

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010

SEP 28 2016

RECEIVED

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter a
abandoned well. Use form 3160-3 (APD) for such proposals.Carlsbad Field Office
OCD Hobbs

Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.

KING AIR 8 FEDERAL COM 3H

2. Name of Operator

COG OPERATING LLC

Contact: MAYTE X REYES

E-Mail: mreyes1@concho.com

9. API Well No.

30-025-41476-00-X1

3a. Address

ONE CONCHO CENTER 600 W ILLINOIS AVENUE
MIDLAND, TX 79701-4287

3b. Phone No. (include area code)

Ph: 575-748-6945

10. Field and Pool, or Exploratory

LUSK

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 8 T19S R32E NENW 0410FNL 1960FWL
32.668132 N Lat, 103.790071 W Lon

11. County or Parish, and State

LEA COUNTY, NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

TYPE OF ACTION

☒ Notice of Intent☐ Subsequent Report☐ Final Abandonment Notice☐ Acidize☐ Alter Casing☐ Casing Repair☐ Change Plans☐ Convert to Injection☐ Deepen☐ Fracture Treat☐ New Construction☐ Plug and Abandon☐ Plug Back☐ Production (Start/Resume)☐ Reclamation☐ Recomplete☐ Temporarily Abandon☐ Water Disposal☐ Water Shut-Off☐ Well Integrity☒ Other
Change to Original A
PD

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

COG Operating LLC, respectfully requests approval for the following changes to the original approved APD.

? Operator will drill 8-3/4" hole to TD at 17,153' MD.

? Operator will increase cmt volume for the larger hole size.

? Operator will need a variance for a flex hose.

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #351421 verified by the BLM Well Information System

For COG OPERATING LLC, sent to the Hobbs

Committed to AFMSS for processing by MUSTAFA HAQUE on 09/19/2016 (16MH0027SE)

Name (Printed/Typed) MAYTE X REYES

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 09/15/2016

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By (BLM Approver Not Specified) Mustafa Haque

Title

PETROLEUM ENGINEER

Date 09/20/2016

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Hobbs

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **



COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 17, T 19S. , R 32 E

King Air 8 Fed Com #3H

Wellbore #1

Plan#1

HOBBS OCD

SEP 28 2016

RECEIVED

Anticollision Report

11 September, 2016





Integrity Directional Services, LLC
Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well King Air 8 Fed Com #3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3635.40ft (Scandrill Freedom)
Reference Site:	Sec. 17, T 19S., R 32 E	MD Reference:	RKB @ 3635.40ft (Scandrill Freedom)
Site Error:	5.00 ft	North Reference:	Grid
Reference Well:	King Air 8 Fed Com #3H	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:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 ft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	9/8/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	8,852.00	Plan#1 (Wellbore #1)	Keeper	Standard Wireline Keeper ver 1.0.2
8,853.00	17,153.74	Plan#1 (Wellbore #1)	MWD	MWD - Standard

Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Summary						
Offset Well - Wellbore - Design						
Sec. 17, T 19S., R 32 E						
Bonanza Fed Com 1 (Offset Well, Inc Only) - Wellbore #	16,829.06	8,706.00	867.77	468.20	2.172	CC, ES, SF
Lusk Deep Unit A #22 - Wellbore #1 - Wellbore #1	3,361.50	3,353.62	193.42	186.61	28.394	CC
Lusk Deep Unit A #22 - Wellbore #1 - Wellbore #1	3,500.00	3,491.35	193.65	186.52	27.158	ES
Lusk Deep Unit A #22 - Wellbore #1 - Wellbore #1	9,000.00	9,028.83	282.84	263.30	14.473	SF
TBM Fed 1 (Offset Well) - Wellbore #1 - Wellbore #1	13,964.66	9,310.21	415.08	320.59	4.393	CC, ES
TBM Fed 1 (Offset Well) - Wellbore #1 - Wellbore #1	14,000.00	9,310.89	416.58	321.45	4.379	SF
USA Trig Fed 1 (Offset Well, Inc Only Svy, No Plat SHL)	11,216.95	9,324.75	600.28	283.35	1.894	CC, ES, SF

Offset Design											Offset Site Error:	0.00 ft
Survey Program: 238-Inclinometer only											Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance				Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	21.60	21.60	0.00	0.65	-2.68	7,667.82	-359.20	7,676.22			
100.00	100.00	121.60	121.60	0.07	3.65	-2.68	7,667.82	-359.20	7,676.22	7,672.51	3.71	2,066.666
200.00	200.00	221.60	221.60	0.20	6.65	-2.68	7,667.82	-359.20	7,676.22	7,669.38	6.84	1,121.669
300.00	300.00	321.60	321.60	0.33	9.65	-2.68	7,667.82	-359.20	7,676.22	7,666.25	9.97	769.554
400.00	400.00	421.60	421.60	0.46	12.65	-2.68	7,667.82	-359.20	7,676.22	7,663.12	13.11	585.679
461.86	461.86	483.46	483.46	0.54	14.50	-2.68	7,667.82	-359.20	7,676.22	7,661.18	15.04	510.258
500.00	500.00	509.00	509.00	0.59	15.27	-2.68	7,667.82	-359.20	7,676.23	7,660.37	15.86	483.992
600.00	600.00	621.60	621.60	0.72	18.65	-2.68	7,667.82	-359.20	7,676.22	7,656.85	19.37	396.292
700.00	700.00	721.60	721.60	0.85	21.65	-2.68	7,667.82	-359.20	7,676.22	7,653.72	22.50	341.137
800.00	800.00	821.61	821.60	0.99	24.65	-2.68	7,667.82	-359.20	7,676.22	7,650.59	25.63	299.457
900.00	900.00	921.61	921.60	1.12	27.65	-2.68	7,667.82	-359.20	7,676.22	7,647.46	28.77	266.854
1,000.00	1,000.00	1,021.61	1,021.60	1.25	30.65	-2.68	7,667.82	-359.20	7,676.22	7,644.33	31.90	240.653
1,100.00	1,100.00	1,121.61	1,121.60	1.38	33.65	-2.68	7,667.82	-359.20	7,676.22	7,641.20	35.03	219.138
1,200.00	1,200.00	1,221.61	1,221.60	1.51	36.65	-2.68	7,667.82	-359.20	7,676.22	7,638.06	38.16	201.153
1,300.00	1,300.00	1,233.00	1,232.99	1.64	36.99	-2.68	7,667.82	-359.20	7,676.74	7,638.10	38.63	198.700
1,400.00	1,400.00	1,421.61	1,421.60	1.78	42.65	-2.68	7,667.82	-359.20	7,676.22	7,631.80	44.42	172.791
1,449.02	1,449.02	1,470.62	1,470.62	1.84	44.12	-2.68	7,667.82	-359.20	7,676.22	7,630.26	45.96	167.020
1,500.00	1,500.00	1,487.00	1,486.98	1.91	44.61	-2.68	7,667.82	-359.20	7,676.30	7,629.78	46.52	165.017
1,600.00	1,600.00	1,621.62	1,621.60	2.04	48.65	-2.68	7,667.82	-359.20	7,676.22	7,625.54	50.69	151.438

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandril Freedom)
MD Reference: RKB @ 3635.40ft (Scandril Freedom)
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. 17, T 19S. , R 32 E - Bonanza Fed Com 1 (Offset Well, Inc Only) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.00 ft
Survey Program: 238-Inclinometer only													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	
1,700.00	1,700.00	1,721.62	1,721.60	2.17	51.65	-2.68	7,667.82	-359.20	7,676.22	7,622.40	53.82	142.626	
1,735.11	1,735.11	1,756.73	1,756.71	2.22	52.70	-2.68	7,667.82	-359.20	7,676.22	7,621.30	54.92	139.770	
1,800.00	1,800.00	1,773.00	1,772.97	2.30	53.19	-2.68	7,667.82	-359.20	7,676.38	7,620.88	55.49	138.328	
1,900.00	1,900.00	1,921.63	1,921.60	2.44	57.65	-2.68	7,667.82	-359.20	7,676.22	7,616.14	60.08	127.757	
2,000.00	2,000.00	2,021.63	2,021.60	2.57	60.65	-2.68	7,667.82	-359.20	7,676.22	7,613.01	63.22	121.428	
2,100.00	2,100.00	2,121.63	2,121.60	2.70	63.65	-2.68	7,667.82	-359.20	7,676.22	7,609.88	66.35	115.696	
2,161.40	2,161.40	2,183.03	2,183.00	2.78	65.49	-2.68	7,667.82	-359.20	7,676.22	7,607.95	68.27	112.437	
2,200.00	2,200.00	2,208.00	2,207.97	2.83	66.24	-2.68	7,667.82	-359.20	7,676.24	7,607.17	69.07	111.135	
2,300.00	2,300.00	2,321.63	2,321.60	2.96	69.65	-2.68	7,667.82	-359.20	7,676.22	7,603.61	72.61	105.716	
2,400.00	2,400.00	2,421.63	2,421.60	3.09	72.65	-2.68	7,667.82	-359.20	7,676.22	7,600.48	75.74	101.344	
2,500.00	2,500.00	2,521.63	2,521.60	3.23	75.65	-2.68	7,667.82	-359.20	7,676.22	7,597.35	78.88	97.320	
2,556.91	2,556.91	2,578.54	2,578.51	3.30	77.36	-2.68	7,667.82	-359.20	7,676.22	7,595.57	80.66	95.170	
2,600.00	2,600.00	2,599.00	2,598.95	3.36	77.97	-2.68	7,667.82	-359.20	7,676.26	7,594.93	81.33	94.386	
2,700.00	2,700.00	2,599.00	2,598.95	3.49	77.97	-2.68	7,667.82	-359.20	7,677.20	7,595.74	81.46	94.245	
2,800.00	2,800.00	2,821.65	2,821.60	3.62	84.65	-2.68	7,667.82	-359.20	7,676.22	7,587.95	88.27	86.961	
2,900.00	2,900.00	2,921.65	2,921.60	3.75	87.65	-2.68	7,667.82	-359.20	7,676.22	7,584.82	91.40	83.982	
2,943.82	2,943.82	2,965.47	2,965.42	3.81	88.96	-2.68	7,667.82	-359.20	7,676.22	7,583.45	92.78	82.739	
3,000.00	3,000.00	2,981.00	2,980.93	3.89	89.43	-2.68	7,667.82	-359.20	7,676.33	7,583.02	93.32	82.262	
3,100.00	3,100.00	3,121.67	3,121.60	4.02	93.65	-2.68	7,667.82	-359.20	7,676.22	7,578.56	97.67	78.595	
3,200.00	3,200.00	3,221.67	3,221.60	4.15	96.65	-2.68	7,667.82	-359.20	7,676.22	7,575.42	100.80	76.153	
3,300.00	3,300.00	3,321.67	3,321.60	4.28	99.65	-2.68	7,667.82	-359.20	7,676.22	7,572.29	103.93	73.859	
3,353.91	3,353.91	3,375.58	3,375.51	4.35	101.27	-2.68	7,667.82	-359.20	7,676.22	7,570.60	105.62	72.678	
3,400.00	3,400.00	3,394.00	3,393.92	4.41	101.82	-2.68	7,667.82	-359.20	7,676.27	7,570.04	106.23	72.259	
3,500.00	3,500.00	3,521.68	3,521.60	4.55	105.65	-2.68	7,667.82	-359.20	7,676.22	7,566.03	110.20	69.660	
3,600.00	3,600.00	3,621.68	3,621.60	4.68	108.65	-2.68	7,667.82	-359.20	7,676.22	7,562.90	113.33	67.735	
3,700.00	3,700.00	3,648.00	3,647.91	4.81	109.44	-2.68	7,667.82	-359.20	7,676.58	7,562.33	114.25	67.192	
3,800.00	3,800.00	3,821.69	3,821.60	4.94	114.65	-2.68	7,667.82	-359.20	7,676.22	7,556.63	119.59	64.187	
3,858.49	3,858.49	3,880.18	3,880.09	5.02	116.41	-2.68	7,667.82	-359.20	7,676.22	7,554.80	121.42	63.219	
3,900.00	3,900.00	3,902.00	3,901.90	5.07	117.06	-2.68	7,667.82	-359.20	7,676.25	7,554.12	122.13	62.852	
4,000.00	4,000.00	3,902.00	3,901.90	5.20	117.06	-2.68	7,667.82	-359.20	7,677.16	7,554.89	122.26	62.791	
4,100.00	4,100.00	4,121.70	4,121.60	5.34	123.65	-2.68	7,667.82	-359.20	7,676.22	7,547.24	128.99	59.512	
4,150.46	4,150.46	4,172.16	4,172.06	5.40	125.16	-2.68	7,667.82	-359.20	7,676.22	7,545.66	130.57	58.791	
4,200.00	4,200.00	4,189.00	4,188.89	5.47	125.67	-2.68	7,667.82	-359.20	7,676.29	7,545.16	131.14	58.536	
4,300.00	4,300.00	4,321.71	4,321.60	5.60	129.65	-2.68	7,667.82	-359.20	7,676.22	7,540.97	135.25	56.755	
4,400.00	4,400.00	4,421.71	4,421.60	5.73	132.65	-2.68	7,667.82	-359.20	7,676.22	7,537.84	138.38	55.471	
4,500.00	4,500.00	4,521.71	4,521.60	5.86	135.65	-2.68	7,667.82	-359.20	7,676.22	7,534.71	141.51	54.243	
4,600.00	4,600.00	4,621.71	4,621.60	6.00	138.65	-2.68	7,667.82	-359.20	7,676.22	7,531.58	144.65	53.069	
4,636.23	4,636.23	4,657.95	4,657.83	6.04	139.74	-2.68	7,667.82	-359.20	7,676.22	7,530.44	145.78	52.656	
4,700.00	4,700.00	4,674.00	4,673.87	6.13	140.22	-2.68	7,667.82	-359.20	7,676.37	7,530.03	146.35	52.453	
4,800.00	4,800.00	4,821.73	4,821.60	6.26	144.65	-2.68	7,667.82	-359.20	7,676.22	7,525.31	150.91	50.866	
4,900.00	4,900.00	4,921.73	4,921.60	6.39	147.65	-2.68	7,667.82	-359.20	7,676.22	7,522.18	154.04	49.832	
4,941.79	4,941.79	4,963.52	4,963.39	6.45	148.91	-2.68	7,667.82	-359.20	7,676.22	7,520.87	155.35	49.412	
5,000.00	5,000.00	4,979.00	4,978.87	6.52	149.37	-2.68	7,667.82	-359.20	7,676.34	7,520.45	155.89	49.241	
5,100.00	5,100.00	5,121.73	5,121.60	6.65	153.65	-2.68	7,667.82	-359.20	7,676.22	7,515.92	160.31	47.885	
5,200.00	5,200.00	5,221.73	5,221.60	6.79	156.65	-2.68	7,667.82	-359.20	7,676.22	7,512.79	163.44	46.967	
5,300.00	5,300.00	5,321.73	5,321.60	6.92	159.65	-2.68	7,667.82	-359.20	7,676.22	7,509.65	166.57	46.084	
5,400.00	5,400.00	5,421.73	5,421.60	7.05	162.65	-2.68	7,667.82	-359.20	7,676.22	7,506.52	169.70	45.234	
5,500.00	5,500.00	5,437.00	5,436.85	7.18	163.11	-2.68	7,667.82	-359.20	7,676.69	7,506.40	170.29	45.080	
5,600.00	5,600.00	5,621.75	5,621.60	7.31	168.65	-2.68	7,667.82	-359.20	7,676.22	7,500.26	175.97	43.623	
5,651.85	5,651.85	5,673.59	5,673.45	7.38	170.21	-2.68	7,667.82	-359.20	7,676.22	7,498.63	177.59	43.224	
5,700.00	5,700.00	5,691.00	5,690.82	7.45	170.73	-2.68	7,667.82	-359.20	7,676.29	7,498.11	178.18	43.083	
5,800.00	5,800.00	5,691.00	5,690.82	7.58	170.73	-2.68	7,667.82	-359.20	7,677.34	7,499.03	178.31	43.057	

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Anticollision Report



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Offset Design Sec. 17, T 19S., R 32 E - Bonanza Fed Com 1 (Offset Well, Inc Only) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.00 ft	
Survey Program: 238-Inclinometer 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)		+N/-S (ft)	+E/-W (ft)				Between Centres (ft)	Between Ellipses (ft)	
5,900.00	5,900.00	5,921.78	5,921.60	7.71	177.65	-2.68	7,667.82	-359.20	7,676.22	7,490.86	185.36	41.412		
6,000.00	6,000.00	6,021.78	6,021.60	7.84	180.65	-2.68	7,667.82	-359.20	7,676.22	7,487.73	188.49	40.724		
6,100.00	6,100.00	6,121.78	6,121.60	7.97	183.65	-2.68	7,667.82	-359.20	7,676.22	7,484.60	191.63	40.058		
6,127.80	6,127.80	6,149.58	6,149.40	8.01	184.49	-2.68	7,667.82	-359.20	7,676.22	7,483.73	192.50	39.877		
6,200.00	6,200.00	6,168.00	6,167.77	8.10	185.04	-2.68	7,667.82	-359.20	7,676.41	7,483.27	193.14	39.744		
6,300.00	6,300.00	6,321.83	6,321.60	8.24	189.65	-2.68	7,667.82	-359.20	7,676.22	7,478.33	197.89	38.790		
6,400.00	6,400.00	6,327.00	6,326.74	8.37	189.81	-2.68	7,667.82	-359.20	7,676.81	7,478.63	198.18	38.737		
6,500.00	6,500.00	6,521.86	6,521.60	8.50	195.66	-2.68	7,667.82	-359.20	7,676.22	7,472.07	204.16	37.600		
6,600.00	6,600.00	6,621.89	6,621.60	8.63	198.66	-2.68	7,667.82	-359.20	7,676.22	7,468.94	207.29	37.032		
6,700.00	6,700.00	6,721.91	6,721.60	8.76	201.66	-2.68	7,667.82	-359.20	7,676.22	7,465.80	210.42	36.480		
6,800.00	6,800.00	6,821.91	6,821.60	8.90	204.66	-2.68	7,667.82	-359.20	7,676.22	7,462.67	213.55	35.945		
6,900.00	6,900.00	6,921.91	6,921.60	9.03	207.66	-2.68	7,667.82	-359.20	7,676.22	7,459.54	216.69	35.426		
7,000.00	7,000.00	7,021.91	7,021.60	9.16	210.66	-2.68	7,667.82	-359.20	7,676.22	7,456.41	219.82	34.921		
7,051.04	7,051.04	7,072.96	7,072.64	9.23	212.19	-2.68	7,667.82	-359.20	7,676.22	7,454.81	221.42	34.669		
7,100.00	7,100.00	7,090.00	7,089.69	9.29	212.70	-2.68	7,667.82	-359.20	7,676.29	7,454.30	221.99	34.579		
7,200.00	7,200.00	7,090.00	7,089.69	9.42	212.70	-2.68	7,667.82	-359.20	7,677.36	7,455.23	222.12	34.564		
7,300.00	7,300.00	7,321.91	7,321.60	9.56	219.66	-2.68	7,667.82	-359.20	7,676.22	7,447.01	229.21	33.490		
7,366.00	7,366.00	7,387.91	7,387.60	9.64	221.64	-2.68	7,667.82	-359.20	7,676.22	7,444.94	231.28	33.190		
7,400.00	7,400.00	7,420.00	7,419.63	9.69	222.60	-2.68	7,667.82	-359.20	7,676.22	7,443.94	232.29	33.046		
7,500.00	7,500.00	7,420.00	7,419.63	9.82	222.60	-2.68	7,667.82	-359.20	7,676.90	7,444.48	232.42	33.030		
7,600.00	7,600.00	7,621.97	7,621.60	9.95	228.66	-2.68	7,667.82	-359.20	7,676.22	7,437.61	238.61	32.171		
7,653.05	7,653.05	7,675.01	7,674.65	10.02	230.25	-2.68	7,667.82	-359.20	7,676.22	7,435.95	240.27	31.948		
7,700.00	7,700.00	7,693.00	7,692.59	10.08	230.79	-2.68	7,667.82	-359.20	7,676.28	7,435.41	240.87	31.869		
7,800.00	7,800.00	7,822.01	7,821.60	10.21	234.66	-2.68	7,667.82	-359.20	7,676.22	7,431.35	244.87	31.348		
7,900.00	7,900.00	7,922.01	7,921.60	10.35	237.66	-2.68	7,667.82	-359.20	7,676.22	7,428.22	248.01	30.952		
8,000.00	8,000.00	7,947.00	7,946.54	10.48	238.41	-2.68	7,667.82	-359.20	7,676.59	7,427.70	248.89	30.844		
8,100.00	8,100.00	7,947.00	7,946.54	10.61	238.41	-2.68	7,667.82	-359.20	7,678.22	7,429.20	249.02	30.834		
8,200.00	8,200.00	8,222.06	8,221.60	10.74	246.66	-2.68	7,667.82	-359.20	7,676.22	7,418.82	257.40	29.822		
8,300.00	8,300.00	8,322.06	8,321.60	10.87	249.66	-2.68	7,667.82	-359.20	7,676.22	7,415.69	260.54	29.463		
8,400.00	8,400.00	8,422.06	8,421.60	11.01	252.66	-2.68	7,667.82	-359.20	7,676.22	7,412.56	263.67	29.113		
8,500.00	8,500.00	8,424.00	8,423.44	11.14	252.72	-2.68	7,667.82	-359.20	7,676.85	7,412.99	263.86	29.095		
8,600.00	8,600.00	8,622.16	8,621.60	11.27	258.66	-2.68	7,667.82	-359.20	7,676.22	7,406.29	269.93	28.437		
8,660.19	8,660.19	8,682.35	8,681.79	11.35	260.47	-2.68	7,667.82	-359.20	7,676.22	7,404.41	271.82	28.240		
8,700.00	8,700.00	8,706.00	8,705.34	11.40	261.18	-2.68	7,667.82	-359.20	7,676.24	7,403.66	272.58	28.161		
8,800.00	8,800.00	8,706.00	8,705.34	11.53	261.18	-2.68	7,667.82	-359.20	7,677.10	7,404.39	272.71	28.151		
8,842.54	8,842.54	8,706.00	8,705.34	11.59	261.18	-2.68	7,667.82	-359.20	7,677.87	7,405.10	272.77	28.148		
8,850.00	8,850.00	8,706.00	8,705.34	11.60	261.18	-21.03	7,667.82	-359.20	7,677.97	7,405.19	272.78	28.147		
8,875.00	8,874.98	8,706.00	8,705.34	11.62	261.18	-21.04	7,667.82	-359.20	7,677.58	7,404.78	272.80	28.144		
8,900.00	8,899.86	8,706.00	8,705.34	11.62	261.18	-21.11	7,667.82	-359.20	7,676.04	7,403.25	272.80	28.138		
8,925.00	8,924.59	8,706.00	8,705.34	11.62	261.18	-21.23	7,667.82	-359.20	7,673.38	7,400.57	272.80	28.128		
8,950.00	8,949.10	8,706.00	8,705.34	11.63	261.18	-21.39	7,667.82	-359.20	7,669.58	7,396.77	272.81	28.113		
8,975.00	8,973.31	8,706.00	8,705.34	11.63	261.18	-21.62	7,667.82	-359.20	7,664.66	7,391.84	272.81	28.095		
9,000.00	8,997.16	8,706.00	8,705.34	11.64	261.18	-21.89	7,667.82	-359.20	7,658.63	7,385.81	272.82	28.072		
9,025.00	9,020.59	8,706.00	8,705.34	11.65	261.18	-22.23	7,667.82	-359.20	7,651.51	7,378.67	272.83	28.045		
9,050.00	9,043.53	8,706.00	8,705.34	11.67	261.18	-22.62	7,667.82	-359.20	7,643.30	7,370.46	272.85	28.013		
9,075.00	9,065.92	8,706.00	8,705.34	11.68	261.18	-23.09	7,667.82	-359.20	7,634.04	7,361.18	272.86	27.978		
9,100.00	9,087.70	8,706.00	8,705.34	11.70	261.18	-23.63	7,667.82	-359.20	7,623.74	7,350.86	272.88	27.938		
9,125.00	9,108.81	8,706.00	8,705.34	11.72	261.18	-24.25	7,667.82	-359.20	7,612.42	7,339.53	272.90	27.895		
9,150.00	9,129.19	8,706.00	8,705.34	11.74	261.18	-24.95	7,667.82	-359.20	7,600.12	7,327.20	272.92	27.848		
9,175.00	9,148.78	8,706.00	8,705.34	11.76	261.18	-25.76	7,667.82	-359.20	7,586.85	7,313.92	272.94	27.797		
9,200.00	9,167.53	8,706.00	8,705.34	11.78	261.18	-26.67	7,667.82	-359.20	7,572.66	7,299.70	272.96	27.742		
9,225.00	9,185.39	8,706.00	8,705.34	11.81	261.18	-27.71	7,667.82	-359.20	7,557.58	7,284.59	272.99	27.684		

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandrill Freedom)
MD Reference: RKB @ 3635.40ft (Scandrill Freedom)
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. 17, T 19S., R 32 E - Bonanza Fed Com 1 (Offset Well, Inc Only) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.00 ft
Survey Program: 238-Inclinometer only													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	
9,250.00	9,202.31	8,706.00	8,705.34	11.84	261.18	-28.88	7,667.82	-359.20	7,541.64	7,268.62	273.02	27.623	
9,275.00	9,218.25	8,706.00	8,705.34	11.87	261.18	-30.22	7,667.82	-359.20	7,524.88	7,251.83	273.05	27.559	
9,300.00	9,233.15	8,706.00	8,705.34	11.90	261.18	-31.74	7,667.82	-359.20	7,507.34	7,234.25	273.08	27.491	
9,325.00	9,246.99	8,706.00	8,705.34	11.94	261.18	-33.48	7,667.82	-359.20	7,489.06	7,215.94	273.12	27.421	
9,350.00	9,259.72	8,706.00	8,705.34	11.98	261.18	-35.45	7,667.82	-359.20	7,470.10	7,196.94	273.16	27.347	
9,375.00	9,271.30	8,706.00	8,705.34	12.02	261.18	-37.71	7,667.82	-359.20	7,450.49	7,177.29	273.20	27.271	
9,400.00	9,281.71	8,706.00	8,705.34	12.06	261.18	-40.31	7,667.82	-359.20	7,430.28	7,157.04	273.24	27.193	
9,425.00	9,290.91	8,706.00	8,705.34	12.11	261.18	-43.28	7,667.82	-359.20	7,409.53	7,136.24	273.29	27.113	
9,450.00	9,298.88	8,706.00	8,705.34	12.16	261.18	-46.70	7,667.82	-359.20	7,388.29	7,114.95	273.34	27.030	
9,475.00	9,305.61	8,706.00	8,705.34	12.22	261.18	-50.62	7,667.82	-359.20	7,366.61	7,093.21	273.40	26.945	
9,500.00	9,311.06	8,706.00	8,705.34	12.28	261.18	-55.11	7,667.82	-359.20	7,344.55	7,071.09	273.46	26.857	
9,525.00	9,315.23	8,706.00	8,705.34	12.36	261.18	-60.21	7,667.82	-359.20	7,322.16	7,048.62	273.54	26.768	
9,550.00	9,318.11	8,706.00	8,705.34	12.45	261.18	-65.93	7,667.82	-359.20	7,299.51	7,025.88	273.63	26.676	
9,575.00	9,319.68	8,706.00	8,705.34	12.56	261.18	-72.25	7,667.82	-359.20	7,276.66	7,002.92	273.74	26.582	
9,593.79	9,320.00	8,706.00	8,705.34	12.66	261.18	-77.34	7,667.82	-359.20	7,259.38	6,985.55	273.84	26.510	
9,600.00	9,319.98	8,706.00	8,705.34	12.69	261.18	-77.28	7,667.82	-359.20	7,253.66	6,979.79	273.87	26.486	
9,700.00	9,319.72	8,706.00	8,705.34	13.40	261.18	-76.14	7,667.82	-359.20	7,160.92	6,886.34	274.58	26.080	
9,800.00	9,319.46	8,706.00	8,705.34	14.50	261.18	-74.80	7,667.82	-359.20	7,067.14	6,791.46	275.68	25.635	
9,900.00	9,319.19	8,706.00	8,705.34	15.84	261.18	-73.17	7,667.82	-359.20	6,972.39	6,695.37	277.02	25.169	
10,000.00	9,318.93	8,706.00	8,705.34	17.31	261.18	-71.17	7,667.82	-359.20	6,876.76	6,598.26	278.49	24.693	
10,100.00	9,318.66	8,706.00	8,705.34	18.85	261.18	-68.67	7,667.82	-359.20	6,780.32	6,500.29	280.03	24.213	
10,200.00	9,318.39	8,706.00	8,705.34	20.43	261.18	-65.48	7,667.82	-359.20	6,683.16	6,401.55	281.61	23.732	
10,300.00	9,318.13	8,706.00	8,705.34	22.03	261.18	-61.29	7,667.82	-359.20	6,585.36	6,302.15	283.21	23.253	
10,400.00	9,317.86	8,706.00	8,705.34	23.65	261.18	-55.63	7,667.82	-359.20	6,487.03	6,202.20	284.83	22.775	
10,500.00	9,317.59	8,706.00	8,705.34	25.27	261.18	-47.79	7,667.82	-359.20	6,388.26	6,101.80	286.45	22.301	
10,531.97	9,317.51	8,706.00	8,705.34	25.80	261.18	-44.67	7,667.82	-359.20	6,356.61	6,069.63	286.98	22.150	
10,600.00	9,317.33	8,706.00	8,705.34	26.90	261.18	-44.67	7,667.82	-359.20	6,289.22	6,001.14	288.08	21.832	
10,700.00	9,317.07	8,706.00	8,705.34	28.51	261.18	-44.67	7,667.82	-359.20	6,190.19	5,900.50	289.69	21.368	
10,800.00	9,316.80	8,706.00	8,705.34	30.14	261.18	-44.67	7,667.82	-359.20	6,091.19	5,799.87	291.33	20.909	
10,900.00	9,316.54	8,706.00	8,705.34	31.80	261.18	-44.67	7,667.82	-359.20	5,992.23	5,699.24	292.99	20.452	
11,000.00	9,316.27	8,706.00	8,705.34	33.48	261.18	-44.67	7,667.82	-359.20	5,893.30	5,598.64	294.66	20.000	
11,100.00	9,316.01	8,706.00	8,705.34	35.18	261.18	-44.67	7,667.82	-359.20	5,794.41	5,498.05	296.36	19.552	
11,200.00	9,315.74	8,706.00	8,705.34	36.89	261.18	-44.67	7,667.82	-359.20	5,695.56	5,397.49	298.07	19.108	
11,300.00	9,315.48	8,706.00	8,705.34	38.61	261.18	-44.67	7,667.82	-359.20	5,596.74	5,296.96	299.79	18.669	
11,400.00	9,315.21	8,706.00	8,705.34	40.34	261.18	-44.67	7,667.82	-359.20	5,497.98	5,196.46	301.52	18.234	
11,500.00	9,314.95	8,706.00	8,705.34	42.08	261.18	-44.67	7,667.82	-359.20	5,399.25	5,095.99	303.26	17.804	
11,600.00	9,314.69	8,706.00	8,705.34	43.83	261.18	-44.67	7,667.82	-359.20	5,300.58	4,995.57	305.01	17.378	
11,700.00	9,314.42	8,706.00	8,705.34	45.58	261.18	-44.67	7,667.82	-359.20	5,201.95	4,895.19	306.76	16.958	
11,800.00	9,314.16	8,706.00	8,705.34	47.34	261.18	-44.67	7,667.82	-359.20	5,103.38	4,794.86	308.52	16.541	
11,900.00	9,313.89	8,706.00	8,705.34	49.11	261.18	-44.67	7,667.82	-359.20	5,004.87	4,694.57	310.29	16.130	
12,000.00	9,313.63	8,706.00	8,705.34	50.88	261.18	-44.67	7,667.82	-359.20	4,906.41	4,594.35	312.06	15.723	
12,100.00	9,313.36	8,706.00	8,705.34	52.66	261.18	-44.67	7,667.82	-359.20	4,808.02	4,494.18	313.84	15.320	
12,200.00	9,313.10	8,706.00	8,705.34	54.44	261.18	-44.67	7,667.82	-359.20	4,709.70	4,394.08	315.62	14.922	
12,300.00	9,312.83	8,706.00	8,705.34	56.22	261.18	-44.67	7,667.82	-359.20	4,611.45	4,294.04	317.40	14.529	
12,400.00	9,312.57	8,706.00	8,705.34	58.01	261.18	-44.67	7,667.82	-359.20	4,513.27	4,194.08	319.19	14.140	
12,500.00	9,312.31	8,706.00	8,705.34	59.80	261.18	-44.67	7,667.82	-359.20	4,415.18	4,094.20	320.98	13.755	
12,600.00	9,312.04	8,706.00	8,705.34	61.59	261.18	-44.67	7,667.82	-359.20	4,317.17	3,994.40	322.77	13.375	
12,700.00	9,311.78	8,706.00	8,705.34	63.38	261.18	-44.67	7,667.82	-359.20	4,219.26	3,894.70	324.56	13.000	
12,800.00	9,311.51	8,706.00	8,705.34	65.18	261.18	-44.67	7,667.82	-359.20	4,121.45	3,795.09	326.36	12.629	
12,900.00	9,311.25	8,706.00	8,705.34	66.98	261.18	-44.67	7,667.82	-359.20	4,023.75	3,695.59	328.16	12.262	
13,000.00	9,310.98	8,706.00	8,705.34	68.78	261.18	-44.67	7,667.82	-359.20	3,926.16	3,596.20	329.96	11.899	
13,100.00	9,310.72	8,706.00	8,705.34	70.58	261.18	-44.67	7,667.82	-359.20	3,828.70	3,496.94	331.76	11.540	

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S. , R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandril Freedom)
MD Reference: RKB @ 3635.40ft (Scandril Freedom)
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. 17, T 19S. , R 32 E - Bonanza Fed Com 1 (Offset Well, Inc Only) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.00 ft
Survey Program: 238-Inclinometer only													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
13,200.00	9,310.45	8,706.00	8,705.34	72.39	261.18	-44.67	7,667.82	-359.20	3,731.37	3,397.80	333.57	11.186	
13,300.00	9,310.19	8,706.00	8,705.34	74.19	261.18	-44.67	7,667.82	-359.20	3,634.19	3,298.81	335.37	10.836	
13,400.00	9,309.93	8,706.00	8,705.34	76.00	261.18	-44.67	7,667.82	-359.20	3,537.16	3,199.98	337.18	10.490	
13,500.00	9,309.66	8,706.00	8,705.34	77.81	261.18	-44.67	7,667.82	-359.20	3,440.30	3,101.31	338.99	10.149	
13,600.00	9,309.40	8,706.00	8,705.34	79.62	261.18	-44.67	7,667.82	-359.20	3,343.63	3,002.83	340.80	9.811	
13,700.00	9,309.13	8,706.00	8,705.34	81.43	261.18	-44.67	7,667.82	-359.20	3,247.16	2,904.55	342.61	9.478	
13,800.00	9,308.87	8,706.00	8,705.34	83.24	261.18	-44.67	7,667.82	-359.20	3,150.91	2,806.49	344.42	9.148	
13,900.00	9,308.60	8,706.00	8,705.34	85.05	261.18	-44.67	7,667.82	-359.20	3,054.90	2,708.67	346.23	8.823	
14,000.00	9,308.34	8,706.00	8,705.34	86.86	261.18	-44.67	7,667.82	-359.20	2,959.16	2,611.11	348.04	8.502	
14,100.00	9,308.07	8,706.00	8,705.34	88.68	261.18	-44.67	7,667.82	-359.20	2,863.70	2,513.85	349.86	8.185	
14,200.00	9,307.81	8,706.00	8,705.34	90.49	261.18	-44.67	7,667.82	-359.20	2,768.57	2,416.90	351.67	7.873	
14,300.00	9,307.55	8,706.00	8,705.34	92.31	261.18	-44.67	7,667.82	-359.20	2,673.80	2,320.31	353.49	7.564	
14,400.00	9,307.28	8,706.00	8,705.34	94.13	261.18	-44.67	7,667.82	-359.20	2,579.41	2,224.11	355.31	7.260	
14,500.00	9,307.02	8,706.00	8,705.34	95.94	261.18	-44.67	7,667.82	-359.20	2,485.47	2,128.35	357.12	6.960	
14,600.00	9,306.75	8,706.00	8,705.34	97.76	261.18	-44.67	7,667.82	-359.20	2,392.02	2,033.08	358.94	6.664	
14,700.00	9,306.49	8,706.00	8,705.34	99.58	261.18	-44.67	7,667.82	-359.20	2,299.12	1,938.36	360.76	6.373	
14,800.00	9,306.22	8,706.00	8,705.34	101.40	261.18	-44.67	7,667.82	-359.20	2,206.83	1,844.26	362.58	6.087	
14,900.00	9,305.96	8,706.00	8,705.34	103.22	261.18	-44.67	7,667.82	-359.20	2,115.26	1,750.86	364.40	5.805	
15,000.00	9,305.70	8,706.00	8,705.34	105.04	261.18	-44.67	7,667.82	-359.20	2,024.47	1,658.26	366.22	5.528	
15,100.00	9,305.43	8,706.00	8,705.34	106.86	261.18	-44.67	7,667.82	-359.20	1,934.60	1,566.56	368.04	5.257	
15,200.00	9,305.17	8,706.00	8,705.34	108.68	261.18	-44.67	7,667.82	-359.20	1,845.77	1,475.91	369.86	4.990	
15,300.00	9,304.90	8,706.00	8,705.34	110.50	261.18	-44.67	7,667.82	-359.20	1,758.14	1,386.46	371.68	4.730	
15,400.00	9,304.64	8,706.00	8,705.34	112.32	261.18	-44.67	7,667.82	-359.20	1,671.90	1,298.40	373.50	4.476	
15,500.00	9,304.37	8,706.00	8,705.34	114.14	261.18	-44.67	7,667.82	-359.20	1,587.27	1,211.95	375.32	4.229	
15,600.00	9,304.11	8,706.00	8,705.34	115.97	261.18	-44.67	7,667.82	-359.20	1,504.53	1,127.39	377.15	3.989	
15,700.00	9,303.84	8,706.00	8,705.34	117.79	261.18	-44.67	7,667.82	-359.20	1,424.01	1,045.04	378.97	3.758	
15,800.00	9,303.58	8,706.00	8,705.34	119.61	261.18	-44.67	7,667.82	-359.20	1,346.11	965.31	380.79	3.535	
15,900.00	9,303.32	8,706.00	8,705.34	121.44	261.18	-44.67	7,667.82	-359.20	1,271.29	888.68	382.62	3.323	
16,000.00	9,303.05	8,706.00	8,705.34	123.26	261.18	-44.67	7,667.82	-359.20	1,200.16	815.72	384.44	3.122	
16,100.00	9,302.79	8,706.00	8,705.34	125.08	261.18	-44.67	7,667.82	-359.20	1,133.39	747.12	386.26	2.934	
16,200.00	9,302.52	8,706.00	8,705.34	126.91	261.18	-44.67	7,667.82	-359.20	1,071.80	683.71	388.09	2.762	
16,300.00	9,302.26	8,706.00	8,705.34	128.73	261.18	-44.67	7,667.82	-359.20	1,016.34	626.42	389.91	2.607	
16,400.00	9,301.99	8,706.00	8,705.34	130.56	261.18	-44.67	7,667.82	-359.20	968.05	576.32	391.74	2.471	
16,500.00	9,301.73	8,706.00	8,705.34	132.38	261.18	-44.67	7,667.82	-359.20	928.07	534.51	393.56	2.358	
16,600.00	9,301.46	8,706.00	8,705.34	134.21	261.18	-44.67	7,667.82	-359.20	897.50	502.11	395.39	2.270	
16,700.00	9,301.20	8,706.00	8,705.34	136.03	261.18	-44.67	7,667.82	-359.20	877.32	480.11	397.21	2.209	
16,800.00	9,300.94	8,706.00	8,705.34	137.86	261.18	-44.67	7,667.82	-359.20	868.26	469.22	399.04	2.176	
16,829.06	9,300.86	8,706.00	8,705.34	138.39	261.18	-44.67	7,667.82	-359.20	867.77	468.20	399.57	2.172	CC, ES, SF
16,900.00	9,300.67	8,706.00	8,705.34	139.68	261.18	-44.67	7,667.82	-359.20	870.67	469.80	400.87	2.172	
17,000.00	9,300.41	8,706.00	8,705.34	141.51	261.18	-44.67	7,667.82	-359.20	884.45	481.76	402.69	2.196	
17,100.00	9,300.14	8,706.00	8,705.34	143.34	261.18	-44.67	7,667.82	-359.20	909.09	504.57	404.52	2.247	
17,153.74	9,300.00	8,706.00	8,705.34	144.32	261.18	-44.67	7,667.82	-359.20	926.52	521.02	405.50	2.285	

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandril Freedom)
MD Reference: RKB @ 3635.40ft (Scandril Freedom)
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. 17, T 19S., R 32 E - Lusk Deep Unit A #22 - Wellbore #1 - Wellbore #1												Offset Site Error:	0.00 ft
Survey Program: 100-Keeper, 8716-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	-67.37	79.30	-190.20	206.24				
100.00	100.00	92.76	92.76	0.07	0.07	-67.28	79.49	-189.84	205.81	205.68	0.14	1,523.245	
200.00	200.00	192.37	192.36	0.20	0.19	-67.05	80.06	-189.06	205.32	204.93	0.39	530.017	
300.00	300.00	292.01	292.00	0.33	0.32	-66.78	80.82	-188.43	205.04	204.39	0.65	317.432	
350.74	350.74	342.35	342.34	0.39	0.38	-66.66	81.21	-188.21	204.98	204.21	0.77	265.103	
400.00	400.00	391.18	391.17	0.46	0.44	-66.55	81.59	-188.10	205.03	204.14	0.90	228.475	
500.00	500.00	490.31	490.29	0.59	0.53	-66.40	82.26	-188.27	205.46	204.34	1.12	183.695	
600.00	600.00	589.13	589.11	0.72	0.58	-66.39	82.63	-189.09	206.37	205.07	1.31	158.079	
700.00	700.00	688.68	688.65	0.85	0.64	-66.49	82.86	-190.44	207.70	206.21	1.49	139.261	
800.00	800.00	788.44	788.40	0.99	0.71	-66.59	83.11	-191.94	209.18	207.49	1.69	123.456	
900.00	900.00	889.41	889.36	1.12	0.79	-66.73	83.18	-193.37	210.51	208.61	1.90	110.532	
1,000.00	1,000.00	990.53	990.47	1.25	0.86	-66.91	82.86	-194.39	211.31	209.20	2.11	100.328	
1,100.00	1,100.00	1,090.79	1,090.73	1.38	0.92	-67.11	82.38	-195.08	211.77	209.46	2.31	91.869	
1,200.00	1,200.00	1,191.03	1,190.97	1.51	1.00	-67.31	81.83	-195.70	212.12	209.61	2.51	84.552	
1,300.00	1,300.00	1,291.16	1,291.09	1.64	1.07	-67.49	81.30	-196.21	212.39	209.67	2.72	78.096	
1,400.00	1,400.00	1,391.32	1,391.25	1.78	1.16	-67.64	80.88	-196.61	212.59	209.65	2.94	72.333	
1,500.00	1,500.00	1,491.64	1,491.57	1.91	1.25	-67.75	80.52	-196.85	212.68	209.53	3.16	67.361	
1,600.00	1,600.00	1,591.93	1,591.86	2.04	1.32	-67.86	80.13	-196.96	212.63	209.27	3.36	63.204	
1,700.00	1,700.00	1,694.39	1,694.31	2.17	1.38	-67.99	79.45	-196.50	211.97	208.42	3.55	59.737	
1,800.00	1,800.00	1,796.62	1,796.52	2.30	1.40	-67.97	78.81	-194.76	210.16	206.45	3.70	56.723	
1,900.00	1,900.00	1,898.75	1,898.60	2.44	1.42	-67.57	79.06	-191.50	207.29	203.44	3.86	53.738	
2,000.00	2,000.00	2,000.00	1,999.74	2.57	1.45	-66.78	80.14	-186.77	203.41	199.39	4.02	50.610	
2,100.00	2,100.00	2,099.00	2,098.61	2.70	1.49	-65.90	81.40	-181.96	199.46	195.27	4.19	47.599	
2,200.00	2,200.00	2,197.20	2,196.73	2.83	1.54	-65.21	82.32	-178.24	196.40	192.03	4.37	44.931	
2,300.00	2,300.00	2,294.25	2,293.75	2.96	1.60	-64.68	83.18	-175.84	194.53	189.97	4.56	42.668	
2,400.00	2,400.00	2,392.46	2,391.95	3.09	1.66	-64.35	83.94	-174.80	193.91	189.15	4.76	40.778	
2,500.00	2,500.00	2,492.52	2,492.01	3.23	1.73	-64.28	84.07	-174.55	193.75	188.79	4.96	39.085	
2,589.50	2,589.50	2,581.61	2,581.10	3.34	1.79	-64.32	83.92	-174.51	193.64	188.50	5.14	37.686	
2,600.00	2,600.00	2,592.06	2,591.55	3.36	1.80	-64.32	83.92	-174.51	193.64	188.48	5.16	37.531	
2,700.00	2,700.00	2,691.94	2,691.43	3.49	1.87	-64.33	83.92	-174.58	193.71	188.34	5.36	36.129	
2,800.00	2,800.00	2,791.90	2,791.39	3.62	1.95	-64.35	83.89	-174.71	193.80	188.23	5.57	34.787	
2,900.00	2,900.00	2,891.87	2,891.36	3.75	2.03	-64.41	83.75	-174.91	193.92	188.14	5.79	33.513	
3,000.00	3,000.00	2,992.24	2,991.73	3.89	2.12	-64.55	83.34	-175.14	193.96	187.95	6.00	32.300	
3,100.00	3,100.00	3,092.45	3,091.93	4.02	2.21	-64.73	82.74	-175.29	193.84	187.61	6.22	31.142	
3,200.00	3,200.00	3,192.59	3,192.07	4.15	2.30	-64.89	82.17	-175.32	193.63	187.18	6.45	30.042	
3,300.00	3,300.00	3,292.30	3,291.79	4.28	2.39	-65.03	81.66	-175.37	193.45	186.78	6.67	29.002	
3,361.50	3,361.50	3,353.62	3,353.10	4.36	2.45	-65.12	81.37	-175.47	193.42	186.61	6.81	28.394 CC	
3,400.00	3,400.00	3,392.00	3,391.49	4.41	2.49	-65.18	81.21	-175.56	193.43	186.53	6.90	28.029	
3,500.00	3,500.00	3,491.35	3,490.83	4.55	2.59	-65.30	80.93	-175.93	193.65	186.52	7.13	27.158 ES	
3,600.00	3,600.00	3,590.97	3,590.45	4.68	2.67	-65.35	80.98	-176.45	194.15	186.80	7.35	26.428	
3,700.00	3,700.00	3,690.64	3,690.12	4.81	2.74	-65.31	81.37	-177.02	194.83	187.28	7.55	25.803	
3,800.00	3,800.00	3,790.37	3,789.84	4.94	2.81	-65.23	81.97	-177.65	195.66	187.91	7.75	25.240	
3,900.00	3,900.00	3,890.33	3,889.80	5.07	2.88	-65.12	82.71	-178.32	196.57	188.62	7.95	24.711	
4,000.00	4,000.00	3,990.31	3,989.78	5.20	2.96	-65.01	83.44	-178.99	197.49	189.33	8.16	24.196	
4,100.00	4,100.00	4,090.16	4,089.62	5.34	3.04	-64.91	84.15	-179.72	198.45	190.07	8.38	23.695	
4,200.00	4,200.00	4,189.91	4,189.36	5.47	3.13	-64.84	84.82	-180.57	199.51	190.91	8.59	23.213	
4,300.00	4,300.00	4,289.77	4,289.22	5.60	3.22	-64.79	85.47	-181.54	200.67	191.85	8.82	22.753	
4,400.00	4,400.00	4,389.53	4,388.97	5.73	3.32	-64.74	86.15	-182.59	201.91	192.86	9.05	22.317	
4,500.00	4,500.00	4,489.55	4,488.98	5.86	3.42	-64.70	86.83	-183.71	203.21	193.94	9.28	21.901	
4,600.00	4,600.00	4,589.73	4,589.15	6.00	3.52	-64.68	87.44	-184.81	204.46	194.95	9.51	21.493	
4,700.00	4,700.00	4,689.40	4,688.81	6.13	3.62	-64.65	88.09	-185.89	205.72	195.98	9.75	21.105	
4,800.00	4,800.00	4,789.02	4,788.42	6.26	3.72	-64.56	89.00	-187.05	207.17	197.19	9.98	20.756	

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandrill Freedom)
MD Reference: RKB @ 3635.40ft (Scandrill Freedom)
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. 17, T 19S., R 32 E - Lusk Deep Unit A #22 - Wellbore #1 - Wellbore #1													Offset Site Error: 0.00 ft
Survey Program: 100-Keeper, 8716-MWVD													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
4,900.00	4,900.00	4,888.38	4,887.76	6.39	3.82	-64.43	90.12	-188.37	208.85	198.63	10.21	20.446	
5,000.00	5,000.00	4,987.82	4,987.19	6.52	3.93	-64.33	91.30	-189.97	210.82	200.37	10.45	20.171	
5,100.00	5,100.00	5,087.51	5,086.85	6.65	4.04	-64.22	92.62	-191.73	212.99	202.30	10.69	19.924	
5,200.00	5,200.00	5,187.30	5,186.61	6.79	4.14	-64.03	94.25	-193.46	215.26	204.33	10.93	19.700	
5,300.00	5,300.00	5,286.21	5,285.49	6.92	4.24	-63.79	96.17	-195.32	217.79	206.63	11.16	19.510	
5,400.00	5,400.00	5,385.06	5,384.29	7.05	4.35	-63.54	98.34	-197.62	220.86	209.46	11.40	19.371	
5,500.00	5,500.00	5,484.45	5,483.62	7.18	4.46	-63.30	100.73	-200.26	224.31	212.67	11.64	19.268	
5,600.00	5,600.00	5,584.05	5,583.15	7.31	4.57	-63.03	103.30	-203.02	227.95	216.06	11.88	19.183	
5,700.00	5,700.00	5,683.41	5,684.43	7.45	4.68	-62.70	106.10	-205.53	231.41	219.29	12.12	19.087	
5,800.00	5,800.00	5,787.27	5,786.23	7.58	4.78	-62.23	109.04	-207.09	234.11	221.75	12.36	18.944	
5,900.00	5,900.00	5,886.42	5,885.34	7.71	4.88	-61.78	111.78	-208.33	236.51	223.92	12.59	18.786	
6,000.00	6,000.00	5,985.84	5,984.72	7.84	4.99	-61.50	114.13	-210.20	239.29	226.46	12.83	18.650	
6,100.00	6,100.00	6,085.92	6,084.75	7.97	5.10	-61.34	116.09	-212.40	242.15	229.08	13.08	18.517	
6,200.00	6,200.00	6,186.24	6,185.03	8.10	5.22	-61.21	117.91	-214.56	244.91	231.59	13.33	18.378	
6,300.00	6,300.00	6,286.42	6,285.18	8.24	5.34	-61.09	119.62	-216.63	247.55	233.97	13.58	18.234	
6,400.00	6,400.00	6,386.66	6,385.38	8.37	5.46	-60.97	121.32	-218.60	250.09	236.26	13.83	18.089	
6,500.00	6,500.00	6,486.52	6,485.21	8.50	5.58	-60.86	122.96	-220.55	252.59	238.51	14.08	17.944	
6,600.00	6,600.00	6,586.54	6,585.20	8.63	5.70	-60.79	124.46	-222.60	255.11	240.78	14.33	17.805	
6,700.00	6,700.00	6,686.78	6,685.40	8.76	5.82	-60.75	125.80	-224.68	257.57	242.99	14.58	17.665	
6,800.00	6,800.00	6,787.30	6,785.90	8.90	5.94	-60.75	126.94	-226.69	259.88	245.04	14.84	17.517	
6,900.00	6,900.00	6,886.50	6,885.07	9.03	6.06	-60.79	127.90	-228.78	262.19	247.10	15.09	17.376	
7,000.00	7,000.00	6,985.55	6,984.09	9.16	6.18	-60.89	128.78	-231.31	264.85	249.51	15.34	17.263	
7,100.00	7,100.00	7,084.33	7,082.82	9.29	6.30	-61.08	129.50	-234.35	267.90	252.31	15.59	17.180	
7,200.00	7,200.00	7,183.21	7,181.63	9.42	6.42	-61.36	130.00	-238.00	271.38	255.53	15.84	17.129	
7,300.00	7,300.00	7,283.17	7,281.50	9.56	6.54	-61.78	130.01	-242.21	275.08	258.99	16.09	17.095	
7,400.00	7,400.00	7,383.92	7,382.14	9.69	6.65	-62.39	129.07	-246.75	278.63	262.30	16.33	17.058	
7,500.00	7,500.00	7,482.92	7,481.02	9.82	6.75	-63.12	127.47	-251.49	282.15	265.58	16.57	17.026	
7,600.00	7,600.00	7,581.61	7,579.56	9.95	6.86	-63.88	125.86	-256.68	286.13	269.32	16.81	17.022	
7,700.00	7,700.00	7,680.83	7,678.61	10.08	6.97	-64.63	124.34	-262.21	290.49	273.44	17.05	17.038	
7,800.00	7,800.00	7,780.09	7,777.71	10.21	7.08	-65.32	123.06	-267.83	295.08	277.79	17.29	17.064	
7,900.00	7,900.00	7,883.61	7,881.06	10.35	7.19	-66.02	121.60	-273.32	299.34	281.80	17.54	17.068	
8,000.00	8,000.00	7,987.84	7,985.19	10.48	7.30	-66.72	119.39	-277.49	302.15	284.37	17.77	16.999	
8,100.00	8,100.00	8,087.27	8,084.58	10.61	7.40	-67.06	118.57	-280.13	304.27	286.26	18.01	16.893	
8,200.00	8,200.00	8,194.88	8,192.17	10.74	7.48	-66.89	119.94	-280.99	305.52	287.29	18.22	16.764	
8,300.00	8,300.00	8,296.10	8,293.38	10.87	7.51	-66.67	120.84	-280.12	305.07	286.69	18.38	16.596	
8,400.00	8,400.00	8,397.15	8,394.42	11.01	7.53	-66.37	121.97	-278.80	304.32	285.79	18.53	16.419	
8,499.99	8,499.99	8,494.34	8,491.59	11.14	7.56	-66.03	123.42	-277.64	303.84	285.14	18.70	16.247	
8,500.00	8,500.00	8,494.35	8,491.60	11.14	7.56	-66.03	123.42	-277.64	303.84	285.14	18.70	16.247	
8,600.00	8,600.00	8,591.44	8,588.66	11.27	7.63	-65.69	125.27	-277.33	304.32	285.42	18.90	16.101	
8,700.00	8,700.00	8,691.26	8,688.47	11.40	7.65	-65.46	126.82	-277.76	305.36	286.30	19.06	16.025	
8,800.00	8,800.00	8,812.04	8,808.72	11.53	7.67	-66.99	118.57	-279.21	303.83	284.63	19.20	15.824	
8,842.54	8,842.54	8,876.91	8,871.31	11.59	7.69	-70.03	101.78	-280.07	300.30	281.02	19.28	15.575	
8,850.00	8,850.00	8,891.35	8,884.86	11.60	7.70	-89.42	96.79	-279.89	299.30	279.99	19.30	15.506	
8,875.00	8,874.98	8,928.36	8,918.73	11.62	7.74	-92.87	81.95	-278.69	295.18	275.82	19.35	15.252	
8,900.00	8,899.86	8,954.74	8,942.25	11.62	7.77	-96.04	70.06	-277.44	290.89	271.51	19.39	15.004	
8,925.00	8,924.59	8,977.21	8,961.92	11.62	7.80	-99.12	59.29	-276.32	287.14	267.71	19.42	14.783	
8,950.00	8,949.10	8,996.83	8,978.76	11.63	7.83	-102.06	49.25	-275.41	284.31	264.85	19.46	14.609	
8,975.00	8,973.31	9,013.95	8,993.13	11.63	7.86	-104.75	39.97	-274.70	282.77	263.27	19.50	14.499	
8,986.64	8,984.46	9,021.15	8,999.07	11.64	7.87	-105.89	35.92	-274.43	282.59	263.06	19.52	14.476	
9,000.00	8,997.16	9,028.83	9,005.34	11.64	7.89	-107.10	31.49	-274.17	282.84	263.30	19.54	14.473 SF	
9,025.00	9,020.59	9,042.85	9,016.58	11.65	7.92	-109.23	23.12	-273.71	284.75	265.16	19.59	14.536	
9,050.00	9,043.53	9,054.80	9,025.92	11.67	7.96	-110.90	15.67	-273.32	288.64	269.01	19.63	14.701	

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandrill Freedom)
MD Reference: RKB @ 3635.40ft (Scandrill Freedom)
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. 17, T 19S., R 32 E - Lusk Deep Unit A #22 - Wellbore #1 - Wellbore #1												Offset Site Error:	0.00 ft
Survey Program: 100-Keeper, 8716-MWVD												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)	Minimum Separation (ft)	Separation Factor	
9,075.00	9,065.92	9,064.58	9,033.39	11.68	7.98	-111.99	9.38	-272.98	294.65	274.97	19.68	14.975	
9,100.00	9,087.70	9,073.19	9,039.84	11.70	8.01	-112.66	3.68	-272.67	302.77	283.04	19.72	15.351	
9,125.00	9,108.81	9,079.84	9,044.73	11.72	8.03	-112.71	-0.81	-272.40	312.94	293.17	19.77	15.833	
9,150.00	9,129.19	9,084.78	9,048.32	11.74	8.05	-112.16	-4.20	-272.19	325.04	305.24	19.80	16.413	
9,175.00	9,148.78	9,088.23	9,050.81	11.76	8.06	-111.00	-6.59	-272.04	338.90	319.05	19.84	17.082	
9,200.00	9,167.53	9,090.39	9,052.35	11.78	8.07	-109.24	-8.10	-271.94	354.32	334.45	19.87	17.829	
9,225.00	9,185.39	9,095.00	9,055.62	11.81	8.09	-107.65	-11.34	-271.72	371.12	351.20	19.92	18.633	
9,250.00	9,202.31	9,095.00	9,055.62	11.84	8.09	-104.68	-11.34	-271.72	389.03	369.08	19.95	19.502	
9,275.00	9,218.25	9,095.00	9,055.62	11.87	8.09	-101.32	-11.34	-271.72	407.91	387.93	19.98	20.415	
9,300.00	9,233.15	9,088.98	9,051.35	11.90	8.07	-96.23	-7.12	-272.01	427.50	407.51	20.00	21.380	
9,325.00	9,246.99	9,086.68	9,049.69	11.94	8.06	-91.61	-5.51	-272.11	447.74	427.71	20.02	22.360	
9,350.00	9,259.72	9,083.75	9,047.58	11.98	8.05	-86.57	-3.49	-272.24	468.43	448.38	20.05	23.359	
9,375.00	9,271.30	9,080.28	9,045.06	12.02	8.04	-81.24	-1.11	-272.38	489.45	469.36	20.08	24.371	
9,400.00	9,281.71	9,076.31	9,042.15	12.06	8.02	-75.78	1.58	-272.55	510.68	490.56	20.11	25.390	
9,425.00	9,290.91	9,071.89	9,038.87	12.11	8.01	-70.33	4.55	-272.72	532.01	511.87	20.15	26.408	
9,450.00	9,298.88	9,064.00	9,032.95	12.16	7.98	-64.61	9.75	-273.00	553.38	533.21	20.17	27.434	
9,475.00	9,305.61	9,064.00	9,032.95	12.22	7.98	-60.29	9.75	-273.00	574.67	554.44	20.23	28.409	
9,500.00	9,311.06	9,064.00	9,032.95	12.28	7.98	-56.18	9.75	-273.00	595.91	575.62	20.29	29.366	
9,525.00	9,315.23	9,051.70	9,023.51	12.36	7.95	-51.23	17.64	-273.42	616.80	596.47	20.34	30.332	
9,550.00	9,318.11	9,046.11	9,019.15	12.45	7.93	-47.41	21.11	-273.60	637.53	617.12	20.41	31.238	
9,575.00	9,319.68	9,032.00	9,007.91	12.56	7.89	-43.48	29.63	-274.06	658.07	637.60	20.48	32.138	
9,593.79	9,320.00	9,032.00	9,007.91	12.66	7.89	-41.45	29.63	-274.06	673.10	652.53	20.57	32.723	
9,600.00	9,319.98	9,032.00	9,007.91	12.69	7.89	-41.57	29.63	-274.06	678.06	657.46	20.60	32.912	
9,700.00	9,319.72	9,011.56	8,991.14	13.40	7.85	-42.52	41.30	-274.79	759.02	737.76	21.26	35.706	
9,800.00	9,319.46	8,990.79	8,973.61	14.50	7.82	-43.50	52.41	-275.68	841.52	819.21	22.32	37.708	
9,900.00	9,319.19	8,969.00	8,954.78	15.84	7.78	-44.45	63.30	-276.73	925.19	901.56	23.63	39.158	
10,000.00	9,318.93	8,949.27	8,937.41	17.31	7.76	-45.54	72.60	-277.71	1,009.65	984.58	25.07	40.269	
10,100.00	9,318.66	8,937.00	8,926.48	18.85	7.74	-47.08	78.16	-278.30	1,094.70	1,068.11	26.59	41.163	
10,200.00	9,318.39	8,906.00	8,898.40	20.43	7.71	-47.51	91.23	-279.52	1,180.13	1,151.99	28.14	41.938	
10,300.00	9,318.13	8,906.00	8,898.40	22.03	7.71	-49.73	91.23	-279.52	1,265.99	1,236.25	29.74	42.567	
10,400.00	9,317.86	8,888.56	8,882.25	23.65	7.70	-50.88	97.80	-279.94	1,352.13	1,320.78	31.35	43.136	
10,500.00	9,317.59	8,874.00	8,868.56	25.27	7.69	-52.16	102.73	-280.08	1,438.62	1,405.66	32.96	43.641	
10,531.97	9,317.51	8,874.00	8,868.56	25.80	7.69	-52.83	102.73	-280.08	1,466.27	1,432.78	33.49	43.785	
10,600.00	9,317.33	8,874.00	8,868.56	26.90	7.69	-52.83	102.73	-280.08	1,525.52	1,490.93	34.59	44.107	
10,700.00	9,317.07	8,874.00	8,868.56	28.51	7.69	-52.83	102.73	-280.08	1,613.87	1,577.68	36.20	44.585	
10,800.00	9,316.80	8,855.19	8,850.62	30.14	7.68	-51.73	108.40	-280.02	1,703.09	1,665.27	37.83	45.024	
10,900.00	9,316.54	8,842.00	8,837.92	31.80	7.68	-50.96	111.93	-279.82	1,793.53	1,754.05	39.48	45.428	
11,000.00	9,316.27	8,842.00	8,837.92	33.48	7.68	-50.96	111.93	-279.82	1,884.75	1,843.59	41.16	45.791	
11,100.00	9,316.01	8,842.00	8,837.92	35.18	7.68	-50.96	111.93	-279.82	1,976.81	1,933.96	42.86	46.128	
11,200.00	9,315.74	8,842.00	8,837.92	36.89	7.68	-50.96	111.93	-279.82	2,069.62	2,025.05	44.56	46.441	
11,300.00	9,315.48	8,828.83	8,825.13	38.61	7.67	-50.20	115.09	-279.55	2,162.83	2,116.55	46.28	46.732	
11,400.00	9,315.21	8,824.95	8,821.35	40.34	7.67	-49.98	115.95	-279.47	2,256.69	2,208.68	48.01	47.003	
11,500.00	9,314.95	8,811.00	8,807.69	42.08	7.67	-49.19	118.77	-279.19	2,351.15	2,301.41	49.75	47.261	
11,600.00	9,314.69	8,811.00	8,807.69	43.83	7.67	-49.19	118.77	-279.19	2,445.83	2,394.33	51.50	47.495	
11,700.00	9,314.42	8,811.00	8,807.69	45.58	7.67	-49.19	118.77	-279.19	2,540.91	2,487.65	53.25	47.715	
11,800.00	9,314.16	8,811.00	8,807.69	47.34	7.67	-49.19	118.77	-279.19	2,636.35	2,581.34	55.01	47.923	
11,900.00	9,313.89	8,811.00	8,807.69	49.11	7.67	-49.19	118.77	-279.19	2,732.12	2,675.34	56.78	48.118	
12,000.00	9,313.63	8,811.00	8,807.69	50.88	7.67	-49.19	118.77	-279.19	2,828.18	2,769.63	58.55	48.303	
12,100.00	9,313.36	8,811.00	8,807.69	52.66	7.67	-49.19	118.77	-279.19	2,924.51	2,864.18	60.33	48.478	
12,200.00	9,313.10	8,811.00	8,807.69	54.44	7.67	-49.19	118.77	-279.19	3,021.08	2,958.97	62.11	48.644	
12,300.00	9,312.83	8,811.00	8,807.69	56.22	7.67	-49.19	118.77	-279.19	3,117.86	3,053.97	63.89	48.801	
12,400.00	9,312.57	8,811.00	8,807.69	58.01	7.67	-49.19	118.77	-279.19	3,214.84	3,149.16	65.68	48.950	

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandrill Freedom)
MD Reference: RKB @ 3635.40ft (Scandrill Freedom)
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. 17, T 19S., R 32 E - Lusk Deep Unit A #22 - Wellbore #1 - Wellbore #1												Offset Site Error:	0.00 ft
Survey Program: 100-Keeper, 8716-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
12,500.00	9,312.31	8,795.79	8,792.71	59.80	7.67	-48.35	121.36	-278.91	3,311.71	3,244.24	67.46	49.089	
12,600.00	9,312.04	8,793.96	8,790.90	61.59	7.67	-48.25	121.64	-278.87	3,408.96	3,339.70	69.25	49.223	
12,700.00	9,311.78	8,779.00	8,776.08	63.38	7.66	-47.44	123.63	-278.64	3,506.57	3,435.52	71.05	49.355	
12,800.00	9,311.51	8,779.00	8,776.08	65.18	7.66	-47.44	123.63	-278.64	3,604.05	3,531.21	72.84	49.476	
12,900.00	9,311.25	8,779.00	8,776.08	66.98	7.66	-47.44	123.63	-278.64	3,701.67	3,627.02	74.64	49.592	
13,000.00	9,310.98	8,779.00	8,776.08	68.78	7.66	-47.44	123.63	-278.64	3,799.40	3,722.96	76.44	49.702	
13,100.00	9,310.72	8,779.00	8,776.08	70.58	7.66	-47.44	123.63	-278.64	3,897.26	3,819.01	78.25	49.808	
13,200.00	9,310.45	8,779.00	8,776.08	72.39	7.66	-47.44	123.63	-278.64	3,995.22	3,915.17	80.05	49.909	
13,300.00	9,310.19	8,779.00	8,776.08	74.19	7.66	-47.44	123.63	-278.64	4,093.28	4,011.42	81.86	50.006	
13,400.00	9,309.93	8,779.00	8,776.08	76.00	7.66	-47.44	123.63	-278.64	4,191.43	4,107.77	83.66	50.099	
13,500.00	9,309.66	8,779.00	8,776.08	77.81	7.66	-47.44	123.63	-278.64	4,289.67	4,204.19	85.47	50.189	
13,600.00	9,309.40	8,779.00	8,776.08	79.62	7.66	-47.44	123.63	-278.64	4,387.98	4,300.70	87.28	50.275	
13,700.00	9,309.13	8,779.00	8,776.08	81.43	7.66	-47.44	123.63	-278.64	4,486.37	4,397.28	89.09	50.358	
13,800.00	9,308.87	8,779.00	8,776.08	83.24	7.66	-47.44	123.63	-278.64	4,584.83	4,493.93	90.90	50.437	
13,900.00	9,308.60	8,779.00	8,776.08	85.05	7.66	-47.44	123.63	-278.64	4,683.36	4,590.64	92.71	50.514	
14,000.00	9,308.34	8,779.00	8,776.08	86.86	7.66	-47.44	123.63	-278.64	4,781.94	4,687.42	94.53	50.588	
14,100.00	9,308.07	8,779.00	8,776.08	88.68	7.66	-47.44	123.63	-278.64	4,880.59	4,784.25	96.34	50.659	
14,200.00	9,307.81	8,779.00	8,776.08	90.49	7.66	-47.44	123.63	-278.64	4,979.28	4,881.13	98.16	50.728	
14,300.00	9,307.55	8,779.00	8,776.08	92.31	7.66	-47.44	123.63	-278.64	5,078.03	4,978.06	99.97	50.794	
14,400.00	9,307.28	8,779.00	8,776.08	94.13	7.66	-47.44	123.63	-278.64	5,176.83	5,075.04	101.79	50.859	
14,500.00	9,307.02	8,779.00	8,776.08	95.94	7.66	-47.44	123.63	-278.64	5,275.67	5,172.07	103.61	50.921	
14,600.00	9,306.75	8,779.00	8,776.08	97.76	7.66	-47.44	123.63	-278.64	5,374.56	5,269.13	105.42	50.981	
14,700.00	9,306.49	8,779.00	8,776.08	99.58	7.66	-47.44	123.63	-278.64	5,473.48	5,366.24	107.24	51.039	
14,800.00	9,306.22	8,779.00	8,776.08	101.40	7.66	-47.44	123.63	-278.64	5,572.45	5,463.39	109.06	51.095	
14,900.00	9,305.96	8,779.00	8,776.08	103.22	7.66	-47.44	123.63	-278.64	5,671.45	5,560.57	110.88	51.149	
15,000.00	9,305.70	8,779.00	8,776.08	105.04	7.66	-47.44	123.63	-278.64	5,770.48	5,657.78	112.70	51.202	
15,100.00	9,305.43	8,779.00	8,776.08	106.86	7.66	-47.44	123.63	-278.64	5,869.55	5,755.03	114.52	51.253	
15,200.00	9,305.17	8,779.00	8,776.08	108.68	7.66	-47.44	123.63	-278.64	5,968.65	5,852.31	116.34	51.303	
15,300.00	9,304.90	8,779.00	8,776.08	110.50	7.66	-47.44	123.63	-278.64	6,067.78	5,949.61	118.16	51.351	
15,400.00	9,304.64	8,763.60	8,760.76	112.32	7.66	-46.62	125.19	-278.43	6,166.68	6,046.69	119.98	51.396	
15,500.00	9,304.37	8,762.95	8,760.11	114.14	7.66	-46.59	125.25	-278.42	6,265.84	6,144.03	121.81	51.441	
15,600.00	9,304.11	8,762.33	8,759.49	115.97	7.66	-46.55	125.30	-278.41	6,365.02	6,241.40	123.63	51.485	
15,700.00	9,303.84	8,747.00	8,744.20	117.79	7.66	-45.76	126.34	-278.23	6,464.47	6,339.02	125.45	51.531	
15,800.00	9,303.58	8,747.00	8,744.20	119.61	7.66	-45.76	126.34	-278.23	6,563.69	6,436.41	127.27	51.572	
15,900.00	9,303.32	8,747.00	8,744.20	121.44	7.66	-45.76	126.34	-278.23	6,662.92	6,533.83	129.10	51.612	
16,000.00	9,303.05	8,747.00	8,744.20	123.26	7.66	-45.76	126.34	-278.23	6,762.18	6,631.27	130.92	51.651	
16,100.00	9,302.79	8,747.00	8,744.20	125.08	7.66	-45.76	126.34	-278.23	6,861.47	6,728.72	132.74	51.690	
16,200.00	9,302.52	8,747.00	8,744.20	126.91	7.66	-45.76	126.34	-278.23	6,960.77	6,826.20	134.57	51.727	
16,300.00	9,302.26	8,747.00	8,744.20	128.73	7.66	-45.76	126.34	-278.23	7,060.09	6,923.70	136.39	51.763	
16,400.00	9,301.99	8,747.00	8,744.20	130.56	7.66	-45.76	126.34	-278.23	7,159.43	7,021.22	138.22	51.798	
16,500.00	9,301.73	8,747.00	8,744.20	132.38	7.66	-45.76	126.34	-278.23	7,258.79	7,118.75	140.04	51.833	
16,600.00	9,301.46	8,747.00	8,744.20	134.21	7.66	-45.76	126.34	-278.23	7,358.17	7,216.30	141.87	51.866	
16,700.00	9,301.20	8,747.00	8,744.20	136.03	7.66	-45.76	126.34	-278.23	7,457.57	7,313.87	143.69	51.899	
16,800.00	9,300.94	8,747.00	8,744.20	137.86	7.66	-45.76	126.34	-278.23	7,556.98	7,411.46	145.52	51.931	
16,900.00	9,300.67	8,747.00	8,744.20	139.68	7.66	-45.76	126.34	-278.23	7,656.40	7,509.05	147.35	51.962	
17,000.00	9,300.41	8,747.00	8,744.20	141.51	7.66	-45.76	126.34	-278.23	7,755.84	7,606.67	149.17	51.993	
17,100.00	9,300.14	8,747.00	8,744.20	143.34	7.66	-45.76	126.34	-278.23	7,855.29	7,704.30	151.00	52.022	
17,153.74	9,300.00	8,747.00	8,744.20	144.32	7.66	-45.76	126.34	-278.23	7,908.74	7,756.76	151.98	52.038	

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandrill Freedom)
MD Reference: RKB @ 3635.40ft (Scandrill Freedom)
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. 17, T 19S., R 32 E - TBM Fed 1 (Offset Well) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-Keper													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.66	0.66	0.00	0.00	-0.13	4,788.71	-10.50	4,788.72					
100.00	100.00	110.71	110.71	0.07	0.10	-0.12	4,788.59	-10.32	4,788.61	4,788.44	0.17	N/A		
200.00	200.00	217.14	217.14	0.20	0.21	-0.12	4,788.30	-10.29	4,788.34	4,787.94	0.40	N/A		
300.00	300.00	329.99	329.99	0.33	0.33	-0.13	4,787.75	-10.65	4,787.86	4,787.20	0.66	7,298.481		
400.00	400.00	439.61	439.60	0.46	0.46	-0.13	4,786.96	-11.24	4,787.14	4,786.22	0.92	5,219.939		
500.00	500.00	552.85	552.83	0.59	0.60	-0.14	4,785.91	-12.08	4,786.21	4,785.03	1.19	4,023.993		
600.00	600.00	662.44	662.42	0.72	0.74	-0.15	4,784.56	-12.86	4,784.98	4,783.52	1.46	3,273.608		
700.00	700.00	768.11	768.07	0.85	0.88	-0.16	4,783.14	-13.68	4,783.64	4,781.91	1.73	2,764.599		
800.00	800.00	871.95	871.89	0.99	1.01	-0.17	4,781.62	-14.56	4,782.18	4,780.18	2.00	2,394.790		
900.00	900.00	972.49	972.42	1.12	1.14	-0.19	4,780.11	-15.50	4,780.68	4,778.42	2.26	2,116.482		
1,000.00	1,000.00	1,064.65	1,064.57	1.25	1.26	-0.20	4,778.78	-16.43	4,779.23	4,776.72	2.51	1,904.111		
1,100.00	1,100.00	1,149.28	1,149.19	1.38	1.37	-0.20	4,777.76	-16.96	4,778.04	4,775.29	2.75	1,736.402		
1,200.00	1,200.00	1,236.20	1,236.10	1.51	1.48	-0.21	4,777.03	-17.46	4,777.19	4,774.20	3.00	1,594.268		
1,300.00	1,300.00	1,324.24	1,324.14	1.64	1.61	-0.22	4,776.33	-17.96	4,776.49	4,773.23	3.26	1,467.011		
1,400.00	1,400.00	1,414.78	1,414.68	1.78	1.74	-0.22	4,775.61	-18.41	4,775.76	4,772.24	3.52	1,357.072		
1,500.00	1,500.00	1,527.50	1,527.40	1.91	1.86	-0.22	4,774.99	-18.70	4,775.10	4,771.33	3.77	1,265.825		
1,600.00	1,600.00	1,615.02	1,614.91	2.04	1.98	-0.23	4,774.63	-18.84	4,774.69	4,770.67	4.02	1,188.093		
1,700.00	1,700.00	1,717.33	1,717.23	2.17	2.11	-0.23	4,774.29	-18.97	4,774.36	4,770.08	4.28	1,116.028		
1,800.00	1,800.00	1,814.73	1,814.62	2.30	2.19	-0.22	4,773.97	-18.73	4,774.03	4,769.54	4.49	1,062.780		
1,900.00	1,900.00	1,906.48	1,906.37	2.44	2.22	-0.22	4,773.79	-18.20	4,773.83	4,769.17	4.66	1,024.464		
1,999.06	1,999.06	2,000.00	1,999.89	2.57	2.25	-0.21	4,773.72	-17.58	4,773.75	4,768.94	4.81	992.185		
2,000.00	2,000.00	2,000.00	1,999.89	2.57	2.25	-0.21	4,773.72	-17.58	4,773.75	4,768.94	4.81	991.929		
2,100.00	2,100.00	2,080.42	2,080.30	2.70	2.25	-0.20	4,773.88	-16.97	4,773.95	4,769.01	4.95	965.384		
2,200.00	2,200.00	2,177.68	2,177.56	2.83	2.24	-0.19	4,774.37	-15.94	4,774.46	4,769.38	5.07	940.940		
2,300.00	2,300.00	2,267.29	2,267.16	2.96	2.25	-0.17	4,774.88	-14.58	4,775.02	4,769.81	5.21	916.715		
2,400.00	2,400.00	2,352.19	2,352.04	3.09	2.25	-0.16	4,775.61	-13.19	4,775.87	4,770.53	5.35	893.347		
2,500.00	2,500.00	2,442.92	2,442.74	3.23	2.26	-0.14	4,776.66	-11.29	4,777.02	4,771.54	5.49	870.622		
2,600.00	2,600.00	2,536.15	2,535.94	3.36	2.27	-0.11	4,777.82	-9.24	4,778.27	4,772.64	5.63	848.191		
2,700.00	2,700.00	2,623.99	2,623.75	3.49	2.29	-0.09	4,779.15	-7.21	4,779.77	4,773.99	5.78	826.538		
2,800.00	2,800.00	2,722.35	2,722.07	3.62	2.32	-0.06	4,780.77	-4.78	4,781.42	4,775.48	5.94	805.169		
2,900.00	2,900.00	2,833.24	2,832.93	3.75	2.34	-0.03	4,782.48	-2.90	4,782.96	4,776.86	6.10	784.420		
3,000.00	3,000.00	2,946.93	2,946.60	3.89	2.37	-0.02	4,783.92	-1.66	4,784.22	4,777.96	6.26	764.240		
3,100.00	3,100.00	3,056.01	3,055.67	4.02	2.41	-0.01	4,785.04	-0.60	4,785.25	4,778.82	6.43	744.255		
3,200.00	3,200.00	3,173.06	3,172.71	4.15	2.46	0.00	4,785.97	0.22	4,786.05	4,779.44	6.61	723.688		
3,300.00	3,300.00	3,274.49	3,274.15	4.28	2.52	0.01	4,786.49	0.91	4,786.57	4,779.77	6.80	703.959		
3,400.00	3,400.00	3,395.91	3,395.56	4.41	2.57	0.01	4,786.97	1.25	4,786.97	4,779.99	6.98	685.614		
3,500.00	3,500.00	3,512.07	3,511.72	4.55	2.63	0.01	4,786.85	1.09	4,786.87	4,779.69	7.17	667.433		
3,600.00	3,600.00	3,603.06	3,602.71	4.68	2.68	0.01	4,786.73	0.78	4,786.73	4,779.38	7.36	650.430		
3,700.00	3,700.00	3,718.64	3,718.29	4.81	2.77	0.01	4,786.47	0.50	4,786.50	4,778.92	7.58	631.773		
3,800.00	3,800.00	3,816.43	3,816.08	4.94	2.85	0.00	4,786.10	0.22	4,786.12	4,778.33	7.79	614.337		
3,890.18	3,890.18	3,891.66	3,891.31	5.06	2.90	0.00	4,785.97	-0.12	4,785.97	4,778.01	7.96	601.177		
3,900.00	3,900.00	3,900.00	3,899.65	5.07	2.91	0.00	4,785.97	-0.16	4,785.97	4,777.99	7.98	599.760		
4,000.00	4,000.00	4,007.58	4,007.22	5.20	2.98	-0.01	4,785.90	-0.60	4,785.91	4,777.72	8.18	584.926		
4,100.00	4,100.00	4,102.17	4,101.82	5.34	3.05	-0.01	4,785.83	-1.03	4,785.83	4,777.44	8.38	570.999		
4,200.00	4,200.00	4,205.24	4,204.89	5.47	3.13	-0.02	4,785.77	-1.25	4,785.77	4,777.18	8.60	556.802		
4,300.00	4,300.00	4,310.92	4,310.57	5.60	3.22	-0.02	4,785.57	-1.38	4,785.58	4,776.76	8.82	542.520		
4,332.13	4,332.13	4,336.19	4,335.83	5.64	3.24	-0.02	4,785.54	-1.45	4,785.54	4,776.66	8.88	538.924		
4,400.00	4,400.00	4,400.00	4,399.64	5.73	3.28	-0.02	4,785.61	-1.63	4,785.61	4,776.60	9.01	531.074		
4,500.00	4,500.00	4,482.49	4,482.13	5.86	3.31	-0.02	4,785.89	-1.87	4,785.93	4,776.76	9.17	521.637		
4,600.00	4,600.00	4,600.00	4,599.64	6.00	3.38	-0.03	4,786.15	-2.18	4,786.15	4,776.78	9.37	510.715		
4,700.00	4,700.00	4,697.93	4,697.57	6.13	3.45	-0.03	4,786.17	-2.59	4,786.17	4,776.60	9.58	499.785		
4,800.00	4,800.00	4,781.66	4,781.30	6.26	3.50	-0.04	4,786.36	-3.06	4,786.40	4,776.64	9.76	490.339		

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandrill Freedom)
MD Reference: RKB @ 3635.40ft (Scandrill Freedom)
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. 17, T 19S., R 32 E - TBM Fed 1 (Offset Well) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-Keeper													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		
4,900.00	4,900.00	4,886.64	4,886.27	6.39	3.57	-0.04	4,786.78	-3.70	4,786.80	4,776.84	9.96	480.606		
5,000.00	5,000.00	4,987.54	4,987.17	6.52	3.64	-0.06	4,787.06	-4.63	4,787.08	4,776.92	10.17	470.880		
5,100.00	5,100.00	5,077.74	5,077.37	6.65	3.71	-0.07	4,787.39	-5.62	4,787.45	4,777.09	10.37	461.814		
5,200.00	5,200.00	5,163.86	5,163.48	6.79	3.78	-0.08	4,787.93	-6.65	4,788.08	4,777.51	10.56	453.283		
5,300.00	5,300.00	5,260.88	5,260.48	6.92	3.85	-0.10	4,788.76	-8.10	4,788.93	4,778.17	10.77	444.694		
5,400.00	5,400.00	5,367.16	5,366.75	7.05	3.94	-0.12	4,789.58	-9.71	4,789.71	4,778.72	10.99	435.965		
5,500.00	5,500.00	5,475.92	5,475.49	7.18	4.03	-0.14	4,790.25	-11.56	4,790.33	4,779.12	11.21	427.234		
5,600.00	5,600.00	5,565.74	5,565.29	7.31	4.11	-0.16	4,790.77	-13.41	4,790.92	4,779.49	11.43	419.324		
5,700.00	5,700.00	5,661.84	5,661.36	7.45	4.20	-0.19	4,791.56	-15.63	4,791.74	4,780.10	11.64	411.485		
5,800.00	5,800.00	5,765.64	5,765.13	7.58	4.30	-0.21	4,792.36	-17.86	4,792.52	4,780.65	11.87	403.629		
5,900.00	5,900.00	5,866.19	5,865.65	7.71	4.39	-0.24	4,793.08	-20.25	4,793.25	4,781.14	12.10	396.068		
6,000.00	6,000.00	5,972.95	5,972.37	7.84	4.50	-0.28	4,793.79	-23.21	4,793.93	4,781.59	12.34	388.495		
6,100.00	6,100.00	6,068.89	6,068.27	7.97	4.60	-0.31	4,794.35	-25.82	4,794.53	4,781.96	12.57	381.469		
6,200.00	6,200.00	6,157.45	6,156.79	8.10	4.69	-0.34	4,795.03	-28.44	4,795.31	4,782.52	12.79	374.919		
6,300.00	6,300.00	6,262.81	6,262.10	8.24	4.79	-0.38	4,796.00	-31.51	4,796.26	4,783.23	13.03	368.096		
6,400.00	6,400.00	6,368.38	6,367.63	8.37	4.90	-0.41	4,796.72	-34.60	4,796.95	4,783.68	13.27	361.430		
6,500.00	6,500.00	6,457.86	6,457.06	8.50	5.00	-0.44	4,797.38	-37.24	4,797.72	4,784.22	13.50	355.432		
6,600.00	6,600.00	6,549.67	6,548.83	8.63	5.09	-0.48	4,798.30	-40.04	4,798.75	4,785.02	13.73	349.586		
6,700.00	6,700.00	6,649.32	6,648.42	8.76	5.20	-0.52	4,799.36	-43.21	4,799.84	4,785.87	13.96	343.715		
6,800.00	6,800.00	6,753.61	6,752.65	8.90	5.31	-0.56	4,800.43	-46.59	4,800.90	4,786.69	14.21	337.887		
6,900.00	6,900.00	6,855.50	6,854.49	9.03	5.42	-0.59	4,801.37	-49.83	4,801.85	4,787.40	14.45	332.276		
7,000.00	7,000.00	6,956.22	6,955.15	9.16	5.53	-0.63	4,802.31	-53.05	4,802.82	4,788.13	14.69	326.856		
7,100.00	7,100.00	7,060.44	7,059.31	9.29	5.65	-0.67	4,803.22	-56.25	4,803.73	4,788.79	14.94	321.502		
7,200.00	7,200.00	7,161.40	7,160.23	9.42	5.76	-0.71	4,804.03	-59.27	4,804.56	4,789.38	15.19	316.372		
7,300.00	7,300.00	7,267.57	7,266.35	9.56	5.88	-0.74	4,804.84	-62.37	4,805.37	4,789.93	15.44	311.263		
7,400.00	7,400.00	7,400.20	7,398.93	9.69	6.04	-0.79	4,805.35	-66.00	4,805.81	4,790.09	15.72	305.661		
7,500.00	7,500.00	7,504.19	7,502.88	9.82	6.16	-0.82	4,805.31	-68.70	4,805.80	4,789.82	15.98	300.811		
7,600.00	7,600.00	7,604.06	7,602.71	9.95	6.27	-0.85	4,805.23	-71.37	4,805.76	4,789.54	16.23	296.190		
7,700.00	7,700.00	7,724.42	7,723.02	10.08	6.42	-0.89	4,804.83	-74.93	4,805.47	4,788.97	16.50	291.263		
7,800.00	7,800.00	7,828.06	7,826.59	10.21	6.54	-0.94	4,804.24	-78.50	4,804.96	4,788.20	16.75	286.818		
7,900.00	7,900.00	7,927.93	7,926.40	10.35	6.66	-0.98	4,803.65	-82.19	4,804.42	4,787.42	17.00	282.572		
8,000.00	8,000.00	8,025.61	8,024.01	10.48	6.77	-1.03	4,803.06	-85.99	4,803.88	4,786.63	17.25	278.484		
8,100.00	8,100.00	8,117.42	8,115.74	10.61	6.88	-1.07	4,802.63	-89.67	4,803.49	4,786.00	17.49	274.623		
8,200.00	8,200.00	8,212.67	8,210.91	10.74	7.00	-1.12	4,802.29	-93.55	4,803.21	4,785.47	17.74	270.803		
8,263.73	8,263.73	8,266.14	8,264.33	10.83	7.06	-1.14	4,802.19	-95.74	4,803.14	4,785.26	17.88	268.557		
8,300.00	8,300.00	8,300.00	8,298.16	10.87	7.10	-1.16	4,802.18	-97.12	4,803.17	4,785.19	17.97	267.238		
8,400.00	8,400.00	8,408.05	8,406.13	11.01	7.23	-1.21	4,802.10	-101.42	4,803.18	4,784.94	18.24	263.403		
8,500.00	8,500.00	8,514.95	8,512.94	11.14	7.36	-1.26	4,801.79	-105.79	4,802.97	4,784.48	18.50	259.679		
8,600.00	8,600.00	8,610.14	8,608.04	11.27	7.47	-1.31	4,801.51	-110.02	4,802.77	4,784.03	18.74	256.249		
8,700.00	8,700.00	8,713.20	8,710.98	11.40	7.60	-1.37	4,801.20	-114.92	4,802.59	4,783.59	19.00	252.781		
8,800.00	8,800.00	8,818.61	8,816.24	11.53	7.73	-1.44	4,800.79	-120.37	4,802.32	4,783.07	19.26	249.363		
8,842.54	8,842.54	8,864.72	8,862.28	11.59	7.78	-1.47	4,800.56	-122.98	4,802.17	4,782.80	19.37	247.915		
8,850.00	8,850.00	8,872.80	8,870.35	11.60	7.79	-19.83	4,800.51	-123.46	4,802.09	4,782.70	19.39	247.663		
8,875.00	8,874.98	8,899.83	8,897.33	11.62	7.82	-19.90	4,800.35	-125.09	4,800.99	4,781.55	19.44	246.966		
8,900.00	8,899.86	8,918.30	8,915.76	11.62	7.85	-20.01	4,800.25	-126.23	4,798.69	4,779.22	19.46	246.533		
8,925.00	8,924.59	8,936.58	8,934.01	11.62	7.87	-20.18	4,800.18	-127.37	4,795.19	4,775.70	19.49	246.025		
8,950.00	8,949.10	8,954.68	8,952.06	11.63	7.89	-20.41	4,800.12	-128.51	4,790.52	4,771.00	19.52	245.441		
8,975.00	8,973.31	8,972.54	8,969.89	11.63	7.91	-20.69	4,800.09	-129.65	4,784.68	4,765.14	19.55	244.782		
9,000.00	8,997.16	9,000.00	8,997.30	11.64	7.95	-21.07	4,800.09	-131.42	4,777.71	4,758.12	19.59	243.901		
9,025.00	9,020.59	9,000.00	8,997.30	11.65	7.95	-21.44	4,800.09	-131.42	4,769.59	4,749.99	19.60	243.355		
9,050.00	9,043.53	9,000.00	8,997.30	11.67	7.95	-21.87	4,800.09	-131.42	4,760.43	4,740.82	19.61	242.733		
9,075.00	9,065.92	9,030.26	9,027.49	11.68	7.98	-22.47	4,800.20	-133.34	4,750.10	4,730.44	19.66	241.586		

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandril Freedom)
MD Reference: RKB @ 3635.40ft (Scandril Freedom)
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. 17, T 19S., R 32 E - TBM Fed 1 (Offset Well) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-Keeper													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		
9,100.00	9,087.70	9,042.19	9,039.40	11.70	8.00	-23.10	4,800.29	-134.06	4,738.79	4,719.09	19.69	240.637		
9,125.00	9,108.81	9,053.78	9,050.98	11.72	8.01	-23.83	4,800.40	-134.75	4,726.46	4,706.74	19.72	239.619		
9,150.00	9,129.19	9,065.01	9,062.18	11.74	8.02	-24.65	4,800.53	-135.41	4,713.16	4,693.40	19.76	238.536		
9,175.00	9,148.78	9,075.83	9,072.98	11.76	8.04	-25.58	4,800.67	-136.02	4,698.91	4,679.12	19.79	237.389		
9,200.00	9,167.53	9,100.00	9,097.11	11.78	8.06	-26.72	4,801.06	-137.35	4,683.79	4,663.94	19.85	235.987		
9,225.00	9,185.39	9,100.00	9,097.11	11.81	8.06	-27.87	4,801.06	-137.35	4,667.72	4,647.84	19.87	234.861		
9,250.00	9,202.31	9,100.00	9,097.11	11.84	8.06	-29.18	4,801.06	-137.35	4,650.86	4,630.96	19.90	233.673		
9,275.00	9,218.25	9,100.00	9,097.11	11.87	8.06	-30.67	4,801.06	-137.35	4,633.24	4,613.31	19.93	232.427		
9,300.00	9,233.15	9,125.93	9,123.01	11.90	8.09	-32.60	4,801.59	-138.66	4,614.79	4,594.80	20.00	230.791		
9,325.00	9,246.99	9,134.81	9,131.87	11.94	8.10	-34.65	4,801.79	-139.08	4,595.69	4,575.65	20.04	229.320		
9,350.00	9,259.72	9,143.02	9,140.08	11.98	8.11	-37.01	4,801.98	-139.45	4,575.94	4,555.85	20.09	227.804		
9,375.00	9,271.30	9,150.56	9,147.60	12.02	8.12	-39.71	4,802.17	-139.78	4,555.59	4,535.46	20.14	226.243		
9,400.00	9,281.71	9,157.39	9,154.42	12.06	8.13	-42.82	4,802.34	-140.06	4,534.70	4,514.52	20.19	224.637		
9,425.00	9,290.91	9,163.49	9,160.51	12.11	8.13	-46.39	4,802.50	-140.31	4,513.33	4,493.09	20.24	222.982		
9,450.00	9,298.88	9,168.83	9,165.85	12.16	8.14	-50.50	4,802.65	-140.52	4,491.52	4,471.22	20.30	221.271		
9,475.00	9,305.61	9,173.40	9,170.42	12.22	8.14	-55.20	4,802.78	-140.69	4,469.34	4,448.98	20.36	219.495		
9,500.00	9,311.06	9,177.18	9,174.19	12.28	8.15	-60.53	4,802.88	-140.83	4,446.85	4,426.42	20.43	217.638		
9,525.00	9,315.23	9,180.15	9,177.16	12.36	8.15	-66.49	4,802.97	-140.94	4,424.10	4,403.59	20.51	215.680		
9,550.00	9,318.11	9,182.29	9,179.30	12.45	8.15	-73.05	4,803.03	-141.02	4,401.17	4,380.56	20.61	213.593		
9,575.00	9,319.68	9,200.00	9,196.99	12.56	8.17	-80.62	4,803.58	-141.62	4,378.15	4,357.42	20.73	211.166		
9,593.79	9,320.00	9,200.00	9,196.99	12.66	8.17	-86.07	4,803.58	-141.62	4,360.77	4,339.94	20.83	209.359		
9,600.00	9,319.98	9,200.00	9,196.99	12.69	8.17	-86.05	4,803.58	-141.62	4,355.02	4,334.15	20.86	208.751		
9,700.00	9,319.72	9,200.00	9,196.99	13.40	8.17	-85.69	4,803.58	-141.62	4,261.91	4,240.34	21.57	197.560		
9,800.00	9,319.46	9,200.00	9,196.99	14.50	8.17	-85.26	4,803.58	-141.62	4,167.87	4,145.20	22.67	183.830		
9,900.00	9,319.19	9,200.00	9,196.99	15.84	8.17	-84.75	4,803.58	-141.62	4,072.95	4,048.93	24.02	169.590		
10,000.00	9,318.93	9,200.00	9,196.99	17.31	8.17	-84.11	4,803.58	-141.62	3,977.20	3,951.71	25.49	156.054		
10,100.00	9,318.66	9,200.00	9,196.99	18.85	8.17	-83.30	4,803.58	-141.62	3,880.69	3,853.66	27.02	143.607		
10,200.00	9,318.39	9,200.00	9,196.99	20.43	8.17	-82.27	4,803.58	-141.62	3,783.47	3,754.87	28.60	132.291		
10,300.00	9,318.13	9,200.00	9,196.99	22.03	8.17	-80.88	4,803.58	-141.62	3,685.63	3,655.43	30.20	122.037		
10,400.00	9,317.86	9,200.00	9,196.99	23.65	8.17	-78.95	4,803.58	-141.62	3,587.22	3,555.40	31.82	112.740		
10,500.00	9,317.59	9,200.00	9,196.99	25.27	8.17	-76.07	4,803.58	-141.62	3,488.33	3,454.88	33.45	104.292		
10,531.97	9,317.51	9,200.00	9,196.99	25.80	8.17	-74.83	4,803.58	-141.62	3,456.63	3,422.66	33.97	101.752		
10,600.00	9,317.33	9,200.00	9,196.99	26.90	8.17	-74.83	4,803.58	-141.62	3,389.13	3,354.06	35.07	96.639		
10,700.00	9,317.07	9,204.83	9,201.82	28.51	8.18	-75.46	4,803.73	-141.77	3,289.95	3,253.26	36.68	89.682		
10,800.00	9,316.80	9,209.69	9,206.67	30.14	8.18	-76.09	4,803.88	-141.92	3,190.82	3,152.49	38.33	83.254		
10,900.00	9,316.54	9,214.40	9,211.37	31.80	8.19	-76.71	4,804.02	-142.06	3,091.74	3,051.75	39.99	77.312		
11,000.00	9,316.27	9,218.96	9,215.93	33.48	8.19	-77.32	4,804.16	-142.18	2,992.72	2,951.05	41.67	71.814		
11,100.00	9,316.01	9,223.39	9,220.36	35.18	8.19	-77.91	4,804.30	-142.30	2,893.76	2,850.39	43.37	66.720		
11,200.00	9,315.74	9,227.70	9,224.66	36.89	8.20	-78.48	4,804.42	-142.41	2,794.87	2,749.79	45.08	61.992		
11,300.00	9,315.48	9,231.87	9,228.84	38.61	8.20	-79.04	4,804.54	-142.51	2,696.06	2,649.25	46.81	57.597		
11,400.00	9,315.21	9,235.94	9,232.89	40.34	8.20	-79.58	4,804.66	-142.60	2,597.34	2,548.79	48.54	53.505		
11,500.00	9,314.95	9,239.88	9,236.84	42.08	8.21	-80.11	4,804.77	-142.69	2,498.71	2,448.42	50.29	49.689		
11,600.00	9,314.69	9,243.72	9,240.67	43.83	8.21	-80.63	4,804.88	-142.77	2,400.20	2,348.16	52.04	46.124		
11,700.00	9,314.42	9,247.46	9,244.41	45.58	8.21	-81.14	4,804.98	-142.84	2,301.80	2,248.01	53.80	42.787		
11,800.00	9,314.16	9,251.09	9,248.04	47.34	8.22	-81.63	4,805.08	-142.91	2,203.55	2,147.99	55.56	39.660		
11,900.00	9,313.89	9,254.63	9,251.57	49.11	8.22	-82.11	4,805.18	-142.97	2,105.46	2,048.13	57.33	36.725		
12,000.00	9,313.63	9,258.07	9,255.02	50.88	8.22	-82.58	4,805.27	-143.03	2,007.55	1,948.44	59.10	33.966		
12,100.00	9,313.36	9,261.43	9,258.37	52.66	8.23	-83.03	4,805.36	-143.09	1,909.85	1,848.97	60.88	31.369		
12,200.00	9,313.10	9,264.70	9,261.64	54.44	8.23	-83.48	4,805.45	-143.14	1,812.40	1,749.74	62.67	28.922		
12,300.00	9,312.83	9,267.89	9,264.83	56.22	8.23	-83.92	4,805.53	-143.18	1,715.24	1,650.79	64.45	26.613		
12,400.00	9,312.57	9,271.00	9,267.94	58.01	8.23	-84.34	4,805.61	-143.22	1,618.42	1,552.18	66.24	24.432		
12,500.00	9,312.31	9,274.04	9,270.97	59.80	8.24	-84.76	4,805.68	-143.26	1,522.01	1,453.98	68.03	22.372		

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandrill Freedom)
MD Reference: RKB @ 3635.40ft (Scandrill Freedom)
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. 17, T 19S., R 32 E - TBM Fed 1 (Offset Well) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-Keeper													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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
12,600.00	9,312.04	9,277.00	9,273.93	61.59	8.24	-85.16	4,805.76	-143.30	1,426.09	1,356.26	69.83	20.423		
12,700.00	9,311.78	9,279.89	9,276.82	63.38	8.24	-85.56	4,805.83	-143.33	1,330.77	1,259.14	71.62	18.580		
12,800.00	9,311.51	9,282.71	9,279.64	65.18	8.24	-85.95	4,805.90	-143.36	1,236.17	1,162.75	73.42	16.836		
12,900.00	9,311.25	9,285.46	9,282.40	66.98	8.25	-86.33	4,805.97	-143.38	1,142.50	1,067.27	75.23	15.188		
13,000.00	9,310.98	9,288.16	9,285.09	68.78	8.25	-86.70	4,806.03	-143.41	1,049.98	972.95	77.03	13.631		
13,100.00	9,310.72	9,290.79	9,287.72	70.58	8.25	-87.06	4,806.09	-143.43	958.96	880.13	78.83	12.165		
13,200.00	9,310.45	9,293.36	9,290.29	72.39	8.25	-87.41	4,806.15	-143.45	869.92	789.28	80.64	10.788		
13,300.00	9,310.19	9,295.87	9,292.80	74.19	8.25	-87.76	4,806.21	-143.46	783.51	701.06	82.45	9.503		
13,400.00	9,309.93	9,298.33	9,295.26	76.00	8.26	-88.10	4,806.27	-143.48	700.72	616.46	84.26	8.317		
13,500.00	9,309.66	9,300.67	9,297.60	77.81	8.26	-88.42	4,806.32	-143.49	622.99	536.92	86.07	7.239		
13,600.00	9,309.40	9,302.81	9,299.74	79.62	8.26	-88.72	4,806.37	-143.50	552.46	464.59	87.88	6.287		
13,700.00	9,309.13	9,304.90	9,301.83	81.43	8.26	-89.01	4,806.42	-143.51	492.25	402.56	89.69	5.488		
13,800.00	9,308.87	9,306.94	9,303.87	83.24	8.26	-89.29	4,806.46	-143.52	446.53	355.03	91.50	4.880		
13,900.00	9,308.60	9,308.94	9,305.87	85.05	8.26	-89.56	4,806.51	-143.53	420.08	326.77	93.31	4.502		
13,964.66	9,308.43	9,310.21	9,307.14	86.22	8.26	-89.74	4,806.53	-143.54	415.08	320.59	94.49	4.393 CC, ES		
14,000.00	9,308.34	9,310.89	9,307.82	86.86	8.26	-89.83	4,806.55	-143.54	416.58	321.45	95.13	4.379 SF		
14,100.00	9,308.07	9,312.80	9,309.73	88.68	8.27	-90.10	4,806.59	-143.55	436.58	339.63	96.94	4.503		
14,200.00	9,307.81	9,314.67	9,311.60	90.49	8.27	-90.35	4,806.63	-143.56	477.13	378.37	98.76	4.831		
14,300.00	9,307.55	9,316.50	9,313.43	92.31	8.27	-90.61	4,806.67	-143.57	533.57	433.00	100.58	5.305		
14,400.00	9,307.28	9,318.29	9,315.21	94.13	8.27	-90.85	4,806.71	-143.58	601.45	499.06	102.39	5.874		
14,500.00	9,307.02	9,320.04	9,316.96	95.94	8.27	-91.09	4,806.74	-143.58	677.33	573.12	104.21	6.499		
14,600.00	9,306.75	9,321.75	9,318.68	97.76	8.27	-91.33	4,806.78	-143.59	758.82	652.79	106.03	7.157		
14,700.00	9,306.49	9,323.43	9,320.36	99.58	8.27	-91.56	4,806.81	-143.60	844.29	736.44	107.85	7.828		
14,800.00	9,306.22	9,325.08	9,322.00	101.40	8.27	-91.79	4,806.84	-143.60	932.66	822.98	109.67	8.504		
14,900.00	9,305.96	9,326.69	9,323.61	103.22	8.27	-92.01	4,806.88	-143.61	1,023.16	911.67	111.49	9.177		
15,000.00	9,305.70	9,328.27	9,325.19	105.04	8.28	-92.23	4,806.91	-143.62	1,115.29	1,001.97	113.31	9.843		
15,100.00	9,305.43	9,329.81	9,326.74	106.86	8.28	-92.44	4,806.94	-143.62	1,208.66	1,093.53	115.13	10.498		
15,200.00	9,305.17	9,331.33	9,328.25	108.68	8.28	-92.65	4,806.97	-143.63	1,303.02	1,186.06	116.96	11.141		
15,300.00	9,304.90	9,332.82	9,329.74	110.50	8.28	-92.86	4,807.00	-143.63	1,398.16	1,279.38	118.78	11.771		
15,400.00	9,304.64	9,334.28	9,331.20	112.32	8.28	-93.06	4,807.02	-143.64	1,493.93	1,373.33	120.60	12.387		
15,500.00	9,304.37	9,335.71	9,332.63	114.14	8.28	-93.25	4,807.05	-143.64	1,590.22	1,467.80	122.42	12.990		
15,600.00	9,304.11	9,337.11	9,334.03	115.97	8.28	-93.45	4,807.08	-143.65	1,686.95	1,562.70	124.25	13.577		
15,700.00	9,303.84	9,338.49	9,335.41	117.79	8.28	-93.64	4,807.10	-143.65	1,784.03	1,657.96	126.07	14.151		
15,800.00	9,303.58	9,339.84	9,336.76	119.61	8.28	-93.82	4,807.13	-143.66	1,881.42	1,753.52	127.89	14.711		
15,900.00	9,303.32	9,341.17	9,338.09	121.44	8.28	-94.00	4,807.15	-143.66	1,979.06	1,849.34	129.72	15.257		
16,000.00	9,303.05	9,342.47	9,339.39	123.26	8.28	-94.18	4,807.18	-143.67	2,076.93	1,945.39	131.54	15.789		
16,100.00	9,302.79	9,343.75	9,340.67	125.08	8.29	-94.36	4,807.20	-143.67	2,174.99	2,041.63	133.37	16.308		
16,200.00	9,302.52	9,345.01	9,341.93	126.91	8.29	-94.53	4,807.22	-143.67	2,273.23	2,138.03	135.19	16.815		
16,300.00	9,302.26	9,346.24	9,343.16	128.73	8.29	-94.70	4,807.24	-143.68	2,371.60	2,234.58	137.02	17.309		
16,400.00	9,301.99	9,347.46	9,344.38	130.56	8.29	-94.87	4,807.27	-143.68	2,470.11	2,331.26	138.84	17.790		
16,500.00	9,301.73	9,348.65	9,345.57	132.38	8.29	-95.03	4,807.29	-143.68	2,568.73	2,428.06	140.67	18.261		
16,600.00	9,301.46	9,349.82	9,346.74	134.21	8.29	-95.19	4,807.31	-143.69	2,667.46	2,524.96	142.50	18.719		
16,700.00	9,301.20	9,350.97	9,347.89	136.03	8.29	-95.35	4,807.33	-143.69	2,766.27	2,621.95	144.32	19.167		
16,800.00	9,300.94	9,352.10	9,349.02	137.86	8.29	-95.50	4,807.35	-143.69	2,865.17	2,719.02	146.15	19.604		
16,900.00	9,300.67	9,353.21	9,350.13	139.68	8.29	-95.65	4,807.36	-143.70	2,964.14	2,816.16	147.98	20.031		
17,000.00	9,300.41	9,354.31	9,351.22	141.51	8.29	-95.80	4,807.38	-143.70	3,063.17	2,913.37	149.80	20.448		
17,100.00	9,300.14	9,355.38	9,352.30	143.34	8.29	-95.95	4,807.40	-143.70	3,162.27	3,010.64	151.63	20.855		
17,153.74	9,300.00	9,355.95	9,352.87	144.32	8.29	-96.03	4,807.41	-143.70	3,215.54	3,062.93	152.61	21.070		

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandril Freedom)
MD Reference: RKB @ 3635.40ft (Scandril Freedom)
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. 17, T 19S., R 32 E - USA Trig Fed 1 (Offset Well, Inc Only Svy, No Plat SHL) - Wellbore #1 - Well													Offset Site Error:	0.00 ft
Survey Program: 280-Inclinometer only													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	6.60	6.60	0.00	0.20	-8.54	2,057.57	-308.90	2,080.63					
100.00	100.00	106.60	106.60	0.07	3.20	-8.54	2,057.57	-308.90	2,080.63	2,077.37	3.26	637.383		
200.00	200.00	206.60	206.60	0.20	6.20	-8.54	2,057.57	-308.90	2,080.63	2,074.24	6.39	325.423		
254.59	254.59	261.19	261.19	0.27	7.84	-8.54	2,057.57	-308.90	2,080.63	2,072.53	8.10	256.777		
300.00	300.00	280.00	280.00	0.33	8.40	-8.54	2,057.57	-308.90	2,080.80	2,072.08	8.73	238.435		
400.00	400.00	406.60	406.60	0.46	12.20	-8.54	2,057.57	-308.90	2,080.63	2,067.98	12.66	164.391		
500.00	500.00	506.61	506.60	0.59	15.20	-8.54	2,057.57	-308.90	2,080.63	2,064.84	15.79	131.782		
600.00	600.00	606.61	606.60	0.72	18.20	-8.54	2,057.57	-308.90	2,080.63	2,061.71	18.92	109.969		
654.58	654.58	661.18	661.18	0.79	19.84	-8.54	2,057.57	-308.90	2,080.63	2,060.00	20.63	100.857		
700.00	700.00	680.00	679.98	0.85	20.40	-8.54	2,057.57	-308.90	2,080.80	2,059.55	21.25	97.902		
800.00	800.00	806.62	806.60	0.99	24.20	-8.54	2,057.57	-308.90	2,080.63	2,055.45	25.18	82.617		
900.00	900.00	906.62	906.60	1.12	27.20	-8.54	2,057.57	-308.90	2,080.63	2,052.32	28.32	73.479		
1,000.00	1,000.00	1,006.62	1,006.60	1.25	30.20	-8.54	2,057.57	-308.90	2,080.63	2,049.18	31.45	66.162		
1,100.00	1,100.00	1,106.62	1,106.60	1.38	33.20	-8.54	2,057.57	-308.90	2,080.63	2,046.05	34.58	60.169		
1,200.00	1,200.00	1,206.62	1,206.60	1.51	36.20	-8.54	2,057.57	-308.90	2,080.63	2,042.92	37.71	55.173		
1,300.00	1,300.00	1,306.66	1,306.60	1.64	39.20	-8.54	2,057.57	-308.90	2,080.63	2,039.79	40.84	50.940		
1,400.00	1,400.00	1,406.66	1,406.60	1.78	42.20	-8.54	2,057.57	-308.90	2,080.63	2,036.66	43.98	47.313		
1,500.00	1,500.00	1,506.66	1,506.60	1.91	45.20	-8.54	2,057.57	-308.90	2,080.63	2,033.52	47.11	44.167		
1,600.00	1,600.00	1,606.66	1,606.60	2.04	48.20	-8.54	2,057.57	-308.90	2,080.63	2,030.39	50.24	41.414		
1,700.00	1,700.00	1,706.66	1,706.60	2.17	51.20	-8.54	2,057.57	-308.90	2,080.63	2,027.26	53.37	38.984		
1,800.00	1,800.00	1,806.66	1,806.60	2.30	54.20	-8.54	2,057.57	-308.90	2,080.63	2,024.13	56.50	36.823		
1,900.00	1,900.00	1,906.66	1,906.60	2.44	57.20	-8.54	2,057.57	-308.90	2,080.63	2,021.00	59.64	34.889		
2,000.00	2,000.00	2,006.67	2,006.60	2.57	60.20	-8.54	2,057.57	-308.90	2,080.63	2,017.86	62.77	33.148		
2,100.00	2,100.00	2,106.67	2,106.60	2.70	63.20	-8.54	2,057.57	-308.90	2,080.63	2,014.73	65.90	31.573		
2,200.00	2,200.00	2,130.00	2,129.89	2.83	63.90	-8.54	2,057.57	-308.90	2,082.05	2,015.31	66.73	31.200		
2,300.00	2,300.00	2,306.71	2,306.60	2.96	69.20	-8.54	2,057.57	-308.90	2,080.63	2,008.47	72.16	28.832		
2,400.00	2,400.00	2,406.80	2,406.60	3.09	72.20	-8.54	2,057.57	-308.90	2,080.63	2,005.33	75.30	27.632		
2,451.08	2,451.08	2,457.92	2,457.68	3.16	73.74	-8.54	2,057.57	-308.90	2,080.63	2,003.73	76.90	27.056		
2,500.00	2,500.00	2,475.00	2,474.74	3.23	74.25	-8.54	2,057.57	-308.90	2,080.88	2,003.40	77.48	26.858		
2,582.17	2,582.17	2,589.03	2,588.77	3.34	77.67	-8.54	2,057.57	-308.90	2,080.63	1,999.63	81.01	25.685		
2,600.00	2,600.00	2,590.00	2,589.72	3.36	77.70	-8.54	2,057.57	-308.90	2,080.70	1,999.64	81.06	25.669		
2,700.00	2,700.00	2,706.88	2,706.60	3.49	81.21	-8.54	2,057.57	-308.90	2,080.63	1,995.94	84.70	24.566		
2,800.00	2,800.00	2,806.91	2,806.60	3.62	84.21	-8.54	2,057.57	-308.90	2,080.63	1,992.80	87.83	23.689		
2,900.00	2,900.00	2,906.91	2,906.60	3.75	87.21	-8.54	2,057.57	-308.90	2,080.63	1,989.67	90.96	22.874		
2,954.37	2,954.37	2,961.28	2,960.97	3.83	88.84	-8.54	2,057.57	-308.90	2,080.63	1,987.97	92.66	22.453		
3,000.00	3,000.00	2,980.00	2,979.65	3.89	89.40	-8.54	2,057.57	-308.90	2,080.81	1,987.52	93.29	22.306		
3,100.00	3,100.00	3,106.95	3,106.60	4.02	93.21	-8.54	2,057.57	-308.90	2,080.63	1,983.41	97.23	21.400		
3,200.00	3,200.00	3,206.95	3,206.60	4.15	96.21	-8.54	2,057.57	-308.90	2,080.63	1,980.27	100.36	20.732		
3,300.00	3,300.00	3,306.95	3,306.60	4.28	99.21	-8.54	2,057.57	-308.90	2,080.63	1,977.14	103.49	20.105		
3,400.00	3,400.00	3,407.03	3,406.60	4.41	102.21	-8.54	2,057.57	-308.90	2,080.63	1,974.01	106.62	19.514		
3,450.90	3,450.90	3,457.97	3,457.50	4.48	103.74	-8.54	2,057.57	-308.90	2,080.63	1,972.41	108.22	19.226		
3,500.00	3,500.00	3,475.00	3,474.49	4.55	104.25	-8.54	2,057.57	-308.90	2,080.88	1,972.08	108.80	19.127		
3,585.16	3,585.16	3,592.31	3,591.76	4.66	107.77	-8.54	2,057.57	-308.90	2,080.63	1,968.21	112.43	18.507		
3,600.00	3,600.00	3,595.00	3,594.43	4.68	107.85	-8.54	2,057.57	-308.90	2,080.67	1,968.14	112.53	18.490		
3,680.85	3,680.85	3,688.06	3,687.45	4.78	110.64	-8.54	2,057.57	-308.90	2,080.63	1,965.21	115.43	18.026		
3,700.00	3,700.00	3,697.00	3,696.36	4.81	110.91	-8.54	2,057.57	-308.90	2,080.66	1,964.94	115.72	17.980		
3,800.00	3,800.00	3,807.27	3,806.60	4.94	114.22	-8.54	2,057.57	-308.90	2,080.63	1,961.47	119.16	17.461		
3,900.00	3,900.00	3,907.34	3,906.60	5.07	117.22	-8.54	2,057.57	-308.90	2,080.63	1,958.34	122.29	17.014		
4,000.00	4,000.00	4,007.41	4,006.60	5.20	120.22	-8.54	2,057.57	-308.90	2,080.63	1,955.21	125.43	16.588		
4,059.60	4,059.60	4,067.04	4,066.20	5.28	122.01	-8.54	2,057.57	-308.90	2,080.63	1,953.34	127.29	16.345		
4,100.00	4,100.00	4,090.00	4,089.11	5.34	122.70	-8.54	2,057.57	-308.90	2,080.71	1,952.67	128.04	16.251		
4,173.06	4,173.06	4,180.60	4,179.66	5.43	125.42	-8.54	2,057.57	-308.90	2,080.63	1,949.78	130.85	15.901		

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandril Freedom)
MD Reference: RKB @ 3635.40ft (Scandril Freedom)
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. 17, T 19S., R 32 E - USA Trig Fed 1 (Offset Well, Inc Only Svy, No Plat SHL) - Wellbore #1 - Well													Offset Site Error:	0.00 ft
Survey Program: 280-Inclinometer only													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		
4,200.00	4,200.00	4,189.00	4,188.04	5.47	125.67	-8.54	2,057.57	-308.90	2,080.72	1,949.58	131.14	15.867		
4,300.00	4,300.00	4,307.61	4,306.60	5.60	129.23	-8.54	2,057.57	-308.90	2,080.63	1,945.80	134.83	15.432		
4,359.99	4,359.99	4,367.64	4,366.59	5.68	131.03	-8.54	2,057.57	-308.90	2,080.63	1,943.92	136.71	15.220		
4,400.00	4,400.00	4,391.00	4,389.91	5.73	131.73	-8.54	2,057.57	-308.90	2,080.70	1,943.24	137.46	15.137		
4,500.00	4,500.00	4,507.73	4,506.60	5.86	135.23	-8.54	2,057.57	-308.90	2,080.63	1,939.54	141.10	14.746		
4,600.00	4,600.00	4,607.79	4,606.60	6.00	138.23	-8.54	2,057.57	-308.90	2,080.63	1,936.40	144.23	14.426		
4,654.42	4,654.42	4,662.26	4,661.02	6.07	139.87	-8.54	2,057.57	-308.90	2,080.63	1,934.70	145.94	14.257		
4,700.00	4,700.00	4,681.00	4,679.74	6.13	140.43	-8.54	2,057.57	-308.90	2,080.81	1,934.25	146.56	14.198		
4,793.82	4,793.82	4,801.71	4,800.42	6.25	144.05	-8.54	2,057.57	-308.90	2,080.63	1,930.33	150.30	13.843		
4,800.00	4,800.00	4,807.00	4,805.69	6.26	144.21	-8.54	2,057.57	-308.90	2,080.63	1,930.16	150.47	13.828		
4,846.90	4,846.90	4,854.82	4,853.50	6.32	145.64	-8.54	2,057.57	-308.90	2,080.63	1,928.67	151.97	13.691		
4,900.00	4,900.00	4,870.00	4,868.66	6.39	146.10	-8.54	2,057.57	-308.90	2,080.98	1,928.49	152.49	13.647		
4,980.61	4,980.61	4,985.00	4,983.63	6.50	149.55	-8.54	2,057.57	-308.90	2,080.64	1,924.59	156.05	13.333		
5,000.00	5,000.00	4,985.00	4,983.63	6.52	149.55	-8.54	2,057.57	-308.90	2,080.76	1,924.69	156.07	13.332		
5,100.00	5,100.00	5,107.99	5,106.60	6.65	153.24	-8.54	2,057.57	-308.90	2,080.63	1,920.74	159.89	13.013		
5,127.51	5,127.51	5,135.50	5,134.11	6.69	154.07	-8.54	2,057.57	-308.90	2,080.63	1,919.88	160.76	12.943		
5,200.00	5,200.00	5,154.00	5,152.59	6.79	154.62	-8.54	2,057.57	-308.90	2,081.33	1,919.93	161.41	12.895		
5,300.00	5,300.00	5,308.02	5,306.60	6.92	159.24	-8.54	2,057.57	-308.90	2,080.63	1,914.47	166.16	12.522		
5,350.20	5,350.20	5,358.22	5,356.80	6.98	160.75	-8.54	2,057.57	-308.90	2,080.63	1,912.90	167.73	12.405		
5,400.00	5,400.00	5,375.00	5,373.54	7.05	161.25	-8.54	2,057.57	-308.90	2,080.89	1,912.59	168.30	12.364		
5,469.96	5,469.96	5,469.00	5,467.52	7.14	164.07	-8.54	2,057.57	-308.90	2,080.65	1,909.44	171.21	12.152		
5,500.00	5,500.00	5,469.00	5,467.52	7.18	164.07	-8.54	2,057.57	-308.90	2,081.00	1,909.75	171.25	12.152		
5,600.00	5,600.00	5,608.08	5,606.60	7.31	168.24	-8.54	2,057.57	-308.90	2,080.63	1,905.08	175.56	11.852		
5,700.00	5,700.00	5,708.08	5,706.60	7.45	171.24	-8.54	2,057.57	-308.90	2,080.63	1,901.94	178.69	11.644		
5,748.62	5,748.62	5,756.70	5,755.22	7.51	172.70	-8.54	2,057.57	-308.90	2,080.63	1,900.42	180.21	11.546		
5,800.00	5,800.00	5,773.00	5,771.47	7.58	173.19	-8.54	2,057.57	-308.90	2,080.93	1,900.16	180.77	11.512		
5,900.00	5,900.00	5,908.13	5,906.60	7.71	177.24	-8.54	2,057.57	-308.90	2,080.63	1,895.68	184.95	11.250		
6,000.00	6,000.00	6,008.13	6,006.60	7.84	180.24	-8.54	2,057.57	-308.90	2,080.63	1,892.55	188.09	11.062		
6,100.00	6,100.00	6,108.13	6,106.60	7.97	183.24	-8.54	2,057.57	-308.90	2,080.63	1,889.42	191.22	10.881		
6,200.00	6,200.00	6,208.13	6,206.60	8.10	186.24	-8.54	2,057.57	-308.90	2,080.63	1,886.28	194.35	10.706		
6,300.00	6,300.00	6,308.16	6,306.60	8.24	189.25	-8.54	2,057.57	-308.90	2,080.63	1,883.15	197.48	10.536		
6,363.70	6,363.70	6,371.86	6,370.30	8.32	191.16	-8.54	2,057.57	-308.90	2,080.63	1,881.16	199.48	10.430		
6,400.00	6,400.00	6,400.00	6,398.42	8.37	192.00	-8.54	2,057.57	-308.90	2,080.65	1,880.28	200.37	10.384		
6,500.00	6,500.00	6,508.18	6,506.60	8.50	195.25	-8.54	2,057.57	-308.90	2,080.63	1,876.89	203.75	10.212		
6,600.00	6,600.00	6,608.18	6,606.60	8.63	198.25	-8.54	2,057.57	-308.90	2,080.63	1,873.75	206.88	10.057		
6,700.00	6,700.00	6,708.18	6,706.60	8.76	201.25	-8.54	2,057.57	-308.90	2,080.63	1,870.62	210.01	9.907		
6,800.00	6,800.00	6,808.18	6,806.60	8.90	204.25	-8.54	2,057.57	-308.90	2,080.63	1,867.49	213.14	9.762		
6,846.06	6,846.06	6,854.24	6,852.66	8.96	205.63	-8.54	2,057.57	-308.90	2,080.63	1,866.05	214.58	9.696		
6,900.00	6,900.00	6,870.00	6,868.40	9.03	206.10	-8.54	2,057.57	-308.90	2,080.98	1,865.86	215.13	9.673		
7,000.00	7,000.00	7,008.20	7,006.60	9.16	210.25	-8.54	2,057.57	-308.90	2,080.63	1,861.23	219.41	9.483		
7,063.68	7,063.68	7,071.88	7,070.28	9.24	212.16	-8.54	2,057.57	-308.90	2,080.63	1,859.23	221.40	9.398		
7,100.00	7,100.00	7,100.00	7,098.38	9.29	213.00	-8.54	2,057.57	-308.90	2,080.65	1,858.36	222.29	9.360		
7,200.00	7,200.00	7,208.22	7,206.60	9.42	216.25	-8.54	2,057.57	-308.90	2,080.63	1,854.96	225.67	9.220		
7,300.00	7,300.00	7,308.22	7,306.60	9.56	219.25	-8.54	2,057.57	-308.90	2,080.63	1,851.83	228.80	9.094		
7,400.00	7,400.00	7,408.28	7,406.60	9.69	222.25	-8.54	2,057.57	-308.90	2,080.63	1,848.70	231.94	8.971		
7,500.00	7,500.00	7,508.28	7,506.60	9.82	225.25	-8.54	2,057.57	-308.90	2,080.63	1,845.56	235.07	8.851		
7,600.00	7,600.00	7,608.28	7,606.60	9.95	228.25	-8.54	2,057.57	-308.90	2,080.63	1,842.43	238.20	8.735		
7,700.00	7,700.00	7,708.28	7,706.60	10.08	231.25	-8.54	2,057.57	-308.90	2,080.63	1,839.30	241.33	8.621		
7,800.00	7,800.00	7,808.28	7,806.60	10.21	234.25	-8.54	2,057.57	-308.90	2,080.63	1,836.17	244.46	8.511		
7,900.00	7,900.00	7,840.00	7,838.29	10.35	235.20	-8.54	2,057.57	-308.90	2,081.75	1,836.21	245.55	8.478		
7,991.63	7,991.63	8,000.00	7,998.23	10.47	240.00	-8.54	2,057.57	-308.90	2,080.63	1,830.17	250.47	8.307		
8,000.00	8,000.00	8,000.00	7,998.23	10.48	240.00	-8.54	2,057.57	-308.90	2,080.65	1,830.17	250.48	8.307		

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandril Freedom)
MD Reference: RKB @ 3635.40ft (Scandril Freedom)
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. 17, T 19S., R 32 E - USA Trig Fed 1 (Offset Well, Inc Only Svy, No Plat SHL) - Wellbore #1 - Well													Offset Site Error:	0.00 ft
Survey Program: 280-Inclinometer only													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	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)						
8,100.00	8,100.00	8,108.42	8,106.60	10.61	243.25	-8.54	2,057.57	-308.90	2,080.63	1,826.77	253.86	8.196		
8,200.00	8,200.00	8,208.51	8,206.60	10.74	246.26	-8.54	2,057.57	-308.90	2,080.63	1,823.64	257.00	8.096		
8,300.00	8,300.00	8,308.53	8,306.60	10.87	249.26	-8.54	2,057.57	-308.90	2,080.63	1,820.50	260.13	7.998		
8,400.00	8,400.00	8,408.60	8,406.60	11.01	252.26	-8.54	2,057.57	-308.90	2,080.63	1,817.37	263.26	7.903		
8,466.43	8,466.43	8,475.09	8,473.03	11.09	254.25	-8.54	2,057.57	-308.90	2,080.63	1,815.29	265.35	7.841		
8,500.00	8,500.00	8,508.00	8,505.89	11.14	255.24	-8.54	2,057.57	-308.90	2,080.63	1,814.25	266.38	7.811		
8,546.93	8,546.93	8,555.64	8,553.53	11.20	256.67	-8.54	2,057.57	-308.90	2,080.63	1,812.76	267.87	7.767		
8,600.00	8,600.00	8,571.00	8,568.86	11.27	257.13	-8.54	2,057.57	-308.90	2,080.97	1,812.58	268.40	7.753		
8,700.00	8,700.00	8,708.74	8,706.60	11.40	261.26	-8.54	2,057.57	-308.90	2,080.63	1,807.97	272.66	7.631		
8,759.92	8,759.92	8,768.66	8,766.52	11.48	263.06	-8.54	2,057.57	-308.90	2,080.63	1,806.09	274.54	7.579		
8,800.00	8,800.00	8,792.00	8,789.76	11.53	263.76	-8.54	2,057.57	-308.90	2,080.70	1,805.41	275.29	7.558		
8,842.54	8,842.54	8,792.00	8,789.76	11.59	263.76	-8.54	2,057.57	-308.90	2,081.48	1,806.13	275.35	7.559		
8,850.00	8,850.00	8,858.84	8,856.60	11.60	265.77	-26.89	2,057.57	-308.90	2,080.58	1,803.22	277.36	7.501		
8,875.00	8,874.98	8,883.82	8,881.58	11.62	266.51	-26.96	2,057.57	-308.90	2,079.65	1,801.52	278.13	7.477		
8,900.00	8,899.86	8,908.70	8,906.46	11.62	267.26	-27.10	2,057.57	-308.90	2,077.55	1,798.67	278.88	7.450		
8,925.00	8,924.59	8,915.00	8,912.73	11.62	267.45	-27.28	2,057.57	-308.90	2,074.38	1,795.31	279.07	7.433		
8,950.00	8,949.10	8,915.00	8,912.73	11.63	267.45	-27.51	2,057.57	-308.90	2,070.35	1,791.27	279.08	7.419		
8,975.00	8,973.31	8,982.18	8,979.91	11.63	269.47	-28.03	2,057.57	-308.90	2,064.37	1,783.27	281.10	7.344		
9,000.00	8,997.16	9,006.03	9,003.76	11.64	270.18	-28.52	2,057.57	-308.90	2,057.72	1,775.89	281.83	7.301		
9,025.00	9,020.59	9,010.00	9,007.68	11.65	270.30	-29.01	2,057.57	-308.90	2,050.07	1,768.11	281.95	7.271		
9,050.00	9,043.53	9,052.46	9,050.13	11.67	271.57	-29.80	2,057.57	-308.90	2,041.16	1,757.92	283.24	7.206		
9,075.00	9,065.92	9,074.85	9,072.52	11.68	272.25	-30.60	2,057.57	-308.90	2,031.31	1,747.38	283.93	7.154		
9,100.00	9,087.70	9,086.00	9,083.64	11.70	272.58	-31.43	2,057.57	-308.90	2,020.47	1,736.19	284.28	7.107		
9,125.00	9,108.81	9,086.00	9,083.64	11.72	272.58	-32.26	2,057.57	-308.90	2,008.85	1,724.55	284.30	7.066		
9,150.00	9,129.19	9,138.15	9,135.79	11.74	274.14	-33.76	2,057.57	-308.90	1,995.82	1,709.94	285.88	6.981		
9,175.00	9,148.78	9,157.74	9,155.38	11.76	274.73	-35.11	2,057.57	-308.90	1,982.14	1,695.65	286.49	6.919		
9,200.00	9,167.53	9,168.00	9,165.60	11.78	275.04	-36.50	2,057.57	-308.90	1,967.63	1,680.80	286.82	6.860		
9,225.00	9,185.39	9,168.00	9,165.60	11.81	275.04	-37.88	2,057.57	-308.90	1,952.45	1,665.59	286.85	6.806		
9,250.00	9,202.31	9,168.00	9,165.60	11.84	275.04	-39.41	2,057.57	-308.90	1,936.65	1,649.77	286.88	6.751		
9,275.00	9,218.25	9,227.25	9,224.85	11.87	276.82	-42.35	2,057.57	-308.90	1,919.36	1,630.67	288.69	6.649		
9,300.00	9,233.15	9,242.16	9,239.75	11.90	277.27	-44.71	2,057.57	-308.90	1,901.89	1,612.72	289.17	6.577		
9,325.00	9,246.99	9,255.99	9,253.59	11.94	277.68	-47.33	2,057.57	-308.90	1,883.83	1,594.21	289.62	6.505		
9,350.00	9,259.72	9,268.72	9,266.32	11.98	278.06	-50.22	2,057.57	-308.90	1,865.22	1,575.18	290.04	6.431		
9,375.00	9,271.30	9,276.00	9,273.55	12.02	278.28	-53.24	2,057.57	-308.90	1,846.13	1,555.83	290.30	6.359		
9,400.00	9,281.71	9,276.00	9,273.55	12.06	278.28	-56.28	2,057.57	-308.90	1,826.67	1,536.33	290.34	6.291		
9,425.00	9,290.91	9,276.00	9,273.55	12.11	278.28	-59.57	2,057.57	-308.90	1,806.89	1,516.50	290.39	6.222		
9,450.00	9,298.88	9,276.00	9,273.55	12.16	278.28	-63.11	2,057.57	-308.90	1,786.83	1,496.39	290.44	6.152		
9,475.00	9,305.61	9,276.00	9,273.55	12.22	278.28	-66.88	2,057.57	-308.90	1,766.55	1,476.05	290.50	6.081		
9,500.00	9,311.06	9,320.11	9,317.66	12.28	279.60	-73.25	2,057.57	-308.90	1,745.53	1,453.64	291.89	5.980		
9,525.00	9,315.23	9,324.28	9,321.83	12.36	279.73	-77.78	2,057.57	-308.90	1,724.82	1,432.73	292.09	5.905		
9,550.00	9,318.11	9,327.16	9,324.71	12.45	279.82	-82.35	2,057.57	-308.90	1,704.07	1,411.80	292.27	5.831		
9,575.00	9,319.68	9,328.73	9,326.28	12.56	279.86	-86.88	2,057.57	-308.90	1,683.32	1,390.90	292.42	5.756		
9,593.79	9,320.00	9,329.05	9,326.60	12.66	279.87	-90.22	2,057.57	-308.90	1,667.78	1,375.26	292.53	5.701		
9,600.00	9,319.98	9,329.03	9,326.58	12.69	279.87	-90.22	2,057.57	-308.90	1,662.65	1,370.09	292.56	5.683		
9,700.00	9,319.72	9,328.77	9,326.32	13.40	279.86	-90.22	2,057.57	-308.90	1,580.07	1,286.81	293.26	5.388		
9,800.00	9,319.46	9,328.51	9,326.06	14.50	279.86	-90.22	2,057.57	-308.90	1,497.54	1,203.19	294.36	5.088		
9,900.00	9,319.19	9,328.24	9,325.79	15.84	279.85	-90.22	2,057.57	-308.90	1,415.17	1,119.48	295.69	4.786		
10,000.00	9,318.93	9,327.98	9,325.53	17.31	279.84	-90.22	2,057.57	-308.90	1,333.11	1,035.95	297.15	4.486		
10,100.00	9,318.66	9,327.71	9,325.26	18.85	279.83	-90.21	2,057.57	-308.90	1,251.51	952.83	298.68	4.190		
10,200.00	9,318.39	9,327.44	9,324.99	20.43	279.82	-90.21	2,057.57	-308.90	1,170.60	870.35	300.25	3.899		
10,300.00	9,318.13	9,327.18	9,324.73	22.03	279.82	-90.20	2,057.57	-308.90	1,090.63	788.79	301.84	3.613		
10,400.00	9,317.86	9,326.91	9,324.46	23.65	279.81	-90.19	2,057.57	-308.90	1,011.94	708.49	303.45	3.335		

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 Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandrill Freedom)
MD Reference: RKB @ 3635.40ft (Scandrill Freedom)
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. 17, T 19S., R 32 E - USA Trig Fed 1 (Offset Well, Inc Only Svy, No Plat SHL) - Wellbore #1 - Well													Offset Site Error:	0.00 ft
Survey Program: 280-Inclinometer only													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	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)						
10,500.00	9,317.59	9,326.64	9,324.19	25.27	279.80	-90.18	2,057.57	-308.90	934.95	629.88	305.07	3.065		
10,531.97	9,317.51	9,326.56	9,324.11	25.80	279.80	-90.17	2,057.57	-308.90	910.79	605.19	305.60	2.980		
10,600.00	9,317.33	9,326.38	9,323.93	26.90	279.79	-90.16	2,057.57	-308.90	860.79	554.10	306.69	2.807		
10,700.00	9,317.07	9,326.12	9,323.67	28.51	279.78	-90.13	2,057.57	-308.90	792.19	483.90	308.29	2.570		
10,800.00	9,316.80	9,325.85	9,323.40	30.14	279.78	-90.11	2,057.57	-308.90	730.87	420.95	309.92	2.358		
10,900.00	9,316.54	9,325.59	9,323.14	31.80	279.77	-90.08	2,057.57	-308.90	678.81	367.24	311.57	2.179		
11,000.00	9,316.27	9,325.32	9,322.87	33.48	279.76	-90.05	2,057.57	-308.90	638.28	325.03	313.24	2.038		
11,100.00	9,316.01	9,325.06	9,322.61	35.18	279.75	-90.03	2,057.57	-308.90	611.56	296.63	314.93	1.942		
11,200.00	9,315.74	9,324.79	9,322.34	36.89	279.74	-90.00	2,057.57	-308.90	600.51	283.88	316.63	1.897		
11,216.95	9,315.70	9,324.75	9,322.30	37.18	279.74	-90.00	2,057.57	-308.90	600.28	283.35	316.92	1.894 CC, ES, SF		
11,300.00	9,315.48	9,324.53	9,322.08	38.61	279.74	-89.98	2,057.57	-308.90	605.99	287.65	318.35	1.904		
11,400.00	9,315.21	9,324.27	9,321.81	40.34	279.73	-89.95	2,057.57	-308.90	627.56	307.50	320.07	1.961		
11,500.00	9,314.95	9,324.00	9,321.55	42.08	279.72	-89.93	2,057.57	-308.90	663.66	341.86	321.80	2.062		
11,600.00	9,314.69	9,323.74	9,321.29	43.83	279.71	-89.90	2,057.57	-308.90	712.08	388.54	323.54	2.201		
11,700.00	9,314.42	9,323.47	9,321.02	45.58	279.70	-89.88	2,057.57	-308.90	770.50	445.21	325.29	2.369		
11,800.00	9,314.16	9,323.21	9,320.76	47.34	279.70	-89.85	2,057.57	-308.90	836.82	509.78	327.04	2.559		
11,900.00	9,313.89	9,322.94	9,320.49	49.11	279.69	-89.83	2,057.57	-308.90	909.33	580.53	328.80	2.766		
12,000.00	9,313.63	9,357.00	9,354.51	50.88	280.71	-93.07	2,057.57	-308.90	987.25	655.66	331.59	2.977		
12,100.00	9,313.36	9,357.00	9,354.51	52.66	280.71	-93.07	2,057.57	-308.90	1,068.31	734.94	333.37	3.205		
12,200.00	9,313.10	9,357.00	9,354.51	54.44	280.71	-93.07	2,057.57	-308.90	1,152.35	817.21	335.15	3.438		
12,300.00	9,312.83	9,357.00	9,354.51	56.22	280.71	-93.07	2,057.57	-308.90	1,238.77	901.84	336.93	3.677		
12,400.00	9,312.57	9,357.00	9,354.51	58.01	280.71	-93.07	2,057.57	-308.90	1,327.09	988.37	338.72	3.918		
12,500.00	9,312.31	9,357.00	9,354.51	59.80	280.71	-93.07	2,057.57	-308.90	1,416.97	1,076.46	340.51	4.161		
12,600.00	9,312.04	9,357.00	9,354.51	61.59	280.71	-93.07	2,057.57	-308.90	1,508.12	1,165.82	342.30	4.406		
12,700.00	9,311.78	9,357.00	9,354.51	63.38	280.71	-93.07	2,057.57	-308.90	1,600.33	1,256.24	344.09	4.651		
12,800.00	9,311.51	9,357.00	9,354.51	65.18	280.71	-93.07	2,057.57	-308.90	1,693.42	1,347.53	345.89	4.896		
12,900.00	9,311.25	9,357.00	9,354.51	66.98	280.71	-93.07	2,057.57	-308.90	1,787.26	1,439.57	347.69	5.140		
13,000.00	9,310.98	9,357.00	9,354.51	68.78	280.71	-93.07	2,057.57	-308.90	1,881.74	1,532.25	349.49	5.384		
13,100.00	9,310.72	9,357.00	9,354.51	70.58	280.71	-93.07	2,057.57	-308.90	1,976.76	1,625.46	351.29	5.627		
13,200.00	9,310.45	9,357.00	9,354.51	72.39	280.71	-93.07	2,057.57	-308.90	2,072.24	1,719.15	353.10	5.869		
13,300.00	9,310.19	9,357.00	9,354.51	74.19	280.71	-93.07	2,057.57	-308.90	2,168.14	1,813.23	354.90	6.109		
13,400.00	9,309.93	9,357.00	9,354.51	76.00	280.71	-93.07	2,057.57	-308.90	2,264.39	1,907.68	356.71	6.348		
13,500.00	9,309.66	9,357.00	9,354.51	77.81	280.71	-93.07	2,057.57	-308.90	2,360.95	2,002.43	358.52	6.585		
13,600.00	9,309.40	9,357.00	9,354.51	79.62	280.71	-93.07	2,057.57	-308.90	2,457.78	2,097.46	360.33	6.821		
13,700.00	9,309.13	9,357.00	9,354.51	81.43	280.71	-93.07	2,057.57	-308.90	2,554.86	2,192.73	362.14	7.055		
13,800.00	9,308.87	9,357.00	9,354.51	83.24	280.71	-93.07	2,057.57	-308.90	2,652.16	2,288.21	363.95	7.287		
13,900.00	9,308.60	9,357.00	9,354.51	85.05	280.71	-93.07	2,057.57	-308.90	2,749.65	2,383.89	365.76	7.518		
14,000.00	9,308.34	9,357.00	9,354.51	86.86	280.71	-93.07	2,057.57	-308.90	2,847.32	2,479.74	367.57	7.746		
14,100.00	9,308.07	9,357.00	9,354.51	88.68	280.71	-93.07	2,057.57	-308.90	2,945.14	2,575.75	369.39	7.973		
14,200.00	9,307.81	9,357.00	9,354.51	90.49	280.71	-93.07	2,057.57	-308.90	3,043.10	2,671.90	371.20	8.198		
14,300.00	9,307.55	9,357.00	9,354.51	92.31	280.71	-93.07	2,057.57	-308.90	3,141.19	2,768.17	373.02	8.421		
14,400.00	9,307.28	9,316.33	9,313.88	94.13	279.49	-89.20	2,057.57	-308.90	3,239.14	2,865.53	373.62	8.670		
14,500.00	9,307.02	9,316.07	9,313.62	95.94	279.48	-89.17	2,057.57	-308.90	3,337.46	2,962.04	375.43	8.890		
14,600.00	9,306.75	9,315.80	9,313.35	97.76	279.47	-89.15	2,057.57	-308.90	3,435.88	3,058.64	377.23	9.108		
14,700.00	9,306.49	9,315.54	9,313.09	99.58	279.47	-89.12	2,057.57	-308.90	3,534.38	3,155.34	379.05	9.324		
14,800.00	9,306.22	9,315.27	9,312.82	101.40	279.46	-89.10	2,057.57	-308.90	3,632.97	3,252.11	380.86	9.539		
14,900.00	9,305.96	9,315.01	9,312.56	103.22	279.45	-89.07	2,057.57	-308.90	3,731.63	3,348.97	382.67	9.752		
15,000.00	9,305.70	9,314.75	9,312.30	105.04	279.44	-89.05	2,057.57	-308.90	3,830.36	3,445.88	384.48	9.962		
15,100.00	9,305.43	9,314.48	9,312.03	106.86	279.43	-89.02	2,057.57	-308.90	3,929.16	3,542.87	386.29	10.171		
15,200.00	9,305.17	9,314.22	9,311.77	108.68	279.43	-88.99	2,057.57	-308.90	4,028.01	3,639.91	388.11	10.379		
15,300.00	9,304.90	9,313.95	9,311.50	110.50	279.42	-88.97	2,057.57	-308.90	4,126.92	3,737.01	389.92	10.584		
15,400.00	9,304.64	9,313.69	9,311.24	112.32	279.41	-88.94	2,057.57	-308.90	4,225.89	3,834.15	391.73	10.788		

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



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S. , R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandril Freedom)
MD Reference: RKB @ 3635.40ft (Scandril Freedom)
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. 17, T 19S. , R 32 E - USA Trig Fed 1 (Offset Well, Inc Only Svy, No Plat SHL) - Wellbore #1 - Well													Offset Site Error:	0.00 ft
Survey Program: 280-Inclinometer only													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		
15,500.00	9,304.37	9,313.42	9,310.97	114.14	279.40	-88.92	2,057.57	-308.90	4,324.89	3,931.35	393.55	10.990		
15,600.00	9,304.11	9,313.16	9,310.71	115.97	279.40	-88.89	2,057.57	-308.90	4,423.95	4,028.59	395.36	11.190		
15,700.00	9,303.84	9,312.90	9,310.44	117.79	279.39	-88.87	2,057.57	-308.90	4,523.04	4,125.87	397.18	11.388		
15,800.00	9,303.58	9,312.63	9,310.18	119.61	279.38	-88.84	2,057.57	-308.90	4,622.18	4,223.19	398.99	11.585		
15,900.00	9,303.32	9,312.37	9,309.92	121.44	279.37	-88.82	2,057.57	-308.90	4,721.35	4,320.54	400.81	11.780		
16,000.00	9,303.05	9,312.10	9,309.65	123.26	279.36	-88.79	2,057.57	-308.90	4,820.55	4,417.93	402.62	11.973		
16,100.00	9,302.79	9,311.84	9,309.39	125.08	279.36	-88.77	2,057.57	-308.90	4,919.79	4,515.35	404.44	12.164		
16,200.00	9,302.52	9,311.57	9,309.12	126.91	279.35	-88.74	2,057.57	-308.90	5,019.06	4,612.80	406.26	12.354		
16,300.00	9,302.26	9,311.31	9,308.86	128.73	279.34	-88.72	2,057.57	-308.90	5,118.35	4,710.28	408.07	12.543		
16,400.00	9,301.99	9,311.04	9,308.59	130.56	279.33	-88.69	2,057.57	-308.90	5,217.68	4,807.79	409.89	12.729		
16,500.00	9,301.73	9,310.78	9,308.33	132.38	279.32	-88.67	2,057.57	-308.90	5,317.02	4,905.32	411.71	12.915		
16,600.00	9,301.46	9,310.52	9,308.06	134.21	279.32	-88.64	2,057.57	-308.90	5,416.40	5,002.87	413.52	13.098		
16,700.00	9,301.20	9,310.25	9,307.80	136.03	279.31	-88.62	2,057.57	-308.90	5,515.79	5,100.45	415.34	13.280		
16,800.00	9,300.94	9,309.99	9,307.54	137.86	279.30	-88.59	2,057.57	-308.90	5,615.21	5,198.05	417.16	13.461		
16,900.00	9,300.67	9,309.72	9,307.27	139.68	279.29	-88.57	2,057.57	-308.90	5,714.64	5,295.67	418.98	13.640		
17,000.00	9,300.41	9,309.46	9,307.01	141.51	279.28	-88.54	2,057.57	-308.90	5,814.10	5,393.30	420.80	13.817		
17,100.00	9,300.14	9,309.19	9,306.74	143.34	279.28	-88.52	2,057.57	-308.90	5,913.57	5,490.96	422.61	13.993		
17,153.74	9,300.00	9,309.05	9,306.60	144.32	279.27	-88.50	2,057.57	-308.90	5,967.03	5,543.44	423.59	14.087		



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandril Freedom)
MD Reference: RKB @ 3635.40ft (Scandril Freedom)
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

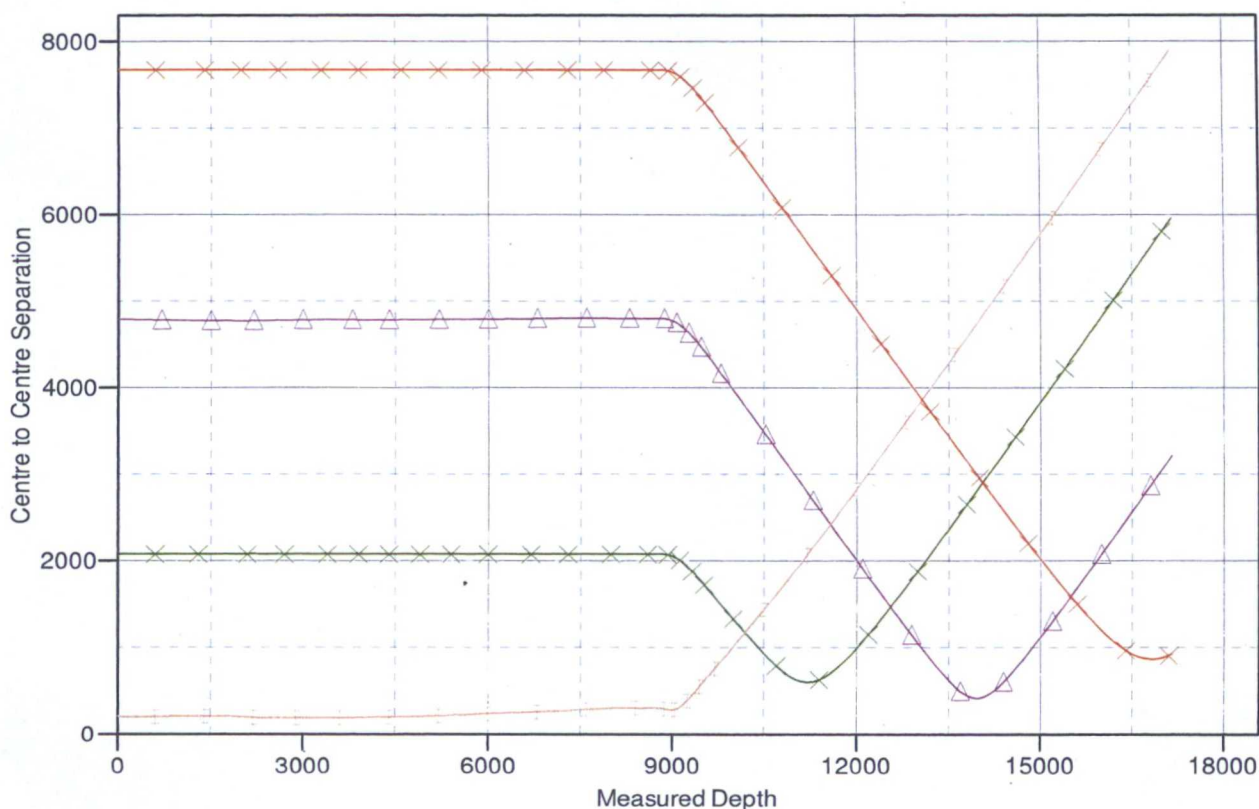
Reference Depths are relative to RKB @ 3635.40ft (Scandril Freedom) Coordinates are relative to: King Air 8 Fed Com #3H

Offset Depths are relative to Offset Datum

Central Meridian is 104° 20' 0.000 W

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.29°

Ladder Plot



LEGEND

IL, Wellbore #1, Wellbore #1 V0 — Lusk Deep Unit A#22, Wellbore #1, Wellbore #1 V0
— Bonanza Fed Com 1 (Offset Well, Inc Only), Wellbore #1, Wellbore #1 V0



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 17, T 19S., R 32 E
Site Error: 5.00 ft
Reference Well: King Air 8 Fed Com #3H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan#1

Local Co-ordinate Reference: Well King Air 8 Fed Com #3H
TVD Reference: RKB @ 3635.40ft (Scandrift Freedom)
MD Reference: RKB @ 3635.40ft (Scandrift Freedom)
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

Reference Depths are relative to RKB @ 3635.40ft (Scandrift Freedom) Coordinates are relative to: King Air 8 Fed Com #3H

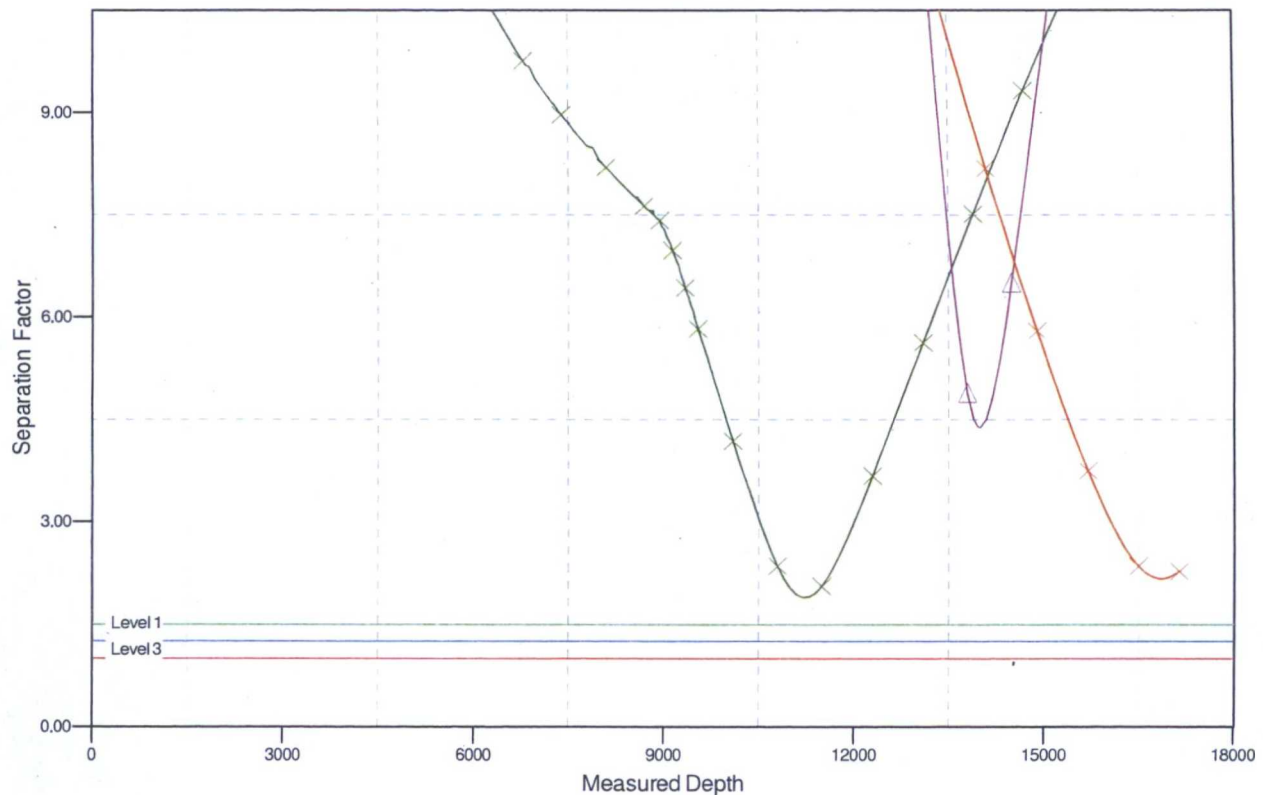
Offset Depths are relative to Offset Datum

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Central Meridian is 104° 20' 0.000 W

Grid Convergence at Surface is: 0.29°

Separation Factor Plot



LEGEND

IL, Wellbore #1, Wellbore #1 V0 — Lusk Deep Unit A#22, Wellbore #1, Wellbore #1 V0
J — Bonanza Fed Com 1 (Offset Well, Inc Only), Wellbore #1, Wellbore #1 V0



COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 17, T 19S., R 32 E
Well: King Air 8 Fed Com #3H
Wellbore: Wellbore #1
Plan: Plan#1 (King Air 8 Fed Com #3H/Wellbore #1)
Scandrift Freedom



WELL DETAILS: King Air 8 Fed Com #3H

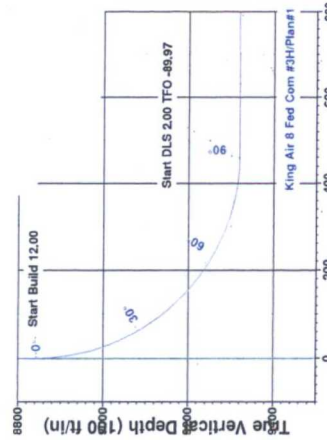
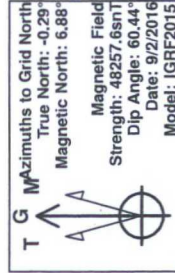
Ground Elevation:: 3609.40
RKB Elevation: RKB @ 3635.40ft (Scandrift Freedom)
Rig Name: Scandrift Freedom

Northing 606605.40
Easting 667159.70
Latitude 32° 39' 59.339 N
Longitude 103° 47' 24.493 W

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	8842.54	0.00	0.00	8842.54	0.00	0.00	0.00	0.00	0.00
3	9593.78	90.15	18.35	9320.00	454.37	150.71	12.00	18.35	458.83
4	10531.97	90.15	359.59	9317.51	1376.94	296.30	2.00	-89.97	1385.48
5	17153.74	90.15	359.59	9300.00	7998.52	248.50	0.00	0.00	8002.38

PROJECT DETAILS: Lea County, NM (NAD27 NME)
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

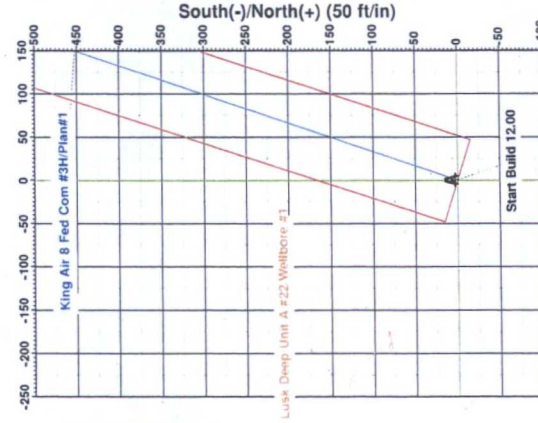


Vertical Section at 1.78° (100 ft/in)

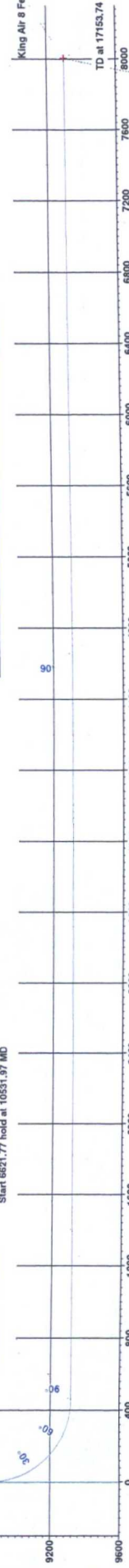
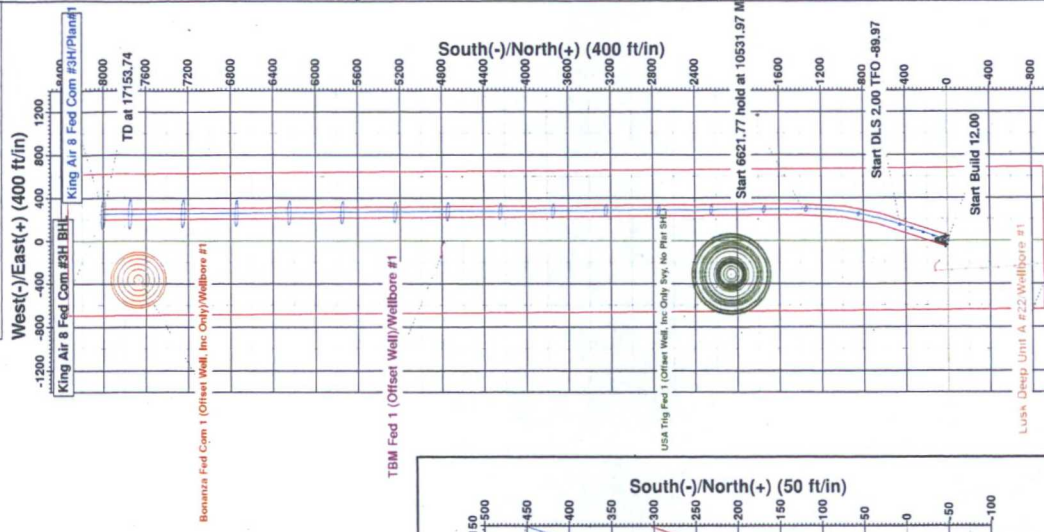
Start Build 12.00

Start DLS 2.00 TFO -89.97

Start 6621.77 hold at 10531.97 MD

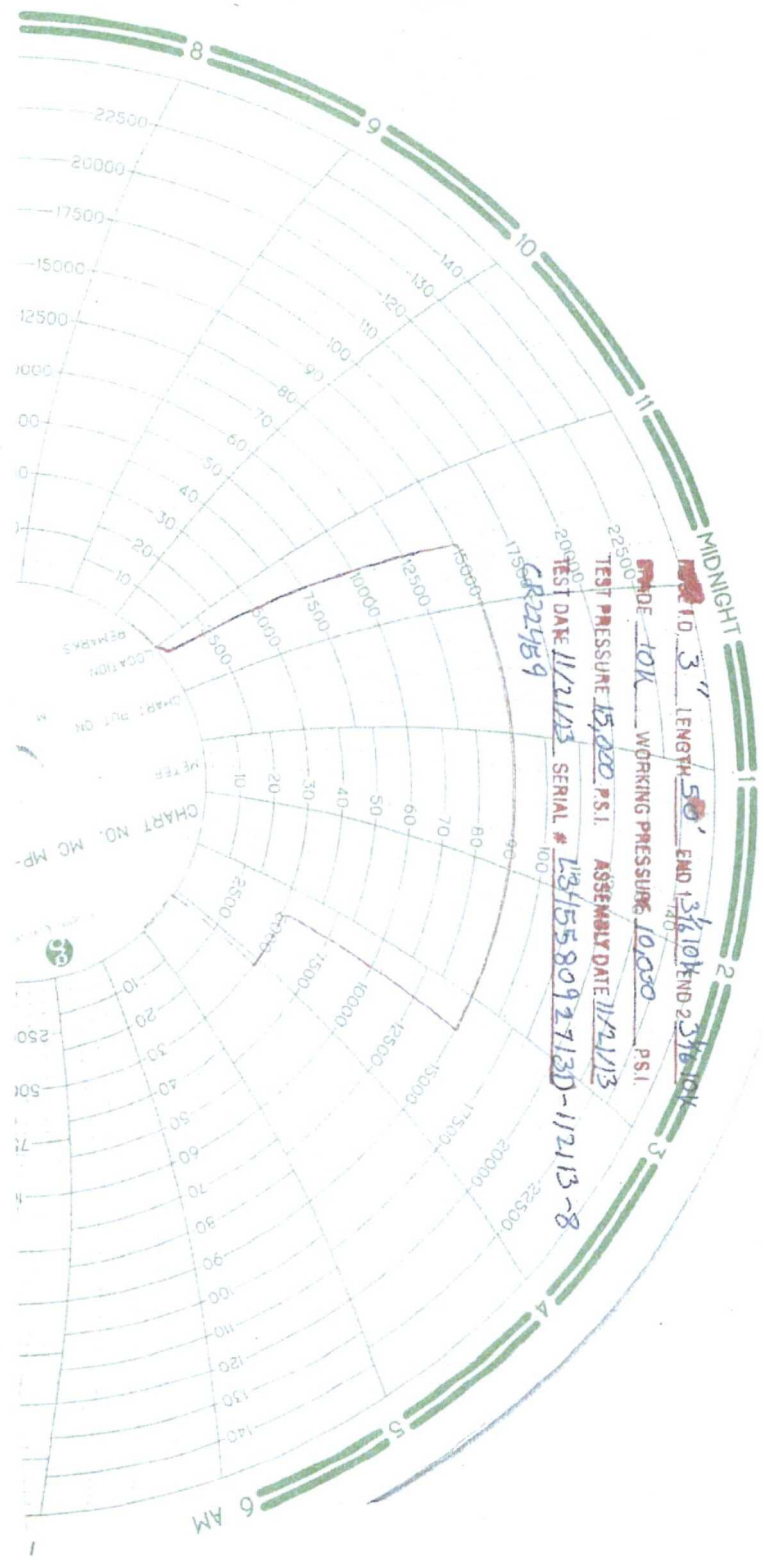


South(-)/North(+) (50 ft/in)



Vertical Section at 1.78° (200 ft/in)

King Air 8 Fed Com #3H/Plan#1



MIDNIGHT

1.0 3" LENGTH 50' END 13/10 END 23/6 10K

MADE 10K WORKING PRESSURE 10,000 PSI.

TEST PRESSURE 15,000 PSI. ASSEMBLY DATE 11/21/13

TEST DATE 11/21/13 SERIAL # 1341558092713D-112113-8

CR22459

6 AM



GATES E & S NORTH AMERICA, INC
DU-TEX
134 44TH STREET
CORPUS CHRISTI, TEXAS 78405

PHONE: 361-887-9807
FAX: 361-887-0812
EMAIL: crpe&s@gates.com
WEB: www.gates.com

10K CHOKE & KILL ASSEMBLY PRESSURE TEST CERTIFICATE

Customer :	SPECIALTY SALES, INC.	Test Date:	11/21/2013
Customer Ref. :	49680-S	Hose Serial No.:	D-112113-8
Invoice No. :	197465	Created By:	Norma M.
Product Description:	10K3.050.0CK31/1610KFLGE/E		
End Fitting 1 :	3 1/16 10K FLG	End Fitting 2 :	3 1/16 10K FLG
Gates Part No. :	47773-4290	Assembly Code :	L34558092713D-112113-8
Working Pressure :	10,000 PSI	Test Pressure :	15,000 PSI

Gates E & S North America, Inc. certifies that the following hose assembly has been tested to the Gates Oilfield Roughneck Agreement/Specification requirements and passed the 15 minute hydrostatic test per API Spec 7K/Q1, Fifth Edition, June 2010, Test pressure 9.6.7 and per Table 9 to 15,000 psi in accordance with this product number. Hose burst pressure 9.6.7.2 exceeds the minimum of 2.5 times the working pressure per Table 9.

Quality Manager :
Date :
Signature :

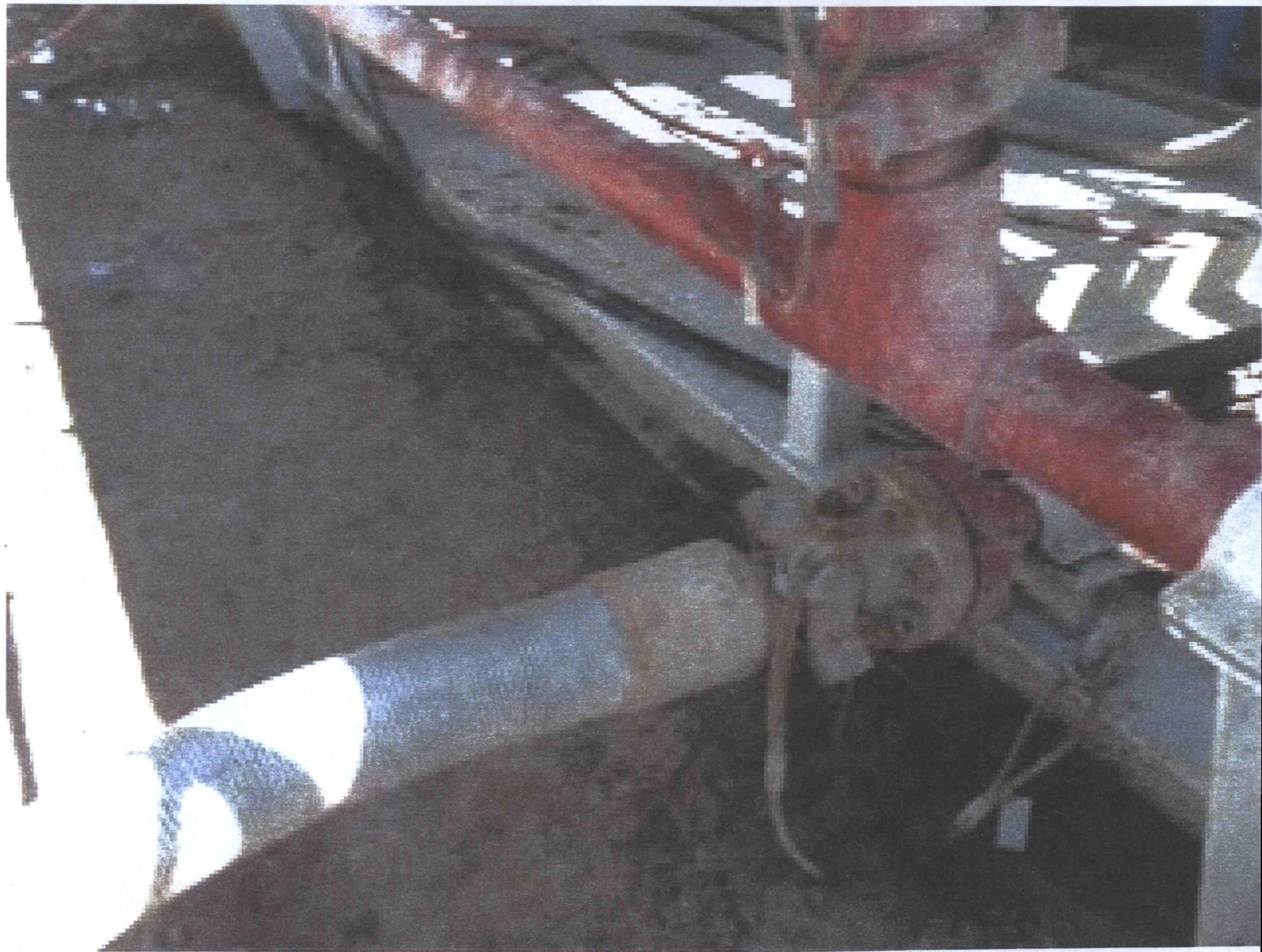
QUALITY
11/22/2013

Technical Supervisor :
Date :
Signature :

PRODUCTION
11/21/2013

Form PTC - 01 Rev.0 2







PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating, LLC
LEASE NO.:	NMNM-036100
WELL NAME & NO.:	King Air 8 Federal Com 3H
SURFACE HOLE FOOTAGE:	0410' FNL & 1960' FWL
BOTTOM HOLE FOOTAGE:	2310' FSL & 2260' FWL
LOCATION:	Section 17, T. 19 S., R 32 E., NMPM
COUNTY:	Lea County, New Mexico

All previous COAs still apply except for the following:

A. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

MHH 09202016