

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

Carlsbad Field Office

HOBBS OGD

5. Lease Serial No. NMNM125658

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

NOV 28 2018

RECEIVED

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other2. Name of Operator
COG OPERATING LLCContact: MAYTE X REYES
E-Mail: mreyes1@concho.com7. If Unit or CA/Agreement, Name and/or No.
FEZ FEDERAL COM 702H9. API Well No.
30-025-452783a. Address
2208 WEST MAIN STREET
ARTESIA, NM 882103b. Phone No. (include area code)
Ph: 575-748-694510. Field and Pool or Exploratory Area
WILDCAT; WOLFBONE

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

Sec 9 T25S R35E SWSW 280FSL 1115FWL

11. County or Parish, State

LEA COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	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 recomplete 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 must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must 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 originally approved APD.

BHL

From: 200' FNL & 1310' FWL Section 4, T25S, R35E.

To: 200' FNL & 1570' FWL Section 4, T25S, R35E

MD TD change to 22,397? and a TVD change to 12,282?.

C102 Attached.

AC Report Attached.

Directional Plan Attached.

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

Electronic Submission #442393 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Hobbs
Committed to AFMSS for processing by MUSTAFA HAQUE on 11/02/2018 ()

Name (Printed/Typed) MAYTE X REYES

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 11/02/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By

Mustafa Haque

Title

Petroleum Engineer

Date

11-02-2018

Carlsbad Field Office

Office

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.

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.

(Instructions on page 2)

** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED **

KZ

DISTRICT I
1525 N. FRANCH DR., SUITE 200, NM 87505
Phone: (505) 255-4181 Fax: (505) 255-0720

DISTRICT II
511 S. FIRST ST., ARTESIA, NM 86210
Phone: (505) 746-1253 Fax: (505) 746-0720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-8170 Fax: (505) 334-8170

DISTRICT IV
1250 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3460

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-025-45278	Pool Code 98098	Pool Name Wildcat; Wolfbone
Property Code 322742	Property Name FEZ FEDERAL COM	Well Number 702H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3251.8'

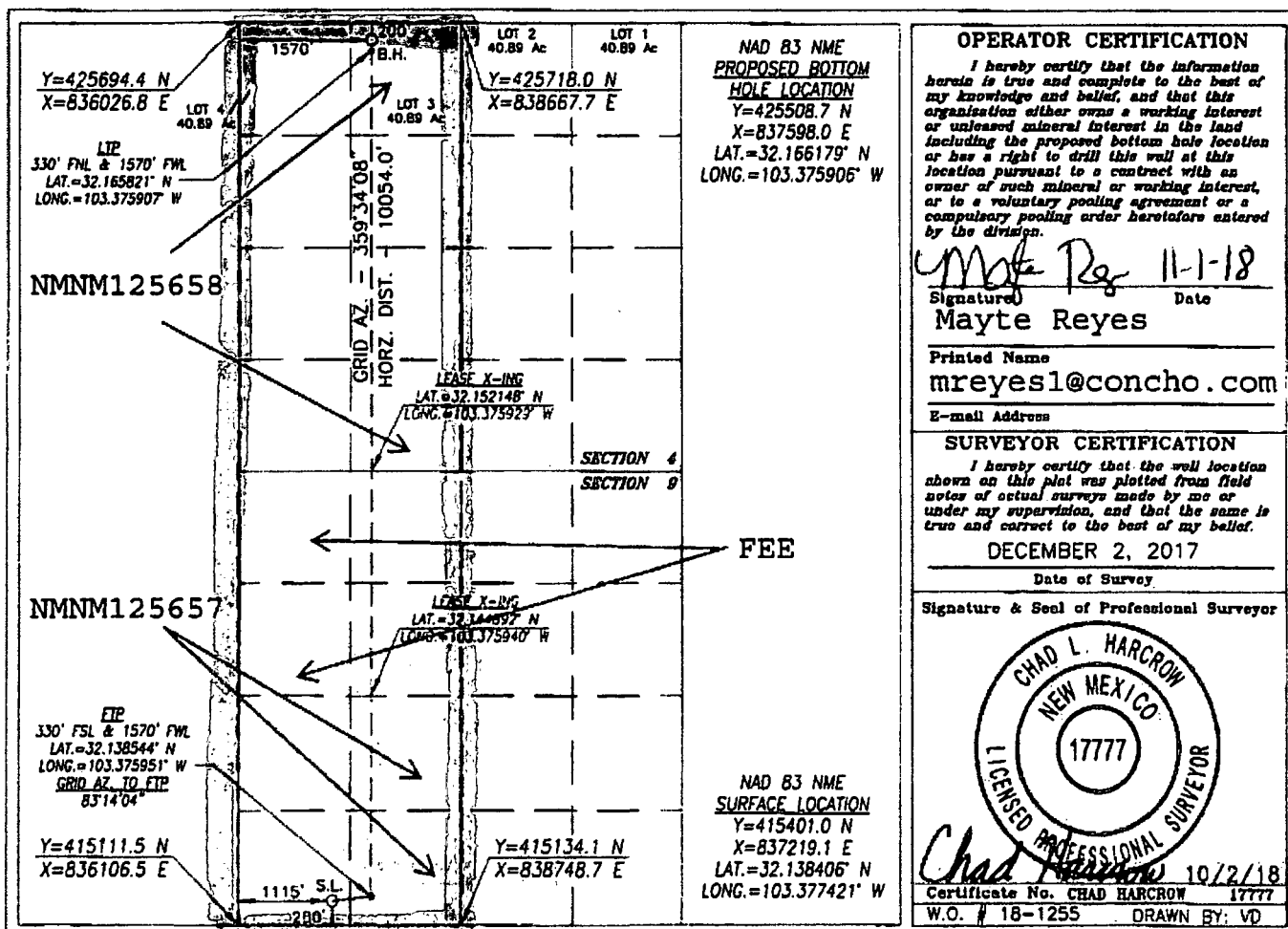
Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	9	25-S	35-E		280	SOUTH	1115	WEST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
43	4	25-S	35-E		200	NORTH	1570	WEST	LEA
Dedicated Acres 639.8	Joint or Infill	Consolidation Code	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



As per LR2000: Lot 3: 39.89 Lot 4: 39.91

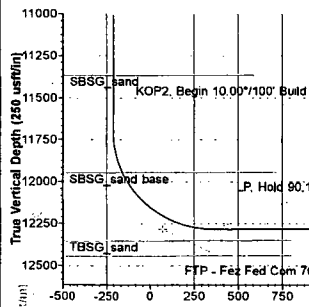
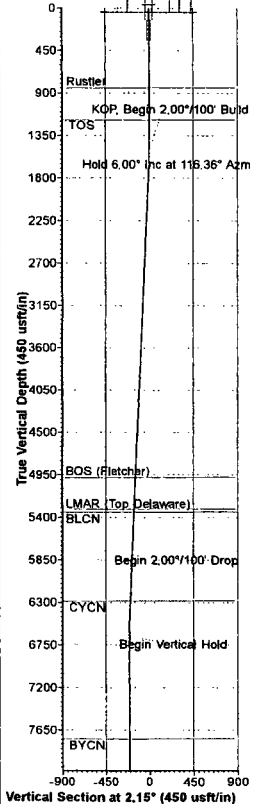


Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH
Design: Plan 1 10-12-18
Rig: Precision 595



Azimuths to Grid North
True North: -0.51°
Magnetic North: 6.17°
Magnetic Field
Strength: 47836.3nT
Dip Angle: 59.80°
Date: 10/11/2018
Model: MVHD

KB=25° @ 3276.80usft (Precision 595)
3251.80

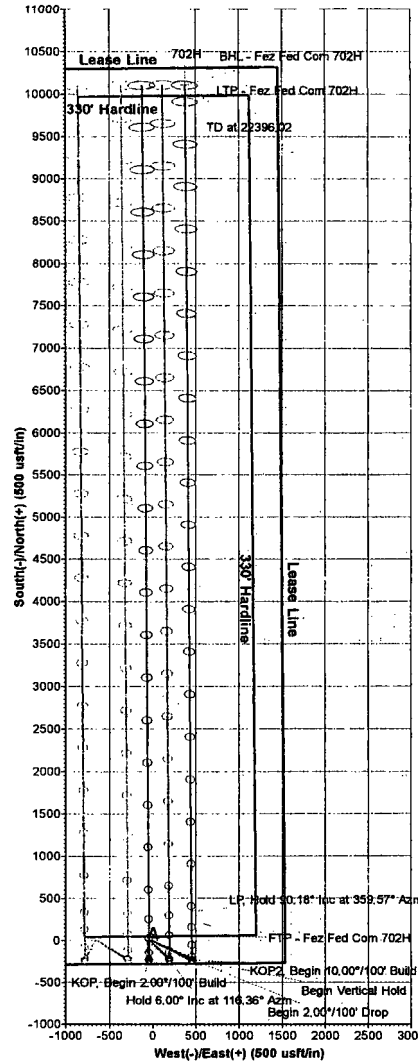
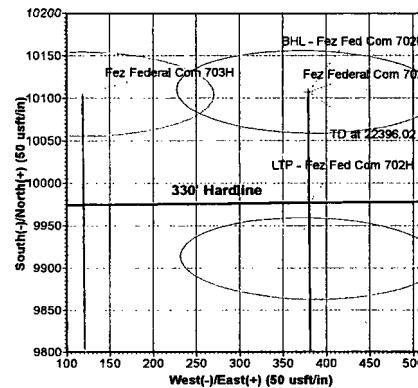
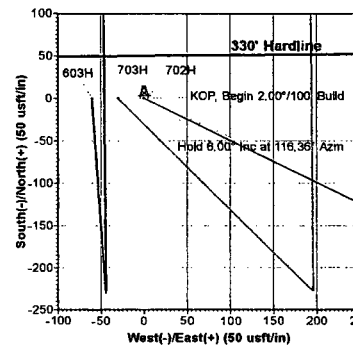
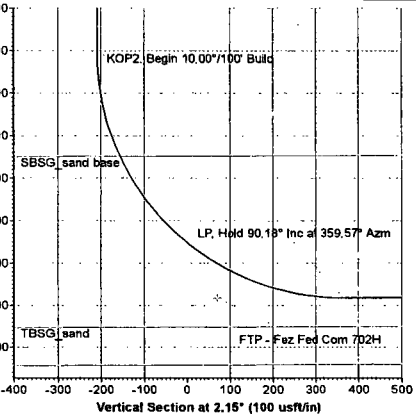


WELL DETAILS						
			3251.80			
+N/S	+E/W	Northing	Easting	Latitude	Longitude	
0.00	0.00	415342.70	796032.50	32° 8' 17.80969 N	103° 22' 37.03705 W	

DESIGN TARGET DETAILS									
Name	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude		
BHL - Fez Fed Com 702H	12252.00	10107.40	379.30	425450.10	796411.80	32° 9' 57.79017 N	103° 22' 31.58034 W		
LTP - Fez Fed Com 702H	12252.37	9977.23	380.45	425319.93	796412.95	32° 9' 56.50200 N	103° 22' 31.58040 W		
FTP - Fez Fed Com 702H	12282.00	53.71	454.51	415396.41	796487.01	32° 8' 18.30120 N	103° 22' 31.74690 W		

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Diag	TFace	VSecl
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00
3	1789.79	5.00	116.36	1799.24	-6.98	14.04	2.00	118.36	-6.43
4	6374.33	8.00	116.36	6348.70	-215.13	442.18	0.00	0.00	-202.40
5	6874.12	0.00	0.00	6848.00	-226.00	458.72	2.00	180.00	-208.82
6	11735.16	0.00	0.00	11709.04	-228.09	458.22	0.00	0.00	-208.82
7	12636.92	90.18	359.57	12282.00	348.61	451.95	10.00	359.57	365.32
8	22396.02	90.18	359.57	12252.00	10107.40	379.30	0.00	0.00	0.00

LEGEND									
---	604H, OH, Plan 1 10-12-18 VO								
---	603H, OH, Plan 1 10-12-18 VO								
---	703H, OH, Plan 1 10-12-18 VO								
---	704H, OH, Plan 1 10-12-18 VO								
---	Plan 1 10-12-18								





COG Operating LLC

Lea County, NM (NAD27 NME)

Fez Federal Com

702H

OH

Plan: Plan 1 10-12-18

Standard Planning Report

12 October, 2018



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH
Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Lea County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Fez Federal Com			
Site Position:		Northing:	415,342.20 usft	Latitude: 32° 8' 17.81002 N
From:	Map	Easting:	795,972.50 usft	Longitude: 103° 22' 37.73484 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.51 °

Well:	702H			
Well Position	+N/-S	0.50 usft	Northing:	415,342.70 usft
	+E/-W	60.00 usft	Easting:	796,032.50 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	Ground Level: 3,251.80 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	10/11/2018	6.68	59.80	47,836.34305950

Design	Plan 1 10-12-18			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	2.15

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,799.79	6.00	116.36	1,799.24	-6.96	14.04	2.00	2.00	0.00	116.36	
6,374.33	6.00	116.36	6,348.76	-219.13	442.18	0.00	0.00	0.00	0.00	
6,674.12	0.00	0.00	6,648.00	-226.09	456.22	2.00	-2.00	0.00	180.00	
11,735.16	0.00	0.00	11,709.04	-226.09	456.22	0.00	0.00	0.00	0.00	
12,636.92	90.18	359.57	12,282.00	348.61	451.95	10.00	10.00	-0.05	359.57	
22,396.02	90.18	359.57	12,252.00	10,107.40	379.30	0.00	0.00	0.00	0.00	BHL - Fez Fed Com 7

Database: USA Compass
 Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Site: Fez Federal Com
 Well: 702H
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Local Co-ordinate Reference: Well 702H
 TVD Reference: KB=25' @ 3276.80usft (Precision 595)
 MD Reference: KB=25' @ 3276.80usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
843.00	0.00	0.00	843.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,184.00	0.00	0.00	1,184.00	0.00	0.00	0.00	0.00	0.00	0.00
TOS									
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 2.00°/100' Build									
1,600.00	2.00	116.36	1,599.98	-0.77	1.56	-0.72	2.00	2.00	0.00
1,700.00	4.00	116.36	1,699.84	-3.10	6.25	-2.86	2.00	2.00	0.00
1,799.79	6.00	116.36	1,799.24	-6.96	14.04	-6.43	2.00	2.00	0.00
Hold 6.00° Inc at 116.36° Azm									
1,800.00	6.00	116.36	1,799.45	-6.97	14.06	-6.44	0.00	0.00	0.00
1,900.00	6.00	116.36	1,898.91	-11.61	23.42	-10.72	0.00	0.00	0.00
2,000.00	6.00	116.36	1,998.36	-16.24	32.78	-15.00	0.00	0.00	0.00
2,100.00	6.00	116.36	2,097.81	-20.88	42.14	-19.29	0.00	0.00	0.00
2,200.00	6.00	116.36	2,197.26	-25.52	51.50	-23.57	0.00	0.00	0.00
2,300.00	6.00	116.36	2,296.72	-30.16	60.86	-27.86	0.00	0.00	0.00
2,400.00	6.00	116.36	2,396.17	-34.80	70.22	-32.14	0.00	0.00	0.00
2,500.00	6.00	116.36	2,495.62	-39.44	79.58	-36.42	0.00	0.00	0.00
2,600.00	6.00	116.36	2,595.08	-44.07	88.94	-40.71	0.00	0.00	0.00
2,700.00	6.00	116.36	2,694.53	-48.71	98.29	-44.99	0.00	0.00	0.00
2,800.00	6.00	116.36	2,793.98	-53.35	107.65	-49.28	0.00	0.00	0.00
2,900.00	6.00	116.36	2,893.43	-57.99	117.01	-53.56	0.00	0.00	0.00
3,000.00	6.00	116.36	2,992.89	-62.63	126.37	-57.84	0.00	0.00	0.00
3,100.00	6.00	116.36	3,092.34	-67.26	135.73	-62.13	0.00	0.00	0.00
3,200.00	6.00	116.36	3,191.79	-71.90	145.09	-66.41	0.00	0.00	0.00
3,300.00	6.00	116.36	3,291.25	-76.54	154.45	-70.69	0.00	0.00	0.00
3,400.00	6.00	116.36	3,390.70	-81.18	163.81	-74.98	0.00	0.00	0.00
3,500.00	6.00	116.36	3,490.15	-85.82	173.17	-79.26	0.00	0.00	0.00
3,600.00	6.00	116.36	3,589.61	-90.45	182.53	-83.55	0.00	0.00	0.00
3,700.00	6.00	116.36	3,689.06	-95.09	191.89	-87.83	0.00	0.00	0.00
3,800.00	6.00	116.36	3,788.51	-99.73	201.25	-92.11	0.00	0.00	0.00
3,900.00	6.00	116.36	3,887.96	-104.37	210.61	-96.40	0.00	0.00	0.00
4,000.00	6.00	116.36	3,987.42	-109.01	219.96	-100.68	0.00	0.00	0.00
4,100.00	6.00	116.36	4,086.87	-113.65	229.32	-104.97	0.00	0.00	0.00
4,200.00	6.00	116.36	4,186.32	-118.28	238.68	-109.25	0.00	0.00	0.00
4,300.00	6.00	116.36	4,285.78	-122.92	248.04	-113.53	0.00	0.00	0.00
4,400.00	6.00	116.36	4,385.23	-127.56	257.40	-117.82	0.00	0.00	0.00
4,500.00	6.00	116.36	4,484.68	-132.20	266.76	-122.10	0.00	0.00	0.00
4,600.00	6.00	116.36	4,584.14	-136.84	276.12	-126.38	0.00	0.00	0.00
4,700.00	6.00	116.36	4,683.59	-141.47	285.48	-130.67	0.00	0.00	0.00
4,800.00	6.00	116.36	4,783.04	-146.11	294.84	-134.95	0.00	0.00	0.00
4,900.00	6.00	116.36	4,882.49	-150.75	304.20	-139.24	0.00	0.00	0.00
4,997.49	6.00	116.36	4,979.45	-155.27	313.32	-143.41	0.00	0.00	0.00
BOS (Fletcher)									
5,000.00	6.00	116.36	4,981.95	-155.39	313.56	-143.52	0.00	0.00	0.00
5,100.00	6.00	116.36	5,081.40	-160.03	322.92	-147.80	0.00	0.00	0.00
5,200.00	6.00	116.36	5,180.85	-164.66	332.28	-152.09	0.00	0.00	0.00
5,300.00	6.00	116.36	5,280.31	-169.30	341.63	-156.37	0.00	0.00	0.00
5,330.36	6.00	116.36	5,310.50	-170.71	344.48	-157.67	0.00	0.00	0.00
LMAR (Top Delaware)									
5,362.54	6.00	116.36	5,342.50	-172.20	347.49	-159.05	0.00	0.00	0.00
BLCN									

Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH
Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.00	6.00	116.36	5,379.76	-173.94	350.99	-160.66	0.00	0.00	0.00
5,500.00	6.00	116.36	5,479.21	-178.58	360.35	-164.94	0.00	0.00	0.00
5,600.00	6.00	116.36	5,578.66	-183.22	369.71	-169.22	0.00	0.00	0.00
5,700.00	6.00	116.36	5,678.12	-187.86	379.07	-173.51	0.00	0.00	0.00
5,800.00	6.00	116.36	5,777.57	-192.49	388.43	-177.79	0.00	0.00	0.00
5,900.00	6.00	116.36	5,877.02	-197.13	397.79	-182.08	0.00	0.00	0.00
6,000.00	6.00	116.36	5,976.48	-201.77	407.15	-186.36	0.00	0.00	0.00
6,100.00	6.00	116.36	6,075.93	-206.41	416.51	-190.64	0.00	0.00	0.00
6,200.00	6.00	116.36	6,175.38	-211.05	425.87	-194.93	0.00	0.00	0.00
6,300.00	6.00	116.36	6,274.84	-215.68	435.23	-199.21	0.00	0.00	0.00
6,306.83	6.00	116.36	6,281.63	-216.00	435.87	-199.50	0.00	0.00	0.00
CYCN									
6,374.33	6.00	116.36	6,348.76	-219.13	442.18	-202.40	0.00	0.00	0.00
Begin 2.00°/100' Drop									
6,400.00	5.48	116.36	6,374.30	-220.27	444.48	-203.45	2.00	-2.00	0.00
6,500.00	3.48	116.36	6,473.99	-223.74	451.49	-206.65	2.00	-2.00	0.00
6,600.00	1.48	116.36	6,573.89	-225.66	455.37	-208.43	2.00	-2.00	0.00
6,674.12	0.00	0.00	6,648.00	-226.09	456.22	-208.82	2.00	-2.00	-157.00
Begin Vertical Hold									
7,767.77	0.00	0.00	7,741.66	-226.09	456.22	-208.82	0.00	0.00	0.00
BYCN									
8,998.77	0.00	0.00	8,972.66	-226.09	456.22	-208.82	0.00	0.00	0.00
Bone Sprg									
9,215.77	0.00	0.00	9,189.66	-226.09	456.22	-208.82	0.00	0.00	0.00
U Avalon									
9,579.77	0.00	0.00	9,553.66	-226.09	456.22	-208.82	0.00	0.00	0.00
L Avalon									
10,396.77	0.00	0.00	10,370.66	-226.09	456.22	-208.82	0.00	0.00	0.00
FBSP_sand									
10,916.77	0.00	0.00	10,890.66	-226.09	456.22	-208.82	0.00	0.00	0.00
SBSG_sand									
11,390.77	0.00	0.00	11,364.66	-226.09	456.22	-208.82	0.00	0.00	0.00
SBSG_sand									
11,735.16	0.00	0.00	11,709.04	-226.09	456.22	-208.82	0.00	0.00	0.00
KOP2, Begin 10.00°/100' Build									
11,800.00	6.48	359.57	11,773.74	-222.42	456.20	-205.16	10.00	10.00	0.00
11,900.00	16.48	359.57	11,871.62	-202.54	456.05	-185.30	10.00	10.00	0.00
11,981.09	24.59	359.57	11,947.49	-174.11	455.84	-156.90	10.00	10.00	0.00
SBSG_sand base									
12,000.00	26.48	359.57	11,964.55	-165.96	455.78	-148.76	10.00	10.00	0.00
12,100.00	36.48	359.57	12,049.72	-113.81	455.39	-96.65	10.00	10.00	0.00
12,200.00	46.48	359.57	12,124.54	-47.65	454.90	-30.56	10.00	10.00	0.00
12,300.00	56.48	359.57	12,186.73	30.49	454.31	47.51	10.00	10.00	0.00
12,400.00	66.48	359.57	12,234.41	118.25	453.66	135.18	10.00	10.00	0.00
12,500.00	76.48	359.57	12,266.13	212.95	452.96	229.78	10.00	10.00	0.00
12,600.00	86.48	359.57	12,280.92	311.72	452.22	328.46	10.00	10.00	0.00
12,636.92	90.18	359.57	12,282.00	348.61	451.95	365.32	10.00	10.00	0.00
LP, Hold 90.18° Inc at 359.57° Azm									
12,700.00	90.18	359.57	12,281.80	411.69	451.48	428.33	0.00	0.00	0.00
12,800.00	90.18	359.57	12,281.49	511.69	450.73	528.23	0.00	0.00	0.00
12,900.00	90.18	359.57	12,281.19	611.69	449.99	628.13	0.00	0.00	0.00
13,000.00	90.18	359.57	12,280.88	711.68	449.24	728.03	0.00	0.00	0.00

Database: USA Compass
 Company: COG Operating LLC
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 Site: Fez Federal Com
 Well: 702H
 Wellbore: OH
 Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
 TVD Reference: KB=25' @ 3276.80usft (Precision 595)
 MD Reference: KB=25' @ 3276.80usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,100.00	90.18	359.57	12,280.57	811.68	448.50	827.93	0.00	0.00	0.00
13,200.00	90.18	359.57	12,280.26	911.68	447.76	927.83	0.00	0.00	0.00
13,300.00	90.18	359.57	12,279.96	1,011.67	447.01	1,027.72	0.00	0.00	0.00
13,400.00	90.18	359.57	12,279.65	1,111.67	446.27	1,127.62	0.00	0.00	0.00
13,500.00	90.18	359.57	12,279.34	1,211.67	445.52	1,227.52	0.00	0.00	0.00
13,600.00	90.18	359.57	12,279.04	1,311.66	444.78	1,327.42	0.00	0.00	0.00
13,700.00	90.18	359.57	12,278.73	1,411.66	444.03	1,427.32	0.00	0.00	0.00
13,800.00	90.18	359.57	12,278.42	1,511.66	443.29	1,527.22	0.00	0.00	0.00
13,900.00	90.18	359.57	12,278.11	1,611.65	442.54	1,627.12	0.00	0.00	0.00
14,000.00	90.18	359.57	12,277.81	1,711.65	441.80	1,727.01	0.00	0.00	0.00
14,100.00	90.18	359.57	12,277.50	1,811.65	441.06	1,826.91	0.00	0.00	0.00
14,200.00	90.18	359.57	12,277.19	1,911.64	440.31	1,926.81	0.00	0.00	0.00
14,300.00	90.18	359.57	12,276.88	2,011.64	439.57	2,026.71	0.00	0.00	0.00
14,400.00	90.18	359.57	12,276.58	2,111.64	438.82	2,126.61	0.00	0.00	0.00
14,500.00	90.18	359.57	12,276.27	2,211.63	438.08	2,226.51	0.00	0.00	0.00
14,600.00	90.18	359.57	12,275.96	2,311.63	437.33	2,326.40	0.00	0.00	0.00
14,700.00	90.18	359.57	12,275.65	2,411.63	436.59	2,426.30	0.00	0.00	0.00
14,800.00	90.18	359.57	12,275.35	2,511.62	435.84	2,526.20	0.00	0.00	0.00
14,900.00	90.18	359.57	12,275.04	2,611.62	435.10	2,626.10	0.00	0.00	0.00
15,000.00	90.18	359.57	12,274.73	2,711.62	434.36	2,726.00	0.00	0.00	0.00
15,100.00	90.18	359.57	12,274.42	2,811.61	433.61	2,825.90	0.00	0.00	0.00
15,200.00	90.18	359.57	12,274.12	2,911.61	432.87	2,925.80	0.00	0.00	0.00
15,300.00	90.18	359.57	12,273.81	3,011.61	432.12	3,025.69	0.00	0.00	0.00
15,400.00	90.18	359.57	12,273.50	3,111.60	431.38	3,125.59	0.00	0.00	0.00
15,500.00	90.18	359.57	12,273.20	3,211.60	430.63	3,225.49	0.00	0.00	0.00
15,600.00	90.18	359.57	12,272.89	3,311.60	429.89	3,325.39	0.00	0.00	0.00
15,700.00	90.18	359.57	12,272.58	3,411.59	429.15	3,425.29	0.00	0.00	0.00
15,800.00	90.18	359.57	12,272.27	3,511.59	428.40	3,525.19	0.00	0.00	0.00
15,900.00	90.18	359.57	12,271.97	3,611.59	427.66	3,625.09	0.00	0.00	0.00
16,000.00	90.18	359.57	12,271.66	3,711.58	426.91	3,724.98	0.00	0.00	0.00
16,100.00	90.18	359.57	12,271.35	3,811.58	426.17	3,824.88	0.00	0.00	0.00
16,200.00	90.18	359.57	12,271.04	3,911.58	425.42	3,924.78	0.00	0.00	0.00
16,300.00	90.18	359.57	12,270.74	4,011.58	424.68	4,024.68	0.00	0.00	0.00
16,400.00	90.18	359.57	12,270.43	4,111.57	423.93	4,124.58	0.00	0.00	0.00
16,500.00	90.18	359.57	12,270.12	4,211.57	423.19	4,224.48	0.00	0.00	0.00
16,600.00	90.18	359.57	12,269.81	4,311.57	422.45	4,324.37	0.00	0.00	0.00
16,700.00	90.18	359.57	12,269.51	4,411.56	421.70	4,424.27	0.00	0.00	0.00
16,800.00	90.18	359.57	12,269.20	4,511.56	420.96	4,524.17	0.00	0.00	0.00
16,900.00	90.18	359.57	12,268.89	4,611.56	420.21	4,624.07	0.00	0.00	0.00
17,000.00	90.18	359.57	12,268.59	4,711.55	419.47	4,723.97	0.00	0.00	0.00
17,100.00	90.18	359.57	12,268.28	4,811.55	418.72	4,823.87	0.00	0.00	0.00
17,200.00	90.18	359.57	12,267.97	4,911.55	417.98	4,923.77	0.00	0.00	0.00
17,300.00	90.18	359.57	12,267.66	5,011.54	417.23	5,023.66	0.00	0.00	0.00
17,400.00	90.18	359.57	12,267.36	5,111.54	416.49	5,123.56	0.00	0.00	0.00
17,500.00	90.18	359.57	12,267.05	5,211.54	415.75	5,223.46	0.00	0.00	0.00
17,600.00	90.18	359.57	12,266.74	5,311.53	415.00	5,323.36	0.00	0.00	0.00
17,700.00	90.18	359.57	12,266.43	5,411.53	414.26	5,423.26	0.00	0.00	0.00
17,800.00	90.18	359.57	12,266.13	5,511.53	413.51	5,523.16	0.00	0.00	0.00
17,900.00	90.18	359.57	12,265.82	5,611.52	412.77	5,623.06	0.00	0.00	0.00
18,000.00	90.18	359.57	12,265.51	5,711.52	412.02	5,722.95	0.00	0.00	0.00
18,100.00	90.18	359.57	12,265.20	5,811.52	411.28	5,822.85	0.00	0.00	0.00
18,200.00	90.18	359.57	12,264.90	5,911.51	410.54	5,922.75	0.00	0.00	0.00
18,300.00	90.18	359.57	12,264.59	6,011.51	409.79	6,022.65	0.00	0.00	0.00
18,400.00	90.18	359.57	12,264.28	6,111.51	409.05	6,122.55	0.00	0.00	0.00



Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH
Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,500.00	90.18	359.57	12,263.97	6,211.50	408.30	6,222.45	0.00	0.00	0.00
18,600.00	90.18	359.57	12,263.67	6,311.50	407.56	6,322.34	0.00	0.00	0.00
18,700.00	90.18	359.57	12,263.36	6,411.50	406.81	6,422.24	0.00	0.00	0.00
18,800.00	90.18	359.57	12,263.05	6,511.49	406.07	6,522.14	0.00	0.00	0.00
18,900.00	90.18	359.57	12,262.75	6,611.49	405.32	6,622.04	0.00	0.00	0.00
19,000.00	90.18	359.57	12,262.44	6,711.49	404.58	6,721.94	0.00	0.00	0.00
19,100.00	90.18	359.57	12,262.13	6,811.48	403.84	6,821.84	0.00	0.00	0.00
19,200.00	90.18	359.57	12,261.82	6,911.48	403.09	6,921.74	0.00	0.00	0.00
19,300.00	90.18	359.57	12,261.52	7,011.48	402.35	7,021.63	0.00	0.00	0.00
19,400.00	90.18	359.57	12,261.21	7,111.47	401.60	7,121.53	0.00	0.00	0.00
19,500.00	90.18	359.57	12,260.90	7,211.47	400.86	7,221.43	0.00	0.00	0.00
19,600.00	90.18	359.57	12,260.59	7,311.47	400.11	7,321.33	0.00	0.00	0.00
19,700.00	90.18	359.57	12,260.29	7,411.47	399.37	7,421.23	0.00	0.00	0.00
19,800.00	90.18	359.57	12,259.98	7,511.46	398.62	7,521.13	0.00	0.00	0.00
19,900.00	90.18	359.57	12,259.67	7,611.46	397.88	7,621.03	0.00	0.00	0.00
20,000.00	90.18	359.57	12,259.36	7,711.46	397.14	7,720.92	0.00	0.00	0.00
20,100.00	90.18	359.57	12,259.06	7,811.45	396.39	7,820.82	0.00	0.00	0.00
20,200.00	90.18	359.57	12,258.75	7,911.45	395.65	7,920.72	0.00	0.00	0.00
20,300.00	90.18	359.57	12,258.44	8,011.45	394.90	8,020.62	0.00	0.00	0.00
20,400.00	90.18	359.57	12,258.14	8,111.44	394.16	8,120.52	0.00	0.00	0.00
20,500.00	90.18	359.57	12,257.83	8,211.44	393.41	8,220.42	0.00	0.00	0.00
20,600.00	90.18	359.57	12,257.52	8,311.44	392.67	8,320.32	0.00	0.00	0.00
20,700.00	90.18	359.57	12,257.21	8,411.43	391.93	8,420.21	0.00	0.00	0.00
20,800.00	90.18	359.57	12,256.91	8,511.43	391.18	8,520.11	0.00	0.00	0.00
20,900.00	90.18	359.57	12,256.60	8,611.43	390.44	8,620.01	0.00	0.00	0.00
21,000.00	90.18	359.57	12,256.29	8,711.42	389.69	8,719.91	0.00	0.00	0.00
21,100.00	90.18	359.57	12,255.98	8,811.42	388.95	8,819.81	0.00	0.00	0.00
21,200.00	90.18	359.57	12,255.68	8,911.42	388.20	8,919.71	0.00	0.00	0.00
21,300.00	90.18	359.57	12,255.37	9,011.41	387.46	9,019.60	0.00	0.00	0.00
21,400.00	90.18	359.57	12,255.06	9,111.41	386.71	9,119.50	0.00	0.00	0.00
21,500.00	90.18	359.57	12,254.75	9,211.41	385.97	9,219.40	0.00	0.00	0.00
21,600.00	90.18	359.57	12,254.45	9,311.40	385.23	9,319.30	0.00	0.00	0.00
21,700.00	90.18	359.57	12,254.14	9,411.40	384.48	9,419.20	0.00	0.00	0.00
21,800.00	90.18	359.57	12,253.83	9,511.40	383.74	9,519.10	0.00	0.00	0.00
21,900.00	90.18	359.57	12,253.52	9,611.39	382.99	9,619.00	0.00	0.00	0.00
22,000.00	90.18	359.57	12,253.22	9,711.39	382.25	9,718.89	0.00	0.00	0.00
22,100.00	90.18	359.57	12,252.91	9,811.39	381.50	9,818.79	0.00	0.00	0.00
22,200.00	90.18	359.57	12,252.60	9,911.38	380.76	9,918.69	0.00	0.00	0.00
22,300.00	90.18	359.57	12,252.30	10,011.38	380.01	10,018.59	0.00	0.00	0.00
22,396.02	90.18	359.57	12,252.00	10,107.40	379.30	10,114.51	0.00	0.00	0.00

TD at 22396.02

Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH
Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL - Fez Fed Com 702 - plan hits target center - Point	0.00	0.00	12,252.00	10,107.40	379.30	425,450.10	796,411.80	32° 9' 57.79018 N	103° 22' 31.58034 W
LTP - Fez Fed Com 702I - plan misses target center by 0.19usft at 22265.84usft MD (12252.40 TVD, 9977.23 N, 380.27 E) - Point	0.00	0.00	12,252.37	9,977.23	380.45	425,319.93	796,412.95	32° 9' 56.50200 N	103° 22' 31.58040 W
FTP - Fez Fed Com 702 - plan misses target center by 70.67usft at 12365.96usft MD (12219.91 TVD, 87.46 N, 453.89 E) - Point	0.00	0.00	12,282.00	53.71	454.51	415,396.41	796,487.01	32° 8' 18.30120 N	103° 22' 31.74600 W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
843.00	843.00	Rustler		-0.18	2.15
1,184.00	1,184.00	TOS		-0.18	2.15
4,997.49	4,979.45	BOS (Fletcher)		-0.18	2.15
5,330.36	5,310.50	LMAR (Top Delaware)		-0.18	2.15
5,362.54	5,342.50	BLCN		-0.18	2.15
6,306.83	6,281.63	CYCN		-0.18	2.15
7,767.77	7,741.66	BYCN		-0.18	2.15
8,998.77	8,972.66	Bone Sprg		-0.18	2.15
9,215.77	9,189.66	U Avalon		-0.18	2.15
9,579.77	9,553.66	L Avalon		-0.18	2.15
10,396.77	10,370.66	FBSP_sand		-0.18	2.15
10,916.77	10,890.66	SBSG_sand		-0.18	2.15
11,390.77	11,364.66	SBSG_sand		-0.18	2.15
11,981.09	11,947.49	SBSG_sand base		-0.18	2.15

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,500.00	1,500.00	0.00	0.00	KOP, Begin 2.00°/100' Build
1,799.79	1,799.24	-6.96	14.04	Hold 6.00° Inc at 116.36° Azm
6,374.33	6,348.76	-219.13	442.18	Begin 2.00°/100' Drop
6,674.12	6,648.00	-226.09	456.22	Begin Vertical Hold
11,735.16	11,709.04	-226.09	456.22	KOP2, Begin 10.00°/100' Build
12,636.92	12,282.00	348.61	451.95	LP, Hold 90.18° Inc at 359.57° Azm
22,396.02	12,252.00	10,107.40	379.30	TD at 22396.02



COG Operating LLC

Lea County, NM (NAD27 NME)

Fez Federal Com

702H

OH

Plan 1 10-12-18

Anticollision Report

12 October, 2018





Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Reference Plan 1 10-12-18

Filter type: NO GLOBAL FILTER: Using user defined selection & filtering criteria

Interpolation Method: MD Interval 100.00usft

Depth Range: Unlimited

Results Limited by: Maximum center-center distance of 50,000.00 usft

Warning Levels Evaluated at: 2.00 Sigma

Error Model: ISCWSA

Scan Method: Closest Approach 3D

Error Surface: Major Axis

Casing Method: Not applied

Survey Tool Program Date 10/12/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	22,396.02	Plan 1 10-12-18 (OH)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

Summary

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Fez Federal Com						
603H - OH - Plan 1 10-12-18	1,500.00	1,499.90	60.00	49.70	5.822	CC, ES
603H - OH - Plan 1 10-12-18	22,396.02	22,394.02	500.09	196.03	1.645	SF
604H - OH - Plan 1 10-12-18	1,410.27	1,426.37	664.92	655.21	68.468	CC
604H - OH - Plan 1 10-12-18	1,500.00	1,514.54	664.94	654.60	64.266	ES
604H - OH - Plan 1 10-12-18	22,396.02	22,420.22	1,240.18	936.11	4.079	SF
703H - OH - Plan 1 10-12-18	1,500.00	1,498.80	29.90	19.60	2.902	CC
703H - OH - Plan 1 10-12-18	1,600.00	1,599.52	30.26	19.27	2.753	ES
703H - OH - Plan 1 10-12-18	22,396.02	22,563.04	973.43	609.98	1.223	Level 2, CC
704H - OH - Plan 1 10-12-18	1,733.05	1,792.54	632.89	620.81	52.367	CC
704H - OH - Plan 1 10-12-18	22,396.02	22,584.14	767.20	463.09	2.523	ES, SF

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18

Survey Program: 0-MWD+HDGM

Offset Site Error: 0.00 usft

Offset Well Error: 0.00 usft

Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	0.00	0.00	0.00	0.00	-90.48	-0.50	-60.00	60.00				
100.00	100.00	99.90	99.90	0.13	0.13	-90.48	-0.50	-60.00	60.00	59.73	0.27	223.289	
200.00	200.00	199.90	199.90	0.49	0.49	-90.48	-0.50	-60.00	60.00	59.02	0.99	60.889	
300.00	300.00	299.90	299.90	0.85	0.85	-90.48	-0.50	-60.00	60.00	58.30	1.70	35.246	
400.00	400.00	399.90	399.90	1.21	1.21	-90.48	-0.50	-60.00	60.00	57.58	2.42	24.801	
500.00	500.00	499.90	499.90	1.57	1.57	-90.48	-0.50	-60.00	60.00	56.87	3.14	19.132	
600.00	600.00	599.90	599.90	1.93	1.93	-90.48	-0.50	-60.00	60.00	56.15	3.85	15.572	
700.00	700.00	699.90	699.90	2.29	2.28	-90.48	-0.50	-60.00	60.00	55.43	4.57	13.129	
800.00	800.00	799.90	799.90	2.64	2.64	-90.48	-0.50	-60.00	60.00	54.71	5.29	11.349	
900.00	900.00	899.90	899.90	3.00	3.00	-90.48	-0.50	-60.00	60.00	54.00	6.00	9.994	
1,000.00	1,000.00	999.90	999.90	3.36	3.36	-90.48	-0.50	-60.00	60.00	53.28	6.72	8.928	
1,100.00	1,100.00	1,099.90	1,099.90	3.72	3.72	-90.48	-0.50	-60.00	60.00	52.56	7.44	8.067	
1,200.00	1,200.00	1,199.90	1,199.90	4.08	4.08	-90.48	-0.50	-60.00	60.00	51.85	8.15	7.358	
1,300.00	1,300.00	1,299.90	1,299.90	4.44	4.44	-90.48	-0.50	-60.00	60.00	51.13	8.87	6.763	
1,400.00	1,400.00	1,399.90	1,399.90	4.79	4.79	-90.48	-0.50	-60.00	60.00	50.41	9.59	6.258	
1,500.00	1,500.00	1,499.90	1,499.90	5.15	5.15	-90.48	-0.50	-60.00	60.00	49.70	10.31	5.822	CC, ES
1,600.00	1,599.98	1,600.00	1,599.98	5.50	5.49	152.26	-2.24	-59.88	61.46	50.47	10.99	5.591	

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18														Offset Site Error:	0.00 usft
Survey/Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore +N/-S (usft)	Centre +E/-W (usft)							
1,700.00	1,699.84	1,699.92	1,699.76	5.84	5.82	149.79	-7.46	-59.51	65.90	54.25	11.66	5.654			
1,800.00	1,799.45	1,799.48	1,798.94	6.18	6.15	146.34	-16.10	-58.89	73.53	61.20	12.33	5.965			
1,900.00	1,898.91	1,898.94	1,897.85	6.52	6.48	143.12	-26.47	-58.16	82.93	69.92	13.00	6.377			
2,000.00	1,998.36	1,998.41	1,996.77	6.87	6.82	140.57	-36.83	-57.42	92.53	78.84	13.69	6.758			
2,100.00	2,097.81	2,097.87	2,095.69	7.23	7.16	138.50	-47.19	-56.69	102.29	87.90	14.39	7.108			
2,200.00	2,197.26	2,197.33	2,194.61	7.59	7.51	136.79	-57.56	-55.95	112.15	97.06	15.10	7.429			
2,300.00	2,296.72	2,296.79	2,293.52	7.95	7.86	135.35	-67.92	-55.22	122.10	106.29	15.81	7.723			
2,400.00	2,396.17	2,396.25	2,392.44	8.31	8.22	134.14	-78.29	-54.48	132.11	115.59	16.53	7.993			
2,500.00	2,495.62	2,495.71	2,491.36	8.67	8.58	133.09	-88.65	-53.75	142.18	124.93	17.25	8.242			
2,600.00	2,595.08	2,595.17	2,590.27	9.04	8.94	132.18	-99.02	-53.01	152.28	134.30	17.98	8.471			
2,700.00	2,694.53	2,694.63	2,689.19	9.41	9.30	131.39	-109.38	-52.27	162.42	143.71	18.71	8.682			
2,800.00	2,793.98	2,794.10	2,788.11	9.78	9.66	130.69	-119.75	-51.54	172.58	153.14	19.44	8.877			
2,900.00	2,893.43	2,893.56	2,887.03	10.15	10.03	130.07	-130.11	-50.80	182.77	162.59	20.18	9.057			
3,000.00	2,992.89	2,993.02	2,985.94	10.52	10.40	129.51	-140.48	-50.07	192.97	172.06	20.92	9.225			
3,100.00	3,092.34	3,092.48	3,084.86	10.90	10.76	129.01	-150.84	-49.33	203.20	181.54	21.66	9.381			
3,200.00	3,191.79	3,191.94	3,183.78	11.27	11.13	128.56	-161.21	-48.60	213.43	191.03	22.40	9.526			
3,300.00	3,291.25	3,291.40	3,282.69	11.65	11.50	128.15	-171.57	-47.86	223.68	200.53	23.15	9.662			
3,400.00	3,390.70	3,390.86	3,381.61	12.02	11.88	127.77	-181.94	-47.13	233.94	210.04	23.90	9.789			
3,500.00	3,490.15	3,490.32	3,480.53	12.40	12.25	127.43	-192.30	-46.39	244.21	219.56	24.65	9.908			
3,600.00	3,589.61	3,589.79	3,579.44	12.78	12.62	127.11	-202.66	-45.66	254.48	229.08	25.40	10.020			
3,700.00	3,689.06	3,689.25	3,678.36	13.15	13.00	126.82	-213.03	-44.92	264.76	238.61	26.15	10.125			
3,800.00	3,788.51	3,791.89	3,780.56	13.53	13.38	126.79	-222.44	-44.25	274.57	247.66	26.91	10.203			
3,900.00	3,887.96	3,895.30	3,883.80	13.91	13.76	127.46	-228.27	-43.84	283.04	255.37	27.67	10.231			
4,000.00	3,987.42	3,998.59	3,987.07	14.29	14.11	128.76	-230.37	-43.69	290.25	261.85	28.40	10.220			
4,100.00	4,086.87	4,098.29	4,086.77	14.67	14.45	130.33	-230.38	-43.69	296.92	267.81	29.11	10.199			
4,200.00	4,186.32	4,197.75	4,186.22	15.05	14.78	131.83	-230.38	-43.69	303.81	273.98	29.83	10.186			
4,300.00	4,285.78	4,297.20	4,285.68	15.43	15.11	133.26	-230.38	-43.69	310.89	280.35	30.54	10.179			
4,400.00	4,385.23	4,396.65	4,385.13	15.81	15.45	134.63	-230.38	-43.69	318.16	286.91	31.26	10.179			
4,500.00	4,484.68	4,496.11	4,484.58	16.19	15.78	135.93	-230.38	-43.69	325.61	293.63	31.97	10.183			
4,600.00	4,584.14	4,595.56	4,584.04	16.57	16.12	137.18	-230.38	-43.69	333.21	300.52	32.69	10.192			
4,700.00	4,683.59	4,695.01	4,683.49	16.95	16.46	138.37	-230.38	-43.69	340.96	307.55	33.41	10.205			
4,800.00	4,783.04	4,794.46	4,782.94	17.34	16.80	139.51	-230.38	-43.69	348.86	314.73	34.13	10.221			
4,900.00	4,882.49	4,893.92	4,882.39	17.72	17.14	140.59	-230.38	-43.69	356.88	322.03	34.85	10.240			
5,000.00	4,981.95	4,993.37	4,981.85	18.10	17.48	141.63	-230.38	-43.69	365.03	329.46	35.58	10.261			
5,100.00	5,081.40	5,092.82	5,081.30	18.48	17.82	142.62	-230.38	-43.69	373.30	337.00	36.30	10.284			
5,200.00	5,180.85	5,192.28	5,180.75	18.86	18.16	143.57	-230.38	-43.69	381.66	344.64	37.02	10.309			
5,300.00	5,280.31	5,291.73	5,280.21	19.25	18.50	144.48	-230.38	-43.69	390.13	352.39	37.75	10.336			
5,400.00	5,379.76	5,391.18	5,379.66	19.63	18.84	145.35	-230.38	-43.69	398.70	360.23	38.47	10.363			
5,500.00	5,479.21	5,490.64	5,479.11	20.01	19.18	146.19	-230.38	-43.69	407.35	368.15	39.20	10.392			
5,600.00	5,578.66	5,590.09	5,578.56	20.40	19.53	146.99	-230.38	-43.69	416.08	376.16	39.92	10.422			
5,700.00	5,678.12	5,689.54	5,678.02	20.78	19.87	147.75	-230.38	-43.69	424.89	384.24	40.65	10.452			
5,800.00	5,777.57	5,788.99	5,777.47	21.16	20.22	148.49	-230.38	-43.69	433.78	392.40	41.38	10.483			
5,900.00	5,877.02	5,888.45	5,876.92	21.55	20.56	149.19	-230.38	-43.69	442.73	400.62	42.11	10.514			
6,000.00	5,976.48	5,987.90	5,976.38	21.93	20.90	149.87	-230.38	-43.69	451.75	408.91	42.84	10.546			
6,100.00	6,075.93	6,087.35	6,075.83	22.32	21.25	150.52	-230.38	-43.69	460.82	417.26	43.57	10.578			
6,200.00	6,175.38	6,186.81	6,175.28	22.70	21.60	151.15	-230.38	-43.69	469.95	425.66	44.30	10.610			
6,300.00	6,274.84	6,286.26	6,274.74	23.08	21.94	151.75	-230.38	-43.69	479.14	434.12	45.03	10.642			
6,400.00	6,374.30	6,385.72	6,374.20	23.47	22.29	152.34	-230.38	-43.69	488.28	442.52	45.76	10.671			
6,500.00	6,473.99	6,485.41	6,473.89	23.84	22.64	152.83	-230.38	-43.69	495.22	448.74	46.48	10.655			
6,600.00	6,573.89	6,585.31	6,573.79	24.20	22.98	153.09	-230.38	-43.69	499.08	451.89	47.18	10.577			
6,700.00	6,673.88	6,685.31	6,673.78	24.54	23.33	-90.49	-230.38	-43.69	499.93	452.05	47.87	10.444			
6,800.00	6,773.88	6,785.31	6,773.78	24.86	23.68	-90.49	-230.38	-43.69	499.93	451.39	48.55	10.298			

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
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Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
6,900.00	6,873.88	6,885.31	6,873.78	25.19	24.03	-90.49	-230.38	-43.69	499.93	450.71	49.23	10.156		
7,000.00	6,973.88	6,985.31	6,973.78	25.52	24.38	-90.49	-230.38	-43.69	499.93	450.03	49.91	10.017		
7,100.00	7,073.88	7,085.31	7,073.78	25.85	24.73	-90.49	-230.38	-43.69	499.93	449.35	50.59	9.883		
7,200.00	7,173.88	7,185.31	7,173.78	26.19	25.08	-90.49	-230.38	-43.69	499.93	448.66	51.27	9.751		
7,300.00	7,273.88	7,285.31	7,273.78	26.52	25.43	-90.49	-230.38	-43.69	499.93	447.98	51.95	9.623		
7,400.00	7,373.88	7,385.31	7,373.78	26.85	25.79	-90.49	-230.38	-43.69	499.93	447.30	52.64	9.498		
7,500.00	7,473.88	7,485.31	7,473.78	27.18	26.14	-90.49	-230.38	-43.69	499.93	446.61	53.32	9.376		
7,600.00	7,573.88	7,585.31	7,573.78	27.52	26.49	-90.49	-230.38	-43.69	499.93	445.93	54.01	9.257		
7,700.00	7,673.88	7,685.31	7,673.78	27.85	26.84	-90.49	-230.38	-43.69	499.93	445.24	54.69	9.141		
7,800.00	7,773.88	7,785.31	7,773.78	28.19	27.19	-90.49	-230.38	-43.69	499.93	444.55	55.38	9.027		
7,900.00	7,873.88	7,885.31	7,873.78	28.52	27.54	-90.49	-230.38	-43.69	499.93	443.87	56.07	8.917		
8,000.00	7,973.88	7,985.31	7,973.78	28.86	27.90	-90.49	-230.38	-43.69	499.93	443.18	56.76	8.808		
8,100.00	8,073.88	8,085.31	8,073.78	29.20	28.25	-90.49	-230.38	-43.69	499.93	442.49	57.45	8.703		
8,200.00	8,173.88	8,185.31	8,173.78	29.54	28.60	-90.49	-230.38	-43.69	499.93	441.80	58.14	8.599		
8,300.00	8,273.88	8,285.31	8,273.78	29.87	28.95	-90.49	-230.38	-43.69	499.93	441.11	58.83	8.499		
8,400.00	8,373.88	8,385.31	8,373.78	30.21	29.31	-90.49	-230.38	-43.69	499.93	440.42	59.52	8.400		
8,500.00	8,473.88	8,485.31	8,473.78	30.55	29.66	-90.49	-230.38	-43.69	499.93	439.72	60.21	8.303		
8,600.00	8,573.88	8,585.31	8,573.78	30.89	30.01	-90.49	-230.38	-43.69	499.93	439.03	60.90	8.209		
8,700.00	8,673.88	8,685.31	8,673.78	31.23	30.36	-90.49	-230.38	-43.69	499.93	438.34	61.59	8.117		
8,800.00	8,773.88	8,785.31	8,773.78	31.57	30.72	-90.49	-230.38	-43.69	499.93	437.65	62.29	8.026		
8,900.00	8,873.88	8,885.31	8,873.78	31.91	31.07	-90.49	-230.38	-43.69	499.93	436.95	62.98	7.938		
9,000.00	8,973.88	8,985.31	8,973.78	32.25	31.42	-90.49	-230.38	-43.69	499.93	436.26	63.68	7.851		
9,100.00	9,073.88	9,085.31	9,073.78	32.59	31.78	-90.49	-230.38	-43.69	499.93	435.56	64.37	7.767		
9,200.00	9,173.88	9,185.31	9,173.78	32.93	32.13	-90.49	-230.38	-43.69	499.93	434.87	65.07	7.684		
9,300.00	9,273.88	9,285.31	9,273.78	33.28	32.48	-90.49	-230.38	-43.69	499.93	434.17	65.76	7.602		
9,400.00	9,373.88	9,385.31	9,373.78	33.62	32.84	-90.49	-230.38	-43.69	499.93	433.48	66.46	7.523		
9,500.00	9,473.88	9,485.31	9,473.78	33.96	33.19	-90.49	-230.38	-43.69	499.93	432.78	67.15	7.445		
9,600.00	9,573.88	9,585.31	9,573.78	34.31	33.55	-90.49	-230.38	-43.69	499.93	432.08	67.85	7.368		
9,700.00	9,673.88	9,685.31	9,673.78	34.65	33.90	-90.49	-230.38	-43.69	499.93	431.38	68.55	7.293		
9,800.00	9,773.88	9,785.31	9,773.78	34.99	34.26	-90.49	-230.38	-43.69	499.93	430.69	69.25	7.220		
9,900.00	9,873.88	9,885.31	9,873.78	35.34	34.61	-90.49	-230.38	-43.69	499.93	429.99	69.95	7.147		
10,000.00	9,973.88	9,985.31	9,973.78	35.68	34.96	-90.49	-230.38	-43.69	499.93	429.29	70.64	7.077		
10,100.00	10,073.88	10,085.31	10,073.78	36.02	35.32	-90.49	-230.38	-43.69	499.93	428.59	71.34	7.007		
10,200.00	10,173.88	10,185.31	10,173.78	36.37	35.67	-90.49	-230.38	-43.69	499.93	427.89	72.04	6.939		
10,300.00	10,273.88	10,285.31	10,273.78	36.71	36.03	-90.49	-230.38	-43.69	499.93	427.19	72.74	6.873		
10,400.00	10,373.88	10,385.31	10,373.78	37.06	36.38	-90.49	-230.38	-43.69	499.93	426.49	73.44	6.807		
10,500.00	10,473.88	10,485.31	10,473.78	37.41	36.74	-90.49	-230.38	-43.69	499.93	425.79	74.14	6.743		
10,600.00	10,573.88	10,585.31	10,573.78	37.75	37.09	-90.49	-230.38	-43.69	499.93	425.09	74.84	6.680		
10,700.00	10,673.88	10,685.31	10,673.78	38.10	37.45	-90.49	-230.38	-43.69	499.93	424.39	75.54	6.618		
10,800.00	10,773.88	10,785.31	10,773.78	38.44	37.80	-90.49	-230.38	-43.69	499.93	423.69	76.25	6.557		
10,900.00	10,873.88	10,885.31	10,873.78	38.79	38.16	-90.49	-230.38	-43.69	499.93	422.99	76.95	6.497		
11,000.00	10,973.88	10,985.31	10,973.78	39.14	38.51	-90.49	-230.38	-43.69	499.93	422.28	77.65	6.438		
11,100.00	11,073.88	11,085.31	11,073.78	39.48	38.87	-90.49	-230.38	-43.69	499.93	421.58	78.35	6.381		
11,200.00	11,173.88	11,185.31	11,173.78	39.83	39.22	-90.49	-230.38	-43.69	499.93	420.88	79.05	6.324		
11,300.00	11,273.88	11,285.31	11,273.78	40.18	39.58	-90.49	-230.38	-43.69	499.93	420.18	79.76	6.268		
11,400.00	11,373.88	11,385.31	11,373.78	40.53	39.93	-90.49	-230.38	-43.69	499.93	419.47	80.46	6.213		
11,500.00	11,473.88	11,485.31	11,473.78	40.87	40.29	-90.49	-230.38	-43.69	499.93	418.77	81.16	6.160		
11,600.00	11,573.88	11,585.31	11,573.78	41.22	40.64	-90.49	-230.38	-43.69	499.93	418.07	81.87	6.107		
11,700.00	11,673.88	11,685.31	11,673.78	41.57	41.00	-90.49	-230.38	-43.69	499.93	417.36	82.57	6.055		
11,800.00	11,773.74	11,785.41	11,773.82	41.91	41.35	-90.22	-228.04	-43.71	499.94	416.67	83.27	6.004		
11,900.00	11,871.62	11,885.91	11,872.60	42.24	41.69	-90.47	-210.24	-43.84	499.95	416.02	83.93	5.957		
12,000.00	11,964.55	11,986.81	11,967.12	42.53	42.00	-90.71	-175.32	-44.10	499.97	415.44	84.53	5.915		

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

Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Com
 Site Error: 0.00 usft
 Reference Well: 702H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
 TVD Reference: KB=25' @ 3276.80usft (Precision 595)
 MD Reference: KB=25' @ 3276.80usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)
12,100.00	12,049.72	12,088.06	12,054.35	42.77	42.29	-90.93	-124.17	-44.48	500.00	414.94	85.06	5.878	
12,200.00	12,124.54	12,189.65	12,131.46	42.96	42.55	-91.13	-58.24	-44.97	500.03	414.52	85.51	5.848	
12,300.00	12,186.73	12,291.51	12,195.89	43.09	42.79	-91.28	20.48	-45.56	500.06	414.18	85.88	5.823	
12,400.00	12,234.41	12,393.60	12,245.48	43.17	43.01	-91.40	109.56	-46.22	500.08	413.89	86.19	5.802	
12,500.00	12,266.13	12,495.84	12,278.53	43.25	43.22	-91.47	206.16	-46.94	500.10	413.60	86.49	5.782	
12,600.00	12,280.92	12,598.16	12,293.90	43.42	43.43	-91.50	307.19	-47.69	500.10	413.22	86.89	5.756	
12,700.00	12,281.80	12,699.01	12,294.80	43.63	43.62	-91.50	408.01	-48.44	500.10	412.83	87.28	5.730	
12,800.00	12,281.49	12,799.01	12,294.49	43.88	43.87	-91.50	508.01	-49.19	500.10	412.35	87.76	5.699	
12,900.00	12,281.19	12,899.01	12,294.18	44.18	44.15	-91.50	608.00	-49.93	500.10	411.77	88.33	5.662	
13,000.00	12,280.88	12,999.01	12,293.88	44.52	44.48	-91.50	708.00	-50.67	500.10	411.10	89.00	5.619	
13,100.00	12,280.57	13,099.01	12,293.57	44.89	44.86	-91.50	808.00	-51.42	500.10	410.35	89.75	5.572	
13,200.00	12,280.26	13,199.01	12,293.26	45.31	45.28	-91.50	908.00	-52.16	500.10	409.51	90.59	5.520	
13,300.00	12,279.96	13,299.01	12,292.96	45.77	45.74	-91.50	1,007.99	-52.91	500.10	408.59	91.51	5.465	
13,400.00	12,279.65	13,399.01	12,292.65	46.27	46.24	-91.50	1,107.99	-53.65	500.10	407.60	92.51	5.406	
13,500.00	12,279.34	13,499.01	12,292.34	46.81	46.77	-91.50	1,207.99	-54.40	500.10	406.52	93.58	5.344	
13,600.00	12,279.04	13,599.01	12,292.03	47.38	47.35	-91.50	1,307.98	-55.14	500.10	405.37	94.73	5.279	
13,700.00	12,278.73	13,699.01	12,291.73	47.99	47.96	-91.50	1,407.98	-55.88	500.10	404.16	95.95	5.212	
13,800.00	12,278.42	13,799.01	12,291.42	48.63	48.61	-91.50	1,507.98	-56.63	500.10	402.87	97.24	5.143	
13,900.00	12,278.11	13,899.01	12,291.11	49.31	49.29	-91.50	1,607.97	-57.37	500.10	401.51	98.59	5.072	
14,000.00	12,277.81	13,999.01	12,290.80	50.01	50.00	-91.50	1,707.97	-58.12	500.10	400.09	100.01	5.001	
14,100.00	12,277.50	14,099.01	12,290.50	50.75	50.74	-91.50	1,807.97	-58.86	500.10	398.61	101.49	4.928	
14,200.00	12,277.19	14,199.01	12,290.19	51.52	51.51	-91.50	1,907.96	-59.61	500.10	397.07	103.03	4.854	
14,300.00	12,276.88	14,299.01	12,289.88	52.31	52.31	-91.50	2,007.96	-60.35	500.10	395.48	104.62	4.780	
14,400.00	12,276.58	14,399.01	12,289.57	53.14	53.14	-91.50	2,107.96	-61.09	500.10	393.83	106.27	4.706	
14,500.00	12,276.27	14,499.01	12,289.27	53.98	53.99	-91.50	2,207.95	-61.84	500.10	392.13	107.97	4.632	
14,600.00	12,275.96	14,599.01	12,288.96	54.86	54.86	-91.50	2,307.95	-62.58	500.10	390.38	109.72	4.558	
14,700.00	12,275.65	14,699.01	12,288.65	55.75	55.76	-91.50	2,407.95	-63.33	500.10	388.59	111.51	4.485	
14,800.00	12,275.35	14,799.01	12,288.34	56.67	56.69	-91.50	2,507.94	-64.07	500.10	386.75	113.35	4.412	
14,900.00	12,275.04	14,899.01	12,288.04	57.61	57.63	-91.50	2,607.94	-64.82	500.10	384.87	115.23	4.340	
15,000.00	12,274.73	14,999.01	12,287.73	58.56	58.59	-91.50	2,707.94	-65.56	500.10	382.95	117.16	4.269	
15,100.00	12,274.42	15,099.01	12,287.42	59.54	59.57	-91.50	2,807.93	-66.30	500.10	380.99	119.11	4.198	
15,200.00	12,274.12	15,199.01	12,287.12	60.54	60.57	-91.50	2,907.93	-67.05	500.10	378.99	121.11	4.129	
15,300.00	12,273.81	15,299.01	12,286.81	61.55	61.59	-91.50	3,007.93	-67.79	500.10	376.96	123.14	4.061	
15,400.00	12,273.50	15,399.01	12,286.50	62.58	62.62	-91.50	3,107.92	-68.54	500.10	374.90	125.20	3.994	
15,500.00	12,273.20	15,499.01	12,286.19	63.63	63.67	-91.50	3,207.92	-69.28	500.10	372.80	127.30	3.929	
15,600.00	12,272.89	15,599.01	12,285.89	64.69	64.74	-91.50	3,307.92	-70.03	500.10	370.68	129.42	3.864	
15,700.00	12,272.58	15,699.01	12,285.58	65.76	65.81	-91.50	3,407.91	-70.77	500.10	368.53	131.58	3.801	
15,800.00	12,272.27	15,799.01	12,285.27	66.85	66.91	-91.50	3,507.91	-71.51	500.10	366.35	133.75	3.739	
15,900.00	12,271.97	15,899.01	12,284.96	67.95	68.01	-91.50	3,607.91	-72.26	500.10	364.14	135.96	3.678	
16,000.00	12,271.66	15,999.01	12,284.66	69.06	69.13	-91.50	3,707.90	-73.00	500.10	361.91	138.19	3.619	
16,100.00	12,271.35	16,099.01	12,284.35	70.19	70.25	-91.50	3,807.90	-73.75	500.10	359.66	140.44	3.561	
16,200.00	12,271.04	16,199.01	12,284.04	71.32	71.39	-91.50	3,907.90	-74.49	500.10	357.38	142.72	3.504	
16,300.00	12,270.74	16,299.01	12,283.73	72.47	72.54	-91.50	4,007.89	-75.24	500.10	355.08	145.02	3.449	
16,400.00	12,270.43	16,399.01	12,283.43	73.63	73.70	-91.50	4,107.89	-75.98	500.10	352.77	147.33	3.394	
16,500.00	12,270.12	16,499.01	12,283.12	74.79	74.87	-91.50	4,207.89	-76.72	500.10	350.43	149.67	3.341	
16,600.00	12,269.81	16,599.01	12,282.81	75.97	76.05	-91.50	4,307.88	-77.47	500.10	348.08	152.02	3.290	
16,700.00	12,269.51	16,699.01	12,282.50	77.15	77.24	-91.50	4,407.88	-78.21	500.10	345.71	154.39	3.239	
16,800.00	12,269.20	16,799.01	12,282.20	78.35	78.43	-91.50	4,507.88	-78.96	500.10	343.32	156.78	3.190	
16,900.00	12,268.89	16,899.01	12,281.89	79.55	79.64	-91.50	4,607.88	-79.70	500.10	340.91	159.19	3.142	
17,000.00	12,268.59	16,999.01	12,281.58	80.76	80.85	-91.50	4,707.87	-80.45	500.10	338.49	161.61	3.095	
17,100.00	12,268.28	17,099.01	12,281.28	81.97	82.07	-91.50	4,807.87	-81.19	500.10	336.06	164.04	3.049	
17,200.00	12,267.97	17,199.01	12,280.97	83.20	83.29	-91.50	4,907.87	-81.93	500.10	333.61	166.49	3.004	

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (")	Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
17,300.00	12,267.66	17,299.01	12,280.66	84.43	84.52	-91.50	5,007.86	-82.68	500.10	331.15	168.95	2.960			
17,400.00	12,267.36	17,399.01	12,280.35	85.86	85.76	-91.50	5,107.86	-83.42	500.10	328.67	171.43	2.917			
17,500.00	12,267.05	17,499.01	12,280.05	86.90	87.01	-91.50	5,207.86	-84.17	500.10	326.19	173.91	2.876			
17,600.00	12,266.74	17,599.01	12,279.74	88.15	88.26	-91.50	5,307.85	-84.91	500.10	323.69	176.41	2.835			
17,700.00	12,266.43	17,699.01	12,279.43	89.41	89.51	-91.50	5,407.85	-85.66	500.10	321.18	178.92	2.795			
17,800.00	12,266.13	17,799.01	12,279.12	90.67	90.77	-91.50	5,507.85	-86.40	500.10	318.66	181.44	2.756			
17,900.00	12,265.82	17,899.01	12,278.82	91.93	92.04	-91.50	5,607.84	-87.14	500.10	316.13	183.97	2.718			
18,000.00	12,265.51	17,999.01	12,278.51	93.20	93.31	-91.50	5,707.84	-87.89	500.10	313.59	186.51	2.681			
18,100.00	12,265.20	18,099.01	12,278.20	94.47	94.59	-91.50	5,807.84	-88.63	500.10	311.04	189.06	2.645			
18,200.00	12,264.90	18,199.01	12,277.89	95.75	95.87	-91.50	5,907.83	-89.38	500.10	308.48	191.62	2.610			
18,300.00	12,264.59	18,299.01	12,277.59	97.03	97.15	-91.50	6,007.83	-90.12	500.10	305.91	194.19	2.575			
18,400.00	12,264.28	18,399.01	12,277.28	98.32	98.44	-91.50	6,107.83	-90.87	500.10	303.33	196.76	2.542			
18,500.00	12,263.97	18,499.01	12,276.97	99.61	99.74	-91.50	6,207.82	-91.61	500.10	300.75	199.35	2.509			
18,600.00	12,263.67	18,599.01	12,276.66	100.91	101.03	-91.50	6,307.82	-92.35	500.10	298.16	201.94	2.476			
18,700.00	12,263.36	18,699.01	12,276.36	102.21	102.33	-91.50	6,407.82	-93.10	500.10	295.56	204.54	2.445			
18,800.00	12,263.05	18,799.01	12,276.05	103.51	103.64	-91.50	6,507.81	-93.84	500.10	292.95	207.15	2.414			
18,900.00	12,262.75	18,899.01	12,275.74	104.82	104.94	-91.50	6,607.81	-94.59	500.10	290.34	209.76	2.384			
19,000.00	12,262.44	18,999.01	12,275.44	106.13	106.26	-91.50	6,707.81	-95.33	500.10	287.72	212.38	2.355			
19,100.00	12,262.13	19,099.01	12,275.13	107.44	107.57	-91.50	6,807.80	-96.08	500.10	285.09	215.01	2.326			
19,200.00	12,261.82	19,199.01	12,274.82	108.75	108.89	-91.50	6,907.80	-96.82	500.10	282.46	217.64	2.298			
19,300.00	12,261.52	19,299.01	12,274.51	110.07	110.21	-91.50	7,007.80	-97.56	500.10	279.82	220.28	2.270			
19,400.00	12,261.21	19,399.01	12,274.21	111.39	111.53	-91.50	7,107.79	-98.31	500.10	277.17	222.92	2.243			
19,500.00	12,260.90	19,499.01	12,273.90	112.72	112.86	-91.50	7,207.79	-99.05	500.10	274.52	225.57	2.217			
19,600.00	12,260.59	19,599.01	12,273.59	114.05	114.18	-91.50	7,307.79	-99.80	500.10	271.87	228.23	2.191			
19,700.00	12,260.29	19,699.01	12,273.28	115.38	115.51	-91.50	7,407.78	-100.54	500.10	269.20	230.89	2.166			
19,800.00	12,259.98	19,799.01	12,272.98	116.71	116.85	-91.50	7,507.78	-101.29	500.10	266.54	233.56	2.141			
19,900.00	12,259.67	19,899.01	12,272.67	118.04	118.18	-91.50	7,607.78	-102.03	500.10	263.87	236.23	2.117			
20,000.00	12,259.36	19,999.01	12,272.36	119.38	119.52	-91.50	7,707.77	-102.77	500.10	261.19	238.90	2.093			
20,100.00	12,259.06	20,099.01	12,272.05	120.72	120.86	-91.50	7,807.77	-103.52	500.10	258.51	241.58	2.070			
20,200.00	12,258.75	20,199.01	12,271.75	122.06	122.21	-91.50	7,907.77	-104.26	500.10	255.83	244.27	2.047			
20,300.00	12,258.44	20,299.01	12,271.44	123.40	123.55	-91.50	8,007.76	-105.01	500.10	253.14	246.96	2.025			
20,400.00	12,258.14	20,399.01	12,271.13	124.75	124.90	-91.50	8,107.76	-105.75	500.09	250.45	249.65	2.003			
20,500.00	12,257.83	20,499.01	12,270.82	126.10	126.25	-91.50	8,207.76	-106.50	500.09	247.75	252.34	1.982			
20,600.00	12,257.52	20,599.01	12,270.52	127.45	127.60	-91.50	8,307.76	-107.24	500.09	245.05	255.04	1.961			
20,700.00	12,257.21	20,699.01	12,270.21	128.80	128.95	-91.50	8,407.75	-107.98	500.09	242.35	257.75	1.940			
20,800.00	12,256.91	20,799.01	12,269.90	130.15	130.30	-91.50	8,507.75	-108.73	500.09	239.64	260.46	1.920			
20,900.00	12,256.60	20,899.01	12,269.60	131.51	131.66	-91.50	8,607.75	-109.47	500.09	236.93	263.17	1.900			
21,000.00	12,256.29	20,999.01	12,269.29	132.86	133.02	-91.50	8,707.74	-110.22	500.09	234.21	265.88	1.881			
21,100.00	12,255.98	21,099.01	12,268.98	134.22	134.38	-91.50	8,807.74	-110.96	500.09	231.49	268.60	1.862			
21,200.00	12,255.68	21,199.01	12,268.67	135.58	135.74	-91.50	8,907.74	-111.71	500.09	228.77	271.32	1.843			
21,300.00	12,255.37	21,299.01	12,268.37	136.94	137.10	-91.50	9,007.73	-112.45	500.09	226.05	274.04	1.825			
21,400.00	12,255.06	21,399.01	12,268.06	138.31	138.46	-91.50	9,107.73	-113.19	500.09	223.32	276.77	1.807			
21,500.00	12,254.75	21,499.01	12,267.75	139.67	139.83	-91.50	9,207.73	-113.94	500.09	220.59	279.50	1.789			
21,600.00	12,254.45	21,599.01	12,267.44	141.04	141.20	-91.50	9,307.72	-114.68	500.09	217.86	282.23	1.772			
21,700.00	12,254.14	21,699.01	12,267.14	142.41	142.56	-91.50	9,407.72	-115.43	500.09	215.12	284.97	1.755			
21,800.00	12,253.83	21,799.01	12,266.83	143.77	143.93	-91.50	9,507.72	-116.17	500.09	212.39	287.71	1.738			
21,900.00	12,253.52	21,899.01	12,266.52	145.14	145.30	-91.50	9,607.71	-116.92	500.09	209.64	290.45	1.722			
22,000.00	12,253.22	21,999.01	12,266.21	146.52	146.68	-91.50	9,707.71	-117.66	500.09	206.90	293.19	1.706			
22,100.00	12,252.91	22,099.01	12,265.91	147.89	148.05	-91.50	9,807.71	-118.40	500.09	204.16	295.94	1.690			
22,200.00	12,252.60	22,199.01	12,265.60	149.26	149.42	-91.50	9,907.70	-119.15	500.09	201.41	298.69	1.674			
22,300.00	12,252.30	22,299.01	12,265.29	150.64	150.80	-91.50	10,007.70	-119.89	500.09	198.66	301.44	1.659			
22,392.89	12,252.01	22,391.90	12,265.01	151.91	152.08	-91.50	10,100.59	-120.58	500.09	196.10	303.99	1.645			

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
22,396.02	12,252.00	22,394.02	12,265.00	151.96	152.11	-91.50	10,102.70	-120.60	500.09	196.03	304.06	1.645 SF	

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

Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Com
 Site Error: 0.00 usft
 Reference Well: 702H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
 TVD Reference: KB=25' @ 3276.80usft (Precision 595)
 MD Reference: KB=25' @ 3276.80usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 604H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toothface (")	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference, (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
0.00	0.00	16.10	16.10	0.00	0.02	-90.49	-5.70	-664.90	664.92				
100.00	100.00	116.10	116.10	0.13	0.18	-90.49	-5.70	-664.90	664.92	664.61	0.32	2,093.550	
200.00	200.00	216.10	216.10	0.49	0.54	-90.49	-5.70	-664.90	664.92	663.89	1.03	642.719	
300.00	300.00	316.10	316.10	0.85	0.90	-90.49	-5.70	-664.90	664.92	663.17	1.75	379.633	
400.00	400.00	416.10	416.10	1.21	1.26	-90.49	-5.70	-664.90	664.92	662.46	2.47	269.371	
500.00	500.00	516.10	516.10	1.57	1.62	-90.49	-5.70	-664.90	664.92	661.74	3.19	208.743	
600.00	600.00	616.10	616.10	1.93	1.98	-90.49	-5.70	-664.90	664.92	661.02	3.90	170.392	
700.00	700.00	716.10	716.10	2.29	2.33	-90.49	-5.70	-664.90	664.92	660.31	4.62	143.946	
800.00	800.00	816.10	816.10	2.64	2.69	-90.49	-5.70	-664.90	664.92	659.59	5.34	124.606	
900.00	900.00	916.10	916.10	3.00	3.05	-90.49	-5.70	-664.90	664.92	658.87	6.05	109.848	
1,000.00	1,000.00	1,016.10	1,016.10	3.36	3.41	-90.49	-5.70	-664.90	664.92	658.15	6.77	98.215	
1,100.00	1,100.00	1,116.10	1,116.10	3.72	3.77	-90.49	-5.70	-664.90	664.92	657.44	7.49	88.810	
1,200.00	1,200.00	1,216.10	1,216.10	4.08	4.13	-90.49	-5.70	-664.90	664.92	656.72	8.20	81.049	
1,300.00	1,300.00	1,316.10	1,316.10	4.44	4.48	-90.49	-5.70	-664.90	664.92	656.00	8.92	74.535	
1,400.00	1,400.00	1,416.10	1,416.10	4.79	4.84	-90.49	-5.70	-664.90	664.92	655.29	9.64	68.991	
1,410.27	1,410.27	1,426.37	1,426.37	4.83	4.88	-90.49	-5.70	-664.90	664.92	655.21	9.71	68.468 CC	
1,500.00	1,500.00	1,514.54	1,514.54	5.15	5.19	-90.49	-5.73	-664.92	664.94	654.60	10.35	64.266 ES	
1,600.00	1,599.98	1,600.00	1,599.98	5.50	5.49	153.05	-7.25	-665.70	667.48	656.50	10.98	60.765	
1,700.00	1,699.84	1,694.67	1,694.52	5.84	5.80	152.80	-11.59	-667.91	674.56	662.93	11.63	57.991	
1,800.00	1,799.45	1,787.79	1,787.33	6.18	6.11	152.45	-18.34	-671.37	686.11	673.82	12.28	55.859	
1,900.00	1,898.91	1,886.86	1,886.02	6.52	6.44	152.21	-26.03	-675.30	699.47	686.51	12.96	53.968	
2,000.00	1,998.36	1,985.92	1,984.70	6.87	6.78	151.99	-33.71	-679.24	712.86	699.21	13.65	52.227	
2,100.00	2,097.81	2,084.98	2,083.39	7.23	7.12	151.77	-41.40	-683.18	726.25	711.90	14.35	50.626	
2,200.00	2,197.26	2,184.04	2,182.07	7.59	7.46	151.56	-49.09	-687.11	739.65	724.60	15.05	49.153	
2,300.00	2,296.72	2,283.10	2,280.76	7.95	7.81	151.36	-56.78	-691.05	753.06	737.30	15.76	47.795	
2,400.00	2,296.17	2,282.17	2,279.44	8.31	8.16	151.16	-64.47	-694.98	766.48	750.01	16.47	46.539	
2,500.00	2,495.62	2,481.23	2,478.13	8.67	8.51	150.97	-72.16	-698.92	779.90	762.72	17.19	45.378	
2,600.00	2,595.08	2,580.29	2,576.81	9.04	8.87	150.79	-79.84	-702.85	793.34	775.43	17.91	44.300	
2,700.00	2,694.53	2,679.35	2,675.50	9.41	9.22	150.62	-87.53	-706.79	806.78	788.15	18.63	43.298	
2,800.00	2,793.98	2,778.42	2,774.18	9.78	9.58	150.45	-95.22	-710.72	820.23	800.87	19.36	42.366	
2,900.00	2,893.43	2,877.48	2,872.87	10.15	9.94	150.28	-102.91	-714.66	833.69	813.60	20.09	41.495	
3,000.00	2,992.89	2,976.54	2,971.55	10.52	10.30	150.12	-110.60	-718.59	847.16	826.33	20.82	40.682	
3,100.00	3,092.34	3,075.60	3,070.24	10.90	10.66	149.97	-118.29	-722.53	860.63	839.07	21.56	39.920	
3,200.00	3,191.79	3,174.67	3,168.92	11.27	11.03	149.82	-125.98	-726.47	874.10	851.81	22.30	39.205	
3,300.00	3,291.25	3,273.73	3,267.61	11.65	11.39	149.67	-133.66	-730.40	887.58	864.55	23.03	38.533	
3,400.00	3,390.70	3,372.79	3,366.29	12.02	11.75	149.53	-141.35	-734.34	901.07	877.30	23.77	37.901	
3,500.00	3,490.15	3,471.85	3,464.98	12.40	12.12	149.39	-149.04	-738.27	914.56	890.05	24.52	37.305	
3,600.00	3,589.61	3,570.92	3,563.66	12.78	12.48	149.26	-156.73	-742.21	928.06	902.80	25.26	36.742	
3,700.00	3,689.06	3,669.98	3,662.35	13.15	12.85	149.13	-164.42	-746.14	941.56	915.56	26.00	36.210	
3,800.00	3,788.51	3,769.04	3,761.03	13.53	13.22	149.01	-172.11	-750.08	955.07	928.32	26.75	35.706	
3,900.00	3,887.96	3,868.10	3,859.72	13.91	13.58	148.89	-179.80	-754.01	968.58	941.09	27.49	35.229	
4,000.00	3,987.42	3,967.17	3,958.40	14.29	13.95	148.77	-187.48	-757.95	982.09	953.85	28.24	34.775	
4,100.00	4,086.87	4,066.23	4,057.09	14.67	14.32	148.65	-195.17	-761.89	995.61	966.62	28.99	34.344	
4,200.00	4,186.32	4,165.29	4,155.77	15.05	14.69	148.54	-202.86	-765.82	1,009.14	979.40	29.74	33.934	
4,300.00	4,285.78	4,264.35	4,254.46	15.43	15.06	148.43	-210.55	-769.76	1,022.66	992.18	30.49	33.544	
4,400.00	4,385.23	4,363.41	4,353.15	15.81	15.43	148.33	-218.24	-773.69	1,036.19	1,004.96	31.24	33.171	
4,500.00	4,484.68	4,462.48	4,451.83	16.19	15.80	148.22	-225.93	-777.63	1,049.73	1,017.74	31.99	32.816	
4,600.00	4,584.14	4,562.77	4,551.81	16.57	16.24	148.19	-233.49	-781.50	1,062.41	1,029.60	32.81	32.378	
4,700.00	4,683.59	4,706.89	4,695.87	16.95	16.68	148.40	-236.62	-783.10	1,072.82	1,039.18	33.64	31.895	
4,800.00	4,783.04	4,810.16	4,799.14	17.34	17.03	148.70	-236.68	-783.13	1,081.77	1,047.41	34.36	31.481	
4,900.00	4,882.49	4,909.61	4,898.59	17.72	17.36	148.98	-236.68	-783.13	1,090.72	1,055.64	35.08	31.096	
5,000.00	4,981.95	5,009.06	4,998.05	18.10	17.69	149.26	-236.68	-783.13	1,099.70	1,063.91	35.79	30.726	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 604H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (')	Distance				Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)
5,100.00	5,081.40	5,108.52	5,097.50	18.48	18.02	149.54	-236.68	-783.13	1,108.70	1,072.19	36.51	30.370	
5,200.00	5,180.85	5,207.97	5,196.95	18.86	18.36	149.81	-236.68	-783.13	1,117.73	1,080.51	37.22	30.028	
5,300.00	5,280.31	5,307.42	5,296.41	19.25	18.69	150.07	-236.68	-783.13	1,126.78	1,088.84	37.94	29.698	
5,400.00	5,379.76	5,406.87	5,395.86	19.63	19.03	150.34	-236.68	-783.13	1,135.86	1,097.20	38.86	29.381	
5,500.00	5,479.21	5,506.33	5,495.31	20.01	19.37	150.60	-236.68	-783.13	1,144.96	1,105.58	39.38	29.075	
5,600.00	5,578.66	5,605.78	5,594.76	20.40	19.70	150.85	-236.68	-783.13	1,154.08	1,113.98	40.10	28.780	
5,700.00	5,678.12	5,705.23	5,694.22	20.78	20.04	151.10	-236.68	-783.13	1,163.23	1,122.41	40.82	28.495	
5,800.00	5,777.57	5,804.69	5,793.67	21.16	20.38	151.35	-236.68	-783.13	1,172.40	1,130.85	41.54	28.220	
5,900.00	5,877.02	5,904.14	5,893.12	21.55	20.72	151.59	-236.68	-783.13	1,181.58	1,139.32	42.27	27.955	
6,000.00	5,976.48	6,003.59	5,992.58	21.93	21.06	151.83	-236.68	-783.13	1,190.79	1,147.80	42.99	27.699	
6,100.00	6,075.93	6,103.05	6,092.03	22.32	21.40	152.06	-236.68	-783.13	1,200.02	1,156.31	43.71	27.451	
6,200.00	6,175.38	6,202.50	6,191.48	22.70	21.74	152.29	-236.68	-783.13	1,209.27	1,164.83	44.44	27.211	
6,300.00	6,274.84	6,301.95	6,290.94	23.08	22.08	152.52	-236.68	-783.13	1,218.54	1,173.37	45.17	26.980	
6,400.00	6,374.30	6,401.42	6,390.40	23.47	22.42	152.77	-236.68	-783.13	1,227.73	1,181.83	45.89	26.753	
6,500.00	6,473.99	6,501.11	6,490.09	23.84	22.77	153.00	-236.68	-783.13	1,234.69	1,188.08	46.61	26.491	
6,600.00	6,573.89	6,601.01	6,589.99	24.20	23.11	153.12	-236.68	-783.13	1,238.55	1,191.24	47.31	26.179	
6,700.00	6,673.88	6,701.00	6,689.98	24.54	23.46	-90.49	-236.68	-783.13	1,239.40	1,191.41	47.99	25.825	
6,800.00	6,773.88	6,801.00	6,789.98	24.86	23.80	-90.49	-236.68	-783.13	1,239.40	1,190.74	48.67	25.468	
6,900.00	6,873.88	6,901.00	6,889.98	25.19	24.15	-90.49	-236.68	-783.13	1,239.40	1,190.06	49.34	25.119	
7,000.00	6,973.88	7,001.00	6,989.98	25.52	24.49	-90.49	-236.68	-783.13	1,239.40	1,189.39	50.02	24.780	
7,100.00	7,073.88	7,101.00	7,089.98	25.85	24.84	-90.49	-236.68	-783.13	1,239.40	1,188.71	50.69	24.449	
7,200.00	7,173.88	7,201.00	7,189.98	26.19	25.19	-90.49	-236.68	-783.13	1,239.40	1,188.03	51.37	24.126	
7,300.00	7,273.88	7,301.00	7,289.98	26.52	25.53	-90.49	-236.68	-783.13	1,239.40	1,187.35	52.05	23.811	
7,400.00	7,373.88	7,401.00	7,389.98	26.85	25.88	-90.49	-236.68	-783.13	1,239.40	1,186.67	52.73	23.504	
7,500.00	7,473.88	7,501.00	7,489.98	27.18	26.23	-90.49	-236.68	-783.13	1,239.40	1,185.99	53.41	23.204	
7,600.00	7,573.88	7,601.00	7,589.98	27.52	26.58	-90.49	-236.68	-783.13	1,239.40	1,185.31	54.10	22.911	
7,700.00	7,673.88	7,701.00	7,689.98	27.85	26.93	-90.49	-236.68	-783.13	1,239.40	1,184.62	54.78	22.625	
7,800.00	7,773.88	7,801.00	7,789.98	28.19	27.27	-90.49	-236.68	-783.13	1,239.40	1,183.94	55.46	22.346	
7,900.00	7,873.88	7,901.00	7,889.98	28.52	27.62	-90.49	-236.68	-783.13	1,239.40	1,183.25	56.15	22.074	
8,000.00	7,973.88	8,001.00	7,989.98	28.86	27.97	-90.49	-236.68	-783.13	1,239.40	1,182.57	56.83	21.808	
8,100.00	8,073.88	8,101.00	8,089.98	29.20	28.32	-90.49	-236.68	-783.13	1,239.40	1,181.88	57.52	21.547	
8,200.00	8,173.88	8,201.00	8,189.98	29.54	28.67	-90.49	-236.68	-783.13	1,239.40	1,181.20	58.21	21.293	
8,300.00	8,273.88	8,301.00	8,289.98	29.87	29.02	-90.49	-236.68	-783.13	1,239.40	1,180.51	58.89	21.044	
8,400.00	8,373.88	8,401.00	8,389.98	30.21	29.37	-90.49	-236.68	-783.13	1,239.40	1,179.82	59.58	20.801	
8,500.00	8,473.88	8,501.00	8,489.98	30.55	29.72	-90.49	-236.68	-783.13	1,239.40	1,179.13	60.27	20.563	
8,600.00	8,573.88	8,601.00	8,589.98	30.89	30.07	-90.49	-236.68	-783.13	1,239.40	1,178.44	60.96	20.331	
8,700.00	8,673.88	8,701.00	8,689.98	31.23	30.42	-90.49	-236.68	-783.13	1,239.40	1,177.75	61.65	20.103	
8,800.00	8,773.88	8,801.00	8,789.98	31.57	30.77	-90.49	-236.68	-783.13	1,239.40	1,177.06	62.34	19.880	
8,900.00	8,873.88	8,901.00	8,889.98	31.91	31.12	-90.49	-236.68	-783.13	1,239.40	1,176.37	63.03	19.662	
9,000.00	8,973.88	9,001.00	8,989.98	32.25	31.48	-90.49	-236.68	-783.13	1,239.40	1,175.68	63.73	19.449	
9,100.00	9,073.88	9,101.00	9,089.98	32.59	31.83	-90.49	-236.68	-783.13	1,239.40	1,174.98	64.42	19.240	
9,200.00	9,173.88	9,201.00	9,189.98	32.93	32.18	-90.49	-236.68	-783.13	1,239.40	1,174.29	65.11	19.035	
9,300.00	9,273.88	9,301.00	9,289.98	33.28	32.53	-90.49	-236.68	-783.13	1,239.40	1,173.60	65.81	18.834	
9,400.00	9,373.88	9,401.00	9,389.98	33.62	32.88	-90.49	-236.68	-783.13	1,239.40	1,172.90	66.50	18.637	
9,500.00	9,473.88	9,501.00	9,489.98	33.96	33.23	-90.49	-236.68	-783.13	1,239.40	1,172.21	67.20	18.445	
9,600.00	9,573.88	9,601.00	9,589.98	34.31	33.59	-90.49	-236.68	-783.13	1,239.40	1,171.51	67.89	18.256	
9,700.00	9,673.88	9,701.00	9,689.98	34.65	33.94	-90.49	-236.68	-783.13	1,239.40	1,170.82	68.59	18.071	
9,800.00	9,773.88	9,801.00	9,789.98	34.99	34.29	-90.49	-236.68	-783.13	1,239.40	1,170.12	69.28	17.889	
9,900.00	9,873.88	9,901.00	9,889.98	35.34	34.64	-90.49	-236.68	-783.13	1,239.40	1,169.42	69.98	17.711	
10,000.00	9,973.88	10,001.00	9,989.98	35.68	34.99	-90.49	-236.68	-783.13	1,239.40	1,168.73	70.68	17.537	
10,100.00	10,073.88	10,101.00	10,089.98	36.02	35.35	-90.49	-236.68	-783.13	1,239.40	1,168.03	71.37	17.365	
10,200.00	10,173.88	10,201.00	10,189.98	36.37	35.70	-90.49	-236.68	-783.13	1,239.40	1,167.33	72.07	17.197	

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



Anticollision Report



Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Com
 Site Error: 0.00 usft
 Reference Well: 702H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
 TVD Reference: KB=25' @ 3276.80usft (Precision 595)
 MD Reference: KB=25' @ 3276.80usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 604H - OH - Plan 1 10-12-18

Survey Program: 0-MWD+HDGM

Offset Site Error: 0.00 usft

Offset Well Error: 0.00 usft

Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
10,300.00	10,273.88	10,301.00	10,289.98	36.71	36.05	-90.49	-236.68	-783.13	1,239.40	1,166.63	72.77	17.032	
10,400.00	10,373.88	10,401.00	10,389.98	37.06	36.41	-90.49	-236.68	-783.13	1,239.40	1,165.94	73.47	16.870	
10,500.00	10,473.88	10,501.00	10,489.98	37.41	36.76	-90.49	-236.68	-783.13	1,239.40	1,165.24	74.17	16.711	
10,600.00	10,573.88	10,601.00	10,589.98	37.75	37.11	-90.49	-236.68	-783.13	1,239.40	1,164.54	74.86	16.555	
10,700.00	10,673.88	10,701.00	10,689.98	38.10	37.47	-90.49	-236.68	-783.13	1,239.40	1,163.84	75.56	16.402	
10,800.00	10,773.88	10,801.00	10,789.98	38.44	37.82	-90.49	-236.68	-783.13	1,239.40	1,163.14	76.26	16.252	
10,900.00	10,873.88	10,901.00	10,889.98	38.79	38.17	-90.49	-236.68	-783.13	1,239.40	1,162.44	76.96	16.104	
11,000.00	10,973.88	11,001.00	10,989.98	39.14	38.53	-90.49	-236.68	-783.13	1,239.40	1,161.74	77.66	15.959	
11,100.00	11,073.88	11,101.00	11,089.98	39.48	38.88	-90.49	-236.68	-783.13	1,239.40	1,161.04	78.36	15.816	
11,200.00	11,173.88	11,201.00	11,189.98	39.83	39.23	-90.49	-236.68	-783.13	1,239.40	1,160.34	79.07	15.676	
11,300.00	11,273.88	11,301.00	11,289.98	40.18	39.59	-90.49	-236.68	-783.13	1,239.40	1,159.64	79.77	15.538	
11,400.00	11,373.88	11,401.00	11,389.98	40.53	39.94	-90.49	-236.68	-783.13	1,239.40	1,158.93	80.47	15.402	
11,500.00	11,473.88	11,501.00	11,489.98	40.87	40.30	-90.49	-236.68	-783.13	1,239.40	1,158.23	81.17	15.269	
11,600.00	11,573.88	11,601.00	11,589.98	41.22	40.65	-90.49	-236.68	-783.13	1,239.40	1,157.53	81.87	15.138	
11,700.00	11,673.88	11,701.00	11,689.98	41.57	41.00	-90.49	-236.68	-783.13	1,239.40	1,156.83	82.57	15.010	
11,800.00	11,773.74	11,801.15	11,790.09	41.91	41.36	-90.16	-235.21	-783.14	1,239.41	1,156.13	83.27	14.884	
11,900.00	11,871.62	11,902.04	11,889.58	42.24	41.70	-90.35	-219.18	-783.26	1,239.43	1,155.49	83.94	14.766	
12,000.00	11,964.55	12,003.66	11,985.37	42.53	42.01	-90.53	-185.67	-783.51	1,239.46	1,154.92	84.54	14.661	
12,100.00	12,049.72	12,105.96	12,074.31	42.77	42.29	-90.69	-135.40	-783.89	1,239.50	1,154.44	85.06	14.572	
12,200.00	12,124.54	12,208.88	12,153.35	42.96	42.54	-90.83	-69.70	-784.38	1,239.54	1,154.04	85.50	14.497	
12,300.00	12,186.73	12,312.33	12,219.68	43.09	42.78	-90.95	9.50	-784.98	1,239.59	1,153.72	85.87	14.436	
12,400.00	12,234.41	12,416.21	12,270.89	43.17	43.00	-91.04	99.72	-785.55	1,239.62	1,153.45	86.17	14.385	
12,500.00	12,266.13	12,520.39	12,305.06	43.25	43.21	-91.09	197.98	-786.39	1,239.65	1,153.16	86.49	14.334	
12,600.00	12,280.92	12,624.72	12,320.91	43.42	43.42	-91.11	300.95	-787.16	1,239.66	1,152.78	86.88	14.268	
12,700.00	12,281.80	12,726.27	12,321.80	43.63	43.62	-91.10	402.47	-787.92	1,239.67	1,152.39	87.28	14.203	
12,800.00	12,281.49	12,826.27	12,321.49	43.88	43.87	-91.10	502.47	-788.67	1,239.67	1,151.91	87.76	14.126	
12,900.00	12,281.19	12,926.27	12,321.18	44.18	44.15	-91.10	602.47	-789.42	1,239.68	1,151.34	88.34	14.034	
13,000.00	12,280.88	13,026.27	12,320.88	44.52	44.49	-91.10	702.46	-790.17	1,239.68	1,150.68	89.01	13.928	
13,100.00	12,280.57	13,126.27	12,320.57	44.89	44.86	-91.10	802.46	-790.92	1,239.69	1,149.93	89.76	13.811	
13,200.00	12,280.26	13,226.27	12,320.26	45.31	45.28	-91.10	902.46	-791.67	1,239.69	1,149.10	90.60	13.684	
13,300.00	12,279.96	13,326.27	12,319.95	45.77	45.74	-91.10	1,002.45	-792.42	1,239.70	1,148.18	91.52	13.546	
13,400.00	12,279.65	13,426.27	12,319.65	46.27	46.24	-91.10	1,102.45	-793.17	1,239.70	1,147.19	92.51	13.400	
13,500.00	12,279.34	13,526.27	12,319.34	46.81	46.78	-91.10	1,202.45	-793.92	1,239.71	1,146.12	93.59	13.246	
13,600.00	12,279.04	13,626.27	12,319.03	47.38	47.36	-91.10	1,302.44	-794.67	1,239.71	1,144.98	94.74	13.086	
13,700.00	12,278.73	13,726.27	12,318.72	47.99	47.97	-91.10	1,402.44	-795.42	1,239.72	1,143.76	95.96	12.919	
13,800.00	12,278.42	13,826.27	12,318.42	48.63	48.62	-91.10	1,502.44	-796.17	1,239.72	1,142.48	97.25	12.748	
13,900.00	12,278.11	13,926.27	12,318.11	49.31	49.30	-91.10	1,602.43	-796.92	1,239.73	1,141.13	98.60	12.573	
14,000.00	12,277.81	14,026.27	12,317.80	50.01	50.01	-91.10	1,702.43	-797.67	1,239.73	1,139.71	100.02	12.395	
14,100.00	12,277.50	14,126.27	12,317.49	50.75	50.75	-91.10	1,802.43	-798.42	1,239.74	1,138.24	101.50	12.214	
14,200.00	12,277.19	14,226.27	12,317.19	51.52	51.52	-91.10	1,902.42	-799.17	1,239.75	1,136.70	103.04	12.031	
14,300.00	12,276.88	14,326.27	12,316.88	52.31	52.32	-91.10	2,002.42	-799.92	1,239.75	1,135.11	104.64	11.848	
14,400.00	12,276.58	14,426.27	12,316.57	53.14	53.15	-91.10	2,102.42	-800.67	1,239.76	1,133.47	106.29	11.664	
14,500.00	12,276.27	14,526.27	12,316.26	53.98	54.00	-91.10	2,202.41	-801.42	1,239.76	1,131.78	107.99	11.481	
14,600.00	12,275.96	14,626.27	12,315.96	54.86	54.88	-91.10	2,302.41	-802.17	1,239.77	1,130.03	109.73	11.298	
14,700.00	12,275.65	14,726.27	12,315.65	55.75	55.78	-91.10	2,402.41	-802.92	1,239.77	1,128.24	111.53	11.116	
14,800.00	12,275.35	14,826.27	12,315.34	56.67	56.70	-91.10	2,502.40	-803.67	1,239.78	1,126.41	113.37	10.936	
14,900.00	12,275.04	14,926.27	12,315.03	57.61	57.64	-91.10	2,602.40	-804.42	1,239.78	1,124.53	115.25	10.757	
15,000.00	12,274.73	15,026.27	12,314.73	58.56	58.61	-91.10	2,702.40	-805.17	1,239.79	1,122.62	117.17	10.581	
15,100.00	12,274.42	15,126.27	12,314.42	59.54	59.59	-91.10	2,802.39	-805.92	1,239.79	1,120.66	119.13	10.407	
15,200.00	12,274.12	15,226.27	12,314.11	60.54	60.59	-91.10	2,902.39	-806.67	1,239.80	1,118.67	121.13	10.235	
15,300.00	12,273.81	15,326.27	12,313.81	61.55	61.61	-91.10	3,002.39	-807.42	1,239.80	1,116.65	123.16	10.067	
15,400.00	12,273.50	15,426.27	12,313.50	62.58	62.64	-91.10	3,102.38	-808.17	1,239.81	1,114.59	125.22	9.901	

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

Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Com
 Site Error: 0.00 usft
 Reference Well: 702H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
 TVD Reference: KB=25' @ 3276.80usft (Precision 595)
 MD Reference: KB=25' @ 3276.80usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 604H - OH - Plan 1 10-12-18												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
15,500.00	12,273.20	15,526.27	12,313.19	63.63	63.69	-91.10	3,202.38	-808.92	1,239.81	1,112.50	127.32	9.738	
15,600.00	12,272.89	15,626.27	12,312.88	64.69	64.76	-91.10	3,302.38	-809.67	1,239.82	1,110.38	129.44	9.578	
15,700.00	12,272.58	15,726.27	12,312.58	65.76	65.83	-91.10	3,402.37	-810.42	1,239.83	1,108.23	131.59	9.422	
15,800.00	12,272.27	15,826.27	12,312.27	66.85	66.93	-91.10	3,502.37	-811.17	1,239.83	1,106.06	133.77	9.268	
15,900.00	12,271.97	15,926.27	12,311.96	67.95	68.03	-91.10	3,602.37	-811.91	1,239.84	1,103.86	135.98	9.118	
16,000.00	12,271.66	16,026.27	12,311.65	69.06	69.15	-91.10	3,702.36	-812.66	1,239.84	1,101.63	138.21	8.971	
16,100.00	12,271.35	16,126.27	12,311.35	70.19	70.28	-91.10	3,802.36	-813.41	1,239.85	1,099.38	140.46	8.827	
16,200.00	12,271.04	16,226.27	12,311.04	71.32	71.41	-91.10	3,902.36	-814.16	1,239.85	1,097.11	142.74	8.686	
16,300.00	12,270.74	16,326.27	12,310.73	72.47	72.56	-91.10	4,002.36	-814.91	1,239.86	1,094.82	145.04	8.549	
16,400.00	12,270.43	16,426.27	12,310.42	73.63	73.72	-91.10	4,102.35	-815.66	1,239.86	1,092.51	147.35	8.414	
16,500.00	12,270.12	16,526.27	12,310.12	74.79	74.89	-91.10	4,202.35	-816.41	1,239.87	1,090.18	149.69	8.283	
16,600.00	12,269.81	16,626.27	12,309.81	75.97	76.07	-91.10	4,302.35	-817.16	1,239.87	1,087.83	152.04	8.155	
16,700.00	12,269.51	16,726.27	12,309.50	77.15	77.26	-91.10	4,402.34	-817.91	1,239.88	1,085.46	154.42	8.030	
16,800.00	12,269.20	16,826.27	12,309.19	78.35	78.46	-91.10	4,502.34	-818.66	1,239.88	1,083.08	156.80	7.907	
16,900.00	12,268.89	16,926.27	12,308.89	79.55	79.66	-91.10	4,602.34	-819.41	1,239.89	1,080.68	159.21	7.788	
17,000.00	12,268.59	17,026.27	12,308.58	80.76	80.87	-91.10	4,702.33	-820.16	1,239.89	1,078.27	161.63	7.671	
17,100.00	12,268.28	17,126.27	12,308.27	81.97	82.09	-91.10	4,802.33	-820.91	1,239.90	1,075.84	164.06	7.557	
17,200.00	12,267.97	17,226.27	12,307.97	83.20	83.32	-91.10	4,902.33	-821.66	1,239.90	1,073.39	166.51	7.446	
17,300.00	12,267.66	17,326.27	12,307.66	84.43	84.55	-91.10	5,002.32	-822.41	1,239.91	1,070.94	168.97	7.338	
17,400.00	12,267.36	17,426.27	12,307.35	85.66	85.79	-91.10	5,102.32	-823.16	1,239.92	1,068.47	171.45	7.232	
17,500.00	12,267.05	17,526.27	12,307.04	86.90	87.03	-91.10	5,202.32	-823.91	1,239.92	1,065.99	173.93	7.129	
17,600.00	12,266.74	17,626.27	12,306.74	88.15	88.28	-91.10	5,302.31	-824.66	1,239.93	1,063.49	176.43	7.028	
17,700.00	12,266.43	17,726.27	12,306.43	89.41	89.54	-91.10	5,402.31	-825.41	1,239.93	1,060.99	178.94	6.929	
17,800.00	12,266.13	17,826.27	12,306.12	90.67	90.80	-91.10	5,502.31	-826.16	1,239.94	1,058.47	181.46	6.833	
17,900.00	12,265.82	17,926.27	12,305.81	91.93	92.06	-91.10	5,602.30	-826.91	1,239.94	1,055.95	183.99	6.739	
18,000.00	12,265.51	18,026.27	12,305.51	93.20	93.34	-91.10	5,702.30	-827.66	1,239.95	1,053.41	186.53	6.647	
18,100.00	12,265.20	18,126.27	12,305.20	94.47	94.61	-91.10	5,802.30	-828.41	1,239.95	1,050.87	189.08	6.558	
18,200.00	12,264.90	18,226.27	12,304.89	95.75	95.89	-91.10	5,902.29	-829.16	1,239.96	1,048.31	191.64	6.470	
18,300.00	12,264.59	18,326.27	12,304.58	97.03	97.18	-91.10	6,002.29	-829.91	1,239.96	1,045.75	194.21	6.385	
18,400.00	12,264.28	18,426.27	12,304.28	98.32	98.47	-91.10	6,102.29	-830.66	1,239.97	1,043.18	196.79	6.301	
18,500.00	12,263.97	18,526.27	12,303.97	99.61	99.76	-91.10	6,202.28	-831.41	1,239.97	1,040.60	199.37	6.219	
18,600.00	12,263.67	18,626.27	12,303.66	100.91	101.06	-91.10	6,302.28	-832.16	1,239.98	1,038.01	201.96	6.140	
18,700.00	12,263.36	18,726.27	12,303.35	102.21	102.36	-91.10	6,402.28	-832.91	1,239.98	1,035.42	204.56	6.062	
18,800.00	12,263.05	18,826.27	12,303.05	103.51	103.66	-91.10	6,502.27	-833.66	1,239.99	1,032.82	207.17	5.985	
18,900.00	12,262.75	18,926.27	12,302.74	104.82	104.97	-91.10	6,602.27	-834.41	1,239.99	1,030.21	209.78	5.911	
19,000.00	12,262.44	19,026.27	12,302.43	106.13	106.28	-91.10	6,702.27	-835.16	1,240.00	1,027.60	212.40	5.838	
19,100.00	12,262.13	19,126.27	12,302.13	107.44	107.59	-91.10	6,802.26	-835.91	1,240.01	1,024.97	215.03	5.767	
19,200.00	12,261.82	19,226.27	12,301.82	108.75	108.91	-91.10	6,902.26	-836.65	1,240.01	1,022.35	217.66	5.697	
19,300.00	12,261.52	19,326.27	12,301.51	110.07	110.23	-91.10	7,002.26	-837.40	1,240.02	1,019.71	220.30	5.629	
19,400.00	12,261.21	19,426.27	12,301.20	111.39	111.55	-91.10	7,102.25	-838.15	1,240.02	1,017.07	222.95	5.562	
19,500.00	12,260.90	19,526.27	12,300.90	112.72	112.88	-91.10	7,202.25	-838.90	1,240.03	1,014.43	225.60	5.497	
19,600.00	12,260.59	19,626.27	12,300.59	114.05	114.21	-91.10	7,302.25	-839.65	1,240.03	1,011.78	228.25	5.433	
19,700.00	12,260.29	19,726.27	12,300.28	115.38	115.54	-91.10	7,402.24	-840.40	1,240.04	1,009.12	230.92	5.370	
19,800.00	12,259.98	19,826.27	12,299.97	116.71	116.87	-91.10	7,502.24	-841.15	1,240.04	1,006.46	233.58	5.309	
19,900.00	12,259.67	19,926.27	12,299.67	118.04	118.21	-91.10	7,602.24	-841.90	1,240.05	1,003.80	236.25	5.249	
20,000.00	12,259.36	20,026.27	12,299.36	119.38	119.55	-91.10	7,702.23	-842.65	1,240.05	1,001.13	238.93	5.190	
20,100.00	12,259.06	20,126.27	12,299.05	120.72	120.89	-91.10	7,802.23	-843.40	1,240.06	998.45	241.61	5.133	
20,200.00	12,258.75	20,226.27	12,298.74	122.06	122.23	-91.10	7,902.23	-844.15	1,240.06	995.77	244.29	5.076	
20,300.00	12,258.44	20,326.27	12,298.44	123.40	123.58	-91.10	8,002.22	-844.90	1,240.07	993.09	246.98	5.021	
20,400.00	12,258.14	20,426.27	12,298.13	124.75	124.92	-91.10	8,102.22	-845.65	1,240.07	990.40	249.67	4.967	
20,500.00	12,257.83	20,526.27	12,297.82	126.10	126.27	-91.10	8,202.22	-846.40	1,240.08	987.71	252.37	4.914	
20,600.00	12,257.52	20,626.27	12,297.51	127.45	127.62	-91.10	8,302.21	-847.15	1,240.08	985.02	255.07	4.862	

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

Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Com
 Site Error: 0.00 usft
 Reference Well: 702H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
 TVD Reference: KB=25' @ 3276.80usft (Precision 595)
 MD Reference: KB=25' @ 3276.80usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 604H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
20,700.00	12,257.21	20,726.27	12,297.21	128.80	128.97	-91.10	8,402.21	-847.90	1,240.09	982.32	257.77	4.811	
20,800.00	12,256.91	20,826.27	12,296.90	130.15	130.33	-91.10	8,502.21	-848.65	1,240.10	979.61	260.48	4.761	
20,900.00	12,256.60	20,926.27	12,296.59	131.51	131.69	-91.10	8,602.20	-849.40	1,240.10	976.91	263.19	4.712	
21,000.00	12,256.29	21,026.27	12,296.28	132.86	133.04	-91.10	8,702.20	-850.15	1,240.11	974.20	265.91	4.664	
21,100.00	12,255.98	21,126.27	12,295.98	134.22	134.40	-91.10	8,802.20	-850.90	1,240.11	971.49	268.63	4.617	
21,200.00	12,255.68	21,226.27	12,295.67	135.58	135.76	-91.10	8,902.19	-851.65	1,240.12	968.77	271.35	4.570	
21,300.00	12,255.37	21,326.27	12,295.36	136.94	137.13	-91.10	9,002.19	-852.40	1,240.12	966.05	274.07	4.525	
21,400.00	12,255.06	21,426.27	12,295.06	138.31	138.49	-91.10	9,102.19	-853.15	1,240.13	963.33	276.80	4.480	
21,500.00	12,254.75	21,526.27	12,294.75	139.67	139.86	-91.10	9,202.18	-853.90	1,240.13	960.61	279.53	4.437	
21,600.00	12,254.45	21,626.27	12,294.44	141.04	141.22	-91.10	9,302.18	-854.65	1,240.14	957.88	282.26	4.394	
21,700.00	12,254.14	21,726.27	12,294.13	142.41	142.59	-91.10	9,402.18	-855.40	1,240.14	955.15	285.00	4.351	
21,800.00	12,253.83	21,826.27	12,293.83	143.77	143.96	-91.10	9,502.17	-856.15	1,240.15	952.41	287.73	4.310	
21,900.00	12,253.52	21,926.27	12,293.52	145.14	145.33	-91.10	9,602.17	-856.90	1,240.15	949.68	290.47	4.269	
22,000.00	12,253.22	22,026.27	12,293.21	146.52	146.70	-91.10	9,702.17	-857.65	1,240.16	946.94	293.22	4.229	
22,100.00	12,252.91	22,126.27	12,292.90	147.89	148.08	-91.10	9,802.16	-858.40	1,240.16	944.20	295.96	4.190	
22,200.00	12,252.60	22,226.27	12,292.60	149.26	149.45	-91.10	9,902.16	-859.15	1,240.17	941.46	298.71	4.152	
22,300.00	12,252.30	22,326.27	12,292.29	150.64	150.83	-91.10	10,002.16	-859.90	1,240.18	938.71	301.46	4.114	
22,308.35	12,252.27	22,334.62	12,292.26	150.75	150.94	-91.10	10,010.51	-859.96	1,240.18	938.48	301.69	4.111	
22,396.02	12,252.00	22,420.22	12,292.00	151.96	152.12	-91.10	10,096.10	-860.60	1,240.18	936.11	304.08	4.079 SF	

Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Com
 Site Error: 0.00 usft
 Reference Well: 702H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
 TVD Reference: KB=25' @ 3276.80usft (Precision 595)
 MD Reference: KB=25' @ 3276.80usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 703H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N-S (usft)	-E/W (usft)				Between Centres (usft)	Between Ellipses (usft)
0.00	0.00	0.00	0.00	0.00	0.00	-90.38	-0.20	-29.90	29.92				
100.00	100.00	98.80	98.80	0.13	0.13	-90.38	-0.20	-29.90	29.90	29.63	0.27	111.887	
200.00	200.00	198.80	198.80	0.49	0.49	-90.38	-0.20	-29.90	29.90	28.92	0.98	30.464	
300.00	300.00	298.80	298.80	0.85	0.85	-90.38	-0.20	-29.90	29.90	28.20	1.70	17.605	
400.00	400.00	398.80	398.80	1.21	1.21	-90.38	-0.20	-29.90	29.90	27.49	2.42	12.379	
500.00	500.00	498.80	498.80	1.57	1.56	-90.38	-0.20	-29.90	29.90	26.77	3.13	9.546	
600.00	600.00	598.80	598.80	1.93	1.92	-90.38	-0.20	-29.90	29.90	26.05	3.85	7.768	
700.00	700.00	698.80	698.80	2.29	2.28	-90.38	-0.20	-29.90	29.90	25.33	4.57	6.548	
800.00	800.00	798.80	798.80	2.64	2.64	-90.38	-0.20	-29.90	29.90	24.62	5.28	5.660	
900.00	900.00	898.80	898.80	3.00	3.00	-90.38	-0.20	-29.90	29.90	23.90	6.00	4.983	
1,000.00	1,000.00	998.80	998.80	3.36	3.36	-90.38	-0.20	-29.90	29.90	23.18	6.72	4.451	
1,100.00	1,100.00	1,098.80	1,098.80	3.72	3.71	-90.38	-0.20	-29.90	29.90	22.47	7.43	4.022	
1,200.00	1,200.00	1,198.80	1,198.80	4.08	4.07	-90.38	-0.20	-29.90	29.90	21.75	8.15	3.668	
1,300.00	1,300.00	1,298.80	1,298.80	4.44	4.43	-90.38	-0.20	-29.90	29.90	21.03	8.87	3.372	
1,400.00	1,400.00	1,398.80	1,398.80	4.79	4.79	-90.38	-0.20	-29.90	29.90	20.32	9.58	3.120	
1,500.00	1,500.00	1,498.80	1,498.80	5.15	5.15	-90.38	-0.20	-29.90	29.90	19.60	10.30	2.902 CC	
1,600.00	1,599.98	1,599.52	1,599.50	5.50	5.49	152.41	-1.43	-28.68	30.26	19.27	10.99	2.753 ES	
1,700.00	1,699.84	1,700.24	1,700.07	5.84	5.83	149.88	-5.17	-24.97	31.33	19.66	11.66	2.686	
1,800.00	1,799.45	1,800.91	1,800.35	6.18	6.17	146.00	-11.41	-18.78	33.21	20.86	12.34	2.690	
1,900.00	1,898.91	1,900.85	1,899.75	6.52	6.51	141.99	-18.83	-11.42	35.64	22.61	13.03	2.735	
2,000.00	1,998.36	2,000.79	1,999.14	6.87	6.86	138.50	-26.25	-4.07	38.23	24.50	13.73	2.785	
2,100.00	2,097.81	2,100.73	2,098.53	7.23	7.21	135.46	-33.67	3.29	40.94	26.51	14.43	2.836	
2,200.00	2,197.26	2,200.67	2,197.93	7.59	7.56	132.81	-41.09	10.65	43.75	28.61	15.15	2.889	
2,300.00	2,296.72	2,300.61	2,297.32	7.95	7.92	130.48	-48.51	18.01	46.65	30.78	15.86	2.940	
2,400.00	2,396.17	2,400.55	2,396.71	8.31	8.28	128.42	-55.93	25.37	49.61	33.02	16.59	2.991	
2,500.00	2,495.62	2,500.49	2,496.11	8.67	8.64	126.60	-63.35	32.73	52.63	35.31	17.31	3.039	
2,600.00	2,595.08	2,600.44	2,595.50	9.04	9.00	124.98	-70.77	40.09	55.69	37.64	18.05	3.086	
2,700.00	2,694.53	2,700.38	2,694.89	9.41	9.37	123.53	-78.19	47.44	58.80	40.01	18.78	3.131	
2,800.00	2,793.98	2,800.32	2,794.29	9.78	9.74	122.22	-85.61	54.80	61.94	42.42	19.52	3.173	
2,900.00	2,893.43	2,900.26	2,893.68	10.15	10.11	121.04	-93.03	62.16	65.10	44.84	20.26	3.213	
3,000.00	2,992.89	3,000.20	2,993.07	10.52	10.48	119.98	-100.45	69.52	68.30	47.29	21.00	3.252	
3,100.00	3,092.34	3,100.14	3,092.47	10.90	10.85	119.00	-107.87	76.88	71.51	49.76	21.75	3.288	
3,200.00	3,191.79	3,200.08	3,191.86	11.27	11.23	118.11	-115.28	84.24	74.74	52.25	22.50	3.323	
3,300.00	3,291.25	3,300.02	3,291.25	11.65	11.60	117.30	-122.70	91.60	77.99	54.75	23.24	3.355	
3,400.00	3,390.70	3,399.97	3,390.65	12.02	11.97	116.55	-130.12	98.95	81.26	57.26	24.00	3.386	
3,500.00	3,490.15	3,499.91	3,490.04	12.40	12.35	115.85	-137.54	106.31	84.54	59.79	24.75	3.416	
3,600.00	3,589.61	3,599.85	3,589.43	12.78	12.73	115.21	-144.96	113.67	87.83	62.32	25.50	3.444	
3,700.00	3,689.06	3,699.79	3,688.83	13.15	13.10	114.62	-152.38	121.03	91.13	64.87	26.26	3.471	
3,800.00	3,788.51	3,799.73	3,788.22	13.53	13.48	114.07	-159.80	128.39	94.43	67.42	27.01	3.496	
3,900.00	3,887.96	3,899.67	3,887.61	13.91	13.86	113.55	-167.22	135.75	97.75	69.98	27.77	3.520	
4,000.00	3,987.42	3,999.61	3,987.01	14.29	14.24	113.07	-174.64	143.11	101.07	72.55	28.53	3.543	
4,100.00	4,086.87	4,099.55	4,086.40	14.67	14.62	112.62	-182.06	150.46	104.40	75.12	29.29	3.565	
4,200.00	4,186.32	4,199.50	4,185.79	15.05	15.00	112.20	-189.48	157.82	107.74	77.69	30.05	3.586	
4,300.00	4,285.78	4,299.44	4,285.19	15.43	15.38	111.80	-196.90	165.18	111.08	80.28	30.81	3.606	
4,400.00	4,385.23	4,399.38	4,384.58	15.81	15.76	111.43	-204.32	172.54	114.43	82.86	31.57	3.625	
4,500.00	4,484.68	4,499.32	4,483.98	16.19	16.14	111.08	-211.74	179.90	117.78	85.45	32.33	3.643	
4,600.00	4,584.14	4,599.22	4,583.34	16.57	16.52	110.80	-219.07	187.16	121.14	88.05	33.09	3.661	
4,700.00	4,683.59	4,698.96	4,682.77	16.95	16.89	111.72	-224.58	192.63	124.61	90.77	33.84	3.682	
4,800.00	4,783.04	4,798.43	4,782.15	17.34	17.25	114.12	-227.62	195.65	128.38	93.80	34.58	3.712	
4,900.00	4,882.49	4,897.59	4,881.29	17.72	17.58	117.80	-228.30	196.32	132.86	97.56	35.30	3.764	
5,000.00	4,981.95	4,997.04	4,980.75	18.10	17.91	121.62	-228.30	196.32	138.06	102.05	36.01	3.834	
5,100.00	5,081.40	5,096.49	5,080.20	18.48	18.24	125.15	-228.30	196.32	143.83	107.11	36.73	3.916	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 703H - OH - Plan 1 10-12-18														Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance				Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)	
5,200.00	5,180.85	5,195.95	5,179.65	18.86	18.58	128.40	-228.30	196.32	150.11	112.67	37.44	4.009		
5,300.00	5,280.31	5,295.40	5,279.11	19.25	18.91	131.39	-228.30	196.32	156.83	118.68	38.16	4.110		
5,400.00	5,379.76	5,394.85	5,378.56	19.63	19.24	134.12	-228.30	196.32	163.95	125.07	38.87	4.218		
5,500.00	5,479.21	5,494.30	5,478.01	20.01	19.58	136.62	-228.30	196.32	171.40	131.81	39.59	4.329		
5,600.00	5,578.66	5,593.76	5,577.46	20.40	19.91	138.91	-228.30	196.32	179.15	138.85	40.31	4.445		
5,700.00	5,678.12	5,693.21	5,676.92	20.78	20.25	141.01	-228.30	196.32	187.17	146.14	41.03	4.562		
5,800.00	5,777.57	5,792.66	5,776.37	21.16	20.58	142.93	-228.30	196.32	195.42	153.67	41.75	4.681		
5,900.00	5,877.02	5,892.12	5,875.82	21.55	20.92	144.70	-228.30	196.32	203.86	161.40	42.47	4.800		
6,000.00	5,976.48	5,991.57	5,975.28	21.93	21.26	146.32	-228.30	196.32	212.49	169.30	43.19	4.920		
6,100.00	6,075.93	6,091.02	6,074.73	22.32	21.60	147.82	-228.30	196.32	221.27	177.36	43.91	5.039		
6,200.00	6,175.38	6,190.47	6,174.18	22.70	21.94	149.20	-228.30	196.32	230.19	185.56	44.64	5.157		
6,300.00	6,274.84	6,289.93	6,273.64	23.08	22.28	150.48	-228.30	196.32	239.24	193.88	45.36	5.274		
6,400.00	6,374.30	6,389.39	6,373.10	23.47	22.62	151.68	-228.30	196.32	248.29	202.21	46.08	5.388		
6,500.00	6,473.99	6,489.08	6,472.79	23.84	22.96	152.57	-228.30	196.32	255.20	208.41	46.80	5.453		
6,600.00	6,573.89	6,588.98	6,572.69	24.20	23.30	153.05	-228.30	196.32	259.06	211.56	47.50	5.454		
6,700.00	6,673.88	6,688.97	6,672.68	24.54	23.64	-90.49	-228.30	196.32	259.91	211.73	48.18	5.395		
6,800.00	6,773.88	6,788.97	6,772.68	24.86	23.99	-90.49	-228.30	196.32	259.91	211.06	48.85	5.320		
6,900.00	6,873.88	6,888.97	6,872.68	25.19	24.33	-90.49	-228.30	196.32	259.91	210.39	49.53	5.248		
7,000.00	6,973.88	6,988.97	6,972.68	25.52	24.68	-90.49	-228.30	196.32	259.91	209.71	50.20	5.178		
7,100.00	7,073.88	7,088.97	7,072.68	25.85	25.02	-90.49	-228.30	196.32	259.91	209.04	50.88	5.109		
7,200.00	7,173.88	7,188.97	7,172.68	26.19	25.37	-90.49	-228.30	196.32	259.91	208.36	51.55	5.042		
7,300.00	7,273.88	7,288.97	7,272.68	26.52	25.71	-90.49	-228.30	196.32	259.91	207.68	52.23	4.976		
7,400.00	7,373.88	7,388.97	7,372.68	26.85	26.06	-90.49	-228.30	196.32	259.91	207.00	52.91	4.912		
7,500.00	7,473.88	7,488.97	7,472.68	27.18	26.41	-90.49	-228.30	196.32	259.91	206.32	53.59	4.850		
7,600.00	7,573.88	7,588.97	7,572.68	27.52	26.75	-90.49	-228.30	196.32	259.91	205.64	54.27	4.789		
7,700.00	7,673.88	7,688.97	7,672.68	27.85	27.10	-90.49	-228.30	196.32	259.91	204.96	54.95	4.730		
7,800.00	7,773.88	7,788.97	7,772.68	28.19	27.45	-90.49	-228.30	196.32	259.91	204.28	55.64	4.672		
7,900.00	7,873.88	7,888.97	7,872.68	28.52	27.80	-90.49	-228.30	196.32	259.91	203.59	56.32	4.615		
8,000.00	7,973.88	7,988.97	7,972.68	28.86	28.14	-90.49	-228.30	196.32	259.91	202.91	57.00	4.560		
8,100.00	8,073.88	8,088.97	8,072.68	29.20	28.49	-90.49	-228.30	196.32	259.91	202.22	57.69	4.505		
8,200.00	8,173.88	8,188.97	8,172.68	29.54	28.84	-90.49	-228.30	196.32	259.91	201.54	58.38	4.452		
8,300.00	8,273.88	8,288.97	8,272.68	29.87	29.19	-90.49	-228.30	196.32	259.91	200.85	59.06	4.401		
8,400.00	8,373.88	8,388.97	8,372.68	30.21	29.54	-90.49	-228.30	196.32	259.91	200.16	59.75	4.350		
8,500.00	8,473.88	8,488.97	8,472.68	30.55	29.89	-90.49	-228.30	196.32	259.91	199.47	60.44	4.301		
8,600.00	8,573.88	8,588.97	8,572.68	30.89	30.24	-90.49	-228.30	196.32	259.91	198.79	61.13	4.252		
8,700.00	8,673.88	8,688.97	8,672.68	31.23	30.59	-90.49	-228.30	196.32	259.91	198.10	61.82	4.205		
8,800.00	8,773.88	8,788.97	8,772.68	31.57	30.94	-90.49	-228.30	196.32	259.91	197.41	62.51	4.158		
8,900.00	8,873.88	8,888.97	8,872.68	31.91	31.29	-90.49	-228.30	196.32	259.91	196.72	63.20	4.113		
9,000.00	8,973.88	8,988.97	8,972.68	32.25	31.64	-90.49	-228.30	196.32	259.91	196.02	63.89	4.068		
9,100.00	9,073.88	9,088.97	9,072.68	32.59	31.99	-90.49	-228.30	196.32	259.91	195.33	64.58	4.025		
9,200.00	9,173.88	9,188.97	9,172.68	32.93	32.34	-90.49	-228.30	196.32	259.91	194.64	65.27	3.982		
9,300.00	9,273.88	9,288.97	9,272.68	33.28	32.69	-90.49	-228.30	196.32	259.91	193.95	65.96	3.940		
9,400.00	9,373.88	9,388.97	9,372.68	33.62	33.04	-90.49	-228.30	196.32	259.91	193.25	66.66	3.899		
9,500.00	9,473.88	9,488.97	9,472.68	33.96	33.39	-90.49	-228.30	196.32	259.91	192.56	67.35	3.859		
9,600.00	9,573.88	9,588.97	9,572.68	34.31	33.74	-90.49	-228.30	196.32	259.91	191.87	68.05	3.820		
9,700.00	9,673.88	9,688.97	9,672.68	34.65	34.09	-90.49	-228.30	196.32	259.91	191.17	68.74	3.781		
9,800.00	9,773.88	9,788.97	9,772.68	34.99	34.44	-90.49	-228.30	196.32	259.91	190.48	69.44	3.743		
9,900.00	9,873.88	9,888.97	9,872.68	35.34	34.80	-90.49	-228.30	196.32	259.91	189.78	70.13	3.706		
10,000.00	9,973.88	9,988.97	9,972.68	35.68	35.15	-90.49	-228.30	196.32	259.91	189.08	70.83	3.670		
10,100.00	10,073.88	10,088.97	10,072.68	36.02	35.50	-90.49	-228.30	196.32	259.91	188.39	71.52	3.634		
10,200.00	10,173.88	10,188.97	10,172.68	36.37	35.85	-90.49	-228.30	196.32	259.91	187.69	72.22	3.599		
10,300.00	10,273.88	10,288.97	10,272.68	36.71	36.20	-90.49	-228.30	196.32	259.91	186.99	72.92	3.564		

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 703H - OH - Plan 1 10-12-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
10,400.00	10,373.88	10,388.97	10,372.68	37.06	36.56	-90.49	-228.30	196.32	259.91	186.30	73.62	3.531		
10,500.00	10,473.88	10,488.97	10,472.68	37.41	36.91	-90.49	-228.30	196.32	259.91	185.60	74.31	3.497		
10,600.00	10,573.88	10,588.97	10,572.68	37.75	37.26	-90.49	-228.30	196.32	259.91	184.90	75.01	3.465		
10,700.00	10,673.88	10,688.97	10,672.68	38.10	37.61	-90.49	-228.30	196.32	259.91	184.20	75.71	3.433		
10,800.00	10,773.88	10,788.97	10,772.68	38.44	37.97	-90.49	-228.30	196.32	259.91	183.50	76.41	3.402		
10,900.00	10,873.88	10,888.97	10,872.68	38.79	38.32	-90.49	-228.30	196.32	259.91	182.80	77.11	3.371		
11,000.00	10,973.88	10,988.97	10,972.68	39.14	38.67	-90.49	-228.30	196.32	259.91	182.10	77.81	3.340		
11,100.00	11,073.88	11,088.97	11,072.68	39.48	39.03	-90.49	-228.30	196.32	259.91	181.40	78.51	3.311		
11,200.00	11,173.88	11,188.97	11,172.68	39.83	39.38	-90.49	-228.30	196.32	259.91	180.70	79.21	3.281		
11,300.00	11,273.88	11,288.97	11,272.68	40.18	39.73	-90.49	-228.30	196.32	259.91	180.00	79.91	3.253		
11,400.00	11,373.88	11,388.97	11,372.68	40.53	40.09	-90.49	-228.30	196.32	259.91	179.30	80.61	3.224		
11,500.00	11,473.88	11,488.97	11,472.68	40.87	40.44	-90.49	-228.30	196.32	259.91	178.60	81.31	3.196		
11,600.00	11,573.88	11,588.97	11,572.68	41.22	40.79	-90.49	-228.30	196.32	259.91	177.90	82.02	3.169		
11,700.00	11,673.88	11,688.97	11,672.68	41.57	41.15	-90.49	-228.30	196.32	259.91	177.20	82.72	3.142		
11,703.38	11,677.26	11,692.35	11,676.06	41.58	41.16	-90.06	-228.30	196.32	259.91	177.17	82.74	3.141		
11,800.00	11,773.74	11,788.84	11,772.54	41.91	41.50	-90.86	-228.30	196.32	259.94	176.53	83.41	3.116		
11,900.00	11,871.62	11,886.71	11,870.42	42.24	41.85	-95.02	-228.30	196.32	261.00	176.92	84.09	3.104		
12,000.00	11,964.55	11,979.64	11,963.35	42.53	42.18	-101.75	-228.30	196.32	266.84	182.13	84.70	3.150		
12,100.00	12,049.72	12,081.80	12,065.15	42.77	42.53	-110.04	-221.33	196.27	281.03	195.73	85.30	3.295		
12,200.00	12,124.54	12,197.21	12,176.58	42.96	42.90	-117.74	-192.06	196.05	301.15	215.29	85.86	3.507		
12,300.00	12,186.73	12,327.68	12,292.57	43.09	43.26	-124.47	-132.93	195.61	324.18	237.83	86.35	3.754		
12,400.00	12,234.41	12,476.32	12,404.49	43.17	43.59	-129.95	-35.76	194.89	346.43	259.67	86.76	3.993		
12,500.00	12,266.13	12,644.09	12,496.06	43.25	43.90	-133.85	104.10	193.85	363.87	276.71	87.17	4.174		
12,600.00	12,280.92	12,826.85	12,545.26	43.42	44.24	-135.76	279.30	192.54	372.82	285.11	87.71	4.251		
12,700.00	12,281.80	12,958.27	12,548.80	43.63	44.49	-135.90	410.58	191.57	373.48	285.32	88.15	4.237		
12,800.00	12,281.49	13,058.27	12,548.49	43.88	44.72	-135.90	510.58	190.82	373.48	284.85	88.62	4.214		
12,900.00	12,281.19	13,158.27	12,548.18	44.18	45.00	-135.90	610.57	190.08	373.48	284.29	89.19	4.188		
13,000.00	12,280.88	13,258.27	12,547.88	44.52	45.32	-135.90	710.57	189.33	373.48	283.63	89.84	4.157		
13,100.00	12,280.57	13,358.27	12,547.57	44.89	45.69	-135.90	810.57	188.59	373.48	282.89	90.59	4.123		
13,200.00	12,280.26	13,458.27	12,547.26	45.31	46.09	-135.90	910.57	187.84	373.48	282.07	91.41	4.086		
13,300.00	12,279.96	13,558.27	12,546.95	45.77	46.54	-135.90	1,010.56	187.10	373.48	281.16	92.31	4.046		
13,400.00	12,279.65	13,658.27	12,546.65	46.27	47.03	-135.90	1,110.56	186.36	373.48	280.18	93.30	4.003		
13,500.00	12,279.34	13,758.27	12,546.34	46.81	47.55	-135.90	1,210.56	185.61	373.48	279.12	94.36	3.958		
13,600.00	12,279.04	13,858.27	12,546.03	47.38	48.11	-135.90	1,310.55	184.87	373.48	277.98	95.49	3.911		
13,700.00	12,278.73	13,958.27	12,545.72	47.99	48.71	-135.90	1,410.55	184.12	373.48	276.78	96.70	3.862		
13,800.00	12,278.42	14,058.27	12,545.42	48.63	49.34	-135.90	1,510.55	183.38	373.48	275.50	97.97	3.812		
13,900.00	12,278.11	14,158.27	12,545.11	49.31	50.01	-135.90	1,610.54	182.63	373.48	274.16	99.31	3.761		
14,000.00	12,277.81	14,258.27	12,544.80	50.01	50.70	-135.90	1,710.54	181.89	373.48	272.76	100.72	3.708		
14,100.00	12,277.50	14,358.27	12,544.50	50.75	51.43	-135.90	1,810.54	181.14	373.48	271.29	102.18	3.655		
14,200.00	12,277.19	14,458.27	12,544.19	51.52	52.19	-135.90	1,910.53	180.40	373.48	269.77	103.71	3.601		
14,300.00	12,276.88	14,558.27	12,543.88	52.31	52.97	-135.90	2,010.53	179.66	373.48	268.19	105.29	3.547		
14,400.00	12,276.58	14,658.27	12,543.57	53.14	53.78	-135.90	2,110.53	178.91	373.48	266.56	106.92	3.493		
14,500.00	12,276.27	14,758.27	12,543.27	53.98	54.62	-135.90	2,210.52	178.17	373.48	264.87	108.60	3.439		
14,600.00	12,275.96	14,858.27	12,542.96	54.86	55.48	-135.90	2,310.52	177.42	373.48	263.14	110.34	3.385		
14,700.00	12,275.65	14,958.27	12,542.65	55.75	56.37	-135.90	2,410.52	176.68	373.48	261.36	112.12	3.331		
14,800.00	12,275.35	15,058.27	12,542.34	56.67	57.27	-135.90	2,510.51	175.93	373.48	259.53	113.94	3.278		
14,900.00	12,275.04	15,158.27	12,542.04	57.61	58.20	-135.90	2,610.51	175.19	373.48	257.67	115.81	3.225		
15,000.00	12,274.73	15,258.27	12,541.73	58.56	59.15	-135.90	2,710.51	174.45	373.48	255.76	117.72	3.173		
15,100.00	12,274.42	15,358.27	12,541.42	59.54	60.12	-135.90	2,810.50	173.70	373.48	253.81	119.66	3.121		
15,200.00	12,274.12	15,458.27	12,541.11	60.54	61.11	-135.90	2,910.50	172.96	373.48	251.83	121.64	3.070		
15,300.00	12,273.81	15,558.27	12,540.81	61.55	62.11	-135.90	3,010.50	172.21	373.48	249.81	123.66	3.020		
15,400.00	12,273.50	15,658.27	12,540.50	62.58	63.13	-135.90	3,110.49	171.47	373.48	247.76	125.71	2.971		

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 703H - OH - Plan 1 10-12-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
15,500.00	12,273.20	15,758.27	12,540.19	63.63	64.17	-135.90	3,210.49	170.72	373.48	245.68	127.79	2.922		
15,600.00	12,272.89	15,858.27	12,539.88	64.69	65.22	-135.90	3,310.49	169.98	373.48	243.57	129.91	2.875		
15,700.00	12,272.58	15,958.27	12,539.58	65.76	66.29	-135.90	3,410.48	169.23	373.48	241.43	132.05	2.828		
15,800.00	12,272.27	16,058.27	12,539.27	66.85	67.37	-135.90	3,510.48	168.49	373.48	239.26	134.22	2.783		
15,900.00	12,271.97	16,158.27	12,538.96	67.95	68.46	-135.90	3,610.48	167.75	373.48	237.07	136.41	2.738		
16,000.00	12,271.66	16,258.27	12,538.66	69.06	69.57	-135.90	3,710.47	167.00	373.48	234.85	138.63	2.694		
16,100.00	12,271.35	16,358.27	12,538.35	70.19	70.68	-135.90	3,810.47	166.26	373.48	232.60	140.87	2.651		
16,200.00	12,271.04	16,458.27	12,538.04	71.32	71.81	-135.90	3,910.47	165.51	373.48	230.34	143.14	2.609		
16,300.00	12,270.74	16,558.27	12,537.73	72.47	72.95	-135.90	4,010.46	164.77	373.48	228.05	145.42	2.568		
16,400.00	12,270.43	16,658.27	12,537.43	73.63	74.10	-135.90	4,110.46	164.02	373.48	225.75	147.73	2.528		
16,500.00	12,270.12	16,758.27	12,537.12	74.79	75.26	-135.90	4,210.46	163.28	373.48	223.42	150.06	2.489		
16,600.00	12,269.81	16,858.27	12,536.81	75.97	76.43	-135.90	4,310.46	162.54	373.48	221.08	152.40	2.451		
16,700.00	12,269.51	16,958.27	12,536.50	77.15	77.61	-135.90	4,410.45	161.79	373.48	218.71	154.76	2.413		
16,800.00	12,269.20	17,058.27	12,536.20	78.35	78.79	-135.90	4,510.45	161.05	373.48	216.33	157.14	2.377		
16,900.00	12,268.89	17,158.27	12,535.89	79.55	79.99	-135.90	4,610.45	160.30	373.48	213.94	159.54	2.341		
17,000.00	12,268.59	17,258.27	12,535.58	80.76	81.19	-135.90	4,710.44	159.56	373.48	211.53	161.95	2.306		
17,100.00	12,268.28	17,358.27	12,535.27	81.97	82.40	-135.90	4,810.44	158.81	373.48	209.10	164.38	2.272		
17,200.00	12,267.97	17,458.27	12,534.97	83.20	83.62	-135.90	4,910.44	158.07	373.48	206.66	166.82	2.239		
17,300.00	12,267.66	17,558.27	12,534.66	84.43	84.84	-135.90	5,010.43	157.32	373.48	204.21	169.27	2.206		
17,400.00	12,267.36	17,658.27	12,534.35	85.66	86.07	-135.90	5,110.43	156.58	373.48	201.74	171.74	2.174		
17,500.00	12,267.05	17,758.27	12,534.04	86.90	87.31	-135.90	5,210.43	155.84	373.48	199.26	174.21	2.144		
17,600.00	12,266.74	17,858.27	12,533.74	88.15	88.55	-135.90	5,310.42	155.09	373.48	196.77	176.71	2.114		
17,700.00	12,266.43	17,958.27	12,533.43	89.41	89.80	-135.90	5,410.42	154.35	373.48	194.27	179.21	2.084		
17,800.00	12,266.13	18,058.27	12,533.12	90.67	91.06	-135.90	5,510.42	153.60	373.48	191.75	181.72	2.055		
17,900.00	12,265.82	18,158.27	12,532.82	91.93	92.32	-135.90	5,610.41	152.86	373.48	189.23	184.25	2.027		
18,000.00	12,265.51	18,258.27	12,532.51	93.20	93.58	-135.90	5,710.41	152.11	373.48	186.70	186.78	2.000		
18,100.00	12,265.20	18,358.27	12,532.20	94.47	94.85	-135.90	5,810.41	151.37	373.48	184.15	189.32	1.973		
18,200.00	12,264.90	18,458.27	12,531.89	95.75	96.12	-135.90	5,910.40	150.63	373.48	181.60	191.88	1.946		
18,300.00	12,264.59	18,558.27	12,531.59	97.03	97.40	-135.90	6,010.40	149.88	373.48	179.04	194.44	1.921		
18,400.00	12,264.28	18,658.27	12,531.28	98.32	98.69	-135.90	6,110.40	149.14	373.48	176.47	197.01	1.896		
18,500.00	12,263.97	18,758.27	12,530.97	99.61	99.97	-135.90	6,210.39	148.39	373.48	173.89	199.59	1.871		
18,600.00	12,263.67	18,858.27	12,530.66	100.91	101.26	-135.90	6,310.39	147.65	373.48	171.30	202.17	1.847		
18,700.00	12,263.36	18,958.27	12,530.36	102.21	102.56	-135.90	6,410.39	146.90	373.48	168.71	204.77	1.824		
18,800.00	12,263.05	19,058.27	12,530.05	103.51	103.86	-135.90	6,510.38	146.16	373.48	166.11	207.37	1.801		
18,900.00	12,262.75	19,158.27	12,529.74	104.82	105.16	-135.90	6,610.38	145.41	373.48	163.50	209.98	1.779		
19,000.00	12,262.44	19,258.27	12,529.43	106.13	106.47	-135.90	6,710.38	144.67	373.48	160.88	212.59	1.757		
19,100.00	12,262.13	19,358.27	12,529.13	107.44	107.77	-135.90	6,810.37	143.93	373.48	158.26	215.21	1.735		
19,200.00	12,261.82	19,458.27	12,528.82	108.75	109.09	-135.90	6,910.37	143.18	373.48	155.63	217.84	1.714		
19,300.00	12,261.52	19,558.27	12,528.51	110.07	110.40	-135.90	7,010.37	142.44	373.48	153.00	220.48	1.694		
19,400.00	12,261.21	19,658.27	12,528.20	111.39	111.72	-135.90	7,110.36	141.69	373.48	150.36	223.12	1.674		
19,500.00	12,260.90	19,758.27	12,527.90	112.72	113.04	-135.90	7,210.36	140.95	373.48	147.71	225.76	1.654		
19,600.00	12,260.59	19,858.27	12,527.59	114.05	114.37	-135.90	7,310.36	140.20	373.48	145.06	228.41	1.635		
19,700.00	12,260.29	19,958.27	12,527.28	115.38	115.69	-135.90	7,410.35	139.46	373.48	142.41	231.07	1.616		
19,800.00	12,259.98	20,058.27	12,526.98	116.71	117.02	-135.90	7,510.35	138.71	373.48	139.75	233.73	1.598		
19,900.00	12,259.67	20,158.27	12,526.67	118.04	118.35	-135.90	7,610.35	137.97	373.48	137.08	236.40	1.580		
20,000.00	12,259.36	20,258.27	12,526.36	119.38	119.69	-135.90	7,710.34	137.23	373.48	134.41	239.07	1.562		
20,100.00	12,259.06	20,358.27	12,526.05	120.72	121.02	-135.90	7,810.34	136.48	373.47	131.73	241.74	1.545		
20,200.00	12,258.75	20,458.27	12,525.75	122.06	122.36	-135.90	7,910.34	135.74	373.47	129.05	244.42	1.528		
20,300.00	12,258.44	20,558.27	12,525.44	123.40	123.70	-135.90	8,010.34	134.99	373.47	126.37	247.11	1.511		
20,400.00	12,258.14	20,658.27	12,525.13	124.75	125.05	-135.90	8,110.33	134.25	373.47	123.68	249.80	1.495 Level 3		
20,500.00	12,257.83	20,758.27	12,524.82	126.10	126.39	-135.90	8,210.33	133.50	373.47	120.99	252.49	1.479 Level 3		
20,600.00	12,257.52	20,858.27	12,524.52	127.45	127.74	-135.90	8,310.33	132.76	373.47	118.29	255.19	1.464 Level 3		

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 703H - OH - Plan 1 10-12-18												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
20,700.00	12,257.21	20,958.27	12,524.21	128.80	129.09	-135.90	8,410.32	132.02	373.47	115.59	257.89	1.448	Level 3
20,800.00	12,256.91	21,058.27	12,523.90	130.15	130.44	-135.90	8,510.32	131.27	373.47	112.88	260.59	1.433	Level 3
20,900.00	12,256.60	21,158.27	12,523.59	131.51	131.79	-135.90	8,610.32	130.53	373.47	110.18	263.30	1.418	Level 3
21,000.00	12,256.29	21,258.27	12,523.29	132.86	133.15	-135.90	8,710.31	129.78	373.47	107.47	266.01	1.404	Level 3
21,100.00	12,255.98	21,358.27	12,522.98	134.22	134.50	-135.90	8,810.31	129.04	373.47	104.75	268.72	1.390	Level 3
21,200.00	12,255.68	21,458.27	12,522.67	135.58	135.86	-135.90	8,910.31	128.29	373.47	102.03	271.44	1.376	Level 3
21,300.00	12,255.37	21,558.27	12,522.37	136.94	137.22	-135.90	9,010.30	127.55	373.47	99.31	274.16	1.362	Level 3
21,400.00	12,255.06	21,658.27	12,522.06	138.31	138.58	-135.90	9,110.30	126.80	373.47	96.59	276.89	1.349	Level 3
21,500.00	12,254.75	21,758.27	12,521.75	139.67	139.94	-135.90	9,210.30	126.06	373.47	93.86	279.61	1.336	Level 3
21,600.00	12,254.45	21,858.27	12,521.44	141.04	141.31	-135.90	9,310.29	125.32	373.47	91.13	282.34	1.323	Level 3
21,700.00	12,254.14	21,958.27	12,521.14	142.41	142.67	-135.90	9,410.29	124.57	373.47	88.40	285.08	1.310	Level 3
21,800.00	12,253.83	22,058.27	12,520.83	143.77	144.04	-135.90	9,510.29	123.83	373.47	85.66	287.81	1.298	Level 3
21,900.00	12,253.52	22,158.27	12,520.52	145.14	145.40	-135.90	9,610.28	123.08	373.47	82.93	290.55	1.285	Level 3
22,000.00	12,253.22	22,258.27	12,520.21	146.52	146.77	-135.90	9,710.28	122.34	373.47	80.19	293.29	1.273	Level 3
22,100.00	12,252.91	22,358.27	12,519.91	147.89	148.14	-135.90	9,810.28	121.59	373.47	77.44	296.03	1.262	Level 3
22,200.00	12,252.60	22,458.27	12,519.60	149.26	149.52	-135.90	9,910.27	120.85	373.47	74.70	298.78	1.250	Level 3
22,300.00	12,252.30	22,558.27	12,519.29	150.64	150.89	-135.90	10,010.27	120.11	373.47	71.95	301.53	1.239	Level 2
22,392.77	12,252.01	22,651.05	12,519.01	151.91	152.16	-135.90	10,103.04	119.41	373.47	69.40	304.08	1.228	Level 2
22,396.02	12,252.00	22,653.01	12,519.00	151.96	152.19	-135.90	10,105.00	119.40	373.48	69.33	304.15	1.228	Level 2, SF



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
0.00	0.00	13.50	13.50	0.00	0.02	-90.49	-5.40	-634.90	634.92				
100.00	100.00	113.50	113.50	0.13	0.17	-90.49	-5.40	-634.90	634.92	634.61	0.31	2,059.527	
200.00	200.00	213.50	213.50	0.49	0.53	-90.49	-5.40	-634.90	634.92	633.90	1.03	619.299	
300.00	300.00	313.50	313.50	0.85	0.89	-90.49	-5.40	-634.90	634.92	633.18	1.74	364.443	
400.00	400.00	413.50	413.50	1.21	1.25	-90.49	-5.40	-634.90	634.92	632.46	2.46	258.192	
500.00	500.00	513.50	513.50	1.57	1.61	-90.49	-5.40	-634.90	634.92	631.75	3.18	199.909	
600.00	600.00	613.50	613.50	1.93	1.97	-90.49	-5.40	-634.90	634.92	631.03	3.89	163.093	
700.00	700.00	713.50	713.50	2.29	2.32	-90.49	-5.40	-634.90	634.92	630.31	4.61	137.729	
800.00	800.00	813.50	813.50	2.64	2.68	-90.49	-5.40	-634.90	634.92	629.60	5.33	119.192	
900.00	900.00	913.50	913.50	3.00	3.04	-90.49	-5.40	-634.90	634.92	628.88	6.04	105.053	
1,000.00	1,000.00	1,013.50	1,013.50	3.36	3.40	-90.49	-5.40	-634.90	634.92	628.16	6.76	93.913	
1,100.00	1,100.00	1,113.50	1,113.50	3.72	3.76	-90.49	-5.40	-634.90	634.92	627.45	7.48	84.909	
1,200.00	1,200.00	1,213.50	1,213.50	4.08	4.12	-90.49	-5.40	-634.90	634.92	626.73	8.19	77.480	
1,300.00	1,300.00	1,313.50	1,313.50	4.44	4.48	-90.49	-5.40	-634.90	634.92	626.01	8.91	71.247	
1,400.00	1,400.00	1,413.50	1,413.50	4.79	4.83	-90.49	-5.40	-634.90	634.92	625.29	9.63	65.942	
1,500.00	1,500.00	1,516.55	1,516.55	5.15	5.20	-90.49	-5.43	-634.86	634.89	624.54	10.35	61.317	
1,600.00	1,599.98	1,639.12	1,639.07	5.50	5.62	153.08	-7.25	-632.07	634.19	623.07	11.12	57.037	
1,700.00	1,699.84	1,759.49	1,759.13	5.84	6.03	152.92	-11.83	-625.09	633.06	621.20	11.86	53.375	
1,733.05	1,732.80	1,792.54	1,792.06	5.95	6.14	152.88	-13.41	-622.68	632.89	620.81	12.09	52.367 CC	
1,800.00	1,799.45	1,859.48	1,858.74	6.18	6.37	152.84	-16.60	-617.80	633.59	621.05	12.54	50.511	
1,900.00	1,898.91	1,959.46	1,958.34	6.52	6.71	152.83	-21.38	-610.51	635.67	622.43	13.24	48.026	
2,000.00	1,998.36	2,059.43	2,057.94	6.87	7.06	152.82	-26.16	-603.22	637.74	623.80	13.94	45.763	
2,100.00	2,097.81	2,159.41	2,157.54	7.23	7.41	152.81	-30.93	-595.93	639.82	625.17	14.64	43.897	
2,200.00	2,197.26	2,259.39	2,257.13	7.59	7.77	152.80	-35.71	-588.63	641.89	626.54	15.35	41.805	
2,300.00	2,296.72	2,359.37	2,356.73	7.95	8.13	152.79	-40.48	-581.34	643.97	627.90	16.07	40.069	
2,400.00	2,396.17	2,459.35	2,456.33	8.31	8.48	152.78	-45.26	-574.05	646.04	629.25	16.79	38.471	
2,500.00	2,495.62	2,559.33	2,555.93	8.67	8.84	152.77	-50.04	-566.76	648.12	630.60	17.52	36.996	
2,600.00	2,595.08	2,659.30	2,655.53	9.04	9.21	152.76	-54.81	-559.47	650.19	631.95	18.25	35.633	
2,700.00	2,694.53	2,759.28	2,755.12	9.41	9.57	152.75	-59.59	-552.18	652.27	633.29	18.98	34.369	
2,800.00	2,793.98	2,859.26	2,854.72	9.78	9.93	152.74	-64.36	-544.89	654.34	634.63	19.71	33.194	
2,900.00	2,893.43	2,959.24	2,954.32	10.15	10.30	152.73	-69.14	-537.60	656.42	635.97	20.45	32.100	
3,000.00	2,992.89	3,059.22	3,053.92	10.52	10.66	152.72	-73.92	-530.31	658.50	637.31	21.19	31.079	
3,100.00	3,092.34	3,159.20	3,153.51	10.90	11.03	152.72	-78.69	-523.02	660.57	638.64	21.93	30.124	
3,200.00	3,191.79	3,259.17	3,253.11	11.27	11.40	152.71	-83.47	-515.73	662.65	639.98	22.67	29.229	
3,300.00	3,291.25	3,359.15	3,352.71	11.65	11.77	152.70	-88.24	-508.44	664.72	641.31	23.41	28.390	
3,400.00	3,390.70	3,459.13	3,452.31	12.02	12.14	152.69	-93.02	-501.15	666.80	642.64	24.16	27.600	
3,500.00	3,490.15	3,559.11	3,551.91	12.40	12.51	152.68	-97.80	-493.86	668.87	643.97	24.91	26.856	
3,600.00	3,589.61	3,659.09	3,651.50	12.78	12.88	152.67	-102.57	-486.56	670.95	645.30	25.65	26.155	
3,700.00	3,689.06	3,759.07	3,751.10	13.15	13.25	152.66	-107.35	-479.27	673.03	646.62	26.40	25.492	
3,800.00	3,788.51	3,859.05	3,850.70	13.53	13.62	152.65	-112.12	-471.98	675.10	647.95	27.15	24.864	
3,900.00	3,887.96	3,959.02	3,950.30	13.91	13.99	152.65	-116.90	-464.69	677.18	649.27	27.90	24.270	
4,000.00	3,987.42	4,059.00	4,049.89	14.29	14.36	152.64	-121.68	-457.40	679.25	650.60	28.65	23.706	
4,100.00	4,086.87	4,158.98	4,149.49	14.67	14.74	152.63	-126.45	-450.11	681.33	651.92	29.41	23.170	
4,200.00	4,186.32	4,258.96	4,249.09	15.05	15.11	152.62	-131.23	-442.82	683.40	653.25	30.16	22.661	
4,300.00	4,285.78	4,358.94	4,348.69	15.43	15.48	152.61	-136.00	-435.53	685.48	654.57	30.91	22.176	
4,400.00	4,385.23	4,458.92	4,448.29	15.81	15.86	152.60	-140.78	-428.24	687.56	655.89	31.67	21.713	
4,500.00	4,484.68	4,558.89	4,547.88	16.19	16.23	152.60	-145.56	-420.95	689.63	657.21	32.42	21.272	
4,600.00	4,584.14	4,658.87	4,647.48	16.57	16.60	152.59	-150.33	-413.66	691.71	658.53	33.17	20.850	
4,700.00	4,683.59	4,758.85	4,747.08	16.95	16.98	152.58	-155.11	-406.37	693.78	659.85	33.93	20.447	
4,800.00	4,783.04	4,858.83	4,846.68	17.34	17.35	152.57	-159.88	-399.08	695.86	661.17	34.69	20.061	
4,900.00	4,882.49	4,958.81	4,946.27	17.72	17.73	152.56	-164.66	-391.79	697.93	662.49	35.44	19.692	
5,000.00	4,981.95	5,058.79	5,045.87	18.10	18.10	152.56	-169.44	-384.49	700.01	663.81	36.20	19.337	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (')	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
5,100.00	5,081.40	5,158.76	5,145.47	18.48	18.47	152.55	-174.21	-377.20	702.09	665.13	36.96	18.997	
5,200.00	5,180.85	5,258.74	5,245.07	18.86	18.85	152.54	-178.99	-369.91	704.16	666.45	37.71	18.671	
5,300.00	5,280.31	5,358.72	5,344.67	19.25	19.23	152.53	-183.76	-362.62	706.24	667.77	38.47	18.357	
5,400.00	5,379.76	5,458.70	5,444.26	19.63	19.60	152.53	-188.54	-355.33	708.31	669.08	39.23	18.055	
5,500.00	5,479.21	5,558.68	5,543.86	20.01	19.98	152.52	-193.32	-348.04	710.39	670.40	39.99	17.764	
5,600.00	5,578.66	5,658.66	5,643.46	20.40	20.35	152.51	-198.09	-340.75	712.47	671.72	40.75	17.485	
5,700.00	5,678.12	5,758.64	5,743.06	20.78	20.73	152.50	-202.87	-333.46	714.54	673.04	41.51	17.215	
5,800.00	5,777.57	5,858.61	5,842.65	21.16	21.10	152.49	-207.65	-326.17	716.62	674.35	42.27	16.955	
5,900.00	5,877.02	5,958.59	5,942.25	21.55	21.48	152.49	-212.42	-318.88	718.69	675.67	43.03	16.704	
6,000.00	5,976.48	6,058.57	6,041.85	21.93	21.85	152.48	-217.20	-311.59	720.77	676.98	43.79	16.461	
6,100.00	6,075.93	6,158.55	6,141.45	22.32	22.23	152.47	-221.97	-304.30	722.85	678.30	44.55	16.227	
6,200.00	6,175.38	6,257.52	6,240.05	22.70	22.60	152.47	-226.70	-297.08	724.93	679.62	45.30	16.002	
6,300.00	6,274.84	6,340.16	6,322.47	23.08	22.91	152.52	-229.92	-292.17	728.33	682.34	45.99	15.836	
6,400.00	6,374.30	6,422.58	6,404.81	23.47	23.20	152.69	-231.83	-289.24	734.02	687.35	46.67	15.727	
6,500.00	6,473.99	6,505.27	6,487.49	23.84	23.49	152.92	-232.45	-288.31	739.84	692.51	47.33	15.632	
6,600.00	6,573.89	6,605.17	6,587.39	24.20	23.82	153.11	-232.45	-288.31	743.70	695.68	48.02	15.488	
6,700.00	6,673.88	6,705.16	6,687.38	24.54	24.15	-90.49	-232.45	-288.31	744.56	695.87	48.69	15.293	
6,800.00	6,773.88	6,805.16	6,787.38	24.86	24.48	-90.49	-232.45	-288.31	744.56	695.21	49.35	15.088	
6,900.00	6,873.88	6,905.16	6,887.38	25.19	24.82	-90.49	-232.45	-288.31	744.56	694.55	50.01	14.888	
7,000.00	6,973.88	7,005.16	6,987.38	25.52	25.15	-90.49	-232.45	-288.31	744.56	693.88	50.68	14.693	
7,100.00	7,073.88	7,105.16	7,087.38	25.85	25.49	-90.49	-232.45	-288.31	744.56	693.22	51.34	14.502	
7,200.00	7,173.88	7,205.16	7,187.38	26.19	25.82	-90.49	-232.45	-288.31	744.56	692.55	52.01	14.316	
7,300.00	7,273.88	7,305.16	7,287.38	26.52	26.16	-90.49	-232.45	-288.31	744.56	691.88	52.68	14.135	
7,400.00	7,373.88	7,405.16	7,387.38	26.85	26.49	-90.49	-232.45	-288.31	744.56	691.21	53.35	13.957	
7,500.00	7,473.88	7,505.16	7,487.38	27.18	26.83	-90.49	-232.45	-288.31	744.56	690.54	54.02	13.784	
7,600.00	7,573.88	7,605.16	7,587.38	27.52	27.17	-90.49	-232.45	-288.31	744.56	689.87	54.69	13.615	
7,700.00	7,673.88	7,705.16	7,687.38	27.85	27.51	-90.49	-232.45	-288.31	744.56	689.20	55.36	13.449	
7,800.00	7,773.88	7,805.16	7,787.38	28.19	27.85	-90.49	-232.45	-288.31	744.56	688.52	56.04	13.287	
7,900.00	7,873.88	7,905.16	7,887.38	28.52	28.19	-90.49	-232.45	-288.31	744.56	687.85	56.71	13.129	
8,000.00	7,973.88	8,005.16	7,987.38	28.86	28.53	-90.49	-232.45	-288.31	744.56	687.17	57.39	12.974	
8,100.00	8,073.88	8,105.16	8,087.38	29.20	28.87	-90.49	-232.45	-288.31	744.56	686.49	58.06	12.823	
8,200.00	8,173.88	8,205.16	8,187.38	29.54	29.21	-90.49	-232.45	-288.31	744.56	685.82	58.74	12.675	
8,300.00	8,273.88	8,305.16	8,287.38	29.87	29.55	-90.49	-232.45	-288.31	744.56	685.14	59.42	12.530	
8,400.00	8,373.88	8,405.16	8,387.38	30.21	29.89	-90.49	-232.45	-288.31	744.56	684.46	60.10	12.388	
8,500.00	8,473.88	8,505.16	8,487.38	30.55	30.23	-90.49	-232.45	-288.31	744.56	683.78	60.78	12.250	
8,600.00	8,573.88	8,605.16	8,587.38	30.89	30.57	-90.49	-232.45	-288.31	744.56	683.09	61.46	12.114	
8,700.00	8,673.88	8,705.16	8,687.38	31.23	30.92	-90.49	-232.45	-288.31	744.56	682.41	62.15	11.981	
8,800.00	8,773.88	8,805.16	8,787.38	31.57	31.26	-90.49	-232.45	-288.31	744.56	681.73	62.83	11.850	
8,900.00	8,873.88	8,905.16	8,887.38	31.91	31.60	-90.49	-232.45	-288.31	744.56	681.04	63.51	11.723	
9,000.00	8,973.88	9,005.16	8,987.38	32.25	31.95	-90.49	-232.45	-288.31	744.56	680.36	64.20	11.598	
9,100.00	9,073.88	9,105.16	9,087.38	32.59	32.29	-90.49	-232.45	-288.31	744.56	679.67	64.88	11.475	
9,200.00	9,173.88	9,205.16	9,187.38	32.93	32.63	-90.49	-232.45	-288.31	744.56	678.99	65.57	11.355	
9,300.00	9,273.88	9,305.16	9,287.38	33.28	32.98	-90.49	-232.45	-288.31	744.56	678.30	66.26	11.238	
9,400.00	9,373.88	9,405.16	9,387.38	33.62	33.32	-90.49	-232.45	-288.31	744.56	677.61	66.94	11.122	
9,500.00	9,473.88	9,505.16	9,487.38	33.96	33.67	-90.49	-232.45	-288.31	744.56	676.93	67.63	11.009	
9,600.00	9,573.88	9,605.16	9,587.38	34.31	34.02	-90.49	-232.45	-288.31	744.56	676.24	68.32	10.898	
9,700.00	9,673.88	9,705.16	9,687.38	34.65	34.36	-90.49	-232.45	-288.31	744.56	675.55	69.01	10.789	
9,800.00	9,773.88	9,805.16	9,787.38	34.99	34.71	-90.49	-232.45	-288.31	744.56	674.86	69.70	10.682	
9,900.00	9,873.88	9,905.16	9,887.38	35.34	35.05	-90.49	-232.45	-288.31	744.56	674.17	70.39	10.578	
10,000.00	9,973.88	10,005.16	9,987.38	35.68	35.40	-90.49	-232.45	-288.31	744.56	673.48	71.08	10.475	
10,100.00	10,073.88	10,105.16	10,087.38	36.02	35.75	-90.49	-232.45	-288.31	744.56	672.79	71.77	10.374	
10,200.00	10,173.88	10,205.16	10,187.38	36.37	36.09	-90.49	-232.45	-288.31	744.56	672.09	72.46	10.275	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
10,300.00	10,273.88	10,305.16	10,287.38	36.71	36.44	-90.49	-232.45	-288.31	744.56	671.40	73.16	10.178	
10,400.00	10,373.88	10,405.16	10,387.38	37.06	36.79	-90.49	-232.45	-288.31	744.56	670.71	73.85	10.082	
10,500.00	10,473.88	10,505.16	10,487.38	37.41	37.14	-90.49	-232.45	-288.31	744.56	670.02	74.54	9.989	
10,600.00	10,573.88	10,605.16	10,587.38	37.75	37.48	-90.49	-232.45	-288.31	744.56	669.32	75.24	9.896	
10,700.00	10,673.88	10,705.16	10,687.38	38.10	37.83	-90.49	-232.45	-288.31	744.56	668.63	75.93	9.806	
10,800.00	10,773.88	10,805.16	10,787.38	38.44	38.18	-90.49	-232.45	-288.31	744.56	667.93	76.62	9.717	
10,900.00	10,873.88	10,905.16	10,887.38	38.79	38.53	-90.49	-232.45	-288.31	744.56	667.24	77.32	9.630	
11,000.00	10,973.88	11,005.16	10,987.38	39.14	38.88	-90.49	-232.45	-288.31	744.56	666.54	78.01	9.544	
11,100.00	11,073.88	11,105.16	11,087.38	39.48	39.23	-90.49	-232.45	-288.31	744.56	665.85	78.71	9.460	
11,200.00	11,173.88	11,205.16	11,187.38	39.83	39.57	-90.49	-232.45	-288.31	744.56	665.15	79.41	9.377	
11,300.00	11,273.88	11,305.16	11,287.38	40.18	39.92	-90.49	-232.45	-288.31	744.56	664.46	80.10	9.295	
11,400.00	11,373.88	11,405.16	11,387.38	40.53	40.27	-90.49	-232.45	-288.31	744.56	663.76	80.80	9.215	
11,500.00	11,473.88	11,505.16	11,487.38	40.87	40.62	-90.49	-232.45	-288.31	744.56	663.06	81.50	9.136	
11,600.00	11,573.88	11,605.16	11,587.38	41.22	40.97	-90.49	-232.45	-288.31	744.56	662.36	82.19	9.059	
11,700.00	11,673.88	11,705.16	11,687.38	41.57	41.32	-90.49	-232.45	-288.31	744.56	661.67	82.89	8.982	
11,700.36	11,674.25	11,705.52	11,687.75	41.57	41.32	-90.06	-232.45	-288.31	744.56	661.66	82.89	8.982	
11,800.00	11,773.74	11,805.02	11,787.24	41.91	41.67	-90.34	-232.45	-288.31	744.57	660.98	83.59	8.908	
11,900.00	11,871.62	11,902.89	11,885.12	42.24	42.01	-91.80	-232.45	-288.31	744.96	660.70	84.25	8.842	
12,000.00	11,964.55	12,003.87	11,985.83	42.53	42.36	-94.07	-226.86	-288.35	746.65	661.76	84.89	8.795	
12,100.00	12,049.72	12,112.52	12,091.35	42.77	42.71	-96.35	-201.66	-288.54	749.62	664.14	85.48	8.769	
12,200.00	12,124.54	12,228.90	12,196.91	42.96	43.04	-98.52	-153.13	-288.90	753.54	667.55	85.99	8.763	
12,300.00	12,186.73	12,353.73	12,296.73	43.09	43.31	-100.47	-78.59	-289.46	757.90	671.49	86.40	8.771	
12,400.00	12,234.41	12,487.03	12,382.83	43.17	43.53	-102.10	22.77	-290.22	762.02	675.32	86.70	8.789	
12,500.00	12,266.13	12,627.70	12,445.76	43.25	43.73	-103.25	148.18	-291.15	765.17	678.17	87.00	8.795	
12,600.00	12,280.92	12,773.28	12,476.77	43.42	43.99	-103.81	290.02	-292.21	766.75	679.28	87.47	8.765	
12,700.00	12,281.80	12,890.01	12,478.80	43.63	44.22	-103.84	406.69	-293.09	766.86	678.97	87.89	8.725	
12,800.00	12,281.49	12,990.01	12,478.49	43.88	44.46	-103.84	506.68	-293.83	766.86	678.50	88.37	8.678	
12,900.00	12,281.19	13,090.01	12,478.18	44.18	44.75	-103.84	606.68	-294.58	766.87	677.93	88.93	8.623	
13,000.00	12,280.88	13,190.01	12,477.88	44.52	45.08	-103.84	706.68	-295.33	766.87	677.27	89.59	8.559	
13,100.00	12,280.57	13,290.01	12,477.57	44.89	45.45	-103.84	806.67	-296.08	766.87	676.53	90.34	8.488	
13,200.00	12,280.26	13,390.01	12,477.26	45.31	45.86	-103.84	906.67	-296.83	766.88	675.70	91.17	8.411	
13,300.00	12,279.96	13,490.01	12,476.95	45.77	46.31	-103.84	1,006.67	-297.57	766.88	674.79	92.09	8.328	
13,400.00	12,279.65	13,590.01	12,476.65	46.27	46.81	-103.84	1,106.66	-298.32	766.88	673.81	93.08	8.239	
13,500.00	12,279.34	13,690.01	12,476.34	46.81	47.34	-103.84	1,206.66	-299.07	766.89	672.74	94.14	8.146	
13,600.00	12,279.04	13,790.01	12,476.03	47.38	47.90	-103.84	1,306.66	-299.82	766.89	671.61	95.28	8.049	
13,700.00	12,278.73	13,890.01	12,475.72	47.99	48.51	-103.84	1,406.65	-300.57	766.89	670.40	96.49	7.948	
13,800.00	12,278.42	13,990.01	12,475.42	48.63	49.14	-103.84	1,506.65	-301.31	766.90	669.12	97.77	7.844	
13,900.00	12,278.11	14,090.01	12,475.11	49.31	49.81	-103.84	1,606.65	-302.06	766.90	667.78	99.12	7.737	
14,000.00	12,277.81	14,190.01	12,474.80	50.01	50.51	-103.84	1,706.64	-302.81	766.90	666.38	100.53	7.629	
14,100.00	12,277.50	14,290.01	12,474.49	50.75	51.25	-103.84	1,806.64	-303.56	766.91	664.91	102.00	7.519	
14,200.00	12,277.19	14,390.01	12,474.19	51.52	52.01	-103.84	1,906.64	-304.31	766.91	663.39	103.53	7.408	
14,300.00	12,276.88	14,490.01	12,473.88	52.31	52.80	-103.84	2,006.63	-305.06	766.91	661.80	105.11	7.296	
14,400.00	12,276.58	14,590.01	12,473.57	53.14	53.61	-103.84	2,106.63	-305.80	766.92	660.17	106.75	7.184	
14,500.00	12,276.27	14,690.01	12,473.26	53.98	54.45	-103.84	2,206.63	-306.55	766.92	658.48	108.44	7.073	
14,600.00	12,275.96	14,790.01	12,472.96	54.86	55.32	-103.84	2,306.62	-307.30	766.92	656.75	110.17	6.961	
14,700.00	12,275.65	14,890.01	12,472.65	55.75	56.21	-103.84	2,406.62	-308.05	766.93	654.97	111.96	6.850	
14,800.00	12,275.35	14,990.01	12,472.34	56.67	57.12	-103.84	2,506.62	-308.80	766.93	653.14	113.79	6.740	
14,900.00	12,275.04	15,090.01	12,472.04	57.61	58.05	-103.84	2,606.61	-309.54	766.94	651.28	115.66	6.631	
15,000.00	12,274.73	15,190.01	12,471.73	58.56	59.01	-103.84	2,706.61	-310.29	766.94	649.37	117.57	6.523	
15,100.00	12,274.42	15,290.01	12,471.42	59.54	59.98	-103.84	2,806.61	-311.04	766.94	647.42	119.52	6.417	
15,200.00	12,274.12	15,390.01	12,471.11	60.54	60.97	-103.84	2,906.60	-311.79	766.95	645.44	121.51	6.312	
15,300.00	12,273.81	15,490.01	12,470.81	61.55	61.97	-103.84	3,006.60	-312.54	766.95	643.42	123.53	6.209	

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
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Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Seimi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
15,400.00	12,273.50	15,590.01	12,470.50	62.58	63.00	-103.84	3,106.60	-313.28	766.95	641.37	125.58	6.107	
15,500.00	12,273.20	15,690.01	12,470.19	63.63	64.04	-103.84	3,206.59	-314.03	766.96	639.29	127.67	6.008	
15,600.00	12,272.89	15,790.01	12,469.88	64.69	65.09	-103.84	3,306.59	-314.78	766.96	637.18	129.78	5.910	
15,700.00	12,272.58	15,890.01	12,469.58	65.76	66.16	-103.84	3,406.59	-315.53	766.96	635.04	131.92	5.814	
15,800.00	12,272.27	15,990.01	12,469.27	66.85	67.25	-103.84	3,506.59	-316.28	766.97	632.87	134.10	5.720	
15,900.00	12,271.97	16,090.01	12,468.96	67.95	68.34	-103.84	3,606.58	-317.02	766.97	630.68	136.29	5.627	
16,000.00	12,271.66	16,190.01	12,468.65	69.06	69.45	-103.84	3,706.58	-317.77	766.97	628.46	138.51	5.537	
16,100.00	12,271.35	16,290.01	12,468.35	70.19	70.57	-103.84	3,806.58	-318.52	766.98	626.22	140.76	5.449	
16,200.00	12,271.04	16,390.01	12,468.04	71.32	71.70	-103.84	3,906.57	-319.27	766.98	623.95	143.03	5.362	
16,300.00	12,270.74	16,490.01	12,467.73	72.47	72.85	-103.84	4,006.57	-320.02	766.98	621.67	145.32	5.278	
16,400.00	12,270.43	16,590.01	12,467.42	73.63	74.00	-103.84	4,106.57	-320.76	766.99	619.36	147.63	5.195	
16,500.00	12,270.12	16,690.01	12,467.12	74.79	75.16	-103.84	4,206.56	-321.51	766.99	617.04	149.95	5.115	
16,600.00	12,269.81	16,790.01	12,466.81	75.97	76.33	-103.84	4,306.56	-322.26	766.99	614.69	152.30	5.036	
16,700.00	12,269.51	16,890.01	12,466.50	77.15	77.51	-103.84	4,406.56	-323.01	767.00	612.33	154.67	4.959	
16,800.00	12,269.20	16,990.01	12,466.20	78.35	78.70	-103.84	4,506.55	-323.76	767.00	609.95	157.05	4.884	
16,900.00	12,268.89	17,090.01	12,465.89	79.55	79.90	-103.84	4,606.55	-324.50	767.01	607.56	159.45	4.810	
17,000.00	12,268.59	17,190.01	12,465.58	80.76	81.10	-103.84	4,706.55	-325.25	767.01	605.15	161.86	4.739	
17,100.00	12,268.28	17,290.01	12,465.27	81.97	82.31	-103.84	4,806.54	-326.00	767.01	602.72	164.29	4.669	
17,200.00	12,267.97	17,390.01	12,464.97	83.20	83.53	-103.84	4,906.54	-326.75	767.02	600.29	166.73	4.600	
17,300.00	12,267.66	17,490.01	12,464.66	84.43	84.76	-103.84	5,006.54	-327.50	767.02	597.83	169.19	4.534	
17,400.00	12,267.36	17,590.01	12,464.35	85.66	85.99	-103.84	5,106.53	-328.24	767.02	595.37	171.65	4.468	
17,500.00	12,267.05	17,690.01	12,464.04	86.90	87.23	-103.84	5,206.53	-328.99	767.03	592.89	174.14	4.405	
17,600.00	12,266.74	17,790.01	12,463.74	88.15	88.48	-103.84	5,306.53	-329.74	767.03	590.40	176.63	4.343	
17,700.00	12,266.43	17,890.01	12,463.43	89.41	89.73	-103.84	5,406.52	-330.49	767.03	587.90	179.13	4.282	
17,800.00	12,266.13	17,990.01	12,463.12	90.67	90.98	-103.84	5,506.52	-331.24	767.04	585.39	181.65	4.223	
17,900.00	12,265.82	18,090.01	12,462.81	91.93	92.24	-103.84	5,606.52	-331.98	767.04	582.87	184.17	4.165	
18,000.00	12,265.51	18,190.01	12,462.51	93.20	93.51	-103.84	5,706.51	-332.73	767.04	580.33	186.71	4.108	
18,100.00	12,265.20	18,290.01	12,462.20	94.47	94.78	-103.84	5,806.51	-333.48	767.05	577.79	189.25	4.053	
18,200.00	12,264.90	18,390.01	12,461.89	95.75	96.06	-103.84	5,906.51	-334.23	767.05	575.24	191.81	3.999	
18,300.00	12,264.59	18,490.01	12,461.58	97.03	97.34	-103.84	6,006.50	-334.98	767.05	572.68	194.37	3.946	
18,400.00	12,264.28	18,590.01	12,461.28	98.32	98.62	-103.84	6,106.50	-335.72	767.06	570.11	196.94	3.895	
18,500.00	12,263.97	18,690.01	12,460.97	99.61	99.91	-103.84	6,206.50	-336.47	767.06	567.54	199.52	3.844	
18,600.00	12,263.67	18,790.01	12,460.66	100.91	101.20	-103.84	6,306.49	-337.22	767.06	564.95	202.11	3.795	
18,700.00	12,263.36	18,890.01	12,460.36	102.21	102.50	-103.84	6,406.49	-337.97	767.07	562.36	204.71	3.747	
18,800.00	12,263.05	18,990.01	12,460.05	103.51	103.80	-103.84	6,506.49	-338.72	767.07	559.76	207.31	3.700	
18,900.00	12,262.75	19,090.01	12,459.74	104.82	105.10	-103.84	6,606.48	-339.46	767.08	557.16	209.92	3.654	
19,000.00	12,262.44	19,190.01	12,459.43	106.13	106.41	-103.84	6,706.48	-340.21	767.08	554.54	212.54	3.609	
19,100.00	12,262.13	19,290.01	12,459.13	107.44	107.72	-103.84	6,806.48	-340.96	767.08	551.92	215.16	3.565	
19,200.00	12,261.82	19,390.01	12,458.82	108.75	109.03	-103.84	6,906.47	-341.71	767.09	549.30	217.79	3.522	
19,300.00	12,261.52	19,490.01	12,458.51	110.07	110.35	-103.84	7,006.47	-342.46	767.09	546.67	220.42	3.480	
19,400.00	12,261.21	19,590.01	12,458.20	111.39	111.67	-103.84	7,106.47	-343.20	767.09	544.03	223.06	3.439	
19,500.00	12,260.90	19,690.01	12,457.90	112.72	112.99	-103.84	7,206.46	-343.95	767.10	541.39	225.71	3.399	
19,600.00	12,260.59	19,790.01	12,457.59	114.05	114.32	-103.84	7,306.46	-344.70	767.10	538.74	228.36	3.359	
19,700.00	12,260.29	19,890.01	12,457.28	115.38	115.64	-103.84	7,406.46	-345.45	767.10	536.08	231.02	3.320	
19,800.00	12,259.98	19,990.01	12,456.97	116.71	116.97	-103.84	7,506.45	-346.20	767.11	533.42	233.68	3.283	
19,900.00	12,259.67	20,090.01	12,456.67	118.04	118.31	-103.84	7,606.45	-346.94	767.11	530.76	236.35	3.246	
20,000.00	12,259.36	20,190.01	12,456.36	119.38	119.64	-103.84	7,706.45	-347.69	767.11	528.09	239.02	3.209	
20,100.00	12,259.06	20,290.01	12,456.05	120.72	120.98	-103.84	7,806.44	-348.44	767.12	525.42	241.70	3.174	
20,200.00	12,258.75	20,390.01	12,455.74	122.06	122.32	-103.84	7,906.44	-349.19	767.12	522.74	244.38	3.139	
20,300.00	12,258.44	20,490.01	12,455.44	123.40	123.66	-103.84	8,006.44	-349.94	767.12	520.06	247.07	3.105	
20,400.00	12,258.14	20,590.01	12,455.13	124.75	125.01	-103.84	8,106.43	-350.68	767.13	517.37	249.76	3.072	
20,500.00	12,257.83	20,690.01	12,454.82	126.10	126.35	-103.84	8,206.43	-351.43	767.13	514.68	252.45	3.039	

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 702H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

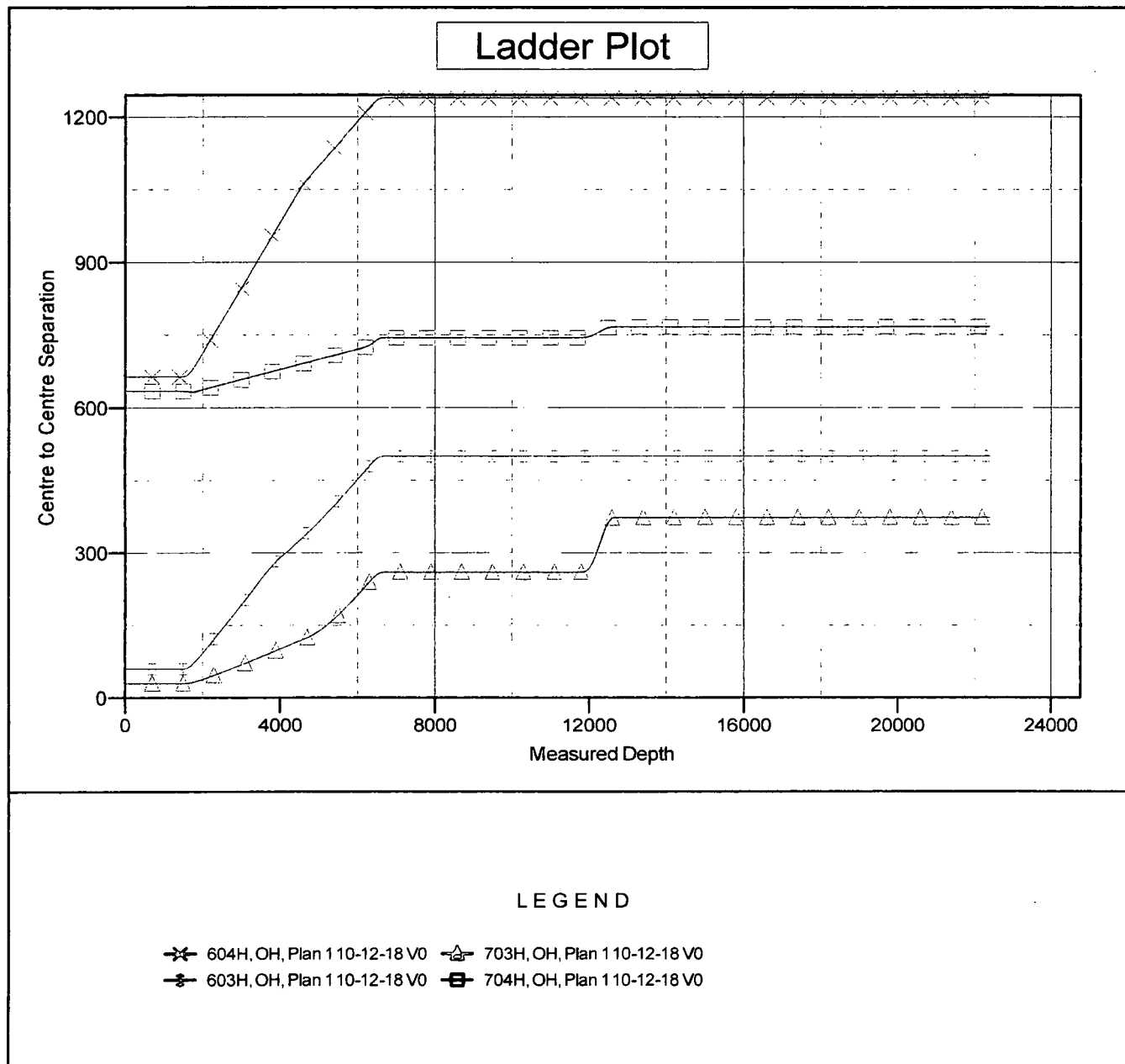
Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre N-S (usft)	Offset Wellbore Centre E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
20,600.00	12,257.52	20,790.01	12,454.51	127.45	127.70	-103.84	8,306.43	-352.18	767.13	511.99	255.15	3.007		
20,700.00	12,257.21	20,890.01	12,454.21	128.80	129.05	-103.84	8,406.42	-352.93	767.14	509.29	257.85	2.975		
20,800.00	12,256.91	20,990.01	12,453.90	130.15	130.40	-103.84	8,506.42	-353.68	767.14	506.59	260.55	2.944		
20,900.00	12,256.60	21,090.01	12,453.59	131.51	131.75	-103.84	8,606.42	-354.42	767.15	503.88	263.26	2.914		
21,000.00	12,256.29	21,190.01	12,453.29	132.86	133.11	-103.84	8,706.42	-355.17	767.15	501.17	265.97	2.884		
21,100.00	12,255.98	21,290.01	12,452.98	134.22	134.47	-103.84	8,806.41	-355.92	767.15	498.46	268.69	2.855		
21,200.00	12,255.68	21,390.01	12,452.67	135.58	135.82	-103.84	8,906.41	-356.67	767.16	495.75	271.41	2.827		
21,300.00	12,255.37	21,490.01	12,452.36	136.94	137.19	-103.84	9,006.41	-357.42	767.16	493.03	274.13	2.799		
21,400.00	12,255.06	21,590.01	12,452.06	138.31	138.55	-103.84	9,106.40	-358.16	767.16	490.31	276.85	2.771		
21,500.00	12,254.75	21,690.01	12,451.75	139.67	139.91	-103.84	9,206.40	-358.91	767.17	487.58	279.58	2.744		
21,600.00	12,254.45	21,790.01	12,451.44	141.04	141.27	-103.84	9,306.40	-359.66	767.17	484.86	282.31	2.717		
21,700.00	12,254.14	21,890.01	12,451.13	142.41	142.64	-103.84	9,406.39	-360.41	767.17	482.13	285.05	2.691		
21,800.00	12,253.83	21,990.01	12,450.83	143.77	144.01	-103.84	9,506.39	-361.16	767.18	479.40	287.78	2.666		
21,900.00	12,253.52	22,090.01	12,450.52	145.14	145.38	-103.84	9,606.39	-361.90	767.18	476.66	290.52	2.641		
22,000.00	12,253.22	22,190.01	12,450.21	146.52	146.75	-103.84	9,706.38	-362.65	767.18	473.92	293.26	2.616		
22,100.00	12,252.91	22,290.01	12,449.90	147.89	148.12	-103.84	9,806.38	-363.40	767.19	471.18	296.01	2.592		
22,200.00	12,252.60	22,390.01	12,449.60	149.26	149.49	-103.84	9,906.38	-364.15	767.19	468.44	298.75	2.568		
22,300.00	12,252.30	22,490.01	12,449.29	150.64	150.86	-103.84	10,006.37	-364.90	767.19	465.69	301.50	2.545		
22,309.32	12,252.27	22,499.33	12,449.26	150.76	150.99	-103.84	10,015.69	-364.97	767.19	465.44	301.76	2.542		
22,396.02	12,252.00	22,584.14	12,449.00	151.96	152.16	-103.84	10,100.50	-365.60	767.20	463.09	304.11	2.523 ES, SF		

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 Well Error: 0.00 usft
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 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 702H
 TVD Reference: KB=25' @ 3276.80usft (Precision 595)
 MD Reference: KB=25' @ 3276.80usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=25' @ 3276.80usft (Precision 595)
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 702H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.51°



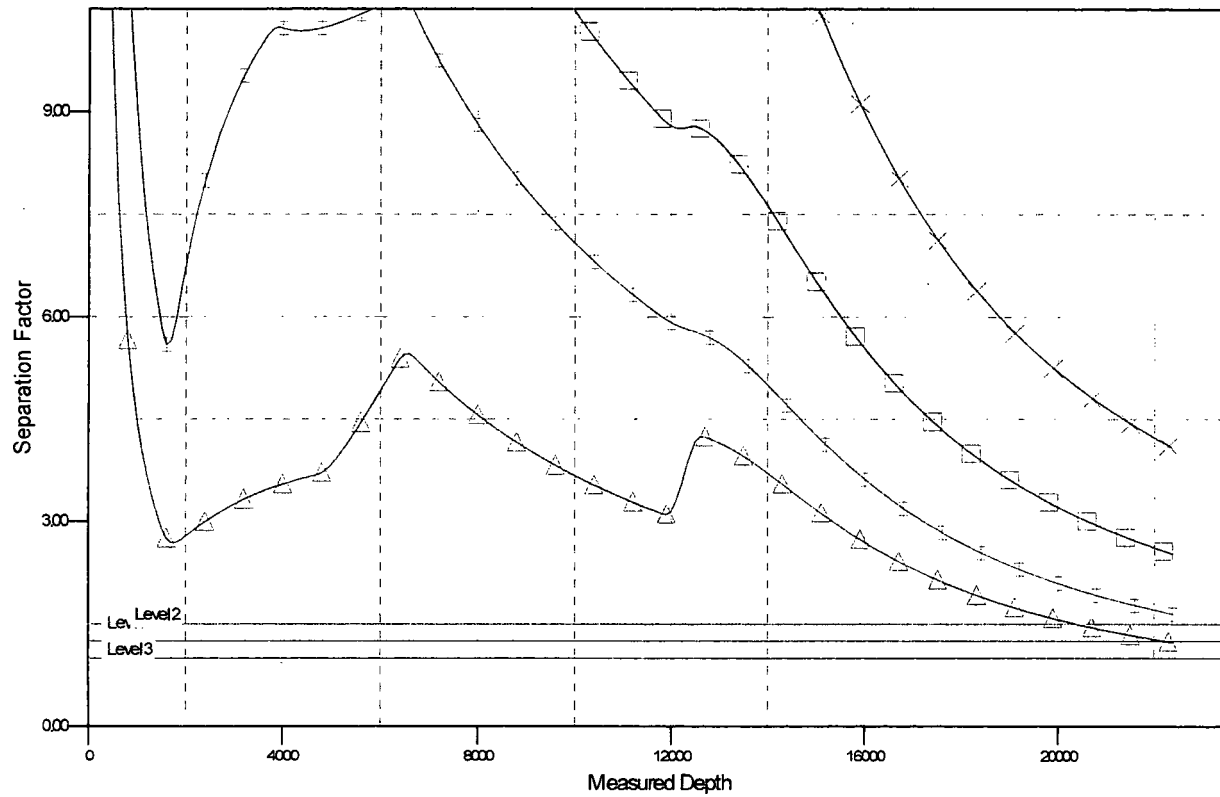
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Separation Factor Plot



LEGEND

✕ 604H, OH, Plan 1 10-12-18 V0 △ 703H, OH, Plan 1 10-12-18 V0
 □ 603H, OH, Plan 1 10-12-18 V0 ◇ 704H, OH, Plan 1 10-12-18 V0