

CONCHO

30-015-44118

COG Production, LLC

Lea County, NM (NAD 27)

Sec. 30, T 26 S. , R 29 E

Copperhead Fee 21H

Wellbore #1

Plan #1

Anticollision Report

29 March, 2017





Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User 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 100.00ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 10,000.00 ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic
Casing Method:	Not applied

Survey Tool Program		Date 3/29/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	16,793.04	Plan #1 (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec. 30, T 26 S. , R 29 E						
Copperhead "30" Fee #1 H - Wellbore #1 - Acutal Wellbore	6,993.84	7,952.73	328.76	277.54	6.419	CC, ES, SF
Copperhead 31 Fed Com #2H - Wellbore #1 - Wellbore #	8,335.68	13,306.00	1,683.56	1,644.44	43.031	CC, ES
Copperhead 31 Fed Com #2H - Wellbore #1 - Wellbore #	12,200.00	13,286.46	2,388.10	2,332.28	42.784	SF
PERKINS SWD #001 (4220'MD) - Wellbore #1 - Actual V	4,200.00	4,189.82	1,799.96	1,647.59	11.813	CC
PERKINS SWD #001 (4220'MD) - Wellbore #1 - Actual V	4,300.00	4,220.00	1,801.35	1,647.23	11.688	ES, SF
Ridge Nose Fed Com 1H - Wellbore #1 - Wellbore #1	6,412.23	13,030.00	669.42	559.71	6.102	CC, ES, SF

Offset Design Sec. 30, T 26 S. , R 29 E - Copperhead "30" Fee #1 H - Wellbore #1 - Acutal Wellbore #1											
Survey Program: 100-Gyro, 6496-MWD											
Offset Site Error: 0.00 ft											
Offset Well Error: 0.00 ft											
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Separation Factor
0.00	0.00	14.84	14.84	0.00	0.24	102.68	-229.17	1,018.73	1,044.19		
100.00	100.00	118.43	118.43	0.08	2.23	102.68	-229.07	1,018.46	1,043.91	1,041.60	2.31
200.00	200.00	220.05	220.05	0.31	5.71	102.65	-228.49	1,018.18	1,043.52	1,037.50	6.02
300.00	300.00	327.68	327.64	0.53	9.58	102.53	-226.12	1,017.54	1,042.45	1,032.33	10.12
400.00	400.00	425.34	425.26	0.76	13.25	102.37	-223.04	1,017.07	1,041.30	1,027.29	14.01
500.00	500.00	525.19	525.05	0.98	17.05	102.19	-219.68	1,016.73	1,040.25	1,022.22	18.03
600.00	600.00	625.62	625.43	1.21	20.97	102.02	-216.39	1,016.35	1,039.19	1,017.01	22.17
700.00	700.00	728.06	727.82	1.43	25.02	101.86	-213.34	1,015.81	1,038.06	1,011.61	26.45
800.00	800.00	834.83	834.54	1.66	29.19	101.73	-210.59	1,014.56	1,036.39	1,005.54	30.85
900.00	900.00	938.16	937.84	1.88	33.04	101.63	-208.46	1,012.72	1,034.23	999.30	34.92
1,000.00	1,000.00	1,038.65	1,038.29	2.11	36.54	101.57	-206.82	1,010.66	1,031.89	993.24	38.65
1,100.00	1,100.00	1,136.81	1,136.42	2.33	39.66	101.53	-205.74	1,008.61	1,029.62	987.62	41.99
1,200.00	1,200.00	1,233.38	1,232.97	2.56	42.15	101.53	-205.29	1,006.73	1,027.62	982.92	44.70
1,300.00	1,300.00	1,330.80	1,330.38	2.78	43.85	101.56	-205.61	1,005.01	1,025.95	979.33	46.83
1,400.00	1,400.00	1,432.94	1,432.50	3.01	45.64	101.61	-206.08	1,003.23	1,024.34	975.71	48.63
1,500.00	1,500.00	1,539.90	1,539.43	3.23	48.75	101.61	-205.70	1,000.99	1,022.22	970.26	51.96
1,600.00	1,600.00	1,642.79	1,642.29	3.46	52.59	101.57	-204.35	998.40	1,019.48	963.46	56.03
1,700.00	1,700.00	1,740.04	1,739.49	3.68	56.39	101.51	-202.88	996.10	1,016.87	956.82	60.05
1,800.00	1,800.00	1,836.83	1,836.25	3.91	60.14	101.47	-201.78	994.00	1,014.52	950.50	64.01
1,900.00	1,900.00	1,932.83	1,932.24	4.13	63.81	101.45	-200.97	992.23	1,012.54	944.64	67.90
2,000.00	2,000.00	2,022.26	2,021.66	4.35	66.61	101.43	-200.39	990.96	1,011.05	940.12	70.92

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 30, T 26 S. , R 29 E - Copperhead "30" Fee #1 H - Wellbore #1 - Acutal Wellbore #1												Offset Site Error:	0.00 ft
Survey Program: 100-Gyro, 6496-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
2,028.20	2,028.20	2,043.03	2,042.43	4.42	66.83	101.42	-200.23	990.91	1,010.94	939.73	71.21	14.197	
2,100.00	2,100.00	2,100.00	2,099.39	4.58	67.44	101.39	-199.71	991.60	1,011.62	939.64	71.98	14.054	
2,200.00	2,200.00	2,174.69	2,174.04	4.80	65.79	101.33	-199.20	993.98	1,014.54	943.97	70.57	14.376	
2,300.00	2,300.00	2,265.26	2,264.50	5.03	63.40	101.28	-199.12	998.26	1,019.14	950.72	68.42	14.896	
2,400.00	2,400.00	2,349.63	2,348.75	5.25	61.06	101.23	-199.21	1,002.88	1,024.57	958.26	66.31	15.452	
2,500.00	2,500.00	2,428.66	2,427.56	5.48	58.88	101.18	-199.44	1,008.83	1,032.00	967.64	64.36	16.035	
2,600.00	2,600.00	2,514.01	2,512.53	5.70	56.53	101.14	-200.23	1,016.74	1,041.25	979.02	62.23	16.732	
2,700.00	2,700.00	2,626.53	2,624.57	5.93	53.46	101.11	-201.65	1,026.94	1,050.38	991.02	59.36	17.696	
2,800.00	2,800.00	2,737.97	2,735.66	6.15	50.53	101.10	-203.15	1,035.71	1,058.36	1,001.75	56.61	18.697	
2,900.00	2,900.00	2,845.09	2,842.52	6.38	47.83	101.10	-204.66	1,043.01	1,065.31	1,011.22	54.09	19.697	
3,000.00	3,000.00	2,948.10	2,945.30	6.60	45.45	101.11	-206.11	1,049.67	1,071.93	1,020.07	51.87	20.667	
3,100.00	3,100.00	3,053.02	3,050.02	6.83	43.36	101.11	-207.37	1,056.04	1,078.11	1,028.18	49.93	21.593	
3,200.00	3,200.00	3,156.58	3,153.42	7.05	41.67	101.10	-208.40	1,061.91	1,083.87	1,035.49	48.39	22.400	
3,300.00	3,300.00	3,260.65	3,257.33	7.28	40.31	101.10	-209.44	1,067.48	1,089.31	1,042.14	47.17	23.094	
3,400.00	3,400.00	3,366.00	3,362.55	7.50	39.28	101.10	-210.48	1,072.61	1,094.29	1,048.02	46.27	23.650	
3,500.00	3,500.00	3,468.91	3,465.35	7.73	38.65	101.11	-211.46	1,077.18	1,098.83	1,053.05	45.78	24.002	
3,600.00	3,600.00	3,575.93	3,572.28	7.95	38.50	101.11	-212.35	1,081.58	1,103.03	1,057.25	45.77	24.098	
3,700.00	3,700.00	3,684.08	3,680.36	8.18	39.03	101.10	-212.92	1,085.24	1,106.44	1,059.99	46.46	23.817	
3,800.00	3,800.00	3,786.04	3,782.28	8.40	40.13	101.09	-213.21	1,088.22	1,109.37	1,061.63	47.74	23.236	
3,900.00	3,900.00	3,890.22	3,886.42	8.63	41.79	101.07	-213.39	1,091.06	1,112.08	1,062.48	49.60	22.422	
4,000.00	4,000.00	3,994.17	3,990.34	8.85	44.01	101.04	-213.38	1,093.51	1,114.39	1,062.37	52.02	21.421	
4,100.00	4,100.00	4,097.14	4,093.29	9.07	46.52	101.02	-213.32	1,095.63	1,116.40	1,061.64	54.75	20.389	
4,200.00	4,200.00	4,202.07	4,198.20	9.30	49.33	101.00	-213.26	1,097.40	1,118.05	1,060.24	57.80	19.342	
4,300.00	4,300.00	4,303.46	4,299.58	9.52	52.29	100.98	-213.17	1,098.84	1,119.42	1,058.42	61.00	18.350	
4,400.00	4,400.00	4,408.97	4,405.09	9.75	55.59	100.96	-213.08	1,099.99	1,120.48	1,055.93	64.54	17.360	
4,500.00	4,500.00	4,513.15	4,509.27	9.97	59.02	100.95	-212.99	1,100.66	1,121.09	1,052.86	68.23	16.431	
4,600.00	4,600.00	4,614.61	4,610.72	10.20	61.81	100.95	-212.99	1,101.04	1,121.46	1,050.19	71.27	15.736	
4,700.00	4,700.00	4,715.28	4,711.39	10.42	62.31	100.96	-213.34	1,101.27	1,121.75	1,049.75	71.99	15.581	
4,800.00	4,800.00	4,817.43	4,813.54	10.65	60.47	101.00	-214.06	1,101.27	1,121.89	1,051.52	70.37	15.944	
4,900.00	4,900.00	4,917.31	4,913.42	10.87	58.16	101.04	-214.89	1,101.17	1,121.94	1,053.69	68.26	16.437	
5,000.00	5,000.00	5,300.00	5,183.87	11.10	53.81	108.41	-345.10	1,036.73	1,105.76	1,042.66	63.10	17.523	
5,100.00	5,100.00	5,300.00	5,183.87	11.32	53.81	108.41	-345.10	1,036.73	1,094.88	1,031.56	63.33	17.290	
5,200.00	5,200.00	5,335.67	5,219.53	11.55	52.76	108.45	-345.72	1,036.36	1,092.52	1,029.97	62.55	17.467	
5,300.00	5,300.00	5,437.40	5,321.25	11.77	49.75	108.55	-347.38	1,035.17	1,091.93	1,032.02	59.91	18.227	
5,400.00	5,400.00	5,537.63	5,421.45	12.00	46.85	108.65	-349.03	1,033.92	1,091.27	1,033.89	57.37	19.020	
5,500.00	5,500.00	5,638.39	5,522.19	12.22	44.12	108.77	-350.84	1,032.59	1,090.59	1,035.56	55.03	19.818	
5,600.00	5,600.00	5,740.07	5,623.84	12.45	41.49	108.88	-352.69	1,031.08	1,089.77	1,036.97	52.81	20.638	
5,700.00	5,700.00	5,840.62	5,724.35	12.67	39.07	109.00	-354.56	1,029.45	1,088.85	1,038.06	50.78	21.441	
5,800.00	5,800.00	5,939.92	5,823.62	12.90	37.00	109.13	-356.50	1,027.82	1,087.93	1,038.81	49.13	22.145	
5,900.00	5,900.00	6,038.92	5,922.60	13.12	35.38	109.25	-358.35	1,026.33	1,087.12	1,039.22	47.91	22.691	
6,000.00	6,000.00	8,022.17	7,001.65	13.35	38.78	-166.66	-326.73	-77.50	1,042.99	991.87	51.12	20.403	
6,100.00	6,100.00	8,017.86	7,001.95	13.57	38.70	-167.38	-326.85	-73.20	948.84	897.63	51.21	18.528	
6,200.00	6,200.00	8,013.16	7,002.29	13.80	38.61	-168.17	-326.99	-68.52	855.99	804.70	51.29	16.689	
6,300.00	6,300.00	8,008.03	7,002.69	14.02	38.52	-169.03	-327.14	-63.40	764.89	713.54	51.35	14.894	
6,400.00	6,400.00	8,002.39	7,003.14	14.24	38.42	-169.99	-327.30	-57.78	676.25	624.85	51.40	13.156	
6,500.00	6,500.00	7,996.17	7,003.66	14.47	38.30	-171.05	-327.48	-51.59	591.17	539.73	51.43	11.494	
6,600.00	6,600.00	7,989.28	7,004.27	14.69	38.18	-172.23	-327.67	-44.72	511.40	459.95	51.44	9.941	
6,700.00	6,700.00	7,981.59	7,004.98	14.92	38.04	-173.55	-327.89	-37.08	439.82	388.39	51.43	8.552	
6,800.00	6,800.00	7,972.98	7,005.84	15.14	37.89	-175.03	-328.12	-28.51	381.05	329.66	51.39	7.415	
6,900.00	6,900.00	7,963.24	7,006.86	15.37	37.71	-176.72	-328.38	-18.83	341.72	290.41	51.32	6.659	
6,993.84	6,993.84	7,952.73	7,008.03	15.58	37.53	-178.54	-328.65	-8.39	328.76	277.54	51.22	6.419 CC, ES, SF	
7,000.00	7,000.00	7,951.99	7,008.11	15.59	37.52	-178.67	-328.67	-7.65	328.82	277.61	51.21	6.421	

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 30, T 26 S. , R 29 E - Copperhead "30" Fee #1 H - Wellbore #1 - Acutal Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-Gyro, 6496-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
7,100.00	7,100.00	7,939.80	7,009.50	15.82	37.32	179.22	-328.97	4.46	345.25	294.16	51.09	6.758		
7,200.00	7,200.00	7,927.52	7,010.90	16.04	37.12	177.10	-329.23	16.66	387.30	336.31	50.98	7.597		
7,300.00	7,300.00	7,915.14	7,012.32	16.27	36.92	174.98	-329.47	28.96	447.79	396.90	50.89	8.800		
7,400.00	7,400.00	7,902.66	7,013.75	16.49	36.72	172.85	-329.67	41.35	520.34	469.53	50.81	10.242		
7,500.00	7,500.00	7,890.08	7,015.20	16.72	36.53	170.73	-329.85	53.84	600.58	549.84	50.74	11.836		
7,600.00	7,600.00	7,877.40	7,016.67	16.94	36.33	168.62	-329.99	66.44	685.82	635.12	50.70	13.528		
7,700.00	7,700.00	7,864.62	7,018.16	17.17	36.14	166.52	-330.11	79.13	774.40	723.73	50.68	15.282		
7,800.00	7,800.00	7,852.84	7,019.53	17.39	35.98	164.62	-330.19	90.83	865.31	814.61	50.70	17.068		
7,900.00	7,900.00	7,841.51	7,020.85	17.62	35.83	162.82	-330.28	102.08	957.90	907.15	50.75	18.874		
8,000.00	8,000.00	7,830.22	7,022.16	17.84	35.69	161.07	-330.37	113.29	1,051.72	1,000.89	50.82	20.693		
8,100.00	8,100.00	7,818.97	7,023.47	18.07	35.56	159.36	-330.46	124.46	1,146.46	1,095.55	50.91	22.518		
8,200.00	8,200.00	7,807.76	7,024.76	18.29	35.43	157.70	-330.56	135.60	1,241.93	1,190.91	51.02	24.341		
8,300.00	8,300.00	7,796.59	7,026.06	18.52	35.30	156.08	-330.66	146.69	1,337.97	1,286.82	51.15	26.159		
8,400.00	8,400.00	7,785.46	7,027.34	18.74	35.18	154.50	-330.76	157.75	1,434.45	1,383.16	51.29	27.968		
8,500.00	8,500.00	7,774.37	7,028.62	18.96	35.07	152.98	-330.87	168.76	1,531.31	1,479.86	51.45	29.765		
8,600.00	8,600.00	7,763.21	7,029.90	19.19	34.97	151.48	-330.99	179.85	1,628.46	1,576.84	51.62	31.549		
8,700.00	8,700.00	7,751.70	7,031.23	19.41	34.88	149.99	-331.12	191.29	1,725.86	1,674.06	51.80	33.315		
8,800.00	8,800.00	7,740.14	7,032.56	19.64	34.79	148.53	-331.26	202.76	1,823.48	1,771.47	52.00	35.064		
8,900.00	8,900.00	7,728.55	7,033.90	19.86	34.71	147.11	-331.41	214.28	1,921.27	1,869.05	52.21	36.797		
9,000.00	9,000.00	7,716.91	7,035.24	20.09	34.64	145.74	-331.58	225.84	2,019.20	1,966.77	52.43	38.511		
9,100.00	9,100.00	7,705.23	7,036.60	20.31	34.57	144.41	-331.76	237.44	2,117.27	2,064.61	52.66	40.206		
9,200.00	9,200.00	7,693.51	7,037.96	20.54	34.50	143.12	-331.95	249.08	2,215.45	2,162.56	52.90	41.883		
9,300.00	9,300.00	7,681.74	7,039.33	20.76	34.45	141.87	-332.16	260.76	2,313.73	2,260.59	53.14	43.542		
9,400.00	9,400.00	7,669.93	7,040.71	20.99	34.39	140.65	-332.37	272.49	2,412.09	2,358.70	53.39	45.182		
9,500.00	9,500.00	7,658.12	7,042.08	21.21	34.35	139.48	-332.60	284.22	2,510.52	2,456.88	53.64	46.801		
9,600.00	9,600.00	7,646.32	7,043.46	21.44	34.31	138.36	-332.81	295.94	2,609.03	2,555.12	53.90	48.403		
9,700.00	9,700.00	7,634.51	7,044.84	21.66	34.27	137.27	-333.03	307.67	2,707.59	2,653.42	54.16	49.988		
9,800.00	9,800.00	7,622.70	7,046.22	21.89	34.24	136.21	-333.23	319.39	2,806.20	2,751.77	54.43	51.556		
9,900.00	9,900.00	7,610.89	7,047.59	22.11	34.21	135.20	-333.44	331.12	2,904.86	2,850.16	54.70	53.108		
10,000.00	10,000.00	7,599.08	7,048.97	22.34	34.18	134.22	-333.63	342.85	3,003.56	2,948.60	54.96	54.645		
10,100.00	10,100.00	7,587.27	7,050.35	22.56	34.15	133.27	-333.83	354.57	3,102.31	3,047.07	55.23	56.167		
10,200.00	10,200.00	7,575.47	7,051.73	22.79	34.13	132.36	-334.01	366.30	3,201.08	3,145.58	55.50	57.673		
10,300.00	10,299.89	7,575.00	7,051.78	22.98	34.12	-42.85	-334.02	366.76	3,299.67	3,245.68	53.99	61.119		
10,400.00	10,397.37	7,575.00	7,051.78	23.16	34.12	-21.85	-334.02	366.76	3,395.22	3,341.05	54.17	62.674		
10,500.00	10,488.26	7,575.00	7,051.78	23.32	34.12	-14.58	-334.02	366.76	3,483.95	3,432.17	51.78	67.281		
10,600.00	10,568.59	7,582.80	7,050.87	23.51	34.14	-10.98	-333.90	359.02	3,562.63	3,515.08	47.54	74.938		
10,700.00	10,634.85	7,605.21	7,048.26	23.77	34.19	-8.72	-333.53	336.76	3,628.45	3,586.40	42.05	86.282		
10,800.00	10,684.13	7,634.37	7,044.86	24.13	34.27	-7.23	-333.03	307.81	3,679.17	3,643.17	36.00	102.207		
10,900.00	10,714.29	7,668.92	7,040.82	24.61	34.39	-6.19	-332.39	273.50	3,713.08	3,682.55	30.53	121.607		
11,000.00	10,724.00	7,710.60	7,035.98	25.21	34.60	-5.40	-331.67	232.10	3,729.03	3,701.65	27.38	136.181		
11,100.00	10,723.25	7,751.26	7,031.28	25.88	34.88	-5.14	-331.12	191.72	3,736.51	3,709.02	27.48	135.949		
11,200.00	10,722.48	7,782.69	7,027.66	26.62	35.16	-5.08	-330.79	160.51	3,745.67	3,717.97	27.70	135.226		
11,300.00	10,721.71	7,805.94	7,024.98	27.43	35.40	-5.21	-330.57	137.41	3,756.66	3,728.64	28.02	134.086		
11,400.00	10,720.94	7,822.91	7,023.01	28.32	35.60	-5.50	-330.43	120.56	3,769.52	3,741.09	28.42	132.627		
11,500.00	10,720.17	7,833.44	7,021.79	29.25	35.73	-5.96	-330.34	110.09	3,784.26	3,755.35	28.91	130.888		
11,600.00	10,719.40	7,837.42	7,021.33	30.23	35.78	-6.60	-330.31	106.14	3,800.85	3,771.37	29.49	128.906		
11,700.00	10,718.64	7,837.14	7,021.36	31.26	35.78	-6.72	-330.31	106.42	3,819.50	3,789.57	29.93	127.614		
11,800.00	10,717.89	7,836.78	7,021.40	32.33	35.77	-6.73	-330.31	106.78	3,840.66	3,810.29	30.37	126.474		
11,900.00	10,717.13	7,836.42	7,021.44	33.47	35.77	-6.73	-330.32	107.14	3,864.29	3,833.46	30.83	125.343		
12,000.00	10,716.37	7,836.05	7,021.48	34.66	35.77	-6.74	-330.32	107.50	3,890.34	3,859.03	31.32	124.232		
12,100.00	10,715.61	7,835.68	7,021.53	35.91	35.76	-6.74	-330.32	107.87	3,918.78	3,886.96	31.82	123.147		
12,200.00	10,714.85	7,835.31	7,021.57	37.21	35.76	-6.75	-330.33	108.24	3,949.54	3,917.19	32.35	122.096		

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design											Sec. 30, T 26 S. , R 29 E - Copperhead "30" Fee #1 H - Wellbore #1 - Acutal Wellbore #1		Offset Site Error:		0.00 ft
Survey Program: 100-Gyro, 6496-MWD													Offset Well Error:		0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
12,300.00	10,714.09	7,834.94	7,021.61	38.55	35.75	-6.75	-330.33	108.61	3,982.58	3,949.69	32.89	121.083			
12,400.00	10,713.33	7,834.56	7,021.66	39.93	35.75	-6.76	-330.33	108.98	4,017.83	3,984.38	33.45	120.113			
12,500.00	10,712.57	7,834.18	7,021.70	41.34	35.74	-6.77	-330.33	109.36	4,055.25	4,021.22	34.02	119.187			
12,600.00	10,711.82	7,833.80	7,021.75	42.78	35.74	-6.77	-330.34	109.74	4,094.76	4,060.15	34.61	118.308			
12,700.00	10,711.06	7,833.41	7,021.79	44.25	35.73	-6.78	-330.34	110.12	4,136.32	4,101.11	35.21	117.475			
12,800.00	10,710.30	7,833.02	7,021.84	45.75	35.73	-6.78	-330.34	110.51	4,179.85	4,144.03	35.82	116.690			
12,900.00	10,709.54	7,832.63	7,021.88	47.27	35.72	-6.79	-330.35	110.90	4,225.31	4,188.87	36.44	115.952			
13,000.00	10,708.78	7,832.24	7,021.93	48.81	35.72	-6.80	-330.35	111.29	4,272.62	4,235.55	37.07	115.261			
13,100.00	10,708.02	7,831.84	7,021.97	50.37	35.71	-6.80	-330.35	111.68	4,321.73	4,284.02	37.71	114.614			
13,200.00	10,707.26	7,831.44	7,022.02	51.95	35.71	-6.81	-330.36	112.08	4,372.57	4,334.22	38.35	114.011			
13,300.00	10,706.50	7,831.04	7,022.07	53.54	35.70	-6.81	-330.36	112.48	4,425.09	4,386.08	39.00	113.451			
13,400.00	10,705.75	7,830.63	7,022.11	55.15	35.70	-6.82	-330.36	112.88	4,479.23	4,439.56	39.66	112.931			
13,500.00	10,704.99	7,830.23	7,022.16	56.77	35.69	-6.83	-330.37	113.29	4,534.92	4,494.59	40.33	112.450			
13,600.00	10,704.23	7,829.81	7,022.21	58.41	35.69	-6.83	-330.37	113.70	4,592.12	4,551.12	41.00	112.006			
13,700.00	10,703.47	7,829.40	7,022.26	60.05	35.68	-6.84	-330.37	114.11	4,650.76	4,609.09	41.67	111.598			
13,800.00	10,702.71	7,828.98	7,022.31	61.71	35.68	-6.85	-330.38	114.52	4,710.80	4,668.45	42.35	111.222			
13,900.00	10,701.95	7,828.56	7,022.35	63.37	35.67	-6.85	-330.38	114.94	4,772.18	4,729.14	43.04	110.879			
14,000.00	10,701.19	7,828.14	7,022.40	65.04	35.67	-6.86	-330.38	115.36	4,834.85	4,791.12	43.73	110.565			
14,100.00	10,700.43	7,827.71	7,022.45	66.73	35.66	-6.86	-330.39	115.79	4,898.75	4,854.33	44.42	110.279			
14,200.00	10,699.68	7,827.28	7,022.50	68.41	35.66	-6.87	-330.39	116.22	4,963.85	4,918.73	45.12	110.020			
14,300.00	10,698.92	7,826.84	7,022.55	70.11	35.65	-6.88	-330.39	116.65	5,030.10	4,984.28	45.82	109.785			
14,400.00	10,698.16	7,826.40	7,022.60	71.81	35.65	-6.88	-330.40	117.08	5,097.44	5,050.92	46.52	109.574			
14,500.00	10,697.40	7,825.96	7,022.66	73.52	35.64	-6.89	-330.40	117.52	5,165.85	5,118.62	47.23	109.385			
14,600.00	10,696.64	7,825.52	7,022.71	75.23	35.63	-6.90	-330.40	117.96	5,235.27	5,187.33	47.93	109.216			
14,700.00	10,695.88	7,825.07	7,022.76	76.95	35.63	-6.91	-330.41	118.41	5,305.66	5,257.02	48.65	109.067			
14,800.00	10,695.12	7,824.62	7,022.81	78.67	35.62	-6.91	-330.41	118.86	5,377.00	5,327.64	49.36	108.935			
14,900.00	10,694.36	7,824.16	7,022.87	80.40	35.62	-6.92	-330.42	119.31	5,449.23	5,399.16	50.08	108.820			
15,000.00	10,693.61	7,823.70	7,022.92	82.13	35.61	-6.93	-330.42	119.77	5,522.33	5,471.54	50.79	108.721			
15,100.00	10,692.85	7,823.24	7,022.97	83.87	35.61	-6.93	-330.42	120.23	5,596.27	5,544.75	51.51	108.637			
15,200.00	10,692.09	7,822.77	7,023.03	85.61	35.60	-6.94	-330.43	120.69	5,671.00	5,618.77	52.24	108.566			
15,300.00	10,691.33	7,822.30	7,023.08	87.35	35.60	-6.95	-330.43	121.16	5,746.50	5,693.54	52.96	108.508			
15,400.00	10,690.57	7,821.83	7,023.14	89.10	35.59	-6.95	-330.44	121.63	5,822.74	5,769.06	53.68	108.461			
15,500.00	10,689.81	7,821.35	7,023.19	90.85	35.58	-6.96	-330.44	122.10	5,899.69	5,845.28	54.41	108.426			
15,600.00	10,689.05	7,820.87	7,023.25	92.60	35.58	-6.97	-330.44	122.58	5,977.33	5,922.18	55.14	108.401			
15,700.00	10,688.29	7,820.38	7,023.30	94.36	35.57	-6.98	-330.45	123.06	6,055.61	5,999.74	55.87	108.385			
15,800.00	10,687.54	7,819.89	7,023.36	96.12	35.57	-6.98	-330.45	123.55	6,134.53	6,077.93	56.60	108.378			
15,900.00	10,686.78	7,819.40	7,023.42	97.88	35.56	-6.99	-330.46	124.04	6,214.06	6,156.72	57.34	108.379			
16,000.00	10,686.02	7,818.90	7,023.47	99.64	35.55	-7.00	-330.46	124.53	6,294.17	6,236.10	58.07	108.388			
16,100.00	10,685.26	7,818.40	7,023.53	101.41	35.55	-7.01	-330.46	125.03	6,374.84	6,316.04	58.81	108.404			
16,200.00	10,684.50	7,817.89	7,023.59	103.17	35.54	-7.01	-330.47	125.54	6,456.06	6,396.51	59.54	108.427			
16,300.00	10,683.74	7,817.38	7,023.65	104.94	35.54	-7.02	-330.47	126.04	6,537.79	6,477.51	60.28	108.455			
16,400.00	10,682.98	7,816.87	7,023.71	106.71	35.53	-7.03	-330.48	126.55	6,620.02	6,559.00	61.02	108.489			
16,500.00	10,682.22	7,816.35	7,023.77	108.49	35.52	-7.04	-330.48	127.07	6,702.74	6,640.98	61.76	108.528			
16,600.00	10,681.46	7,815.83	7,023.83	110.26	35.52	-7.05	-330.49	127.59	6,785.93	6,723.42	62.50	108.572			
16,700.00	10,680.71	7,815.30	7,023.89	112.04	35.51	-7.05	-330.49	128.11	6,869.56	6,806.31	63.24	108.620			
16,793.62	10,680.00	7,814.80	7,023.95	113.70	35.51	-7.06	-330.49	128.61	6,948.25	6,884.31	63.94	108.669			

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S., R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Sec. 30, T 26 S., R 29 E - Copperhead 31 Fed Com #2H - Wellbore #1 - Wellbore #1		Offset Site Error: 0.00 ft	
Survey Program: 100-MWD													Offset Well Error: 0.00 ft			
Reference		Offset		Semi Major Axis			Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning			
0.00	0.00	0.00	0.00	0.00	0.00	-175.78	-6,878.21	-507.00	6,896.95							
100.00	100.00	209.03	209.00	0.08	0.34	-175.76	-6,875.87	-509.26	6,896.16	6,895.74	0.42	N/A				
200.00	200.00	389.98	389.81	0.31	0.76	-175.72	-6,870.46	-513.63	6,893.23	6,892.17	1.06	6,497.321				
300.00	300.00	462.65	462.41	0.53	0.91	-175.71	-6,868.07	-515.74	6,890.17	6,888.74	1.43	4,807.370				
400.00	400.00	527.64	527.36	0.76	1.05	-175.69	-6,866.25	-517.38	6,887.58	6,885.79	1.78	3,859.949				
500.00	500.00	600.00	599.68	0.98	1.19	-175.68	-6,864.67	-519.11	6,885.55	6,883.40	2.15	3,209.455				
600.00	600.00	674.57	674.22	1.21	1.34	-175.66	-6,863.34	-520.84	6,883.91	6,881.39	2.52	2,732.411				
700.00	700.00	753.39	753.00	1.43	1.50	-175.64	-6,862.08	-522.59	6,882.48	6,879.58	2.91	2,368.686				
800.00	800.00	830.40	830.00	1.66	1.67	-175.63	-6,861.13	-524.27	6,881.42	6,878.12	3.29	2,090.949				
900.00	900.00	915.99	915.56	1.88	1.85	-175.62	-6,860.33	-525.86	6,880.63	6,876.93	3.70	1,861.615				
1,000.00	1,000.00	1,018.86	1,018.41	2.11	2.06	-175.60	-6,859.45	-527.53	6,879.89	6,875.76	4.14	1,662.976				
1,100.00	1,100.00	1,111.59	1,111.13	2.33	2.26	-175.59	-6,858.69	-528.88	6,879.19	6,874.63	4.56	1,508.961				
1,200.00	1,200.00	1,200.00	1,199.53	2.56	2.45	-175.58	-6,858.14	-530.07	6,878.68	6,873.70	4.97	1,382.949				
1,300.00	1,300.00	1,291.65	1,291.18	2.78	2.65	-175.57	-6,857.72	-531.14	6,878.30	6,872.91	5.40	1,274.638				
1,400.00	1,400.00	1,371.49	1,371.01	3.01	2.82	-175.57	-6,857.53	-531.48	6,878.09	6,872.30	5.79	1,187.407				
1,417.52	1,417.52	1,385.19	1,384.71	3.05	2.85	-175.57	-6,857.53	-531.42	6,878.09	6,872.23	5.86	1,173.473				
1,500.00	1,500.00	1,455.17	1,454.69	3.23	3.00	-175.57	-6,857.65	-530.78	6,878.17	6,871.97	6.20	1,109.950				
1,600.00	1,600.00	1,560.16	1,559.68	3.46	3.21	-175.59	-6,857.98	-529.38	6,878.38	6,871.74	6.64	1,035.772				
1,700.00	1,700.00	13,306.00	8,302.87	3.68	92.90	-161.23	-1,594.04	-541.70	6,845.92	6,821.71	24.21	282.774				
1,800.00	1,800.00	13,306.00	8,302.87	3.91	92.90	-161.23	-1,594.04	-541.70	6,749.03	6,724.60	24.43	276.208				
1,900.00	1,900.00	13,306.00	8,302.87	4.13	92.90	-161.23	-1,594.04	-541.70	6,652.24	6,627.58	24.66	269.765				
2,000.00	2,000.00	13,306.00	8,302.87	4.35	92.90	-161.23	-1,594.04	-541.70	6,555.55	6,530.66	24.88	263.443				
2,100.00	2,100.00	13,306.00	8,302.87	4.58	92.90	-161.23	-1,594.04	-541.70	6,458.95	6,433.84	25.11	257.238				
2,200.00	2,200.00	13,306.00	8,302.87	4.80	92.90	-161.23	-1,594.04	-541.70	6,362.46	6,337.13	25.33	251.147				
2,300.00	2,300.00	13,306.00	8,302.87	5.03	92.90	-161.23	-1,594.04	-541.70	6,266.08	6,240.52	25.56	245.167				
2,400.00	2,400.00	13,306.00	8,302.87	5.25	92.90	-161.23	-1,594.04	-541.70	6,169.82	6,144.03	25.78	239.296				
2,500.00	2,500.00	13,306.00	8,302.87	5.48	92.90	-161.23	-1,594.04	-541.70	6,073.67	6,047.67	26.01	233.531				
2,600.00	2,600.00	13,306.00	8,302.87	5.70	92.90	-161.23	-1,594.04	-541.70	5,977.66	5,951.42	26.23	227.870				
2,700.00	2,700.00	13,306.00	8,302.87	5.93	92.90	-161.23	-1,594.04	-541.70	5,881.77	5,855.31	26.46	222.310				
2,800.00	2,800.00	13,306.00	8,302.87	6.15	92.90	-161.23	-1,594.04	-541.70	5,786.03	5,759.34	26.68	216.849				
2,900.00	2,900.00	13,306.00	8,302.87	6.38	92.90	-161.23	-1,594.04	-541.70	5,690.43	5,663.52	26.91	211.485				
3,000.00	3,000.00	13,306.00	8,302.87	6.60	92.90	-161.23	-1,594.04	-541.70	5,594.98	5,567.85	27.13	206.215				
3,100.00	3,100.00	13,306.00	8,302.87	6.83	92.90	-161.23	-1,594.04	-541.70	5,499.70	5,472.34	27.36	201.038				
3,200.00	3,200.00	13,306.00	8,302.87	7.05	92.90	-161.23	-1,594.04	-541.70	5,404.59	5,377.01	27.58	195.951				
3,300.00	3,300.00	13,306.00	8,302.87	7.28	92.90	-161.23	-1,594.04	-541.70	5,309.65	5,281.85	27.81	190.953				
3,400.00	3,400.00	13,306.00	8,302.87	7.50	92.90	-161.23	-1,594.04	-541.70	5,214.91	5,186.88	28.03	186.042				
3,500.00	3,500.00	13,306.00	8,302.87	7.73	92.90	-161.23	-1,594.04	-541.70	5,120.37	5,092.11	28.26	181.216				
3,600.00	3,600.00	13,306.00	8,302.87	7.95	92.90	-161.23	-1,594.04	-541.70	5,026.03	4,997.55	28.48	176.474				
3,700.00	3,700.00	13,306.00	8,302.87	8.18	92.90	-161.23	-1,594.04	-541.70	4,931.92	4,903.22	28.71	171.813				
3,800.00	3,800.00	13,306.00	8,302.87	8.40	92.90	-161.23	-1,594.04	-541.70	4,838.05	4,809.12	28.93	167.234				
3,900.00	3,900.00	13,306.00	8,302.87	8.63	92.90	-161.23	-1,594.04	-541.70	4,744.43	4,715.28	29.15	162.733				
4,000.00	4,000.00	13,306.00	8,302.87	8.85	92.90	-161.23	-1,594.04	-541.70	4,651.07	4,621.69	29.38	158.310				
4,100.00	4,100.00	13,306.00	8,302.87	9.07	92.90	-161.23	-1,594.04	-541.70	4,558.00	4,528.39	29.60	153.965				
4,200.00	4,200.00	13,306.00	8,302.87	9.30	92.90	-161.23	-1,594.04	-541.70	4,465.22	4,435.39	29.83	149.694				
4,300.00	4,300.00	13,306.00	8,302.87	9.52	92.90	-161.23	-1,594.04	-541.70	4,372.76	4,342.71	30.05	145.498				
4,400.00	4,400.00	13,306.00	8,302.87	9.75	92.90	-161.23	-1,594.04	-541.70	4,280.65	4,250.37	30.28	141.376				
4,500.00	4,500.00	13,306.00	8,302.87	9.97	92.90	-161.23	-1,594.04	-541.70	4,188.89	4,158.39	30.50	137.326				
4,600.00	4,600.00	13,306.00	8,302.87	10.20	92.90	-161.23	-1,594.04	-541.70	4,097.52	4,066.79	30.73	133.348				
4,700.00	4,700.00	13,306.00	8,302.87	10.42	92.90	-161.23	-1,594.04	-541.70	4,006.56	3,975.61	30.95	129.441				
4,800.00	4,800.00	13,306.00	8,302.87	10.65	92.90	-161.23	-1,594.04	-541.70	3,916.04	3,884.87	31.18	125.605				
4,900.00	4,900.00	13,306.00	8,302.87	10.87	92.90	-161.23	-1,594.04	-541.70	3,826.00	3,794.60	31.40	121.838				
5,000.00	5,000.00	13,306.00	8,302.87	11.10	92.90	-161.23	-1,594.04	-541.70	3,736.46	3,704.83	31.63	118.141				

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S., R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Sec. 30, T 26 S., R 29 E - Copperhead 31 Fed Com #2H - Wellbore #1 - Wellbore #1													Offset Well Error:	0.00 ft
Survey Program: 100-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,100.00	5,100.00	13,306.00	8,302.87	11.32	92.90	-161.23	-1,594.04	-541.70	3,847.46	3,615.61	31.85	114.513		
5,200.00	5,200.00	13,306.00	8,302.87	11.55	92.90	-161.23	-1,594.04	-541.70	3,559.05	3,526.98	32.08	110.955		
5,300.00	5,300.00	13,306.00	8,302.87	11.77	92.90	-161.23	-1,594.04	-541.70	3,471.27	3,438.97	32.30	107.465		
5,400.00	5,400.00	13,306.00	8,302.87	12.00	92.90	-161.23	-1,594.04	-541.70	3,384.17	3,351.64	32.53	104.044		
5,500.00	5,500.00	13,306.00	8,302.87	12.22	92.90	-161.23	-1,594.04	-541.70	3,297.79	3,265.04	32.75	100.693		
5,600.00	5,600.00	13,306.00	8,302.87	12.45	92.90	-161.23	-1,594.04	-541.70	3,212.21	3,179.24	32.98	97.412		
5,700.00	5,700.00	13,306.00	8,302.87	12.67	92.90	-161.23	-1,594.04	-541.70	3,127.49	3,094.29	33.20	94.200		
5,800.00	5,800.00	13,306.00	8,302.87	12.90	92.90	-161.23	-1,594.04	-541.70	3,043.69	3,010.26	33.43	91.060		
5,900.00	5,900.00	13,306.00	8,302.87	13.12	92.90	-161.23	-1,594.04	-541.70	2,960.90	2,927.25	33.65	87.991		
6,000.00	6,000.00	13,306.00	8,302.87	13.35	92.90	-161.23	-1,594.04	-541.70	2,879.20	2,845.32	33.87	84.995		
6,100.00	6,100.00	13,306.00	8,302.87	13.57	92.90	-161.23	-1,594.04	-541.70	2,798.68	2,764.59	34.10	82.074		
6,200.00	6,200.00	13,306.00	8,302.87	13.80	92.90	-161.23	-1,594.04	-541.70	2,719.47	2,685.14	34.32	79.229		
6,300.00	6,300.00	13,306.00	8,302.87	14.02	92.90	-161.23	-1,594.04	-541.70	2,641.66	2,607.11	34.55	76.461		
6,400.00	6,400.00	13,306.00	8,302.87	14.24	92.90	-161.23	-1,594.04	-541.70	2,565.39	2,530.62	34.77	73.774		
6,500.00	6,500.00	13,306.00	8,302.87	14.47	92.90	-161.23	-1,594.04	-541.70	2,490.80	2,455.80	35.00	71.169		
6,600.00	6,600.00	13,306.00	8,302.87	14.69	92.90	-161.23	-1,594.04	-541.70	2,418.05	2,382.83	35.22	68.649		
6,700.00	6,700.00	13,306.00	8,302.87	14.92	92.90	-161.23	-1,594.04	-541.70	2,347.30	2,311.85	35.45	66.218		
6,800.00	6,800.00	13,306.00	8,302.87	15.14	92.90	-161.23	-1,594.04	-541.70	2,278.75	2,243.07	35.67	63.879		
6,900.00	6,900.00	13,306.00	8,302.87	15.37	92.90	-161.23	-1,594.04	-541.70	2,212.59	2,176.69	35.90	61.636		
7,000.00	7,000.00	13,306.00	8,302.87	15.59	92.90	-161.23	-1,594.04	-541.70	2,149.05	2,112.93	36.12	59.494		
7,100.00	7,100.00	13,306.00	8,302.87	15.82	92.90	-161.23	-1,594.04	-541.70	2,088.37	2,052.02	36.35	57.456		
7,200.00	7,200.00	13,306.00	8,302.87	16.04	92.90	-161.23	-1,594.04	-541.70	2,030.80	1,994.23	36.57	55.529		
7,300.00	7,300.00	13,306.00	8,302.87	16.27	92.90	-161.23	-1,594.04	-541.70	1,976.62	1,939.82	36.80	53.717		
7,400.00	7,400.00	13,306.00	8,302.87	16.49	92.90	-161.23	-1,594.04	-541.70	1,926.10	1,889.08	37.02	52.027		
7,500.00	7,500.00	13,306.00	8,302.87	16.72	92.90	-161.23	-1,594.04	-541.70	1,879.56	1,842.31	37.25	50.463		
7,600.00	7,600.00	13,306.00	8,302.87	16.94	92.90	-161.23	-1,594.04	-541.70	1,837.28	1,799.81	37.47	49.032		
7,700.00	7,700.00	13,306.00	8,302.87	17.17	92.90	-161.23	-1,594.04	-541.70	1,799.58	1,761.88	37.70	47.739		
7,800.00	7,800.00	13,306.00	8,302.87	17.39	92.90	-161.23	-1,594.04	-541.70	1,766.73	1,728.81	37.92	46.590		
7,900.00	7,900.00	13,306.00	8,302.87	17.62	92.90	-161.23	-1,594.04	-541.70	1,739.02	1,700.88	38.15	45.589		
8,000.00	8,000.00	13,306.00	8,302.87	17.84	92.90	-161.23	-1,594.04	-541.70	1,716.70	1,678.33	38.37	44.741		
8,100.00	8,100.00	13,306.00	8,302.87	18.07	92.90	-161.23	-1,594.04	-541.70	1,699.98	1,661.38	38.59	44.047		
8,200.00	8,200.00	13,306.00	8,302.87	18.29	92.90	-161.23	-1,594.04	-541.70	1,689.02	1,650.20	38.82	43.510		
8,300.00	8,300.00	13,306.00	8,302.87	18.52	92.90	-161.23	-1,594.04	-541.70	1,683.94	1,644.90	39.04	43.129		
8,335.68	8,335.68	13,306.00	8,302.87	18.60	92.90	-161.23	-1,594.04	-541.70	1,683.56	1,644.44	39.12	43.031 CC, ES		
8,400.00	8,400.00	13,306.00	8,302.87	18.74	92.90	-161.23	-1,594.04	-541.70	1,684.79	1,645.52	39.27	42.904		
8,500.00	8,500.00	13,306.00	8,302.87	18.96	92.90	-161.23	-1,594.04	-541.70	1,691.56	1,652.07	39.49	42.831		
8,600.00	8,600.00	13,306.00	8,302.87	19.19	92.90	-161.23	-1,594.04	-541.70	1,704.19	1,664.47	39.72	42.906		
8,700.00	8,700.00	13,306.00	8,302.87	19.41	92.90	-161.23	-1,594.04	-541.70	1,722.53	1,682.59	39.94	43.124		
8,800.00	8,800.00	13,306.00	8,302.87	19.64	92.90	-161.23	-1,594.04	-541.70	1,746.42	1,706.25	40.17	43.478		
8,900.00	8,900.00	13,306.00	8,302.87	19.86	92.90	-161.23	-1,594.04	-541.70	1,775.63	1,735.23	40.39	43.959		
9,000.00	9,000.00	13,306.00	8,302.87	20.09	92.90	-161.23	-1,594.04	-541.70	1,809.89	1,769.28	40.62	44.559		
9,100.00	9,100.00	13,306.00	8,302.87	20.31	92.90	-161.23	-1,594.04	-541.70	1,848.94	1,808.10	40.84	45.270		
9,200.00	9,200.00	13,306.00	8,302.87	20.54	92.90	-161.23	-1,594.04	-541.70	1,892.47	1,851.40	41.07	46.082		
9,300.00	9,300.00	13,306.00	8,302.87	20.76	92.90	-161.23	-1,594.04	-541.70	1,940.18	1,898.89	41.29	46.987		
9,400.00	9,400.00	13,306.00	8,302.87	20.99	92.90	-161.23	-1,594.04	-541.70	1,991.78	1,950.26	41.52	47.975		
9,500.00	9,500.00	13,306.00	8,302.87	21.21	92.90	-161.23	-1,594.04	-541.70	2,046.96	2,005.22	41.74	49.039		
9,600.00	9,600.00	13,306.00	8,302.87	21.44	92.90	-161.23	-1,594.04	-541.70	2,105.45	2,063.48	41.97	50.170		
9,700.00	9,700.00	13,306.00	8,302.87	21.66	92.90	-161.23	-1,594.04	-541.70	2,166.97	2,124.78	42.19	51.361		
9,800.00	9,800.00	13,306.00	8,302.87	21.89	92.90	-161.23	-1,594.04	-541.70	2,231.28	2,188.87	42.42	52.605		
9,900.00	9,900.00	13,306.00	8,302.87	22.11	92.90	-161.23	-1,594.04	-541.70	2,298.15	2,255.51	42.64	53.896		
10,000.00	10,000.00	13,306.00	8,302.87	22.34	92.90	-161.23	-1,594.04	-541.70	2,367.35	2,324.49	42.87	55.228		
10,100.00	10,100.00	13,306.00	8,302.87	22.56	92.90	-161.23	-1,594.04	-541.70	2,438.69	2,395.60	43.09	56.595		

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Production, LLC
Project: Lea County, NM (NAD 27)
Reference Site: Sec. 30, T 26 S., R 29 E
Site Error: 0.00 ft
Reference Well: Copperhead Fee 21H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Copperhead Fee 21H
TVD Reference: KB=25' @ 2953.81ft
MD Reference: KB=25' @ 2953.81ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 30, T 26 S., R 29 E - Copperhead 31 Fed Com #2H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
10,200.00	10,200.00	13,306.00	8,302.87	22.79	92.90	-161.23	-1,594.04	-541.70	2,511.99	2,468.67	43.31	57.994		
10,300.00	10,299.89	13,306.00	8,302.87	22.98	92.90	-5.37	-1,594.04	-541.70	2,585.06	2,526.44	58.62	44.101		
10,400.00	10,397.37	13,306.00	8,302.87	23.16	92.90	-4.56	-1,594.04	-541.70	2,646.45	2,587.80	58.65	45.124		
10,500.00	10,488.26	13,306.00	8,302.87	23.32	92.90	-4.08	-1,594.04	-541.70	2,693.01	2,635.54	57.48	46.854		
10,600.00	10,568.59	13,306.00	8,302.87	23.51	92.90	-3.82	-1,594.04	-541.70	2,723.51	2,668.00	55.51	49.063		
10,700.00	10,634.85	13,306.00	8,302.87	23.77	92.90	-3.71	-1,594.04	-541.70	2,737.15	2,683.92	53.23	51.421		
10,800.00	10,684.13	13,306.00	8,302.87	24.13	92.90	-3.74	-1,594.04	-541.70	2,733.60	2,682.38	51.23	53.364		
10,900.00	10,714.29	13,306.00	8,302.87	24.61	92.90	-3.91	-1,594.04	-541.70	2,712.95	2,662.72	50.22	54.018		
11,000.00	10,724.00	13,306.00	8,302.87	25.21	92.90	-4.25	-1,594.04	-541.70	2,675.71	2,624.74	50.98	52.490		
11,100.00	10,723.25	13,306.00	8,302.87	25.88	92.90	-2.33	-1,594.04	-541.70	2,631.75	2,580.81	50.84	51.764		
11,200.00	10,722.48	13,306.00	8,302.87	26.62	92.90	-0.56	-1,594.04	-541.70	2,590.64	2,539.70	50.94	50.860		
11,300.00	10,721.71	13,306.00	8,302.87	27.43	92.90	1.05	-1,594.04	-541.70	2,552.71	2,501.46	51.25	49.807		
11,400.00	10,720.94	13,306.00	8,302.87	28.32	92.90	2.49	-1,594.04	-541.70	2,518.30	2,466.55	51.75	48.660		
11,500.00	10,720.17	13,306.00	8,302.87	29.25	92.90	3.74	-1,594.04	-541.70	2,487.73	2,435.34	52.39	47.486		
11,600.00	10,719.40	13,306.00	8,302.87	30.23	92.90	4.80	-1,594.04	-541.70	2,461.29	2,408.19	53.10	46.349		
11,700.00	10,718.64	13,306.00	8,302.87	31.26	92.90	4.95	-1,594.04	-541.70	2,439.03	2,385.46	53.56	45.534		
11,800.00	10,717.89	13,306.00	8,302.87	32.33	92.90	4.95	-1,594.04	-541.70	2,420.70	2,366.70	54.00	44.828		
11,900.00	10,717.13	13,306.00	8,302.87	33.47	92.90	4.95	-1,594.04	-541.70	2,406.38	2,351.93	54.46	44.187		
12,000.00	10,716.37	13,306.00	8,302.87	34.66	92.90	4.95	-1,594.04	-541.70	2,396.16	2,341.22	54.94	43.614		
12,100.00	10,715.61	13,306.00	8,302.87	35.91	92.90	4.95	-1,594.04	-541.70	2,390.09	2,334.65	55.44	43.110		
12,200.00	10,714.85	13,286.46	8,302.85	37.21	92.56	4.95	-1,613.58	-541.75	2,388.10	2,332.28	55.82	42.784 SF		
12,300.00	10,714.09	13,193.86	8,302.58	38.55	90.97	4.95	-1,706.37	-541.96	2,387.63	2,331.95	55.67	42.888		
12,375.42	10,713.52	13,123.59	8,302.14	39.59	89.78	4.93	-1,776.44	-541.97	2,387.47	2,331.90	55.57	42.966		
12,400.00	10,713.33	13,116.00	8,302.07	39.93	89.65	4.93	-1,784.03	-541.36	2,387.50	2,331.86	55.64	42.906		
12,500.00	10,712.57	13,037.27	8,300.72	41.34	88.31	4.87	-1,862.73	-539.36	2,388.29	2,332.68	55.61	42.946		
12,600.00	10,711.82	12,916.90	8,297.59	42.78	86.29	4.70	-1,982.86	-532.63	2,389.69	2,334.45	55.24	43.259		
12,700.00	10,711.06	12,793.60	8,296.49	44.25	84.18	4.50	-2,105.88	-524.56	2,389.13	2,334.28	54.85	43.554		
12,719.33	10,710.91	12,781.49	8,296.37	44.54	83.98	4.48	-2,117.98	-523.95	2,389.10	2,334.23	54.88	43.536		
12,800.00	10,710.30	12,723.87	8,295.35	45.75	82.99	4.42	-2,175.54	-521.66	2,389.61	2,334.69	54.92	43.513		
12,900.00	10,709.54	12,597.04	8,294.44	47.27	80.84	4.39	-2,302.35	-520.85	2,389.35	2,334.76	54.59	43.770		
12,911.12	10,709.46	12,588.94	8,294.40	47.44	80.70	4.39	-2,310.45	-520.96	2,389.34	2,334.74	54.60	43.762		
13,000.00	10,708.78	12,510.00	8,293.44	48.81	79.36	4.43	-2,389.36	-522.67	2,389.82	2,335.24	54.58	43.783		
13,100.00	10,708.02	12,459.23	8,292.26	50.37	78.51	4.47	-2,440.09	-524.49	2,391.44	2,336.59	54.85	43.599		
13,200.00	10,707.26	12,384.40	8,289.55	51.95	77.26	4.54	-2,514.78	-528.11	2,394.59	2,339.63	54.96	43.566		
13,300.00	10,706.50	12,271.80	8,285.26	53.54	75.42	4.64	-2,627.20	-532.82	2,397.96	2,343.14	54.82	43.743		
13,400.00	10,705.75	12,090.13	8,281.90	55.15	72.49	4.77	-2,808.72	-538.90	2,399.35	2,345.16	54.19	44.274		
13,500.00	10,704.99	11,939.00	8,283.54	56.77	70.01	4.82	-2,959.82	-541.22	2,397.49	2,343.72	53.77	44.590		
13,600.00	10,704.23	11,843.00	8,285.31	58.41	68.40	4.87	-3,055.77	-543.44	2,395.06	2,341.31	53.75	44.560		
13,700.00	10,703.47	11,766.32	8,285.98	60.05	67.13	4.94	-3,132.38	-546.57	2,393.61	2,339.73	53.88	44.422		
13,800.00	10,702.71	11,689.45	8,286.58	61.71	65.84	5.04	-3,209.12	-550.94	2,392.58	2,338.54	54.03	44.279		
13,831.93	10,702.47	11,666.90	8,286.59	62.24	65.46	5.07	-3,231.63	-552.37	2,392.50	2,338.40	54.10	44.225		
13,900.00	10,701.95	11,625.10	8,286.32	63.37	64.76	5.13	-3,273.34	-555.15	2,392.81	2,338.53	54.28	44.084		
14,000.00	10,701.19	11,558.00	8,284.80	65.04	63.65	5.23	-3,340.27	-559.63	2,394.78	2,340.27	54.51	43.933		
14,100.00	10,700.43	11,475.41	8,282.02	66.73	62.32	5.34	-3,422.65	-564.70	2,397.86	2,343.22	54.64	43.884		
14,200.00	10,699.68	11,323.97	8,279.14	68.41	59.86	5.52	-3,573.85	-572.80	2,399.21	2,344.91	54.31	44.179		
14,300.00	10,698.92	11,247.20	8,277.73	70.11	58.59	5.61	-3,650.50	-576.78	2,400.78	2,346.29	54.48	44.065		
14,400.00	10,698.16	11,107.78	8,274.70	71.81	56.37	5.75	-3,789.73	-583.39	2,402.89	2,348.66	54.24	44.304		
14,500.00	10,697.40	10,991.14	8,280.59	73.52	52.97	5.98	-4,006.03	-593.24	2,398.73	2,345.24	53.49	44.840		
14,600.00	10,696.64	10,759.51	8,288.21	75.23	50.83	5.99	-4,137.40	-593.08	2,391.73	2,338.46	53.26	44.903		
14,700.00	10,695.88	10,697.00	8,289.51	76.95	49.78	5.93	-4,199.83	-590.31	2,387.76	2,334.27	53.49	44.639		
14,800.00	10,695.12	10,697.00	8,289.51	78.67	49.78	5.93	-4,199.83	-590.31	2,385.61	2,331.42	54.19	44.019		
14,828.66	10,694.91	10,669.68	8,289.26	79.17	49.33	5.89	-4,227.11	-588.84	2,385.50	2,331.31	54.19	44.025		

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 30, T 26 S. , R 29 E - Copperhead 31 Fed Com #2H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
14,900.00	10,694.36	10,628.17	8,288.46	80.40	48.63	5.84	-4,268.56	-586.81	2,385.95	2,331.58	54.37	43.884		
15,000.00	10,693.61	10,559.87	8,286.22	82.13	47.51	5.76	-4,336.77	-583.98	2,387.96	2,333.40	54.56	43.769		
15,100.00	10,692.85	10,465.92	8,282.37	83.87	46.01	5.67	-4,430.59	-581.03	2,390.92	2,336.36	54.57	43.817		
15,200.00	10,692.09	10,318.05	8,278.20	85.61	43.72	5.62	-4,578.39	-579.36	2,392.87	2,338.65	54.22	44.135		
15,300.00	10,691.33	10,219.00	8,277.34	87.35	42.15	5.62	-4,677.43	-579.86	2,393.01	2,338.76	54.24	44.116		
15,400.00	10,690.57	10,147.09	8,276.32	89.10	40.99	5.63	-4,749.32	-580.75	2,393.95	2,339.48	54.47	43.951		
15,500.00	10,689.81	10,081.25	8,273.93	90.85	39.96	5.64	-4,815.12	-581.42	2,396.82	2,342.09	54.73	43.790		
15,600.00	10,689.05	9,838.00	8,270.81	92.60	36.36	5.84	-5,058.04	-590.85	2,398.26	2,344.35	53.91	44.490		
15,700.00	10,688.29	9,786.71	8,272.50	94.36	35.25	5.93	-5,129.20	-594.68	2,395.86	2,341.67	54.19	44.209		
15,758.76	10,687.85	9,743.00	8,272.62	95.39	34.88	5.96	-5,152.89	-595.73	2,395.47	2,341.00	54.47	43.976		
15,800.00	10,687.54	9,715.72	8,272.47	96.12	34.46	5.98	-5,180.14	-596.78	2,395.58	2,340.98	54.60	43.874		
15,900.00	10,686.78	9,647.00	8,270.55	97.88	33.42	6.01	-5,248.81	-598.46	2,397.56	2,342.67	54.89	43.682		
16,000.00	10,686.02	9,591.56	8,268.05	99.64	32.64	6.02	-5,304.19	-599.10	2,401.01	2,345.76	55.25	43.454		
16,100.00	10,685.26	9,361.00	8,266.56	101.41	29.37	5.99	-5,534.66	-598.64	2,399.06	2,344.55	54.51	44.008		
16,200.00	10,684.50	9,283.39	8,266.59	103.17	28.31	5.94	-5,612.24	-596.66	2,397.98	2,343.24	54.75	43.803		
16,300.00	10,683.74	9,141.03	8,267.45	104.94	26.44	5.88	-5,754.57	-594.30	2,396.38	2,341.77	54.61	43.880		
16,400.00	10,682.98	9,059.74	8,268.26	106.71	25.39	5.84	-5,835.85	-593.02	2,394.44	2,339.57	54.87	43.640		
16,500.00	10,682.22	8,973.23	8,268.38	108.49	24.33	5.77	-5,922.31	-590.07	2,393.16	2,338.07	55.10	43.437		
16,600.00	10,681.46	8,880.00	8,268.09	110.26	23.23	5.68	-6,015.47	-586.55	2,392.31	2,337.00	55.31	43.255		
16,700.00	10,680.71	8,781.01	8,267.80	112.04	22.11	5.62	-6,114.43	-584.36	2,391.60	2,336.06	55.54	43.060		
16,793.62	10,680.00	8,697.77	8,267.41	113.70	21.20	5.59	-6,197.67	-583.28	2,391.18	2,335.33	55.85	42.817		

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S., R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 30, T 26 S., R 29 E - PERKINS SWD #001 (4220'MD) - Wellbore #1 - Actual Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 500-INC-ONLY													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
0.00	0.00	0.00	0.00	0.00	0.00	-169.38	-1,769.14	-331.69	1,800.00					
100.00	100.00	89.19	89.19	0.08	1.97	-169.38	-1,769.14	-331.69	1,799.96	1,797.91	2.06	874.961		
200.00	200.00	189.19	189.19	0.31	4.19	-169.38	-1,769.14	-331.69	1,799.96	1,795.47	4.49	400.536		
300.00	300.00	289.19	289.19	0.53	6.40	-169.38	-1,769.14	-331.69	1,799.96	1,793.03	6.93	259.713		
400.00	400.00	389.19	389.19	0.76	8.61	-169.38	-1,769.14	-331.69	1,799.96	1,790.60	9.37	192.155		
500.00	500.00	500.00	500.00	0.98	11.06	-169.38	-1,769.14	-331.69	1,800.00	1,787.95	12.04	149.464		
537.37	537.37	526.57	526.57	1.07	11.92	-169.38	-1,769.14	-331.69	1,799.96	1,786.98	12.98	138.652		
600.00	600.00	589.19	589.19	1.21	13.93	-169.38	-1,769.14	-331.69	1,799.96	1,784.83	15.14	118.903		
700.00	700.00	689.19	689.19	1.43	17.15	-169.38	-1,769.14	-331.69	1,799.96	1,781.38	18.58	96.871		
800.00	800.00	790.00	789.82	1.66	20.39	-169.38	-1,769.14	-331.69	1,799.96	1,777.91	22.05	81.632		
833.54	833.54	822.92	822.74	1.73	21.11	-169.38	-1,769.14	-331.69	1,799.96	1,777.12	22.85	78.786		
900.00	900.00	889.37	889.19	1.88	22.57	-169.38	-1,769.14	-331.69	1,799.96	1,775.51	24.45	73.614		
1,000.00	1,000.00	989.37	989.19	2.11	24.76	-169.38	-1,769.14	-331.69	1,799.96	1,773.10	26.87	66.996		
1,100.00	1,100.00	1,100.00	1,099.80	2.33	27.18	-169.38	-1,769.14	-331.69	1,800.00	1,770.48	29.52	60.986		
1,137.29	1,137.29	1,126.68	1,126.48	2.42	27.69	-169.38	-1,769.14	-331.69	1,799.96	1,769.86	30.10	59.794		
1,200.00	1,200.00	1,189.39	1,189.19	2.56	28.87	-169.38	-1,769.14	-331.69	1,799.96	1,768.54	31.43	57.272		
1,300.00	1,300.00	1,289.39	1,289.19	2.78	30.76	-169.38	-1,769.14	-331.69	1,799.96	1,766.42	33.54	53.663		
1,400.00	1,400.00	1,389.39	1,389.19	3.01	32.65	-169.38	-1,769.14	-331.69	1,799.96	1,764.31	35.66	50.482		
1,500.00	1,500.00	1,489.39	1,489.19	3.23	34.54	-169.38	-1,769.14	-331.69	1,799.96	1,762.19	37.77	47.657		
1,600.00	1,600.00	1,589.44	1,589.19	3.46	36.45	-169.38	-1,769.14	-331.69	1,799.96	1,760.05	39.91	45.101		
1,700.00	1,700.00	1,689.44	1,689.19	3.68	38.41	-169.38	-1,769.14	-331.69	1,799.96	1,757.88	42.09	42.767		
1,800.00	1,800.00	1,789.44	1,789.19	3.91	40.36	-169.38	-1,769.14	-331.69	1,799.96	1,755.70	44.27	40.663		
1,900.00	1,900.00	1,889.44	1,889.19	4.13	42.31	-169.38	-1,769.14	-331.69	1,799.96	1,753.52	46.44	38.756		
2,000.00	2,000.00	1,989.44	1,989.19	4.35	44.27	-169.38	-1,769.14	-331.69	1,799.96	1,751.34	48.62	37.019		
2,100.00	2,100.00	2,089.44	2,089.19	4.58	46.75	-169.38	-1,769.14	-331.69	1,799.96	1,748.64	51.33	35.069		
2,200.00	2,200.00	2,189.44	2,189.19	4.80	50.19	-169.38	-1,769.14	-331.69	1,799.96	1,744.97	54.99	32.732		
2,300.00	2,300.00	2,289.44	2,289.19	5.03	53.62	-169.38	-1,769.14	-331.69	1,799.96	1,741.31	58.65	30.688		
2,400.00	2,400.00	2,389.44	2,389.19	5.25	57.06	-169.38	-1,769.14	-331.69	1,799.96	1,737.65	62.32	28.884		
2,500.00	2,500.00	2,489.44	2,489.19	5.48	60.50	-169.38	-1,769.14	-331.69	1,799.96	1,733.98	65.98	27.280		
2,600.00	2,600.00	2,600.00	2,599.69	5.70	64.30	-169.38	-1,769.14	-331.69	1,799.99	1,729.99	70.01	25.712		
2,637.24	2,637.24	2,626.75	2,626.44	5.79	65.56	-169.38	-1,769.14	-331.69	1,799.96	1,728.62	71.35	25.228		
2,700.00	2,700.00	2,689.51	2,689.19	5.93	68.51	-169.38	-1,769.14	-331.69	1,799.96	1,725.52	74.44	24.180		
2,800.00	2,800.00	2,789.51	2,789.19	6.15	73.22	-169.38	-1,769.14	-331.69	1,799.96	1,720.60	79.37	22.679		
2,900.00	2,900.00	2,889.51	2,889.19	6.38	77.92	-169.38	-1,769.14	-331.69	1,799.96	1,715.67	84.30	21.353		
3,000.00	3,000.00	3,100.00	3,099.38	6.60	87.82	-169.38	-1,769.14	-331.69	1,803.33	1,708.91	94.42	19.099		
3,100.00	3,100.00	3,100.00	3,099.38	6.83	87.82	-169.38	-1,769.14	-331.69	1,799.99	1,705.35	94.64	19.019		
3,137.11	3,137.11	3,126.93	3,126.31	6.91	89.18	-169.38	-1,769.14	-331.69	1,799.96	1,703.87	96.09	18.732		
3,200.00	3,200.00	3,189.82	3,189.19	7.05	92.37	-169.38	-1,769.14	-331.69	1,799.96	1,700.54	99.42	18.104		
3,300.00	3,300.00	3,289.82	3,289.19	7.28	97.44	-169.38	-1,769.14	-331.69	1,799.96	1,695.25	104.72	17.189		
3,400.00	3,400.00	3,389.82	3,389.19	7.50	102.51	-169.38	-1,769.14	-331.69	1,799.96	1,689.95	110.01	16.362		
3,500.00	3,500.00	3,489.82	3,489.19	7.73	107.58	-169.38	-1,769.14	-331.69	1,799.96	1,684.66	115.31	15.610		
3,600.00	3,600.00	3,589.82	3,589.19	7.95	112.65	-169.38	-1,769.14	-331.69	1,799.96	1,679.36	120.60	14.925		
3,700.00	3,700.00	3,689.82	3,689.19	8.18	117.72	-169.38	-1,769.14	-331.69	1,799.96	1,674.07	125.90	14.297		
3,800.00	3,800.00	3,789.82	3,789.19	8.40	122.79	-169.38	-1,769.14	-331.69	1,799.96	1,668.77	131.19	13.720		
3,900.00	3,900.00	3,889.82	3,889.19	8.63	127.86	-169.38	-1,769.14	-331.69	1,799.96	1,663.48	136.49	13.188		
4,000.00	4,000.00	3,989.82	3,989.19	8.85	132.93	-169.38	-1,769.14	-331.69	1,799.96	1,658.18	141.78	12.695		
4,100.00	4,100.00	4,089.82	4,089.19	9.07	138.00	-169.38	-1,769.14	-331.69	1,799.96	1,652.89	147.07	12.238		
4,200.00	4,200.00	4,189.82	4,189.19	9.30	143.07	-169.38	-1,769.14	-331.69	1,799.96	1,647.59	152.37	11.813 CC		
4,300.00	4,300.00	4,220.00	4,218.47	9.52	144.60	-169.38	-1,769.14	-331.69	1,801.35	1,647.23	154.12	11.688 ES, SF		
4,400.00	4,400.00	4,220.00	4,218.47	9.75	144.60	-169.38	-1,769.14	-331.69	1,808.04	1,653.69	154.35	11.714		
4,500.00	4,500.00	4,220.00	4,218.47	9.97	144.60	-169.38	-1,769.14	-331.69	1,820.21	1,665.64	154.57	11.776		
4,600.00	4,600.00	4,220.00	4,218.47	10.20	144.60	-169.38	-1,769.14	-331.69	1,837.75	1,682.95	154.80	11.872		

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 30, T 26 S. , R 29 E - PERKINS SWD #001 (4220'MD) - Wellbore #1 - Actual Wellbore #1													Offset Site Error: 0.00 ft
Survey Program: 500-INC-ONLY													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)					
4,700.00	4,700.00	4,220.00	4,218.47	10.42	144.60	-169.38	-1,769.14	-331.69	1,860.50	1,705.47	155.02	12.001	
4,800.00	4,800.00	4,220.00	4,218.47	10.65	144.60	-169.38	-1,769.14	-331.69	1,888.28	1,733.03	155.25	12.163	
4,900.00	4,900.00	4,220.00	4,218.47	10.87	144.60	-169.38	-1,769.14	-331.69	1,920.87	1,765.40	155.47	12.355	
5,000.00	5,000.00	4,220.00	4,218.47	11.10	144.60	-169.38	-1,769.14	-331.69	1,958.03	1,802.33	155.70	12.576	
5,100.00	5,100.00	4,220.00	4,218.47	11.32	144.60	-169.38	-1,769.14	-331.69	1,999.51	1,843.59	155.92	12.824	
5,200.00	5,200.00	4,220.00	4,218.47	11.55	144.60	-169.38	-1,769.14	-331.69	2,045.04	1,888.89	156.15	13.097	
5,300.00	5,300.00	4,220.00	4,218.47	11.77	144.60	-169.38	-1,769.14	-331.69	2,094.36	1,937.98	156.37	13.393	
5,400.00	5,400.00	4,220.00	4,218.47	12.00	144.60	-169.38	-1,769.14	-331.69	2,147.20	1,990.60	156.60	13.712	
5,500.00	5,500.00	4,220.00	4,218.47	12.22	144.60	-169.38	-1,769.14	-331.69	2,203.32	2,046.50	156.82	14.050	
5,600.00	5,600.00	4,220.00	4,218.47	12.45	144.60	-169.38	-1,769.14	-331.69	2,262.47	2,105.42	157.05	14.406	
5,700.00	5,700.00	4,220.00	4,218.47	12.67	144.60	-169.38	-1,769.14	-331.69	2,324.42	2,167.14	157.27	14.780	
5,800.00	5,800.00	4,220.00	4,218.47	12.90	144.60	-169.38	-1,769.14	-331.69	2,388.94	2,231.45	157.50	15.168	
5,900.00	5,900.00	4,220.00	4,218.47	13.12	144.60	-169.38	-1,769.14	-331.69	2,455.85	2,298.13	157.72	15.571	
6,000.00	6,000.00	4,220.00	4,218.47	13.35	144.60	-169.38	-1,769.14	-331.69	2,524.94	2,367.00	157.95	15.986	
6,100.00	6,100.00	4,220.00	4,218.47	13.57	144.60	-169.38	-1,769.14	-331.69	2,596.05	2,437.88	158.17	16.413	
6,200.00	6,200.00	4,220.00	4,218.47	13.80	144.60	-169.38	-1,769.14	-331.69	2,669.01	2,510.62	158.40	16.850	
6,300.00	6,300.00	4,220.00	4,218.47	14.02	144.60	-169.38	-1,769.14	-331.69	2,743.68	2,585.06	158.62	17.297	
6,400.00	6,400.00	4,220.00	4,218.47	14.24	144.60	-169.38	-1,769.14	-331.69	2,819.92	2,661.07	158.84	17.753	
6,500.00	6,500.00	4,220.00	4,218.47	14.47	144.60	-169.38	-1,769.14	-331.69	2,897.60	2,738.53	159.07	18.216	
6,600.00	6,600.00	4,220.00	4,218.47	14.69	144.60	-169.38	-1,769.14	-331.69	2,976.61	2,817.32	159.29	18.686	
6,700.00	6,700.00	4,220.00	4,218.47	14.92	144.60	-169.38	-1,769.14	-331.69	3,056.85	2,897.34	159.52	19.163	
6,800.00	6,800.00	4,220.00	4,218.47	15.14	144.60	-169.38	-1,769.14	-331.69	3,138.23	2,978.49	159.74	19.645	
6,900.00	6,900.00	4,220.00	4,218.47	15.37	144.60	-169.38	-1,769.14	-331.69	3,220.66	3,060.69	159.97	20.133	
7,000.00	7,000.00	4,220.00	4,218.47	15.59	144.60	-169.38	-1,769.14	-331.69	3,304.06	3,143.86	160.19	20.625	
7,100.00	7,100.00	4,220.00	4,218.47	15.82	144.60	-169.38	-1,769.14	-331.69	3,388.35	3,227.94	160.42	21.122	
7,200.00	7,200.00	4,220.00	4,218.47	16.04	144.60	-169.38	-1,769.14	-331.69	3,473.48	3,312.84	160.64	21.622	
7,300.00	7,300.00	4,220.00	4,218.47	16.27	144.60	-169.38	-1,769.14	-331.69	3,559.39	3,398.52	160.87	22.126	
7,400.00	7,400.00	4,220.00	4,218.47	16.49	144.60	-169.38	-1,769.14	-331.69	3,646.01	3,484.92	161.09	22.633	
7,500.00	7,500.00	4,220.00	4,218.47	16.72	144.60	-169.38	-1,769.14	-331.69	3,733.30	3,571.98	161.32	23.143	
7,600.00	7,600.00	4,220.00	4,218.47	16.94	144.60	-169.38	-1,769.14	-331.69	3,821.21	3,659.67	161.54	23.655	
7,700.00	7,700.00	4,220.00	4,218.47	17.17	144.60	-169.38	-1,769.14	-331.69	3,909.71	3,747.94	161.77	24.169	
7,800.00	7,800.00	4,220.00	4,218.47	17.39	144.60	-169.38	-1,769.14	-331.69	3,998.74	3,836.75	161.99	24.685	
7,900.00	7,900.00	4,220.00	4,218.47	17.62	144.60	-169.38	-1,769.14	-331.69	4,088.29	3,926.07	162.22	25.203	
8,000.00	8,000.00	4,220.00	4,218.47	17.84	144.60	-169.38	-1,769.14	-331.69	4,178.31	4,015.87	162.44	25.722	
8,100.00	8,100.00	4,220.00	4,218.47	18.07	144.60	-169.38	-1,769.14	-331.69	4,268.77	4,106.10	162.67	26.243	
8,200.00	8,200.00	4,220.00	4,218.47	18.29	144.60	-169.38	-1,769.14	-331.69	4,359.65	4,196.76	162.89	26.764	
8,300.00	8,300.00	4,220.00	4,218.47	18.52	144.60	-169.38	-1,769.14	-331.69	4,450.92	4,287.80	163.12	27.287	
8,400.00	8,400.00	4,220.00	4,218.47	18.74	144.60	-169.38	-1,769.14	-331.69	4,542.56	4,379.22	163.34	27.810	
8,500.00	8,500.00	4,220.00	4,218.47	18.96	144.60	-169.38	-1,769.14	-331.69	4,634.54	4,470.98	163.56	28.335	
8,600.00	8,600.00	4,220.00	4,218.47	19.19	144.60	-169.38	-1,769.14	-331.69	4,726.85	4,563.06	163.79	28.859	
8,700.00	8,700.00	4,220.00	4,218.47	19.41	144.60	-169.38	-1,769.14	-331.69	4,819.47	4,655.45	164.01	29.384	
8,800.00	8,800.00	4,220.00	4,218.47	19.64	144.60	-169.38	-1,769.14	-331.69	4,912.37	4,748.13	164.24	29.910	
8,900.00	8,900.00	4,220.00	4,218.47	19.86	144.60	-169.38	-1,769.14	-331.69	5,005.55	4,841.09	164.46	30.436	
9,000.00	9,000.00	4,220.00	4,218.47	20.09	144.60	-169.38	-1,769.14	-331.69	5,098.99	4,934.30	164.69	30.961	
9,100.00	9,100.00	4,220.00	4,218.47	20.31	144.60	-169.38	-1,769.14	-331.69	5,192.67	5,027.76	164.91	31.487	
9,200.00	9,200.00	4,220.00	4,218.47	20.54	144.60	-169.38	-1,769.14	-331.69	5,286.59	5,121.45	165.14	32.013	
9,300.00	9,300.00	4,220.00	4,218.47	20.76	144.60	-169.38	-1,769.14	-331.69	5,380.72	5,215.36	165.36	32.539	
9,400.00	9,400.00	4,220.00	4,218.47	20.99	144.60	-169.38	-1,769.14	-331.69	5,475.06	5,309.47	165.59	33.064	
9,500.00	9,500.00	4,220.00	4,218.47	21.21	144.60	-169.38	-1,769.14	-331.69	5,569.60	5,403.79	165.81	33.590	
9,600.00	9,600.00	4,220.00	4,218.47	21.44	144.60	-169.38	-1,769.14	-331.69	5,664.32	5,498.29	166.04	34.115	
9,700.00	9,700.00	4,220.00	4,218.47	21.66	144.60	-169.38	-1,769.14	-331.69	5,759.23	5,592.97	166.26	34.640	
9,800.00	9,800.00	4,220.00	4,218.47	21.89	144.60	-169.38	-1,769.14	-331.69	5,854.30	5,687.82	166.49	35.164	

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 30, T 26 S. , R 29 E - PERKINS SWD #001 (4220'MD) - Wellbore #1 - Actual Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 500-INC-ONLY													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
9,900.00	9,900.00	4,220.00	4,218.47	22.11	144.60	-169.38	-1,769.14	-331.69	5,949.54	5,782.83	166.71	35.688		
10,000.00	10,000.00	4,220.00	4,218.47	22.34	144.60	-169.38	-1,769.14	-331.69	6,044.93	5,877.99	166.94	36.211		
10,100.00	10,100.00	4,220.00	4,218.47	22.56	144.60	-169.38	-1,769.14	-331.69	6,140.46	5,973.30	167.16	36.734		
10,200.00	10,200.00	4,220.00	4,218.47	22.79	144.60	-169.38	-1,769.14	-331.69	6,236.14	6,068.75	167.39	37.256		
10,300.00	10,299.89	4,220.00	4,218.47	22.98	144.60	-10.37	-1,769.14	-331.69	6,331.02	6,164.42	166.60	38.002		
10,400.00	10,397.37	4,220.00	4,218.47	23.16	144.60	-7.02	-1,769.14	-331.69	6,418.77	6,259.20	159.57	40.226		
10,500.00	10,488.26	4,220.00	4,218.47	23.32	144.60	-5.46	-1,769.14	-331.69	6,495.37	6,349.54	145.83	44.542		
10,600.00	10,568.59	4,220.00	4,218.47	23.51	144.60	-4.61	-1,769.14	-331.69	6,557.92	6,431.85	126.07	52.018		
10,700.00	10,634.85	4,220.00	4,218.47	23.77	144.60	-4.13	-1,769.14	-331.69	6,604.12	6,502.77	101.35	65.162		
10,800.00	10,684.13	4,220.00	4,218.47	24.13	144.60	-3.88	-1,769.14	-331.69	6,632.30	6,559.19	73.11	90.718		
10,900.00	10,714.29	4,220.00	4,218.47	24.61	144.60	-3.81	-1,769.14	-331.69	6,641.47	6,597.95	43.52	152.621		
11,000.00	10,724.00	4,220.00	4,218.47	25.21	144.60	-3.89	-1,769.14	-331.69	6,631.30	6,608.35	22.95	288.962		
11,100.00	10,723.25	4,220.00	4,218.47	25.88	144.60	-3.14	-1,769.14	-331.69	6,612.01	6,590.57	21.44	308.449		
11,200.00	10,722.48	4,220.00	4,218.47	26.62	144.60	-2.43	-1,769.14	-331.69	6,593.79	6,573.63	20.16	327.111		
11,300.00	10,721.71	4,220.00	4,218.47	27.43	144.60	-1.77	-1,769.14	-331.69	6,576.74	6,557.57	19.16	343.169		
11,400.00	10,720.94	4,220.00	4,218.47	28.32	144.60	-1.16	-1,769.14	-331.69	6,560.96	6,542.44	18.51	354.413		
11,500.00	10,720.17	4,220.00	4,218.47	29.25	144.60	-0.61	-1,769.14	-331.69	6,546.53	6,528.28	18.25	358.742		
11,600.00	10,719.40	4,220.00	4,218.47	30.23	144.60	-0.11	-1,769.14	-331.69	6,533.53	6,515.15	18.38	355.483		
11,700.00	10,718.64	4,220.00	4,218.47	31.26	144.60	-0.04	-1,769.14	-331.69	6,522.02	6,503.25	18.77	347.490		
11,800.00	10,717.89	4,220.00	4,218.47	32.33	144.60	-0.04	-1,769.14	-331.69	6,512.03	6,492.84	19.19	339.303		
11,900.00	10,717.13	4,220.00	4,218.47	33.47	144.60	-0.04	-1,769.14	-331.69	6,503.57	6,483.93	19.64	331.143		
12,000.00	10,716.37	4,220.00	4,218.47	34.66	144.60	-0.04	-1,769.14	-331.69	6,496.63	6,476.52	20.11	323.070		
12,100.00	10,715.61	4,220.00	4,218.47	35.91	144.60	-0.04	-1,769.14	-331.69	6,491.22	6,470.62	20.60	315.135		
12,200.00	10,714.85	4,220.00	4,218.47	37.21	144.60	-0.04	-1,769.14	-331.69	6,487.35	6,466.25	21.11	307.375		
12,300.00	10,714.09	4,220.00	4,218.47	38.55	144.60	-0.04	-1,769.14	-331.69	6,485.03	6,463.40	21.63	299.822		
12,400.00	10,713.33	4,220.00	4,218.47	39.93	144.60	-0.04	-1,769.14	-331.69	6,484.24	6,462.07	22.17	292.497		
12,401.00	10,713.33	4,220.00	4,218.47	39.94	144.60	-0.04	-1,769.14	-331.69	6,484.24	6,462.07	22.17	292.424		
12,500.00	10,712.57	4,220.00	4,218.47	41.34	144.60	-0.04	-1,769.14	-331.69	6,485.00	6,462.27	22.72	285.415		
12,600.00	10,711.82	4,220.00	4,218.47	42.78	144.60	-0.04	-1,769.14	-331.69	6,487.29	6,464.01	23.29	278.586		
12,700.00	10,711.06	4,220.00	4,218.47	44.25	144.60	-0.04	-1,769.14	-331.69	6,491.13	6,467.27	23.86	272.016		
12,800.00	10,710.30	4,220.00	4,218.47	45.75	144.60	-0.04	-1,769.14	-331.69	6,496.50	6,472.05	24.45	265.706		
12,900.00	10,709.54	4,220.00	4,218.47	47.27	144.60	-0.04	-1,769.14	-331.69	6,503.41	6,478.37	25.05	259.654		
13,000.00	10,708.78	4,220.00	4,218.47	48.81	144.60	-0.04	-1,769.14	-331.69	6,511.85	6,486.20	25.65	253.858		
13,100.00	10,708.02	4,220.00	4,218.47	50.37	144.60	-0.04	-1,769.14	-331.69	6,521.81	6,495.54	26.26	248.311		
13,200.00	10,707.26	4,220.00	4,218.47	51.95	144.60	-0.04	-1,769.14	-331.69	6,533.28	6,506.40	26.89	243.008		
13,300.00	10,706.50	4,220.00	4,218.47	53.54	144.60	-0.04	-1,769.14	-331.69	6,546.26	6,518.75	27.51	237.941		
13,400.00	10,705.75	4,220.00	4,218.47	55.15	144.60	-0.04	-1,769.14	-331.69	6,560.75	6,532.60	28.15	233.102		
13,500.00	10,704.99	4,220.00	4,218.47	56.77	144.60	-0.04	-1,769.14	-331.69	6,576.71	6,547.93	28.78	228.483		
13,600.00	10,704.23	4,220.00	4,218.47	58.41	144.60	-0.04	-1,769.14	-331.69	6,594.16	6,564.73	29.43	224.075		
13,700.00	10,703.47	4,220.00	4,218.47	60.05	144.60	-0.04	-1,769.14	-331.69	6,613.08	6,583.00	30.08	219.868		
13,800.00	10,702.71	4,220.00	4,218.47	61.71	144.60	-0.04	-1,769.14	-331.69	6,633.44	6,602.71	30.73	215.856		
13,900.00	10,701.95	4,220.00	4,218.47	63.37	144.60	-0.04	-1,769.14	-331.69	6,655.25	6,623.86	31.39	212.028		
14,000.00	10,701.19	4,220.00	4,218.47	65.04	144.60	-0.04	-1,769.14	-331.69	6,678.49	6,646.44	32.05	208.377		
14,100.00	10,700.43	4,220.00	4,218.47	66.73	144.60	-0.04	-1,769.14	-331.69	6,703.13	6,670.42	32.72	204.895		
14,200.00	10,699.68	4,220.00	4,218.47	68.41	144.60	-0.04	-1,769.14	-331.69	6,729.17	6,695.79	33.38	201.572		
14,300.00	10,698.92	4,220.00	4,218.47	70.11	144.60	-0.04	-1,769.14	-331.69	6,756.60	6,722.54	34.05	198.403		
14,400.00	10,698.16	4,220.00	4,218.47	71.81	144.60	-0.04	-1,769.14	-331.69	6,785.38	6,750.65	34.73	195.379		
14,500.00	10,697.40	4,220.00	4,218.47	73.52	144.60	-0.04	-1,769.14	-331.69	6,815.51	6,780.10	35.41	192.494		
14,600.00	10,696.64	4,220.00	4,218.47	75.23	144.60	-0.04	-1,769.14	-331.69	6,846.97	6,810.88	36.09	189.741		
14,700.00	10,695.88	4,220.00	4,218.47	76.95	144.60	-0.04	-1,769.14	-331.69	6,879.74	6,842.97	36.77	187.113		
14,800.00	10,695.12	4,220.00	4,218.47	78.67	144.60	-0.04	-1,769.14	-331.69	6,913.80	6,876.34	37.45	184.604		
14,900.00	10,694.36	4,220.00	4,218.47	80.40	144.60	-0.04	-1,769.14	-331.69	6,949.13	6,910.99	38.14	182.208		

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



Integrity Directional Services, LLC
Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 30, T 26 S. , R 29 E - PERKINS SWD #001 (4220'MD) - Wellbore #1 - Actual Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 500-INC-ONLY													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
15,000.00	10,693.61	4,220.00	4,218.47	82.13	144.60	-0.04	-1,769.14	-331.69	6,985.71	6,946.89	38.83	179.921		
15,100.00	10,692.85	4,220.00	4,218.47	83.87	144.60	-0.04	-1,769.14	-331.69	7,023.53	6,984.01	39.52	177.736		
15,200.00	10,692.09	4,220.00	4,218.47	85.61	144.60	-0.04	-1,769.14	-331.69	7,062.56	7,022.35	40.21	175.649		
15,300.00	10,691.33	4,220.00	4,218.47	87.35	144.60	-0.04	-1,769.14	-331.69	7,102.79	7,061.89	40.90	173.654		
15,400.00	10,690.57	4,220.00	4,218.47	89.10	144.60	-0.04	-1,769.14	-331.69	7,144.19	7,102.59	41.60	171.748		
15,500.00	10,689.81	4,220.00	4,218.47	90.85	144.60	-0.04	-1,769.14	-331.69	7,186.74	7,144.44	42.29	169.926		
15,600.00	10,689.05	4,220.00	4,218.47	92.60	144.60	-0.04	-1,769.14	-331.69	7,230.42	7,187.43	42.99	168.184		
15,700.00	10,688.29	4,220.00	4,218.47	94.36	144.60	-0.04	-1,769.14	-331.69	7,275.22	7,231.53	43.69	166.518		
15,800.00	10,687.54	4,220.00	4,218.47	96.12	144.60	-0.04	-1,769.14	-331.69	7,321.11	7,276.72	44.39	164.924		
15,900.00	10,686.78	4,220.00	4,218.47	97.88	144.60	-0.04	-1,769.14	-331.69	7,368.07	7,322.97	45.09	163.400		
16,000.00	10,686.02	4,220.00	4,218.47	99.64	144.60	-0.04	-1,769.14	-331.69	7,416.08	7,370.28	45.79	161.941		
16,100.00	10,685.26	4,220.00	4,218.47	101.41	144.60	-0.04	-1,769.14	-331.69	7,465.12	7,418.62	46.50	160.545		
16,200.00	10,684.50	4,220.00	4,218.47	103.17	144.60	-0.04	-1,769.14	-331.69	7,515.17	7,467.97	47.20	159.208		
16,300.00	10,683.74	4,220.00	4,218.47	104.94	144.60	-0.04	-1,769.14	-331.69	7,566.21	7,518.31	47.91	157.929		
16,400.00	10,682.98	4,220.00	4,218.47	106.71	144.60	-0.04	-1,769.14	-331.69	7,618.23	7,569.61	48.62	156.703		
16,500.00	10,682.22	4,220.00	4,218.47	108.49	144.60	-0.04	-1,769.14	-331.69	7,671.19	7,621.87	49.32	155.530		
16,600.00	10,681.46	4,220.00	4,218.47	110.26	144.60	-0.04	-1,769.14	-331.69	7,725.09	7,675.06	50.03	154.405		
16,700.00	10,680.71	4,220.00	4,218.47	112.04	144.60	-0.04	-1,769.14	-331.69	7,779.90	7,729.16	50.74	153.328		
16,793.62	10,680.00	4,220.00	4,218.47	113.70	144.60	-0.04	-1,769.14	-331.69	7,832.02	7,780.61	51.40	152.359		

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



Integrity Directional Services, LLC
Anticollision Report



Company: COG Production, LLC
Project: Lea County, NM (NAD 27)
Reference Site: Sec. 30, T 26 S., R 29 E
Site Error: 0.00 ft
Reference Well: Copperhead Fee 21H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Copperhead Fee 21H
TVD Reference: KB=25' @ 2953.81ft
MD Reference: KB=25' @ 2953.81ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 30, T 26 S., R 29 E - Ridge Nose Fed Com 1H - Wellbore #1 - Wellbore #1													Offset Site Error: 0.00 ft
Survey Program: 100-MWD													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.00	0.00	13,030.00	6,377.12	0.00	122.14	-103.99	-161.87	-649.55	6,447.08				
100.00	100.00	13,030.00	6,377.12	0.08	122.14	-103.99	-161.87	-649.55	6,347.63	6,252.11	95.52	86.454	
200.00	200.00	13,030.00	6,377.12	0.31	122.14	-103.99	-161.87	-649.55	6,248.19	6,152.45	95.74	85.280	
300.00	300.00	13,030.00	6,377.12	0.53	122.14	-103.99	-161.87	-649.55	6,148.78	6,052.81	95.97	84.071	
400.00	400.00	13,030.00	6,377.12	0.76	122.14	-103.99	-161.87	-649.55	6,049.38	5,953.19	96.19	82.888	
500.00	500.00	13,030.00	6,377.12	0.98	122.14	-103.99	-161.87	-649.55	5,950.01	5,853.59	96.42	81.711	
600.00	600.00	13,030.00	6,377.12	1.21	122.14	-103.99	-161.87	-649.55	5,850.65	5,754.01	96.64	80.539	
700.00	700.00	13,030.00	6,377.12	1.43	122.14	-103.99	-161.87	-649.55	5,751.32	5,654.45	96.87	79.373	
800.00	800.00	13,030.00	6,377.12	1.66	122.14	-103.99	-161.87	-649.55	5,652.01	5,554.92	97.09	78.213	
900.00	900.00	13,030.00	6,377.12	1.88	122.14	-103.99	-161.87	-649.55	5,552.73	5,455.41	97.32	77.058	
1,000.00	1,000.00	13,030.00	6,377.12	2.11	122.14	-103.99	-161.87	-649.55	5,453.47	5,355.93	97.54	75.909	
1,100.00	1,100.00	13,030.00	6,377.12	2.33	122.14	-103.99	-161.87	-649.55	5,354.24	5,256.48	97.77	74.766	
1,200.00	1,200.00	13,030.00	6,377.12	2.56	122.14	-103.99	-161.87	-649.55	5,255.04	5,157.05	97.99	73.628	
1,300.00	1,300.00	13,030.00	6,377.12	2.78	122.14	-103.99	-161.87	-649.55	5,155.87	5,057.66	98.22	72.495	
1,400.00	1,400.00	13,030.00	6,377.12	3.01	122.14	-103.99	-161.87	-649.55	5,056.74	4,958.29	98.44	71.368	
1,500.00	1,500.00	13,030.00	6,377.12	3.23	122.14	-103.99	-161.87	-649.55	4,957.63	4,858.97	98.67	70.247	
1,600.00	1,600.00	13,030.00	6,377.12	3.46	122.14	-103.99	-161.87	-649.55	4,858.57	4,759.68	98.89	69.131	
1,700.00	1,700.00	13,030.00	6,377.12	3.68	122.14	-103.99	-161.87	-649.55	4,759.54	4,660.43	99.12	68.020	
1,800.00	1,800.00	13,030.00	6,377.12	3.91	122.14	-103.99	-161.87	-649.55	4,660.56	4,561.22	99.34	66.915	
1,900.00	1,900.00	13,030.00	6,377.12	4.13	122.14	-103.99	-161.87	-649.55	4,561.62	4,462.05	99.56	65.816	
2,000.00	2,000.00	13,030.00	6,377.12	4.35	122.14	-103.99	-161.87	-649.55	4,462.72	4,362.93	99.79	64.721	
2,100.00	2,100.00	13,030.00	6,377.12	4.58	122.14	-103.99	-161.87	-649.55	4,363.88	4,263.87	100.01	63.633	
2,200.00	2,200.00	13,030.00	6,377.12	4.80	122.14	-103.99	-161.87	-649.55	4,265.09	4,164.85	100.24	62.549	
2,300.00	2,300.00	13,030.00	6,377.12	5.03	122.14	-103.99	-161.87	-649.55	4,166.36	4,065.90	100.46	61.471	
2,400.00	2,400.00	13,030.00	6,377.12	5.25	122.14	-103.99	-161.87	-649.55	4,067.69	3,967.00	100.69	60.399	
2,500.00	2,500.00	13,030.00	6,377.12	5.48	122.14	-103.99	-161.87	-649.55	3,969.09	3,868.18	100.91	59.332	
2,600.00	2,600.00	13,030.00	6,377.12	5.70	122.14	-103.99	-161.87	-649.55	3,870.56	3,769.42	101.14	58.270	
2,700.00	2,700.00	13,030.00	6,377.12	5.93	122.14	-103.99	-161.87	-649.55	3,772.10	3,670.74	101.36	57.214	
2,800.00	2,800.00	13,030.00	6,377.12	6.15	122.14	-103.99	-161.87	-649.55	3,673.74	3,572.15	101.59	56.163	
2,900.00	2,900.00	13,030.00	6,377.12	6.38	122.14	-103.99	-161.87	-649.55	3,575.46	3,473.64	101.81	55.118	
3,000.00	3,000.00	13,030.00	6,377.12	6.60	122.14	-103.99	-161.87	-649.55	3,477.27	3,375.24	102.04	54.079	
3,100.00	3,100.00	13,030.00	6,377.12	6.83	122.14	-103.99	-161.87	-649.55	3,379.20	3,276.94	102.26	53.045	
3,200.00	3,200.00	13,030.00	6,377.12	7.05	122.14	-103.99	-161.87	-649.55	3,281.24	3,178.75	102.49	52.016	
3,300.00	3,300.00	13,030.00	6,377.12	7.28	122.14	-103.99	-161.87	-649.55	3,183.41	3,080.70	102.71	50.994	
3,400.00	3,400.00	13,030.00	6,377.12	7.50	122.14	-103.99	-161.87	-649.55	3,085.72	2,982.78	102.94	49.977	
3,500.00	3,500.00	13,030.00	6,377.12	7.73	122.14	-103.99	-161.87	-649.55	2,988.18	2,885.02	103.16	48.966	
3,600.00	3,600.00	13,030.00	6,377.12	7.95	122.14	-103.99	-161.87	-649.55	2,890.81	2,787.42	103.39	47.961	
3,700.00	3,700.00	13,030.00	6,377.12	8.18	122.14	-103.99	-161.87	-649.55	2,793.62	2,690.01	103.61	46.963	
3,800.00	3,800.00	13,030.00	6,377.12	8.40	122.14	-103.99	-161.87	-649.55	2,696.64	2,592.81	103.84	45.970	
3,900.00	3,900.00	13,030.00	6,377.12	8.63	122.14	-103.99	-161.87	-649.55	2,599.89	2,495.83	104.06	44.985	
4,000.00	4,000.00	13,030.00	6,377.12	8.85	122.14	-103.99	-161.87	-649.55	2,503.39	2,399.11	104.28	44.005	
4,100.00	4,100.00	13,030.00	6,377.12	9.07	122.14	-103.99	-161.87	-649.55	2,407.18	2,302.67	104.51	43.033	
4,200.00	4,200.00	13,030.00	6,377.12	9.30	122.14	-103.99	-161.87	-649.55	2,311.29	2,206.56	104.73	42.068	
4,300.00	4,300.00	13,030.00	6,377.12	9.52	122.14	-103.99	-161.87	-649.55	2,215.77	2,110.81	104.96	41.111	
4,400.00	4,400.00	13,030.00	6,377.12	9.75	122.14	-103.99	-161.87	-649.55	2,120.66	2,015.47	105.18	40.161	
4,500.00	4,500.00	13,030.00	6,377.12	9.97	122.14	-103.99	-161.87	-649.55	2,026.02	1,920.61	105.41	39.221	
4,600.00	4,600.00	13,030.00	6,377.12	10.20	122.14	-103.99	-161.87	-649.55	1,931.92	1,826.28	105.63	38.289	
4,700.00	4,700.00	13,030.00	6,377.12	10.42	122.14	-103.99	-161.87	-649.55	1,838.44	1,732.58	105.86	37.367	
4,800.00	4,800.00	13,030.00	6,377.12	10.65	122.14	-103.99	-161.87	-649.55	1,745.68	1,639.60	106.08	36.456	
4,900.00	4,900.00	13,030.00	6,377.12	10.87	122.14	-103.99	-161.87	-649.55	1,653.77	1,547.46	106.31	35.556	
5,000.00	5,000.00	13,030.00	6,377.12	11.10	122.14	-103.99	-161.87	-649.55	1,562.85	1,456.32	106.53	34.670	
5,100.00	5,100.00	13,030.00	6,377.12	11.32	122.14	-103.99	-161.87	-649.55	1,473.12	1,366.36	106.76	33.799	

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



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 30, T 26 S. , R 29 E - Ridge Nose Fed Com 1H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
5,200.00	5,200.00	13,030.00	6,377.12	11.55	122.14	-103.99	-161.87	-649.55	1,384.78	1,277.80	106.98	12.944		
5,300.00	5,300.00	13,030.00	6,377.12	11.77	122.14	-103.99	-161.87	-649.55	1,298.14	1,190.94	107.21	12.109		
5,400.00	5,400.00	13,030.00	6,377.12	12.00	122.14	-103.99	-161.87	-649.55	1,213.56	1,106.13	107.43	11.296		
5,500.00	5,500.00	13,030.00	6,377.12	12.22	122.14	-103.99	-161.87	-649.55	1,131.50	1,023.84	107.66	10.510		
5,600.00	5,600.00	13,030.00	6,377.12	12.45	122.14	-103.99	-161.87	-649.55	1,052.54	944.66	107.88	9.756		
5,700.00	5,700.00	13,030.00	6,377.12	12.67	122.14	-103.99	-161.87	-649.55	977.44	869.34	108.11	9.042		
5,800.00	5,800.00	13,030.00	6,377.12	12.90	122.14	-103.99	-161.87	-649.55	907.16	798.83	108.33	8.374		
5,900.00	5,900.00	13,030.00	6,377.12	13.12	122.14	-103.99	-161.87	-649.55	842.91	734.36	108.56	7.765		
6,000.00	6,000.00	13,030.00	6,377.12	13.35	122.14	-103.99	-161.87	-649.55	786.16	677.38	108.78	7.227		
6,100.00	6,100.00	13,030.00	6,377.12	13.57	122.14	-103.99	-161.87	-649.55	738.65	629.65	109.00	6.776		
6,200.00	6,200.00	13,030.00	6,377.12	13.80	122.14	-103.99	-161.87	-649.55	702.25	593.02	109.23	6.429		
6,300.00	6,300.00	13,030.00	6,377.12	14.02	122.14	-103.99	-161.87	-649.55	678.76	569.31	109.45	6.201		
6,400.00	6,400.00	13,030.00	6,377.12	14.24	122.14	-103.99	-161.87	-649.55	669.53	559.85	109.68	6.104		
6,412.23	6,412.23	13,030.00	6,377.12	14.27	122.14	-103.99	-161.87	-649.55	669.42	559.71	109.71	6.102 CC, ES, SF		
6,500.00	6,500.00	13,030.00	6,377.12	14.47	122.14	-103.99	-161.87	-649.55	675.15	565.24	109.90	6.143		
6,600.00	6,600.00	13,030.00	6,377.12	14.69	122.14	-103.99	-161.87	-649.55	695.25	585.12	110.13	6.313		
6,700.00	6,700.00	13,030.00	6,377.12	14.92	122.14	-103.99	-161.87	-649.55	728.65	618.30	110.35	6.603		
6,800.00	6,800.00	13,030.00	6,377.12	15.14	122.14	-103.99	-161.87	-649.55	773.62	663.04	110.58	6.996		
6,900.00	6,900.00	13,030.00	6,377.12	15.37	122.14	-103.99	-161.87	-649.55	828.27	717.47	110.80	7.475		
7,000.00	7,000.00	13,030.00	6,377.12	15.59	122.14	-103.99	-161.87	-649.55	890.84	779.81	111.03	8.024		
7,100.00	7,100.00	13,030.00	6,377.12	15.82	122.14	-103.99	-161.87	-649.55	959.76	848.51	111.25	8.627		
7,200.00	7,200.00	13,030.00	6,377.12	16.04	122.14	-103.99	-161.87	-649.55	1,033.78	922.30	111.48	9.273		
7,300.00	7,300.00	13,030.00	6,377.12	16.27	122.14	-103.99	-161.87	-649.55	1,111.87	1,000.17	111.70	9.954		
7,400.00	7,400.00	13,030.00	6,377.12	16.49	122.14	-103.99	-161.87	-649.55	1,193.23	1,081.31	111.93	10.661		
7,500.00	7,500.00	13,030.00	6,377.12	16.72	122.14	-103.99	-161.87	-649.55	1,277.25	1,165.10	112.15	11.389		
7,600.00	7,600.00	13,030.00	6,377.12	16.94	122.14	-103.99	-161.87	-649.55	1,363.42	1,251.04	112.38	12.133		
7,700.00	7,700.00	13,030.00	6,377.12	17.17	122.14	-103.99	-161.87	-649.55	1,451.37	1,338.77	112.60	12.889		
7,800.00	7,800.00	13,030.00	6,377.12	17.39	122.14	-103.99	-161.87	-649.55	1,540.79	1,427.96	112.83	13.656		
7,900.00	7,900.00	13,030.00	6,377.12	17.62	122.14	-103.99	-161.87	-649.55	1,631.43	1,518.38	113.05	14.431		
8,000.00	8,000.00	13,030.00	6,377.12	17.84	122.14	-103.99	-161.87	-649.55	1,723.12	1,609.84	113.28	15.212		
8,100.00	8,100.00	13,030.00	6,377.12	18.07	122.14	-103.99	-161.87	-649.55	1,815.68	1,702.18	113.50	15.997		
8,200.00	8,200.00	13,030.00	6,377.12	18.29	122.14	-103.99	-161.87	-649.55	1,908.99	1,795.26	113.72	16.786		
8,300.00	8,300.00	13,030.00	6,377.12	18.52	122.14	-103.99	-161.87	-649.55	2,002.95	1,889.00	113.95	17.577		
8,400.00	8,400.00	13,030.00	6,377.12	18.74	122.14	-103.99	-161.87	-649.55	2,097.46	1,983.29	114.17	18.371		
8,500.00	8,500.00	13,030.00	6,377.12	18.96	122.14	-103.99	-161.87	-649.55	2,192.46	2,078.07	114.40	19.165		
8,600.00	8,600.00	13,030.00	6,377.12	19.19	122.14	-103.99	-161.87	-649.55	2,287.89	2,173.27	114.62	19.960		
8,700.00	8,700.00	13,030.00	6,377.12	19.41	122.14	-103.99	-161.87	-649.55	2,383.70	2,268.85	114.85	20.755		
8,800.00	8,800.00	13,030.00	6,377.12	19.64	122.14	-103.99	-161.87	-649.55	2,479.83	2,364.76	115.07	21.550		
8,900.00	8,900.00	13,030.00	6,377.12	19.86	122.14	-103.99	-161.87	-649.55	2,576.26	2,460.96	115.30	22.344		
9,000.00	9,000.00	13,030.00	6,377.12	20.09	122.14	-103.99	-161.87	-649.55	2,672.95	2,557.43	115.52	23.138		
9,100.00	9,100.00	13,030.00	6,377.12	20.31	122.14	-103.99	-161.87	-649.55	2,769.88	2,654.13	115.75	23.930		
9,200.00	9,200.00	13,030.00	6,377.12	20.54	122.14	-103.99	-161.87	-649.55	2,867.02	2,751.04	115.97	24.722		
9,300.00	9,300.00	13,030.00	6,377.12	20.76	122.14	-103.99	-161.87	-649.55	2,964.34	2,848.15	116.20	25.511		
9,400.00	9,400.00	13,030.00	6,377.12	20.99	122.14	-103.99	-161.87	-649.55	3,061.84	2,945.42	116.42	26.300		
9,500.00	9,500.00	13,030.00	6,377.12	21.21	122.14	-103.99	-161.87	-649.55	3,159.50	3,042.85	116.65	27.086		
9,600.00	9,600.00	13,030.00	6,377.12	21.44	122.14	-103.99	-161.87	-649.55	3,257.30	3,140.43	116.87	27.871		
9,700.00	9,700.00	13,030.00	6,377.12	21.66	122.14	-103.99	-161.87	-649.55	3,355.23	3,238.13	117.10	28.654		
9,800.00	9,800.00	13,030.00	6,377.12	21.89	122.14	-103.99	-161.87	-649.55	3,453.27	3,335.95	117.32	29.434		
9,900.00	9,900.00	13,030.00	6,377.12	22.11	122.14	-103.99	-161.87	-649.55	3,551.43	3,433.88	117.55	30.213		
10,000.00	10,000.00	13,030.00	6,377.12	22.34	122.14	-103.99	-161.87	-649.55	3,649.69	3,531.92	117.77	30.990		
10,100.00	10,100.00	13,030.00	6,377.12	22.56	122.14	-103.99	-161.87	-649.55	3,748.03	3,630.04	118.00	31.764		
10,200.00	10,200.00	13,030.00	6,377.12	22.79	122.14	-103.99	-161.87	-649.55	3,846.47	3,728.25	118.22	32.536		

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



Integrity Directional Services, LLC
Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design												Sec. 30, T 26 S. , R 29 E - Ridge Nose Fed Com 1H - Wellbore #1 - Wellbore #1		Offset Site Error:		0.00 ft
Survey Program: 100-MWD														Offset Well Error:		0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor				
10,300.00	10,299.89	13,030.00	6,377.12	22.98	122.14	31.60	-161.87	-649.55	3,944.55	3,820.04	124.51	31.680				
10,400.00	10,397.37	13,030.00	6,377.12	23.16	122.14	17.71	-161.87	-649.55	4,038.51	3,934.73	103.78	38.913				
10,500.00	10,488.26	13,019.09	6,377.33	23.32	121.95	12.26	-172.77	-648.94	4,124.47	4,032.59	91.88	44.891				
10,600.00	10,568.59	12,974.00	6,378.20	23.51	121.15	9.21	-217.78	-646.43	4,198.83	4,116.28	82.54	50.869				
10,700.00	10,634.85	12,910.99	6,379.33	23.77	120.03	7.33	-280.69	-643.06	4,258.47	4,183.66	74.81	56.923				
10,800.00	10,684.13	12,855.31	6,380.17	24.13	119.04	6.24	-336.30	-640.34	4,301.10	4,232.38	68.73	62.581				
10,900.00	10,714.29	12,788.00	6,380.70	24.61	117.84	5.49	-403.53	-637.35	4,325.28	4,261.24	64.03	67.548				
11,000.00	10,724.00	12,735.69	6,380.81	25.21	116.91	5.11	-455.81	-635.24	4,329.89	4,268.49	61.40	70.519				
11,100.00	10,723.25	12,670.60	6,380.70	25.88	115.77	4.91	-520.85	-632.84	4,325.28	4,264.20	61.09	70.807				
11,200.00	10,722.48	12,601.00	6,380.04	26.62	114.55	4.68	-590.41	-630.75	4,322.31	4,261.55	60.76	71.136				
11,300.00	10,721.71	12,552.27	6,379.19	27.43	113.72	4.52	-639.11	-629.34	4,320.88	4,260.24	60.65	71.245				
11,342.85	10,721.38	12,526.34	6,378.59	27.81	113.27	4.43	-665.02	-628.49	4,320.75	4,260.18	60.57	71.339				
11,400.00	10,720.94	12,507.00	6,378.07	28.32	112.94	4.35	-684.34	-627.80	4,321.03	4,260.45	60.58	71.328				
11,500.00	10,720.17	12,438.77	6,375.69	29.25	111.79	4.10	-752.47	-624.74	4,322.67	4,262.32	60.34	71.635				
11,600.00	10,719.40	12,302.46	6,370.14	30.23	109.44	3.76	-888.36	-615.75	4,325.29	4,265.69	59.61	72.564				
11,700.00	10,718.64	12,079.96	6,365.15	31.26	105.60	3.55	-1,110.37	-602.09	4,326.70	4,268.40	58.31	74.205				
11,800.00	10,717.89	11,985.51	6,364.92	32.33	103.94	3.50	-1,204.74	-598.38	4,325.94	4,267.91	58.03	74.552				
11,876.25	10,717.31	11,930.23	6,364.50	33.20	102.96	3.47	-1,259.99	-596.60	4,325.77	4,267.81	57.96	74.637				
11,900.00	10,717.13	11,911.42	6,364.31	33.47	102.63	3.46	-1,278.80	-596.05	4,325.78	4,267.85	57.92	74.680				
12,000.00	10,716.37	11,851.00	6,363.57	34.66	101.56	3.44	-1,339.19	-594.51	4,326.19	4,268.24	57.95	74.656				
12,100.00	10,715.61	11,757.00	6,361.77	35.91	99.94	3.41	-1,433.15	-592.87	4,327.23	4,269.48	57.74	74.938				
12,200.00	10,714.85	11,590.88	6,360.63	37.21	97.09	3.40	-1,599.26	-592.32	4,326.77	4,269.74	57.03	75.868				
12,300.00	10,714.09	11,452.42	6,360.88	38.55	94.71	3.43	-1,737.70	-594.72	4,325.90	4,269.35	56.55	76.499				
12,400.00	10,713.33	11,382.00	6,361.03	39.93	93.48	3.45	-1,808.10	-596.39	4,325.03	4,268.45	56.58	76.440				
12,482.78	10,712.71	11,323.57	6,360.80	41.10	92.47	3.47	-1,866.51	-597.95	4,324.83	4,268.21	56.62	76.386				
12,500.00	10,712.57	11,310.68	6,360.72	41.34	92.25	3.47	-1,879.39	-598.32	4,324.84	4,268.22	56.62	76.383				
12,600.00	10,711.82	11,219.37	6,359.94	42.78	90.68	3.50	-1,970.65	-601.26	4,325.10	4,268.57	56.53	76.510				
12,700.00	10,711.06	11,153.65	6,359.20	44.25	89.57	3.53	-2,036.33	-603.42	4,325.70	4,269.06	56.64	76.377				
12,800.00	10,710.30	11,100.00	6,358.00	45.75	88.66	3.55	-2,089.95	-604.75	4,327.32	4,270.49	56.84	76.133				
12,900.00	10,709.54	11,027.66	6,355.69	47.27	87.45	3.55	-2,162.05	-605.49	4,329.80	4,272.89	56.91	76.077				
13,000.00	10,708.78	10,901.34	6,351.36	48.81	85.29	3.53	-2,288.49	-604.78	4,332.43	4,275.84	56.59	76.559				
13,100.00	10,708.02	10,816.38	6,348.68	50.37	83.84	3.53	-2,373.41	-604.67	4,334.81	4,278.22	56.58	76.610				
13,200.00	10,707.26	10,716.67	6,345.37	51.95	82.14	3.52	-2,473.06	-604.66	4,337.34	4,280.87	56.47	76.801				
13,300.00	10,706.50	10,464.00	6,340.21	53.54	77.89	3.50	-2,725.65	-604.47	4,339.31	4,284.06	55.25	78.544				
13,400.00	10,705.75	10,381.86	6,340.36	55.15	76.47	3.50	-2,807.80	-604.04	4,338.36	4,283.08	55.28	78.479				
13,440.57	10,705.44	10,360.77	6,340.27	55.81	76.11	3.49	-2,828.88	-604.05	4,338.22	4,282.83	55.39	78.325				
13,500.00	10,704.99	10,316.00	6,339.77	56.77	75.32	3.50	-2,873.65	-604.29	4,338.40	4,282.95	55.44	78.250				
13,600.00	10,704.23	10,257.99	6,338.76	58.41	74.34	3.50	-2,931.64	-604.93	4,339.29	4,283.62	55.67	77.948				
13,700.00	10,703.47	9,996.63	6,339.85	60.05	69.98	3.55	-3,192.93	-609.46	4,337.51	4,283.09	54.42	79.704				
13,800.00	10,702.71	9,911.28	6,341.33	61.71	68.53	3.56	-3,278.27	-610.32	4,335.09	4,280.63	54.46	79.605				
13,900.00	10,701.95	9,755.00	6,344.18	63.37	65.89	3.58	-3,434.51	-611.56	4,332.70	4,278.72	53.98	80.264				
14,000.00	10,701.19	9,661.00	6,346.72	65.04	64.27	3.58	-3,528.47	-612.05	4,329.26	4,275.30	53.96	80.229				
14,100.00	10,700.43	9,661.00	6,346.72	66.73	64.27	3.58	-3,528.47	-612.05	4,327.07	4,272.44	54.63	79.201				
14,187.09	10,699.77	9,619.23	6,346.91	68.20	63.56	3.58	-3,570.24	-612.04	4,326.32	4,271.41	54.92	78.781				
14,200.00	10,699.68	9,615.62	6,346.87	68.41	63.50	3.58	-3,573.85	-612.01	4,326.34	4,271.36	54.98	78.695				
14,300.00	10,698.92	9,565.00	6,345.55	70.11	62.64	3.56	-3,624.44	-611.13	4,327.61	4,272.33	55.28	78.286				
14,400.00	10,698.16	9,550.47	6,344.93	71.81	62.40	3.56	-3,638.96	-610.74	4,330.10	4,274.25	55.85	77.527				
14,500.00	10,697.40	9,470.00	6,341.24	73.52	61.04	3.52	-3,719.30	-608.23	4,333.71	4,277.77	55.94	77.475				
14,600.00	10,696.64	9,423.46	6,338.68	75.23	60.25	3.49	-3,765.74	-606.35	4,338.14	4,281.86	56.27	77.088				
14,700.00	10,695.88	9,063.67	6,326.53	76.95	54.30	3.32	-4,125.00	-595.40	4,341.55	4,287.26	54.29	79.970				
14,800.00	10,695.12	8,994.00	6,326.32	78.67	53.13	3.30	-4,194.66	-594.14	4,340.97	4,286.50	54.47	79.700				
14,900.00	10,694.36	8,880.03	6,325.85	80.40	51.25	3.27	-4,308.60	-591.67	4,340.47	4,286.15	54.32	79.907				

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



Integrity Directional Services, LLC
Anticollision Report



Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

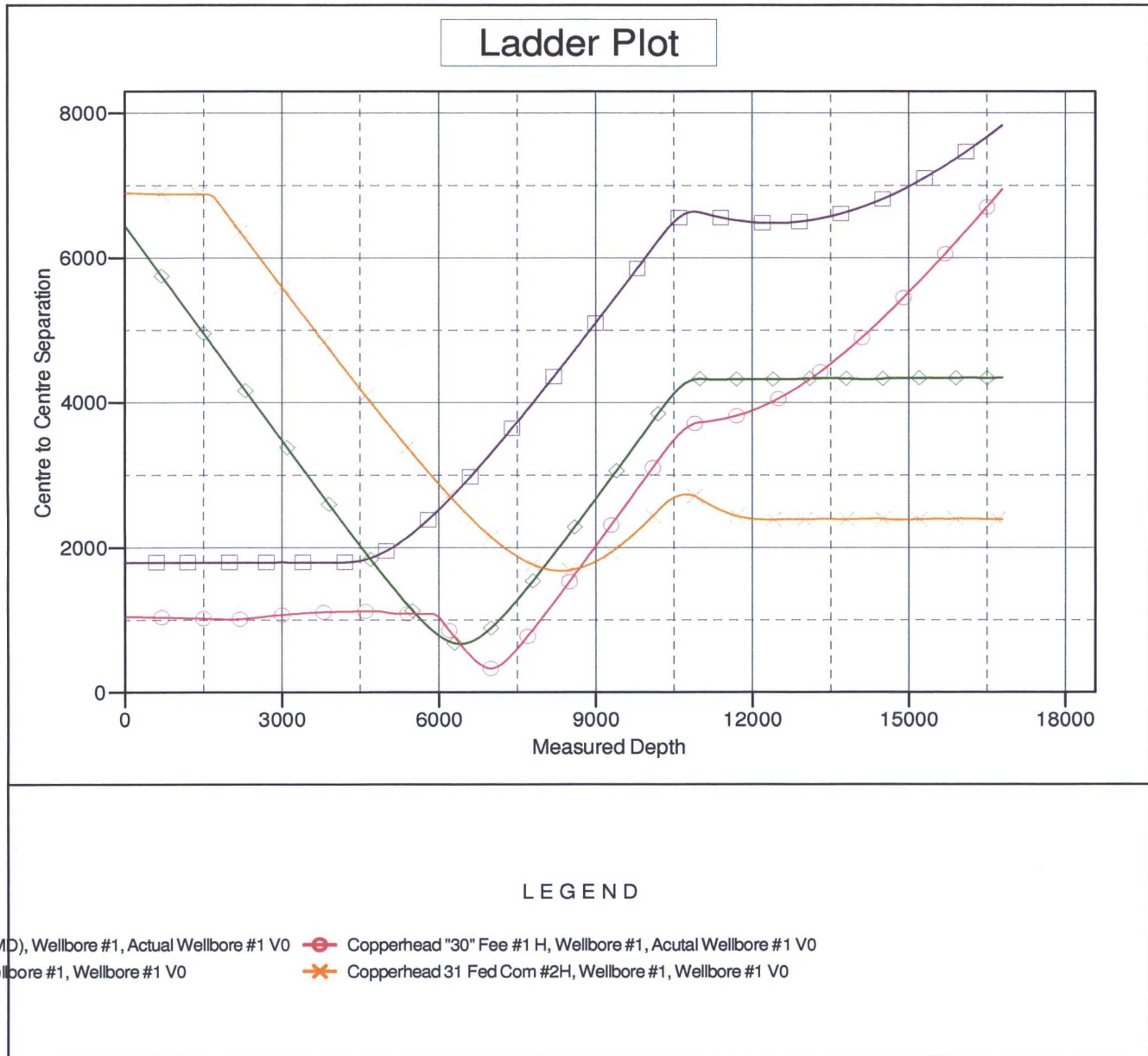
Offset Design Sec. 30, T 26 S. , R 29 E - Ridge Nose Fed Com 1H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)				Between Centres (ft)	Between Ellipses (ft)	
15,000.00	10,693.61	8,804.00	6,325.32	82.13	49.96	3.23	-4,384.59	-589.42	4,340.21	4,285.76	54.45	79.709		
15,001.02	10,693.60	8,804.00	6,325.32	82.15	49.96	3.23	-4,384.59	-589.42	4,340.21	4,285.75	54.46	79.699		
15,100.00	10,692.85	8,740.46	6,324.43	83.87	48.89	3.21	-4,448.10	-587.50	4,340.64	4,285.96	54.68	79.387		
15,200.00	10,692.09	8,613.00	6,322.32	85.61	46.76	3.16	-4,575.51	-584.76	4,341.47	4,287.03	54.44	79.751		
15,300.00	10,691.33	8,518.00	6,321.24	87.35	45.14	3.14	-4,670.50	-583.51	4,341.75	4,287.31	54.44	79.750		
15,400.00	10,690.57	8,447.08	6,320.19	89.10	43.98	3.13	-4,741.40	-583.14	4,342.42	4,287.79	54.63	79.492		
15,500.00	10,689.81	8,235.00	6,320.10	90.85	40.47	3.12	-4,953.47	-582.60	4,341.19	4,287.40	53.79	80.702		
15,600.00	10,689.05	8,168.99	6,320.40	92.60	39.36	3.11	-5,019.48	-582.26	4,339.95	4,285.93	54.02	80.341		
15,687.57	10,688.39	8,117.59	6,320.22	94.14	38.50	3.11	-5,070.88	-582.01	4,339.57	4,285.30	54.27	79.970		
15,700.00	10,688.29	8,111.02	6,320.17	94.36	38.40	3.11	-5,077.45	-581.99	4,339.58	4,285.27	54.31	79.911		
15,800.00	10,687.54	8,045.00	6,319.11	96.12	37.31	3.10	-5,143.46	-581.94	4,340.30	4,285.76	54.54	79.586		
15,900.00	10,686.78	7,950.22	6,317.21	97.88	35.81	3.11	-5,238.21	-582.68	4,341.56	4,286.99	54.57	79.567		
16,000.00	10,686.02	7,871.30	6,315.60	99.64	34.59	3.11	-5,317.12	-583.17	4,342.84	4,288.13	54.71	79.379		
16,100.00	10,685.26	7,700.00	6,312.74	101.41	32.00	3.08	-5,488.38	-581.49	4,343.77	4,289.58	54.19	80.151		
16,200.00	10,684.50	7,569.18	6,312.38	103.17	29.96	3.05	-5,619.19	-579.79	4,343.17	4,289.20	53.98	80.466		
16,299.80	10,683.74	7,505.00	6,312.10	104.94	28.98	3.04	-5,683.37	-579.39	4,342.79	4,288.55	54.23	80.076		
16,300.00	10,683.74	7,505.00	6,312.10	104.94	28.98	3.04	-5,683.37	-579.39	4,342.79	4,288.55	54.23	80.074		
16,400.00	10,682.98	7,352.00	6,312.28	106.71	26.74	3.03	-5,836.37	-578.60	4,341.70	4,287.82	53.88	80.580		
16,499.77	10,682.23	7,305.03	6,312.26	108.48	26.02	3.02	-5,883.33	-578.13	4,341.02	4,286.75	54.27	79.993		
16,500.00	10,682.22	7,304.94	6,312.26	108.49	26.02	3.02	-5,883.43	-578.13	4,341.02	4,286.75	54.27	79.992		
16,600.00	10,681.46	7,260.00	6,311.56	110.26	25.34	3.01	-5,928.36	-577.87	4,341.70	4,287.03	54.67	79.414		
16,700.00	10,680.71	7,162.71	6,309.44	112.04	24.00	3.01	-6,025.62	-577.98	4,343.10	4,288.38	54.73	79.361		
16,793.62	10,680.00	7,077.00	6,307.73	113.70	22.81	3.01	-6,111.31	-578.35	4,344.28	4,289.46	54.82	79.243		

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

Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB=25' @ 2953.81ft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Copperhead Fee 21H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.17°

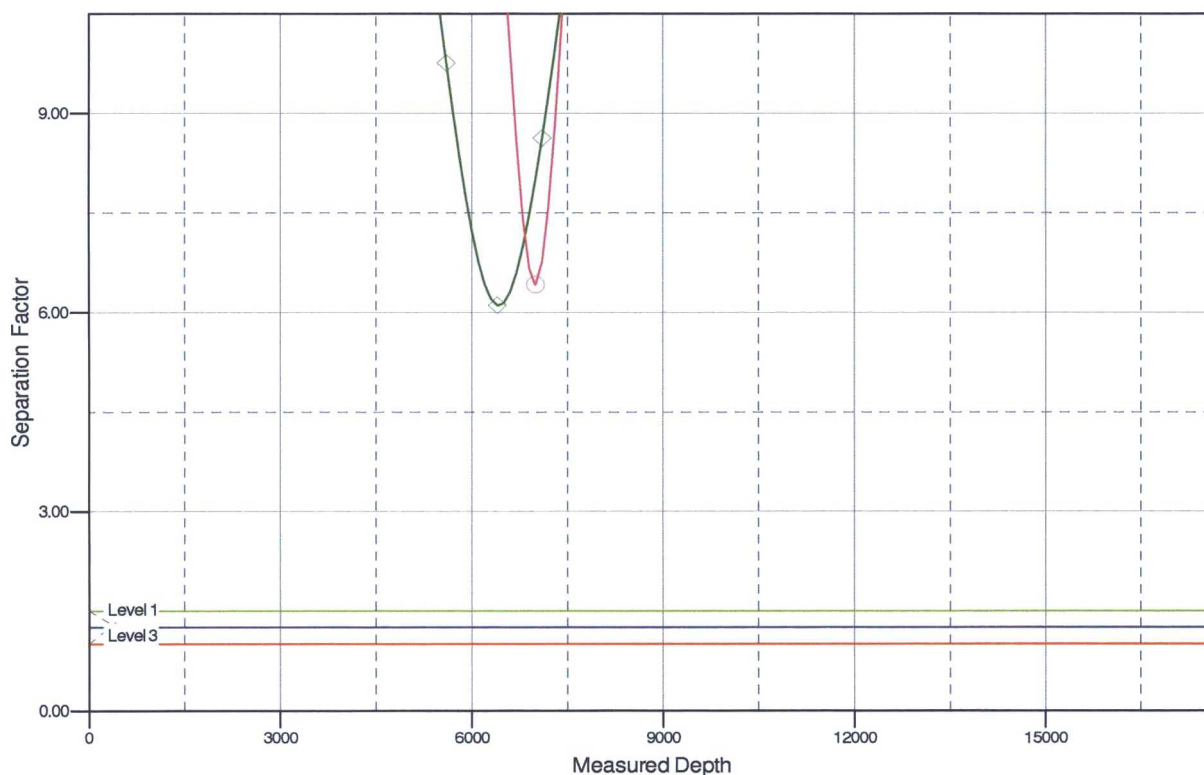


Company:	COG Production, LLC	Local Co-ordinate Reference:	Well Copperhead Fee 21H
Project:	Lea County, NM (NAD 27)	TVD Reference:	KB=25' @ 2953.81ft
Reference Site:	Sec. 30, T 26 S. , R 29 E	MD Reference:	KB=25' @ 2953.81ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Copperhead Fee 21H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB=25' @ 2953.81ft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Copperhead Fee 21H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.17°

Separation Factor Plot



LEGEND

MD), Wellbore #1, Actual Wellbore #1 V0  Copperhead "30" Fee #1 H, Wellbore #1, Actual Wellbore #1 V0
 Wellbore #1, Wellbore #1 V0  Copperhead 31 Fed Com #2H, Wellbore #1, Wellbore #1 V0



COG Production, LLC
 Project: Lea County, NM (NAD 27)
 Site: Sec. 30, T 26 S., R 29 E
 Well: Copperhead Fee 21H
 Wellbore: Wellbore #1
 Plan: Plan #1 (Copperhead Fee 21H/Wellbore #1)



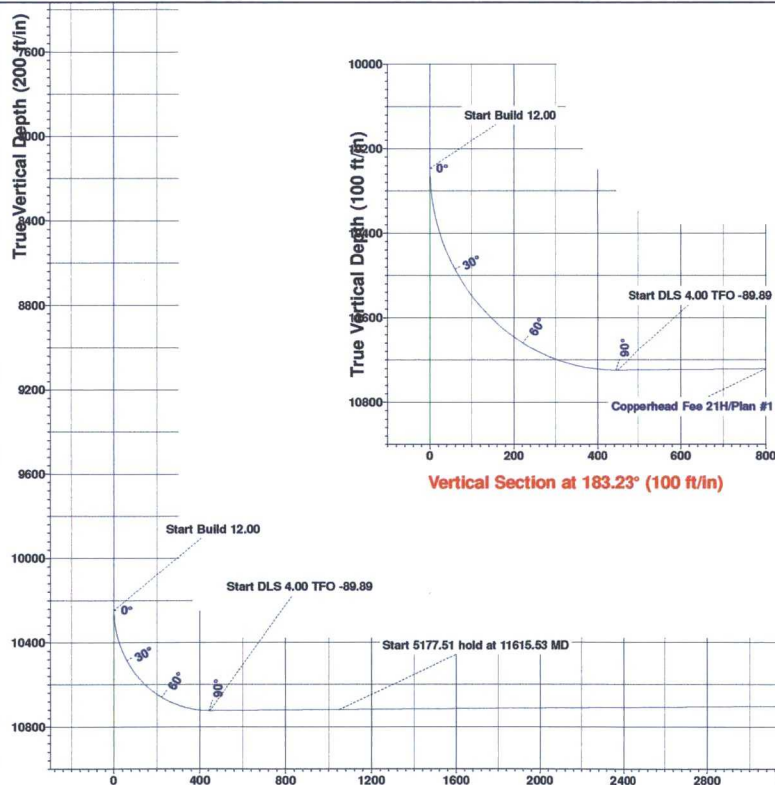
WELL DETAILS: Copperhead Fee 21H

Ground Elevation:: 2928.81
 RKB Elevation: KB=25' @ 2953.81ft
 Rig Name:

Northing	Easting	Latitude	Longitude
371210.7000	597099.3000	32° 1' 12.667 N	104° 1' 12.131 W

Planned Section Details

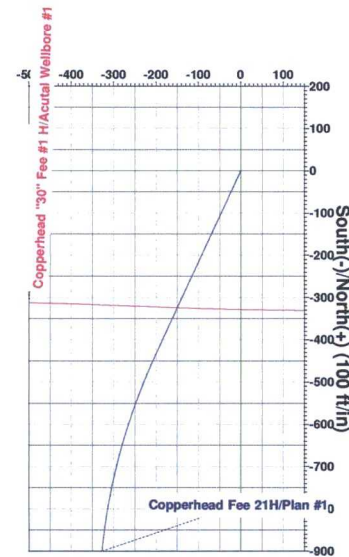
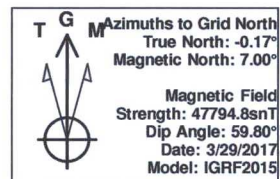
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	10246.55	0.00	0.00	10246.55	0.00	0.00	0.00	0.00	0.00
3	11000.13	90.43	204.80	10724.00	-436.69	-201.78	12.00	204.80	447.36
4	11615.53	90.43	180.18	10719.29	-1032.89	-333.86	4.00	-89.89	1050.05
5	16793.04	90.43	180.18	10680.00	-6210.22	-350.44	0.00	0.00	6220.10



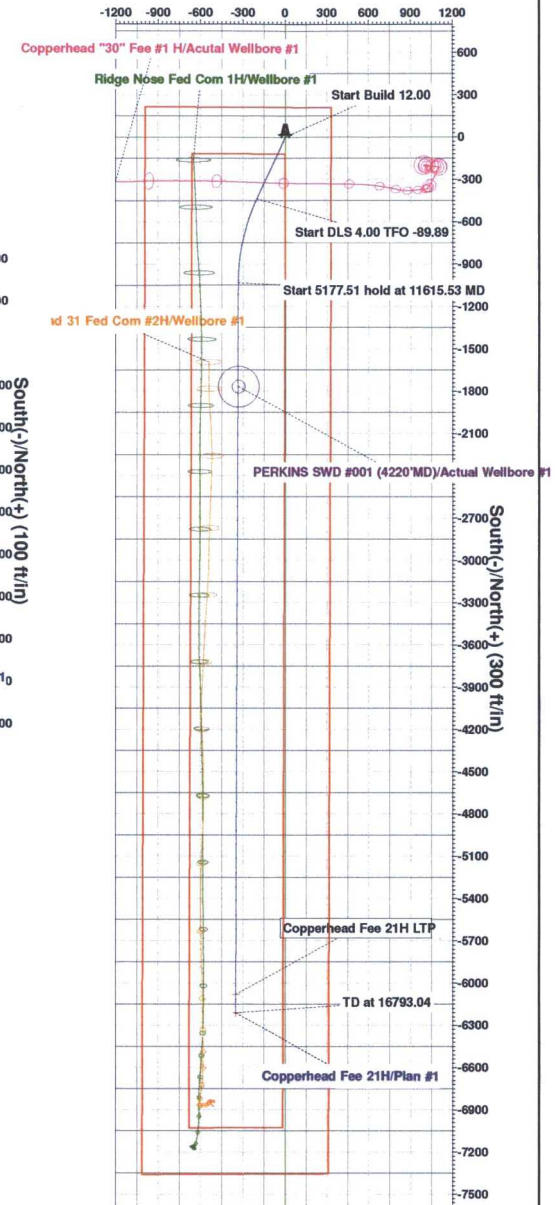
Vertical Section at 183.23° (100 ft/in)

Vertical Section at 183.23° (200 ft/in)

PROJECT DETAILS: Lea County, NM (NAD 27)
 Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 System Datum: Mean Sea Level
 Local North: Grid



West(-)/East(+) (100 ft/in)



South(-)/North(+) (300 ft/in)