

District I
1625 N. French Dr., Hobbs, NM 88240

District II
811 S. First St., Artesia, NM 88210

District III
1000 Rio Brazos Rd., Aztec, NM 87410

District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-104
Revised August 1, 2011

Submit one copy to appropriate District Office

☐ AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

¹ Operator name and Address COG Operating LLC 2208 W. Main Street Artesia, NM 88210		² O GRID Number 229137	
		³ Reason for Filing Code/ Effective Date RT	
API Number 30-015-46814	⁵ Pool Name Purple Sage; Wolfcamp		⁶ Pool Code 98220
⁷ Property Code 323072	⁸ Property Name Hambone Federal Com		⁹ Well Number 703H

II. ¹⁰ Surface Location

Ul or lot no. P	Section 8	Township 26S	Range 29E	Lot Idn	Feet from the 222	North/South Line South	Feet from the 1228	East/West line East	County Eddy
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¹¹ Bottom Hole Location

Ul or lot no. 2	Section 5	Township 26S	Range 29E	Lot Idn	Feet from the 202	North/South Line North	Feet from the 2182	East/West line East	County Eddy
¹² Lse Code F	¹³ Producing Method Code		¹⁴ Gas Connection Date		¹⁵ C -129 Permit Number	¹⁶ C -129 Effective Date		¹⁷ C -129 Expiration Date	

III. Oil and Gas Transporters

¹⁸ Transporter O GRID	¹⁹ Transporter Name and Address	²⁰ O/G/W
	ACC	O
298751	ETC	G
278421	Holly Refining and Marketing PO Box 159 Artesia, NM 88210	O

IV. Well Completion Data

²¹ Spud Date 3/17/20	²² Ready Date 1/25/21	²³ TD 20,046'	²⁴ PBTD 19,895'	²⁵ Perforations 10,270-19,928'	²⁶ DHC, MC
²⁷ Hole Size		²⁸ Casing & Tubing Size		²⁹ Depth Set	³⁰ Sacks Cement
17 1/2"		13 3/8"		357'	616
12 1/4" 9 7/8"		10 3/4" 7 5/8"		2,898' 9,171'	625 890
6 3/4"		5 1/2"		20,030'	1330
		2 7/8"		9,213'	

V. Well Test Data

³¹ Date New Oil	³² Gas Delivery Date	³³ Test Date	³⁴ Test Length	³⁵ Tbg. Pressure	³⁶ Csg. Pressure
³⁷ Choke Size	³⁸ Oil	³⁹ Water	⁴⁰ Gas		⁴¹ Test Method

⁴² I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief. Signature: <i>Amanda Avery</i>		OIL CONSERVATION DIVISION Approved by: <i>Amanda Avery</i>	
Printed name: Amanda Avery		Title: BUSINESS OP. SPEC.	
Title: Regulatory Analyst		Approval Date: 02/17/2021	
E-mail Address:		C-104 RT Expires: 4/25/2021	
Date: 1/20/21	Phone: 575-748-6962		

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
511 S. FIRST ST., ARTESIA, NM 88210
Phone: (575) 746-1283 Fax: (575) 746-9720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

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
As Drilled

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-46814		Pool Code 98220	Pool Name Purple Sage; Wolfcamp
Property Code 323072	Property Name HAMBONE FEDERAL COM		Well Number 703H
OGRID No. 229137	Operator Name COG OPERATING, LLC		Elevation 2913.8'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	8	26-S	29-E		222	SOUTH	1228	EAST	EDDY

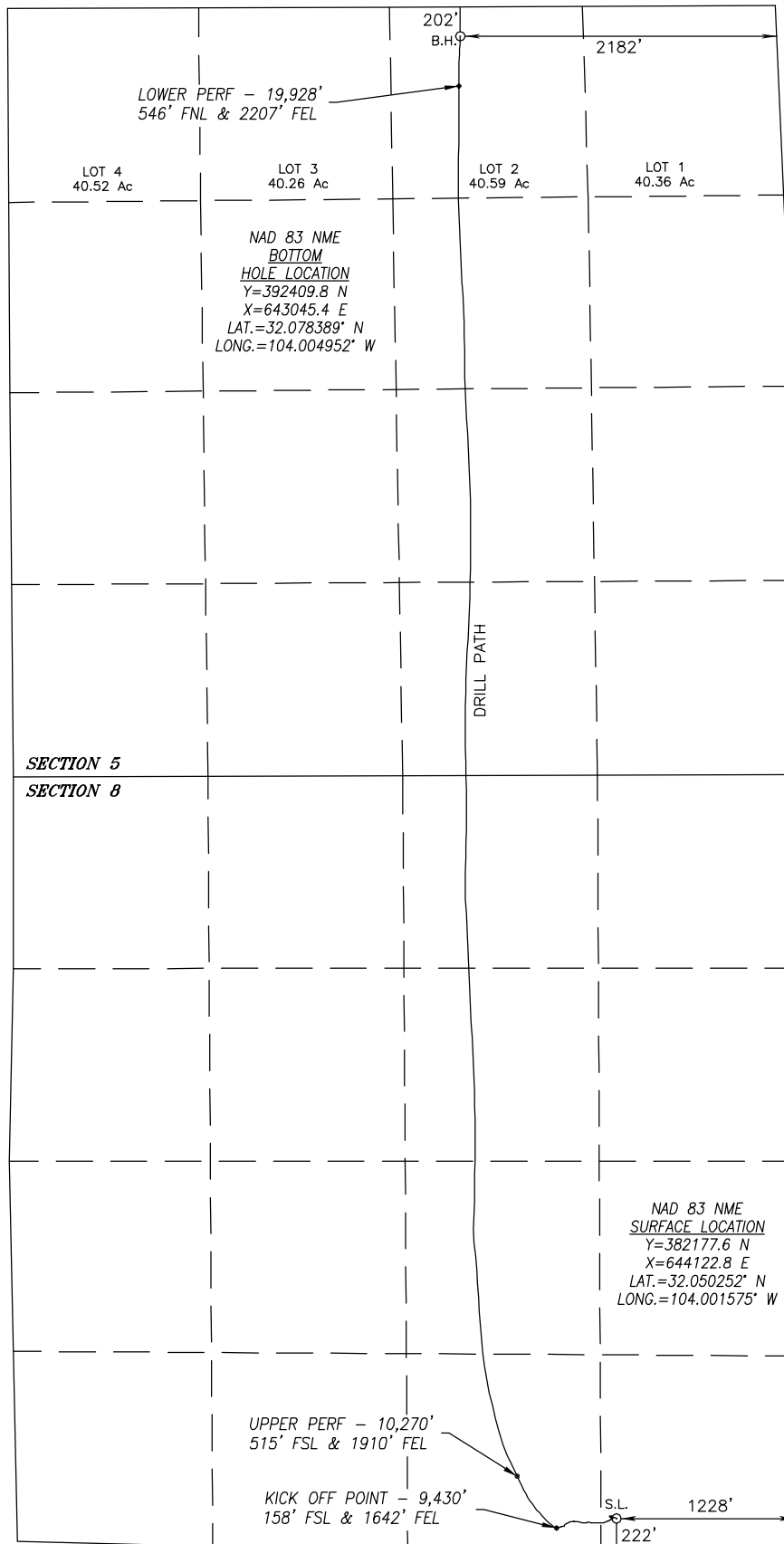
Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
2	5	26-S	29-E		202	NORTH	2182	EAST	EDDY
Dedicated Acres 640		Joint or Infill	Consolidation Code		Order No.				

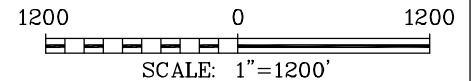
NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

SEE PAGE 2

Property Code 323072	Property Name HAMBONE FEDERAL COM	Well Number 703H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 2913.8'



SURFACE INFO AND BOREPATH SHOWN HEREON IS BASED ON DIRECTIONAL SURVEY REPORT PROVIDED BY COG OPERATING, LLC FOR THE HAMBONE FEDERAL COM #703H SUPPLIED TO HARCROW SURVEYING, LLC ON DECEMBER 4, 2020



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.

Amanda Avery 1/20/21

Signature Date

Amanda Avery

Printed Name

aavery@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.

JULY 3, 2019/APRIL 16, 2020

Date of Survey/Date of Geographic Survey

Signature & Seal of Professional Surveyor



Chad Harcrow 12/8/20

Certificate No. CHAD HARCROW 17777

PAGE 2 OF 2

W.O. #20-1643

DRAWN BY: WN

Intent ☐ As Drilled ☐

API #		
Operator Name:	Property Name:	Well Number

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

First Take Point (FTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

Is this well the defining well for the Horizontal Spacing Unit? ☐Is this well an infill well? ☐

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #		
Operator Name:	Property Name:	Well Number

KZ 06/29/2018



COG Operating LLC

**Eddy County, NM (NAD27 NME)
Hambone Federal Com
703H**

OH / 66457

Design: Surveys (Pioneer 84)

Standard Survey Report

16 April, 2020





Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Project	Eddy 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	Hambone Federal Com		
Site Position:		Northing:	382,232.28 usft
From:	Map	Easting:	601,211.49 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 3' 1.622153 N
		Longitude:	104° 0' 23.979022 W
		Grid Convergence:	0.17 °

Well	703H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	1.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 3' 0.457866 N
		Longitude:	104° 0' 3.929216 W
		Ground Level:	2,913.80 usft

Wellbore	OH / 66457		
Magnetics	Model Name	Sample Date	Declination (°)
	MVHD	4/19/2020	6.72
			Dip Angle (°)
			59.64
			Field Strength (nT)
			47,710.46971170

Design	Surveys (Pioneer 84)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			354.02

Survey Program	Date 4/16/2020		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.00	6,254.00	SDI Gyro Surveys (OH / 66457)	Scientific Keeper
6,263.00	20,272.00	Phoenix MWD Surveys - SQC FDIR (OH /	MWD+IFR1+FDIR
			Description
			Scientific Drilling Intl. Standard Wireline Keeper
			OWSG MWD + IFR1 + FDIR Correction

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
100.00	1.11	319.72	99.99	0.74	-0.63	0.80	1.11	1.11	0.00
125.00	0.96	316.98	124.99	1.08	-0.93	1.17	0.63	-0.60	-10.96
150.00	1.31	321.87	149.98	1.45	-1.25	1.58	1.45	1.40	19.56
175.00	0.89	316.84	174.98	1.82	-1.55	1.97	1.72	-1.68	-20.12
200.00	0.82	314.58	199.98	2.09	-1.81	2.27	0.31	-0.28	-9.04
225.00	0.76	308.85	224.97	2.32	-2.07	2.52	0.40	-0.24	-22.92
250.00	0.74	308.33	249.97	2.52	-2.33	2.75	0.08	-0.08	-2.08
275.00	0.70	308.74	274.97	2.72	-2.57	2.97	0.16	-0.16	1.64
300.00	0.72	298.93	299.97	2.89	-2.83	3.17	0.49	0.08	-39.24



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)
325.00	0.64	300.53	324.97	3.04	-3.09	3.34	0.33	-0.32	6.40
350.00	0.63	300.22	349.97	3.18	-3.33	3.51	0.04	-0.04	-1.24
375.00	0.69	299.66	374.96	3.32	-3.58	3.67	0.24	0.24	-2.24
400.00	0.66	295.88	399.96	3.46	-3.84	3.84	0.21	-0.12	-15.12
425.00	0.67	299.03	424.96	3.59	-4.09	4.00	0.15	0.04	12.60
450.00	0.69	298.41	449.96	3.73	-4.35	4.17	0.09	0.08	-2.48
475.00	0.73	297.29	474.96	3.88	-4.63	4.34	0.17	0.16	-4.48
500.00	0.82	298.53	499.95	4.04	-4.93	4.53	0.37	0.36	4.96
525.00	0.86	297.74	524.95	4.21	-5.25	4.73	0.17	0.16	-3.16
550.00	1.07	294.33	549.95	4.39	-5.63	4.96	0.87	0.84	-13.64
575.00	1.02	299.38	574.94	4.60	-6.03	5.20	0.42	-0.20	20.20
600.00	1.19	292.17	599.94	4.81	-6.47	5.45	0.88	0.68	-28.84
625.00	1.31	287.30	624.93	4.99	-6.98	5.69	0.64	0.48	-19.48
650.00	1.44	286.39	649.93	5.16	-7.56	5.92	0.53	0.52	-3.64
675.00	1.57	284.08	674.92	5.33	-8.19	6.16	0.57	0.52	-9.24
700.00	1.76	279.68	699.91	5.48	-8.90	6.38	0.92	0.76	-17.60
725.00	1.81	278.78	724.90	5.61	-9.67	6.58	0.23	0.20	-3.60
750.00	1.89	279.34	749.88	5.73	-10.47	6.79	0.33	0.32	2.24
775.00	1.93	278.36	774.87	5.86	-11.29	7.01	0.21	0.16	-3.92
800.00	1.98	279.11	799.85	5.99	-12.13	7.22	0.22	0.20	3.00
825.00	2.00	277.53	824.84	6.12	-12.99	7.44	0.23	0.08	-6.32
850.00	2.11	279.21	849.82	6.25	-13.88	7.66	0.50	0.44	6.72
875.00	2.18	278.07	874.80	6.39	-14.80	7.90	0.33	0.28	-4.56
900.00	2.25	280.98	899.79	6.55	-15.76	8.15	0.53	0.28	11.64
925.00	2.27	278.81	924.77	6.72	-16.73	8.42	0.35	0.08	-8.68
950.00	2.36	279.91	949.75	6.88	-17.72	8.69	0.40	0.36	4.40
975.00	2.45	282.04	974.72	7.08	-18.75	9.00	0.51	0.36	8.52
1,000.00	2.50	281.76	999.70	7.30	-19.81	9.33	0.21	0.20	-1.12
1,025.00	2.60	280.70	1,024.68	7.52	-20.90	9.66	0.44	0.40	-4.24
1,050.00	2.78	276.74	1,049.65	7.70	-22.06	9.95	1.03	0.72	-15.84
1,075.00	3.08	271.49	1,074.62	7.79	-23.33	10.17	1.61	1.20	-21.00
1,100.00	3.11	269.24	1,099.58	7.79	-24.68	10.32	0.50	0.12	-9.00
1,125.00	2.83	251.48	1,124.55	7.59	-25.95	10.25	3.83	-1.12	-71.04
1,150.00	2.80	229.32	1,149.52	7.00	-26.99	9.77	4.33	-0.12	-88.64
1,175.00	3.01	214.60	1,174.49	6.06	-27.83	8.92	3.09	0.84	-58.88
1,200.00	3.00	214.69	1,199.45	4.98	-28.57	7.93	0.04	-0.04	0.36
1,225.00	3.08	216.68	1,224.42	3.90	-29.35	6.94	0.53	0.32	7.96
1,250.00	3.07	219.22	1,249.38	2.85	-30.17	5.97	0.55	-0.04	10.16
1,275.00	3.10	224.70	1,274.34	1.85	-31.07	5.07	1.19	0.12	21.92
1,300.00	2.93	231.55	1,299.31	0.97	-32.05	4.30	1.59	-0.68	27.40
1,325.00	2.27	245.55	1,324.28	0.37	-33.00	3.80	3.65	-2.64	56.00
1,350.00	1.47	275.67	1,349.27	0.19	-33.77	3.71	4.97	-3.20	120.48
1,375.00	1.11	306.94	1,374.26	0.37	-34.28	3.94	3.11	-1.44	125.08



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)
1,400.00	0.94	332.11	1,399.26	0.70	-34.57	4.29	1.91	-0.68	100.68
1,425.00	0.99	335.00	1,424.26	1.07	-34.76	4.69	0.28	0.20	11.56
1,450.00	1.04	331.92	1,449.25	1.47	-34.96	5.10	0.30	0.20	-12.32
1,475.00	1.16	332.88	1,474.25	1.90	-35.18	5.55	0.49	0.48	3.84
1,500.00	1.08	329.52	1,499.24	2.32	-35.41	6.00	0.41	-0.32	-13.44
1,525.00	1.20	324.89	1,524.24	2.74	-35.68	6.44	0.60	0.48	-18.52
1,550.00	1.18	324.97	1,549.23	3.17	-35.98	6.90	0.08	-0.08	0.32
1,575.00	1.08	323.12	1,574.23	3.56	-36.27	7.32	0.43	-0.40	-7.40
1,600.00	1.16	322.20	1,599.22	3.95	-36.57	7.74	0.33	0.32	-3.68
1,625.00	1.19	320.36	1,624.22	4.35	-36.89	8.17	0.19	0.12	-7.36
1,650.00	1.18	323.22	1,649.21	4.76	-37.21	8.61	0.24	-0.04	11.44
1,675.00	1.23	322.56	1,674.21	5.18	-37.52	9.06	0.21	0.20	-2.64
1,700.00	1.18	321.78	1,699.20	5.59	-37.85	9.51	0.21	-0.20	-3.12
1,725.00	1.22	322.84	1,724.20	6.01	-38.17	9.95	0.18	0.16	4.24
1,750.00	1.21	320.98	1,749.19	6.43	-38.49	10.40	0.16	-0.04	-7.44
1,775.00	1.24	320.12	1,774.19	6.84	-38.83	10.85	0.14	0.12	-3.44
1,800.00	1.26	315.20	1,799.18	7.24	-39.20	11.29	0.44	0.08	-19.68
1,825.00	1.21	313.84	1,824.17	7.62	-39.58	11.70	0.23	-0.20	-5.44
1,850.00	1.28	311.34	1,849.17	7.99	-39.98	12.11	0.35	0.28	-10.00
1,875.00	1.33	312.58	1,874.16	8.37	-40.41	12.53	0.23	0.20	4.96
1,900.00	1.34	310.80	1,899.15	8.75	-40.84	12.96	0.17	0.04	-7.12
1,925.00	1.29	309.44	1,924.15	9.12	-41.28	13.37	0.24	-0.20	-5.44
1,950.00	1.40	308.96	1,949.14	9.49	-41.74	13.79	0.44	0.44	-1.92
1,975.00	1.33	306.12	1,974.13	9.86	-42.21	14.20	0.39	-0.28	-11.36
2,000.00	1.33	305.31	1,999.13	10.20	-42.68	14.59	0.08	0.00	-3.24
2,025.00	1.43	304.80	2,024.12	10.54	-43.17	14.98	0.40	0.40	-2.04
2,050.00	1.56	305.28	2,049.11	10.92	-43.71	15.41	0.52	0.52	1.92
2,075.00	1.56	302.56	2,074.10	11.30	-44.27	15.85	0.30	0.00	-10.88
2,100.00	1.52	302.01	2,099.09	11.66	-44.84	16.26	0.17	-0.16	-2.20
2,125.00	1.61	302.43	2,124.08	12.02	-45.42	16.69	0.36	0.36	1.68
2,150.00	1.51	299.19	2,149.07	12.37	-46.00	17.09	0.53	-0.40	-12.96
2,175.00	1.39	305.46	2,174.07	12.70	-46.53	17.48	0.80	-0.48	25.08
2,200.00	1.31	313.69	2,199.06	13.08	-46.99	17.90	0.84	-0.32	32.92
2,225.00	0.92	329.44	2,224.05	13.45	-47.30	18.30	1.97	-1.56	63.00
2,250.00	0.80	346.44	2,249.05	13.79	-47.44	18.66	1.12	-0.48	68.00
2,275.00	0.88	358.75	2,274.05	14.15	-47.49	19.02	0.79	0.32	49.24
2,300.00	0.95	359.67	2,299.05	14.55	-47.49	19.42	0.29	0.28	3.68
2,325.00	0.96	7.74	2,324.04	14.97	-47.46	19.83	0.54	0.04	32.28
2,350.00	1.00	4.93	2,349.04	15.39	-47.42	20.25	0.25	0.16	-11.24
2,375.00	1.06	4.99	2,374.03	15.84	-47.38	20.69	0.24	0.24	0.24
2,400.00	1.01	15.30	2,399.03	16.28	-47.30	21.12	0.77	-0.20	41.24
2,425.00	1.04	30.15	2,424.03	16.69	-47.13	21.51	1.07	0.12	59.40
2,450.00	1.21	43.92	2,449.02	17.08	-46.83	21.86	1.27	0.68	55.08



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)
2,475.00	1.47	56.87	2,474.02	17.44	-46.38	22.18	1.59	1.04	51.80
2,500.00	1.80	73.15	2,499.01	17.73	-45.73	22.40	2.27	1.32	65.12
2,525.00	2.22	77.20	2,523.99	17.95	-44.89	22.53	1.77	1.68	16.20
2,550.00	2.58	85.60	2,548.97	18.10	-43.85	22.57	2.01	1.44	33.60
2,575.00	3.00	89.28	2,573.94	18.15	-42.64	22.50	1.83	1.68	14.72
2,600.00	3.25	88.85	2,598.90	18.18	-41.28	22.38	1.00	1.00	-1.72
2,625.00	3.42	90.10	2,623.86	18.19	-39.82	22.24	0.74	0.68	5.00
2,650.00	3.50	92.09	2,648.81	18.16	-38.31	22.05	0.58	0.32	7.96
2,675.00	3.45	90.33	2,673.77	18.13	-36.80	21.86	0.47	-0.20	-7.04
2,700.00	3.24	93.14	2,698.72	18.09	-35.34	21.67	1.07	-0.84	11.24
2,725.00	2.69	111.03	2,723.69	17.84	-34.09	21.29	4.28	-2.20	71.56
2,750.00	2.39	117.51	2,748.67	17.38	-33.08	20.74	1.66	-1.20	25.92
2,775.00	2.31	120.59	2,773.65	16.89	-32.18	20.15	0.60	-0.32	12.32
2,800.00	2.24	123.08	2,798.63	16.36	-31.34	19.54	0.48	-0.28	9.96
2,825.00	2.34	123.53	2,823.61	15.82	-30.50	18.91	0.41	0.40	1.80
2,850.00	2.30	123.13	2,848.59	15.26	-29.66	18.27	0.17	-0.16	-1.60
2,875.00	2.37	125.76	2,873.57	14.68	-28.82	17.61	0.51	0.28	10.52
2,900.00	2.36	124.61	2,898.54	14.09	-27.98	16.93	0.19	-0.04	-4.60
2,925.00	2.31	123.83	2,923.52	13.52	-27.13	16.27	0.24	-0.20	-3.12
2,950.00	2.27	122.40	2,948.50	12.97	-26.30	15.64	0.28	-0.16	-5.72
2,975.00	2.29	132.36	2,973.48	12.37	-25.51	14.96	1.58	0.08	39.84
3,000.00	1.92	143.19	2,998.47	11.70	-24.89	14.23	2.17	-1.48	43.32
3,025.00	2.09	153.12	3,023.45	10.95	-24.43	13.44	1.54	0.68	39.72
3,050.00	2.23	156.37	3,048.43	10.10	-24.03	12.55	0.74	0.56	13.00
3,075.00	1.93	165.83	3,073.42	9.25	-23.73	11.67	1.82	-1.20	37.84
3,100.00	2.41	172.95	3,098.40	8.32	-23.57	10.73	2.20	1.92	28.48
3,125.00	2.53	177.39	3,123.38	7.25	-23.48	9.65	0.90	0.48	17.76
3,150.00	2.61	183.12	3,148.35	6.13	-23.48	8.54	1.08	0.32	22.92
3,175.00	2.65	188.99	3,173.32	4.99	-23.60	7.42	1.09	0.16	23.48
3,200.00	3.06	205.35	3,198.29	3.81	-23.98	6.29	3.63	1.64	65.44
3,225.00	3.28	211.90	3,223.26	2.60	-24.64	5.16	1.69	0.88	26.20
3,250.00	3.92	222.47	3,248.21	1.37	-25.60	4.03	3.68	2.56	42.28
3,275.00	4.78	232.81	3,273.13	0.11	-27.00	2.92	4.64	3.44	41.36
3,300.00	5.08	237.75	3,298.04	-1.11	-28.77	1.89	2.08	1.20	19.76
3,325.00	5.15	236.45	3,322.94	-2.33	-30.64	0.88	0.54	0.28	-5.20
3,350.00	5.13	237.65	3,347.84	-3.54	-32.52	-0.14	0.44	-0.08	4.80
3,375.00	5.11	238.82	3,372.74	-4.72	-34.42	-1.11	0.43	-0.08	4.68
3,400.00	5.15	236.48	3,397.64	-5.91	-36.31	-2.10	0.85	0.16	-9.36
3,425.00	5.02	236.65	3,422.54	-7.13	-38.16	-3.12	0.52	-0.52	0.68
3,450.00	5.05	236.99	3,447.45	-8.34	-39.99	-4.12	0.17	0.12	1.36
3,475.00	5.03	236.41	3,472.35	-9.54	-41.83	-5.13	0.22	-0.08	-2.32
3,500.00	5.05	235.98	3,497.25	-10.76	-43.65	-6.16	0.17	0.08	-1.72
3,525.00	5.05	236.71	3,522.16	-11.98	-45.48	-7.18	0.26	0.00	2.92
3,550.00	5.13	237.86	3,547.06	-13.18	-47.35	-8.18	0.52	0.32	4.60



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)
3,575.00	5.17	246.71	3,571.96	-14.22	-49.33	-9.00	3.18	0.16	35.40
3,600.00	5.21	249.56	3,596.86	-15.06	-51.43	-9.62	1.04	0.16	11.40
3,625.00	5.27	250.98	3,621.75	-15.83	-53.58	-10.17	0.57	0.24	5.68
3,650.00	5.22	250.35	3,646.65	-16.59	-55.73	-10.69	0.31	-0.20	-2.52
3,675.00	5.19	249.21	3,671.54	-17.37	-57.86	-11.25	0.43	-0.12	-4.56
3,700.00	5.15	250.46	3,696.44	-18.15	-59.98	-11.80	0.48	-0.16	5.00
3,725.00	5.08	247.94	3,721.34	-18.94	-62.06	-12.37	0.94	-0.28	-10.08
3,750.00	5.12	246.36	3,746.24	-19.80	-64.11	-13.02	0.58	0.16	-6.32
3,775.00	5.07	247.14	3,771.14	-20.68	-66.15	-13.68	0.34	-0.20	3.12
3,800.00	5.10	246.72	3,796.05	-21.55	-68.19	-14.33	0.19	0.12	-1.68
3,825.00	5.17	246.34	3,820.95	-22.44	-70.24	-15.00	0.31	0.28	-1.52
3,850.00	5.19	246.89	3,845.84	-23.34	-72.31	-15.68	0.21	0.08	2.20
3,875.00	5.29	246.63	3,870.74	-24.24	-74.41	-16.35	0.41	0.40	-1.04
3,900.00	5.69	250.19	3,895.62	-25.11	-76.63	-16.99	2.10	1.60	14.24
3,925.00	6.60	255.26	3,920.48	-25.90	-79.19	-17.51	4.23	3.64	20.28
3,950.00	6.91	256.94	3,945.31	-26.61	-82.04	-17.91	1.47	1.24	6.72
3,975.00	6.96	257.00	3,970.12	-27.29	-84.98	-18.28	0.20	0.20	0.24
4,000.00	7.01	255.75	3,994.94	-28.00	-87.94	-18.69	0.64	0.20	-5.00
4,025.00	7.04	256.70	4,019.75	-28.73	-90.91	-19.10	0.48	0.12	3.80
4,050.00	7.09	257.17	4,044.56	-29.43	-93.90	-19.48	0.31	0.20	1.88
4,075.00	7.11	259.74	4,069.37	-30.04	-96.93	-19.78	1.27	0.08	10.28
4,100.00	7.13	266.00	4,094.18	-30.43	-100.00	-19.84	3.10	0.08	25.04
4,125.00	7.27	271.78	4,118.98	-30.49	-103.13	-19.58	2.95	0.56	23.12
4,150.00	7.37	273.48	4,143.78	-30.34	-106.31	-19.10	0.95	0.40	6.80
4,175.00	7.41	273.62	4,168.57	-30.14	-109.52	-18.57	0.18	0.16	0.56
4,200.00	7.36	272.60	4,193.36	-29.97	-112.73	-18.06	0.56	-0.20	-4.08
4,225.00	7.42	273.85	4,218.15	-29.79	-115.94	-17.54	0.69	0.24	5.00
4,250.00	7.26	272.67	4,242.95	-29.60	-119.13	-17.03	0.88	-0.64	-4.72
4,275.00	7.16	271.02	4,267.75	-29.50	-122.26	-16.60	0.92	-0.40	-6.60
4,300.00	7.18	271.22	4,292.56	-29.44	-125.38	-16.22	0.13	0.08	0.80
4,325.00	7.12	270.17	4,317.36	-29.40	-128.49	-15.86	0.58	-0.24	-4.20
4,350.00	7.07	271.10	4,342.17	-29.37	-131.58	-15.50	0.50	-0.20	3.72
4,375.00	6.72	272.56	4,366.99	-29.27	-134.58	-15.09	1.57	-1.40	5.84
4,400.00	6.23	274.34	4,391.83	-29.11	-137.39	-14.63	2.12	-1.96	7.12
4,425.00	6.02	274.29	4,416.69	-28.91	-140.05	-14.16	0.84	-0.84	-0.20
4,450.00	5.91	273.45	4,441.55	-28.73	-142.65	-13.71	0.56	-0.44	-3.36
4,475.00	5.88	273.25	4,466.42	-28.58	-145.21	-13.30	0.15	-0.12	-0.80
4,500.00	5.89	273.55	4,491.29	-28.43	-147.77	-12.88	0.13	0.04	1.20
4,525.00	5.77	272.06	4,516.16	-28.30	-150.30	-12.49	0.77	-0.48	-5.96
4,550.00	5.66	270.35	4,541.03	-28.25	-152.79	-12.18	0.81	-0.44	-6.84
4,575.00	5.74	271.96	4,565.91	-28.20	-155.28	-11.87	0.72	0.32	6.44
4,600.00	5.51	267.98	4,590.79	-28.20	-157.72	-11.61	1.81	-0.92	-15.92
4,625.00	5.47	267.49	4,615.68	-28.29	-160.11	-11.46	0.25	-0.16	-1.96



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)	
4,650.00	5.54	268.21	4,640.56	-28.38	-162.51	-11.30	0.39	0.28	2.88	
4,675.00	5.48	267.14	4,665.44	-28.48	-164.91	-11.15	0.48	-0.24	-4.28	
4,700.00	5.63	269.77	4,690.33	-28.55	-167.33	-10.96	1.18	0.60	10.52	
4,725.00	5.54	272.24	4,715.21	-28.50	-169.76	-10.66	1.03	-0.36	9.88	
4,750.00	5.75	273.36	4,740.09	-28.38	-172.22	-10.29	0.95	0.84	4.48	
4,775.00	5.87	273.98	4,764.96	-28.22	-174.74	-9.86	0.54	0.48	2.48	
4,800.00	5.74	271.65	4,789.83	-28.10	-177.27	-9.48	1.08	-0.52	-9.32	
4,825.00	5.82	273.75	4,814.70	-27.98	-179.78	-9.10	0.90	0.32	8.40	
4,850.00	5.79	272.82	4,839.58	-27.83	-182.31	-8.69	0.39	-0.12	-3.72	
4,875.00	5.80	272.45	4,864.45	-27.72	-184.83	-8.31	0.15	0.04	-1.48	
4,900.00	5.89	272.93	4,889.32	-27.60	-187.37	-7.93	0.41	0.36	1.92	
4,925.00	5.82	272.04	4,914.19	-27.49	-189.92	-7.55	0.46	-0.28	-3.56	
4,950.00	5.78	270.23	4,939.06	-27.44	-192.44	-7.24	0.75	-0.16	-7.24	
4,975.00	5.83	270.42	4,963.93	-27.42	-194.97	-6.96	0.21	0.20	0.76	
5,000.00	5.66	268.48	4,988.81	-27.45	-197.47	-6.72	1.03	-0.68	-7.76	
5,025.00	5.58	266.71	5,013.69	-27.55	-199.92	-6.57	0.76	-0.32	-7.08	
5,050.00	5.49	263.46	5,038.57	-27.75	-202.32	-6.52	1.30	-0.36	-13.00	
5,075.00	5.42	262.32	5,063.46	-28.05	-204.68	-6.57	0.52	-0.28	-4.56	
5,100.00	5.52	266.52	5,088.34	-28.28	-207.05	-6.55	1.65	0.40	16.80	
5,125.00	5.42	269.15	5,113.23	-28.37	-209.43	-6.40	1.08	-0.40	10.52	
5,150.00	5.41	271.19	5,138.12	-28.36	-211.79	-6.14	0.77	-0.04	8.16	
5,175.00	5.55	272.35	5,163.00	-28.29	-214.18	-5.82	0.71	0.56	4.64	
5,200.00	5.59	272.05	5,187.88	-28.19	-216.60	-5.48	0.20	0.16	-1.20	
5,225.00	5.46	270.43	5,212.77	-28.14	-219.01	-5.17	0.81	-0.52	-6.48	
5,250.00	5.61	271.17	5,237.65	-28.11	-221.42	-4.89	0.66	0.60	2.96	
5,275.00	5.56	269.09	5,262.53	-28.10	-223.85	-4.63	0.83	-0.20	-8.32	
5,300.00	5.68	269.64	5,287.41	-28.13	-226.30	-4.40	0.53	0.48	2.20	
5,325.00	5.68	268.92	5,312.29	-28.16	-228.77	-4.17	0.29	0.00	-2.88	
5,350.00	5.53	266.11	5,337.17	-28.27	-231.21	-4.02	1.25	-0.60	-11.24	
5,375.00	5.56	267.53	5,362.05	-28.40	-233.62	-3.91	0.56	0.12	5.68	
5,400.00	5.25	265.86	5,386.94	-28.53	-235.97	-3.80	1.39	-1.24	-6.68	
5,425.00	5.02	272.35	5,411.84	-28.57	-238.21	-3.60	2.50	-0.92	25.96	
5,450.00	4.92	282.59	5,436.75	-28.29	-240.35	-3.10	3.57	-0.40	40.96	
5,475.00	4.87	284.56	5,461.66	-27.79	-242.42	-2.39	0.70	-0.20	7.88	
5,500.00	4.83	284.39	5,486.57	-27.26	-244.47	-1.65	0.17	-0.16	-0.68	
5,525.00	4.93	285.69	5,511.48	-26.71	-246.52	-0.88	0.60	0.40	5.20	
5,550.00	4.95	285.38	5,536.38	-26.14	-248.59	-0.10	0.13	0.08	-1.24	
5,575.00	4.87	285.34	5,561.29	-25.57	-250.66	0.68	0.32	-0.32	-0.16	
5,600.00	4.78	283.24	5,586.20	-25.05	-252.70	1.41	0.79	-0.36	-8.40	
5,625.00	4.86	282.69	5,611.12	-24.58	-254.74	2.09	0.37	0.32	-2.20	
5,650.00	4.75	283.33	5,636.03	-24.11	-256.78	2.78	0.49	-0.44	2.56	
5,675.00	4.60	281.36	5,660.95	-23.67	-258.77	3.42	0.88	-0.60	-7.88	
5,700.00	4.63	281.27	5,685.86	-23.28	-260.75	4.01	0.12	0.12	-0.36	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,725.00	4.72	281.39	5,710.78	-22.88	-262.74	4.62	0.36	0.36	0.48	
5,750.00	4.58	278.21	5,735.70	-22.53	-264.74	5.17	1.17	-0.56	-12.72	
5,775.00	4.57	278.18	5,760.62	-22.25	-266.71	5.66	0.04	-0.04	-0.12	
5,800.00	4.66	279.26	5,785.54	-21.94	-268.70	6.17	0.50	0.36	4.32	
5,825.00	4.67	278.39	5,810.46	-21.63	-270.71	6.69	0.29	0.04	-3.48	
5,850.00	4.69	277.88	5,835.37	-21.34	-272.73	7.19	0.18	0.08	-2.04	
5,875.00	4.59	276.44	5,860.29	-21.09	-274.74	7.65	0.61	-0.40	-5.76	
5,900.00	4.52	276.55	5,885.21	-20.86	-276.71	8.08	0.28	-0.28	0.44	
5,925.00	4.43	275.55	5,910.13	-20.66	-278.65	8.48	0.48	-0.36	-4.00	
5,950.00	4.40	274.93	5,935.06	-20.48	-280.56	8.86	0.23	-0.12	-2.48	
5,975.00	4.44	274.98	5,959.99	-20.32	-282.48	9.22	0.16	0.16	0.20	
6,000.00	4.34	273.96	5,984.91	-20.17	-284.39	9.57	0.51	-0.40	-4.08	
6,025.00	4.24	273.94	6,009.84	-20.04	-286.26	9.89	0.40	-0.40	-0.08	
6,050.00	4.12	272.66	6,034.78	-19.93	-288.08	10.19	0.61	-0.48	-5.12	
6,075.00	4.04	271.03	6,059.71	-19.88	-289.85	10.43	0.56	-0.32	-6.52	
6,100.00	3.99	271.90	6,084.65	-19.83	-291.60	10.66	0.32	-0.20	3.48	
6,125.00	3.92	272.08	6,109.59	-19.77	-293.33	10.90	0.28	-0.28	0.72	
6,150.00	3.65	270.28	6,134.54	-19.74	-294.98	11.10	1.18	-1.08	-7.20	
6,175.00	3.48	266.08	6,159.49	-19.78	-296.53	11.22	1.25	-0.68	-16.80	
6,200.00	3.46	267.21	6,184.44	-19.87	-298.04	11.29	0.29	-0.08	4.52	
6,225.00	3.38	264.00	6,209.40	-19.99	-299.53	11.33	0.83	-0.32	-12.84	
6,250.00	3.41	263.39	6,234.36	-20.15	-301.00	11.32	0.19	0.12	-2.44	
6,254.00	3.48	266.63	6,238.35	-20.17	-301.24	11.32	5.17	1.75	81.00	
Tie In										
6,263.00	3.40	265.83	6,247.33	-20.21	-301.78	11.34	1.04	-0.89	-8.89	
First Phoenix MWD Survey										
6,358.00	3.33	261.06	6,342.17	-20.84	-307.31	11.29	0.30	-0.07	-5.02	
6,452.00	3.10	258.55	6,436.02	-21.77	-312.50	10.91	0.29	-0.24	-2.67	
6,546.00	2.96	252.82	6,529.89	-22.99	-317.31	10.19	0.35	-0.15	-6.10	
6,642.00	3.28	243.93	6,625.75	-24.93	-322.14	8.77	0.60	0.33	-9.26	
6,736.00	3.33	238.49	6,719.59	-27.54	-326.89	6.67	0.34	0.05	-5.79	
6,831.00	2.65	243.40	6,814.46	-29.96	-331.20	4.71	0.76	-0.72	5.17	
6,925.00	2.11	248.26	6,908.38	-31.58	-334.75	3.47	0.61	-0.57	5.17	
7,020.00	1.83	256.53	7,003.32	-32.58	-337.85	2.80	0.42	-0.29	8.71	
7,115.00	1.88	243.44	7,098.27	-33.63	-340.72	2.05	0.45	0.05	-13.78	
7,209.00	2.18	239.66	7,192.22	-35.22	-343.65	0.77	0.35	0.32	-4.02	
7,304.00	2.43	240.10	7,287.14	-37.14	-346.95	-0.79	0.26	0.26	0.46	
7,399.00	2.36	243.91	7,382.06	-39.00	-350.45	-2.28	0.18	-0.07	4.01	
7,494.00	2.27	230.34	7,476.98	-41.06	-353.66	-3.99	0.58	-0.09	-14.28	
7,589.00	2.21	213.68	7,571.91	-43.79	-356.12	-6.45	0.69	-0.06	-17.54	
7,683.00	2.59	182.73	7,665.83	-47.42	-357.23	-9.94	1.42	0.40	-32.93	
7,778.00	2.09	199.17	7,760.75	-51.20	-357.90	-13.63	0.88	-0.53	17.31	
7,873.00	1.84	248.35	7,855.70	-53.40	-359.89	-15.61	1.74	-0.26	51.77	
7,968.00	2.30	262.56	7,950.64	-54.21	-363.19	-16.07	0.72	0.48	14.96	



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)
8,063.00	4.89	264.93	8,045.44	-54.81	-369.12	-16.06	2.73	2.73	2.49
8,158.00	2.84	271.23	8,140.22	-55.12	-375.51	-15.70	2.20	-2.16	6.63
8,252.00	0.89	252.89	8,234.17	-55.28	-378.53	-15.55	2.14	-2.07	-19.51
8,347.00	0.63	248.09	8,329.16	-55.69	-379.72	-15.83	0.28	-0.27	-5.05
8,442.00	0.38	133.31	8,424.16	-56.11	-379.98	-16.21	0.91	-0.26	-120.82
8,536.00	0.45	103.40	8,518.16	-56.40	-379.39	-16.57	0.24	0.07	-31.82
8,631.00	0.38	222.15	8,613.16	-56.72	-379.24	-16.91	0.75	-0.07	125.00
8,727.00	1.32	247.66	8,709.14	-57.38	-380.48	-17.43	1.03	0.98	26.57
8,900.00	2.86	253.28	8,882.02	-59.38	-386.45	-18.80	0.90	0.89	3.25
8,995.00	2.90	252.17	8,976.90	-60.80	-391.01	-19.73	0.07	0.04	-1.17
9,089.00	2.84	255.63	9,070.79	-62.10	-395.53	-20.56	0.20	-0.06	3.68
9,185.00	2.73	255.75	9,166.67	-63.26	-400.05	-21.24	0.11	-0.11	0.13
9,279.00	2.56	253.79	9,260.57	-64.39	-404.23	-21.93	0.20	-0.18	-2.09
9,374.00	3.09	266.73	9,355.46	-65.13	-408.83	-22.19	0.87	0.56	13.62
9,421.00	4.87	269.83	9,402.34	-65.21	-412.09	-21.92	3.81	3.79	6.60
9,469.00	6.41	275.46	9,450.11	-64.96	-416.79	-21.19	3.41	3.21	11.73
9,516.00	10.57	304.90	9,496.60	-62.24	-422.95	-17.84	12.53	8.85	62.64
9,564.00	11.47	299.40	9,543.72	-57.38	-430.72	-12.20	2.88	1.88	-11.46
9,658.00	20.53	308.77	9,634.00	-42.44	-451.76	4.86	9.99	9.64	9.97
9,753.00	32.47	319.30	9,718.91	-12.55	-481.50	37.68	13.46	12.57	11.08
9,848.00	37.84	315.86	9,796.56	27.73	-518.45	81.59	6.02	5.65	-3.62
9,880.00	37.21	315.20	9,821.94	41.64	-532.10	96.85	2.34	-1.97	-2.06
9,911.00	37.23	317.04	9,846.63	55.15	-545.10	111.64	3.59	0.06	5.94
9,943.00	39.03	322.29	9,871.80	70.21	-557.86	127.95	11.58	5.63	16.41
9,993.00	39.92	324.20	9,910.40	95.68	-576.88	155.26	3.01	1.78	3.82
10,014.21	41.80	324.52	9,926.44	106.96	-584.96	167.32	8.90	8.84	1.53
FTP @ 10014.2' MD									
10,025.00	42.75	324.68	9,934.42	112.87	-589.17	173.64	8.90	8.85	1.44
10,056.00	45.64	327.60	9,956.65	130.82	-601.19	192.74	11.40	9.32	9.42
10,088.00	48.65	330.16	9,978.41	150.90	-613.30	213.98	11.08	9.41	8.00
10,119.00	53.40	331.91	9,997.91	171.99	-624.96	236.16	15.94	15.32	5.65
10,151.00	58.04	333.00	10,015.93	195.43	-637.17	260.75	14.77	14.50	3.41
10,183.00	62.22	334.29	10,031.86	220.29	-649.48	286.76	13.52	13.06	4.03
10,214.00	66.29	333.74	10,045.32	245.38	-661.72	312.99	13.23	13.13	-1.77
10,246.00	69.16	334.07	10,057.45	271.98	-674.74	340.79	9.02	8.97	1.03
10,277.00	71.81	333.94	10,067.81	298.24	-687.55	368.24	8.56	8.55	-0.42
10,373.00	82.40	333.86	10,089.20	382.15	-728.66	455.99	11.03	11.03	-0.08
10,436.00	91.15	337.21	10,092.74	439.34	-754.67	515.58	14.87	13.89	5.32
10,513.00	98.15	339.97	10,086.50	510.74	-782.67	589.50	9.77	9.09	3.58
10,608.00	98.07	345.94	10,073.09	600.62	-810.23	681.76	6.22	-0.08	6.28
10,703.00	99.05	345.69	10,058.95	691.69	-833.25	774.74	1.06	1.03	-0.26
10,798.00	100.39	345.15	10,042.91	782.31	-856.82	867.32	1.52	1.41	-0.57
10,892.00	101.36	347.42	10,025.17	871.98	-878.71	958.78	2.59	1.03	2.41



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)
10,986.00	100.42	350.04	10,007.41	962.50	-896.74	1,050.69	2.91	-1.00	2.79
11,081.00	99.42	352.14	9,991.04	1,054.95	-911.23	1,144.14	2.42	-1.05	2.21
11,176.00	96.02	353.58	9,978.28	1,148.34	-922.93	1,238.24	3.88	-3.58	1.52
11,271.00	89.80	355.77	9,973.46	1,242.76	-931.72	1,333.06	6.94	-6.55	2.31
11,365.00	88.21	355.39	9,975.09	1,336.46	-938.96	1,427.01	1.74	-1.69	-0.40
11,460.00	89.67	356.33	9,976.85	1,431.19	-945.82	1,521.94	1.83	1.54	0.99
11,554.00	89.98	356.20	9,977.14	1,524.99	-951.94	1,615.87	0.36	0.33	-0.14
11,650.00	90.77	356.06	9,976.51	1,620.77	-958.42	1,711.80	0.84	0.82	-0.15
11,744.00	90.69	356.30	9,975.31	1,714.55	-964.69	1,805.72	0.27	-0.09	0.26
11,839.00	86.94	354.23	9,977.28	1,809.19	-972.52	1,900.66	4.51	-3.95	-2.18
11,933.00	90.87	355.29	9,979.07	1,902.76	-981.10	1,994.62	4.33	4.18	1.13
12,029.00	93.04	359.40	9,975.80	1,998.57	-985.55	2,090.37	4.84	2.26	4.28
12,123.00	89.38	1.50	9,973.81	2,092.53	-984.81	2,183.74	4.49	-3.89	2.23
12,218.00	91.09	3.25	9,973.42	2,187.44	-980.87	2,277.72	2.58	1.80	1.84
12,313.00	88.33	0.40	9,973.90	2,282.37	-977.85	2,371.82	4.18	-2.91	-3.00
12,407.00	89.94	0.44	9,975.32	2,376.35	-977.16	2,465.22	1.71	1.71	0.04
12,501.00	88.55	0.00	9,976.56	2,470.34	-976.80	2,558.66	1.55	-1.48	-0.47
12,597.00	89.78	0.68	9,977.96	2,566.33	-976.23	2,654.07	1.46	1.28	0.71
12,692.00	91.23	0.62	9,977.12	2,661.31	-975.15	2,748.42	1.53	1.53	-0.06
12,787.00	89.60	359.09	9,976.43	2,756.31	-975.39	2,842.92	2.35	-1.72	-1.61
12,881.00	88.15	358.85	9,978.28	2,850.27	-977.08	2,936.55	1.56	-1.54	-0.26
12,976.00	89.34	359.06	9,980.36	2,945.23	-978.81	3,031.18	1.27	1.25	0.22
13,071.00	86.00	357.86	9,984.22	3,040.10	-981.36	3,125.80	3.74	-3.52	-1.26
13,166.00	89.32	357.21	9,988.10	3,134.92	-985.44	3,220.53	3.56	3.49	-0.68
13,261.00	90.25	356.52	9,988.46	3,229.78	-990.64	3,315.41	1.22	0.98	-0.73
13,356.00	89.46	356.67	9,988.70	3,324.61	-996.28	3,410.31	0.85	-0.83	0.16
13,452.00	93.21	357.29	9,986.46	3,420.43	-1,001.34	3,506.14	3.96	3.91	0.65
13,547.00	91.38	357.13	9,982.66	3,515.24	-1,005.96	3,600.91	1.93	-1.93	-0.17
13,642.00	90.64	358.13	9,980.98	3,610.14	-1,009.89	3,695.71	1.31	-0.78	1.05
13,737.00	89.55	357.94	9,980.83	3,705.08	-1,013.14	3,790.47	1.16	-1.15	-0.20
13,832.00	88.61	357.32	9,982.35	3,799.99	-1,017.07	3,885.27	1.19	-0.99	-0.65
13,926.00	89.28	357.18	9,984.08	3,893.86	-1,021.58	3,979.10	0.73	0.71	-0.15
14,021.00	88.89	357.10	9,985.60	3,988.73	-1,026.32	4,073.95	0.42	-0.41	-0.08
14,116.00	90.52	357.19	9,986.09	4,083.61	-1,031.05	4,168.80	1.72	1.72	0.09
14,211.00	91.05	357.03	9,984.79	4,178.48	-1,035.84	4,263.66	0.58	0.56	-0.17
14,306.00	91.23	356.77	9,982.90	4,273.32	-1,040.98	4,358.52	0.33	0.19	-0.27
14,401.00	93.58	359.96	9,978.91	4,368.18	-1,043.69	4,453.14	4.17	2.47	3.36
14,496.00	92.99	1.41	9,973.47	4,463.01	-1,042.55	4,547.34	1.65	-0.62	1.53
14,591.00	92.72	1.20	9,968.73	4,557.87	-1,040.39	4,641.46	0.36	-0.28	-0.22
14,686.00	92.89	1.80	9,964.08	4,652.72	-1,037.91	4,735.54	0.66	0.18	0.63
14,781.00	89.41	0.86	9,962.18	4,747.66	-1,035.70	4,829.73	3.79	-3.66	-0.99
14,876.00	88.79	0.28	9,963.67	4,842.65	-1,034.76	4,924.10	0.89	-0.65	-0.61
14,972.00	86.49	359.35	9,967.62	4,938.56	-1,035.07	5,019.52	2.58	-2.40	-0.97
15,067.00	85.42	359.29	9,974.32	5,033.31	-1,036.19	5,113.87	1.13	-1.13	-0.06



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)
15,162.00	85.70	359.09	9,981.68	5,128.02	-1,037.53	5,208.20	0.36	0.29	-0.21
15,257.00	88.25	357.71	9,986.69	5,222.84	-1,040.18	5,302.78	3.05	2.68	-1.45
15,352.00	90.50	359.27	9,987.73	5,317.79	-1,042.69	5,397.48	2.88	2.37	1.64
15,447.00	92.67	0.20	9,985.10	5,412.75	-1,043.12	5,491.97	2.48	2.28	0.98
15,542.00	93.48	0.36	9,980.00	5,507.61	-1,042.66	5,586.26	0.87	0.85	0.17
15,637.00	91.65	0.56	9,975.75	5,602.51	-1,041.90	5,680.56	1.94	-1.93	0.21
15,732.00	89.49	1.54	9,974.81	5,697.48	-1,040.16	5,774.84	2.50	-2.27	1.03
15,827.00	88.77	1.86	9,976.25	5,792.42	-1,037.34	5,868.98	0.83	-0.76	0.34
15,922.00	92.08	2.13	9,975.55	5,887.35	-1,034.03	5,963.04	3.50	3.48	0.28
16,017.00	92.61	3.13	9,971.66	5,982.17	-1,029.68	6,056.89	1.19	0.56	1.05
16,112.00	91.29	2.85	9,968.43	6,076.98	-1,024.73	6,150.67	1.42	-1.39	-0.29
16,206.00	90.82	2.92	9,966.70	6,170.85	-1,020.00	6,243.53	0.51	-0.50	0.07
16,302.00	91.08	3.11	9,965.10	6,266.70	-1,014.95	6,338.34	0.34	0.27	0.20
16,398.00	89.88	1.74	9,964.30	6,362.61	-1,010.89	6,433.30	1.90	-1.25	-1.43
16,493.00	89.24	0.30	9,965.03	6,457.59	-1,009.19	6,527.59	1.66	-0.67	-1.52
16,588.00	88.72	0.49	9,966.72	6,552.57	-1,008.54	6,621.98	0.58	-0.55	0.20
16,684.00	88.52	0.70	9,969.03	6,648.54	-1,007.54	6,717.33	0.30	-0.21	0.22
16,779.00	88.74	0.40	9,971.30	6,743.51	-1,006.63	6,811.68	0.39	0.23	-0.32
16,874.00	88.77	0.14	9,973.37	6,838.48	-1,006.18	6,906.09	0.28	0.03	-0.27
16,969.00	87.99	0.37	9,976.05	6,933.44	-1,005.76	7,000.49	0.86	-0.82	0.24
17,063.00	88.42	358.75	9,979.00	7,027.39	-1,006.48	7,094.01	1.78	0.46	-1.72
17,158.00	90.01	357.23	9,980.30	7,122.32	-1,009.81	7,188.76	2.32	1.67	-1.60
17,252.00	89.73	357.40	9,980.51	7,216.21	-1,014.22	7,282.61	0.35	-0.30	0.18
17,347.00	92.92	357.79	9,978.32	7,311.09	-1,018.20	7,377.38	3.38	3.36	0.41
17,442.00	93.51	357.54	9,972.99	7,405.86	-1,022.07	7,472.04	0.67	0.62	-0.26
17,537.00	92.71	356.83	9,967.83	7,500.61	-1,026.73	7,566.76	1.13	-0.84	-0.75
17,632.00	90.94	355.63	9,964.81	7,595.35	-1,032.97	7,661.63	2.25	-1.86	-1.26
17,727.00	92.07	355.82	9,962.31	7,690.05	-1,040.05	7,756.56	1.21	1.19	0.20
17,822.00	93.15	358.74	9,957.99	7,784.83	-1,044.55	7,851.29	3.27	1.14	3.07
17,916.00	93.99	359.10	9,952.13	7,878.63	-1,046.32	7,944.77	0.97	0.89	0.38
18,012.00	94.36	359.56	9,945.14	7,974.37	-1,047.44	8,040.10	0.61	0.39	0.48
18,107.00	91.60	359.97	9,940.21	8,069.23	-1,047.83	8,134.49	2.94	-2.91	0.43
18,202.00	89.35	358.15	9,939.42	8,164.21	-1,049.39	8,229.11	3.05	-2.37	-1.92
18,296.00	89.54	357.92	9,940.33	8,258.15	-1,052.61	8,322.87	0.32	0.20	-0.24
18,391.00	89.08	357.63	9,941.47	8,353.07	-1,056.30	8,417.66	0.57	-0.48	-0.31
18,485.00	88.98	357.34	9,943.06	8,446.96	-1,060.42	8,511.47	0.33	-0.11	-0.31
18,580.00	88.83	357.17	9,944.88	8,541.84	-1,064.97	8,606.30	0.24	-0.16	-0.18
18,673.00	88.74	357.13	9,946.85	8,634.70	-1,069.60	8,699.15	0.11	-0.10	-0.04
18,767.00	88.01	356.53	9,949.52	8,728.52	-1,074.79	8,792.99	1.01	-0.78	-0.64
18,862.00	90.15	357.80	9,951.04	8,823.38	-1,079.49	8,887.83	2.62	2.25	1.34
18,957.00	88.61	356.94	9,952.07	8,918.27	-1,083.85	8,982.66	1.86	-1.62	-0.91
19,052.00	91.10	358.57	9,952.31	9,013.19	-1,087.57	9,077.45	3.13	2.62	1.72
19,146.00	92.10	358.35	9,949.69	9,107.12	-1,090.09	9,171.13	1.09	1.06	-0.23



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2938.80usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2938.80usft (Pioneer 84)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 66457	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)	
19,241.00	93.08	359.85	9,945.39	9,202.00	-1,091.58	9,265.65	1.88	1.03	1.58	
19,336.00	94.19	0.35	9,939.37	9,296.81	-1,091.42	9,359.93	1.28	1.17	0.53	
19,431.00	94.02	0.73	9,932.57	9,391.56	-1,090.53	9,454.07	0.44	-0.18	0.40	
19,526.00	91.29	1.42	9,928.17	9,486.43	-1,088.75	9,548.24	2.96	-2.87	0.73	
19,621.00	90.59	0.99	9,926.61	9,581.40	-1,086.75	9,642.48	0.86	-0.74	-0.45	
19,716.00	88.52	359.38	9,927.35	9,676.39	-1,086.44	9,736.92	2.76	-2.18	-1.69	
19,811.00	88.67	0.16	9,929.68	9,771.36	-1,086.82	9,831.41	0.84	0.16	0.82	
19,905.00	88.31	359.98	9,932.16	9,865.33	-1,086.71	9,924.86	0.43	-0.38	-0.19	
20,000.00	88.59	0.66	9,934.73	9,960.29	-1,086.18	10,019.25	0.77	0.29	0.72	
20,094.00	88.85	0.79	9,936.83	10,054.26	-1,084.99	10,112.58	0.31	0.28	0.14	
20,144.13	89.79	2.07	9,937.42	10,104.37	-1,083.74	10,162.29	3.16	1.87	2.55	
LTP @ 20144.1' MD										
20,189.00	90.63	3.21	9,937.26	10,149.19	-1,081.67	10,206.65	3.16	1.87	2.55	
20,214.00	90.76	3.12	9,936.95	10,174.15	-1,080.29	10,231.33	0.63	0.52	-0.36	
Final Phoenix MWD Survey										
20,272.00	90.76	3.12	9,936.18	10,232.06	-1,077.14	10,288.59	0.00	0.00	0.00	
Projection @ TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
6,254.00	6,238.35	-20.17	-301.24	Tie In	
6,263.00	6,247.33	-20.21	-301.78	First Phoenix MWD Survey	
10,014.21	9,926.44	106.96	-584.96	FTP @ 10014.2' MD	
20,144.13	9,937.42	10,104.37	-1,083.74	LTP @ 20144.1' MD	
20,214.00	9,936.95	10,174.15	-1,080.29	Final Phoenix MWD Survey	
20,272.00	9,936.18	10,232.06	-1,077.14	Projection @ TD	

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1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 16082

CONDITIONS OF APPROVAL

Operator:	COG OPERATING LLC	600 W Illinois Ave	Midland, TX79701	OGRID:	229137	Action Number:	16082	Action Type:	C-104C
OCD Reviewer									Condition
abustamante									None