

Red Hawk Petroleum

Weld County, Colorado

S13-T2N-R64W (LE GERKIN PADS)

LE GERKIN 13H

HZ

Plan #1

Anticollision Report

30 October, 2014

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 13H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 13H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 200.0usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	10/30/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	16,448.8	Plan #1 (HZ)	Geolink MWD	Geolink MWD	

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						
S13-T2N-R64W (LE GERKIN PADS)						
EXISTING - ARNOLD #1 - EXISTING - EXISTING - NO S						Out of range
EXISTING - DARYL L ARNOLD #1 - EXISTING - EXISTI						Out of range
EXISTING - MCCLINTOCK ET AL #1 - EXISTING - EXIS						Out of range
LE GERKIN 10H - HZ - Plan #1	1,000.0	1,000.0	89.5	86.0	26.151	CC, ES
LE GERKIN 10H - HZ - Plan #1	1,100.0	1,096.2	92.7	88.9	24.628	SF
LE GERKIN 11H - HZ - Plan #1	1,000.0	1,000.0	58.7	55.3	17.162	CC, ES
LE GERKIN 11H - HZ - Plan #1	1,100.0	1,097.6	61.9	58.1	16.425	SF
LE GERKIN 12H - HZ - Plan #1	1,000.0	1,000.0	28.0	24.5	8.172	CC, ES
LE GERKIN 12H - HZ - Plan #1	1,100.0	1,099.2	30.5	26.7	8.093	SF
LE GERKIN 14H - HZ - Plan #1	1,000.0	1,000.0	30.8	27.3	8.989	CC, ES
LE GERKIN 14H - HZ - Plan #1	1,100.0	1,098.8	31.5	27.7	8.360	SF
LE GERKIN 15H - HZ - Plan #1	1,000.0	1,000.0	61.6	58.2	18.010	CC, ES
LE GERKIN 15H - HZ - Plan #1	1,200.0	1,194.7	65.8	61.6	15.983	SF
LE GERKIN 16H - HZ - Plan #1	1,000.0	1,000.0	92.3	88.9	26.989	CC, ES
LE GERKIN 16H - HZ - Plan #1	1,300.0	1,287.8	104.1	99.6	23.347	SF
LE GERKIN 1H - HZ - Plan #3						Out of range
LE GERKIN 2H - HZ - Plan #3						Out of range
LE GERKIN 3H - HZ - Plan #3						Out of range
LE GERKIN 4H - HZ - Plan #3						Out of range
LE GERKIN 5H - HZ - Plan #3						Out of range
LE GERKIN 6H - HZ - Plan #3						Out of range
LE GERKIN 7H - HZ - Plan #3						Out of range
LE GERKIN 8H - HZ - Plan #3						Out of range
LE GERKIN 9H - HZ - Plan #1	1,000.0	1,000.0	117.4	114.0	34.323	CC, ES
LE GERKIN 9H - HZ - Plan #1	1,200.0	1,189.6	129.5	125.4	31.560	SF

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Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 13H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 10H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-89.5	89.5				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-89.5	89.5	89.2	0.28	320.350	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-89.5	89.5	88.8	0.63	142.378	
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-89.5	89.5	88.5	0.98	91.529	
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-89.5	89.5	88.1	1.33	67.442	
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-89.5	89.5	87.8	1.68	53.392	
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-89.5	89.5	87.4	2.02	44.186	
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-89.5	89.5	87.1	2.37	37.688	
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-89.5	89.5	86.7	2.72	32.856	
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-89.5	89.5	86.4	3.07	29.123	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-89.5	89.5	86.0	3.42	26.151 CC, ES	
1,100.0	1,100.0	1,096.2	1,096.2	1.9	1.9	-123.93	0.5	-91.4	92.7	88.9	3.76	24.628 SF	
1,200.0	1,199.8	1,191.9	1,191.7	2.1	2.1	-125.23	2.0	-97.2	101.5	97.4	4.11	24.713	
1,300.0	1,299.7	1,286.8	1,286.1	2.2	2.3	-125.75	4.5	-106.8	114.4	110.0	4.46	25.673	
1,400.0	1,399.6	1,382.1	1,380.4	2.4	2.5	-125.64	8.0	-120.2	131.2	126.4	4.81	27.281	
1,500.0	1,499.5	1,478.8	1,475.7	2.6	2.7	-125.32	12.0	-135.7	149.9	144.7	5.17	29.023	
1,600.0	1,599.3	1,577.0	1,572.5	2.8	3.0	-125.06	16.2	-151.5	168.7	163.1	5.53	30.515	
1,700.0	1,699.2	1,675.2	1,669.4	3.0	3.3	-124.86	20.3	-167.3	187.4	181.5	5.89	31.816	

Cathedral Energy Services

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Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 13H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 11H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-58.7	58.7				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-58.7	58.7	58.4	0.28	210.229	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-58.7	58.7	58.1	0.63	93.435	
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-58.7	58.7	57.7	0.98	60.066	
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-58.7	58.7	57.4	1.33	44.259	
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-58.7	58.7	57.0	1.68	35.038	
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-58.7	58.7	56.7	2.02	28.997	
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-58.7	58.7	56.3	2.37	24.733	
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-58.7	58.7	56.0	2.72	21.562	
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-58.7	58.7	55.6	3.07	19.112	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-58.7	58.7	55.3	3.42	17.162 CC, ES	
1,100.0	1,100.0	1,097.6	1,097.6	1.9	1.9	-124.04	0.8	-60.6	61.9	58.1	3.77	16.425 SF	
1,200.0	1,199.8	1,194.7	1,194.5	2.1	2.1	-125.19	3.3	-66.3	70.5	66.3	4.12	17.121	
1,300.0	1,299.7	1,292.7	1,292.0	2.2	2.3	-125.04	7.2	-75.2	82.3	77.8	4.47	18.416	
1,400.0	1,399.6	1,392.0	1,390.7	2.4	2.5	-124.81	11.3	-84.7	94.6	89.7	4.83	19.581	
1,500.0	1,499.5	1,491.2	1,489.4	2.6	2.7	-124.63	15.4	-94.2	106.8	101.6	5.19	20.575	
1,600.0	1,599.3	1,590.5	1,588.1	2.8	2.9	-124.49	19.5	-103.6	119.1	113.5	5.56	21.433	
1,700.0	1,699.2	1,689.7	1,686.8	3.0	3.1	-124.38	23.7	-113.1	131.3	125.4	5.92	22.179	
1,800.0	1,799.1	1,788.9	1,785.5	3.2	3.4	-124.28	27.8	-122.6	143.6	137.3	6.29	22.835	
1,900.0	1,899.0	1,888.2	1,884.2	3.4	3.6	-124.20	31.9	-132.0	155.9	149.2	6.66	23.414	
2,000.0	1,998.8	1,987.4	1,982.9	3.6	3.8	-124.13	36.0	-141.5	168.1	161.1	7.03	23.929	
2,100.0	2,098.7	2,086.7	2,081.6	3.8	4.1	-124.08	40.1	-151.0	180.4	173.0	7.40	24.391	
2,200.0	2,198.6	2,185.9	2,180.4	3.9	4.3	-124.02	44.2	-160.4	192.6	184.9	7.77	24.807	

Cathedral Energy Services

Anticollision Report

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Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 13H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 12H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-28.0	28.0					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-28.0	28.0	27.7	0.28	100.109		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-28.0	28.0	27.3	0.63	44.493		
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-28.0	28.0	27.0	0.98	28.603		
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-28.0	28.0	26.6	1.33	21.076		
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-28.0	28.0	26.3	1.68	16.685		
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-28.0	28.0	25.9	2.02	13.808		
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-28.0	28.0	25.6	2.37	11.778		
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-28.0	28.0	25.2	2.72	10.268		
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-28.0	28.0	24.9	3.07	9.101		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-28.0	28.0	24.5	3.42	8.172 CC, ES		
1,100.0	1,100.0	1,099.2	1,099.1	1.9	1.9	-123.43	1.7	-29.3	30.5	26.7	3.77	8.093 SF		
1,200.0	1,199.8	1,198.8	1,198.6	2.1	2.1	-123.54	5.7	-32.5	36.5	32.4	4.12	8.844		
1,300.0	1,299.7	1,298.6	1,298.3	2.2	2.2	-123.57	9.8	-35.9	42.5	38.1	4.48	9.489		
1,400.0	1,399.6	1,398.4	1,398.0	2.4	2.4	-123.59	13.9	-39.2	48.6	43.8	4.85	10.031		
1,500.0	1,499.5	1,498.3	1,497.7	2.6	2.6	-123.61	18.0	-42.5	54.7	49.5	5.21	10.494		
1,600.0	1,599.3	1,598.1	1,597.3	2.8	2.8	-123.62	22.2	-45.8	60.7	55.2	5.57	10.893		
1,700.0	1,699.2	1,697.9	1,697.0	3.0	3.0	-123.63	26.3	-49.1	66.8	60.8	5.94	11.240		
1,800.0	1,799.1	1,797.7	1,796.7	3.2	3.2	-123.64	30.4	-52.5	72.9	66.5	6.31	11.545		
1,900.0	1,899.0	1,897.5	1,896.4	3.4	3.4	-123.65	34.5	-55.8	78.9	72.2	6.68	11.814		
2,000.0	1,998.8	1,997.3	1,996.0	3.6	3.6	-123.66	38.6	-59.1	85.0	77.9	7.05	12.053		
2,100.0	2,098.7	2,097.2	2,095.7	3.8	3.8	-123.66	42.7	-62.4	91.0	83.6	7.42	12.267		
2,200.0	2,198.6	2,197.0	2,195.4	3.9	4.0	-123.67	46.8	-65.8	97.1	89.3	7.79	12.460		
2,300.0	2,298.5	2,296.8	2,295.1	4.1	4.1	-123.67	51.0	-69.1	103.2	95.0	8.17	12.635		
2,400.0	2,398.3	2,396.6	2,394.8	4.3	4.3	-123.68	55.1	-72.4	109.2	100.7	8.54	12.794		
2,500.0	2,498.2	2,496.4	2,494.4	4.5	4.5	-123.68	59.2	-75.7	115.3	106.4	8.91	12.938		
2,600.0	2,598.1	2,596.2	2,594.1	4.7	4.7	-123.68	63.3	-79.0	121.4	112.1	9.28	13.071		
2,700.0	2,698.0	2,696.0	2,693.8	4.9	4.9	-123.69	67.4	-82.4	127.4	117.8	9.66	13.193		
2,800.0	2,797.8	2,795.9	2,793.5	5.1	5.1	-123.69	71.5	-85.7	133.5	123.4	10.03	13.305		
2,900.0	2,897.7	2,895.7	2,893.1	5.3	5.3	-123.69	75.6	-89.0	139.5	129.1	10.41	13.409		
3,000.0	2,997.6	2,995.5	2,992.8	5.5	5.5	-123.69	79.8	-92.3	145.6	134.8	10.78	13.506		
3,100.0	3,097.5	3,095.3	3,092.5	5.7	5.7	-123.70	83.9	-95.6	151.7	140.5	11.16	13.596		
3,200.0	3,197.3	3,195.1	3,192.2	5.9	5.9	-123.70	88.0	-99.0	157.7	146.2	11.53	13.680		
3,300.0	3,297.2	3,294.9	3,291.8	6.1	6.1	-123.70	92.1	-102.3	163.8	151.9	11.91	13.758		
3,400.0	3,397.1	3,394.8	3,391.5	6.3	6.3	-123.70	96.2	-105.6	169.9	157.6	12.28	13.831		
3,500.0	3,497.0	3,494.6	3,491.2	6.5	6.5	-123.70	100.3	-108.9	175.9	163.3	12.66	13.900		
3,600.0	3,596.8	3,594.4	3,590.9	6.6	6.7	-123.70	104.5	-112.2	182.0	169.0	13.03	13.965		
3,700.0	3,696.7	3,694.2	3,690.5	6.8	6.9	-123.71	108.6	-115.6	188.0	174.6	13.41	14.026		
3,800.0	3,796.6	3,794.0	3,790.2	7.0	7.1	-123.71	112.7	-118.9	194.1	180.3	13.78	14.083		

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Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 14H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	30.8	30.8					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	30.8	30.8	30.5	0.28	110.120		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	30.8	30.8	30.1	0.63	48.942		
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	30.8	30.8	29.8	0.98	31.463		
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	30.8	30.8	29.4	1.33	23.183		
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	30.8	30.8	29.1	1.68	18.353		
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	30.8	30.8	28.7	2.02	15.189		
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	30.8	30.8	28.4	2.37	12.955		
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	30.8	30.8	28.0	2.72	11.294		
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	30.8	30.8	27.7	3.07	10.011		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	30.8	30.8	27.3	3.42	8.989 CC, ES		
1,100.0	1,100.0	1,098.8	1,098.8	1.9	1.9	58.35	0.9	32.7	31.5	27.7	3.77	8.360 SF		
1,200.0	1,199.8	1,197.5	1,197.3	2.1	2.1	60.36	3.7	38.4	34.7	30.5	4.12	8.409		
1,300.0	1,299.7	1,296.9	1,296.2	2.2	2.3	59.72	7.9	47.1	40.7	36.2	4.48	9.074		
1,400.0	1,399.6	1,396.7	1,395.5	2.4	2.5	59.12	12.3	56.0	46.8	42.0	4.84	9.670		
1,500.0	1,499.5	1,496.5	1,494.8	2.6	2.7	58.67	16.6	64.9	53.0	47.8	5.21	10.180		
1,600.0	1,599.3	1,596.3	1,594.1	2.8	2.9	58.31	20.9	73.8	59.2	53.6	5.58	10.620		
1,700.0	1,699.2	1,696.1	1,693.4	3.0	3.1	58.02	25.3	82.7	65.4	59.5	5.94	11.004		
1,800.0	1,799.1	1,795.9	1,792.8	3.2	3.3	57.78	29.6	91.6	71.6	65.3	6.31	11.341		
1,900.0	1,899.0	1,895.8	1,892.1	3.4	3.6	57.57	33.9	100.5	77.8	71.1	6.68	11.639		
2,000.0	1,998.8	1,995.6	1,991.4	3.6	3.8	57.40	38.3	109.5	84.0	76.9	7.05	11.905		
2,100.0	2,098.7	2,095.4	2,090.7	3.8	4.0	57.25	42.6	118.4	90.2	82.7	7.43	12.143		
2,200.0	2,198.6	2,195.2	2,190.0	3.9	4.3	57.12	46.9	127.3	96.4	88.6	7.80	12.358		
2,300.0	2,298.5	2,295.0	2,289.3	4.1	4.5	57.01	51.2	136.2	102.6	94.4	8.17	12.552		
2,400.0	2,398.3	2,394.8	2,388.7	4.3	4.7	56.90	55.6	145.1	108.8	100.2	8.54	12.729		
2,500.0	2,498.2	2,494.6	2,488.0	4.5	5.0	56.81	59.9	154.0	114.9	106.0	8.92	12.891		
2,600.0	2,598.1	2,594.4	2,587.3	4.7	5.2	56.73	64.2	162.9	121.1	111.9	9.29	13.039		
2,700.0	2,698.0	2,694.2	2,686.6	4.9	5.5	56.66	68.6	171.8	127.3	117.7	9.66	13.176		
2,800.0	2,797.8	2,794.0	2,785.9	5.1	5.7	56.59	72.9	180.7	133.5	123.5	10.04	13.302		
2,900.0	2,897.7	2,893.8	2,885.2	5.3	5.9	56.53	77.2	189.6	139.7	129.3	10.41	13.419		
3,000.0	2,997.6	2,993.6	2,984.5	5.5	6.2	56.48	81.5	198.6	145.9	135.1	10.79	13.527		
3,100.0	3,097.5	3,093.4	3,083.9	5.7	6.4	56.43	85.9	207.5	152.1	141.0	11.16	13.628		
3,200.0	3,197.3	3,193.3	3,183.2	5.9	6.7	56.38	90.2	216.4	158.3	146.8	11.54	13.722		
3,300.0	3,297.2	3,293.1	3,282.5	6.1	6.9	56.34	94.5	225.3	164.5	152.6	11.91	13.811		
3,400.0	3,397.1	3,392.9	3,381.8	6.3	7.1	56.30	98.9	234.2	170.7	158.4	12.29	13.893		
3,500.0	3,497.0	3,492.7	3,481.1	6.5	7.4	56.26	103.2	243.1	176.9	164.2	12.66	13.971		
3,600.0	3,596.8	3,592.5	3,580.4	6.6	7.6	56.22	107.5	252.0	183.1	170.1	13.04	14.044		
3,700.0	3,696.7	3,692.3	3,679.7	6.8	7.9	56.19	111.9	260.9	189.3	175.9	13.41	14.113		
3,800.0	3,796.6	3,792.1	3,779.1	7.0	8.1	56.16	116.2	269.8	195.5	181.7	13.79	14.178		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 13H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 13H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 15H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	86.61	3.6	61.5	61.6				
100.0	100.0	100.0	100.0	0.1	0.1	86.61	3.6	61.5	61.6	61.3	0.28	220.626	
200.0	200.0	200.0	200.0	0.3	0.3	86.61	3.6	61.5	61.6	61.0	0.63	98.056	
300.0	300.0	300.0	300.0	0.5	0.5	86.61	3.6	61.5	61.6	60.6	0.98	63.036	
400.0	400.0	400.0	400.0	0.7	0.7	86.61	3.6	61.5	61.6	60.3	1.33	46.448	
500.0	500.0	500.0	500.0	0.8	0.8	86.61	3.6	61.5	61.6	59.9	1.68	36.771	
600.0	600.0	600.0	600.0	1.0	1.0	86.61	3.6	61.5	61.6	59.6	2.02	30.431	
700.0	700.0	700.0	700.0	1.2	1.2	86.61	3.6	61.5	61.6	59.2	2.37	25.956	
800.0	800.0	800.0	800.0	1.4	1.4	86.61	3.6	61.5	61.6	58.9	2.72	22.628	
900.0	900.0	900.0	900.0	1.5	1.5	86.61	3.6	61.5	61.6	58.5	3.07	20.057	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	86.61	3.6	61.5	61.6	58.2	3.42	18.010 CC, ES	
1,100.0	1,100.0	1,097.4	1,097.4	1.9	1.9	54.52	4.2	63.5	62.4	58.6	3.77	16.569	
1,200.0	1,199.8	1,194.7	1,194.5	2.1	2.1	56.66	5.9	69.4	65.8	61.6	4.11	15.983 SF	
1,300.0	1,299.7	1,291.6	1,290.8	2.2	2.3	57.62	8.7	79.3	73.2	68.8	4.47	16.393	
1,400.0	1,399.6	1,388.5	1,386.6	2.4	2.5	57.57	12.7	93.0	84.6	79.8	4.82	17.549	
1,500.0	1,499.5	1,487.6	1,484.5	2.6	2.7	57.30	17.1	108.3	97.3	92.1	5.18	18.772	
1,600.0	1,599.3	1,586.8	1,582.4	2.8	3.0	57.10	21.4	123.6	110.0	104.5	5.55	19.829	
1,700.0	1,699.2	1,686.0	1,680.3	3.0	3.3	56.93	25.8	138.9	122.7	116.8	5.92	20.750	
1,800.0	1,799.1	1,785.2	1,778.2	3.2	3.6	56.80	30.2	154.2	135.4	129.2	6.28	21.561	
1,900.0	1,899.0	1,884.4	1,876.1	3.4	3.9	56.69	34.6	169.5	148.2	141.5	6.65	22.278	
2,000.0	1,998.8	1,983.6	1,974.0	3.6	4.2	56.60	39.0	184.8	160.9	153.8	7.02	22.918	
2,100.0	2,098.7	2,082.8	2,071.9	3.8	4.5	56.52	43.4	200.1	173.6	166.2	7.39	23.491	
2,200.0	2,198.6	2,182.0	2,169.8	3.9	4.8	56.45	47.8	215.3	186.3	178.5	7.76	24.008	
2,300.0	2,298.5	2,281.2	2,267.8	4.1	5.1	56.39	52.1	230.6	199.0	190.9	8.13	24.476	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 13H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 13H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 16H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis			
0.0	0.0	0.0	0.0	0.0	0.0	87.74	3.6	92.3	92.3					
100.0	100.0	100.0	100.0	0.1	0.1	87.74	3.6	92.3	92.3	92.0	0.28	330.618		
200.0	200.0	200.0	200.0	0.3	0.3	87.74	3.6	92.3	92.3	91.7	0.63	146.941		
300.0	300.0	300.0	300.0	0.5	0.5	87.74	3.6	92.3	92.3	91.3	0.98	94.462		
400.0	400.0	400.0	400.0	0.7	0.7	87.74	3.6	92.3	92.3	91.0	1.33	69.604		
500.0	500.0	500.0	500.0	0.8	0.8	87.74	3.6	92.3	92.3	90.7	1.68	55.103		
600.0	600.0	600.0	600.0	1.0	1.0	87.74	3.6	92.3	92.3	90.3	2.02	45.603		
700.0	700.0	700.0	700.0	1.2	1.2	87.74	3.6	92.3	92.3	90.0	2.37	38.896		
800.0	800.0	800.0	800.0	1.4	1.4	87.74	3.6	92.3	92.3	89.6	2.72	33.910		
900.0	900.0	900.0	900.0	1.5	1.5	87.74	3.6	92.3	92.3	89.3	3.07	30.056		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	87.74	3.6	92.3	92.3	88.9	3.42	26.989 CC, ES		
1,100.0	1,100.0	1,096.2	1,096.1	1.9	1.9	55.35	4.1	94.2	93.1	89.4	3.76	24.748		
1,200.0	1,199.8	1,192.2	1,191.9	2.1	2.1	57.03	5.3	100.1	96.6	92.4	4.11	23.495		
1,300.0	1,299.7	1,287.8	1,287.0	2.2	2.3	58.09	7.3	109.9	104.1	99.6	4.46	23.347 SF		
1,400.0	1,399.6	1,382.7	1,380.9	2.4	2.5	58.53	10.1	123.5	115.7	110.9	4.81	24.051		
1,500.0	1,499.5	1,476.6	1,473.1	2.6	2.8	58.48	13.6	140.6	131.2	126.1	5.16	25.419		
1,600.0	1,599.3	1,572.0	1,566.2	2.8	3.1	58.12	17.9	161.3	150.2	144.7	5.52	27.214		
1,700.0	1,699.2	1,670.1	1,661.7	3.0	3.4	57.80	22.4	183.1	169.7	163.9	5.88	28.846		
1,800.0	1,799.1	1,768.1	1,757.2	3.2	3.8	57.54	26.9	204.9	189.3	183.0	6.25	30.283		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 13H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 13H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 9H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-117.4	117.4				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-117.4	117.4	117.1	0.28	420.459	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-117.4	117.4	116.8	0.63	186.871	
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-117.4	117.4	116.4	0.98	120.131	
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-117.4	117.4	116.1	1.33	88.518	
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-117.4	117.4	115.7	1.68	70.077	
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-117.4	117.4	115.4	2.02	57.994	
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-117.4	117.4	115.0	2.37	49.466	
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-117.4	117.4	114.7	2.72	43.124	
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-117.4	117.4	114.3	3.07	38.224	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-117.4	117.4	114.0	3.42	34.323 CC, ES	
1,100.0	1,100.0	1,095.1	1,095.1	1.9	1.9	-123.81	0.4	-119.4	120.7	116.9	3.76	32.076	
1,200.0	1,199.8	1,189.6	1,189.4	2.1	2.1	-125.02	1.4	-125.1	129.5	125.4	4.10	31.560 SF	
1,300.0	1,299.7	1,283.3	1,282.6	2.2	2.2	-125.74	3.1	-134.6	142.5	138.0	4.45	32.026	
1,400.0	1,399.6	1,376.0	1,374.3	2.4	2.5	-126.02	5.5	-147.7	159.3	154.5	4.79	33.237	
1,500.0	1,499.5	1,467.2	1,464.0	2.6	2.7	-125.96	8.5	-164.1	180.0	174.9	5.14	35.028	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 13H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 13H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB=20' @ 4890.3usft
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: LE GERKIN 13H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.65°

