5	0.5	-174.67	-29.9	-2.8	30.0	28.9	1.07	27.952	
300.0	300.0	300.0	300.0	0.5	0.5	-174.67	-29.9	-2.8	30.0	28.9	1.09	27.410	
393.7	393.7	393.7	393.7	0.8	0.8	-174.67	-29.9	-2.8	30.0	28.5	1.52	19.793	
400.0	400.0	400.0	400.0	0.8	0.8	-174.67	-29.9	-2.8	30.0	28.5	1.54	19.430	
492.1	492.1	492.1	492.1	1.0	1.0	-174.67	-29.9	-2.8	30.0	28.0	1.96	15.321	
500.0	500.0	500.0	500.0	1.0	1.0	-174.67	-29.9	-2.8	30.0	28.0	1.99	15.049	
590.5	590.5	590.5	590.5	1.2	1.2	-174.67	-29.9	-2.8	30.0	27.6	2.40	12.498	
600.0	600.0	600.0	600.0	1.2	1.2	-174.67	-29.9	-2.8	30.0	27.6	2.44	12.280	
689.0	689.0	689.0	689.0	1.4	1.4	-174.67	-29.9	-2.8	30.0	27.2	2.84	10.553	
700.0	700.0	700.0	700.0	1.4	1.4	-174.67	-29.9	-2.8	30.0	27.1	2.89	10.372	
787.4	787.4	787.4	787.4	1.6	1.6	-174.67	-29.9	-2.8	30.0	26.7	3.29	9.132	
800.0	800.0	800.0	800.0	1.7	1.7	-174.67	-29.9	-2.8	30.0	26.7	3.34	8.977	
885.8	885.8	885.8	885.8	1.9	1.9	-174.67	-29.9	-2.8	30.0	26.3	3.73	8.048	

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