

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Carlsbad Field Office
OCD Hobbs

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.

Serial No.
NMNM120907

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.
EIDER FEDERAL 301H

9. API Well No.
30-025-44628-00-X1

10. Field and Pool or Exploratory Area
WC025G08S253235G-LWR BONE SPF

11. County or Parish, State
LEA COUNTY, NM

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator
COG OPERATING LLC
Contact: MAYTE REYES
E-Mail: mreyes1@concho.com

3a. Address
ONE CONCHO CENTER 600 W ILLINOIS AVENUE
MIDLAND, TX 79701-4287
3b. Phone No. (include area code)
Ph: 575-748-6945

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 35 T24S R32E SWSW 210FSL 1020FWL
32.167392 N Lat, 103.650690 W Lon

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 recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 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 Production LLC, respectfully requests approval for the following SHL and name change to the original approved APD.

NAME CHANGE
From: Eider Federal 16H
To: Eider Federal 301H

SHL
From: 210' FSL & 960' FWL SWSW Section 35, T24S, R32E
To: 210' FSL & 1020' FWL SWSW Section 35, T24S, R32E

There are no changes to the drilling program other than the names of course.

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

Electronic Submission #410767 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Hobbs
Committed to AFMSS for processing by DEBORAH HAM on 04/18/2018 (18DMH0063SE)

Name (Printed/Typed) MAYTE REYES

Title SENIOR REGULATORY ANALYST

Signature (Electronic Submission)

Date 04/09/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By CODY LAYTON

Title ASSISTANT FIELD MANAGER

Date 04/18/2018

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

Office Hobbs

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

(Instructions on page 2)

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

[Handwritten signature]

Additional data for EC transaction #410767 that would not fit on the form

32. Additional remarks, continued

Attached:
Directional plan
Anti-collision report
C102

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240
Phone: (505) 393-6161 Fax: (505) 393-0780

DISTRICT II
811 S. FIRST ST., ARTESIA, NM 88210
Phone: (505) 748-1283 Fax: (505) 748-8720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-8178 Fax: (505) 334-8170

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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 30-025-44628	Pool Code 97964	Pool Name WC-025 G-07 S243225S; Lower Bone Spring
Property Code	Property Name EIDER FEDERAL	Well Number 301H
OGRID No. 217955	Operator Name COG PRODUCTION, LLC	Elevation 3521.3'

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	35	24-S	32-E		210	SOUTH	1020	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
L	26	24-S	32-E		<u>2310</u>	SOUTH	330	WEST	LEA

Dedicated Acres 240	Joint or Infill	Consolidation Code	Order No.
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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

*NO LEASE X-ING Y=433001.1 N X=751497.8 E Y=433014.4 N X=752820.0 E Y=425082.4 N X=751546.9 E Y=425095.2 N X=752867.3 E SECTION 26 SECTION 35 NMNM120907 GRID AZ. - 359°38'32" HORZ. DIST. - 7370.0 2310' FSL & 330' FWL LAT = 32.187700° N LONG. = 103.652918° W 330' FSL & 330' FWL LAT = 32.167716° N LONG. = 103.652920° W GRID AZ. TO FTP 279°19'03" PROPOSED BOTTOM HOLE LOCATION Y=432785.5 N X=751828.9 E LAT. = 32.187975° N LONG. = 103.652918° W SURFACE LOCATION Y=425302.3 N X=752565.7 E LAT. = 32.167392° N LONG. = 103.650690° W	OPERATOR CERTIFICATION I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Mayte Reyes</i> 4-9-18 Signature Date Mayte Reyes Printed Name mreyes1@concho.com E-mail Address SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. AUGUST 25, 2017 Date of Survey Signature & Seal of Professional Surveyor CHAD L. HARCROW NEW MEXICO 17777 LICENSED PROFESSIONAL SURVEYOR <i>Chad Harcrow</i> 9/11/17 Certificate No. CHAD HARCROW 17777 W.O. # 17-1015 DRAWN BY: JH
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PHOENIX
TECHNOLOGY SERVICES

COG Operating LLC

Lea County, NM (NAD27 NME)
Eider Federal
301H

OH
Plan 1 04-06-18

Anticollision Report

06 April, 2018



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Reference	Plan 1 04-06-18				
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of refere				
Interpolation Method:	MD Interval 100.00usft		Error Model:	ISCWSA	
Depth Range:	Unlimited		Scan Method:	Closest Approach 3D	
Results Limited by:	Maximum center-center distance of 1,920.81 us		Error Surface:	Major Axis	
Warning Levels Evaluated at:	2.00 Sigma		Casing Method:	Not applied	

Survey Tool Program	Date 4/6/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	17,208.09	Plan 1 04-06-18 (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						
Eider Federal						
101H - OH - Plan 1 10-11-17	2,500.00	2,500.40	30.10	18.13	2.515	CC
101H - OH - Plan 1 10-11-17	2,600.00	2,600.38	30.55	18.10	2.454	ES
101H - OH - Plan 1 10-11-17	17,208.09	16,526.90	418.40	245.70	2.423	SF
102H - OH - Plan 1 10-11-17	2,500.00	2,501.00	67.09	55.12	5.605	CC, ES
102H - OH - Plan 1 10-11-17	17,208.09	16,479.37	775.94	603.62	4.503	SF
201H - OH - Plan 1 10-11-17	2,500.00	2,500.40	42.43	30.46	3.545	CC, ES
201H - OH - Plan 1 10-11-17	17,208.09	16,539.11	436.95	263.90	2.525	SF
202H - OH - Plan 1 04-06-18	2,416.33	2,417.33	59.90	43.02	3.548	CC
202H - OH - Plan 1 04-06-18	2,500.00	2,500.98	59.90	42.42	3.426	ES, SF
302H - OH - Plan 1 10-11-17	2,500.00	2,500.10	29.90	17.93	2.498	CC, ES, SF

Offset Design Eider Federal - 101H - OH - Plan 1 10-11-17												
Survey Program: 0-Scientific Gyro, 8768-MWD+IFR1+MS												
Reference Offset Semi Major Axis												
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)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Warning
0.00	0.00	0.40	0.00	0.00	0.00	-0.38	30.10	-0.20	30.10			
100.00	100.00	100.40	100.00	0.14	0.07	-0.38	30.10	-0.20	30.10	29.90	0.20	147.036
200.00	200.00	200.40	200.00	0.49	0.20	-0.38	30.10	-0.20	30.10	29.41	0.69	43.467
300.00	300.00	300.40	300.00	0.85	0.33	-0.38	30.10	-0.20	30.10	28.92	1.18	25.460
400.00	400.00	400.40	400.00	1.21	0.46	-0.38	30.10	-0.20	30.10	28.43	1.67	17.999
500.00	500.00	500.40	500.00	1.57	0.59	-0.38	30.10	-0.20	30.10	27.94	2.16	13.919
600.00	600.00	600.40	600.00	1.93	0.72	-0.38	30.10	-0.20	30.10	27.45	2.65	11.347
700.00	700.00	700.40	700.00	2.29	0.86	-0.38	30.10	-0.20	30.10	26.96	3.14	9.577
800.00	800.00	800.40	800.00	2.65	0.99	-0.38	30.10	-0.20	30.10	26.47	3.63	8.285
900.00	900.00	900.40	900.00	3.00	1.12	-0.38	30.10	-0.20	30.10	25.98	4.12	7.300
1,000.00	1,000.00	1,000.40	1,000.00	3.36	1.25	-0.38	30.10	-0.20	30.10	25.49	4.61	6.524
1,100.00	1,100.00	1,100.40	1,100.00	3.72	1.38	-0.38	30.10	-0.20	30.10	25.00	5.10	5.897
1,200.00	1,200.00	1,200.40	1,200.00	4.08	1.52	-0.38	30.10	-0.20	30.10	24.51	5.59	5.380
1,300.00	1,300.00	1,300.40	1,300.00	4.44	1.65	-0.38	30.10	-0.20	30.10	24.02	6.08	4.947
1,400.00	1,400.00	1,400.40	1,400.00	4.80	1.78	-0.38	30.10	-0.20	30.10	23.53	6.58	4.578
1,500.00	1,500.00	1,500.40	1,500.00	5.15	1.91	-0.38	30.10	-0.20	30.10	23.04	7.07	4.260
1,600.00	1,600.00	1,600.40	1,600.00	5.51	2.04	-0.38	30.10	-0.20	30.10	22.54	7.56	3.984

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 101H - OH - Plan 1 10-11-17													Offset Site Error:
Survey Program: 0-Scientific Gyro 8768-MWD+IFR1+MS													Offset Well Error:
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
1,700.00	1,700.00	1,700.40	1,700.00	5.87	2.17	-0.38	30.10	-0.20	30.10	22.05	8.05	3.741	
1,800.00	1,800.00	1,800.40	1,800.00	6.23	2.31	-0.38	30.10	-0.20	30.10	21.56	8.54	3.526	
1,900.00	1,900.00	1,900.40	1,900.00	6.59	2.44	-0.38	30.10	-0.20	30.10	21.07	9.03	3.335	
2,000.00	2,000.00	2,000.40	2,000.00	6.95	2.57	-0.38	30.10	-0.20	30.10	20.58	9.52	3.163	
2,100.00	2,100.00	2,100.40	2,100.00	7.31	2.70	-0.38	30.10	-0.20	30.10	20.09	10.01	3.008	
2,200.00	2,200.00	2,200.40	2,200.00	7.66	2.83	-0.38	30.10	-0.20	30.10	19.60	10.50	2.867	
2,300.00	2,300.00	2,300.40	2,300.00	8.02	2.97	-0.38	30.10	-0.20	30.10	19.11	10.99	2.739	
2,400.00	2,400.00	2,400.40	2,400.00	8.38	3.10	-0.38	30.10	-0.20	30.10	18.62	11.48	2.622	
2,500.00	2,500.00	2,500.40	2,500.00	8.74	3.23	-0.38	30.10	-0.20	30.10	18.13	11.97	2.515 CC	
2,600.00	2,599.98	2,600.38	2,599.98	9.09	3.36	106.39	30.10	-0.20	30.55	18.10	12.45	2.454 ES	
2,700.00	2,699.84	2,700.24	2,699.84	9.43	3.49	115.26	30.10	-0.20	32.42	19.50	12.92	2.509	
2,800.00	2,799.45	2,799.85	2,799.45	9.77	3.62	127.46	30.10	-0.20	36.99	23.60	13.39	2.762	
2,900.00	2,898.82	2,899.22	2,898.82	10.11	3.75	138.88	30.10	-0.20	44.73	30.86	13.87	3.225	
3,000.00	2,998.18	2,998.58	2,998.18	10.46	3.89	146.82	30.10	-0.20	53.80	39.45	14.35	3.749	
3,100.00	3,097.53	3,097.93	3,097.53	10.81	4.02	152.41	30.10	-0.20	63.59	48.76	14.83	4.288	
3,200.00	3,196.89	3,197.29	3,196.89	11.17	4.15	156.48	30.10	-0.20	73.83	58.51	15.32	4.821	
3,300.00	3,296.25	3,296.65	3,296.25	11.52	4.28	159.55	30.10	-0.20	84.34	68.54	15.80	5.337	
3,400.00	3,395.60	3,396.00	3,395.60	11.88	4.41	161.93	30.10	-0.20	95.04	78.75	16.29	5.833	
3,500.00	3,494.96	3,495.36	3,494.96	12.24	4.54	163.83	30.10	-0.20	105.87	89.09	16.79	6.308	
3,600.00	3,594.32	3,594.72	3,594.32	12.61	4.67	165.38	30.10	-0.20	116.80	99.52	17.28	6.760	
3,700.00	3,693.67	3,694.07	3,693.67	12.97	4.80	166.66	30.10	-0.20	127.79	110.02	17.77	7.190	
3,800.00	3,793.03	3,793.43	3,793.03	13.34	4.93	167.74	30.10	-0.20	138.84	120.57	18.27	7.599	
3,900.00	3,892.39	3,892.79	3,892.39	13.71	5.06	168.66	30.10	-0.20	149.93	131.16	18.77	7.988	
4,000.00	3,991.74	3,992.14	3,991.74	14.07	5.20	169.45	30.10	-0.20	161.05	141.78	19.27	8.358	
4,100.00	4,091.10	4,091.50	4,091.10	14.44	5.33	170.14	30.10	-0.20	172.20	152.43	19.77	8.710	
4,200.00	4,190.46	4,190.86	4,190.46	14.82	5.46	170.75	30.10	-0.20	183.37	163.10	20.27	9.045	
4,300.00	4,289.81	4,290.21	4,289.81	15.19	5.59	171.28	30.10	-0.20	194.56	173.78	20.78	9.364	
4,400.00	4,389.17	4,389.57	4,389.17	15.56	5.72	171.76	30.10	-0.20	205.76	184.48	21.28	9.669	
4,500.00	4,488.53	4,488.93	4,488.53	15.93	5.85	172.19	30.10	-0.20	216.98	195.19	21.79	9.960	
4,600.00	4,587.88	4,588.28	4,587.88	16.31	5.98	172.57	30.10	-0.20	228.20	205.91	22.29	10.237	
4,700.00	4,687.24	4,695.04	4,694.63	16.69	6.08	172.82	30.10	-1.78	238.08	215.31	22.76	10.459	
4,800.00	4,786.60	4,803.37	4,802.80	17.06	6.12	172.71	30.10	-7.42	244.46	221.28	23.18	10.544	
4,900.00	4,885.95	4,911.06	4,910.05	17.44	6.17	172.27	30.10	-17.05	247.34	223.74	23.61	10.478	
5,000.00	4,985.31	5,011.02	5,009.47	17.82	6.21	171.75	30.10	-27.50	248.84	224.81	24.03	10.356	
5,100.00	5,084.67	5,110.98	5,108.88	18.19	6.26	171.23	30.10	-37.95	250.36	225.91	24.46	10.238	
5,200.00	5,184.02	5,210.95	5,208.30	18.57	6.31	170.72	30.10	-48.40	251.90	227.02	24.88	10.123	
5,300.00	5,283.38	5,310.91	5,307.71	18.95	6.36	170.21	30.10	-58.85	253.46	228.15	25.32	10.012	
5,400.00	5,382.74	5,410.87	5,407.13	19.33	6.42	169.71	30.10	-69.29	255.04	229.29	25.75	9.905	
5,500.00	5,482.09	5,510.84	5,506.54	19.71	6.47	169.22	30.10	-79.74	256.64	230.45	26.19	9.800	
5,600.00	5,581.45	5,610.80	5,605.96	20.09	6.53	168.73	30.10	-90.19	258.25	231.63	26.63	9.699	
5,700.00	5,680.81	5,710.76	5,705.37	20.48	6.59	168.25	30.10	-100.64	259.89	232.82	27.07	9.601	
5,800.00	5,780.16	5,810.73	5,804.79	20.86	6.66	167.78	30.10	-111.09	261.54	234.03	27.52	9.505	
5,900.00	5,879.52	5,910.69	5,904.20	21.24	6.72	167.31	30.10	-121.54	263.21	235.25	27.96	9.413	
6,000.00	5,978.88	6,010.65	6,003.62	21.62	6.79	166.85	30.10	-131.99	264.90	236.49	28.41	9.323	
6,100.00	6,078.23	6,110.61	6,103.03	22.00	6.86	166.39	30.10	-142.44	266.61	237.74	28.87	9.235	
6,200.00	6,177.59	6,210.58	6,202.45	22.39	6.94	165.94	30.10	-152.89	268.33	239.01	29.32	9.151	
6,300.00	6,276.95	6,310.54	6,301.87	22.77	7.01	165.49	30.10	-163.34	270.07	240.29	29.78	9.068	
6,400.00	6,376.30	6,410.50	6,401.28	23.15	7.09	165.05	30.10	-173.78	271.82	241.58	30.24	8.988	
6,500.00	6,475.66	6,510.47	6,500.70	23.54	7.16	164.62	30.10	-184.23	273.59	242.89	30.70	8.911	
6,600.00	6,575.02	6,610.43	6,600.11	23.92	7.24	164.19	30.10	-194.68	275.38	244.21	31.17	8.835	
6,700.00	6,674.37	6,710.39	6,699.53	24.31	7.33	163.77	30.10	-205.13	277.18	245.55	31.63	8.762	
6,800.00	6,773.73	6,810.36	6,798.94	24.69	7.41	163.35	30.10	-215.58	279.00	246.89	32.10	8.691	

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 101H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft
Survey Program: 0-Scientific Gyro, 8768-MWD+IFR1+MS													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
6,900.00	6,873.09	6,910.32	6,898.36	25.08	7.50	162.94	30.10	-226.03	280.83	248.25	32.57	8.621	
7,000.00	6,972.44	7,010.28	6,997.77	25.46	7.58	162.53	30.10	-236.48	282.67	249.63	33.05	8.554	
7,100.00	7,071.80	7,110.24	7,097.19	25.85	7.67	162.13	30.10	-246.93	284.53	251.01	33.52	8.489	
7,200.00	7,171.16	7,210.21	7,196.60	26.23	7.76	161.74	30.10	-257.38	286.40	252.41	33.99	8.425	
7,300.00	7,270.51	7,310.17	7,296.02	26.62	7.85	161.34	30.10	-267.83	288.29	253.82	34.47	8.363	
7,400.00	7,369.87	7,410.13	7,395.44	27.00	7.94	160.96	30.10	-278.27	290.19	255.24	34.95	8.303	
7,500.00	7,469.23	7,510.10	7,494.85	27.39	8.04	160.58	30.10	-288.72	292.10	256.67	35.43	8.244	
7,600.00	7,568.58	7,610.06	7,594.27	27.78	8.13	160.20	30.10	-299.17	294.03	258.12	35.91	8.188	
7,700.00	7,667.94	7,710.02	7,693.68	28.16	8.23	159.83	30.10	-309.62	295.97	259.57	36.39	8.132	
7,800.00	7,767.30	7,809.99	7,793.10	28.55	8.33	159.47	30.10	-320.07	297.92	261.04	36.88	8.078	
7,900.00	7,866.65	7,909.95	7,892.51	28.93	8.43	159.10	30.10	-330.52	299.88	262.51	37.36	8.026	
8,000.00	7,966.01	8,009.91	7,991.93	29.32	8.53	158.75	30.10	-340.97	301.85	264.00	37.85	7.975	
8,100.00	8,065.37	8,109.87	8,091.34	29.71	8.63	158.40	30.10	-351.42	303.84	265.50	38.34	7.925	
8,200.00	8,164.72	8,209.84	8,190.76	30.10	8.73	158.05	30.10	-361.87	305.83	267.01	38.83	7.877	
8,300.00	8,264.08	8,309.80	8,290.17	30.48	8.83	157.71	30.10	-372.31	307.84	268.52	39.32	7.830	
8,400.00	8,363.44	8,409.76	8,389.59	30.87	8.94	157.37	30.10	-382.76	309.86	270.05	39.81	7.784	
8,500.00	8,462.79	8,509.73	8,489.00	31.26	9.04	157.03	30.10	-393.21	311.89	271.59	40.30	7.739	
8,600.00	8,562.15	8,609.69	8,588.42	31.64	9.15	156.70	30.10	-403.66	313.93	273.13	40.79	7.695	
8,700.00	8,661.51	8,709.65	8,687.84	32.03	9.25	156.38	30.10	-414.11	315.98	274.70	41.28	7.654	
8,800.00	8,760.89	8,802.23	8,779.84	32.42	9.28	155.86	31.28	-424.19	318.27	276.57	41.70	7.632	
8,900.00	8,860.55	8,881.98	8,857.68	32.79	9.31	155.40	42.96	-436.39	322.98	280.87	42.11	7.670	
9,000.00	8,960.44	8,954.96	8,925.84	33.15	9.37	149.26	64.37	-450.92	332.53	290.01	42.52	7.821	
9,100.00	9,060.42	9,018.93	8,981.87	33.49	9.43	40.87	91.17	-466.03	349.86	306.93	42.92	8.151	
9,200.00	9,160.42	9,075.00	9,027.30	33.82	9.49	35.96	120.44	-480.88	378.81	335.49	43.32	8.745	
9,300.00	9,260.42	9,125.00	9,064.36	34.16	9.56	31.32	150.75	-495.20	420.27	376.55	43.71	9.614	
9,400.00	9,359.32	9,163.73	9,090.57	34.48	9.61	25.70	176.73	-506.90	462.72	418.63	44.08	10.496	
9,500.00	9,453.25	9,207.63	9,117.39	34.76	9.67	21.20	208.61	-520.69	498.66	454.23	44.43	11.224	
9,600.00	9,538.10	9,250.00	9,140.18	34.99	9.72	17.91	241.57	-534.43	526.67	481.96	44.71	11.779	
9,700.00	9,610.16	9,300.00	9,162.90	35.15	9.79	15.10	282.87	-551.03	545.88	500.94	44.94	12.147	
9,800.00	9,666.29	9,339.61	9,177.54	35.26	9.83	13.31	317.17	-564.37	555.61	510.44	45.17	12.300	
9,900.00	9,704.04	9,383.66	9,190.19	35.31	9.88	11.76	356.62	-579.28	555.57	510.07	45.50	12.211	
10,000.00	9,721.74	9,425.00	9,198.51	35.37	9.92	10.61	394.62	-593.23	545.56	499.77	45.80	11.913	
10,100.00	9,722.27	9,475.00	9,203.86	35.50	9.95	9.11	441.43	-609.90	529.05	482.98	46.06	11.485	
10,200.00	9,721.05	9,533.81	9,204.65	35.72	9.98	7.12	497.12	-628.74	520.83	474.40	46.43	11.219	
10,300.00	9,719.82	9,626.67	9,204.82	36.03	10.05	4.41	586.45	-654.05	516.64	469.66	46.98	10.998	
10,400.00	9,718.59	9,722.53	9,204.99	36.41	10.15	2.27	680.15	-674.05	514.03	466.38	47.65	10.788	
10,500.00	9,717.36	9,820.66	9,205.16	36.85	10.33	0.78	777.29	-687.98	512.26	463.83	48.42	10.579	
10,600.00	9,716.13	9,920.17	9,205.33	37.34	10.61	0.03	876.52	-695.29	510.81	461.51	49.29	10.363	
10,700.00	9,714.91	10,020.15	9,205.50	37.88	11.01	-0.05	976.49	-696.66	509.41	459.15	50.25	10.137	
10,800.00	9,713.68	10,120.14	9,205.67	38.46	11.49	-0.05	1,076.48	-697.27	508.01	456.72	51.30	9.904	
10,900.00	9,712.45	10,220.13	9,205.84	39.09	12.02	-0.05	1,176.46	-697.89	506.61	454.20	52.41	9.666	
11,000.00	9,711.22	10,320.12	9,206.01	39.76	12.59	-0.05	1,276.45	-698.50	505.21	451.62	53.60	9.426	
11,100.00	9,710.00	10,420.11	9,206.18	40.47	13.18	-0.05	1,376.44	-699.11	503.82	448.97	54.85	9.186	
11,200.00	9,708.77	10,520.10	9,206.35	41.21	13.79	-0.05	1,476.43	-699.72	502.42	446.26	56.16	8.947	
11,300.00	9,707.54	10,620.09	9,206.52	42.00	14.42	-0.05	1,576.42	-700.33	501.02	443.50	57.52	8.710	
11,400.00	9,706.31	10,720.08	9,206.69	42.81	15.07	-0.05	1,676.40	-700.95	499.62	440.68	58.94	8.477	
11,500.00	9,705.08	10,820.07	9,206.86	43.66	15.72	-0.05	1,776.39	-701.56	498.22	437.82	60.40	8.248	
11,600.00	9,703.86	10,920.07	9,207.03	44.54	16.39	-0.05	1,876.38	-702.17	496.82	434.91	61.91	8.025	
11,700.00	9,702.63	11,020.06	9,207.21	45.44	17.06	-0.05	1,976.37	-702.78	495.42	431.96	63.46	7.807	
11,800.00	9,701.40	11,120.05	9,207.38	46.37	17.74	-0.04	2,076.36	-703.40	494.03	428.98	65.05	7.595	
11,900.00	9,700.17	11,220.04	9,207.55	47.33	18.43	-0.04	2,176.35	-704.01	492.63	425.96	66.67	7.389	
12,000.00	9,698.95	11,320.03	9,207.72	48.31	19.12	-0.04	2,276.33	-704.62	491.23	422.90	68.33	7.189	

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 101H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft
Survey Program: 0-Scientific Gyro, 8768-MWD+IFR1+MS													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 Tooface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,100.00	9,697.72	11,420.02	9,207.89	49.31	19.82	-0.04	2,376.32	-705.23	489.83	419.82	70.01	6.996	
12,200.00	9,696.49	11,520.01	9,208.06	50.34	20.53	-0.04	2,476.31	-705.84	488.43	416.71	71.73	6.810	
12,300.00	9,695.26	11,620.00	9,208.23	51.38	21.23	-0.04	2,576.30	-706.46	487.03	413.57	73.47	6.629	
12,400.00	9,694.03	11,719.99	9,208.40	52.44	21.94	-0.04	2,676.29	-707.07	485.64	410.40	75.23	6.455	
12,500.00	9,692.81	11,819.98	9,208.57	53.52	22.66	-0.04	2,776.27	-707.68	484.24	407.22	77.02	6.287	
12,600.00	9,691.58	11,919.97	9,208.74	54.62	23.38	-0.04	2,876.26	-708.29	482.84	404.01	78.83	6.125	
12,700.00	9,690.35	12,019.96	9,208.91	55.73	24.10	-0.04	2,976.25	-708.91	481.44	400.78	80.66	5.969	
12,800.00	9,689.12	12,119.95	9,209.08	56.85	24.82	-0.04	3,076.24	-709.52	480.04	397.54	82.50	5.818	
12,900.00	9,687.90	12,219.94	9,209.25	57.99	25.55	-0.04	3,176.23	-710.13	478.64	394.28	84.37	5.673	
13,000.00	9,686.67	12,319.93	9,209.42	59.14	26.28	-0.04	3,276.22	-710.74	477.25	391.00	86.25	5.533	
13,100.00	9,685.44	12,419.92	9,209.59	60.31	27.01	-0.03	3,376.20	-711.35	475.85	387.70	88.15	5.398	
13,200.00	9,684.21	12,519.91	9,209.76	61.48	27.74	-0.03	3,476.19	-711.97	474.45	384.39	90.06	5.268	
13,300.00	9,682.98	12,619.90	9,209.93	62.67	28.47	-0.03	3,576.18	-712.58	473.05	381.07	91.98	5.143	
13,400.00	9,681.76	12,719.89	9,210.11	63.87	29.21	-0.03	3,676.17	-713.19	471.65	377.74	93.92	5.022	
13,500.00	9,680.53	12,819.88	9,210.28	65.07	29.94	-0.03	3,776.16	-713.80	470.25	374.39	95.86	4.905	
13,600.00	9,679.30	12,919.87	9,210.45	66.29	30.68	-0.03	3,876.15	-714.42	468.86	371.03	97.82	4.793	
13,700.00	9,678.07	13,019.86	9,210.62	67.51	31.42	-0.03	3,976.13	-715.03	467.46	367.66	99.79	4.684	
13,800.00	9,676.85	13,119.85	9,210.79	68.75	32.16	-0.03	4,076.12	-715.64	466.06	364.29	101.77	4.579	
13,900.00	9,675.62	13,219.84	9,210.96	69.99	32.90	-0.03	4,176.11	-716.25	464.66	360.90	103.76	4.478	
14,000.00	9,674.39	13,319.83	9,211.13	71.23	33.64	-0.03	4,276.10	-716.86	463.26	357.50	105.76	4.380	
14,100.00	9,673.16	13,419.82	9,211.30	72.49	34.39	-0.03	4,376.09	-717.48	461.86	354.10	107.77	4.286	
14,200.00	9,671.93	13,519.81	9,211.47	73.75	35.13	-0.03	4,476.07	-718.09	460.46	350.68	109.78	4.194	
14,300.00	9,670.71	13,619.80	9,211.64	75.02	35.87	-0.03	4,576.06	-718.70	459.07	347.26	111.80	4.106	
14,400.00	9,669.48	13,719.79	9,211.81	76.29	36.62	-0.02	4,676.05	-719.31	457.67	343.84	113.83	4.021	
14,500.00	9,668.25	13,819.78	9,211.98	77.57	37.37	-0.02	4,776.04	-719.93	456.27	340.40	115.87	3.938	
14,600.00	9,667.02	13,919.77	9,212.15	78.85	38.11	-0.02	4,876.03	-720.54	454.87	336.96	117.91	3.858	
14,700.00	9,665.79	14,019.76	9,212.32	80.14	38.86	-0.02	4,976.02	-721.15	453.47	333.51	119.96	3.780	
14,800.00	9,664.57	14,119.75	9,212.49	81.44	39.61	-0.02	5,076.00	-721.76	452.07	330.06	122.01	3.705	
14,900.00	9,663.34	14,219.74	9,212.66	82.74	40.36	-0.02	5,175.99	-722.37	450.68	326.60	124.07	3.632	
15,000.00	9,662.11	14,319.73	9,212.83	84.04	41.11	-0.02	5,275.98	-722.99	449.28	323.14	126.14	3.562	
15,100.00	9,660.88	14,419.72	9,213.01	85.35	41.86	-0.02	5,375.97	-723.60	447.88	319.67	128.21	3.493	
15,200.00	9,659.66	14,519.71	9,213.18	86.66	42.61	-0.02	5,475.96	-724.21	446.48	316.20	130.28	3.427	
15,300.00	9,658.43	14,619.70	9,213.35	87.98	43.36	-0.02	5,575.94	-724.82	445.08	312.72	132.36	3.363	
15,400.00	9,657.20	14,719.69	9,213.52	89.30	44.11	-0.02	5,675.93	-725.44	443.68	309.24	134.45	3.300	
15,500.00	9,655.97	14,819.68	9,213.69	90.62	44.86	-0.02	5,775.92	-726.05	442.29	305.75	136.53	3.239	
15,600.00	9,654.74	14,919.67	9,213.86	91.95	45.61	-0.01	5,875.91	-726.66	440.89	302.26	138.63	3.180	
15,700.00	9,653.52	15,019.66	9,214.03	93.28	46.37	-0.01	5,975.90	-727.27	439.49	298.77	140.72	3.123	
15,800.00	9,652.29	15,119.65	9,214.20	94.61	47.12	-0.01	6,075.89	-727.88	438.09	295.27	142.82	3.067	
15,900.00	9,651.06	15,219.64	9,214.37	95.95	47.87	-0.01	6,175.87	-728.50	436.69	291.77	144.93	3.013	
16,000.00	9,649.83	15,319.63	9,214.54	97.29	48.63	-0.01	6,275.86	-729.11	435.29	288.26	147.03	2.961	
16,100.00	9,648.61	15,419.63	9,214.71	98.63	49.38	-0.01	6,375.85	-729.72	433.90	284.75	149.14	2.909	
16,200.00	9,647.38	15,519.62	9,214.88	99.97	50.13	-0.01	6,475.84	-730.33	432.50	281.24	151.25	2.859	
16,300.00	9,646.15	15,619.61	9,215.05	101.32	50.89	-0.01	6,575.83	-730.94	431.10	277.73	153.37	2.811	
16,400.00	9,644.92	15,719.60	9,215.22	102.67	51.64	-0.01	6,675.81	-731.56	429.70	274.21	155.49	2.764	
16,500.00	9,643.69	15,819.59	9,215.39	104.02	52.40	-0.01	6,775.80	-732.17	428.30	270.69	157.61	2.717	
16,600.00	9,642.47	15,919.58	9,215.56	105.37	53.15	-0.01	6,875.79	-732.78	426.90	267.17	159.74	2.673	
16,700.00	9,641.24	16,019.57	9,215.73	106.73	53.91	0.00	6,975.78	-733.39	425.50	263.64	161.86	2.629	
16,800.00	9,640.01	16,119.56	9,215.91	108.09	54.67	0.00	7,075.77	-734.01	424.11	260.12	163.99	2.586	
16,900.00	9,638.78	16,219.55	9,216.08	109.45	55.42	0.00	7,175.76	-734.62	422.71	256.59	166.12	2.545	
17,000.00	9,637.56	16,319.54	9,216.25	110.81	56.18	0.00	7,275.74	-735.23	421.31	253.05	168.26	2.504	
17,100.00	9,636.33	16,419.53	9,216.42	112.17	56.93	0.00	7,375.73	-735.84	419.91	249.52	170.39	2.464	
17,200.00	9,635.10	16,519.52	9,216.59	113.54	57.69	0.00	7,475.72	-736.45	418.51	245.98	172.53	2.426	

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Survey Program: 0-Scientific Gyro, 8768-MWD+IFR1+MS													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 Tooface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
17,208.09	9,635.00	16,526.90	9,216.60	113.65	57.75	0.00	7,483.10	-736.50	418.40	245.70	172.70	2.423 SF	

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 102H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft
Survey Program: 0-Scientific Gyro, 8743-MWD+IFR1+MS													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
0.00	0.00	1.00	0.00	0.00	0.00	62.86	30.60	59.70	67.09				
100.00	100.00	101.00	100.00	0.14	0.07	62.86	30.60	59.70	67.09	66.88	0.21	326.461	
200.00	200.00	201.00	200.00	0.49	0.20	62.86	30.60	59.70	67.09	66.39	0.69	96.765	
300.00	300.00	301.00	300.00	0.85	0.33	62.86	30.60	59.70	67.09	65.90	1.18	56.704	
400.00	400.00	401.00	400.00	1.21	0.46	62.86	30.60	59.70	67.09	65.41	1.67	40.095	
500.00	500.00	501.00	500.00	1.57	0.59	62.86	30.60	59.70	67.09	64.92	2.16	31.010	
600.00	600.00	601.00	600.00	1.93	0.73	62.86	30.60	59.70	67.09	64.43	2.65	25.281	
700.00	700.00	701.00	700.00	2.29	0.86	62.86	30.60	59.70	67.09	63.94	3.14	21.339	
800.00	800.00	801.00	800.00	2.65	0.99	62.86	30.60	59.70	67.09	63.45	3.63	18.460	
900.00	900.00	901.00	900.00	3.00	1.12	62.86	30.60	59.70	67.09	62.96	4.12	16.265	
1,000.00	1,000.00	1,001.00	1,000.00	3.36	1.25	62.86	30.60	59.70	67.09	62.47	4.61	14.537	
1,100.00	1,100.00	1,101.00	1,100.00	3.72	1.38	62.86	30.60	59.70	67.09	61.98	5.10	13.141	
1,200.00	1,200.00	1,201.00	1,200.00	4.08	1.52	62.86	30.60	59.70	67.09	61.49	5.60	11.990	
1,300.00	1,300.00	1,301.00	1,300.00	4.44	1.65	62.86	30.60	59.70	67.09	61.00	6.09	11.024	
1,400.00	1,400.00	1,401.00	1,400.00	4.80	1.78	62.86	30.60	59.70	67.09	60.51	6.58	10.202	
1,500.00	1,500.00	1,501.00	1,500.00	5.15	1.91	62.86	30.60	59.70	67.09	60.02	7.07	9.494	
1,600.00	1,600.00	1,601.00	1,600.00	5.51	2.04	62.86	30.60	59.70	67.09	59.53	7.56	8.878	
1,700.00	1,700.00	1,701.00	1,700.00	5.87	2.18	62.86	30.60	59.70	67.09	59.04	8.05	8.337	
1,800.00	1,800.00	1,801.00	1,800.00	6.23	2.31	62.86	30.60	59.70	67.09	58.55	8.54	7.858	
1,900.00	1,900.00	1,901.00	1,900.00	6.59	2.44	62.86	30.60	59.70	67.09	58.06	9.03	7.431	
2,000.00	2,000.00	2,001.00	2,000.00	6.95	2.57	62.86	30.60	59.70	67.09	57.57	9.52	7.048	
2,100.00	2,100.00	2,101.00	2,100.00	7.31	2.70	62.86	30.60	59.70	67.09	57.08	10.01	6.703	
2,200.00	2,200.00	2,201.00	2,200.00	7.66	2.83	62.86	30.60	59.70	67.09	56.59	10.50	6.390	
2,300.00	2,300.00	2,301.00	2,300.00	8.02	2.97	62.86	30.60	59.70	67.09	56.10	10.99	6.105	
2,400.00	2,400.00	2,401.00	2,400.00	8.38	3.10	62.86	30.60	59.70	67.09	55.61	11.48	5.844	
2,500.00	2,500.00	2,501.00	2,500.00	8.74	3.23	62.86	30.60	59.70	67.09	55.12	11.97	5.605 CC, ES	
2,600.00	2,599.98	2,600.98	2,599.98	9.09	3.36	166.79	30.60	59.70	68.78	56.33	12.45	5.525	
2,700.00	2,699.84	2,700.84	2,699.84	9.43	3.49	167.69	30.60	59.70	73.89	60.97	12.92	5.719	
2,800.00	2,799.45	2,800.45	2,799.45	9.77	3.62	168.95	30.60	59.70	82.42	69.03	13.39	6.155	
2,900.00	2,898.82	2,899.82	2,898.82	10.11	3.76	170.26	30.60	59.70	93.46	79.59	13.87	6.739	
3,000.00	2,998.18	2,999.18	2,998.18	10.46	3.89	171.31	30.60	59.70	104.64	90.29	14.35	7.293	
3,100.00	3,097.53	3,098.53	3,097.53	10.81	4.02	172.16	30.60	59.70	115.85	101.02	14.83	7.811	
3,200.00	3,196.89	3,197.89	3,196.89	11.17	4.15	172.85	30.60	59.70	127.08	111.76	15.32	8.297	
3,300.00	3,296.25	3,297.25	3,296.25	11.52	4.28	173.44	30.60	59.70	138.32	122.52	15.80	8.752	
3,400.00	3,395.60	3,396.60	3,395.60	11.88	4.41	173.93	30.60	59.70	149.58	133.29	16.29	9.180	
3,500.00	3,494.96	3,495.96	3,494.96	12.24	4.54	174.36	30.60	59.70	160.85	144.06	16.79	9.582	
3,600.00	3,594.32	3,595.32	3,594.32	12.61	4.67	174.73	30.60	59.70	172.12	154.84	17.28	9.961	
3,700.00	3,693.67	3,694.67	3,693.67	12.97	4.80	175.05	30.60	59.70	183.40	165.63	17.78	10.318	
3,800.00	3,793.03	3,794.03	3,793.03	13.34	4.93	175.34	30.60	59.70	194.69	176.42	18.27	10.655	
3,900.00	3,892.39	3,893.39	3,892.39	13.71	5.07	175.60	30.60	59.70	205.98	187.21	18.77	10.973	
4,000.00	3,991.74	3,992.74	3,991.74	14.07	5.20	175.83	30.60	59.70	217.27	198.00	19.27	11.275	
4,100.00	4,091.10	4,092.10	4,091.10	14.44	5.33	176.03	30.60	59.70	228.57	208.80	19.77	11.560	
4,200.00	4,190.46	4,191.46	4,190.46	14.82	5.46	176.22	30.60	59.70	239.87	219.59	20.27	11.831	
4,300.00	4,289.81	4,290.81	4,289.81	15.19	5.59	176.39	30.60	59.70	251.17	230.39	20.78	12.089	
4,400.00	4,389.17	4,390.17	4,389.17	15.56	5.72	176.55	30.60	59.70	262.47	241.19	21.28	12.334	
4,500.00	4,488.53	4,489.53	4,488.53	15.93	5.85	176.69	30.60	59.70	273.78	251.99	21.79	12.567	
4,600.00	4,587.88	4,588.88	4,587.88	16.31	5.98	176.82	30.60	59.70	285.09	262.79	22.29	12.789	
4,700.00	4,687.24	4,688.24	4,687.24	16.69	6.11	176.94	30.60	59.70	296.39	273.59	22.80	13.000	
4,800.00	4,786.60	4,787.60	4,786.60	17.06	6.24	177.05	30.60	59.70	307.70	284.40	23.31	13.203	
4,900.00	4,885.95	4,886.95	4,885.95	17.44	6.38	177.16	30.60	59.70	319.01	295.20	23.81	13.396	
5,000.00	4,985.31	4,986.31	4,985.31	17.82	6.51	177.26	30.60	59.70	330.33	306.00	24.32	13.581	
5,100.00	5,084.67	5,085.67	5,084.67	18.19	6.64	177.35	30.60	59.70	341.64	316.81	24.83	13.758	

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: Eider Federal
 Site Error: 0.00 usft
 Reference Well: 301H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
 TVD Reference: RKB @ 3545.30usft (Ensign 155)
 MD Reference: RKB @ 3545.30usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 102H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft
Survey Program: 0-Scientific Gyro, 8743-MWD+IFR1+MS													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
5,200.00	5,184.02	5,185.02	5,184.02	18.57	6.77	177.43	30.60	59.70	352.95	327.61	25.34	13.928	
5,300.00	5,283.38	5,284.38	5,283.38	18.95	6.90	177.51	30.60	59.70	364.27	338.41	25.85	14.090	
5,400.00	5,382.74	5,383.74	5,382.74	19.33	7.03	177.59	30.60	59.70	375.58	349.22	26.36	14.246	
5,500.00	5,482.09	5,483.09	5,482.09	19.71	7.16	177.66	30.60	59.70	386.90	360.02	26.87	14.396	
5,600.00	5,581.45	5,582.45	5,581.45	20.09	7.29	177.72	30.60	59.70	398.21	370.82	27.39	14.540	
5,700.00	5,680.81	5,681.81	5,680.81	20.48	7.42	177.79	30.60	59.70	409.53	381.63	27.90	14.679	
5,800.00	5,780.16	5,781.16	5,780.16	20.86	7.55	177.85	30.60	59.70	420.84	392.43	28.41	14.813	
5,900.00	5,879.52	5,880.52	5,879.52	21.24	7.69	177.90	30.60	59.70	432.16	403.24	28.92	14.941	
6,000.00	5,978.88	5,979.88	5,978.88	21.62	7.82	177.96	30.60	59.70	443.48	414.04	29.44	15.065	
6,100.00	6,078.23	6,079.23	6,078.23	22.00	7.95	178.01	30.60	59.70	454.80	424.85	29.95	15.185	
6,200.00	6,177.59	6,178.59	6,177.59	22.39	8.08	178.06	30.60	59.70	466.12	435.65	30.47	15.300	
6,300.00	6,276.95	6,277.95	6,276.95	22.77	8.21	178.10	30.60	59.70	477.43	446.45	30.98	15.411	
6,400.00	6,376.30	6,377.30	6,376.30	23.15	8.34	178.15	30.60	59.70	488.75	457.26	31.49	15.519	
6,500.00	6,475.66	6,476.66	6,475.66	23.54	8.47	178.19	30.60	59.70	500.07	468.06	32.01	15.623	
6,600.00	6,575.02	6,576.02	6,575.02	23.92	8.60	178.23	30.60	59.70	511.39	478.87	32.52	15.723	
6,700.00	6,674.37	6,675.37	6,674.37	24.31	8.73	178.27	30.60	59.70	522.71	489.67	33.04	15.821	
6,800.00	6,773.73	6,774.73	6,773.73	24.69	8.86	178.30	30.60	59.70	534.03	500.48	33.56	15.915	
6,900.00	6,873.09	6,874.09	6,873.09	25.08	9.00	178.34	30.60	59.70	545.35	511.28	34.07	16.006	
7,000.00	6,972.44	6,973.44	6,972.44	25.46	9.13	178.37	30.60	59.70	556.67	522.08	34.59	16.095	
7,100.00	7,071.80	7,072.80	7,071.80	25.85	9.26	178.40	30.60	59.70	567.99	532.89	35.10	16.181	
7,200.00	7,171.16	7,172.16	7,171.16	26.23	9.39	178.44	30.60	59.70	579.31	543.69	35.62	16.264	
7,300.00	7,270.51	7,271.51	7,270.51	26.62	9.52	178.47	30.60	59.70	590.63	554.50	36.14	16.345	
7,400.00	7,369.87	7,370.87	7,369.87	27.00	9.65	178.49	30.60	59.70	601.95	565.30	36.65	16.423	
7,500.00	7,469.23	7,470.23	7,469.23	27.39	9.78	178.52	30.60	59.70	613.28	576.10	37.17	16.499	
7,600.00	7,568.58	7,569.58	7,568.58	27.78	9.91	178.55	30.60	59.70	624.60	586.91	37.69	16.573	
7,700.00	7,667.94	7,668.94	7,667.94	28.16	10.04	178.58	30.60	59.70	635.92	597.71	38.20	16.645	
7,800.00	7,767.30	7,768.30	7,767.30	28.55	10.17	178.60	30.60	59.70	647.24	608.52	38.72	16.715	
7,900.00	7,866.65	7,867.65	7,866.65	28.93	10.31	178.62	30.60	59.70	658.56	619.32	39.24	16.783	
8,000.00	7,966.01	7,967.01	7,966.01	29.32	10.44	178.65	30.60	59.70	669.88	630.13	39.76	16.849	
8,100.00	8,065.37	8,066.37	8,065.37	29.71	10.57	178.67	30.60	59.70	681.20	640.93	40.28	16.914	
8,200.00	8,164.72	8,165.72	8,164.72	30.10	10.70	178.69	30.60	59.70	692.53	651.73	40.79	16.976	
8,300.00	8,264.08	8,265.08	8,264.08	30.48	10.83	178.71	30.60	59.70	703.85	662.54	41.31	17.038	
8,400.00	8,363.44	8,364.44	8,363.44	30.87	10.96	178.73	30.60	59.70	715.17	673.34	41.83	17.097	
8,500.00	8,462.79	8,463.79	8,462.79	31.26	11.09	178.75	30.60	59.70	726.49	684.14	42.35	17.155	
8,600.00	8,562.15	8,563.15	8,562.15	31.64	11.22	178.77	30.60	59.70	737.82	694.95	42.87	17.212	
8,700.00	8,661.51	8,662.51	8,661.51	32.03	11.35	178.79	30.60	59.70	749.14	705.75	43.39	17.267	
8,800.00	8,760.89	8,759.31	8,758.31	32.42	11.46	178.79	30.89	59.65	760.22	716.33	43.88	17.324	
8,900.00	8,860.55	8,844.05	8,842.29	32.79	11.48	178.02	41.21	57.97	769.70	725.43	44.27	17.385	
9,000.00	8,960.44	8,925.00	8,919.59	33.15	11.51	176.30	64.59	54.16	778.23	733.56	44.67	17.422	
9,100.00	9,060.42	8,992.75	8,980.46	33.49	11.56	70.57	93.84	49.40	787.18	742.13	45.05	17.473	
9,200.00	9,160.42	9,050.00	9,028.19	33.82	11.61	68.32	124.98	44.33	800.29	754.86	45.43	17.616	
9,300.00	9,260.42	9,100.00	9,066.53	34.16	11.65	66.05	156.61	39.18	819.97	774.16	45.81	17.899	
9,400.00	9,359.32	9,150.00	9,101.31	34.48	11.71	61.59	192.03	33.41	841.25	795.07	46.18	18.216	
9,500.00	9,453.25	9,200.00	9,132.15	34.76	11.76	57.90	230.85	27.09	859.62	813.10	46.52	18.479	
9,600.00	9,538.10	9,250.00	9,158.72	34.99	11.81	55.09	272.63	20.28	873.55	826.75	46.80	18.666	
9,700.00	9,610.16	9,293.51	9,178.12	35.15	11.85	53.30	311.05	14.03	881.89	834.88	47.01	18.761	
9,800.00	9,666.29	9,341.32	9,195.26	35.26	11.90	52.29	355.09	6.85	883.93	836.78	47.15	18.747	
9,900.00	9,704.04	9,389.13	9,207.85	35.31	11.93	52.16	400.59	-0.56	879.22	831.98	47.24	18.610	
10,000.00	9,721.74	9,436.91	9,215.77	35.37	11.96	52.95	447.07	-8.13	867.68	820.35	47.33	18.333	
10,100.00	9,722.27	9,484.77	9,218.94	35.50	11.98	53.47	494.18	-15.80	851.64	804.16	47.47	17.940	
10,200.00	9,721.05	9,549.12	9,219.07	35.72	11.99	53.16	557.87	-25.02	839.68	791.97	47.72	17.598	
10,300.00	9,719.82	9,617.01	9,219.15	36.03	12.01	52.95	625.43	-31.65	831.55	783.51	48.04	17.308	

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
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Offset Design Eider Federal - 102H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft
Survey Program: 0-Scientific Gyro, 8743-MWD+IFR1+MS													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
10,400.00	9,718.59	9,700.00	9,219.25	36.41	12.04	52.88	708.32	-35.39	827.41	778.97	48.45	17.078	
10,500.00	9,717.36	9,771.88	9,219.33	36.85	12.06	52.93	780.20	-35.90	826.08	777.17	48.90	16.892	
10,600.00	9,716.13	9,871.87	9,219.45	37.34	12.08	53.00	880.19	-36.51	825.28	775.86	49.42	16.698	
10,700.00	9,714.91	9,971.86	9,219.56	37.88	12.12	53.08	980.18	-37.11	824.49	774.43	50.06	16.470	
10,800.00	9,713.68	10,071.85	9,219.68	38.46	12.16	53.15	1,080.17	-37.72	823.69	772.60	51.09	16.121	
10,900.00	9,712.45	10,171.84	9,219.79	39.09	12.21	53.23	1,180.15	-38.32	822.90	770.70	52.20	15.764	
11,000.00	9,711.22	10,271.83	9,219.91	39.76	12.29	53.30	1,280.14	-38.93	822.11	768.73	53.38	15.401	
11,100.00	9,710.00	10,371.82	9,220.02	40.47	12.48	53.38	1,380.13	-39.53	821.32	766.69	54.62	15.036	
11,200.00	9,708.77	10,471.82	9,220.13	41.21	12.95	53.45	1,480.12	-40.14	820.53	764.60	55.93	14.671	
11,300.00	9,707.54	10,571.81	9,220.25	42.00	13.57	53.53	1,580.11	-40.74	819.74	762.46	57.29	14.310	
11,400.00	9,706.31	10,671.80	9,220.36	42.81	14.23	53.61	1,680.10	-41.35	818.96	760.26	58.70	13.952	
11,500.00	9,705.08	10,771.79	9,220.48	43.66	14.91	53.68	1,780.09	-41.95	818.17	758.02	60.15	13.601	
11,600.00	9,703.86	10,871.78	9,220.59	44.54	15.60	53.76	1,880.08	-42.56	817.39	755.73	61.66	13.257	
11,700.00	9,702.63	10,971.77	9,220.71	45.44	16.30	53.83	1,980.07	-43.16	816.61	753.41	63.20	12.921	
11,800.00	9,701.40	11,071.76	9,220.82	46.37	17.00	53.91	2,080.06	-43.77	815.83	751.05	64.78	12.594	
11,900.00	9,700.17	11,171.75	9,220.93	47.33	17.71	53.99	2,180.05	-44.37	815.05	748.65	66.40	12.275	
12,000.00	9,698.95	11,271.74	9,221.05	48.31	18.43	54.06	2,280.03	-44.98	814.27	746.23	68.05	11.967	
12,100.00	9,697.72	11,371.73	9,221.16	49.31	19.14	54.14	2,380.02	-45.59	813.50	743.77	69.73	11.667	
12,200.00	9,696.49	11,471.73	9,221.28	50.34	19.87	54.22	2,480.01	-46.19	812.72	741.29	71.43	11.377	
12,300.00	9,695.26	11,571.72	9,221.39	51.38	20.59	54.30	2,580.00	-46.80	811.95	738.78	73.17	11.097	
12,400.00	9,694.03	11,671.71	9,221.51	52.44	21.32	54.37	2,679.99	-47.40	811.18	736.25	74.93	10.826	
12,500.00	9,692.81	11,771.70	9,221.62	53.52	22.05	54.45	2,779.98	-48.01	810.41	733.70	76.71	10.565	
12,600.00	9,691.58	11,871.69	9,221.73	54.62	22.78	54.53	2,879.97	-48.61	809.64	731.13	78.51	10.312	
12,700.00	9,690.35	11,971.68	9,221.85	55.73	23.52	54.61	2,979.96	-49.22	808.87	728.54	80.34	10.069	
12,800.00	9,689.12	12,071.67	9,221.96	56.85	24.25	54.69	3,079.95	-49.82	808.11	725.93	82.18	9.834	
12,900.00	9,687.90	12,171.66	9,222.08	57.99	24.99	54.76	3,179.94	-50.43	807.35	723.31	84.04	9.607	
13,000.00	9,686.67	12,271.65	9,222.19	59.14	25.73	54.84	3,279.93	-51.03	806.58	720.67	85.91	9.388	
13,100.00	9,685.44	12,371.64	9,222.31	60.31	26.47	54.92	3,379.91	-51.64	805.82	718.02	87.81	9.177	
13,200.00	9,684.21	12,471.64	9,222.42	61.48	27.22	55.00	3,479.90	-52.24	805.06	715.35	89.71	8.974	
13,300.00	9,682.98	12,571.63	9,222.53	62.67	27.96	55.08	3,579.89	-52.85	804.31	712.67	91.63	8.778	
13,400.00	9,681.76	12,671.62	9,222.65	63.87	28.70	55.16	3,679.88	-53.45	803.55	709.99	93.57	8.588	
13,500.00	9,680.53	12,771.61	9,222.76	65.07	29.45	55.24	3,779.87	-54.06	802.80	707.29	95.51	8.405	
13,600.00	9,679.30	12,871.60	9,222.88	66.29	30.20	55.32	3,879.86	-54.66	802.04	704.58	97.47	8.229	
13,700.00	9,678.07	12,971.59	9,222.99	67.51	30.94	55.40	3,979.85	-55.27	801.29	701.86	99.43	8.059	
13,800.00	9,676.85	13,071.58	9,223.11	68.75	31.69	55.48	4,079.84	-55.87	800.54	699.13	101.41	7.894	
13,900.00	9,675.62	13,171.57	9,223.22	69.99	32.44	55.56	4,179.83	-56.48	799.79	696.40	103.40	7.735	
14,000.00	9,674.39	13,271.56	9,223.33	71.23	33.19	55.64	4,279.82	-57.08	799.05	693.65	105.39	7.582	
14,100.00	9,673.16	13,371.55	9,223.45	72.49	33.94	55.72	4,379.81	-57.69	798.30	690.90	107.40	7.433	
14,200.00	9,671.93	13,471.55	9,223.56	73.75	34.69	55.80	4,479.79	-58.29	797.56	688.15	109.41	7.290	
14,300.00	9,670.71	13,571.54	9,223.68	75.02	35.44	55.88	4,579.78	-58.90	796.82	685.39	111.43	7.151	
14,400.00	9,669.48	13,671.53	9,223.79	76.29	36.20	55.96	4,679.77	-59.50	796.08	682.62	113.46	7.016	
14,500.00	9,668.25	13,771.52	9,223.91	77.57	36.95	56.04	4,779.76	-60.11	795.34	679.84	115.49	6.886	
14,600.00	9,667.02	13,871.51	9,224.02	78.85	37.70	56.12	4,879.75	-60.71	794.60	677.07	117.53	6.761	
14,700.00	9,665.79	13,971.50	9,224.13	80.14	38.46	56.20	4,979.74	-61.32	793.86	674.28	119.58	6.639	
14,800.00	9,664.57	14,071.49	9,224.25	81.44	39.21	56.28	5,079.73	-61.92	793.13	671.50	121.63	6.521	
14,900.00	9,663.34	14,171.48	9,224.36	82.74	39.96	56.36	5,179.72	-62.53	792.40	668.70	123.69	6.406	
15,000.00	9,662.11	14,271.47	9,224.48	84.04	40.72	56.44	5,279.71	-63.14	791.67	665.91	125.76	6.295	
15,100.00	9,660.88	14,371.46	9,224.59	85.35	41.47	56.52	5,379.70	-63.74	790.94	663.11	127.83	6.188	
15,200.00	9,659.66	14,471.46	9,224.70	86.66	42.23	56.61	5,479.69	-64.35	790.21	660.31	129.90	6.083	
15,300.00	9,658.43	14,571.45	9,224.82	87.98	42.98	56.69	5,579.67	-64.95	789.48	657.50	131.98	5.982	
15,400.00	9,657.20	14,671.44	9,224.93	89.30	43.74	56.77	5,679.66	-65.56	788.76	654.70	134.06	5.883	
15,500.00	9,655.97	14,771.43	9,225.05	90.62	44.50	56.85	5,779.65	-66.16	788.04	651.88	136.15	5.788	

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 102H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft
Survey Program: 0-Scientific Gyro 8743-MWD+IFR1+MS													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				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)	Minimum Separation (usft)	Separation Factor	
15,600.00	9,654.74	14,871.42	9,225.16	91.95	45.25	56.93	5,879.64	-66.77	787.31	649.07	138.24	5.695	
15,700.00	9,653.52	14,971.41	9,225.28	93.28	46.01	57.02	5,979.63	-67.37	786.59	646.26	140.34	5.605	
15,800.00	9,652.29	15,071.40	9,225.39	94.61	46.77	57.10	6,079.62	-67.98	785.88	643.44	142.44	5.517	
15,900.00	9,651.06	15,171.39	9,225.50	95.95	47.52	57.18	6,179.61	-68.58	785.16	640.62	144.54	5.432	
16,000.00	9,649.83	15,271.38	9,225.62	97.29	48.28	57.27	6,279.60	-69.19	784.45	637.80	146.65	5.349	
16,100.00	9,648.61	15,371.37	9,225.73	98.63	49.04	57.35	6,379.59	-69.79	783.73	634.98	148.76	5.269	
16,200.00	9,647.38	15,471.37	9,225.85	99.97	49.80	57.43	6,479.58	-70.40	783.02	632.15	150.87	5.190	
16,300.00	9,646.15	15,571.36	9,225.96	101.32	50.56	57.52	6,579.57	-71.00	782.31	629.33	152.99	5.114	
16,400.00	9,644.92	15,671.35	9,226.08	102.67	51.31	57.60	6,679.55	-71.61	781.60	626.50	155.10	5.039	
16,500.00	9,643.69	15,771.34	9,226.19	104.02	52.07	57.68	6,779.54	-72.21	780.90	623.67	157.23	4.967	
16,600.00	9,642.47	15,871.33	9,226.30	105.37	52.83	57.77	6,879.53	-72.82	780.19	620.84	159.35	4.896	
16,700.00	9,641.24	15,971.32	9,226.42	106.73	53.59	57.85	6,979.52	-73.42	779.49	618.01	161.48	4.827	
16,800.00	9,640.01	16,071.31	9,226.53	108.09	54.35	57.93	7,079.51	-74.03	778.79	615.18	163.61	4.760	
16,900.00	9,638.78	16,171.30	9,226.65	109.45	55.11	58.02	7,179.50	-74.63	778.09	612.35	165.74	4.695	
17,000.00	9,637.56	16,271.29	9,226.76	110.81	55.87	58.10	7,279.49	-75.24	777.39	609.52	167.87	4.631	
17,100.00	9,636.33	16,371.28	9,226.88	112.17	56.63	58.19	7,379.48	-75.84	776.69	606.69	170.01	4.569	
17,200.00	9,635.10	16,471.28	9,226.99	113.54	57.38	58.27	7,479.47	-76.45	776.00	603.85	172.15	4.508	
17,208.09	9,635.00	16,479.37	9,227.00	113.65	57.45	58.28	7,487.56	-76.50	775.94	603.62	172.32	4.503 SF	

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 201H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft
Survey Program: 0-Scientific Gyro, 4600-MWD+IFR1+MS													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
0.00	0.00	0.40	0.00	0.00	0.00	44.43	30.30	29.70	42.43				
100.00	100.00	100.40	100.00	0.14	0.07	44.43	30.30	29.70	42.43	42.22	0.20	207.255	
200.00	200.00	200.40	200.00	0.49	0.20	44.43	30.30	29.70	42.43	41.74	0.69	61.269	
300.00	300.00	300.40	300.00	0.85	0.33	44.43	30.30	29.70	42.43	41.25	1.18	35.887	
400.00	400.00	400.40	400.00	1.21	0.46	44.43	30.30	29.70	42.43	40.76	1.67	25.370	
500.00	500.00	500.40	500.00	1.57	0.59	44.43	30.30	29.70	42.43	40.27	2.16	19.619	
600.00	600.00	600.40	600.00	1.93	0.72	44.43	30.30	29.70	42.43	39.78	2.65	15.994	
700.00	700.00	700.40	700.00	2.29	0.86	44.43	30.30	29.70	42.43	39.29	3.14	13.499	
800.00	800.00	800.40	800.00	2.65	0.99	44.43	30.30	29.70	42.43	38.80	3.63	11.678	
900.00	900.00	900.40	900.00	3.00	1.12	44.43	30.30	29.70	42.43	38.30	4.12	10.289	
1,000.00	1,000.00	1,000.40	1,000.00	3.36	1.25	44.43	30.30	29.70	42.43	37.81	4.61	9.196	
1,100.00	1,100.00	1,100.40	1,100.00	3.72	1.38	44.43	30.30	29.70	42.43	37.32	5.10	8.312	
1,200.00	1,200.00	1,200.40	1,200.00	4.08	1.52	44.43	30.30	29.70	42.43	36.83	5.59	7.584	
1,300.00	1,300.00	1,300.40	1,300.00	4.44	1.65	44.43	30.30	29.70	42.43	36.34	6.08	6.973	
1,400.00	1,400.00	1,400.40	1,400.00	4.80	1.78	44.43	30.30	29.70	42.43	35.85	6.58	6.453	
1,500.00	1,500.00	1,500.40	1,500.00	5.15	1.91	44.43	30.30	29.70	42.43	35.36	7.07	6.005	
1,600.00	1,600.00	1,600.40	1,600.00	5.51	2.04	44.43	30.30	29.70	42.43	34.87	7.56	5.615	
1,700.00	1,700.00	1,700.40	1,700.00	5.87	2.17	44.43	30.30	29.70	42.43	34.38	8.05	5.273	
1,800.00	1,800.00	1,800.40	1,800.00	6.23	2.31	44.43	30.30	29.70	42.43	33.89	8.54	4.970	
1,900.00	1,900.00	1,900.40	1,900.00	6.59	2.44	44.43	30.30	29.70	42.43	33.40	9.03	4.700	
2,000.00	2,000.00	2,000.40	2,000.00	6.95	2.57	44.43	30.30	29.70	42.43	32.91	9.52	4.458	
2,100.00	2,100.00	2,100.40	2,100.00	7.31	2.70	44.43	30.30	29.70	42.43	32.42	10.01	4.240	
2,200.00	2,200.00	2,200.40	2,200.00	7.66	2.83	44.43	30.30	29.70	42.43	31.93	10.50	4.042	
2,300.00	2,300.00	2,300.40	2,300.00	8.02	2.97	44.43	30.30	29.70	42.43	31.44	10.99	3.861	
2,400.00	2,400.00	2,400.40	2,400.00	8.38	3.10	44.43	30.30	29.70	42.43	30.95	11.48	3.696	
2,500.00	2,500.00	2,500.40	2,500.00	8.74	3.23	44.43	30.30	29.70	42.43	30.46	11.97	3.545 CC, ES	
2,600.00	2,599.98	2,600.38	2,599.98	9.09	3.36	149.21	30.30	29.70	43.92	31.47	12.45	3.528	
2,700.00	2,699.84	2,700.24	2,699.84	9.43	3.49	152.33	30.30	29.70	48.45	35.57	12.92	3.754	
2,800.00	2,799.45	2,799.85	2,799.45	9.77	3.62	156.39	30.30	29.70	56.36	42.97	13.39	4.208	
2,900.00	2,898.82	2,899.22	2,898.82	10.11	3.75	160.22	30.30	29.70	66.79	52.92	13.87	4.816	
3,000.00	2,998.18	2,998.58	2,998.18	10.46	3.89	163.05	30.30	29.70	77.55	63.20	14.35	5.405	
3,100.00	3,097.53	3,097.93	3,097.53	10.81	4.02	165.19	30.30	29.70	88.45	73.62	14.83	5.964	
3,200.00	3,196.89	3,197.29	3,196.89	11.17	4.15	166.86	30.30	29.70	99.45	84.13	15.32	6.493	
3,300.00	3,296.25	3,296.65	3,296.25	11.52	4.28	168.19	30.30	29.70	110.51	94.70	15.80	6.993	
3,400.00	3,395.60	3,396.00	3,395.60	11.88	4.41	169.28	30.30	29.70	121.62	105.32	16.29	7.464	
3,500.00	3,494.96	3,495.36	3,494.96	12.24	4.54	170.19	30.30	29.70	132.76	115.98	16.79	7.910	
3,600.00	3,594.32	3,594.72	3,594.32	12.61	4.67	170.96	30.30	29.70	143.94	126.66	17.28	8.330	
3,700.00	3,693.67	3,694.07	3,693.67	12.97	4.80	171.62	30.30	29.70	155.13	137.36	17.77	8.728	
3,800.00	3,793.03	3,793.43	3,793.03	13.34	4.93	172.19	30.30	29.70	166.35	148.08	18.27	9.104	
3,900.00	3,892.39	3,892.79	3,892.39	13.71	5.06	172.68	30.30	29.70	177.57	158.80	18.77	9.461	
4,000.00	3,991.74	3,992.14	3,991.74	14.07	5.20	173.12	30.30	29.70	188.81	169.54	19.27	9.798	
4,100.00	4,091.10	4,091.50	4,091.10	14.44	5.33	173.51	30.30	29.70	200.06	180.29	19.77	10.119	
4,200.00	4,190.46	4,190.86	4,190.46	14.82	5.46	173.86	30.30	29.70	211.32	191.05	20.27	10.424	
4,300.00	4,289.81	4,290.21	4,289.81	15.19	5.59	174.17	30.30	29.70	222.58	201.81	20.78	10.713	
4,400.00	4,389.17	4,389.57	4,389.17	15.56	5.72	174.45	30.30	29.70	233.85	212.57	21.28	10.989	
4,500.00	4,488.53	4,488.93	4,488.53	15.93	5.85	174.71	30.30	29.70	245.13	223.34	21.79	11.252	
4,600.00	4,587.88	4,588.28	4,587.88	16.31	5.98	174.94	30.30	29.70	256.41	234.12	22.29	11.503	
4,700.00	4,687.24	4,687.64	4,687.24	16.69	6.04	175.15	30.30	29.70	267.69	244.97	22.73	11.779	
4,800.00	4,786.60	4,787.00	4,786.60	17.06	6.07	175.35	30.30	29.70	278.98	255.85	23.13	12.063	
4,900.00	4,885.95	4,886.35	4,885.95	17.44	6.10	175.53	30.30	29.70	290.27	266.72	23.54	12.329	
5,000.00	4,985.31	4,985.71	4,985.31	17.82	6.16	175.70	30.30	29.70	301.56	277.58	23.98	12.575	
5,100.00	5,084.67	5,085.07	5,084.67	18.19	6.24	175.85	30.30	29.70	312.85	288.42	24.44	12.802	

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 201H - OH - Plan 1 10-11-17													Offset Site Error:
Survey Program: 0-Scientific Gyro, 4600-MWD+IFR1+MS													Offset Well Error:
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
5,200.00	5,184.02	5,184.42	5,184.02	18.57	6.34	176.00	30.30	29.70	324.15	299.24	24.92	13.010	
5,300.00	5,283.38	5,283.78	5,283.38	18.95	6.46	176.13	30.30	29.70	335.45	310.04	25.41	13.201	
5,400.00	5,382.74	5,383.14	5,382.74	19.33	6.59	176.26	30.30	29.70	346.75	320.82	25.93	13.375	
5,500.00	5,482.09	5,482.49	5,482.09	19.71	6.74	176.38	30.30	29.70	358.05	331.60	26.46	13.534	
5,600.00	5,581.45	5,581.85	5,581.45	20.09	6.91	176.49	30.30	29.70	369.35	342.35	27.00	13.679	
5,700.00	5,680.81	5,682.62	5,682.21	20.48	7.09	176.42	31.38	29.21	380.51	352.94	27.56	13.805	
5,800.00	5,780.16	5,783.11	5,782.59	20.86	7.28	175.87	35.45	27.35	391.26	363.12	28.14	13.904	
5,900.00	5,879.52	5,882.44	5,881.79	21.24	7.49	175.24	40.18	25.20	401.97	373.24	28.73	13.993	
6,000.00	5,978.88	5,981.77	5,980.98	21.62	7.70	174.65	44.91	23.04	412.71	383.39	29.32	14.075	
6,100.00	6,078.23	6,081.10	6,080.18	22.00	7.93	174.09	49.64	20.89	423.50	393.57	29.93	14.149	
6,200.00	6,177.59	6,180.44	6,179.38	22.39	8.16	173.56	54.37	18.73	434.33	403.78	30.55	14.218	
6,300.00	6,276.95	6,279.77	6,278.57	22.77	8.40	173.05	59.10	16.57	445.19	414.02	31.18	14.280	
6,400.00	6,376.30	6,379.10	6,377.77	23.15	8.66	172.57	63.83	14.42	456.09	424.28	31.81	14.338	
6,500.00	6,475.66	6,478.43	6,476.97	23.54	8.91	172.11	68.56	12.26	467.01	434.56	32.45	14.391	
6,600.00	6,575.02	6,577.77	6,576.16	23.92	9.18	171.67	73.29	10.11	477.97	444.87	33.10	14.439	
6,700.00	6,674.37	6,677.10	6,675.36	24.31	9.45	171.25	78.02	7.95	488.95	455.19	33.76	14.484	
6,800.00	6,773.73	6,776.43	6,774.56	24.69	9.73	170.84	82.76	5.79	499.96	465.54	34.42	14.526	
6,900.00	6,873.09	6,875.76	6,873.75	25.08	10.01	170.46	87.49	3.54	510.99	475.90	35.09	14.564	
7,000.00	6,972.44	6,975.10	6,972.95	25.46	10.30	170.09	92.22	1.48	522.04	486.28	35.76	14.599	
7,100.00	7,071.80	7,074.43	7,072.15	25.85	10.59	169.74	96.95	-0.67	533.11	496.67	36.43	14.632	
7,200.00	7,171.16	7,173.76	7,171.34	26.23	10.88	169.40	101.68	-2.83	544.20	507.08	37.11	14.663	
7,300.00	7,270.51	7,273.10	7,270.54	26.62	11.18	169.07	106.41	-4.98	555.31	517.51	37.80	14.691	
7,400.00	7,369.87	7,372.43	7,369.74	27.00	11.48	168.76	111.14	-7.14	566.43	527.95	38.49	14.718	
7,500.00	7,469.23	7,471.76	7,468.93	27.39	11.79	168.46	115.87	-9.30	577.58	538.40	39.18	14.742	
7,600.00	7,568.58	7,571.09	7,568.13	27.78	12.10	168.17	120.60	-11.45	588.73	548.86	39.87	14.766	
7,700.00	7,667.94	7,670.43	7,667.33	28.16	12.41	167.89	125.33	-13.61	599.90	559.34	40.57	14.787	
7,800.00	7,767.30	7,769.76	7,766.52	28.55	12.72	167.63	130.06	-15.76	611.09	569.82	41.27	14.808	
7,900.00	7,866.65	7,869.09	7,865.72	28.93	13.04	167.37	134.79	-17.92	622.29	580.32	41.97	14.827	
8,000.00	7,966.01	7,968.42	7,964.92	29.32	13.35	167.12	139.52	-20.08	633.50	590.82	42.68	14.845	
8,100.00	8,065.37	8,067.76	8,064.11	29.71	13.67	166.88	144.25	-22.23	644.72	601.34	43.38	14.861	
8,200.00	8,164.72	8,167.09	8,163.31	30.10	13.99	166.65	148.98	-24.39	655.95	611.86	44.09	14.877	
8,300.00	8,264.08	8,266.42	8,262.50	30.48	14.32	166.42	153.71	-26.54	667.19	622.39	44.80	14.892	
8,400.00	8,363.44	8,365.75	8,361.70	30.87	14.64	166.20	158.44	-28.70	678.44	632.93	45.51	14.907	
8,500.00	8,462.79	8,465.09	8,460.90	31.26	14.97	165.99	163.18	-30.85	689.70	643.48	46.23	14.920	
8,600.00	8,562.15	8,564.42	8,560.09	31.64	15.30	165.79	167.91	-33.01	700.97	654.03	46.94	14.933	
8,700.00	8,661.51	8,663.75	8,659.29	32.03	15.63	165.59	172.64	-35.17	712.25	664.59	47.66	14.945	
8,800.00	8,760.89	8,763.11	8,758.51	32.42	15.96	165.42	177.37	-37.32	723.27	674.90	48.38	14.951	
8,900.00	8,860.55	8,862.72	8,857.98	32.79	16.29	165.21	182.11	-39.48	731.54	684.46	49.08	14.904	
9,000.00	8,960.44	8,959.26	8,954.33	33.15	16.61	164.87	187.49	-41.94	736.54	686.77	49.77	14.800	
9,100.00	9,060.42	9,045.71	9,038.90	33.49	16.91	59.97	203.32	-49.15	739.52	689.11	50.40	14.672	
9,200.00	9,160.42	9,125.00	9,112.55	33.82	17.18	57.73	229.81	-61.22	744.12	693.12	51.00	14.590	
9,300.00	9,260.42	9,191.06	9,169.54	34.16	17.39	55.41	260.11	-75.03	753.18	701.63	51.55	14.610	
9,400.00	9,359.32	9,250.00	9,216.09	34.48	17.56	52.40	292.95	-90.00	760.48	708.44	52.04	14.614	
9,500.00	9,453.25	9,311.64	9,259.63	34.76	17.73	50.14	332.61	-108.07	761.24	708.76	52.49	14.504	
9,600.00	9,538.10	9,368.64	9,294.59	34.99	17.86	48.86	373.54	-126.72	754.94	702.10	52.85	14.285	
9,700.00	9,610.16	9,425.00	9,323.64	35.15	17.97	48.41	417.44	-146.73	741.33	688.20	53.13	13.954	
9,800.00	9,666.29	9,475.00	9,344.50	35.26	18.06	48.99	458.77	-165.56	720.37	667.06	53.31	13.512	
9,900.00	9,704.04	9,531.13	9,362.12	35.31	18.14	50.32	507.23	-187.65	692.28	638.83	53.45	12.951	
10,000.00	9,721.74	9,583.66	9,372.85	35.37	18.21	52.77	554.00	-208.96	657.54	603.96	53.58	12.273	
10,100.00	9,722.27	9,636.19	9,377.86	35.50	18.27	53.59	601.56	-230.64	618.82	565.06	53.76	11.510	
10,200.00	9,721.05	9,700.00	9,378.07	35.72	18.34	52.10	659.87	-256.53	584.95	530.88	54.06	10.820	
10,300.00	9,719.82	9,769.21	9,377.76	36.03	18.45	50.51	724.30	-281.80	555.67	501.19	54.48	10.200	

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 201H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft
Survey Program: 0-Scientific Gyro, 4600-MWD+IFR1+MS													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	
10,400.00	9,718.59	9,842.57	9,377.44	36.41	18.59	48.94	793.83	-305.17	530.85	475.86	55.00	9.652	
10,500.00	9,717.36	9,918.27	9,377.10	36.85	18.75	47.49	866.73	-325.51	510.46	454.85	55.60	9.180	
10,600.00	9,716.13	10,000.00	9,376.74	37.34	18.96	46.19	946.53	-343.11	494.41	438.11	56.30	8.782	
10,700.00	9,714.91	10,075.27	9,376.41	37.88	19.17	45.27	1,020.80	-355.28	482.54	425.50	57.04	8.459	
10,800.00	9,713.68	10,155.74	9,376.06	38.46	19.40	44.63	1,100.79	-363.95	474.79	416.93	57.86	8.206	
10,900.00	9,712.45	10,236.88	9,375.70	39.09	19.64	44.37	1,181.81	-368.13	471.04	412.31	58.73	8.020	
11,000.00	9,711.22	10,331.21	9,375.30	39.76	19.94	44.42	1,276.14	-368.92	470.30	410.60	59.70	7.878	
11,100.00	9,710.00	10,431.21	9,374.87	40.47	20.28	44.48	1,376.13	-369.52	469.74	408.99	60.75	7.733	
11,200.00	9,708.77	10,531.21	9,374.44	41.21	20.65	44.55	1,476.13	-370.13	469.18	407.32	61.86	7.585	
11,300.00	9,707.54	10,631.21	9,374.01	42.00	21.04	44.62	1,576.12	-370.73	468.62	405.59	63.03	7.435	
11,400.00	9,706.31	10,731.20	9,373.58	42.81	21.45	44.69	1,676.12	-371.34	468.06	403.80	64.26	7.284	
11,500.00	9,705.08	10,831.20	9,373.15	43.66	21.88	44.76	1,776.11	-371.94	467.50	401.96	65.54	7.133	
11,600.00	9,703.86	10,931.20	9,372.72	44.54	22.34	44.83	1,876.10	-372.55	466.95	400.08	66.87	6.983	
11,700.00	9,702.63	11,031.19	9,372.29	45.44	22.81	44.90	1,976.10	-373.15	466.39	398.15	68.25	6.834	
11,800.00	9,701.40	11,131.19	9,371.86	46.37	23.29	44.97	2,076.09	-373.76	465.84	396.17	69.67	6.687	
11,900.00	9,700.17	11,231.19	9,371.43	47.33	23.79	45.05	2,176.09	-374.36	465.28	394.16	71.12	6.542	
12,000.00	9,698.95	11,331.18	9,371.00	48.31	24.31	45.12	2,276.08	-374.97	464.73	392.11	72.62	6.399	
12,100.00	9,697.72	11,431.18	9,370.57	49.31	24.84	45.19	2,376.08	-375.57	464.18	390.02	74.15	6.260	
12,200.00	9,696.49	11,531.18	9,370.14	50.34	25.38	45.26	2,476.07	-376.18	463.63	387.91	75.72	6.123	
12,300.00	9,695.26	11,631.17	9,369.71	51.38	25.94	45.33	2,576.06	-376.78	463.07	385.76	77.32	5.989	
12,400.00	9,694.03	11,731.17	9,369.28	52.44	26.50	45.40	2,676.06	-377.39	462.52	383.58	78.94	5.859	
12,500.00	9,692.81	11,831.17	9,368.85	53.52	27.07	45.47	2,776.05	-377.99	461.97	381.38	80.60	5.732	
12,600.00	9,691.58	11,931.16	9,368.42	54.62	27.66	45.54	2,876.05	-378.60	461.42	379.15	82.27	5.608	
12,700.00	9,690.35	12,031.16	9,367.99	55.73	28.25	45.62	2,976.04	-379.21	460.88	376.90	83.98	5.488	
12,800.00	9,689.12	12,131.16	9,367.56	56.85	28.85	45.69	3,076.03	-379.81	460.33	374.62	85.70	5.371	
12,900.00	9,687.90	12,231.15	9,367.13	57.99	29.46	45.76	3,176.03	-380.42	459.78	372.33	87.45	5.258	
13,000.00	9,686.67	12,331.15	9,366.70	59.14	30.07	45.83	3,276.02	-381.02	459.24	370.02	89.22	5.147	
13,100.00	9,685.44	12,431.15	9,366.27	60.31	30.70	45.91	3,376.02	-381.63	458.69	367.68	91.01	5.040	
13,200.00	9,684.21	12,531.14	9,365.84	61.48	31.33	45.98	3,476.01	-382.23	458.14	365.34	92.81	4.936	
13,300.00	9,682.98	12,631.14	9,365.41	62.67	31.96	46.05	3,576.00	-382.84	457.60	362.97	94.63	4.836	
13,400.00	9,681.76	12,731.14	9,364.98	63.87	32.60	46.13	3,676.00	-383.44	457.06	360.59	96.47	4.738	
13,500.00	9,680.53	12,831.14	9,364.55	65.07	33.25	46.20	3,775.99	-384.05	456.52	358.20	98.32	4.643	
13,600.00	9,679.30	12,931.13	9,364.12	66.29	33.90	46.27	3,875.99	-384.65	455.97	355.79	100.19	4.551	
13,700.00	9,678.07	13,031.13	9,363.69	67.51	34.55	46.35	3,975.98	-385.26	455.43	353.37	102.07	4.462	
13,800.00	9,676.85	13,131.13	9,363.26	68.75	35.21	46.42	4,075.97	-385.86	454.89	350.93	103.96	4.376	
13,900.00	9,675.62	13,231.12	9,362.83	69.99	35.87	46.49	4,175.97	-386.47	454.35	348.49	105.86	4.292	
14,000.00	9,674.39	13,331.12	9,362.40	71.23	36.54	46.57	4,275.96	-387.07	453.81	346.04	107.78	4.211	
14,100.00	9,673.16	13,431.12	9,361.97	72.49	37.21	46.64	4,375.96	-387.68	453.28	343.57	109.71	4.132	
14,200.00	9,671.93	13,531.11	9,361.54	73.75	37.89	46.72	4,475.95	-388.28	452.74	341.09	111.65	4.055	
14,300.00	9,670.71	13,631.11	9,361.11	75.02	38.57	46.79	4,575.94	-388.89	452.20	338.60	113.60	3.981	
14,400.00	9,669.48	13,731.11	9,360.68	76.29	39.25	46.87	4,675.94	-389.49	451.67	336.10	115.56	3.908	
14,500.00	9,668.25	13,831.10	9,360.25	77.57	39.93	46.94	4,775.93	-390.10	451.13	333.60	117.53	3.838	
14,600.00	9,667.02	13,931.10	9,359.82	78.85	40.62	47.02	4,875.93	-390.70	450.60	331.09	119.51	3.770	
14,700.00	9,665.79	14,031.10	9,359.39	80.14	41.31	47.09	4,975.92	-391.31	450.06	328.57	121.49	3.704	
14,800.00	9,664.57	14,131.09	9,358.96	81.44	42.00	47.17	5,075.91	-391.92	449.53	326.05	123.49	3.640	
14,900.00	9,663.34	14,231.09	9,358.53	82.74	42.70	47.25	5,175.91	-392.52	449.00	323.51	125.49	3.578	
15,000.00	9,662.11	14,331.09	9,358.10	84.04	43.40	47.32	5,275.90	-393.13	448.47	320.98	127.49	3.518	
15,100.00	9,660.88	14,431.08	9,357.67	85.35	44.10	47.40	5,375.90	-393.73	447.94	318.43	129.51	3.459	
15,200.00	9,659.66	14,531.08	9,357.24	86.66	44.80	47.47	5,475.89	-394.34	447.41	315.89	131.52	3.402	
15,300.00	9,658.43	14,631.08	9,356.81	87.98	45.50	47.55	5,575.89	-394.94	446.88	313.33	133.55	3.346	
15,400.00	9,657.20	14,731.07	9,356.38	89.30	46.21	47.63	5,675.88	-395.55	446.35	310.77	135.58	3.292	
15,500.00	9,655.97	14,831.07	9,355.95	90.62	46.92	47.70	5,775.87	-396.15	445.83	308.21	137.62	3.240	

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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	
15,600.00	9,654.74	14,931.07	9,355.52	91.95	47.62	47.78	5,875.87	-396.76	445.30	305.64	139.66	3.189		
15,700.00	9,653.52	15,031.07	9,355.09	93.28	48.34	47.86	5,975.86	-397.36	444.78	303.07	141.70	3.139		
15,800.00	9,652.29	15,131.06	9,354.66	94.61	49.05	47.94	6,075.86	-397.97	444.25	300.50	143.76	3.090		
15,900.00	9,651.06	15,231.06	9,354.23	95.95	49.76	48.01	6,175.85	-398.57	443.73	297.92	145.81	3.043		
16,000.00	9,649.83	15,331.06	9,353.80	97.29	50.48	48.09	6,275.84	-399.18	443.20	295.33	147.87	2.997		
16,100.00	9,648.61	15,431.05	9,353.37	98.63	51.20	48.17	6,375.84	-399.78	442.68	292.75	149.94	2.952		
16,200.00	9,647.38	15,531.05	9,352.94	99.97	51.91	48.25	6,475.83	-400.39	442.16	290.16	152.00	2.909		
16,300.00	9,646.15	15,631.05	9,352.51	101.32	52.63	48.33	6,575.83	-400.99	441.64	287.56	154.08	2.866		
16,400.00	9,644.92	15,731.04	9,352.08	102.67	53.35	48.41	6,675.82	-401.60	441.12	284.97	156.15	2.825		
16,500.00	9,643.69	15,831.04	9,351.65	104.02	54.08	48.48	6,775.81	-402.20	440.60	282.37	158.23	2.785		
16,600.00	9,642.47	15,931.04	9,351.22	105.37	54.80	48.56	6,875.81	-402.81	440.08	279.77	160.31	2.745		
16,700.00	9,641.24	16,031.03	9,350.79	106.73	55.52	48.64	6,975.80	-403.41	439.57	277.17	162.40	2.707		
16,800.00	9,640.01	16,131.03	9,350.36	108.09	56.25	48.72	7,075.80	-404.02	439.05	274.56	164.49	2.669		
16,900.00	9,638.78	16,231.03	9,349.93	109.45	56.98	48.80	7,175.79	-404.63	438.54	271.95	166.58	2.633		
17,000.00	9,637.56	16,331.02	9,349.50	110.81	57.70	48.88	7,275.78	-405.23	438.02	269.34	168.68	2.597		
17,100.00	9,636.33	16,431.02	9,349.07	112.17	58.43	48.96	7,375.78	-405.84	437.51	266.73	170.78	2.562		
17,200.00	9,635.10	16,531.02	9,348.64	113.54	59.16	49.04	7,475.77	-406.44	436.99	264.12	172.88	2.528		
17,208.09	9,635.00	16,539.11	9,348.61	113.65	59.22	49.05	7,483.87	-406.49	436.95	263.90	173.05	2.525 SF		

Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Eider Federal
 Site Error: 0.00 usft
 Reference Well: 301H
 Well Error: 0.00 usft
 Reference Wellbore OH
 Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
 TVD Reference: RKB @ 3545.30usft (Ensign 155)
 MD Reference: RKB @ 3545.30usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 202H - OH - Plan 1 04-06-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	1.00	0.00	0.00	0.00	89.43	0.60	59.90	59.90				
100.00	100.00	101.00	100.00	0.14	0.14	89.43	0.60	59.90	59.90	59.63	0.28	217.021	
200.00	200.00	201.00	200.00	0.49	0.50	89.43	0.60	59.90	59.90	58.91	0.99	60.327	
300.00	300.00	301.00	300.00	0.85	0.86	89.43	0.60	59.90	59.90	58.19	1.71	35.033	
400.00	400.00	401.00	400.00	1.21	1.22	89.43	0.60	59.90	59.90	57.48	2.43	24.683	
500.00	500.00	501.00	500.00	1.57	1.57	89.43	0.60	59.90	59.90	56.76	3.14	19.054	
600.00	600.00	601.00	600.00	1.93	1.93	89.43	0.60	59.90	59.90	56.04	3.86	15.516	
700.00	700.00	701.00	700.00	2.29	2.29	89.43	0.60	59.90	59.90	55.33	4.58	13.086	
800.00	800.00	801.00	800.00	2.65	2.65	89.43	0.60	59.90	59.90	54.61	5.29	11.314	
900.00	900.00	901.00	900.00	3.00	3.01	89.43	0.60	59.90	59.90	53.89	6.01	9.965	
1,000.00	1,000.00	1,001.00	1,000.00	3.36	3.37	89.43	0.60	59.90	59.90	53.17	6.73	8.903	
1,100.00	1,100.00	1,101.00	1,100.00	3.72	3.72	89.43	0.60	59.90	59.90	52.46	7.45	8.046	
1,200.00	1,200.00	1,201.00	1,200.00	4.08	4.08	89.43	0.60	59.90	59.90	51.74	8.16	7.339	
1,300.00	1,300.00	1,301.00	1,300.00	4.44	4.44	89.43	0.60	59.90	59.90	51.02	8.88	6.746	
1,400.00	1,400.00	1,401.00	1,400.00	4.80	4.80	89.43	0.60	59.90	59.90	50.31	9.60	6.242	
1,500.00	1,500.00	1,501.00	1,500.00	5.15	5.16	89.43	0.60	59.90	59.90	49.59	10.31	5.808	
1,600.00	1,600.00	1,601.00	1,600.00	5.51	5.52	89.43	0.60	59.90	59.90	48.87	11.03	5.431	
1,700.00	1,700.00	1,701.00	1,700.00	5.87	5.88	89.43	0.60	59.90	59.90	48.16	11.75	5.099	
1,800.00	1,800.00	1,801.00	1,800.00	6.23	6.23	89.43	0.60	59.90	59.90	47.44	12.46	4.806	
1,900.00	1,900.00	1,901.00	1,900.00	6.59	6.59	89.43	0.60	59.90	59.90	46.72	13.18	4.545	
2,000.00	2,000.00	2,001.00	2,000.00	6.95	6.95	89.43	0.60	59.90	59.90	46.01	13.90	4.310	
2,100.00	2,100.00	2,101.00	2,100.00	7.31	7.31	89.43	0.60	59.90	59.90	45.29	14.61	4.099	
2,200.00	2,200.00	2,201.00	2,200.00	7.66	7.67	89.43	0.60	59.90	59.90	44.57	15.33	3.907	
2,300.00	2,300.00	2,301.00	2,300.00	8.02	8.03	89.43	0.60	59.90	59.90	43.85	16.05	3.733	
2,400.00	2,400.00	2,401.00	2,400.00	8.38	8.38	89.43	0.60	59.90	59.90	43.14	16.77	3.573	
2,416.33	2,416.33	2,417.33	2,416.33	8.44	8.44	89.43	0.60	59.90	59.90	43.02	16.88	3.548 CC	
2,500.00	2,500.00	2,500.98	2,499.98	8.74	8.74	89.43	0.60	59.90	59.90	42.42	17.48	3.426 ES, SF	
2,600.00	2,599.98	2,600.00	2,598.98	9.09	9.08	-166.43	-0.37	61.35	63.05	44.88	18.17	3.470	
2,700.00	2,699.84	2,696.80	2,695.65	9.43	9.41	-165.10	-3.17	65.51	72.43	53.60	18.83	3.846	
2,800.00	2,799.45	2,794.40	2,792.91	9.77	9.73	-163.61	-7.63	72.16	87.75	68.25	19.50	4.500	
2,900.00	2,898.82	2,892.73	2,890.86	10.11	10.07	-162.86	-12.41	79.28	105.91	85.73	20.18	5.248	
3,000.00	2,998.18	2,991.04	2,988.80	10.46	10.40	-162.36	-17.18	86.40	124.18	103.32	20.86	5.952	
3,100.00	3,097.53	3,089.35	3,086.74	10.81	10.74	-161.98	-21.95	93.51	142.47	120.91	21.55	6.610	
3,200.00	3,196.89	3,187.66	3,184.68	11.17	11.08	-161.70	-26.73	100.63	160.75	138.50	22.25	7.225	
3,300.00	3,296.25	3,285.97	3,282.61	11.52	11.42	-161.47	-31.50	107.74	179.04	156.09	22.95	7.802	
3,400.00	3,395.60	3,384.28	3,380.55	11.88	11.77	-161.28	-36.28	114.86	197.33	173.68	23.65	8.344	
3,500.00	3,494.96	3,482.59	3,478.49	12.24	12.11	-161.13	-41.05	121.97	215.62	191.26	24.36	8.853	
3,600.00	3,594.32	3,580.90	3,576.42	12.61	12.46	-161.00	-45.83	129.08	233.91	208.85	25.07	9.332	
3,700.00	3,693.67	3,679.21	3,674.36	12.97	12.81	-160.89	-50.60	136.20	252.21	226.43	25.78	9.783	
3,800.00	3,793.03	3,777.53	3,772.30	13.34	13.16	-160.79	-55.38	143.31	270.50	244.01	26.50	10.209	
3,900.00	3,892.39	3,875.84	3,870.24	13.71	13.51	-160.70	-60.15	150.43	288.80	261.59	27.21	10.612	
4,000.00	3,991.74	3,974.15	3,968.17	14.07	13.86	-160.63	-64.93	157.54	307.10	279.16	27.94	10.993	
4,100.00	4,091.10	4,072.46	4,066.11	14.44	14.21	-160.56	-69.70	164.66	325.39	296.74	28.66	11.354	
4,200.00	4,190.46	4,170.77	4,164.05	14.82	14.57	-160.51	-74.47	171.77	343.69	314.31	29.38	11.697	
4,300.00	4,289.81	4,269.08	4,261.98	15.19	14.92	-160.45	-79.25	178.89	361.99	331.88	30.11	12.022	
4,400.00	4,389.17	4,367.39	4,359.92	15.56	15.28	-160.40	-84.02	186.00	380.29	349.45	30.84	12.331	
4,500.00	4,488.53	4,465.70	4,457.86	15.93	15.64	-160.36	-88.80	193.12	398.58	367.01	31.57	12.625	
4,600.00	4,587.88	4,564.02	4,555.80	16.31	15.99	-160.32	-93.57	200.23	416.88	384.58	32.30	12.905	
4,700.00	4,687.24	4,662.33	4,653.73	16.69	16.35	-160.29	-98.35	207.35	435.18	402.14	33.04	13.172	
4,800.00	4,786.60	4,760.64	4,751.67	17.06	16.71	-160.25	-103.12	214.46	453.48	419.71	33.77	13.428	
4,900.00	4,885.95	4,858.95	4,849.61	17.44	17.07	-160.22	-107.90	221.58	471.78	437.27	34.51	13.671	
5,000.00	4,985.31	4,957.26	4,947.54	17.82	17.43	-160.19	-112.67	228.69	490.08	454.83	35.25	13.904	

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 202H - OH - Plan 1 04-06-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDCM													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)						
5,100.00	5,084.67	5,055.57	5,045.48	18.19	17.79	-160.17	-117.44	235.81	508.38	472.39	35.99	14.127		
5,200.00	5,184.02	5,153.88	5,143.42	18.57	18.15	-160.14	-122.22	242.92	526.68	489.95	36.72	14.341		
5,300.00	5,283.38	5,252.19	5,241.36	18.95	18.51	-160.12	-126.99	250.04	544.97	507.51	37.47	14.546		
5,400.00	5,382.74	5,350.51	5,339.29	19.33	18.87	-160.10	-131.77	257.15	563.27	525.07	38.21	14.743		
5,500.00	5,482.09	5,448.82	5,437.23	19.71	19.24	-160.08	-136.54	264.27	581.57	542.62	38.95	14.931		
5,600.00	5,581.45	5,547.13	5,535.17	20.09	19.60	-160.06	-141.32	271.38	599.87	560.18	39.69	15.113		
5,700.00	5,680.81	5,645.44	5,633.10	20.48	19.96	-160.04	-146.09	278.50	618.17	577.73	40.44	15.287		
5,800.00	5,780.16	5,743.75	5,731.04	20.86	20.33	-160.02	-150.87	285.61	636.47	595.29	41.18	15.455		
5,900.00	5,879.52	5,866.11	5,853.12	21.24	20.77	-160.11	-155.43	292.42	653.02	611.01	42.01	15.545		
6,000.00	5,978.88	5,990.59	5,977.55	21.62	21.21	-160.40	-157.10	294.89	665.80	622.97	42.83	15.545		
6,100.00	6,078.23	6,091.27	6,078.23	22.00	21.55	-160.73	-157.10	294.90	676.49	632.93	43.56	15.530		
6,200.00	6,177.59	6,190.63	6,177.59	22.39	21.90	-161.04	-157.10	294.90	687.20	642.91	44.28	15.518		
6,300.00	6,276.95	6,289.99	6,276.95	22.77	22.24	-161.34	-157.10	294.90	697.92	652.92	45.01	15.507		
6,400.00	6,376.30	6,389.34	6,376.30	23.15	22.58	-161.63	-157.10	294.90	708.67	662.94	45.73	15.496		
6,500.00	6,475.66	6,488.70	6,475.66	23.54	22.92	-161.92	-157.10	294.90	719.43	672.97	46.46	15.485		
6,600.00	6,575.02	6,588.06	6,575.02	23.92	23.27	-162.19	-157.10	294.90	730.21	683.03	47.19	15.475		
6,700.00	6,674.37	6,687.41	6,674.37	24.31	23.61	-162.46	-157.10	294.90	741.01	693.10	47.92	15.465		
6,800.00	6,773.73	6,786.77	6,773.73	24.69	23.95	-162.72	-157.10	294.90	751.82	703.18	48.64	15.456		
6,900.00	6,873.09	6,886.13	6,873.09	25.08	24.30	-162.97	-157.10	294.90	762.65	713.28	49.37	15.447		
7,000.00	6,972.44	6,985.48	6,972.44	25.46	24.64	-163.22	-157.10	294.90	773.49	723.39	50.10	15.438		
7,100.00	7,071.80	7,084.84	7,071.80	25.85	24.99	-163.46	-157.10	294.90	784.35	733.52	50.83	15.430		
7,200.00	7,171.16	7,184.20	7,171.16	26.23	25.33	-163.69	-157.10	294.90	795.22	743.65	51.56	15.422		
7,300.00	7,270.51	7,283.55	7,270.51	26.62	25.68	-163.92	-157.10	294.90	806.10	753.80	52.29	15.415		
7,400.00	7,369.87	7,382.91	7,369.87	27.00	26.02	-164.14	-157.10	294.90	816.99	763.96	53.02	15.408		
7,500.00	7,469.23	7,482.27	7,469.23	27.39	26.37	-164.35	-157.10	294.90	827.89	774.14	53.76	15.401		
7,600.00	7,568.58	7,581.62	7,568.58	27.78	26.71	-164.56	-157.10	294.90	838.81	784.32	54.49	15.394		
7,700.00	7,667.94	7,680.98	7,667.94	28.16	27.06	-164.76	-157.10	294.90	849.74	794.51	55.22	15.388		
7,800.00	7,767.30	7,780.34	7,767.30	28.55	27.41	-164.95	-157.10	294.90	860.67	804.72	55.96	15.381		
7,900.00	7,866.65	7,879.69	7,866.65	28.93	27.75	-165.15	-157.10	294.90	871.62	814.93	56.69	15.376		
8,000.00	7,966.01	7,979.05	7,966.01	29.32	28.10	-165.34	-157.10	294.90	882.58	825.15	57.42	15.370		
8,100.00	8,065.37	8,078.41	8,065.37	29.71	28.45	-165.52	-157.10	294.90	893.54	835.38	58.16	15.364		
8,200.00	8,164.72	8,177.76	8,164.72	30.10	28.80	-165.70	-157.10	294.90	904.51	845.62	58.89	15.359		
8,300.00	8,264.08	8,277.12	8,264.08	30.48	29.14	-165.88	-157.10	294.90	915.50	855.87	59.63	15.354		
8,400.00	8,363.44	8,376.48	8,363.44	30.87	29.49	-166.05	-157.10	294.90	926.49	866.13	60.36	15.349		
8,500.00	8,462.79	8,475.83	8,462.79	31.26	29.84	-166.22	-157.10	294.90	937.49	876.39	61.10	15.344		
8,600.00	8,562.15	8,575.19	8,562.15	31.64	30.19	-166.38	-157.10	294.90	948.49	886.66	61.83	15.339		
8,700.00	8,661.51	8,674.55	8,661.51	32.03	30.54	-166.54	-157.10	294.90	959.51	896.94	62.57	15.335		
8,800.00	8,760.89	8,773.93	8,760.89	32.42	30.89	-166.71	-157.10	294.90	970.26	906.95	63.31	15.327		
8,900.00	8,860.55	8,873.59	8,860.55	32.79	31.24	-166.86	-157.10	294.90	978.24	914.21	64.03	15.278		
9,000.00	8,960.44	8,972.94	8,959.81	33.15	31.58	-167.09	-154.45	294.88	982.85	918.11	64.74	15.182		
9,100.00	9,060.42	9,067.71	9,052.44	33.49	31.90	88.17	-135.21	294.77	984.42	919.03	65.39	15.055		
9,200.00	9,160.42	9,152.12	9,130.34	33.82	32.15	86.30	-102.98	294.57	986.21	920.24	65.97	14.949		
9,300.00	9,260.42	9,225.00	9,192.14	34.16	32.33	84.32	-64.49	294.34	991.08	924.59	66.49	14.906		
9,400.00	9,359.32	9,288.47	9,240.66	34.48	32.47	81.45	-23.63	294.09	998.83	931.88	66.95	14.920		
9,500.00	9,453.25	9,350.00	9,282.12	34.76	32.58	78.75	21.77	293.81	1,007.90	940.56	67.34	14.967		
9,600.00	9,538.10	9,412.44	9,317.87	34.99	32.68	76.28	72.90	293.50	1,017.21	949.54	67.67	15.032		
9,700.00	9,610.16	9,475.00	9,346.71	35.15	32.79	74.20	128.37	293.17	1,025.77	957.81	67.95	15.096		
9,800.00	9,686.29	9,532.10	9,366.49	35.26	32.91	72.67	181.89	292.84	1,032.75	964.57	68.18	15.147		
9,900.00	9,704.04	9,591.10	9,380.07	35.31	33.04	71.64	239.28	292.50	1,037.56	969.19	68.37	15.176		
10,000.00	9,721.74	9,650.00	9,386.47	35.37	33.17	71.17	297.79	292.14	1,039.78	971.23	68.55	15.168		
10,100.00	9,722.27	9,732.47	9,386.76	35.50	33.37	71.17	380.24	291.64	1,039.75	970.88	68.87	15.097		
10,200.00	9,721.05	9,832.47	9,386.34	35.72	33.66	71.22	480.24	291.03	1,039.50	970.12	69.38	14.983		

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 202H - OH - Plan 1 04-06-18													Offset Site Error:
Survey Program: 0-MWD+HDGM													Offset Well Error:
Reference		Offset		Semi Major Axis			Distance						
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	Warning
10,300.00	9,719.82	9,932.46	9,385.92	36.03	34.00	71.26	580.23	290.43	1,039.25	969.22	70.03	14.840	
10,400.00	9,718.59	10,032.46	9,385.50	36.41	34.40	71.30	680.23	289.82	1,039.01	968.19	70.81	14.673	
10,500.00	9,717.36	10,132.46	9,385.08	36.85	34.85	71.34	780.22	289.21	1,038.76	967.06	71.70	14.487	
10,600.00	9,716.13	10,232.45	9,384.67	37.34	35.36	71.39	880.21	288.61	1,038.51	965.81	72.70	14.285	
10,700.00	9,714.91	10,332.45	9,384.25	37.88	35.91	71.43	980.21	288.00	1,038.27	964.47	73.79	14.070	
10,800.00	9,713.68	10,432.45	9,383.83	38.46	36.52	71.47	1,080.20	287.39	1,038.02	963.04	74.98	13.844	
10,900.00	9,712.45	10,532.44	9,383.41	39.09	37.17	71.51	1,180.20	286.79	1,037.78	961.52	76.26	13.609	
11,000.00	9,711.22	10,632.44	9,382.99	39.76	37.86	71.56	1,280.19	286.18	1,037.53	959.91	77.62	13.367	
11,100.00	9,710.00	10,732.44	9,382.57	40.47	38.59	71.60	1,380.18	285.57	1,037.29	958.23	79.06	13.120	
11,200.00	9,708.77	10,832.43	9,382.15	41.21	39.36	71.64	1,480.18	284.97	1,037.04	956.47	80.58	12.870	
11,300.00	9,707.54	10,932.43	9,381.74	42.00	40.17	71.69	1,580.17	284.36	1,036.80	954.64	82.17	12.618	
11,400.00	9,706.31	11,032.43	9,381.32	42.81	41.01	71.73	1,680.17	283.75	1,036.56	952.74	83.82	12.366	
11,500.00	9,705.08	11,132.42	9,380.90	43.66	41.89	71.77	1,780.16	283.15	1,036.32	950.77	85.55	12.114	
11,600.00	9,703.86	11,232.42	9,380.48	44.54	42.79	71.81	1,880.15	282.54	1,036.08	948.75	87.33	11.864	
11,700.00	9,702.63	11,332.42	9,380.06	45.44	43.73	71.86	1,980.15	281.93	1,035.84	946.67	89.17	11.617	
11,800.00	9,701.40	11,432.41	9,379.64	46.37	44.69	71.90	2,080.14	281.33	1,035.60	944.54	91.06	11.373	
11,900.00	9,700.17	11,532.41	9,379.23	47.33	45.67	71.94	2,180.14	280.72	1,035.36	942.36	93.00	11.133	
12,000.00	9,698.95	11,632.41	9,378.81	48.31	46.68	71.98	2,280.13	280.11	1,035.12	940.13	94.99	10.897	
12,100.00	9,697.72	11,732.40	9,378.39	49.31	47.71	72.03	2,380.12	279.51	1,034.88	937.86	97.02	10.666	
12,200.00	9,696.49	11,832.40	9,377.97	50.34	48.76	72.07	2,480.12	278.90	1,034.64	935.55	99.10	10.441	
12,300.00	9,695.26	11,932.40	9,377.55	51.38	49.83	72.11	2,580.11	278.29	1,034.41	933.20	101.21	10.220	
12,400.00	9,694.03	12,032.39	9,377.13	52.44	50.92	72.16	2,680.11	277.69	1,034.17	930.81	103.36	10.006	
12,500.00	9,692.81	12,132.39	9,376.71	53.52	52.02	72.20	2,780.10	277.08	1,033.94	928.39	105.54	9.796	
12,600.00	9,691.58	12,232.39	9,376.30	54.62	53.14	72.24	2,880.09	276.47	1,033.70	925.94	107.76	9.593	
12,700.00	9,690.35	12,332.38	9,375.88	55.73	54.28	72.28	2,980.09	275.87	1,033.47	923.46	110.01	9.395	
12,800.00	9,689.12	12,432.38	9,375.46	56.85	55.43	72.33	3,080.08	275.26	1,033.23	920.95	112.28	9.202	
12,900.00	9,687.90	12,532.38	9,375.04	57.99	56.59	72.37	3,180.08	274.65	1,033.00	918.42	114.58	9.015	
13,000.00	9,686.67	12,632.37	9,374.62	59.14	57.77	72.41	3,280.07	274.05	1,032.77	915.86	116.91	8.834	
13,100.00	9,685.44	12,732.37	9,374.20	60.31	58.95	72.46	3,380.06	273.44	1,032.53	913.27	119.26	8.658	
13,200.00	9,684.21	12,832.37	9,373.78	61.48	60.15	72.50	3,480.06	272.83	1,032.30	910.67	121.63	8.487	
13,300.00	9,682.98	12,932.36	9,373.37	62.67	61.36	72.54	3,580.05	272.23	1,032.07	908.04	124.03	8.321	
13,400.00	9,681.76	13,032.36	9,372.95	63.87	62.58	72.59	3,680.05	271.62	1,031.84	905.40	126.44	8.161	
13,500.00	9,680.53	13,132.36	9,372.53	65.07	63.80	72.63	3,780.04	271.01	1,031.61	902.73	128.88	8.005	
13,600.00	9,679.30	13,232.35	9,372.11	66.29	65.04	72.67	3,880.03	270.41	1,031.38	900.05	131.33	7.854	
13,700.00	9,678.07	13,332.35	9,371.69	67.51	66.28	72.72	3,980.03	269.80	1,031.15	897.36	133.79	7.707	
13,800.00	9,676.85	13,432.35	9,371.27	68.75	67.53	72.76	4,080.02	269.19	1,030.92	894.65	136.28	7.565	
13,900.00	9,675.62	13,532.34	9,370.86	69.99	68.79	72.80	4,180.02	268.58	1,030.70	891.92	138.78	7.427	
14,000.00	9,674.39	13,632.34	9,370.44	71.23	70.05	72.84	4,280.01	267.98	1,030.47	889.18	141.29	7.293	
14,100.00	9,673.16	13,732.34	9,370.02	72.49	71.33	72.89	4,380.00	267.37	1,030.24	886.43	143.81	7.164	
14,200.00	9,671.93	13,832.33	9,369.60	73.75	72.60	72.93	4,480.00	266.76	1,030.02	883.66	146.35	7.038	
14,300.00	9,670.71	13,932.33	9,369.18	75.02	73.89	72.97	4,579.99	266.15	1,029.79	880.89	148.90	6.916	
14,400.00	9,669.48	14,032.33	9,368.76	76.29	75.18	73.02	4,679.99	265.55	1,029.57	878.10	151.47	6.797	
14,500.00	9,668.25	14,132.33	9,368.34	77.57	76.47	73.06	4,779.98	264.94	1,029.34	875.30	154.04	6.682	
14,600.00	9,667.02	14,232.32	9,367.93	78.85	77.77	73.10	4,879.97	264.34	1,029.12	872.50	156.62	6.571	
14,700.00	9,665.79	14,332.32	9,367.51	80.14	79.07	73.15	4,979.97	263.73	1,028.90	869.68	159.22	6.462	
14,800.00	9,664.57	14,432.32	9,367.09	81.44	80.38	73.19	5,079.96	263.12	1,028.68	866.85	161.82	6.357	
14,900.00	9,663.34	14,532.31	9,366.67	82.74	81.70	73.23	5,179.96	262.52	1,028.45	864.02	164.43	6.255	
15,000.00	9,662.11	14,632.31	9,366.25	84.04	83.01	73.28	5,279.95	261.91	1,028.23	861.18	167.05	6.155	
15,100.00	9,660.88	14,732.31	9,365.83	85.35	84.33	73.32	5,379.94	261.30	1,028.01	858.33	169.68	6.058	
15,200.00	9,659.66	14,832.30	9,365.41	86.66	85.66	73.36	5,479.94	260.70	1,027.79	855.47	172.32	5.964	
15,300.00	9,658.43	14,932.30	9,365.00	87.98	86.99	73.41	5,579.93	260.09	1,027.57	852.61	174.96	5.873	
15,400.00	9,657.20	15,032.30	9,364.58	89.30	88.32	73.45	5,679.93	259.48	1,027.35	849.74	177.62	5.784	

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

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Project: Lea County, NM (NAD27 NME)
Reference Site: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 202H - OH - Plan 1 04-06-18													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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	(usft)			
15,500.00	9,655.97	15,132.29	9,364.16	90.62	89.65	73.49	5,779.92	258.88	1,027.14	846.86	180.27	5.698		
15,600.00	9,654.74	15,232.29	9,363.74	91.95	90.99	73.54	5,879.91	258.27	1,026.92	843.98	182.94	5.613		
15,700.00	9,653.52	15,332.29	9,363.32	93.28	92.33	73.58	5,979.91	257.66	1,026.70	841.09	185.61	5.532		
15,800.00	9,652.29	15,432.28	9,362.90	94.61	93.67	73.63	6,079.90	257.06	1,026.48	838.20	188.29	5.452		
15,900.00	9,651.06	15,532.28	9,362.48	95.95	95.02	73.67	6,179.90	256.45	1,026.27	835.30	190.97	5.374		
16,000.00	9,649.83	15,632.28	9,362.07	97.29	96.37	73.71	6,279.89	255.84	1,026.05	832.40	193.66	5.298		
16,100.00	9,648.61	15,732.27	9,361.65	98.63	97.72	73.76	6,379.88	255.24	1,025.84	829.49	196.35	5.225		
16,200.00	9,647.38	15,832.27	9,361.23	99.97	99.08	73.80	6,479.88	254.63	1,025.63	826.58	199.05	5.153		
16,300.00	9,646.15	15,932.27	9,360.81	101.32	100.43	73.84	6,579.87	254.02	1,025.41	823.66	201.75	5.083		
16,400.00	9,644.92	16,032.26	9,360.39	102.67	101.79	73.89	6,679.87	253.42	1,025.20	820.74	204.46	5.014		
16,500.00	9,643.69	16,132.26	9,359.97	104.02	103.15	73.93	6,779.86	252.81	1,024.99	817.82	207.17	4.948		
16,600.00	9,642.47	16,232.26	9,359.56	105.37	104.51	73.97	6,879.86	252.20	1,024.78	814.89	209.89	4.883		
16,700.00	9,641.24	16,332.25	9,359.14	106.73	105.88	74.02	6,979.85	251.60	1,024.56	811.96	212.61	4.819		
16,800.00	9,640.01	16,432.25	9,358.72	108.09	107.24	74.06	7,079.84	250.99	1,024.35	809.02	215.33	4.757		
16,900.00	9,638.78	16,532.25	9,358.30	109.45	108.61	74.11	7,179.84	250.38	1,024.14	806.08	218.06	4.697		
17,000.00	9,637.56	16,632.24	9,357.88	110.81	109.98	74.15	7,279.83	249.78	1,023.93	803.14	220.79	4.638		
17,100.00	9,636.33	16,732.24	9,357.46	112.17	111.35	74.19	7,379.83	249.17	1,023.73	800.20	223.53	4.580		
17,200.00	9,635.10	16,832.24	9,357.04	113.54	112.73	74.24	7,479.82	248.56	1,023.52	797.25	226.27	4.524		
17,208.09	9,635.00	16,840.33	9,357.01	113.65	112.84	74.24	7,487.91	248.51	1,023.50	797.01	226.49	4.519		

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Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 302H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft	
Survey Program: 0-Scientific Gyro. 4600-MWD+IFR1+MS													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		
0.00	0.00	0.10	0.00	0.00	0.00	89.43	0.30	29.90	29.90					
100.00	100.00	100.10	100.00	0.14	0.07	89.43	0.30	29.90	29.90	29.70	0.20	146.340		
200.00	200.00	200.10	200.00	0.49	0.20	89.43	0.30	29.90	29.90	29.21	0.69	43.204		
300.00	300.00	300.10	300.00	0.85	0.33	89.43	0.30	29.90	29.90	28.72	1.18	25.300		
400.00	400.00	400.10	400.00	1.21	0.46	89.43	0.30	29.90	29.90	28.23	1.67	17.884		
500.00	500.00	500.10	500.00	1.57	0.59	89.43	0.30	29.90	29.90	27.74	2.16	13.829		
600.00	600.00	600.10	600.00	1.93	0.72	89.43	0.30	29.90	29.90	27.25	2.65	11.273		
700.00	700.00	700.10	700.00	2.29	0.86	89.43	0.30	29.90	29.90	26.76	3.14	9.515		
800.00	800.00	800.10	800.00	2.65	0.99	89.43	0.30	29.90	29.90	26.27	3.63	8.231		
900.00	900.00	900.10	900.00	3.00	1.12	89.43	0.30	29.90	29.90	25.78	4.12	7.252		
1,000.00	1,000.00	1,000.10	1,000.00	3.36	1.25	89.43	0.30	29.90	29.90	25.29	4.61	6.481		
1,100.00	1,100.00	1,100.10	1,100.00	3.72	1.38	89.43	0.30	29.90	29.90	24.80	5.10	5.859		
1,200.00	1,200.00	1,200.10	1,200.00	4.08	1.51	89.43	0.30	29.90	29.90	24.31	5.59	5.345		
1,300.00	1,300.00	1,300.10	1,300.00	4.44	1.65	89.43	0.30	29.90	29.90	23.82	6.08	4.914		
1,400.00	1,400.00	1,400.10	1,400.00	4.80	1.78	89.43	0.30	29.90	29.90	23.33	6.57	4.548		
1,500.00	1,500.00	1,500.10	1,500.00	5.15	1.91	89.43	0.30	29.90	29.90	22.84	7.07	4.232		
1,600.00	1,600.00	1,600.10	1,600.00	5.51	2.04	89.43	0.30	29.90	29.90	22.35	7.56	3.958		
1,700.00	1,700.00	1,700.10	1,700.00	5.87	2.17	89.43	0.30	29.90	29.90	21.86	8.05	3.716		
1,800.00	1,800.00	1,800.10	1,800.00	6.23	2.31	89.43	0.30	29.90	29.90	21.37	8.54	3.503		
1,900.00	1,900.00	1,900.10	1,900.00	6.59	2.44	89.43	0.30	29.90	29.90	20.88	9.03	3.313		
2,000.00	2,000.00	2,000.10	2,000.00	6.95	2.57	89.43	0.30	29.90	29.90	20.38	9.52	3.142		
2,100.00	2,100.00	2,100.10	2,100.00	7.31	2.70	89.43	0.30	29.90	29.90	19.89	10.01	2.988		
2,200.00	2,200.00	2,200.10	2,200.00	7.66	2.83	89.43	0.30	29.90	29.90	19.40	10.50	2.849		
2,300.00	2,300.00	2,300.10	2,300.00	8.02	2.96	89.43	0.30	29.90	29.90	18.91	10.99	2.721		
2,400.00	2,400.00	2,400.10	2,400.00	8.38	3.10	89.43	0.30	29.90	29.90	18.42	11.48	2.605		
2,500.00	2,500.00	2,500.10	2,500.00	8.74	3.23	89.43	0.30	29.90	29.90	17.93	11.97	2.498 CC, ES, SF		
2,600.00	2,599.98	2,600.08	2,599.98	9.09	3.36	-167.69	0.30	29.90	31.60	19.16	12.45	2.539		
2,700.00	2,699.84	2,699.94	2,699.84	9.43	3.49	-169.41	0.30	29.90	36.73	23.82	12.92	2.844		
2,800.00	2,799.45	2,799.55	2,799.45	9.77	3.62	-171.41	0.30	29.90	45.33	31.94	13.39	3.385		
2,900.00	2,898.82	2,898.92	2,898.82	10.11	3.75	-173.10	0.30	29.90	56.45	42.58	13.87	4.070		
3,000.00	2,998.18	2,998.28	2,998.18	10.46	3.89	-174.25	0.30	29.90	67.70	53.36	14.35	4.719		
3,100.00	3,097.53	3,097.63	3,097.53	10.81	4.02	-175.08	0.30	29.90	78.98	64.15	14.83	5.326		
3,200.00	3,196.89	3,196.99	3,196.89	11.17	4.15	-175.69	0.30	29.90	90.27	74.95	15.32	5.894		
3,300.00	3,296.25	3,296.35	3,296.25	11.52	4.28	-176.17	0.30	29.90	101.57	85.76	15.80	6.427		
3,400.00	3,395.60	3,395.70	3,395.60	11.88	4.41	-176.56	0.30	29.90	112.87	96.57	16.29	6.927		
3,500.00	3,494.96	3,495.06	3,494.96	12.24	4.54	-176.87	0.30	29.90	124.17	107.39	16.78	7.398		
3,600.00	3,594.32	3,594.42	3,594.32	12.61	4.67	-177.13	0.30	29.90	135.48	118.21	17.28	7.841		
3,700.00	3,693.67	3,693.77	3,693.67	12.97	4.80	-177.35	0.30	29.90	146.80	129.02	17.77	8.259		
3,800.00	3,793.03	3,793.13	3,793.03	13.34	4.93	-177.54	0.30	29.90	158.11	139.84	18.27	8.654		
3,900.00	3,892.39	3,892.49	3,892.39	13.71	5.06	-177.71	0.30	29.90	169.42	150.66	18.77	9.027		
4,000.00	3,991.74	3,991.84	3,991.74	14.07	5.20	-177.85	0.30	29.90	180.74	161.47	19.27	9.380		
4,100.00	4,091.10	4,091.20	4,091.10	14.44	5.33	-177.98	0.30	29.90	192.06	172.29	19.77	9.714		
4,200.00	4,190.46	4,190.56	4,190.46	14.82	5.46	-178.09	0.30	29.90	203.38	183.10	20.27	10.032		
4,300.00	4,289.81	4,289.91	4,289.81	15.19	5.59	-178.19	0.30	29.90	214.70	193.92	20.78	10.334		
4,400.00	4,389.17	4,389.27	4,389.17	15.56	5.72	-178.28	0.30	29.90	226.02	204.74	21.28	10.621		
4,500.00	4,488.53	4,488.63	4,488.53	15.93	5.85	-178.36	0.30	29.90	237.34	215.55	21.78	10.895		
4,600.00	4,587.88	4,587.98	4,587.88	16.31	5.98	-178.44	0.30	29.90	248.66	226.37	22.29	11.155		
4,700.00	4,687.24	4,691.51	4,691.39	16.69	6.04	-178.23	-1.09	29.44	259.27	236.55	22.73	11.407		
4,800.00	4,786.60	4,791.83	4,791.64	17.06	6.07	-177.61	-4.67	28.26	268.73	245.60	23.13	11.617		
4,900.00	4,885.95	4,891.34	4,891.08	17.44	6.11	-177.02	-8.27	27.07	278.20	254.65	23.55	11.814		
5,000.00	4,985.31	4,990.85	4,990.52	17.82	6.17	-176.47	-11.87	25.88	287.69	263.70	23.99	11.994		
5,100.00	5,084.67	5,090.36	5,089.96	18.19	6.25	-175.96	-15.47	24.69	297.20	272.76	24.44	12.158		

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 302H - OH - Plan 1 10-11-17														Offset Site Error:	0.00 usft
Survey Program: 0-Scientific Gyro, 4600-MWD+IFR1+MS														Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
5,200.00	5,184.02	5,189.88	5,189.40	18.57	6.35	-175.48	-19.07	23.51	306.74	281.82	24.92	12.308			
5,300.00	5,283.38	5,289.39	5,288.84	18.95	6.47	-175.03	-22.67	22.32	316.30	290.88	25.42	12.443			
5,400.00	5,382.74	5,388.90	5,388.28	19.33	6.60	-174.60	-26.27	21.13	325.87	299.94	25.93	12.565			
5,500.00	5,482.09	5,488.41	5,487.72	19.71	6.75	-174.20	-29.87	19.94	335.46	309.00	26.47	12.676			
5,600.00	5,581.45	5,587.92	5,587.16	20.09	6.92	-173.83	-33.48	18.75	345.07	318.06	27.01	12.775			
5,700.00	5,680.81	5,687.44	5,686.60	20.48	7.10	-173.47	-37.08	17.56	354.69	327.12	27.57	12.863			
5,800.00	5,780.16	5,786.95	5,786.04	20.86	7.29	-173.13	-40.68	16.37	364.33	336.18	28.15	12.943			
5,900.00	5,879.52	5,886.46	5,885.48	21.24	7.50	-172.81	-44.28	15.19	373.97	345.24	28.74	13.014			
6,000.00	5,978.88	5,985.97	5,984.92	21.62	7.71	-172.50	-47.88	14.00	383.63	354.30	29.33	13.078			
6,100.00	6,078.23	6,085.49	6,084.36	22.00	7.94	-172.21	-51.48	12.81	393.30	363.35	29.94	13.134			
6,200.00	6,177.59	6,185.00	6,183.80	22.39	8.18	-171.94	-55.08	11.62	402.98	372.41	30.56	13.185			
6,300.00	6,276.95	6,284.51	6,283.24	22.77	8.42	-171.67	-58.68	10.43	412.66	381.47	31.19	13.230			
6,400.00	6,376.30	6,384.02	6,382.68	23.15	8.67	-171.42	-62.28	9.24	422.36	390.53	31.83	13.270			
6,500.00	6,475.66	6,483.54	6,482.12	23.54	8.93	-171.18	-65.89	8.05	432.06	399.59	32.47	13.306			
6,600.00	6,575.02	6,583.05	6,581.56	23.92	9.20	-170.95	-69.49	6.86	441.77	408.64	33.12	13.338			
6,700.00	6,674.37	6,682.56	6,681.00	24.31	9.47	-170.73	-73.09	5.68	451.48	417.70	33.78	13.366			
6,800.00	6,773.73	6,782.07	6,780.44	24.69	9.75	-170.52	-76.69	4.49	461.20	426.76	34.44	13.391			
6,900.00	6,873.09	6,881.58	6,879.86	25.08	10.03	-170.32	-80.29	3.30	470.93	435.82	35.11	13.413			
7,000.00	6,972.44	6,981.10	6,979.32	25.46	10.32	-170.13	-83.89	2.11	480.67	444.88	35.78	13.433			
7,100.00	7,071.80	7,080.61	7,078.76	25.85	10.61	-169.94	-87.49	0.92	490.41	453.95	36.46	13.451			
7,200.00	7,171.16	7,180.12	7,178.20	26.23	10.91	-169.76	-91.09	-0.27	500.15	463.01	37.14	13.466			
7,300.00	7,270.51	7,279.63	7,277.64	26.62	11.21	-169.59	-94.69	-1.46	509.90	472.07	37.83	13.480			
7,400.00	7,369.87	7,379.15	7,377.08	27.00	11.51	-169.42	-98.30	-2.65	519.65	481.14	38.51	13.492			
7,500.00	7,469.23	7,478.66	7,476.52	27.39	11.81	-169.26	-101.90	-3.83	529.41	490.20	39.21	13.503			
7,600.00	7,568.58	7,578.17	7,575.96	27.78	12.12	-169.11	-105.50	-5.02	539.17	499.27	39.90	13.513			
7,700.00	7,667.94	7,677.68	7,675.40	28.16	12.43	-168.96	-109.10	-6.21	548.93	508.33	40.60	13.521			
7,800.00	7,767.30	7,777.19	7,774.84	28.55	12.75	-168.82	-112.70	-7.40	558.70	517.40	41.30	13.528			
7,900.00	7,866.65	7,876.71	7,874.28	28.93	13.06	-168.68	-116.30	-8.59	568.47	526.47	42.00	13.534			
8,000.00	7,966.01	7,976.22	7,973.72	29.32	13.38	-168.55	-119.90	-9.78	578.25	535.54	42.71	13.540			
8,100.00	8,065.37	8,075.73	8,073.16	29.71	13.70	-168.42	-123.50	-10.97	588.02	544.61	43.41	13.545			
8,200.00	8,164.72	8,175.24	8,172.60	30.10	14.02	-168.30	-127.10	-12.15	597.80	553.68	44.12	13.549			
8,300.00	8,264.08	8,274.76	8,272.04	30.48	14.35	-168.18	-130.71	-13.34	607.59	562.75	44.83	13.552			
8,400.00	8,363.44	8,374.27	8,371.48	30.87	14.67	-168.06	-134.31	-14.53	617.37	571.83	45.55	13.555			
8,500.00	8,462.79	8,473.78	8,470.92	31.26	15.00	-167.95	-137.91	-15.72	627.16	580.90	46.26	13.557			
8,600.00	8,562.15	8,573.29	8,570.36	31.64	15.33	-167.84	-141.51	-16.91	636.95	589.98	46.98	13.559			
8,700.00	8,661.51	8,672.81	8,669.80	32.03	15.66	-167.73	-145.11	-18.10	646.74	599.05	47.69	13.561			
8,800.00	8,760.89	8,772.34	8,769.26	32.42	15.99	-167.64	-148.71	-19.29	656.27	607.86	48.41	13.556			
8,900.00	8,860.55	8,872.09	8,868.94	32.79	16.32	-167.51	-152.32	-20.48	663.01	613.89	49.12	13.499			
9,000.00	8,960.44	8,972.00	8,968.78	33.15	16.65	-167.30	-155.94	-21.67	666.35	616.54	49.81	13.378			
9,100.00	9,060.42	9,071.94	9,068.64	33.49	16.99	89.39	-159.55	-22.87	666.34	615.86	50.48	13.200			
9,200.00	9,160.42	9,171.24	9,167.75	33.82	17.30	89.13	-156.51	-24.09	665.15	614.02	51.13	13.010			
9,300.00	9,260.41	9,265.80	9,259.66	34.16	17.57	87.76	-135.01	-25.35	664.46	612.73	51.73	12.845			
9,400.00	9,359.32	9,363.48	9,359.58	34.48	17.80	85.45	-135.13	-25.34	664.52	612.79	51.73	12.846			
9,500.00	9,453.25	9,457.91	9,453.13	34.76	17.99	83.43	-99.26	-26.55	665.12	612.84	52.28	12.723			
9,600.00	9,538.10	9,542.54	9,538.38	34.99	18.13	81.66	-51.60	-27.69	666.62	613.87	52.75	12.638			
9,700.00	9,610.16	9,600.00	9,514.48	35.15	18.24	80.19	5.43	-28.76	668.63	615.51	53.12	12.586			
9,800.00	9,686.29	9,675.00	9,547.98	35.26	18.32	79.10	70.53	-29.75	670.77	617.37	53.40	12.562			
9,900.00	9,704.04	9,754.10	9,571.49	35.31	18.36	78.35	137.55	-30.58	672.67	619.10	53.57	12.558			
10,000.00	9,721.74	9,830.57	9,582.09	35.37	18.38	78.03	212.98	-31.34	674.03	620.35	53.67	12.551			
10,100.00	9,722.27	9,920.32	9,582.33	35.50	18.39	78.03	288.62	-31.95	674.65	620.90	53.75	12.551			
10,200.00	9,721.05	10,020.32	9,581.32	35.72	18.51	78.05	378.35	-32.52	674.64	620.75	53.89	12.519			

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: Elder Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 302H - OH - Plan 1 10-11-17													Offset Site Error:	0.00 usft
Survey Program: 0-Scientific Gyro, 4600-MWD+IFR1+MS													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	9,719.82	10,120.32	9,580.32	36.03	18.73	78.06	578.34	-33.75	674.55	619.79	54.76	12.317		
10,400.00	9,718.59	10,220.32	9,579.31	36.41	18.98	78.08	678.33	-34.37	674.51	619.12	55.39	12.177		
10,500.00	9,717.36	10,320.32	9,578.31	36.85	19.25	78.10	778.33	-34.99	674.46	618.36	56.10	12.022		
10,600.00	9,716.13	10,420.32	9,577.30	37.34	19.55	78.12	878.32	-35.61	674.42	617.52	56.89	11.854		
10,700.00	9,714.91	10,520.32	9,576.30	37.88	19.88	78.14	978.31	-36.23	674.37	616.61	57.76	11.676		
10,800.00	9,713.68	10,620.32	9,575.29	38.46	20.22	78.16	1,078.30	-36.85	674.33	615.64	58.69	11.490		
10,900.00	9,712.45	10,720.32	9,574.29	39.09	20.60	78.18	1,178.30	-37.47	674.28	614.59	59.69	11.296		
11,000.00	9,711.22	10,820.32	9,573.29	39.76	20.99	78.19	1,278.29	-38.08	674.24	613.48	60.75	11.098		
11,100.00	9,710.00	10,920.32	9,572.28	40.47	21.40	78.21	1,378.28	-38.70	674.19	612.32	61.88	10.896		
11,200.00	9,708.77	11,020.32	9,571.28	41.21	21.83	78.23	1,478.28	-39.32	674.15	611.09	63.05	10.692		
11,300.00	9,707.54	11,120.32	9,570.27	42.00	22.28	78.25	1,578.27	-39.94	674.10	609.82	64.29	10.486		
11,400.00	9,706.31	11,220.32	9,569.27	42.81	22.75	78.27	1,678.26	-40.56	674.06	608.49	65.57	10.280		
11,500.00	9,705.08	11,320.32	9,568.26	43.66	23.23	78.29	1,778.25	-41.18	674.01	607.11	66.90	10.075		
11,600.00	9,703.86	11,420.32	9,567.26	44.54	23.73	78.31	1,878.25	-41.80	673.97	605.69	68.27	9.872		
11,700.00	9,702.63	11,520.32	9,566.25	45.44	24.24	78.32	1,978.24	-42.41	673.92	604.23	69.69	9.670		
11,800.00	9,701.40	11,620.32	9,565.25	46.37	24.76	78.34	2,078.23	-43.03	673.88	602.73	71.15	9.472		
11,900.00	9,700.17	11,720.32	9,564.24	47.33	25.30	78.36	2,178.22	-43.65	673.83	601.19	72.64	9.276		
12,000.00	9,698.95	11,820.32	9,563.24	48.31	25.85	78.38	2,278.22	-44.27	673.79	599.62	74.17	9.085		
12,100.00	9,697.72	11,920.32	9,562.23	49.31	26.41	78.40	2,378.21	-44.89	673.75	598.02	75.73	8.897		
12,200.00	9,696.49	12,020.32	9,561.23	50.34	26.97	78.42	2,478.20	-45.51	673.70	596.38	77.32	8.713		
12,300.00	9,695.26	12,120.32	9,560.23	51.38	27.55	78.44	2,578.20	-46.13	673.66	594.71	78.94	8.533		
12,400.00	9,694.03	12,220.32	9,559.22	52.44	28.14	78.45	2,678.19	-46.74	673.61	593.02	80.59	8.358		
12,500.00	9,692.81	12,320.32	9,558.22	53.52	28.74	78.47	2,778.18	-47.36	673.57	591.30	82.27	8.188		
12,600.00	9,691.58	12,420.32	9,557.21	54.62	29.34	78.49	2,878.17	-47.98	673.53	589.56	83.97	8.021		
12,700.00	9,690.35	12,520.32	9,556.21	55.73	29.95	78.51	2,978.17	-48.60	673.48	587.79	85.69	7.860		
12,800.00	9,689.12	12,620.32	9,555.20	56.85	30.57	78.53	3,078.16	-49.22	673.44	586.01	87.43	7.702		
12,900.00	9,687.90	12,720.32	9,554.20	57.99	31.19	78.55	3,178.15	-49.84	673.39	584.20	89.20	7.550		
13,000.00	9,686.67	12,820.32	9,553.19	59.14	31.82	78.57	3,278.15	-50.46	673.35	582.37	90.98	7.401		
13,100.00	9,685.44	12,920.32	9,552.19	60.31	32.46	78.58	3,378.14	-51.08	673.31	580.53	92.78	7.257		
13,200.00	9,684.21	13,020.32	9,551.18	61.48	33.10	78.60	3,478.13	-51.69	673.26	578.67	94.60	7.117		
13,300.00	9,682.98	13,120.32	9,550.18	62.67	33.74	78.62	3,578.12	-52.31	673.22	576.79	96.43	6.981		
13,400.00	9,681.76	13,220.31	9,549.18	63.87	34.40	78.64	3,678.12	-52.93	673.18	574.90	98.28	6.850		
13,500.00	9,680.53	13,320.31	9,548.17	65.07	35.05	78.66	3,778.11	-53.55	673.13	572.99	100.14	6.722		
13,600.00	9,679.30	13,420.31	9,547.17	66.29	35.71	78.68	3,878.10	-54.17	673.09	571.07	102.02	6.598		
13,700.00	9,678.07	13,520.31	9,546.16	67.51	36.38	78.70	3,978.09	-54.79	673.05	569.14	103.91	6.477		
13,800.00	9,676.85	13,620.31	9,545.16	68.75	37.05	78.72	4,078.09	-55.41	673.00	567.20	105.81	6.361		
13,900.00	9,675.62	13,720.31	9,544.15	69.99	37.72	78.73	4,178.08	-56.02	672.96	565.24	107.72	6.247		
14,000.00	9,674.39	13,820.31	9,543.15	71.23	38.39	78.75	4,278.07	-56.64	672.92	563.28	109.64	6.137		
14,100.00	9,673.16	13,920.31	9,542.14	72.49	39.07	78.77	4,378.07	-57.26	672.88	561.30	111.58	6.031		
14,200.00	9,671.93	14,020.31	9,541.14	73.75	39.75	78.79	4,478.06	-57.88	672.83	559.31	113.52	5.927		
14,300.00	9,670.71	14,120.31	9,540.13	75.02	40.44	78.81	4,578.05	-58.50	672.79	557.32	115.47	5.826		
14,400.00	9,669.48	14,220.31	9,539.13	76.29	41.12	78.83	4,678.04	-59.12	672.75	555.31	117.43	5.729		
14,500.00	9,668.25	14,320.31	9,538.12	77.57	41.82	78.85	4,778.04	-59.74	672.70	553.30	119.40	5.634		
14,600.00	9,667.02	14,420.31	9,537.12	78.85	42.51	78.86	4,878.03	-60.35	672.66	551.28	121.38	5.542		
14,700.00	9,665.79	14,520.31	9,536.12	80.14	43.20	78.88	4,978.02	-60.97	672.62	549.25	123.37	5.452		
14,800.00	9,664.57	14,620.31	9,535.11	81.44	43.90	78.90	5,078.02	-61.59	672.58	547.22	125.36	5.365		
14,900.00	9,663.34	14,720.31	9,534.11	82.74	44.60	78.92	5,178.01	-62.21	672.54	545.18	127.36	5.281		
15,000.00	9,662.11	14,820.31	9,533.10	84.04	45.30	78.94	5,278.00	-62.83	672.49	543.13	129.36	5.198		
15,100.00	9,660.88	14,920.31	9,532.10	85.35	46.01	78.96	5,377.99	-63.45	672.45	541.07	131.38	5.118		
15,200.00	9,659.66	15,020.31	9,531.09	86.66	46.71	78.98	5,477.99	-64.07	672.41	539.01	133.40	5.041		
15,300.00	9,658.43	15,120.31	9,530.09	87.98	47.42	79.00	5,577.98	-64.68	672.37	536.95	135.42	4.965		
15,400.00	9,657.20	15,220.31	9,529.08	89.30	48.13	79.01	5,677.97	-65.30	672.33	534.88	137.45	4.891		

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: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Offset Design Eider Federal - 302H - OH - Plan 1 10-11-17													Offset Site Error: 0.00 usft
Survey Program: 0-Scientific Gyro, 4600-MWD+IFR1+MS													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	Warning
15,500.00	9,655.97	15,320.31	9,528.08	90.62	48.84	79.03	5,777.97	-65.92	672.28	532.80	139.48	4.820	
15,600.00	9,654.74	15,420.31	9,527.07	91.95	49.55	79.05	5,877.96	-66.54	672.24	530.72	141.52	4.750	
15,700.00	9,653.52	15,520.31	9,526.07	93.28	50.27	79.07	5,977.95	-67.16	672.20	528.63	143.57	4.682	
15,800.00	9,652.29	15,620.31	9,525.07	94.61	50.98	79.09	6,077.94	-67.78	672.16	526.54	145.62	4.616	
15,900.00	9,651.06	15,720.31	9,524.06	95.95	51.70	79.11	6,177.94	-68.40	672.12	524.45	147.67	4.551	
16,000.00	9,649.83	15,820.31	9,523.06	97.29	52.42	79.13	6,277.93	-69.01	672.08	522.35	149.73	4.489	
16,100.00	9,648.61	15,920.31	9,522.05	98.63	53.14	79.15	6,377.92	-69.63	672.03	520.24	151.79	4.427	
16,200.00	9,647.38	16,020.31	9,521.05	99.97	53.86	79.16	6,477.91	-70.25	671.99	518.14	153.86	4.368	
16,300.00	9,646.15	16,120.31	9,520.04	101.32	54.58	79.18	6,577.91	-70.87	671.95	516.03	155.92	4.309	
16,400.00	9,644.92	16,220.31	9,519.04	102.67	55.30	79.20	6,677.90	-71.49	671.91	513.91	158.00	4.253	
16,500.00	9,643.69	16,320.31	9,518.03	104.02	56.03	79.22	6,777.89	-72.11	671.87	511.80	160.07	4.197	
16,600.00	9,642.47	16,420.31	9,517.03	105.37	56.75	79.24	6,877.89	-72.73	671.83	509.67	162.15	4.143	
16,700.00	9,641.24	16,520.31	9,516.02	106.73	57.48	79.26	6,977.88	-73.34	671.79	507.55	164.24	4.090	
16,800.00	9,640.01	16,620.31	9,515.02	108.09	58.20	79.28	7,077.87	-73.96	671.75	505.42	166.32	4.039	
16,900.00	9,638.78	16,720.31	9,514.02	109.45	58.93	79.29	7,177.86	-74.58	671.71	503.29	168.41	3.988	
17,000.00	9,637.56	16,820.31	9,513.01	110.81	59.66	79.31	7,277.86	-75.20	671.66	501.16	170.50	3.939	
17,100.00	9,636.33	16,920.31	9,512.01	112.17	60.39	79.33	7,377.85	-75.82	671.62	499.02	172.60	3.891	
17,200.00	9,635.10	17,020.31	9,511.00	113.54	61.12	79.35	7,477.84	-76.44	671.58	496.89	174.70	3.844	
17,208.09	9,635.00	17,028.40	9,510.92	113.65	61.18	79.35	7,485.94	-76.49	671.58	496.71	174.87	3.841	

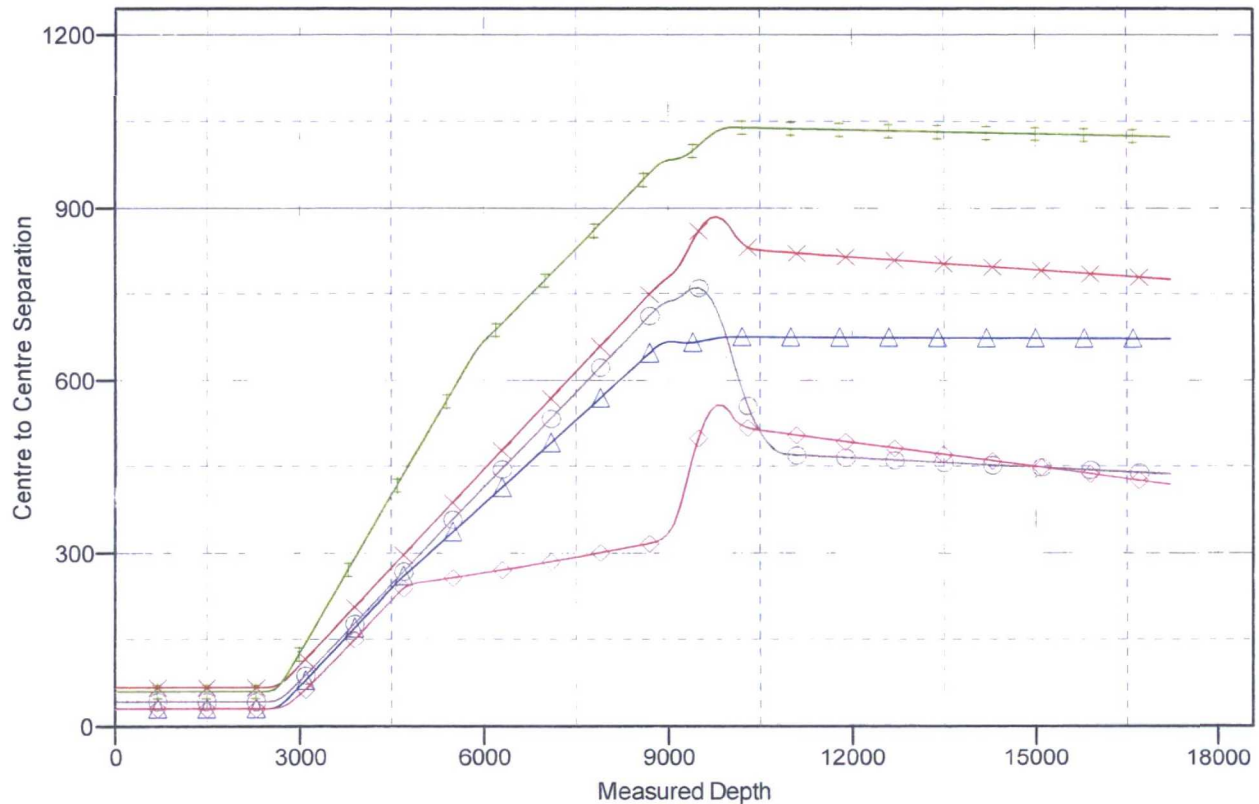
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Reference Depths are relative to RKB @ 3545.30usft (Ensign 155)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 301H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.36°

Ladder Plot



LEGEND

✕ 102H, OH, Plan 1 10-11-17 V0 ▲ 302H, OH, Plan 1 10-11-17 V0 ◆ 101H, OH, Plan 1 10-11-17 V0
 ○ 201H, OH, Plan 1 10-11-17 V0 ■ 202H, OH, Plan 1 04-06-18 V0

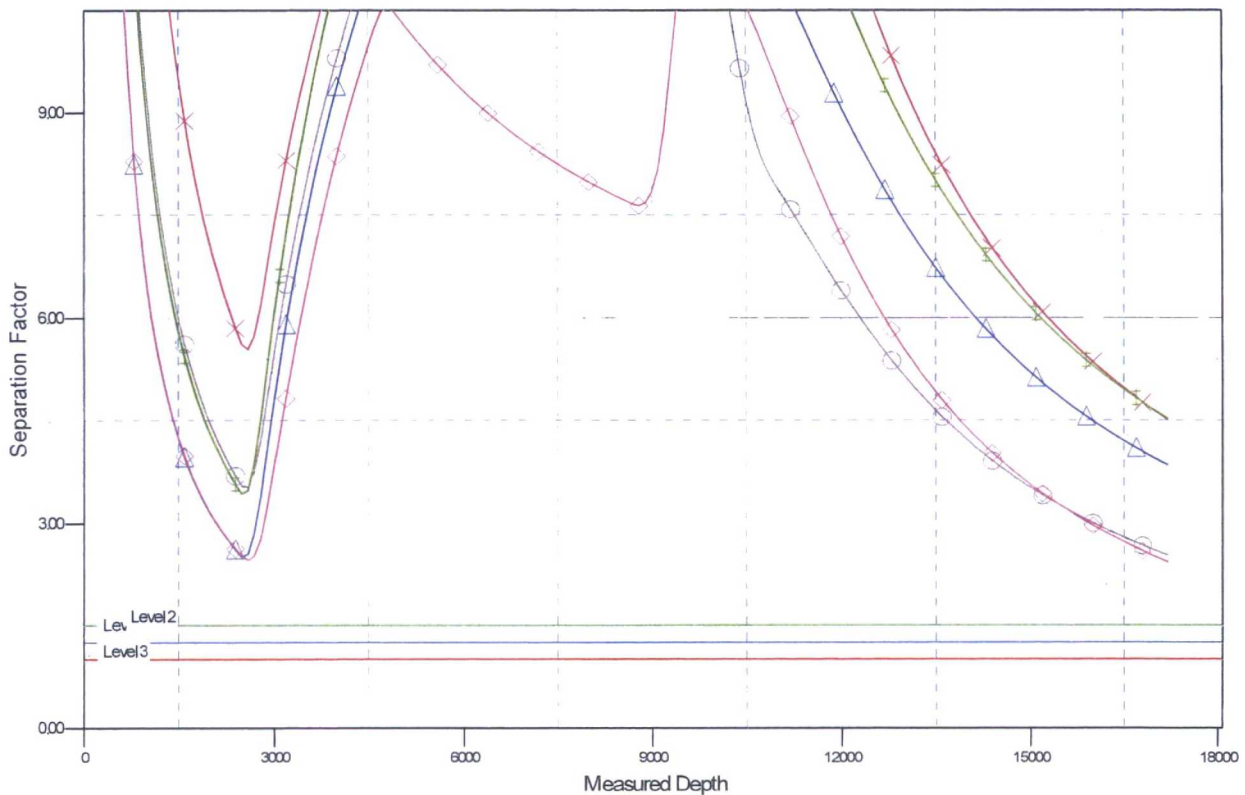
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Eider Federal
Site Error: 0.00 usft
Reference Well: 301H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Reference Datum

Reference Depths are relative to RKB @ 3545.30usft (Ensign 155)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

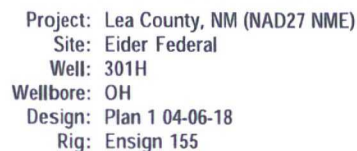
Coordinates are relative to: 301H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.36°

Separation Factor Plot



LEGEND

x 102H, OH, Plan 1 10-11-17 V0
 ▲ 302H, OH, Plan 1 10-11-17 V0
 ◆ 101H, OH, Plan 1 10-11-17 V0
● 201H, OH, Plan 1 10-11-17 V0
 + 202H, OH, Plan 1 04-06-18 V0

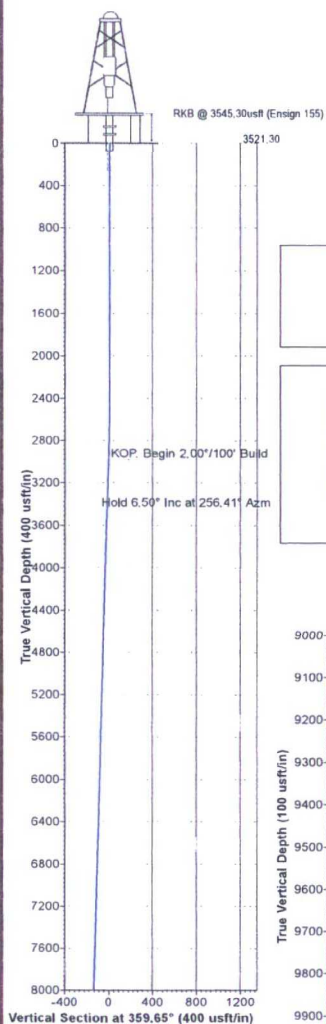


PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: -0.36°
Magnetic North: 6.39°

Magnetic Field
Strength: 47961.6snT
Dip Angle: 59.87°
Date: 4/6/2018
Model: MVHD



WELL DETAILS					
			3521.30		
+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.00	0.00	425243.90	711380.60	32° 10' 2.16522 N	103° 39' 0.76599 W

DESIGN TARGET DETAILS							
Name	TVD	+W-S	+E+W	Northing	Easting	Latitude	Longitude
BHL - Elder Federal 301H	9635.00	7483.10	738.50	432727.00	710644.00	32° 11' 16.26233 N	103° 39' 8.78306 W
LTP - Elder Federal 301H	9635.00	7363.19	735.95	432627.00	710644.65	32° 11' 15.27360 N	103° 39' 8.78400 W
FTP - Elder Federal 301H	9723.00	113.45	690.87	425357.35	710689.73	32° 10' 3.33120 N	103° 39' 8.79480 W

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	T Face	V/sect	Target	Annotation
0	0.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2500.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	0.00	0.00	KCP, Begin 2'00"/100' Build
3	2825.13	8.50	256.41	2824.43	-4.33	-17.91	2.00	256.41	-4.22		Hold 6.50' (in at 256.41' Azm
4	8760.01	8.50	256.41	8761.21	-1.21	-17.91	2.00	256.41	-4.22		Begin 2'00"/100' Drop
5	9085.15	0.00	0.00	9084.57	-166.63	-689.12	2.00	180.00	-162.41		Begin Vertical Well
6	9285.15	0.00	0.00	9245.57	-166.63	-689.12	0.00	0.00	-162.41		KCP, Begin 12.00"/100' Build
7	10041.01	90.70	359.65	10233.00	316.68	-692.11	12.00	359.65	-320.81		LP, Hold 90.70" (in at 359.65' Azm)
8	17208.09	90.70	359.65	16833.00	7483.10	-736.50	0.00	0.00	1782.46	BH/L - Eider Federal 301H	TD at 17208.09

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Local Origin: Well 301H, Grid North

Latitude: 32° 10' 2.16522 N
Longitude: 103° 39' 0.76599 W

Grid East: 711380.60
Grid North: 425243.90
Scale Factor: 1.000

Geomagnetic Model: MVHD

Sample Date: 06-Apr-18

Magnetic Declination: 6.75°

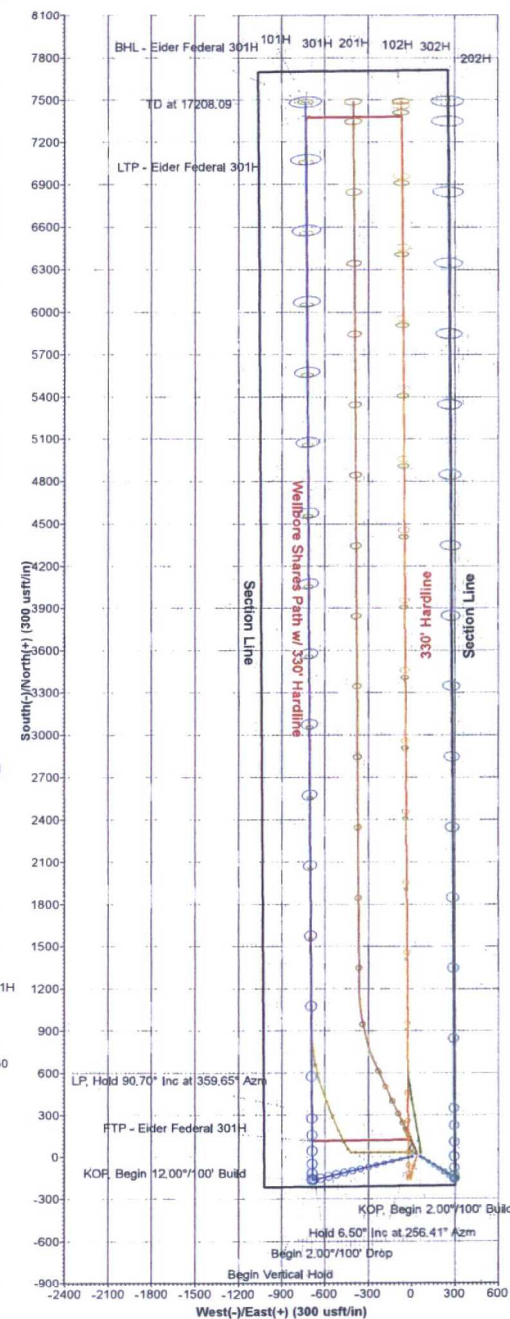
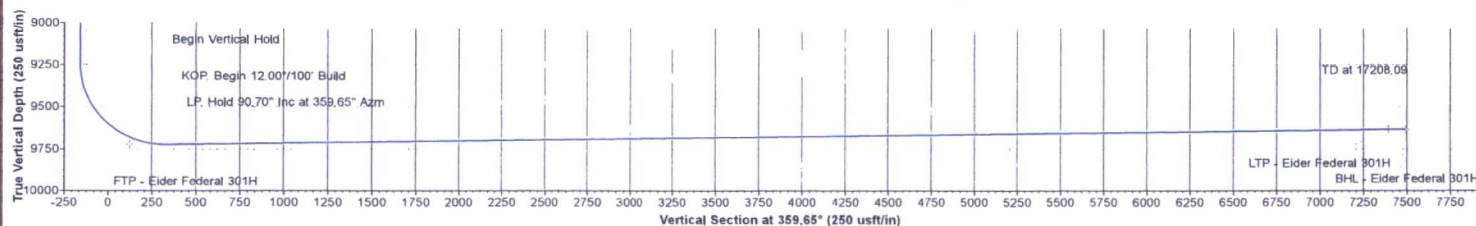
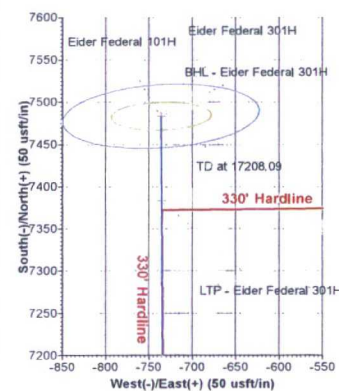
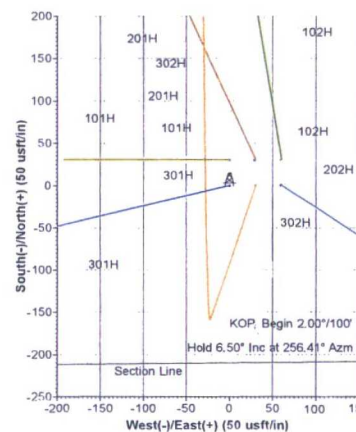
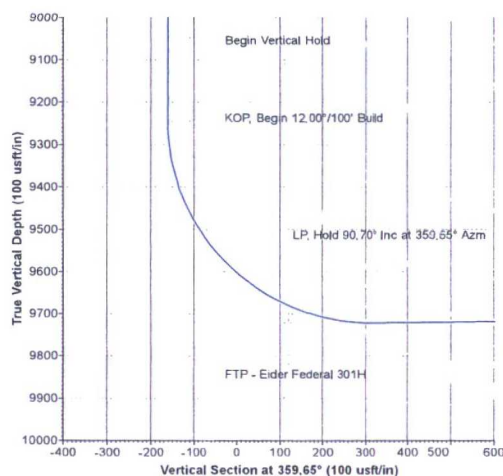
Dip Angle from Horizontal: 59.87°
Magnetic Field Strength: 47061.67077242eT

Magnetic Field Strength: 47961.57077243nT

To convert a Magnetic Direction to a Grid Direction, Add 6.39°
 To convert a Magnetic Direction to a True Direction, Add 6.75° East
 To convert a True Direction to a Grid Direction, Subtract 0.36°

LEGEND

- 102H, OH, Plan 1 10-11-17 V0
— 201H, OH, Plan 1 10-11-17 V0
— 302H, OH, Plan 1 10-11-17 V0
— 202H, OH, Plan 1 04-06-18 V0
— 101H, OH, Plan 1 10-11-17 V0
— Plan 1 04-06-18





COG Operating LLC

**Lea County, NM (NAD27 NME)
Eider Federal
301H**

OH

Plan: Plan 1 04-06-18

Standard Planning Report

06 April, 2018



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Eider Federal
Well: 301H
Wellbore: OH
Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
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 Eider Federal

Site Position:		Northing:	425,274.00 usft	Latitude:	32° 10' 2.46309 N
From:	Map	Easting:	711,380.40 usft	Longitude:	103° 39' 0.76609 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.36 °

Well 301H

Well Position	+N/-S	-30.10 usft	Northing:	425,243.90 usft	Latitude:	32° 10' 2.16522 N
	+E/-W	0.20 usft	Easting:	711,380.60 usft	Longitude:	103° 39' 0.76599 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	3,521.30 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	4/6/2018	6.75	59.87	47,961.57077242

Design Plan 1 04-06-18

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	359.65

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	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,825.13	6.50	256.41	2,824.43	-4.33	-17.91	2.00	2.00	0.00	256.41	
8,760.01	6.50	256.41	8,721.14	-162.30	-671.21	0.00	0.00	0.00	0.00	
9,085.15	0.00	0.00	9,045.57	-166.63	-689.12	2.00	-2.00	0.00	180.00	
9,285.15	0.00	0.00	9,245.57	-166.63	-689.12	0.00	0.00	0.00	0.00	
10,041.01	90.70	359.65	9,723.00	316.69	-692.11	12.00	12.00	0.00	359.65	
17,208.09	90.70	359.65	9,635.00	7,483.10	-736.50	0.00	0.00	0.00	0.00	BHL - Eider Federa

Database: USA Compass
 Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Site: Eider Federal
 Well: 301H
 Wellbore: OH
 Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
 TVD Reference: RKB @ 3545.30usft (Ensign 155)
 MD Reference: RKB @ 3545.30usft (Ensign 155)
 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
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 2.00°/100' Build									
2,600.00	2.00	256.41	2,599.98	-0.41	-1.70	-0.40	2.00	2.00	0.00
2,700.00	4.00	256.41	2,699.84	-1.64	-6.78	-1.60	2.00	2.00	0.00
2,800.00	6.00	256.41	2,799.45	-3.69	-15.25	-3.60	2.00	2.00	0.00
2,825.13	6.50	256.41	2,824.43	-4.33	-17.91	-4.22	2.00	2.00	0.00
Hold 6.50° Inc at 256.41° Azm									
2,900.00	6.50	256.41	2,898.82	-6.32	-26.16	-6.16	0.00	0.00	0.00
3,000.00	6.50	256.41	2,998.18	-8.99	-37.16	-8.76	0.00	0.00	0.00
3,100.00	6.50	256.41	3,097.53	-11.65	-48.17	-11.35	0.00	0.00	0.00
3,200.00	6.50	256.41	3,196.89	-14.31	-59.18	-13.95	0.00	0.00	0.00
3,300.00	6.50	256.41	3,296.25	-16.97	-70.19	-16.54	0.00	0.00	0.00
3,400.00	6.50	256.41	3,395.60	-19.63	-81.19	-19.14	0.00	0.00	0.00
3,500.00	6.50	256.41	3,494.96	-22.29	-92.20	-21.73	0.00	0.00	0.00
3,600.00	6.50	256.41	3,594.32	-24.96	-103.21	-24.32	0.00	0.00	0.00
3,700.00	6.50	256.41	3,693.67	-27.62	-114.22	-26.92	0.00	0.00	0.00
3,800.00	6.50	256.41	3,793.03	-30.28	-125.22	-29.51	0.00	0.00	0.00
3,900.00	6.50	256.41	3,892.39	-32.94	-136.23	-32.11	0.00	0.00	0.00
4,000.00	6.50	256.41	3,991.74	-35.60	-147.24	-34.70	0.00	0.00	0.00
4,100.00	6.50	256.41	4,091.10	-38.26	-158.25	-37.30	0.00	0.00	0.00
4,200.00	6.50	256.41	4,190.46	-40.93	-169.26	-39.89	0.00	0.00	0.00
4,300.00	6.50	256.41	4,289.81	-43.59	-180.26	-42.48	0.00	0.00	0.00
4,400.00	6.50	256.41	4,389.17	-46.25	-191.27	-45.08	0.00	0.00	0.00
4,500.00	6.50	256.41	4,488.53	-48.91	-202.28	-47.67	0.00	0.00	0.00
4,600.00	6.50	256.41	4,587.88	-51.57	-213.29	-50.27	0.00	0.00	0.00
4,700.00	6.50	256.41	4,687.24	-54.23	-224.29	-52.86	0.00	0.00	0.00
4,800.00	6.50	256.41	4,786.60	-56.89	-235.30	-55.46	0.00	0.00	0.00
4,900.00	6.50	256.41	4,885.95	-59.56	-246.31	-58.05	0.00	0.00	0.00
5,000.00	6.50	256.41	4,985.31	-62.22	-257.32	-60.65	0.00	0.00	0.00
5,100.00	6.50	256.41	5,084.67	-64.88	-268.32	-63.24	0.00	0.00	0.00
5,200.00	6.50	256.41	5,184.02	-67.54	-279.33	-65.83	0.00	0.00	0.00
5,300.00	6.50	256.41	5,283.38	-70.20	-290.34	-68.43	0.00	0.00	0.00
5,400.00	6.50	256.41	5,382.74	-72.86	-301.35	-71.02	0.00	0.00	0.00
5,500.00	6.50	256.41	5,482.09	-75.53	-312.36	-73.62	0.00	0.00	0.00
5,600.00	6.50	256.41	5,581.45	-78.19	-323.36	-76.21	0.00	0.00	0.00
5,700.00	6.50	256.41	5,680.81	-80.85	-334.37	-78.81	0.00	0.00	0.00
5,800.00	6.50	256.41	5,780.16	-83.51	-345.38	-81.40	0.00	0.00	0.00
5,900.00	6.50	256.41	5,879.52	-86.17	-356.39	-83.99	0.00	0.00	0.00
6,000.00	6.50	256.41	5,978.88	-88.83	-367.39	-86.59	0.00	0.00	0.00
6,100.00	6.50	256.41	6,078.23	-91.50	-378.40	-89.18	0.00	0.00	0.00
6,200.00	6.50	256.41	6,177.59	-94.16	-389.41	-91.78	0.00	0.00	0.00
6,300.00	6.50	256.41	6,276.95	-96.82	-400.42	-94.37	0.00	0.00	0.00
6,400.00	6.50	256.41	6,376.30	-99.48	-411.42	-96.97	0.00	0.00	0.00
6,500.00	6.50	256.41	6,475.66	-102.14	-422.43	-99.56	0.00	0.00	0.00
6,600.00	6.50	256.41	6,575.02	-104.80	-433.44	-102.15	0.00	0.00	0.00
6,700.00	6.50	256.41	6,674.37	-107.47	-444.45	-104.75	0.00	0.00	0.00
6,800.00	6.50	256.41	6,773.73	-110.13	-455.46	-107.34	0.00	0.00	0.00
6,900.00	6.50	256.41	6,873.09	-112.79	-466.46	-109.94	0.00	0.00	0.00
7,000.00	6.50	256.41	6,972.44	-115.45	-477.47	-112.53	0.00	0.00	0.00
7,100.00	6.50	256.41	7,071.80	-118.11	-488.48	-115.13	0.00	0.00	0.00
7,200.00	6.50	256.41	7,171.16	-120.77	-499.49	-117.72	0.00	0.00	0.00
7,300.00	6.50	256.41	7,270.51	-123.44	-510.49	-120.31	0.00	0.00	0.00
7,400.00	6.50	256.41	7,369.87	-126.10	-521.50	-122.91	0.00	0.00	0.00

Database: USA Compass
 Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Site: Eider Federal
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 Wellbore: OH
 Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
 TVD Reference: RKB @ 3545.30usft (Ensign 155)
 MD Reference: RKB @ 3545.30usft (Ensign 155)
 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)
7,500.00	6.50	256.41	7,469.23	-128.76	-532.51	-125.50	0.00	0.00	0.00
7,600.00	6.50	256.41	7,568.58	-131.42	-543.52	-128.10	0.00	0.00	0.00
7,700.00	6.50	256.41	7,667.94	-134.08	-554.52	-130.69	0.00	0.00	0.00
7,800.00	6.50	256.41	7,767.30	-136.74	-565.53	-133.29	0.00	0.00	0.00
7,900.00	6.50	256.41	7,866.65	-139.40	-576.54	-135.88	0.00	0.00	0.00
8,000.00	6.50	256.41	7,966.01	-142.07	-587.55	-138.47	0.00	0.00	0.00
8,100.00	6.50	256.41	8,065.37	-144.73	-598.56	-141.07	0.00	0.00	0.00
8,200.00	6.50	256.41	8,164.72	-147.39	-609.56	-143.66	0.00	0.00	0.00
8,300.00	6.50	256.41	8,264.08	-150.05	-620.57	-146.26	0.00	0.00	0.00
8,400.00	6.50	256.41	8,363.44	-152.71	-631.58	-148.85	0.00	0.00	0.00
8,500.00	6.50	256.41	8,462.79	-155.37	-642.59	-151.45	0.00	0.00	0.00
8,600.00	6.50	256.41	8,562.15	-158.04	-653.59	-154.04	0.00	0.00	0.00
8,700.00	6.50	256.41	8,661.51	-160.70	-664.60	-156.64	0.00	0.00	0.00
8,760.01	6.50	256.41	8,721.14	-162.30	-671.21	-158.19	0.00	0.00	0.00
Begin 2.00°/100' Drop									
8,800.00	5.70	256.41	8,760.89	-163.29	-675.34	-159.17	2.00	-2.00	0.00
8,900.00	3.70	256.41	8,860.55	-165.22	-683.31	-161.04	2.00	-2.00	0.00
9,000.00	1.70	256.41	8,960.44	-166.33	-687.89	-162.12	2.00	-2.00	0.00
9,085.15	0.00	0.00	9,045.57	-166.63	-689.12	-162.41	2.00	-2.00	0.00
Begin Vertical Hold									
9,285.15	0.00	0.00	9,245.57	-166.63	-689.12	-162.41	0.00	0.00	0.00
KOP, Begin 12.00°/100' Build									
9,300.00	1.78	359.65	9,260.42	-166.40	-689.12	-162.18	12.00	12.00	0.00
9,400.00	13.78	359.65	9,359.32	-152.88	-689.21	-148.67	12.00	12.00	0.00
9,500.00	25.78	359.65	9,453.25	-119.10	-689.42	-114.88	12.00	12.00	0.00
9,600.00	37.78	359.65	9,538.10	-66.52	-689.74	-62.31	12.00	12.00	0.00
9,700.00	49.78	359.65	9,610.16	2.54	-690.17	6.76	12.00	12.00	0.00
9,800.00	61.78	359.65	9,666.29	85.08	-690.68	89.30	12.00	12.00	0.00
9,900.00	73.78	359.65	9,704.04	177.48	-691.25	181.70	12.00	12.00	0.00
10,000.00	85.78	359.65	9,721.74	275.72	-691.86	279.94	12.00	12.00	0.00
10,041.01	90.70	359.65	9,723.00	316.69	-692.11	320.91	12.00	12.00	0.00
LP, Hold 90.70° Inc at 359.65° Azm									
10,100.00	90.70	359.65	9,722.27	375.68	-692.48	379.90	0.00	0.00	0.00
10,200.00	90.70	359.65	9,721.05	475.67	-693.10	479.89	0.00	0.00	0.00
10,300.00	90.70	359.65	9,719.82	575.66	-693.72	579.89	0.00	0.00	0.00
10,400.00	90.70	359.65	9,718.59	675.65	-694.34	679.88	0.00	0.00	0.00
10,500.00	90.70	359.65	9,717.36	775.64	-694.96	779.87	0.00	0.00	0.00
10,600.00	90.70	359.65	9,716.13	875.63	-695.58	879.86	0.00	0.00	0.00
10,700.00	90.70	359.65	9,714.91	975.62	-696.20	979.86	0.00	0.00	0.00
10,800.00	90.70	359.65	9,713.68	1,075.61	-696.82	1,079.85	0.00	0.00	0.00
10,900.00	90.70	359.65	9,712.45	1,175.60	-697.43	1,179.84	0.00	0.00	0.00
11,000.00	90.70	359.65	9,711.22	1,275.59	-698.05	1,279.83	0.00	0.00	0.00
11,100.00	90.70	359.65	9,710.00	1,375.58	-698.67	1,379.83	0.00	0.00	0.00
11,200.00	90.70	359.65	9,708.77	1,475.57	-699.29	1,479.82	0.00	0.00	0.00
11,300.00	90.70	359.65	9,707.54	1,575.56	-699.91	1,579.81	0.00	0.00	0.00
11,400.00	90.70	359.65	9,706.31	1,675.55	-700.53	1,679.80	0.00	0.00	0.00
11,500.00	90.70	359.65	9,705.08	1,775.55	-701.15	1,779.80	0.00	0.00	0.00
11,600.00	90.70	359.65	9,703.86	1,875.54	-701.77	1,879.79	0.00	0.00	0.00
11,700.00	90.70	359.65	9,702.63	1,975.53	-702.39	1,979.78	0.00	0.00	0.00
11,800.00	90.70	359.65	9,701.40	2,075.52	-703.01	2,079.77	0.00	0.00	0.00
11,900.00	90.70	359.65	9,700.17	2,175.51	-703.63	2,179.77	0.00	0.00	0.00
12,000.00	90.70	359.65	9,698.95	2,275.50	-704.25	2,279.76	0.00	0.00	0.00
12,100.00	90.70	359.65	9,697.72	2,375.49	-704.87	2,379.75	0.00	0.00	0.00

Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Eider Federal
Well: 301H
Wellbore: OH
Design: Plan 1 04-06-18

Local Co-ordinate Reference: Well 301H
TVD Reference: RKB @ 3545.30usft (Ensign 155)
MD Reference: RKB @ 3545.30usft (Ensign 155)
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)
12,200.00	90.70	359.65	9,696.49	2,475.48	-705.49	2,479.74	0.00	0.00	0.00
12,300.00	90.70	359.65	9,695.26	2,575.47	-706.10	2,579.73	0.00	0.00	0.00
12,400.00	90.70	359.65	9,694.03	2,675.46	-706.72	2,679.73	0.00	0.00	0.00
12,500.00	90.70	359.65	9,692.81	2,775.45	-707.34	2,779.72	0.00	0.00	0.00
12,600.00	90.70	359.65	9,691.58	2,875.44	-707.96	2,879.71	0.00	0.00	0.00
12,700.00	90.70	359.65	9,690.35	2,975.43	-708.58	2,979.70	0.00	0.00	0.00
12,800.00	90.70	359.65	9,689.12	3,075.42	-709.20	3,079.70	0.00	0.00	0.00
12,900.00	90.70	359.65	9,687.90	3,175.41	-709.82	3,179.69	0.00	0.00	0.00
13,000.00	90.70	359.65	9,686.67	3,275.40	-710.44	3,279.68	0.00	0.00	0.00
13,100.00	90.70	359.65	9,685.44	3,375.39	-711.06	3,379.67	0.00	0.00	0.00
13,200.00	90.70	359.65	9,684.21	3,475.38	-711.68	3,479.67	0.00	0.00	0.00
13,300.00	90.70	359.65	9,682.98	3,575.38	-712.30	3,579.66	0.00	0.00	0.00
13,400.00	90.70	359.65	9,681.76	3,675.37	-712.92	3,679.65	0.00	0.00	0.00
13,500.00	90.70	359.65	9,680.53	3,775.36	-713.54	3,779.64	0.00	0.00	0.00
13,600.00	90.70	359.65	9,679.30	3,875.35	-714.16	3,879.64	0.00	0.00	0.00
13,700.00	90.70	359.65	9,678.07	3,975.34	-714.77	3,979.63	0.00	0.00	0.00
13,800.00	90.70	359.65	9,676.85	4,075.33	-715.39	4,079.62	0.00	0.00	0.00
13,900.00	90.70	359.65	9,675.62	4,175.32	-716.01	4,179.61	0.00	0.00	0.00
14,000.00	90.70	359.65	9,674.39	4,275.31	-716.63	4,279.61	0.00	0.00	0.00
14,100.00	90.70	359.65	9,673.16	4,375.30	-717.25	4,379.60	0.00	0.00	0.00
14,200.00	90.70	359.65	9,671.93	4,475.29	-717.87	4,479.59	0.00	0.00	0.00
14,300.00	90.70	359.65	9,670.71	4,575.28	-718.49	4,579.58	0.00	0.00	0.00
14,400.00	90.70	359.65	9,669.48	4,675.27	-719.11	4,679.58	0.00	0.00	0.00
14,500.00	90.70	359.65	9,668.25	4,775.26	-719.73	4,779.57	0.00	0.00	0.00
14,600.00	90.70	359.65	9,667.02	4,875.25	-720.35	4,879.56	0.00	0.00	0.00
14,700.00	90.70	359.65	9,665.79	4,975.24	-720.97	4,979.55	0.00	0.00	0.00
14,800.00	90.70	359.65	9,664.57	5,075.23	-721.59	5,079.55	0.00	0.00	0.00
14,900.00	90.70	359.65	9,663.34	5,175.22	-722.21	5,179.54	0.00	0.00	0.00
15,000.00	90.70	359.65	9,662.11	5,275.21	-722.83	5,279.53	0.00	0.00	0.00
15,100.00	90.70	359.65	9,660.88	5,375.20	-723.44	5,379.52	0.00	0.00	0.00
15,200.00	90.70	359.65	9,659.66	5,475.20	-724.06	5,479.52	0.00	0.00	0.00
15,300.00	90.70	359.65	9,658.43	5,575.19	-724.68	5,579.51	0.00	0.00	0.00
15,400.00	90.70	359.65	9,657.20	5,675.18	-725.30	5,679.50	0.00	0.00	0.00
15,500.00	90.70	359.65	9,655.97	5,775.17	-725.92	5,779.49	0.00	0.00	0.00
15,600.00	90.70	359.65	9,654.74	5,875.16	-726.54	5,879.49	0.00	0.00	0.00
15,700.00	90.70	359.65	9,653.52	5,975.15	-727.16	5,979.48	0.00	0.00	0.00
15,800.00	90.70	359.65	9,652.29	6,075.14	-727.78	6,079.47	0.00	0.00	0.00
15,900.00	90.70	359.65	9,651.06	6,175.13	-728.40	6,179.46	0.00	0.00	0.00
16,000.00	90.70	359.65	9,649.83	6,275.12	-729.02	6,279.46	0.00	0.00	0.00
16,100.00	90.70	359.65	9,648.61	6,375.11	-729.64	6,379.45	0.00	0.00	0.00
16,200.00	90.70	359.65	9,647.38	6,475.10	-730.26	6,479.44	0.00	0.00	0.00
16,300.00	90.70	359.65	9,646.15	6,575.09	-730.88	6,579.43	0.00	0.00	0.00
16,400.00	90.70	359.65	9,644.92	6,675.08	-731.50	6,679.43	0.00	0.00	0.00
16,500.00	90.70	359.65	9,643.69	6,775.07	-732.11	6,779.42	0.00	0.00	0.00
16,600.00	90.70	359.65	9,642.47	6,875.06	-732.73	6,879.41	0.00	0.00	0.00
16,700.00	90.70	359.65	9,641.24	6,975.05	-733.35	6,979.40	0.00	0.00	0.00
16,800.00	90.70	359.65	9,640.01	7,075.04	-733.97	7,079.40	0.00	0.00	0.00
16,900.00	90.70	359.65	9,638.78	7,175.03	-734.59	7,179.39	0.00	0.00	0.00
17,000.00	90.70	359.65	9,637.56	7,275.03	-735.21	7,279.38	0.00	0.00	0.00
17,100.00	90.70	359.65	9,636.33	7,375.02	-735.83	7,379.37	0.00	0.00	0.00
17,200.00	90.70	359.65	9,635.10	7,475.01	-736.45	7,479.37	0.00	0.00	0.00
17,208.09	90.70	359.65	9,635.00	7,483.10	-736.50	7,487.46	0.00	0.00	0.00

TD at 17208.09

Database: USA Compass
Company: COG Operating LLC
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MD Reference: RKB @ 3545.30usft (Ensign 155)
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 - Eider Federal 3 - plan hits target center - Point	0.00	0.00	9,635.00	7,483.10	-736.50	432,727.00	710,644.10	32° 11' 16.26233 N 103° 39' 8.78306 W	
LTP - Eider Federal 3 - plan misses target center by 1.23usft at 17108.19usft MD (9636.23 TVD, 7383.20 N, -735.88 E) - Point	0.00	0.01	9,635.00	7,383.19	-735.95	432,627.09	710,644.65	32° 11' 15.27360 N 103° 39' 8.78400 W	
FTP - Eider Federal 3 - plan misses target center by 39.16usft at 9847.79usft MD (9686.75 TVD, 128.25 N, -690.95 E) - Point	0.00	0.00	9,723.00	113.45	-690.87	425,357.35	710,689.73	32° 10' 3.33120 N 103° 39' 8.79480 W	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,500.00	2,500.00	0.00	0.00	KOP, Begin 2.00°/100' Build
2,825.13	2,824.43	-4.33	-17.91	Hold 6.50° Inc at 256.41° Azm
8,760.01	8,721.14	-162.30	-671.21	Begin 2.00°/100' Drop
9,085.15	9,045.57	-166.63	-689.12	Begin Vertical Hold
9,285.15	9,245.57	-166.63	-689.12	KOP, Begin 12.00°/100' Build
10,041.01	9,723.00	316.69	-692.11	LP, Hold 90.70° Inc at 359.65° Azm
17,208.09	9,635.00	7,483.10	-736.50	TD at 17208.09