



NM OIL CONSERVATION
ARTESIA DISTRICT

OCT 29 2018

RECEIVED

COG Operating LLC

Eddy County, NM (NAD27 NME)

Myox 21 State Com

37H

OH

Plan 1 10-19-18

30-015-45376

Anticollision Report

19 October, 2018



PHOENIX
TECHNOLOGY SERVICES



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 37H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3000.90usft (Ensign 155)
Reference Site:	Myox 21 State Com	MD Reference:	KB @ 3000.90usft (Ensign 155)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	37H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA Compass
Reference Design:	Plan 1 10-19-18	Offset TVD Reference:	Offset Datum

Reference	Plan 1 10-19-18		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 50,000.00 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	10/19/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	19,712.39	Plan 1 10-19-18 (OH)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Myox 21 State Com						
35H - OH - Plan 1 10-19-18	2,500.03	2,502.13	60.00	42.52	3.432	CC, ES
35H - OH - Plan 1 10-19-18	19,713.14	19,650.31	660.19	358.53	2.189	SF
36H - OH - Plan 1 10-19-18	2,550.28	2,552.10	29.99	12.16	1.682	CC
36H - OH - Plan 1 10-19-18	2,900.00	2,905.23	30.82	10.72	1.534	ES
36H - OH - Plan 1 10-19-18	19,713.14	19,486.36	376.52	102.63	1.375	Level 3, SF
38H - OH - Plan 1 10-19-18	2,416.33	2,417.33	31.00	14.12	1.836	CC
38H - OH - Plan 1 10-19-18	2,999.96	2,995.62	31.07	10.42	1.505	ES
38H - OH - Plan 1 10-19-18	19,713.14	19,573.95	360.50	78.72	1.279	Level 3, SF

Offset Design Myox 21 State Com - 35H - OH - Plan 1 10-19-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	2.10	2.10	0.00	0.00	-90.48	-0.50	-60.00	60.00					
100.00	100.00	102.10	102.10	0.14	0.14	-90.48	-0.50	-60.00	60.00	59.72	0.28	215.700		
200.00	200.00	202.10	202.10	0.49	0.50	-90.48	-0.50	-60.00	60.00	59.01	1.00	60.296		
300.00	300.00	302.10	302.10	0.85	0.86	-90.48	-0.50	-60.00	60.00	58.29	1.71	35.047		
400.00	400.00	402.10	402.10	1.21	1.22	-90.48	-0.50	-60.00	60.00	57.57	2.43	24.702		
500.00	500.00	502.10	502.10	1.57	1.58	-90.48	-0.50	-60.00	60.00	56.86	3.15	19.073		
600.00	600.00	602.10	602.10	1.93	1.93	-90.48	-0.50	-60.00	60.00	56.14	3.86	15.533		
700.00	700.00	702.10	702.10	2.29	2.29	-90.48	-0.50	-60.00	60.00	55.42	4.58	13.101		
800.00	800.00	802.10	802.10	2.65	2.65	-90.48	-0.50	-60.00	60.00	54.71	5.30	11.328		
900.00	900.00	902.10	902.10	3.00	3.01	-90.48	-0.50	-60.00	60.00	53.99	6.01	9.978		
1,000.00	1,000.00	1,002.10	1,002.10	3.36	3.37	-90.48	-0.50	-60.00	60.00	53.27	6.73	8.915		
1,100.00	1,100.00	1,102.10	1,102.10	3.72	3.73	-90.48	-0.50	-60.00	60.00	52.55	7.45	8.057		
1,200.00	1,200.00	1,202.10	1,202.10	4.08	4.09	-90.48	-0.50	-60.00	60.00	51.84	8.16	7.349		
1,300.00	1,300.00	1,302.10	1,302.10	4.44	4.44	-90.48	-0.50	-60.00	60.00	51.12	8.88	6.756		
1,400.00	1,400.00	1,402.10	1,402.10	4.80	4.80	-90.48	-0.50	-60.00	60.00	50.40	9.60	6.251		
1,500.00	1,500.00	1,502.10	1,502.10	5.15	5.16	-90.48	-0.50	-60.00	60.00	49.69	10.32	5.817		
1,600.00	1,600.00	1,602.10	1,602.10	5.51	5.52	-90.48	-0.50	-60.00	60.00	48.97	11.03	5.439		
1,700.00	1,700.00	1,702.10	1,702.10	5.87	5.88	-90.48	-0.50	-60.00	60.00	48.25	11.75	5.107		
1,800.00	1,800.00	1,802.10	1,802.10	6.23	6.24	-90.48	-0.50	-60.00	60.00	47.54	12.47	4.813		
1,900.00	1,900.00	1,902.10	1,902.10	6.59	6.59	-90.48	-0.50	-60.00	60.00	46.82	13.18	4.551		

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Corn
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Corn - 35H - OH - Plan 1 10-19-18													Offset Site Error:	0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	Offset Wellbore Centre +E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
2,000.00	2,000.00	2,002.10	2,002.10	6.95	6.95	-90.48	-0.50	-60.00	60.00	46.10	13.90	4.317		
2,100.00	2,100.00	2,102.10	2,102.10	7.31	7.31	-90.48	-0.50	-60.00	60.00	45.39	14.62	4.105		
2,200.00	2,200.00	2,202.10	2,202.10	7.66	7.67	-90.48	-0.50	-60.00	60.00	44.67	15.33	3.913		
2,300.00	2,300.00	2,302.10	2,302.10	8.02	8.03	-90.48	-0.50	-60.00	60.00	43.95	16.05	3.738		
2,400.00	2,400.00	2,402.10	2,402.10	8.38	8.39	-90.48	-0.50	-60.00	60.00	43.23	16.77	3.578		
2,500.00	2,500.00	2,502.10	2,502.10	8.74	8.74	-90.48	-0.50	-60.00	60.00	42.52	17.48	3.432		
2,500.03	2,500.03	2,502.13	2,502.13	8.74	8.74	-90.48	-0.50	-60.00	60.00	42.52	17.48	3.432	CC, ES	
2,600.00	2,599.98	2,602.08	2,602.05	9.09	9.08	169.85	-2.32	-59.96	61.72	43.55	18.17	3.397		
2,700.00	2,699.84	2,701.74	2,701.58	9.43	9.41	168.09	-7.60	-59.84	67.08	48.24	18.83	3.562		
2,800.00	2,799.45	2,801.02	2,800.51	9.77	9.73	161.40	-15.84	-59.66	76.42	56.93	19.49	3.920		
2,900.00	2,898.70	2,900.07	2,899.18	10.12	10.06	158.29	-24.47	-59.47	89.46	69.30	20.16	4.437		
2,999.96	2,997.42	2,998.64	2,997.37	10.47	10.38	156.69	-33.05	-59.28	105.83	85.00	20.83	5.081		
3,100.00	3,095.95	3,097.04	3,095.40	10.83	10.71	155.95	-41.62	-59.10	123.84	102.34	21.50	5.760		
3,200.00	3,194.43	3,195.39	3,193.38	11.20	11.05	155.39	-50.18	-58.91	141.85	119.67	22.18	6.396		
3,300.00	3,292.91	3,293.75	3,291.36	11.57	11.38	154.97	-58.75	-58.72	159.87	137.02	22.86	6.994		
3,400.00	3,391.39	3,392.10	3,389.35	11.94	11.72	154.62	-67.31	-58.53	177.91	154.36	23.54	7.556		
3,500.00	3,489.87	3,490.46	3,487.33	12.32	12.06	154.34	-75.88	-58.34	195.94	171.71	24.24	8.085		
3,600.00	3,588.35	3,588.82	3,585.31	12.70	12.40	154.11	-84.44	-58.15	213.88	189.05	24.93	8.583		
3,700.00	3,686.83	3,688.07	3,684.21	13.08	12.75	153.98	-92.81	-57.97	231.95	206.31	25.63	9.048		
3,800.00	3,785.31	3,788.88	3,784.86	13.47	13.10	154.52	-98.42	-57.85	249.14	222.79	26.35	9.456		
3,900.00	3,883.79	3,889.75	3,885.70	13.86	13.45	155.73	-100.49	-57.80	265.46	238.40	27.06	9.810		
4,000.00	3,982.28	3,988.42	3,984.38	14.25	13.79	157.18	-100.50	-57.80	281.42	253.66	27.76	10.137		
4,100.00	4,080.76	4,086.90	4,082.88	14.65	14.14	158.47	-100.50	-57.80	297.53	269.07	28.46	10.453		
4,200.00	4,179.24	4,185.39	4,181.34	15.04	14.49	159.63	-100.50	-57.80	313.78	284.62	29.17	10.758		
4,300.00	4,277.72	4,283.87	4,279.82	15.44	14.84	160.68	-100.50	-57.80	330.14	300.27	29.87	11.052		
4,400.00	4,376.20	4,382.35	4,378.30	15.84	15.18	161.63	-100.50	-57.80	346.60	316.03	30.58	11.335		
4,500.00	4,474.68	4,480.83	4,476.78	16.24	15.53	162.49	-100.50	-57.80	363.15	331.86	31.28	11.608		
4,600.00	4,573.16	4,579.31	4,575.26	16.65	15.88	163.28	-100.50	-57.80	379.76	347.77	31.99	11.871		
4,700.00	4,671.64	4,677.79	4,673.74	17.05	16.23	164.00	-100.50	-57.80	396.44	363.75	32.70	12.124		
4,800.00	4,770.12	4,776.27	4,772.22	17.46	16.58	164.66	-100.50	-57.80	413.18	379.77	33.41	12.368		
4,900.00	4,868.61	4,874.75	4,870.71	17.87	16.93	165.27	-100.50	-57.80	429.97	395.85	34.12	12.603		
5,000.00	4,967.09	4,973.23	4,969.19	18.28	17.27	165.84	-100.50	-57.80	446.80	411.97	34.83	12.829		
5,100.00	5,065.57	5,071.71	5,067.67	18.69	17.62	166.36	-100.50	-57.80	463.67	428.13	35.54	13.047		
5,200.00	5,164.05	5,170.20	5,168.15	19.10	17.97	166.85	-100.50	-57.80	480.57	444.32	36.25	13.258		
5,300.00	5,262.53	5,268.68	5,264.63	19.51	18.32	167.31	-100.50	-57.80	497.51	460.55	36.96	13.460		
5,400.00	5,361.01	5,367.16	5,363.11	19.92	18.67	167.73	-100.50	-57.80	514.47	476.80	37.67	13.656		
5,500.00	5,459.49	5,465.64	5,461.59	20.34	19.02	168.13	-100.50	-57.80	531.46	493.08	38.39	13.845		
5,600.00	5,557.97	5,564.12	5,560.07	20.75	19.37	168.50	-100.50	-57.80	548.48	509.38	39.10	14.027		
5,700.00	5,656.45	5,662.60	5,658.55	21.17	19.72	168.85	-100.50	-57.80	565.51	525.70	39.82	14.203		
5,800.00	5,754.93	5,761.08	5,757.03	21.58	20.07	169.18	-100.50	-57.80	582.57	542.04	40.53	14.374		
5,900.00	5,853.42	5,859.56	5,855.52	22.00	20.42	169.49	-100.50	-57.80	599.64	558.40	41.25	14.538		
6,000.00	5,951.90	5,958.04	5,954.00	22.42	20.77	169.79	-100.50	-57.80	616.73	574.77	41.96	14.698		
6,100.00	6,050.66	6,056.80	6,052.76	22.82	21.12	170.09	-100.50	-57.80	633.16	589.48	42.68	14.813		
6,200.00	6,149.90	6,156.05	6,152.00	23.22	21.48	170.32	-100.50	-57.80	644.19	600.80	43.39	14.846		
6,300.00	6,249.52	6,255.66	6,251.62	23.59	21.83	170.48	-100.50	-57.80	652.81	608.71	44.10	14.802		
6,400.00	6,349.37	6,355.52	6,351.47	23.95	22.19	170.57	-100.50	-57.80	657.99	613.18	44.81	14.683		
6,500.00	6,449.35	6,455.50	6,451.45	24.28	22.54	170.60	-100.50	-57.80	659.74	614.22	45.52	14.495		
6,600.00	6,549.35	6,555.50	6,551.45	24.61	22.90	-91.17	-100.50	-57.80	659.74	613.52	46.21	14.276		
6,700.00	6,649.35	6,655.50	6,651.45	24.94	23.25	-91.17	-100.50	-57.80	659.74	612.82	46.91	14.063		
6,800.00	6,749.35	6,755.50	6,751.45	25.27	23.61	-91.17	-100.50	-57.80	659.74	612.13	47.61	13.856		
6,900.00	6,849.35	6,855.50	6,851.45	25.61	23.97	-91.17	-100.50	-57.80	659.74	611.43	48.31	13.656		
7,000.00	6,949.35	6,955.50	6,951.45	25.94	24.32	-91.17	-100.50	-57.80	659.74	610.73	49.01	13.460		

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Com
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
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Offset Design Myox 21 State Com - 35H - OH - Plan 1 10-19-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance		Minimum Separation		Separation		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Factor		
7,100.00	7,049.35	7,055.50	7,051.45	26.27	24.68	-91.17	-100.50	-57.80	659.74	610.02	49.71	13.271		
7,200.00	7,149.35	7,155.50	7,151.45	26.60	25.04	-91.17	-100.50	-57.80	659.74	609.32	50.42	13.086		
7,300.00	7,249.35	7,255.50	7,251.45	26.94	25.39	-91.17	-100.50	-57.80	659.74	608.62	51.12	12.906		
7,400.00	7,349.35	7,355.50	7,351.45	27.27	25.75	-91.17	-100.50	-57.80	659.74	607.92	51.82	12.732		
7,500.00	7,449.35	7,455.50	7,451.45	27.61	26.11	-91.17	-100.50	-57.80	659.74	607.22	52.52	12.561		
7,600.00	7,549.35	7,555.50	7,551.45	27.94	26.46	-91.17	-100.50	-57.80	659.74	606.51	53.22	12.395		
7,700.00	7,649.35	7,655.50	7,651.45	28.28	26.82	-91.17	-100.50	-57.80	659.74	605.81	53.93	12.234		
7,800.00	7,749.35	7,755.50	7,751.45	28.62	27.18	-91.17	-100.50	-57.80	659.74	605.11	54.63	12.078		
7,900.00	7,849.35	7,855.50	7,851.45	28.96	27.53	-91.17	-100.50	-57.80	659.74	604.40	55.34	11.923		
8,000.00	7,949.35	7,955.50	7,951.45	29.29	27.89	-91.17	-100.50	-57.80	659.74	603.70	56.04	11.773		
8,100.00	8,049.35	8,055.50	8,051.45	29.63	28.25	-91.17	-100.50	-57.80	659.74	602.99	56.74	11.627		
8,200.00	8,149.35	8,155.50	8,151.45	29.97	28.60	-91.17	-100.50	-57.80	659.74	602.29	57.45	11.484		
8,300.00	8,249.35	8,255.50	8,251.45	30.31	28.96	-91.17	-100.50	-57.80	659.74	601.58	58.15	11.345		
8,400.00	8,349.35	8,355.50	8,351.45	30.65	29.32	-91.17	-100.50	-57.80	659.74	600.88	58.86	11.209		
8,500.00	8,449.35	8,455.50	8,451.45	30.99	29.67	-91.17	-100.50	-57.80	659.74	600.17	59.57	11.076		
8,600.00	8,549.35	8,555.50	8,551.45	31.33	30.03	-91.17	-100.50	-57.80	659.74	599.47	60.27	10.946		
8,700.00	8,649.35	8,655.50	8,651.45	31.67	30.39	-91.17	-100.50	-57.80	659.74	598.76	60.98	10.819		
8,800.00	8,749.35	8,755.50	8,751.45	32.01	30.75	-91.17	-100.50	-57.80	659.74	598.05	61.68	10.695		
8,900.00	8,849.35	8,855.50	8,851.45	32.36	31.10	-91.17	-100.50	-57.80	659.74	597.35	62.39	10.574		
9,000.00	8,949.35	8,955.50	8,951.45	32.70	31.46	-91.17	-100.50	-57.80	659.74	596.64	63.10	10.456		
9,100.00	9,049.35	9,055.53	9,051.48	33.04	31.82	-91.17	-100.50	-57.80	659.74	595.93	63.81	10.340		
9,200.00	9,149.03	9,156.56	9,151.71	33.38	32.17	-90.24	-89.44	-57.90	659.70	595.20	64.50	10.228		
9,245.96	9,194.00	9,202.58	9,196.12	33.53	32.32	-90.01	-77.44	-58.00	659.69	594.89	64.80	10.180		
9,300.00	9,245.41	9,256.37	9,246.28	33.70	32.49	-89.74	-58.09	-58.17	659.70	594.56	65.14	10.127		
9,400.00	9,334.27	9,355.02	9,331.35	33.97	32.79	-89.26	-8.47	-58.81	659.75	594.03	65.72	10.038		
9,500.00	9,411.73	9,452.62	9,403.72	34.16	33.06	-88.82	56.75	-59.18	659.84	593.59	66.25	9.959		
9,600.00	9,474.42	9,549.29	9,460.87	34.34	33.30	-88.43	134.51	-59.87	659.95	593.21	66.74	9.889		
9,700.00	9,519.58	9,645.18	9,500.97	34.44	33.54	-88.10	221.43	-60.63	660.07	592.87	67.19	9.823		
9,800.00	9,545.25	9,740.47	9,522.84	34.53	33.77	-87.85	314.01	-61.45	660.17	592.53	67.64	9.761		
9,900.00	9,551.06	9,837.17	9,527.11	34.67	34.00	-87.74	410.53	-62.30	660.22	592.14	68.09	9.697		
10,000.00	9,551.26	9,937.17	9,527.41	34.90	34.28	-87.75	510.53	-63.18	660.22	591.58	68.64	9.619		
10,100.00	9,551.46	10,037.17	9,527.72	35.21	34.62	-87.76	610.52	-64.06	660.22	590.91	69.31	9.526		
10,200.00	9,551.67	10,137.17	9,528.02	35.59	35.02	-87.77	710.52	-64.94	660.22	590.13	70.09	9.420		
10,300.00	9,551.87	10,237.17	9,528.33	36.02	35.47	-87.77	810.51	-65.82	660.22	589.24	70.97	9.302		
10,400.00	9,552.07	10,337.17	9,528.63	36.52	35.97	-87.78	910.51	-66.70	660.22	588.25	71.97	9.174		
10,500.00	9,552.28	10,437.17	9,528.94	37.06	36.52	-87.79	1,010.50	-67.58	660.22	587.16	73.06	9.037		
10,600.00	9,552.48	10,537.17	9,529.24	37.65	37.12	-87.80	1,110.50	-68.46	660.21	585.97	74.24	8.892		
10,700.00	9,552.68	10,637.17	9,529.55	38.28	37.76	-87.81	1,210.50	-69.34	660.21	584.69	75.52	8.742		
10,800.00	9,552.89	10,737.17	9,529.85	38.96	38.45	-87.82	1,310.49	-70.22	660.21	583.33	76.89	8.587		
10,900.00	9,553.09	10,837.17	9,530.15	39.67	39.18	-87.83	1,410.49	-71.10	660.21	581.88	78.33	8.428		
11,000.00	9,553.29	10,937.17	9,530.46	40.43	39.94	-87.84	1,510.48	-71.98	660.21	580.35	79.86	8.267		
11,100.00	9,553.50	11,037.17	9,530.76	41.22	40.74	-87.84	1,610.48	-72.86	660.21	578.75	81.48	8.105		
11,200.00	9,553.70	11,137.17	9,531.07	42.05	41.58	-87.85	1,710.47	-73.74	660.21	577.09	83.12	7.943		
11,300.00	9,553.90	11,237.17	9,531.37	42.91	42.45	-87.86	1,810.47	-74.62	660.21	575.36	84.85	7.781		
11,400.00	9,554.11	11,337.17	9,531.68	43.79	43.35	-87.87	1,910.46	-75.50	660.21	573.56	86.65	7.620		
11,500.00	9,554.31	11,437.17	9,531.98	44.71	44.28	-87.88	2,010.46	-76.38	660.21	571.71	88.50	7.460		
11,600.00	9,554.51	11,537.17	9,532.29	45.66	45.23	-87.89	2,110.46	-77.26	660.21	569.81	90.40	7.303		
11,700.00	9,554.72	11,637.17	9,532.59	46.63	46.22	-87.90	2,210.45	-78.14	660.21	567.85	92.35	7.149		
11,800.00	9,554.92	11,737.17	9,532.89	47.62	47.22	-87.91	2,310.45	-79.02	660.20	565.85	94.35	6.997		
11,900.00	9,555.12	11,837.17	9,533.20	48.63	48.24	-87.91	2,410.44	-79.90	660.20	563.80	96.40	6.849		
12,000.00	9,555.33	11,937.17	9,533.50	49.67	49.29	-87.92	2,510.44	-80.78	660.20	561.72	98.49	6.703		
12,100.00	9,555.53	12,037.17	9,533.81	50.72	50.36	-87.93	2,610.43	-81.66	660.20	559.59	100.61	6.562		

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Com
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 35H - OH - Plan 1 10-19-18													Offset Site Error:	0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance		Minimum Separation		Separation Factor		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Ellipses (usft)	Separation (usft)	Factor		
12,200.00	9,555.73	12,137.17	9,534.11	51.80	51.44	-87.94	2,710.43	-82.54	660.20	557.43	102.78	6.424		
12,300.00	9,555.94	12,237.17	9,534.42	52.89	52.54	-87.95	2,810.43	-83.42	660.20	555.23	104.97	6.289		
12,400.00	9,556.14	12,337.17	9,534.72	54.00	53.66	-87.96	2,910.42	-84.30	660.20	553.00	107.20	6.158		
12,500.00	9,556.34	12,437.17	9,535.03	55.12	54.79	-87.97	3,010.42	-85.18	660.20	550.74	109.46	6.031		
12,600.00	9,556.55	12,537.17	9,535.33	56.26	55.94	-87.98	3,110.41	-86.06	660.20	548.45	111.75	5.908		
12,700.00	9,556.75	12,637.17	9,535.64	57.41	57.10	-87.98	3,210.41	-86.94	660.20	546.13	114.07	5.788		
12,800.00	9,556.95	12,737.17	9,535.94	58.57	58.27	-87.99	3,310.40	-87.82	660.20	543.79	116.41	5.672		
12,900.00	9,557.15	12,837.17	9,536.24	59.75	59.45	-88.00	3,410.40	-88.70	660.20	541.43	118.77	5.559		
13,000.00	9,557.36	12,937.17	9,536.55	60.93	60.65	-88.01	3,510.39	-89.58	660.20	539.04	121.16	5.449		
13,100.00	9,557.56	13,037.17	9,536.85	62.13	61.85	-88.02	3,610.39	-90.46	660.20	536.63	123.56	5.343		
13,200.00	9,557.76	13,137.17	9,537.16	63.34	63.07	-88.03	3,710.39	-91.34	660.19	534.21	125.99	5.240		
13,300.00	9,557.97	13,237.17	9,537.46	64.55	64.29	-88.04	3,810.38	-92.22	660.19	531.76	128.43	5.140		
13,400.00	9,558.17	13,337.17	9,537.77	65.78	65.53	-88.05	3,910.38	-93.10	660.19	529.30	130.90	5.044		
13,500.00	9,558.37	13,437.17	9,538.07	67.01	66.77	-88.06	4,010.37	-93.98	660.19	526.82	133.38	4.950		
13,600.00	9,558.58	13,537.17	9,538.38	68.26	68.02	-88.06	4,110.37	-94.86	660.19	524.32	135.87	4.859		
13,700.00	9,558.78	13,637.17	9,538.68	69.51	69.27	-88.07	4,210.36	-95.74	660.19	521.81	138.38	4.771		
13,800.00	9,558.98	13,737.17	9,538.98	70.76	70.54	-88.08	4,310.36	-96.62	660.19	519.28	140.91	4.685		
13,900.00	9,559.19	13,837.17	9,539.29	72.03	71.81	-88.09	4,410.36	-97.50	660.19	516.75	143.45	4.602		
14,000.00	9,559.39	13,937.17	9,539.59	73.30	73.08	-88.10	4,510.35	-98.38	660.19	514.20	146.00	4.522		
14,100.00	9,559.59	14,037.17	9,539.90	74.57	74.37	-88.11	4,610.35	-99.26	660.19	511.63	148.56	4.444		
14,200.00	9,559.80	14,137.17	9,540.20	75.86	75.65	-88.12	4,710.34	-100.14	660.19	509.06	151.13	4.368		
14,300.00	9,560.00	14,237.17	9,540.51	77.14	76.95	-88.13	4,810.34	-101.02	660.19	506.47	153.72	4.295		
14,400.00	9,560.20	14,337.17	9,540.81	78.44	78.25	-88.13	4,910.33	-101.90	660.19	503.88	156.31	4.224		
14,500.00	9,560.41	14,437.17	9,541.12	79.74	79.55	-88.14	5,010.33	-102.79	660.19	501.27	158.92	4.154		
14,600.00	9,560.61	14,537.17	9,541.42	81.04	80.86	-88.15	5,110.32	-103.67	660.19	498.66	161.53	4.087		
14,700.00	9,560.81	14,637.17	9,541.72	82.35	82.17	-88.16	5,210.32	-104.55	660.19	496.04	164.15	4.022		
14,800.00	9,561.02	14,737.17	9,542.03	83.66	83.49	-88.17	5,310.32	-105.43	660.19	493.40	166.78	3.958		
14,900.00	9,561.22	14,837.17	9,542.33	84.97	84.81	-88.18	5,410.31	-106.31	660.19	490.76	169.42	3.897		
15,000.00	9,561.42	14,937.17	9,542.64	86.29	86.13	-88.19	5,510.31	-107.19	660.19	488.12	172.07	3.837		
15,100.00	9,561.63	15,037.17	9,542.94	87.62	87.46	-88.20	5,610.30	-108.07	660.19	485.46	174.72	3.778		
15,200.00	9,561.83	15,137.17	9,543.25	88.94	88.79	-88.20	5,710.30	-108.95	660.19	482.80	177.39	3.722		
15,300.00	9,562.03	15,237.17	9,543.55	90.27	90.12	-88.21	5,810.29	-109.83	660.19	480.13	180.05	3.667		
15,400.00	9,562.24	15,337.17	9,543.86	91.61	91.46	-88.22	5,910.29	-110.71	660.19	477.46	182.73	3.613		
15,500.00	9,562.44	15,437.17	9,544.16	92.94	92.80	-88.23	6,010.28	-111.59	660.19	474.78	185.41	3.561		
15,600.00	9,562.64	15,537.17	9,544.47	94.28	94.15	-88.24	6,110.28	-112.47	660.19	472.09	188.10	3.510		
15,700.00	9,562.84	15,637.17	9,544.77	95.63	95.49	-88.25	6,210.28	-113.35	660.19	469.40	190.79	3.460		
15,800.00	9,563.05	15,737.17	9,545.07	96.97	96.84	-88.26	6,310.27	-114.23	660.19	466.70	193.48	3.412		
15,900.00	9,563.25	15,837.17	9,545.38	98.32	98.19	-88.27	6,410.27	-115.11	660.18	464.00	196.19	3.365		
16,000.00	9,563.45	15,937.17	9,545.68	99.67	99.55	-88.28	6,510.26	-115.99	660.18	461.29	198.89	3.319		
16,100.00	9,563.66	16,037.17	9,545.99	101.02	100.91	-88.28	6,610.26	-116.87	660.18	458.58	201.61	3.275		
16,200.00	9,563.86	16,137.17	9,546.29	102.38	102.26	-88.29	6,710.25	-117.75	660.18	455.86	204.32	3.231		
16,300.00	9,564.06	16,237.17	9,546.60	103.74	103.63	-88.30	6,810.25	-118.63	660.18	453.14	207.05	3.189		
16,400.00	9,564.27	16,337.17	9,546.90	105.10	104.99	-88.31	6,910.25	-119.51	660.18	450.41	209.77	3.147		
16,500.00	9,564.47	16,437.17	9,547.21	106.46	106.35	-88.32	7,010.24	-120.39	660.18	447.68	212.50	3.107		
16,600.00	9,564.67	16,537.17	9,547.51	107.82	107.72	-88.33	7,110.24	-121.27	660.18	444.95	215.23	3.067		
16,700.00	9,564.88	16,637.17	9,547.81	109.19	109.09	-88.34	7,210.23	-122.15	660.18	442.21	217.97	3.029		
16,800.00	9,565.08	16,737.17	9,548.12	110.56	110.46	-88.35	7,310.23	-123.03	660.18	439.47	220.71	2.991		
16,878.21	9,565.24	16,815.38	9,548.36	111.63	111.53	-88.35	7,388.43	-123.72	660.18	437.33	222.86	2.962		
16,900.00	9,565.28	16,837.17	9,548.42	111.93	111.83	-88.35	7,410.22	-123.91	660.18	436.73	223.46	2.954		
17,000.00	9,565.49	16,937.17	9,548.73	113.30	113.21	-88.36	7,510.22	-124.79	660.18	433.98	226.20	2.919		
17,100.00	9,565.69	17,037.17	9,549.03	114.67	114.58	-88.37	7,610.21	-125.67	660.18	431.23	228.95	2.883		
17,200.00	9,565.89	17,137.17	9,549.34	116.05	115.96	-88.38	7,710.21	-126.55	660.18	428.48	231.71	2.849		

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Com
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 35H - OH - Plan 1 10-19-18														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
17,300.00	9,566.10	17,237.17	9,549.64	117.42	117.34	-88.39	7,810.21	-127.43	660.18	425.72	234.47	2.816			
17,400.00	9,566.30	17,337.17	9,549.95	118.80	118.72	-88.40	7,910.20	-128.31	660.18	422.96	237.23	2.783			
17,500.00	9,566.50	17,437.17	9,550.25	120.18	120.10	-88.41	8,010.20	-129.19	660.18	420.20	239.99	2.751			
17,600.00	9,566.71	17,537.17	9,550.56	121.56	121.48	-88.42	8,110.19	-130.07	660.18	417.43	242.75	2.720			
17,700.00	9,566.91	17,637.17	9,550.86	122.94	122.87	-88.42	8,210.19	-130.95	660.18	414.66	245.52	2.689			
17,800.00	9,567.11	17,737.17	9,551.16	124.33	124.25	-88.43	8,310.18	-131.83	660.18	411.89	248.29	2.659			
17,900.00	9,567.32	17,837.17	9,551.47	125.71	125.64	-88.44	8,410.18	-132.71	660.18	409.12	251.07	2.630			
18,000.00	9,567.52	17,937.17	9,551.77	127.10	127.03	-88.45	8,510.18	-133.59	660.19	406.34	253.84	2.601			
18,100.00	9,567.72	18,037.17	9,552.08	128.48	128.42	-88.46	8,610.17	-134.47	660.19	403.57	256.62	2.573			
18,200.00	9,567.93	18,137.17	9,552.38	129.87	129.81	-88.47	8,710.17	-135.35	660.19	400.79	259.40	2.545			
18,300.00	9,568.13	18,237.17	9,552.69	131.26	131.20	-88.48	8,810.16	-136.23	660.19	398.01	262.18	2.518			
18,400.00	9,568.33	18,337.17	9,552.99	132.65	132.59	-88.49	8,910.16	-137.11	660.19	395.22	264.96	2.492			
18,500.00	9,568.53	18,437.17	9,553.30	134.04	133.98	-88.49	9,010.15	-137.99	660.19	392.44	267.75	2.466			
18,600.00	9,568.74	18,537.17	9,553.60	135.43	135.38	-88.50	9,110.15	-138.87	660.19	389.65	270.54	2.440			
18,700.00	9,568.94	18,637.17	9,553.90	136.83	136.77	-88.51	9,210.14	-139.75	660.19	386.86	273.33	2.415			
18,800.00	9,569.14	18,737.17	9,554.21	138.22	138.17	-88.52	9,310.14	-140.63	660.19	384.07	276.12	2.391			
18,900.00	9,569.35	18,837.17	9,554.51	139.61	139.56	-88.53	9,410.14	-141.51	660.19	381.27	278.91	2.367			
19,000.00	9,569.55	18,937.17	9,554.82	141.01	140.96	-88.54	9,510.13	-142.39	660.19	378.48	281.71	2.344			
19,100.00	9,569.75	19,037.17	9,555.12	142.41	142.36	-88.55	9,610.13	-143.27	660.19	375.68	284.51	2.320			
19,200.00	9,569.96	19,137.17	9,555.43	143.81	143.76	-88.56	9,710.12	-144.15	660.19	372.88	287.31	2.298			
19,300.00	9,570.16	19,237.17	9,555.73	145.20	145.16	-88.57	9,810.12	-145.03	660.19	370.08	290.11	2.276			
19,400.00	9,570.36	19,337.17	9,556.04	146.60	146.56	-88.57	9,910.11	-145.91	660.19	367.28	292.91	2.254			
19,500.00	9,570.57	19,437.17	9,556.34	148.00	147.96	-88.58	10,010.11	-146.79	660.19	364.48	295.71	2.233			
19,600.00	9,570.77	19,537.17	9,556.64	149.40	149.36	-88.59	10,110.11	-147.67	660.19	361.67	298.52	2.212			
19,700.00	9,570.97	19,637.17	9,556.95	150.80	150.77	-88.60	10,210.10	-148.55	660.19	358.87	301.32	2.191			
19,713.14	9,571.00	19,650.31	9,556.99	150.97	150.95	-88.60	10,223.24	-148.67	660.19	358.53	301.66	2.189 SF			

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
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 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 36H - OH - Plan 1 10-19-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00		1.30	0.00	0.00	-90.38	-0.20	-30.00	30.00					
100.00	100.00	101.30	101.30	0.14	0.14	-90.38	-0.20	-30.00	30.00	29.73	0.28	108.972		
200.00	200.00	201.30	201.30	0.49	0.50	-90.38	-0.20	-30.00	30.00	29.01	0.99	30.235		
300.00	300.00	301.30	301.30	0.85	0.86	-90.38	-0.20	-30.00	30.00	28.29	1.71	17.553		
400.00	400.00	401.30	401.30	1.21	1.21	-90.38	-0.20	-30.00	30.00	27.57	2.43	12.366		
500.00	500.00	501.30	501.30	1.57	1.57	-90.38	-0.20	-30.00	30.00	26.86	3.14	9.545		
600.00	600.00	601.30	601.30	1.93	1.93	-90.38	-0.20	-30.00	30.00	26.14	3.86	7.772		
700.00	700.00	701.30	701.30	2.29	2.29	-90.38	-0.20	-30.00	30.00	25.42	4.58	6.555		
800.00	800.00	801.30	801.30	2.65	2.65	-90.38	-0.20	-30.00	30.00	24.71	5.29	5.667		
900.00	900.00	901.30	901.30	3.00	3.01	-90.38	-0.20	-30.00	30.00	23.99	6.01	4.991		
1,000.00	1,000.00	1,001.30	1,001.30	3.36	3.37	-90.38	-0.20	-30.00	30.00	23.27	6.73	4.459		
1,100.00	1,100.00	1,101.30	1,101.30	3.72	3.72	-90.38	-0.20	-30.00	30.00	22.56	7.44	4.030		
1,200.00	1,200.00	1,201.30	1,201.30	4.08	4.08	-90.38	-0.20	-30.00	30.00	21.84	8.16	3.676		
1,300.00	1,300.00	1,301.30	1,301.30	4.44	4.44	-90.38	-0.20	-30.00	30.00	21.12	8.88	3.379		
1,400.00	1,400.00	1,401.30	1,401.30	4.80	4.80	-90.38	-0.20	-30.00	30.00	20.41	9.60	3.127		
1,500.00	1,500.00	1,501.30	1,501.30	5.15	5.16	-90.38	-0.20	-30.00	30.00	19.69	10.31	2.909		
1,600.00	1,600.00	1,601.30	1,601.30	5.51	5.52	-90.38	-0.20	-30.00	30.00	18.97	11.03	2.720		
1,700.00	1,700.00	1,701.30	1,701.30	5.87	5.87	-90.38	-0.20	-30.00	30.00	18.25	11.75	2.554		
1,800.00	1,800.00	1,801.30	1,801.30	6.23	6.23	-90.38	-0.20	-30.00	30.00	17.54	12.46	2.407		
1,900.00	1,900.00	1,901.30	1,901.30	6.59	6.59	-90.38	-0.20	-30.00	30.00	16.82	13.18	2.276		
2,000.00	2,000.00	2,001.30	2,001.30	6.95	6.95	-90.38	-0.20	-30.00	30.00	16.10	13.90	2.159		
2,100.00	2,100.00	2,101.30	2,101.30	7.31	7.31	-90.38	-0.20	-30.00	30.00	15.39	14.61	2.053		
2,200.00	2,200.00	2,201.30	2,201.30	7.66	7.67	-90.38	-0.20	-30.00	30.00	14.67	15.33	1.957		
2,300.00	2,300.00	2,301.30	2,301.30	8.02	8.03	-90.38	-0.20	-30.00	30.00	13.95	16.05	1.869		
2,400.00	2,400.00	2,401.30	2,401.30	8.38	8.38	-90.38	-0.20	-30.00	30.00	13.24	16.76	1.789		
2,500.00	2,500.00	2,501.31	2,501.31	8.74	8.74	-90.38	-0.20	-30.00	30.00	12.52	17.48	1.716		
2,550.28	2,550.28	2,552.10	2,552.10	8.91	8.92	171.25	-0.34	-29.55	29.99	12.16	17.83	1.682 CC		
2,600.00	2,599.98	2,602.32	2,602.30	9.09	9.09	170.86	-0.73	-28.25	30.00	11.83	18.17	1.651		
2,700.00	2,699.84	2,703.32	2,703.15	9.43	9.43	169.31	-2.30	-23.10	30.10	11.28	18.82	1.599		
2,800.00	2,799.45	2,804.31	2,803.74	9.77	9.78	166.78	-4.91	-14.55	30.35	10.89	19.46	1.560		
2,900.00	2,898.70	2,805.23	2,803.88	10.12	10.13	163.34	-8.54	-2.64	30.82	10.72	20.09	1.534 ES		
2,999.96	2,997.42	3,005.14	3,002.82	10.47	10.48	160.78	-12.60	10.67	33.27	12.49	20.78	1.601		
3,100.00	3,095.95	3,105.09	3,101.80	10.83	10.83	159.56	-16.66	23.97	37.42	15.94	21.48	1.742		
3,200.00	3,194.43	3,205.01	3,200.74	11.20	11.19	158.59	-20.71	37.28	41.58	19.40	22.18	1.875		
3,300.00	3,292.91	3,304.92	3,299.68	11.57	11.55	157.79	-24.77	50.58	45.75	22.87	22.88	2.000		
3,400.00	3,391.39	3,404.83	3,398.62	11.94	11.91	157.13	-28.82	63.88	49.93	26.34	23.59	2.117		
3,500.00	3,489.87	3,504.74	3,497.55	12.32	12.28	156.57	-32.88	77.19	54.11	29.81	24.30	2.227		
3,600.00	3,588.35	3,604.65	3,596.49	12.70	12.65	156.09	-36.94	90.49	58.30	33.28	25.02	2.330		
3,700.00	3,686.83	3,704.56	3,695.43	13.08	13.02	155.67	-40.99	103.79	62.49	36.75	25.74	2.428		
3,800.00	3,785.31	3,804.47	3,794.37	13.47	13.39	155.31	-45.05	117.09	66.68	40.22	26.46	2.520		
3,900.00	3,883.79	3,904.38	3,893.31	13.86	13.77	154.99	-49.10	130.40	70.87	43.68	27.19	2.607		
4,000.00	3,982.28	4,004.30	3,992.25	14.25	14.14	154.70	-53.16	143.70	75.07	47.15	27.92	2.689		
4,100.00	4,080.76	4,104.21	4,091.19	14.65	14.52	154.45	-57.21	157.00	79.27	50.62	28.65	2.767		
4,200.00	4,179.24	4,204.12	4,190.12	15.04	14.90	154.22	-61.27	170.30	83.47	54.08	29.39	2.840		
4,300.00	4,277.72	4,304.03	4,289.06	15.44	15.28	154.01	-65.33	183.61	87.67	57.55	30.13	2.910		
4,400.00	4,376.20	4,403.94	4,388.00	15.84	15.67	153.82	-69.38	196.91	91.88	61.01	30.87	2.977		
4,500.00	4,474.68	4,503.85	4,486.94	16.24	16.05	153.65	-73.44	210.21	96.08	64.47	31.61	3.040		
4,600.00	4,573.16	4,603.76	4,585.88	16.65	16.44	153.49	-77.49	223.51	100.28	67.93	32.35	3.100		
4,700.00	4,671.64	4,703.67	4,684.82	17.05	16.82	153.35	-81.55	236.82	104.49	71.39	33.10	3.157		
4,800.00	4,770.12	4,802.45	4,782.66	17.46	17.20	153.29	-85.49	249.74	108.89	75.04	33.85	3.217		
4,900.00	4,868.61	4,900.00	4,879.62	17.87	17.57	154.01	-88.61	259.97	115.53	80.94	34.59	3.340		
5,000.00	4,967.09	4,995.27	4,974.61	18.28	17.92	155.46	-90.72	266.90	124.98	89.69	35.29	3.542		

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Com
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 36H - OH - Plan 1 10-19-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minmum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
5,100.00	5,065.57	5,090.70	5,069.95	18.69	18.26	157.42	-91.91	270.81	137.33	101.39	35.94	3.821		
5,200.00	5,164.05	5,186.11	5,165.35	19.10	18.59	159.65	-92.20	271.75	152.63	116.07	36.56	4.175		
5,300.00	5,262.53	5,284.59	5,263.83	19.51	18.93	161.69	-92.20	271.75	169.05	131.81	37.24	4.540		
5,400.00	5,361.01	5,383.07	5,362.31	19.92	19.27	163.37	-92.20	271.75	185.64	147.72	37.92	4.895		
5,500.00	5,459.49	5,481.55	5,460.79	20.34	19.61	164.78	-92.20	271.75	202.35	163.74	38.61	5.241		
5,600.00	5,557.97	5,580.03	5,559.27	20.75	19.95	165.97	-92.20	271.75	219.17	179.87	39.30	5.577		
5,700.00	5,656.45	5,678.51	5,657.75	21.17	20.29	166.99	-92.20	271.75	236.07	196.07	40.00	5.902		
5,800.00	5,754.93	5,776.99	5,756.23	21.58	20.63	167.88	-92.20	271.75	253.03	212.33	40.70	6.218		
5,900.00	5,853.42	5,875.48	5,854.72	22.00	20.97	168.65	-92.20	271.75	270.04	228.64	41.40	6.523		
6,000.00	5,951.90	5,973.96	5,953.20	22.42	21.31	169.33	-92.20	271.75	287.09	244.99	42.10	6.819		
6,100.00	6,050.66	6,072.72	6,051.96	22.82	21.65	169.93	-92.20	271.75	302.51	259.70	42.81	7.067		
6,200.00	6,149.90	6,171.96	6,151.20	23.22	21.99	170.36	-92.20	271.75	314.54	271.03	43.51	7.229		
6,300.00	6,249.52	6,271.58	6,250.82	23.59	22.34	170.65	-92.20	271.75	323.16	278.94	44.22	7.309		
6,400.00	6,349.37	6,371.43	6,350.67	23.95	22.69	170.82	-92.20	271.75	328.35	283.43	44.92	7.310		
6,500.00	6,449.35	6,471.41	6,450.65	24.28	23.03	170.87	-92.20	271.75	330.09	284.47	45.62	7.236		
6,600.00	6,549.35	6,571.41	6,550.65	24.61	23.38	-90.90	-92.20	271.75	330.09	283.78	46.31	7.128		
6,700.00	6,649.35	6,671.41	6,650.65	24.94	23.73	-90.90	-92.20	271.75	330.09	283.08	47.01	7.022		
6,800.00	6,749.35	6,771.41	6,750.65	25.27	24.08	-90.90	-92.20	271.75	330.09	282.39	47.70	6.920		
6,900.00	6,849.35	6,871.41	6,850.65	25.61	24.43	-90.90	-92.20	271.75	330.09	281.69	48.40	6.820		
7,000.00	6,949.35	6,971.41	6,950.65	25.94	24.78	-90.90	-92.20	271.75	330.09	281.00	49.09	6.724		
7,100.00	7,049.35	7,071.41	7,050.65	26.27	25.13	-90.90	-92.20	271.75	330.09	280.30	49.79	6.629		
7,200.00	7,149.35	7,171.41	7,150.65	26.60	25.48	-90.90	-92.20	271.75	330.09	279.60	50.49	6.538		
7,300.00	7,249.35	7,271.41	7,250.65	26.94	25.83	-90.90	-92.20	271.75	330.09	278.90	51.19	6.449		
7,400.00	7,349.35	7,371.41	7,350.65	27.27	26.18	-90.90	-92.20	271.75	330.09	278.21	51.89	6.362		
7,500.00	7,449.35	7,471.41	7,450.65	27.61	26.53	-90.90	-92.20	271.75	330.09	277.51	52.59	6.277		
7,600.00	7,549.35	7,571.41	7,550.65	27.94	26.88	-90.90	-92.20	271.75	330.09	276.81	53.28	6.195		
7,700.00	7,649.35	7,671.41	7,650.65	28.28	27.23	-90.90	-92.20	271.75	330.09	276.11	53.98	6.114		
7,800.00	7,749.35	7,771.41	7,750.65	28.62	27.58	-90.90	-92.20	271.75	330.09	275.41	54.69	6.036		
7,900.00	7,849.35	7,871.41	7,850.65	28.96	27.93	-90.90	-92.20	271.75	330.09	274.70	55.39	5.960		
8,000.00	7,949.35	7,971.41	7,950.65	29.29	28.29	-90.90	-92.20	271.75	330.09	274.00	56.09	5.885		
8,100.00	8,049.35	8,071.41	8,050.65	29.63	28.64	-90.90	-92.20	271.75	330.09	273.30	56.79	5.813		
8,200.00	8,149.35	8,171.41	8,150.65	29.97	28.99	-90.90	-92.20	271.75	330.09	272.60	57.49	5.742		
8,300.00	8,249.35	8,271.41	8,250.65	30.31	29.34	-90.90	-92.20	271.75	330.09	271.90	58.19	5.672		
8,400.00	8,349.35	8,371.41	8,350.65	30.65	29.69	-90.90	-92.20	271.75	330.09	271.19	58.90	5.605		
8,500.00	8,449.35	8,471.41	8,450.65	30.99	30.05	-90.90	-92.20	271.75	330.09	270.49	59.60	5.538		
8,600.00	8,549.35	8,571.41	8,550.65	31.33	30.40	-90.90	-92.20	271.75	330.09	269.79	60.30	5.474		
8,700.00	8,649.35	8,671.41	8,650.65	31.67	30.75	-90.90	-92.20	271.75	330.09	269.08	61.01	5.411		
8,800.00	8,749.35	8,771.41	8,750.65	32.01	31.10	-90.90	-92.20	271.75	330.09	268.38	61.71	5.349		
8,900.00	8,849.35	8,871.41	8,850.65	32.36	31.46	-90.90	-92.20	271.75	330.09	267.67	62.42	5.289		
8,969.77	8,919.12	8,941.26	8,920.42	32.59	31.70	-90.50	-89.89	271.73	330.08	267.18	62.90	5.248		
9,000.00	8,949.35	8,971.12	8,950.03	32.70	31.81	-89.83	-86.03	271.70	330.11	267.01	63.10	5.232		
9,100.00	9,049.35	9,064.66	9,040.30	33.04	32.11	-85.69	-82.13	271.49	331.41	267.78	63.63	5.208		
9,200.00	9,149.03	9,150.00	9,117.19	33.38	32.36	-79.19	-25.35	271.16	336.87	273.02	63.85	5.276		
9,300.00	9,245.41	9,228.46	9,181.09	33.70	32.55	-73.73	20.04	270.77	345.45	281.90	63.55	5.436		
9,400.00	9,334.27	9,304.97	9,235.41	33.97	32.70	-68.97	73.78	270.30	355.55	292.75	62.80	5.662		
9,500.00	9,411.73	9,379.15	9,279.25	34.18	32.80	-65.08	133.52	269.77	365.71	304.01	61.69	5.928		
9,600.00	9,474.42	9,450.00	9,312.01	34.34	32.88	-62.15	196.27	269.22	374.68	314.24	60.45	6.199		
9,700.00	9,519.58	9,525.00	9,336.18	34.44	33.05	-60.02	267.19	268.60	381.53	322.00	59.53	6.409		
9,800.00	9,545.25	9,593.71	9,348.33	34.53	33.22	-58.90	334.75	268.01	385.60	326.69	58.91	6.545		
9,900.00	9,551.06	9,673.24	9,351.13	34.67	33.41	-58.63	414.18	267.31	386.58	327.59	58.99	6.553		
10,000.00	9,551.26	9,773.24	9,351.53	34.90	33.71	-58.66	514.18	266.44	386.48	327.03	59.44	6.501		
10,100.00	9,551.46	9,873.24	9,351.94	35.21	34.06	-58.68	614.17	265.56	386.37	326.37	60.01	6.439		

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Com
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 36H - OH - Plan 1 10-19-18														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance		Minimum Separation		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E/W (usft)	Between Centres (usft)	Ellipse (usft)	Separation (usft)	Factor			
10,200.00	9,551.67	9,973.24	9,352.35	35.59	34.46	-58.71	714.17	264.68	386.26	325.59	60.87	6.366			
10,300.00	9,551.87	10,073.24	9,352.75	36.02	34.91	-58.73	814.16	263.81	386.16	324.72	61.44	6.285			
10,400.00	9,552.07	10,173.24	9,353.16	36.52	35.42	-58.76	914.16	262.93	386.05	323.74	62.31	6.196			
10,500.00	9,552.28	10,273.24	9,353.56	37.06	35.98	-58.79	1,014.15	262.05	385.95	322.67	63.27	6.100			
10,600.00	9,552.48	10,373.24	9,353.97	37.65	36.58	-58.81	1,114.15	261.18	385.84	321.51	64.33	5.998			
10,700.00	9,552.68	10,473.24	9,354.38	38.28	37.23	-58.84	1,214.14	260.30	385.73	320.26	65.47	5.892			
10,800.00	9,552.89	10,573.24	9,354.78	38.96	37.93	-58.86	1,314.14	259.42	385.63	318.94	66.69	5.782			
10,900.00	9,553.09	10,673.24	9,355.19	39.67	38.66	-58.89	1,414.13	258.55	385.52	317.53	67.99	5.670			
11,000.00	9,553.29	10,773.24	9,355.60	40.43	39.43	-58.91	1,514.13	257.67	385.42	316.05	69.37	5.556			
11,100.00	9,553.50	10,873.23	9,356.00	41.22	40.24	-58.94	1,614.12	256.80	385.31	314.50	70.81	5.441			
11,200.00	9,553.70	10,973.23	9,356.41	42.05	41.08	-58.97	1,714.12	255.92	385.21	312.89	72.32	5.326			
11,300.00	9,553.90	11,073.23	9,356.81	42.91	41.96	-58.99	1,814.11	255.04	385.10	311.21	73.89	5.212			
11,400.00	9,554.11	11,173.23	9,357.22	43.79	42.87	-59.02	1,914.11	254.17	385.00	309.48	75.52	5.098			
11,500.00	9,554.31	11,273.23	9,357.63	44.71	43.80	-59.04	2,014.10	253.29	384.89	307.69	77.20	4.985			
11,600.00	9,554.51	11,373.23	9,358.03	45.66	44.76	-59.07	2,114.10	252.41	384.79	305.85	78.94	4.875			
11,700.00	9,554.72	11,473.23	9,358.44	46.63	45.75	-59.10	2,214.09	251.54	384.68	303.96	80.72	4.766			
11,800.00	9,554.92	11,573.23	9,358.85	47.62	46.76	-59.12	2,314.09	250.66	384.58	302.03	82.54	4.659			
11,900.00	9,555.12	11,673.23	9,359.25	48.63	47.79	-59.15	2,414.08	249.78	384.47	300.06	84.41	4.555			
12,000.00	9,555.33	11,773.23	9,359.66	49.67	48.84	-59.17	2,514.08	248.91	384.37	298.05	86.32	4.453			
12,100.00	9,555.53	11,873.23	9,360.06	50.72	49.91	-59.20	2,614.08	248.03	384.26	296.00	88.26	4.354			
12,200.00	9,555.73	11,973.23	9,360.47	51.80	51.00	-59.22	2,714.07	247.15	384.16	293.92	90.24	4.257			
12,300.00	9,555.94	12,073.23	9,360.88	52.89	52.11	-59.25	2,814.07	246.28	384.05	291.81	92.25	4.163			
12,400.00	9,556.14	12,173.23	9,361.28	54.00	53.23	-59.28	2,914.06	245.40	383.95	289.66	94.29	4.072			
12,500.00	9,556.34	12,273.23	9,361.69	55.12	54.37	-59.30	3,014.06	244.53	383.84	287.49	96.36	3.984			
12,600.00	9,556.55	12,373.23	9,362.10	56.26	55.52	-59.33	3,114.05	243.65	383.74	285.29	98.45	3.898			
12,700.00	9,556.75	12,473.23	9,362.50	57.41	56.69	-59.35	3,214.05	242.77	383.63	283.06	100.57	3.815			
12,800.00	9,556.95	12,573.23	9,362.91	58.57	57.86	-59.38	3,314.04	241.90	383.53	280.82	102.71	3.734			
12,900.00	9,557.15	12,673.23	9,363.32	59.75	59.05	-59.41	3,414.04	241.02	383.43	278.55	104.88	3.656			
13,000.00	9,557.36	12,773.23	9,363.72	60.93	60.25	-59.43	3,514.03	240.14	383.32	276.25	107.07	3.580			
13,100.00	9,557.56	12,873.23	9,364.13	62.13	61.46	-59.46	3,614.03	239.27	383.22	273.94	109.27	3.507			
13,200.00	9,557.76	12,973.23	9,364.53	63.34	62.68	-59.48	3,714.02	238.39	383.11	271.61	111.50	3.436			
13,300.00	9,557.97	13,073.23	9,364.94	64.55	63.91	-59.51	3,814.02	237.51	383.01	269.27	113.74	3.367			
13,400.00	9,558.17	13,173.23	9,365.35	65.78	65.14	-59.54	3,914.01	236.64	382.91	266.90	116.00	3.301			
13,500.00	9,558.37	13,273.23	9,365.75	67.01	66.39	-59.56	4,014.01	235.76	382.80	264.53	118.28	3.236			
13,600.00	9,558.58	13,373.23	9,366.16	68.26	67.64	-59.59	4,114.00	234.88	382.70	262.13	120.57	3.174			
13,700.00	9,558.78	13,473.23	9,366.57	69.51	68.90	-59.62	4,214.00	234.01	382.60	259.72	122.87	3.114			
13,800.00	9,558.98	13,573.23	9,366.97	70.76	70.17	-59.64	4,313.99	233.13	382.49	257.30	125.19	3.055			
13,900.00	9,559.19	13,673.23	9,367.38	72.03	71.44	-59.67	4,413.99	232.26	382.39	254.87	127.52	2.999			
14,000.00	9,559.39	13,773.23	9,367.78	73.30	72.72	-59.69	4,513.98	231.38	382.29	252.42	129.86	2.944			
14,100.00	9,559.59	13,873.23	9,368.19	74.57	74.01	-59.72	4,613.98	230.50	382.18	249.96	132.22	2.891			
14,200.00	9,559.80	13,973.23	9,368.60	75.86	75.30	-59.75	4,713.97	229.63	382.08	247.50	134.58	2.839			
14,300.00	9,560.00	14,073.23	9,369.00	77.14	76.60	-59.77	4,813.97	228.75	381.98	245.02	136.96	2.789			
14,400.00	9,560.20	14,173.23	9,369.41	78.44	77.90	-59.80	4,913.96	227.87	381.87	242.53	139.34	2.740			
14,500.00	9,560.41	14,273.23	9,369.82	79.74	79.21	-59.83	5,013.96	227.00	381.77	240.03	141.74	2.693			
14,600.00	9,560.61	14,373.23	9,370.22	81.04	80.52	-59.85	5,113.95	226.12	381.67	237.52	144.14	2.648			
14,700.00	9,560.81	14,473.23	9,370.63	82.35	81.83	-59.88	5,213.95	225.24	381.57	235.01	146.56	2.604			
14,800.00	9,561.02	14,573.23	9,371.03	83.66	83.15	-59.90	5,313.94	224.37	381.46	232.48	148.98	2.561			
14,900.00	9,561.22	14,673.23	9,371.44	84.97	84.47	-59.93	5,413.94	223.49	381.36	229.95	151.41	2.519			
15,000.00	9,561.42	14,773.23	9,371.85	86.29	85.80	-59.96	5,513.93	222.62	381.26	227.41	153.84	2.478			
15,100.00	9,561.63	14,873.23	9,372.25	87.62	87.13	-59.98	5,613.93	221.74	381.16	224.87	156.29	2.439			
15,200.00	9,561.83	14,973.23	9,372.66	88.94	88.46	-60.01	5,713.92	220.86	381.05	222.31	158.74	2.400			
15,300.00	9,562.03	15,073.23	9,373.07	90.27	89.80	-60.04	5,813.92	219.99	380.95	219.75	161.20	2.363			

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Com
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 36H - OH - Plan 1 10-19-18														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
15,400.00	9,562.24	15,173.23	9,373.47	91.61	91.14	-60.06	5,913.91	219.11	380.85	217.19	163.66	2.327			
15,500.00	9,562.44	15,273.23	9,373.88	92.94	92.49	-60.09	6,013.91	218.23	380.75	214.61	166.13	2.292			
15,600.00	9,562.64	15,373.23	9,374.28	94.28	93.83	-60.12	6,113.90	217.36	380.65	212.04	168.61	2.258			
15,700.00	9,562.84	15,473.23	9,374.69	95.63	95.18	-60.14	6,213.90	216.48	380.54	209.45	171.09	2.224			
15,800.00	9,563.05	15,573.23	9,375.10	96.97	96.53	-60.17	6,313.90	215.60	380.44	206.88	173.58	2.192			
15,900.00	9,563.25	15,673.23	9,375.50	98.32	97.89	-60.19	6,413.89	214.73	380.34	204.27	176.07	2.160			
16,000.00	9,563.45	15,773.22	9,375.91	99.67	99.24	-60.22	6,513.89	213.85	380.24	201.67	178.57	2.129			
16,100.00	9,563.66	15,873.22	9,376.32	101.02	100.60	-60.25	6,613.88	212.97	380.14	199.06	181.08	2.099			
16,200.00	9,563.86	15,973.22	9,376.72	102.38	101.96	-60.27	6,713.88	212.10	380.04	196.45	183.58	2.070			
16,300.00	9,564.06	16,073.22	9,377.13	103.74	103.32	-60.30	6,813.87	211.22	379.93	193.84	186.10	2.042			
16,400.00	9,564.27	16,173.22	9,377.54	105.10	104.69	-60.33	6,913.87	210.35	379.83	191.22	188.61	2.014			
16,500.00	9,564.47	16,273.22	9,377.94	106.46	106.06	-60.35	7,013.86	209.47	379.73	188.60	191.14	1.987			
16,600.00	9,564.67	16,373.22	9,378.35	107.82	107.42	-60.38	7,113.86	208.59	379.63	185.97	193.66	1.960			
16,700.00	9,564.88	16,473.22	9,378.75	109.19	108.79	-60.41	7,213.85	207.72	379.53	183.34	196.19	1.934			
16,800.00	9,565.08	16,573.22	9,379.16	110.56	110.17	-60.43	7,313.85	206.84	379.43	180.70	198.73	1.909			
16,900.00	9,565.28	16,673.22	9,379.57	111.93	111.54	-60.46	7,413.84	205.96	379.33	178.06	201.27	1.885			
17,000.00	9,565.49	16,773.22	9,379.97	113.30	112.92	-60.49	7,513.84	205.09	379.23	175.42	203.81	1.861			
17,100.00	9,565.69	16,873.22	9,380.38	114.67	114.29	-60.51	7,613.83	204.21	379.13	172.77	206.35	1.837			
17,200.00	9,565.89	16,973.22	9,380.79	116.05	115.67	-60.54	7,713.83	203.33	379.03	170.12	208.90	1.814			
17,300.00	9,566.10	17,073.22	9,381.19	117.42	117.05	-60.57	7,813.82	202.46	378.92	167.47	211.46	1.792			
17,400.00	9,566.30	17,173.22	9,381.60	118.80	118.43	-60.59	7,913.82	201.58	378.82	164.81	214.01	1.770			
17,500.00	9,566.50	17,273.22	9,382.00	120.18	119.82	-60.62	8,013.81	200.71	378.72	162.15	216.57	1.749			
17,600.00	9,566.71	17,373.22	9,382.41	121.56	121.20	-60.65	8,113.81	199.83	378.62	159.49	219.13	1.728			
17,700.00	9,566.91	17,473.22	9,382.82	122.94	122.59	-60.67	8,213.80	198.95	378.52	156.82	221.70	1.707			
17,800.00	9,567.11	17,573.22	9,383.22	124.33	123.97	-60.70	8,313.80	198.08	378.42	154.15	224.27	1.687			
17,900.00	9,567.32	17,673.22	9,383.63	125.71	125.36	-60.73	8,413.79	197.20	378.32	151.48	226.84	1.668			
18,000.00	9,567.52	17,773.22	9,384.04	127.10	126.75	-60.75	8,513.79	196.32	378.22	148.81	229.42	1.649			
18,100.00	9,567.72	17,873.22	9,384.44	128.48	128.14	-60.78	8,613.78	195.45	378.12	146.13	231.99	1.630			
18,200.00	9,567.93	17,973.22	9,384.85	129.87	129.53	-60.81	8,713.78	194.57	378.02	143.45	234.57	1.612			
18,300.00	9,568.13	18,073.22	9,385.25	131.26	130.93	-60.83	8,813.77	193.69	377.92	140.77	237.16	1.594			
18,400.00	9,568.33	18,173.22	9,385.66	132.65	132.32	-60.86	8,913.77	192.82	377.82	138.08	239.74	1.576			
18,500.00	9,568.53	18,273.22	9,386.07	134.04	133.71	-60.89	9,013.76	191.94	377.72	135.39	242.33	1.559			
18,600.00	9,568.74	18,373.22	9,386.47	135.43	135.11	-60.92	9,113.76	191.06	377.63	132.70	244.92	1.542			
18,700.00	9,568.94	18,473.22	9,386.88	136.83	136.50	-60.94	9,213.75	190.19	377.53	130.01	247.52	1.525			
18,800.00	9,569.14	18,573.22	9,387.29	138.22	137.90	-60.97	9,313.75	189.31	377.43	127.31	250.11	1.509			
18,900.00	9,569.35	18,673.22	9,387.69	139.61	139.30	-61.00	9,413.74	188.44	377.33	124.62	252.71	1.493 Level 3			
19,000.00	9,569.55	18,773.22	9,388.10	141.01	140.70	-61.02	9,513.74	187.56	377.23	121.92	255.31	1.478 Level 3			
19,100.00	9,569.75	18,873.22	9,388.50	142.41	142.10	-61.05	9,613.73	186.68	377.13	119.21	257.91	1.462 Level 3			
19,200.00	9,569.96	18,973.22	9,388.91	143.81	143.50	-61.08	9,713.73	185.81	377.03	116.51	260.52	1.447 Level 3			
19,300.00	9,570.16	19,073.22	9,389.32	145.20	144.90	-61.10	9,813.72	184.93	376.93	113.80	263.13	1.433 Level 3			
19,400.00	9,570.36	19,173.22	9,389.72	146.60	146.30	-61.13	9,913.72	184.05	376.83	111.10	265.74	1.418 Level 3			
19,500.00	9,570.57	19,273.22	9,390.13	148.00	147.70	-61.16	10,013.71	183.18	376.73	108.38	268.35	1.404 Level 3			
19,600.00	9,570.77	19,373.22	9,390.54	149.40	149.11	-61.18	10,113.71	182.30	376.63	105.67	270.96	1.390 Level 3			
19,700.00	9,570.97	19,473.22	9,390.94	150.80	150.51	-61.21	10,213.71	181.42	376.54	102.96	273.58	1.376 Level 3			
19,713.14	9,571.00	19,486.36	9,391.00	150.97	150.69	-61.21	10,226.84	181.31	376.52	102.63	273.89	1.375 Level 3, SF			

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Com
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 38H - OH - Plan 1 10-19-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	1.00	1.00	0.00	0.00	89.45	0.30	31.00	31.00					
100.00	100.00	101.00	101.00	0.14	0.14	89.45	0.30	31.00	31.00	30.73	0.27	113.049		
200.00	200.00	201.00	201.00	0.49	0.50	89.45	0.30	31.00	31.00	30.01	0.99	31.278		
300.00	300.00	301.00	301.00	0.85	0.85	89.45	0.30	31.00	31.00	29.29	1.71	18.149		
400.00	400.00	401.00	401.00	1.21	1.21	89.45	0.30	31.00	31.00	28.58	2.43	12.784		
500.00	500.00	501.00	501.00	1.57	1.57	89.45	0.30	31.00	31.00	27.88	3.14	9.887		
600.00	600.00	601.00	601.00	1.93	1.93	89.45	0.30	31.00	31.00	27.14	3.86	8.034		
700.00	700.00	701.00	701.00	2.29	2.29	89.45	0.30	31.00	31.00	26.43	4.58	6.775		
800.00	800.00	801.00	801.00	2.65	2.65	89.45	0.30	31.00	31.00	25.71	5.29	5.857		
900.00	900.00	901.00	901.00	3.00	3.01	89.45	0.30	31.00	31.00	24.99	6.01	5.159		
1,000.00	1,000.00	1,001.00	1,001.00	3.36	3.36	89.45	0.30	31.00	31.00	24.27	6.73	4.609		
1,100.00	1,100.00	1,101.00	1,101.00	3.72	3.72	89.45	0.30	31.00	31.00	23.56	7.44	4.165		
1,200.00	1,200.00	1,201.00	1,201.00	4.08	4.08	89.45	0.30	31.00	31.00	22.84	8.16	3.799		
1,300.00	1,300.00	1,301.00	1,301.00	4.44	4.44	89.45	0.30	31.00	31.00	22.12	8.88	3.492		
1,400.00	1,400.00	1,401.00	1,401.00	4.80	4.80	89.45	0.30	31.00	31.00	21.41	9.59	3.231		
1,500.00	1,500.00	1,501.00	1,501.00	5.15	5.16	89.45	0.30	31.00	31.00	20.69	10.31	3.007		
1,600.00	1,600.00	1,601.00	1,601.00	5.51	5.52	89.45	0.30	31.00	31.00	19.97	11.03	2.811		
1,700.00	1,700.00	1,701.00	1,701.00	5.87	5.87	89.45	0.30	31.00	31.00	19.26	11.75	2.639		
1,800.00	1,800.00	1,801.00	1,801.00	6.23	6.23	89.45	0.30	31.00	31.00	18.54	12.46	2.488		
1,900.00	1,900.00	1,901.00	1,901.00	6.59	6.59	89.45	0.30	31.00	31.00	17.82	13.18	2.352		
2,000.00	2,000.00	2,001.00	2,001.00	6.95	6.95	89.45	0.30	31.00	31.00	17.11	13.90	2.231		
2,100.00	2,100.00	2,101.00	2,101.00	7.31	7.31	89.45	0.30	31.00	31.00	16.39	14.61	2.121		
2,200.00	2,200.00	2,201.00	2,201.00	7.66	7.67	89.45	0.30	31.00	31.00	15.67	15.33	2.022		
2,300.00	2,300.00	2,301.00	2,301.00	8.02	8.02	89.45	0.30	31.00	31.00	14.95	16.05	1.932		
2,400.00	2,400.00	2,401.00	2,401.00	8.38	8.38	89.45	0.30	31.00	31.00	14.24	16.76	1.849		
2,416.33	2,416.33	2,417.33	2,417.33	8.44	8.44	89.45	0.30	31.00	31.00	14.12	16.88	1.836 CC		
2,500.00	2,500.00	2,500.99	2,500.99	8.74	8.74	89.45	0.30	31.00	31.00	13.52	17.48	1.773		
2,600.00	2,599.98	2,600.00	2,599.98	9.09	9.09	-8.94	0.14	32.74	31.03	12.88	18.17	1.708		
2,600.07	2,600.05	2,600.00	2,599.98	9.09	9.09	-8.94	0.14	32.74	31.03	12.88	18.16	1.708		
2,700.00	2,699.84	2,698.86	2,698.70	9.43	9.42	-9.42	-0.34	37.87	31.04	12.23	18.81	1.650		
2,800.00	2,799.45	2,797.79	2,797.26	9.77	9.76	-10.23	-1.13	46.40	31.05	11.61	19.44	1.587		
2,900.00	2,898.70	2,896.73	2,895.46	10.12	10.11	-11.37	-2.24	56.31	31.06	11.00	20.05	1.549		
2,999.96	2,997.42	2,995.62	2,993.15	10.47	10.46	-12.83	-3.67	73.58	31.07	10.42	20.65	1.505 ES		
3,100.00	3,095.95	3,094.57	3,090.31	10.83	10.82	-13.85	-5.40	92.21	32.80	11.58	21.23	1.545		
3,200.00	3,194.43	3,194.45	3,188.01	11.20	11.19	-14.16	-7.33	112.88	36.41	14.50	21.92	1.661		
3,300.00	3,292.91	3,294.38	3,285.76	11.57	11.56	-14.41	-9.25	133.56	40.02	17.41	22.61	1.770		
3,400.00	3,391.39	3,394.31	3,383.51	11.94	11.94	-14.61	-11.18	154.25	43.64	20.32	23.32	1.871		
3,500.00	3,489.87	3,494.25	3,481.26	12.32	12.33	-14.79	-13.11	174.93	47.25	23.22	24.03	1.967		
3,600.00	3,588.35	3,594.18	3,579.01	12.70	12.72	-14.94	-15.03	195.61	50.87	26.13	24.74	2.056		
3,700.00	3,686.83	3,694.12	3,676.76	13.08	13.12	-15.08	-16.96	216.30	54.48	29.02	25.46	2.140		
3,800.00	3,785.31	3,794.05	3,774.52	13.47	13.52	-15.19	-18.89	236.98	58.10	31.92	26.18	2.219		
3,900.00	3,883.79	3,893.99	3,872.27	13.86	13.93	-15.29	-20.81	257.68	61.71	34.81	26.90	2.294		
4,000.00	3,982.28	3,993.92	3,970.02	14.25	14.34	-15.38	-22.74	278.35	65.33	37.70	27.63	2.365		
4,100.00	4,080.76	4,093.88	4,067.77	14.65	14.75	-15.46	-24.67	299.03	68.95	40.59	28.36	2.431		
4,200.00	4,179.24	4,193.79	4,165.52	15.04	15.16	-15.54	-26.59	319.72	72.56	43.47	29.09	2.494		
4,300.00	4,277.72	4,293.73	4,263.27	15.44	15.58	-15.60	-28.52	340.40	76.18	46.35	29.83	2.554		
4,400.00	4,376.20	4,393.66	4,361.03	15.84	16.00	-15.66	-30.45	361.08	79.80	49.23	30.56	2.611		
4,500.00	4,474.68	4,493.59	4,458.78	16.24	16.42	-15.72	-32.38	381.77	83.41	52.11	31.30	2.665		
4,600.00	4,573.16	4,593.53	4,556.53	16.65	16.85	-15.77	-34.30	402.45	87.03	54.99	32.04	2.716		
4,700.00	4,671.64	4,693.46	4,654.28	17.05	17.28	-15.81	-36.23	423.13	90.64	57.88	32.78	2.765		
4,800.00	4,770.12	4,793.40	4,752.03	17.46	17.70	-15.86	-38.16	443.82	94.26	60.73	33.53	2.811		
4,900.00	4,868.61	4,893.33	4,849.78	17.87	18.13	-15.90	-40.08	464.50	97.88	63.61	34.27	2.856		

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Com
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 38H - OH - Plan 1 10-19-18

Survey Program: 0-MWD+HDGM

Offset Site Error: 0.00 usft
Offset Well Error: 0.00 usft

Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.00	4,967.09	4,993.27	4,947.54	18.28	18.57	-15.93	-42.01	485.18	101.50	66.47	35.02	2.898	
5,100.00	5,065.57	5,093.20	5,045.29	18.69	19.00	-15.97	-43.94	505.87	105.11	69.34	35.77	2.939	
5,200.00	5,164.05	5,193.14	5,143.04	19.10	19.43	-16.00	-45.86	526.55	108.73	72.21	36.52	2.977	
5,300.00	5,262.53	5,293.07	5,240.79	19.51	19.87	-16.03	-47.79	547.23	112.35	75.08	37.27	3.014	
5,400.00	5,361.01	5,393.01	5,338.54	19.92	20.31	-16.06	-49.72	567.92	115.96	77.94	38.02	3.050	
5,500.00	5,459.49	5,492.94	5,438.30	20.34	20.74	-16.08	-51.64	588.60	119.58	80.80	38.77	3.084	
5,600.00	5,557.97	5,592.88	5,534.05	20.75	21.18	-16.11	-53.57	609.28	123.20	83.67	39.53	3.117	
5,700.00	5,656.45	5,692.81	5,631.80	21.17	21.62	-16.13	-55.50	629.97	126.81	86.53	40.28	3.148	
5,800.00	5,754.93	5,792.74	5,729.55	21.58	22.07	-16.15	-57.42	650.65	130.43	89.39	41.04	3.178	
5,900.00	5,853.42	5,892.68	5,827.30	22.00	22.51	-16.17	-59.35	671.33	134.05	92.25	41.80	3.207	
6,000.00	5,951.90	5,992.61	5,925.05	22.42	22.95	-16.19	-61.28	692.02	137.66	95.11	42.55	3.235	
6,100.00	6,050.68	6,092.47	6,022.73	22.82	23.39	-16.05	-63.20	712.68	142.93	99.63	43.30	3.301	
6,200.00	6,149.90	6,192.08	6,120.17	23.22	23.84	-15.57	-65.12	733.30	151.55	107.52	44.04	3.442	
6,300.00	6,249.52	6,291.33	6,217.25	23.59	24.28	-14.85	-67.04	753.84	163.54	118.79	44.75	3.654	
6,400.00	6,349.37	6,390.10	6,313.86	23.95	24.72	-13.97	-68.94	774.29	178.91	133.45	45.46	3.936	
6,500.00	6,449.35	6,488.26	6,409.88	24.28	25.16	-13.02	-70.83	794.60	197.67	151.52	46.14	4.284	
6,600.00	6,549.35	6,588.08	6,505.55	24.61	25.60	86.16	-72.72	814.85	218.17	171.34	46.83	4.659	
6,700.00	6,649.35	6,686.89	6,601.23	24.94	26.03	86.96	-74.60	835.09	238.73	191.21	47.52	5.024	
6,800.00	6,749.35	6,787.71	6,696.91	25.27	26.47	87.63	-76.49	855.34	259.32	211.11	48.21	5.379	
6,900.00	6,849.35	6,887.74	6,800.88	25.61	26.94	88.21	-78.42	876.05	278.81	229.77	49.04	5.685	
7,000.00	6,949.35	6,987.36	6,909.08	25.94	27.40	88.63	-80.05	893.51	294.69	244.83	49.86	5.910	
7,100.00	7,049.35	7,108.18	7,019.07	26.27	27.83	88.93	-81.30	906.95	306.80	256.18	50.62	6.060	
7,200.00	7,149.35	7,219.89	7,130.39	26.60	28.24	89.12	-82.16	916.20	315.07	263.74	51.33	6.139	
7,300.00	7,249.35	7,332.16	7,242.54	26.94	28.63	89.21	-82.62	921.14	319.46	267.50	51.96	6.148	
7,400.00	7,349.35	7,439.98	7,350.35	27.27	28.97	89.23	-82.70	922.00	320.23	267.65	52.58	6.090	
7,500.00	7,449.35	7,539.98	7,450.35	27.61	29.29	89.23	-82.70	922.00	320.23	266.97	53.26	6.012	
7,600.00	7,549.35	7,639.98	7,550.35	27.94	29.61	89.23	-82.70	922.00	320.23	266.28	53.94	5.938	
7,700.00	7,649.35	7,739.98	7,650.35	28.28	29.92	89.23	-82.70	922.00	320.23	265.60	54.63	5.862	
7,800.00	7,749.35	7,839.98	7,750.35	28.62	30.24	89.23	-82.70	922.00	320.23	264.91	55.31	5.789	
7,900.00	7,849.35	7,939.98	7,850.35	28.96	30.56	89.23	-82.70	922.00	320.23	264.23	56.00	5.718	
8,000.00	7,949.35	8,039.98	7,950.35	29.29	30.88	89.23	-82.70	922.00	320.23	263.54	56.69	5.649	
8,100.00	8,049.35	8,139.98	8,050.35	29.63	31.20	89.23	-82.70	922.00	320.23	262.85	57.37	5.581	
8,200.00	8,149.35	8,239.98	8,150.35	29.97	31.52	89.23	-82.70	922.00	320.23	262.17	58.06	5.515	
8,300.00	8,249.35	8,339.98	8,250.35	30.31	31.84	89.23	-82.70	922.00	320.23	261.48	58.75	5.451	
8,400.00	8,349.35	8,439.98	8,350.35	30.65	32.17	89.23	-82.70	922.00	320.23	260.79	59.44	5.387	
8,500.00	8,449.35	8,539.98	8,450.35	30.99	32.49	89.23	-82.70	922.00	320.23	260.10	60.13	5.326	
8,600.00	8,549.35	8,639.98	8,550.35	31.33	32.82	89.23	-82.70	922.00	320.23	259.41	60.82	5.265	
8,700.00	8,649.35	8,739.98	8,650.35	31.67	33.14	89.23	-82.70	922.00	320.23	258.72	61.51	5.206	
8,800.00	8,749.35	8,839.98	8,750.35	32.01	33.47	89.23	-82.70	922.00	320.23	258.02	62.20	5.148	
8,900.00	8,849.35	8,939.98	8,850.35	32.36	33.79	89.23	-82.70	922.00	320.23	257.33	62.90	5.091	
8,908.72	8,858.08	8,948.70	8,859.08	32.39	33.82	89.23	-82.70	922.00	320.23	257.27	62.96	5.088	
9,000.00	8,949.35	9,039.98	8,949.89	32.70	34.12	88.74	-79.93	921.98	320.25	256.65	63.60	5.035	
9,100.00	9,049.35	9,134.73	9,042.81	33.04	34.41	85.25	-60.38	921.80	321.20	256.78	64.41	4.987	
9,200.00	9,149.03	9,221.52	9,122.71	33.38	34.66	80.24	-26.80	921.51	325.47	260.23	65.24	4.989	
9,300.00	9,245.41	9,303.96	9,191.80	33.70	34.85	75.12	17.97	921.11	332.34	266.62	65.71	5.057	
9,400.00	9,334.27	9,383.24	9,250.05	33.97	35.00	70.69	71.62	920.64	340.50	274.80	65.70	5.182	
9,500.00	9,411.73	9,460.17	9,287.34	34.18	35.11	67.08	132.20	920.11	348.76	283.47	65.28	5.342	
9,600.00	9,474.42	9,535.41	9,333.60	34.34	35.18	64.33	198.03	919.53	356.04	291.35	64.69	5.503	
9,700.00	9,519.58	9,609.48	9,358.77	34.44	35.24	62.44	267.62	918.92	361.55	297.35	64.21	5.631	
9,800.00	9,545.25	9,682.86	9,372.80	34.53	35.30	61.41	339.56	918.29	364.73	300.64	64.09	5.691	
9,900.00	9,551.06	9,763.03	9,376.08	34.67	35.38	61.21	419.61	917.58	365.38	300.91	64.48	5.667	
10,000.00	9,551.26	9,863.03	9,376.39	34.90	35.53	61.22	519.61	916.70	365.33	300.23	65.10	5.612	

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



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Corn
 Site Error: 0.00 usft
 Reference Well: 37H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
 TVD Reference: KB @ 3000.90usft (Ensign 155)
 MD Reference: KB @ 3000.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Corn - 38H - OH - Plan 1 10-19-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,100.00	9,551.48	9,963.03	9,376.69	35.21	35.76	61.24	619.60	915.82	365.28	299.48	65.83	5.549		
10,200.00	9,551.87	10,063.03	9,377.00	35.59	36.07	61.25	719.60	914.94	365.23	298.58	66.65	5.480		
10,300.00	9,551.87	10,163.03	9,377.30	36.02	36.45	61.26	819.59	914.06	365.18	297.62	67.56	5.405		
10,400.00	9,552.07	10,263.03	9,377.61	36.52	36.90	61.28	919.59	913.18	365.13	296.57	68.56	5.326		
10,500.00	9,552.28	10,363.03	9,377.91	37.06	37.41	61.29	1,019.58	912.31	365.08	295.43	69.65	5.242		
10,600.00	9,552.48	10,463.03	9,378.22	37.65	37.98	61.31	1,119.58	911.43	365.03	294.21	70.82	5.155		
10,700.00	9,552.68	10,563.03	9,378.52	38.28	38.60	61.32	1,219.58	910.55	364.98	292.91	72.06	5.065		
10,800.00	9,552.89	10,663.03	9,378.83	38.96	39.26	61.33	1,319.57	909.67	364.93	291.54	73.38	4.973		
10,900.00	9,553.09	10,763.03	9,379.13	39.67	39.97	61.35	1,419.57	908.79	364.87	290.10	74.77	4.880		
11,000.00	9,553.29	10,863.03	9,379.44	40.43	40.72	61.36	1,519.56	907.91	364.82	288.59	76.23	4.786		
11,100.00	9,553.50	10,963.03	9,379.74	41.22	41.51	61.37	1,619.56	907.03	364.77	287.02	77.75	4.692		
11,200.00	9,553.70	11,063.03	9,380.05	42.05	42.33	61.39	1,719.55	906.15	364.72	285.39	79.33	4.598		
11,300.00	9,553.90	11,163.03	9,380.35	42.91	43.18	61.40	1,819.55	905.27	364.67	283.71	80.96	4.504		
11,400.00	9,554.11	11,263.03	9,380.66	43.79	44.06	61.42	1,919.54	904.39	364.62	281.97	82.65	4.412		
11,500.00	9,554.31	11,363.03	9,380.96	44.71	44.98	61.43	2,019.54	903.51	364.57	280.19	84.38	4.320		
11,600.00	9,554.51	11,463.03	9,381.27	45.68	45.92	61.44	2,119.54	902.63	364.52	278.35	86.17	4.230		
11,700.00	9,554.72	11,563.03	9,381.57	46.63	46.88	61.46	2,219.53	901.75	364.47	276.48	87.99	4.142		
11,800.00	9,554.92	11,663.03	9,381.88	47.62	47.87	61.47	2,319.53	900.87	364.42	274.56	89.86	4.056		
11,900.00	9,555.12	11,763.03	9,382.18	48.63	48.89	61.49	2,419.52	899.99	364.37	272.61	91.78	3.971		
12,000.00	9,555.33	11,863.03	9,382.49	49.67	49.92	61.50	2,519.52	899.11	364.32	270.61	93.70	3.888		
12,100.00	9,555.53	11,963.03	9,382.79	50.72	50.97	61.51	2,619.51	898.23	364.27	268.59	95.68	3.807		
12,200.00	9,555.73	12,063.03	9,383.10	51.80	52.04	61.53	2,719.51	897.35	364.22	266.53	97.69	3.728		
12,300.00	9,555.94	12,163.03	9,383.40	52.89	53.13	61.54	2,819.51	896.48	364.17	264.44	99.72	3.652		
12,400.00	9,556.14	12,263.03	9,383.71	54.00	54.24	61.56	2,919.50	895.60	364.12	262.33	101.79	3.577		
12,500.00	9,556.34	12,363.03	9,384.01	55.12	55.36	61.57	3,019.50	894.72	364.07	260.19	103.88	3.505		
12,600.00	9,556.55	12,463.03	9,384.32	56.26	56.49	61.58	3,119.49	893.84	364.02	258.02	106.00	3.434		
12,700.00	9,556.75	12,563.03	9,384.62	57.41	57.64	61.60	3,219.49	892.96	363.97	255.83	108.14	3.366		
12,800.00	9,556.95	12,663.03	9,384.93	58.57	58.80	61.61	3,319.48	892.08	363.92	253.61	110.30	3.299		
12,900.00	9,557.15	12,763.03	9,385.23	59.75	59.97	61.62	3,419.48	891.20	363.86	251.38	112.48	3.235		
13,000.00	9,557.36	12,863.03	9,385.54	60.93	61.16	61.64	3,519.47	890.32	363.81	249.13	114.69	3.172		
13,100.00	9,557.56	12,963.03	9,385.84	62.13	62.35	61.65	3,619.47	889.44	363.76	246.85	116.91	3.111		
13,200.00	9,557.76	13,063.03	9,386.15	63.34	63.56	61.67	3,719.47	888.56	363.71	244.56	119.15	3.053		
13,300.00	9,557.97	13,163.03	9,386.45	64.55	64.77	61.68	3,819.46	887.68	363.66	242.25	121.41	2.995		
13,400.00	9,558.17	13,263.03	9,386.76	65.78	66.00	61.69	3,919.46	886.80	363.61	239.93	123.68	2.940		
13,500.00	9,558.37	13,363.03	9,387.06	67.01	67.23	61.71	4,019.45	885.92	363.56	237.59	125.97	2.886		
13,600.00	9,558.58	13,463.03	9,387.37	68.26	68.47	61.72	4,119.45	885.04	363.51	235.24	128.27	2.834		
13,700.00	9,558.78	13,563.03	9,387.67	69.51	69.72	61.74	4,219.44	884.16	363.46	232.87	130.59	2.783		
13,800.00	9,558.98	13,663.03	9,387.98	70.76	70.97	61.75	4,319.44	883.28	363.41	230.49	132.92	2.734		
13,900.00	9,559.19	13,763.03	9,388.28	72.03	72.24	61.76	4,419.44	882.40	363.36	228.10	135.26	2.688		
14,000.00	9,559.39	13,863.03	9,388.59	73.30	73.50	61.78	4,519.43	881.52	363.31	225.70	137.61	2.640		
14,100.00	9,559.59	13,963.03	9,388.89	74.57	74.78	61.79	4,619.43	880.65	363.26	223.29	139.98	2.595		
14,200.00	9,559.80	14,063.03	9,389.20	75.86	76.06	61.81	4,719.42	879.77	363.21	220.86	142.35	2.552		
14,300.00	9,560.00	14,163.03	9,389.50	77.14	77.35	61.82	4,819.42	878.89	363.16	218.43	144.74	2.509		
14,400.00	9,560.20	14,263.03	9,389.81	78.44	78.64	61.83	4,919.41	878.01	363.11	215.98	147.13	2.468		
14,500.00	9,560.41	14,363.03	9,390.11	79.74	79.93	61.85	5,019.41	877.13	363.06	213.53	149.53	2.428		
14,600.00	9,560.61	14,463.03	9,390.42	81.04	81.23	61.86	5,119.40	876.25	363.01	211.07	151.95	2.389		
14,700.00	9,560.81	14,563.03	9,390.72	82.35	82.54	61.88	5,219.40	875.37	362.96	208.60	154.37	2.351		
14,800.00	9,561.02	14,663.03	9,391.02	83.66	83.85	61.89	5,319.40	874.49	362.91	206.12	156.80	2.315		
14,900.00	9,561.22	14,763.03	9,391.33	84.97	85.17	61.90	5,419.39	873.61	362.86	203.63	159.23	2.279		
15,000.00	9,561.42	14,863.03	9,391.63	86.29	86.48	61.92	5,519.39	872.73	362.81	201.14	161.68	2.244		
15,100.00	9,561.63	14,963.03	9,391.94	87.62	87.81	61.93	5,619.38	871.85	362.76	198.64	164.13	2.210		
15,200.00	9,561.83	15,063.03	9,392.24	88.94	89.13	61.95	5,719.38	870.97	362.71	196.13	166.58	2.177		

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



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 37H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
TVD Reference: KB @ 3000 90usft (Ensign 155)
MD Reference: KB @ 3000 90usft (Ensign 155)
North Reference: Gnd
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Reference: Myox 21 State Com - 38H - OH - Plan 1 10-19-18
Survey Program: 0AMWD-HDDGM
Offset Site Error: 0.00 usft
Offset Well Error: 0.00 usft

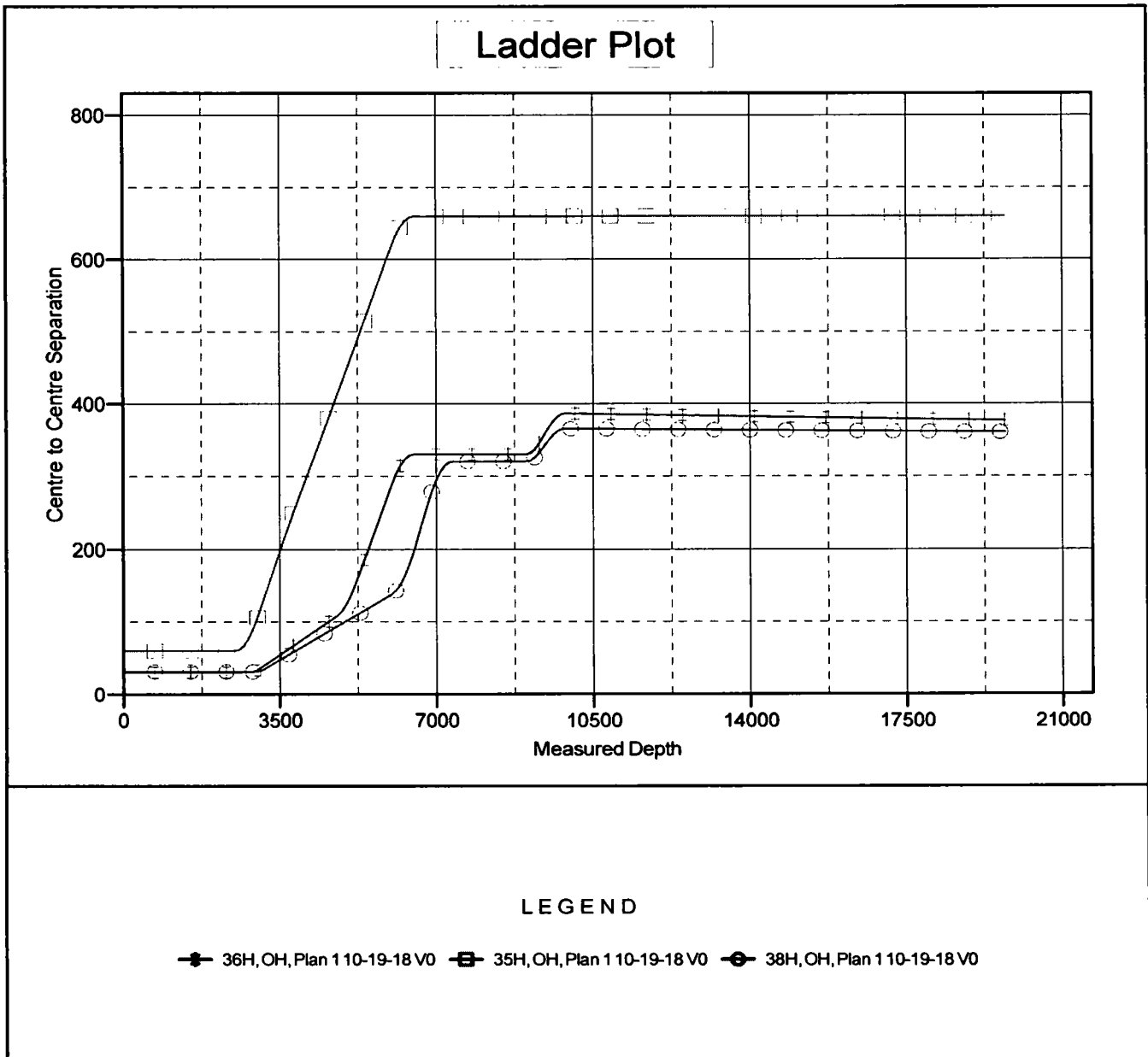
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre +/-S	+E/W	Distance			Warning	
				Reference (usft)	Offset (usft)				Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
15,300.00	9,562.03	15,163.03	9,392.55	90.27	90.46	61.96	5,818.37	870.09	362.66	193.62	169.05	2.145	
15,400.00	9,562.24	15,263.03	9,392.85	91.61	91.79	61.97	5,918.37	889.21	362.61	191.10	171.52	2.114	
15,500.00	9,562.44	15,363.03	9,393.16	92.94	93.13	61.99	6,018.37	888.33	362.56	188.57	173.99	2.084	
15,600.00	9,562.64	15,463.03	9,393.46	94.28	94.47	62.00	6,118.36	867.45	362.51	186.04	176.48	2.054	
15,700.00	9,562.84	15,563.03	9,393.77	95.63	95.81	62.02	6,218.36	866.57	362.47	183.50	178.96	2.025	
15,800.00	9,563.03	15,663.03	9,394.07	96.97	97.15	62.03	6,318.35	865.69	362.42	180.96	181.48	1.997	
15,900.00	9,563.25	15,763.03	9,394.38	98.32	98.50	62.04	6,418.35	864.82	362.37	178.41	183.95	1.970	
16,000.00	9,563.45	15,863.03	9,394.68	99.67	99.85	62.06	6,518.34	863.94	362.32	175.86	186.46	1.943	
16,100.00	9,563.66	15,963.03	9,394.99	101.02	101.20	62.07	6,618.34	863.06	362.27	173.30	188.96	1.917	
16,200.00	9,563.88	16,063.03	9,395.29	102.38	102.56	62.09	6,718.33	862.18	362.22	170.74	191.47	1.892	
16,300.00	9,564.08	16,163.03	9,395.60	103.74	103.91	62.10	6,818.33	861.30	362.17	168.18	193.99	1.867	
16,400.00	9,564.27	16,263.03	9,395.90	105.10	105.27	62.11	6,918.33	860.42	362.12	165.61	196.51	1.843	
16,500.00	9,564.47	16,363.03	9,396.21	106.46	106.63	62.13	7,018.32	859.54	362.07	163.03	198.04	1.819	
16,600.00	9,564.67	16,463.03	9,396.51	107.82	108.00	62.14	7,118.32	858.66	362.02	160.45	201.57	1.796	
16,700.00	9,564.88	16,563.03	9,396.82	109.19	109.36	62.16	7,218.31	857.78	361.97	157.87	204.10	1.774	
16,800.00	9,565.08	16,663.03	9,397.12	110.56	110.73	62.17	7,318.31	856.90	361.92	155.29	206.63	1.752	
16,900.00	9,565.28	16,763.03	9,397.43	111.93	112.10	62.18	7,418.30	856.02	361.87	152.70	209.17	1.730	
17,000.00	9,565.49	16,863.03	9,397.73	113.30	113.47	62.20	7,518.30	855.14	361.82	150.10	211.72	1.709	
17,100.00	9,565.69	16,963.03	9,398.04	114.67	114.84	62.21	7,618.29	854.26	361.77	147.51	214.26	1.688	
17,200.00	9,565.89	17,063.03	9,398.34	116.05	116.21	62.22	7,718.29	853.38	361.72	144.91	216.81	1.668	
17,300.00	9,566.10	17,163.03	9,398.65	117.42	117.59	62.24	7,818.29	852.50	361.67	142.31	219.37	1.649	
17,400.00	9,566.30	17,263.03	9,398.95	118.80	118.96	62.26	7,918.28	851.62	361.62	139.70	221.92	1.629	
17,500.00	9,566.50	17,363.03	9,399.26	120.18	120.34	62.27	8,018.28	850.74	361.57	137.09	224.46	1.611	
17,600.00	9,566.71	17,463.03	9,399.56	121.56	121.72	62.28	8,118.27	849.86	361.53	134.48	227.05	1.592	
17,700.00	9,566.91	17,563.03	9,399.87	122.94	123.10	62.30	8,218.27	848.99	361.48	131.87	229.61	1.574	
17,800.00	9,567.11	17,663.03	9,400.17	124.33	124.49	62.31	8,318.26	848.11	361.43	129.25	232.18	1.557	
17,900.00	9,567.32	17,763.03	9,400.48	125.71	125.87	62.33	8,418.26	847.23	361.38	126.63	234.75	1.539	
18,000.00	9,567.52	17,863.03	9,400.78	127.10	127.25	62.34	8,518.26	846.35	361.33	124.01	237.32	1.523	
18,100.00	9,567.72	17,963.03	9,401.09	128.48	128.64	62.35	8,618.25	845.47	361.28	121.39	239.80	1.506	
18,200.00	9,567.93	18,063.03	9,401.39	129.87	130.03	62.37	8,718.25	844.59	361.23	118.75	242.48	1.490	Level 3
18,300.00	9,568.13	18,163.03	9,401.70	131.26	131.42	62.38	8,818.24	843.71	361.18	116.12	245.06	1.474	Level 3
18,400.00	9,568.33	18,263.03	9,402.00	132.65	132.81	62.40	8,918.24	842.83	361.13	113.49	247.64	1.458	Level 3
18,500.00	9,568.53	18,363.03	9,402.31	134.04	134.50	62.41	9,018.23	841.95	361.08	110.86	250.22	1.443	Level 3
18,600.00	9,568.74	18,463.03	9,402.61	135.43	135.59	62.42	9,118.23	841.07	361.03	108.22	252.81	1.428	Level 3
18,700.00	9,568.94	18,563.03	9,402.92	136.83	136.98	62.44	9,218.22	840.19	360.98	105.58	255.40	1.413	Level 3
18,800.00	9,569.14	18,663.03	9,403.22	138.22	138.37	62.45	9,318.22	839.31	360.94	102.94	257.99	1.399	Level 3
18,900.00	9,569.35	18,763.03	9,403.53	139.61	139.77	62.47	9,418.22	838.43	360.89	100.30	260.59	1.385	Level 3
19,000.00	9,569.55	18,863.03	9,403.83	141.01	141.16	62.48	9,518.21	837.55	360.84	97.66	263.18	1.371	Level 3
19,100.00	9,569.75	18,963.03	9,404.14	142.41	142.56	62.50	9,618.21	836.67	360.79	95.01	265.78	1.357	Level 3
19,200.00	9,569.96	19,063.03	9,404.44	143.81	143.96	62.51	9,718.20	835.79	360.74	92.36	268.38	1.344	Level 3
19,300.00	9,570.16	19,163.03	9,404.75	145.20	145.35	62.52	9,818.20	834.91	360.69	89.71	270.98	1.331	Level 3
19,400.00	9,570.36	19,263.03	9,405.05	146.60	146.75	62.54	9,918.19	834.03	360.64	87.06	273.59	1.318	Level 3
19,500.00	9,570.57	19,363.03	9,405.36	148.00	148.15	62.55	10,018.19	833.15	360.59	84.40	276.19	1.306	Level 3
19,600.00	9,570.77	19,463.03	9,405.66	149.40	149.55	62.57	10,118.19	832.28	360.54	81.75	278.80	1.293	Level 3
19,700.00	9,570.97	19,563.03	9,405.97	150.80	150.95	62.58	10,218.18	831.40	360.50	79.09	281.41	1.281	Level 3
19,711.10	9,571.00	19,573.95	9,406.00	150.94	151.11	62.58	10,230.10	831.30	360.49	78.81	281.68	1.280	Level 3
19,713.14	9,571.00	19,573.95	9,406.00	150.97	151.11	62.58	10,230.10	831.30	360.50	78.72	281.77	1.279	Level 3, SF

Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 37H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 37H
TVD Reference: KB @ 3000.90usft (Ensign 155)
MD Reference: KB @ 3000.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3000.90usft (Ensign 155)
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 37H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.13°



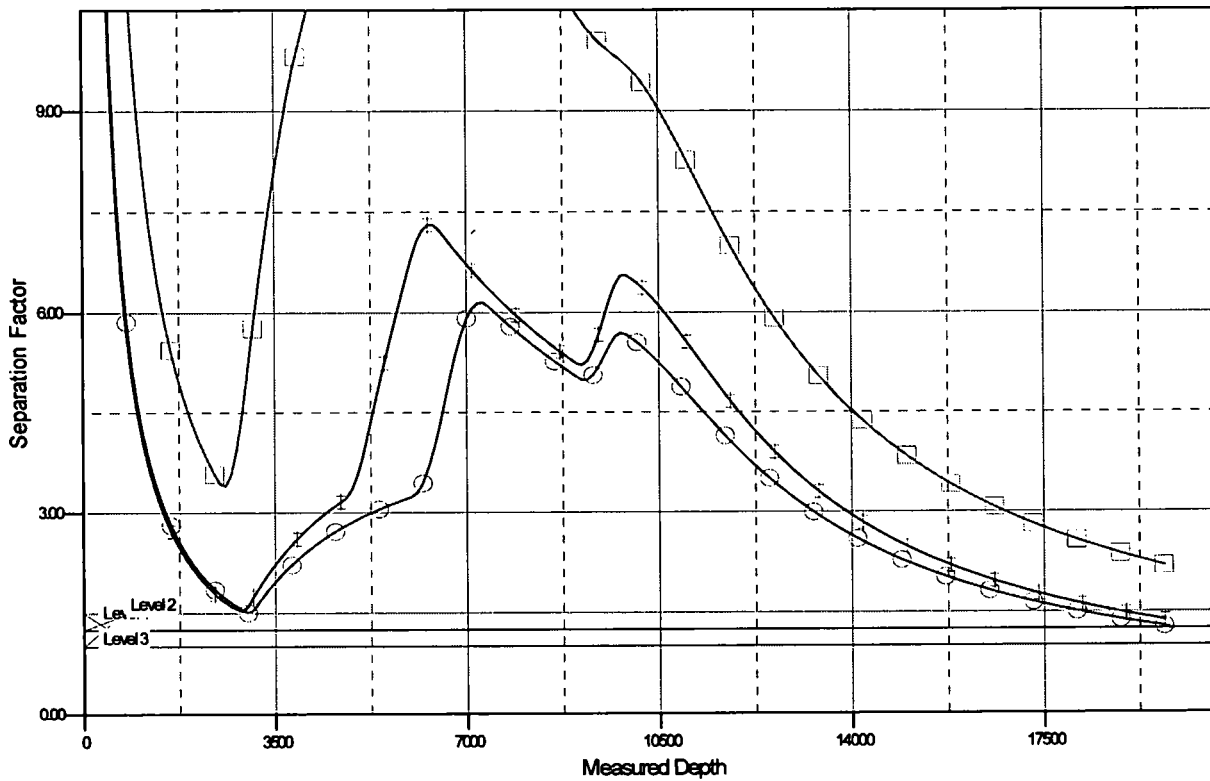
Company: COG Operating LLC
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 Grid Convergence at Surface is: 0.13°

Separation Factor Plot



LEGEND

36H, OH, Plan 110-19-18 V0
 35H, OH, Plan 110-19-18 V0
 38H, OH, Plan 110-19-18 V0