



PHOENIX
TECHNOLOGY SERVICES

COG Operating LLC

Lea County, NM (NAD27 NME)
Fez Federal Com
703H

OH / 64151

Design: Surveys (Precision 595)

Standard Survey Report

23 April, 2019

HOBBS OCD

JAN 15 2020

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Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Site:	Fez Federal Com	MD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 64151	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 595)	Database:	USA Compass

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

Site		Fez Federal Com			
Site Position:		Northing:	415,342.20 usft	Latitude:	32° 8' 17.8100 N
From:	Map	Easting:	795,972.50 usft	Longitude:	103° 22' 37.7348 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.51 °

Well	703H					
Well Position	+N/-S	0.00 usft	Northing:	415,342.50 usft	Latitude:	32° 8' 17.8103 N
	+E/-W	0.00 usft	Easting:	796,002.60 usft	Longitude:	103° 22' 37.3848 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,250.60 usft	

Wellbore	OH / 64151				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	2/23/2019	6.64	59.79	47,793.78380606

Design	Surveys (Precision 595)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	0.85	

Survey Program	Date 4/23/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	11,500.06	SDI Gyros (OH / 64151)	NS-GYRO-MS	North sensing gyrocompassing m/s
11,692.00	22,595.00	Phoenix MWD Surveys (Post Gyros) (OH	MWD+HRGM	OWSG MWD + HRGM

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	0.57	260.71	100.00	-0.08	-0.49	-0.09	0.57	0.57	0.00
124.08	0.55	267.91	124.08	-0.10	-0.72	-0.11	0.30	-0.08	29.90
147.61	0.45	275.62	147.61	-0.10	-0.93	-0.11	0.51	-0.42	32.77
171.78	0.51	271.26	171.78	-0.09	-1.13	-0.10	0.29	0.25	-18.04
197.54	0.58	267.19	197.53	-0.09	-1.38	-0.11	0.31	0.27	-15.80
222.93	0.66	271.75	222.92	-0.09	-1.65	-0.12	0.37	0.32	17.96
247.80	0.75	263.81	247.79	-0.11	-1.96	-0.14	0.53	0.36	-31.93
273.54	0.71	263.91	273.53	-0.14	-2.28	-0.17	0.16	-0.16	0.39
299.03	0.68	267.69	299.02	-0.16	-2.59	-0.20	0.21	-0.12	14.83



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Wellbore: OH / 64151
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
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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)
323.89	0.72	262.81	323.88	-0.19	-2.89	-0.23	0.29	0.16	-19.63
349.61	0.76	266.96	349.59	-0.22	-3.22	-0.27	0.26	0.16	16.14
375.10	0.85	270.08	375.08	-0.23	-3.58	-0.28	0.39	0.35	12.24
399.92	1.08	275.62	399.90	-0.20	-4.00	-0.26	1.00	0.93	22.32
421.41	1.14	271.28	421.38	-0.18	-4.41	-0.24	0.48	0.28	-20.20
446.58	1.15	269.47	446.55	-0.18	-4.92	-0.25	0.15	0.04	-7.19
474.93	1.16	267.23	474.89	-0.19	-5.49	-0.27	0.16	0.04	-7.90
500.04	1.31	268.90	500.00	-0.21	-6.03	-0.30	0.61	0.60	6.65
524.91	1.39	270.31	524.86	-0.21	-6.61	-0.31	0.35	0.32	5.67
549.17	1.45	271.64	549.11	-0.20	-7.21	-0.31	0.28	0.25	5.48
574.14	1.56	274.87	574.07	-0.17	-7.87	-0.28	0.56	0.44	12.94
599.10	1.74	273.27	599.02	-0.12	-8.59	-0.24	0.74	0.72	-6.41
623.32	1.75	270.56	623.23	-0.09	-9.32	-0.23	0.34	0.04	-11.19
648.41	1.70	271.36	648.31	-0.08	-10.08	-0.23	0.22	-0.20	3.19
673.07	1.70	272.18	672.96	-0.06	-10.81	-0.22	0.10	0.00	3.33
697.25	1.68	275.78	697.13	-0.01	-11.52	-0.18	0.45	-0.08	14.89
722.28	1.61	273.32	722.15	0.05	-12.24	-0.13	0.40	-0.28	-9.83
747.20	1.63	274.60	747.06	0.10	-12.94	-0.09	0.17	0.08	5.14
771.26	1.57	267.47	771.11	0.11	-13.61	-0.09	0.86	-0.25	-29.63
796.27	1.16	260.96	796.11	0.06	-14.20	-0.15	1.75	-1.64	-26.03
821.16	0.90	254.44	821.00	-0.03	-14.64	-0.25	1.14	-1.04	-26.20
849.15	0.88	248.64	848.98	-0.17	-15.05	-0.39	0.33	-0.07	-20.72
874.02	0.73	245.56	873.85	-0.31	-15.37	-0.53	0.63	-0.60	-12.38
899.14	0.70	249.69	898.97	-0.43	-15.66	-0.66	0.24	-0.12	16.44
923.06	0.70	253.76	922.89	-0.52	-15.94	-0.75	0.21	0.00	17.02
948.04	0.56	245.10	947.87	-0.61	-16.20	-0.85	0.68	-0.56	-34.67
972.91	0.27	236.44	972.74	-0.70	-16.36	-0.94	1.19	-1.17	-34.82
996.93	0.33	247.17	996.76	-0.75	-16.47	-1.00	0.34	0.25	44.67
1,021.91	0.19	215.25	1,021.74	-0.82	-16.56	-1.06	0.79	-0.56	-127.78
1,046.88	0.19	202.62	1,046.71	-0.89	-16.60	-1.13	0.17	0.00	-50.58
1,070.78	0.16	181.18	1,070.61	-0.96	-16.61	-1.20	0.30	-0.13	-89.71
1,099.71	0.17	219.11	1,099.54	-1.03	-16.64	-1.28	0.37	0.03	131.11
1,124.65	0.17	166.45	1,124.48	-1.10	-16.66	-1.34	0.60	0.00	-211.15
1,149.57	0.09	134.85	1,149.40	-1.15	-16.63	-1.39	0.42	-0.32	-126.81
1,172.96	0.09	160.00	1,172.79	-1.18	-16.61	-1.42	0.17	0.00	107.52
1,197.35	0.10	164.23	1,197.18	-1.21	-16.60	-1.46	0.05	0.04	17.34
1,221.73	0.16	176.63	1,221.56	-1.27	-16.59	-1.51	0.27	0.25	50.86
1,249.13	0.14	167.81	1,248.96	-1.34	-16.58	-1.58	0.11	-0.07	-32.19
1,273.26	0.19	178.62	1,273.09	-1.41	-16.58	-1.65	0.24	0.21	44.80
1,297.61	0.33	137.74	1,297.43	-1.50	-16.53	-1.74	0.92	0.57	-167.89
1,321.12	0.38	136.18	1,320.94	-1.61	-16.43	-1.85	0.22	0.21	-6.64
1,349.17	1.35	118.23	1,348.99	-1.83	-16.07	-2.07	3.55	3.46	-63.99
1,373.48	1.95	119.59	1,373.29	-2.17	-15.46	-2.40	2.47	2.47	5.59

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Survey

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1,398.36	2.84	118.54	1,398.15	-2.67	-14.55	-2.89	3.58	3.58	-4.22
1,421.85	3.25	114.93	1,421.61	-3.23	-13.44	-3.43	1.93	1.75	-15.37
1,449.97	4.07	114.16	1,449.67	-3.98	-11.80	-4.15	2.92	2.92	-2.74
1,473.34	4.88	110.67	1,472.97	-4.67	-10.12	-4.82	3.66	3.47	-14.93
1,496.79	5.15	110.14	1,496.33	-5.38	-8.20	-5.50	1.17	1.15	-2.26
1,524.26	5.80	107.97	1,523.67	-6.23	-5.72	-6.32	2.48	2.37	-7.90
1,546.11	5.82	110.50	1,545.41	-6.96	-3.63	-7.02	1.18	0.09	11.58
1,572.60	5.95	109.27	1,571.76	-7.89	-1.08	-7.90	0.68	0.49	-4.64
1,598.21	5.92	109.64	1,597.23	-8.77	1.42	-8.75	0.19	-0.12	1.44
1,624.45	5.99	109.34	1,623.33	-9.68	3.99	-9.62	0.29	0.27	-1.14
1,645.73	6.02	111.04	1,644.49	-10.45	6.08	-10.35	0.85	0.14	7.99
1,672.20	6.12	109.96	1,670.82	-11.43	8.70	-11.30	0.57	0.38	-4.08
1,698.54	6.11	109.95	1,697.01	-12.38	11.34	-12.21	0.04	-0.04	-0.04
1,724.11	6.23	110.12	1,722.43	-13.32	13.92	-13.12	0.47	0.47	0.66
1,746.26	6.34	111.80	1,744.44	-14.19	16.18	-13.95	0.97	0.50	7.58
1,773.99	6.52	113.26	1,772.00	-15.38	19.05	-15.10	0.88	0.65	5.27
1,798.67	6.86	118.83	1,796.51	-16.65	21.63	-16.33	2.97	1.38	22.57
1,820.94	6.90	119.47	1,818.62	-17.95	23.96	-17.59	0.39	0.18	2.87
1,847.22	7.06	122.46	1,844.71	-19.59	26.69	-19.19	1.51	0.61	11.38
1,872.00	7.01	123.16	1,869.30	-21.23	29.25	-20.80	0.40	-0.20	2.82
1,897.95	7.13	122.27	1,895.05	-22.96	31.93	-22.49	0.63	0.46	-3.43
1,923.65	7.03	123.06	1,920.56	-24.67	34.60	-24.16	0.54	-0.39	3.07
1,948.59	7.07	123.11	1,945.31	-26.34	37.16	-25.79	0.16	0.16	0.20
1,974.53	7.03	126.43	1,971.05	-28.15	39.78	-27.56	1.58	-0.15	12.80
1,999.98	6.85	129.89	1,996.32	-30.05	42.20	-29.43	1.79	-0.71	13.60
2,022.43	6.46	135.90	2,018.62	-31.82	44.10	-31.16	3.55	-1.74	26.77
2,047.36	6.52	137.25	2,043.39	-33.87	46.04	-33.18	0.66	0.24	5.42
2,072.91	6.50	137.85	2,068.77	-36.00	47.99	-35.29	0.28	-0.08	2.35
2,098.46	6.55	138.86	2,094.16	-38.17	49.92	-37.43	0.49	0.20	3.95
2,123.62	6.65	138.75	2,119.15	-40.35	51.83	-39.58	0.40	0.40	-0.44
2,149.16	6.43	139.83	2,144.52	-42.55	53.73	-41.75	0.99	-0.86	4.23
2,170.00	6.64	139.31	2,165.23	-44.36	55.26	-43.54	1.05	1.01	-2.50
2,195.65	6.63	139.23	2,190.71	-46.60	57.20	-45.75	0.05	-0.04	-0.31
2,221.43	6.71	140.58	2,216.31	-48.89	59.13	-48.02	0.68	0.31	5.24
2,246.21	6.51	143.37	2,240.93	-51.14	60.88	-50.24	1.53	-0.81	11.26
2,271.84	6.66	143.70	2,266.39	-53.50	62.63	-52.57	0.60	0.59	1.29
2,297.60	6.56	144.71	2,291.98	-55.91	64.36	-54.95	0.60	-0.39	3.92
2,322.39	6.47	145.99	2,316.61	-58.22	65.96	-57.24	0.69	-0.36	5.16
2,348.03	6.56	144.87	2,342.08	-60.62	67.61	-59.61	0.61	0.35	-4.37
2,373.79	6.51	145.56	2,367.67	-63.03	69.29	-62.00	0.36	-0.19	2.68
2,398.56	6.59	145.32	2,392.28	-65.35	70.89	-64.30	0.34	0.32	-0.97
2,424.20	6.14	145.32	2,417.76	-67.69	72.51	-66.61	1.76	-1.76	0.00
2,449.96	5.97	145.81	2,443.38	-69.93	74.04	-68.83	0.69	-0.66	1.90

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2,474.73	5.79	144.77	2,468.02	-72.02	75.49	-70.89	0.84	-0.73	-4.20
2,496.30	5.77	144.40	2,489.48	-73.79	76.75	-72.65	0.20	-0.09	-1.72
2,522.02	5.79	144.87	2,515.07	-75.90	78.25	-74.74	0.20	0.08	1.83
2,546.47	5.75	145.35	2,539.39	-77.92	79.65	-76.73	0.26	-0.16	1.96
2,571.66	5.79	144.96	2,564.46	-79.99	81.10	-78.79	0.22	0.16	-1.55
2,596.80	5.76	145.03	2,589.47	-82.07	82.55	-80.84	0.12	-0.12	0.28
2,625.06	5.77	144.76	2,617.59	-84.39	84.18	-83.14	0.10	0.04	-0.96
2,649.69	5.73	144.20	2,642.09	-86.40	85.62	-85.12	0.28	-0.16	-2.27
2,674.92	5.74	144.17	2,667.20	-88.44	87.09	-87.15	0.04	0.04	-0.12
2,699.31	4.68	143.80	2,691.49	-90.23	88.39	-88.92	4.35	-4.35	-1.52
2,724.17	4.60	143.92	2,716.26	-91.86	89.58	-90.52	0.32	-0.32	0.48
2,749.25	4.47	143.00	2,741.27	-93.45	90.76	-92.10	0.59	-0.52	-3.67
2,773.49	4.47	141.46	2,765.43	-94.94	91.92	-93.58	0.50	0.00	-6.35
2,798.32	4.44	142.82	2,790.19	-96.47	93.10	-95.08	0.44	-0.12	5.48
2,823.37	4.57	140.41	2,815.16	-98.01	94.32	-96.60	0.92	0.52	-9.62
2,847.60	4.60	139.47	2,839.31	-99.49	95.57	-98.07	0.33	0.12	-3.88
2,872.43	4.78	132.91	2,864.06	-100.95	96.97	-99.51	2.28	0.72	-26.42
2,897.48	4.89	132.48	2,889.02	-102.38	98.53	-100.92	0.46	0.44	-1.72
2,921.68	4.99	129.41	2,913.13	-103.75	100.10	-102.26	1.17	0.41	-12.69
2,946.48	5.04	129.80	2,937.83	-105.13	101.77	-103.62	0.24	0.20	1.57
2,971.51	5.05	129.57	2,962.77	-106.54	103.46	-105.00	0.09	0.04	-0.92
2,995.70	5.12	126.85	2,986.86	-107.86	105.15	-106.30	1.04	0.29	-11.24
3,024.68	5.15	126.24	3,015.73	-109.41	107.23	-107.81	0.21	0.10	-2.10
3,049.21	5.22	125.93	3,040.16	-110.71	109.02	-109.09	0.31	0.29	-1.26
3,074.35	5.25	126.10	3,065.19	-112.06	110.88	-110.41	0.13	0.12	0.68
3,098.63	5.32	123.52	3,089.37	-113.34	112.72	-111.66	1.02	0.29	-10.63
3,123.40	5.38	122.29	3,114.03	-114.59	114.65	-112.88	0.52	0.24	-4.97
3,148.40	5.48	122.12	3,138.92	-115.85	116.66	-114.12	0.41	0.40	-0.68
3,172.57	5.52	122.44	3,162.98	-117.09	118.61	-115.32	0.21	0.17	1.32
3,197.32	5.62	120.09	3,187.61	-118.33	120.67	-116.54	1.01	0.40	-9.49
3,222.15	5.48	120.53	3,212.32	-119.55	122.74	-117.72	0.59	-0.56	1.77
3,249.70	5.71	118.89	3,239.74	-120.88	125.07	-119.02	1.02	0.83	-5.95
3,273.87	5.64	119.82	3,263.79	-122.05	127.16	-120.16	0.48	-0.29	3.85
3,298.15	5.70	119.68	3,287.95	-123.24	129.24	-121.32	0.25	0.25	-0.58
3,321.84	5.82	118.89	3,311.52	-124.40	131.31	-122.45	0.61	0.51	-3.33
3,346.11	5.84	120.19	3,335.67	-125.62	133.46	-123.63	0.55	0.08	5.36
3,374.32	5.93	122.03	3,363.73	-127.11	135.93	-125.09	0.74	0.32	6.52
3,397.89	6.30	125.75	3,387.17	-128.51	138.02	-126.46	2.30	1.57	15.78
3,422.26	6.70	130.08	3,411.38	-130.21	140.19	-128.12	2.59	1.64	17.77
3,446.39	6.83	129.93	3,435.34	-132.04	142.37	-129.92	0.54	0.54	-0.62
3,473.79	6.86	131.25	3,462.55	-134.16	144.85	-132.01	0.58	0.11	4.82
3,497.93	6.70	131.34	3,486.52	-136.04	146.99	-133.86	0.66	-0.66	0.37
3,522.17	6.87	131.46	3,510.59	-137.94	149.14	-135.72	0.70	0.70	0.50
3,545.49	6.88	129.26	3,533.74	-139.74	151.26	-137.49	1.13	0.04	-9.43



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Site:	Fez Federal Com	MD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 64151	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 595)	Database:	USA Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
3,571.42	6.80	130.57	3,559.49	-141.72	153.63	-139.44	0.68	-0.31	5.05
3,597.46	6.58	131.24	3,585.35	-143.71	155.92	-141.39	0.90	-0.84	2.57
3,622.63	6.60	130.97	3,610.35	-145.61	158.10	-143.26	0.15	0.08	-1.07
3,648.78	6.64	130.89	3,636.33	-147.58	160.38	-145.20	0.16	0.15	-0.31
3,674.83	6.55	130.88	3,662.21	-149.54	162.64	-147.12	0.35	-0.35	-0.04
3,699.99	6.70	129.89	3,687.20	-151.42	164.85	-148.97	0.75	0.60	-3.93
3,722.02	6.67	130.45	3,709.08	-153.08	166.81	-150.60	0.33	-0.14	2.54
3,747.92	6.66	130.17	3,734.80	-155.02	169.10	-152.51	0.13	-0.04	-1.08
3,773.20	6.57	130.34	3,759.91	-156.90	171.33	-154.36	0.36	-0.36	0.67
3,799.36	6.86	131.71	3,785.90	-158.91	173.63	-156.33	1.27	1.11	5.24
3,821.02	6.88	132.59	3,807.40	-160.65	175.55	-158.04	0.49	0.09	4.06
3,846.43	6.96	135.92	3,832.62	-162.79	177.74	-160.14	1.61	0.31	13.11
3,872.43	7.05	138.81	3,858.43	-165.12	179.89	-162.44	1.40	0.35	11.12
3,897.75	7.09	139.18	3,883.56	-167.47	181.94	-164.77	0.24	0.16	1.46
3,922.70	7.20	138.13	3,908.31	-169.80	183.99	-167.06	0.68	0.44	-4.21
3,948.10	7.15	138.97	3,933.52	-172.18	186.09	-169.41	0.46	-0.20	3.31
3,973.36	7.22	139.14	3,958.58	-174.57	188.16	-171.77	0.29	0.28	0.67
3,998.26	7.31	139.09	3,983.28	-176.95	190.22	-174.12	0.36	0.36	-0.20
4,023.50	7.19	138.81	4,008.32	-179.35	192.31	-176.49	0.50	-0.48	-1.11
4,048.75	7.19	139.04	4,033.37	-181.73	194.39	-178.84	0.11	0.00	0.91
4,073.63	7.17	139.32	4,058.05	-184.08	196.42	-181.16	0.16	-0.08	1.13
4,098.87	7.21	138.87	4,083.09	-186.47	198.49	-183.52	0.27	0.16	-1.78
4,124.10	7.17	140.85	4,108.12	-188.88	200.52	-185.90	0.99	-0.16	7.85
4,148.83	6.45	140.61	4,132.68	-191.16	202.38	-188.14	2.91	-2.91	-0.97
4,174.17	6.43	140.99	4,157.86	-193.36	204.17	-190.32	0.19	-0.08	1.50
4,199.39	6.25	139.93	4,182.93	-195.51	205.95	-192.44	0.85	-0.71	-4.20
4,224.24	6.04	139.72	4,207.63	-197.54	207.66	-194.45	0.85	-0.85	-0.85
4,249.45	5.98	140.24	4,232.70	-199.56	209.36	-196.44	0.32	-0.24	2.06
4,274.65	5.94	139.17	4,257.77	-201.56	211.05	-198.42	0.47	-0.16	-4.25
4,299.48	5.94	138.37	4,282.47	-203.49	212.75	-200.32	0.33	0.00	-3.22
4,324.43	5.97	136.45	4,307.28	-205.39	214.50	-202.20	0.81	0.12	-7.70
4,349.86	6.22	133.76	4,332.57	-207.30	216.40	-204.08	1.49	0.98	-10.58
4,374.66	6.18	133.50	4,357.22	-209.15	218.34	-205.90	0.20	-0.16	-1.05
4,399.84	6.25	132.93	4,382.25	-211.02	220.33	-207.74	0.37	0.28	-2.26
4,424.89	6.27	132.72	4,407.15	-212.88	222.33	-209.57	0.12	0.08	-0.84
4,449.84	6.27	132.88	4,431.96	-214.73	224.33	-211.39	0.07	0.00	0.64
4,475.02	6.47	136.46	4,456.98	-216.69	226.32	-213.32	1.77	0.79	14.22
4,496.30	5.34	142.44	4,478.15	-218.35	227.75	-214.96	6.04	-5.31	28.10
4,520.85	4.92	149.36	4,502.60	-220.16	228.98	-216.75	3.04	-1.71	28.19
4,546.25	4.62	153.22	4,527.91	-222.01	230.00	-218.58	1.73	-1.18	15.20
4,574.96	4.12	156.24	4,556.54	-223.98	230.93	-220.55	1.92	-1.74	10.52
4,599.76	3.97	153.61	4,581.28	-225.57	231.67	-222.12	0.96	-0.60	-10.60
4,623.60	3.62	151.66	4,605.06	-226.97	232.40	-223.51	1.56	-1.47	-8.18



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH / 64151
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
4,648.39	3.16	149.20	4,629.81	-228.24	233.12	-224.78	1.95	-1.86	-9.92
4,673.06	2.41	139.59	4,654.45	-229.22	233.80	-225.74	3.57	-3.04	-38.95
4,696.89	1.88	125.74	4,678.26	-229.83	234.44	-226.35	3.10	-2.22	-58.12
4,721.31	1.50	98.66	4,702.67	-230.12	235.09	-226.62	3.58	-1.56	-110.89
4,746.21	1.41	78.50	4,727.57	-230.10	235.71	-226.60	2.08	-0.36	-80.96
4,774.31	1.62	55.63	4,755.66	-229.81	236.37	-226.29	2.26	0.75	-81.39
4,798.85	1.55	49.83	4,780.19	-229.40	236.91	-225.88	0.71	-0.29	-23.63
4,823.51	1.53	46.98	4,804.84	-228.96	237.41	-225.43	0.32	-0.08	-11.56
4,847.47	1.62	52.22	4,828.79	-228.54	237.91	-225.00	0.71	0.38	21.87
4,872.13	1.84	49.15	4,853.44	-228.06	238.49	-224.51	0.97	0.89	-12.45
4,896.78	1.86	57.42	4,878.07	-227.59	239.12	-224.03	1.09	0.08	33.55
4,924.75	2.05	59.54	4,906.03	-227.09	239.94	-223.52	0.73	0.68	7.58
4,949.52	2.32	61.61	4,930.78	-226.63	240.76	-223.05	1.14	1.09	8.36
4,974.06	2.35	59.50	4,955.30	-226.14	241.63	-222.54	0.37	0.12	-8.60
4,998.01	2.56	59.88	4,979.23	-225.62	242.52	-222.01	0.88	0.88	1.59
5,022.79	4.09	57.06	5,003.97	-224.86	243.74	-221.23	6.21	6.17	-11.38
5,047.64	3.96	40.32	5,028.76	-223.72	245.04	-220.08	4.74	-0.52	-67.36
5,073.02	4.05	39.01	5,054.07	-222.36	246.17	-218.70	0.51	0.35	-5.16
5,099.29	3.77	35.90	5,080.28	-220.94	247.26	-217.26	1.34	-1.07	-11.84
5,120.77	2.55	25.17	5,101.73	-219.93	247.87	-216.25	6.29	-5.68	-49.95
5,146.52	1.87	18.31	5,127.46	-219.02	248.25	-215.33	2.83	-2.64	-26.64
5,172.24	1.40	0.14	5,153.17	-218.30	248.38	-214.61	2.70	-1.83	-70.65
5,197.76	1.31	0.69	5,178.68	-217.70	248.39	-214.01	0.36	-0.35	2.16
5,222.63	1.39	359.08	5,203.55	-217.12	248.39	-213.42	0.36	0.32	-6.47
5,247.97	1.37	356.29	5,228.88	-216.51	248.36	-212.81	0.28	-0.08	-11.01
5,273.45	1.40	358.37	5,254.35	-215.89	248.33	-212.20	0.23	0.12	8.16
5,298.30	1.28	0.06	5,279.19	-215.31	248.32	-211.62	0.51	-0.48	6.80
5,323.64	1.31	354.90	5,304.53	-214.74	248.30	-211.05	0.48	0.12	-20.36
5,346.10	1.12	346.03	5,326.98	-214.27	248.22	-210.58	1.19	-0.85	-39.49
5,372.17	1.15	294.44	5,353.05	-213.91	247.92	-210.23	3.79	0.12	-197.89
5,398.90	1.42	276.60	5,379.77	-213.76	247.35	-210.09	1.79	1.01	-66.74
5,420.71	1.57	271.69	5,401.57	-213.72	246.78	-210.06	0.90	0.69	-22.51
5,447.40	1.76	269.04	5,428.25	-213.72	246.01	-210.06	0.77	0.71	-9.93
5,474.37	1.81	267.14	5,455.21	-213.75	245.17	-210.10	0.29	0.19	-7.04
5,496.04	1.81	269.66	5,476.87	-213.77	244.48	-210.13	0.37	0.00	11.63
5,522.74	1.83	266.83	5,503.56	-213.79	243.64	-210.17	0.34	0.07	-10.60
5,549.81	1.90	265.61	5,530.61	-213.85	242.76	-210.24	0.30	0.26	-4.51
5,571.47	1.88	264.23	5,552.26	-213.92	242.05	-210.32	0.23	-0.09	-6.37
5,598.42	1.99	265.92	5,579.19	-213.99	241.14	-210.41	0.46	0.41	6.27
5,624.19	1.92	263.65	5,604.95	-214.07	240.26	-210.50	0.41	-0.27	-8.81
5,646.87	1.94	263.60	5,627.62	-214.16	239.51	-210.60	0.09	0.09	-0.22
5,673.55	2.02	263.68	5,654.28	-214.26	238.59	-210.71	0.30	0.30	0.30
5,699.59	2.00	263.57	5,680.30	-214.36	237.68	-210.83	0.08	-0.08	-0.42



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH / 64151
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
5,722.16	2.00	260.75	5,702.86	-214.47	236.90	-210.95	0.44	0.00	-12.49
5,748.85	2.14	262.22	5,729.53	-214.61	235.95	-211.10	0.56	0.52	5.51
5,775.02	2.11	261.02	5,755.68	-214.75	234.99	-211.26	0.21	-0.11	-4.59
5,796.90	2.15	262.26	5,777.55	-214.87	234.18	-211.39	0.28	0.18	5.67
5,823.05	2.05	263.68	5,803.68	-214.99	233.23	-211.52	0.43	-0.38	5.43
5,848.55	2.09	262.08	5,829.17	-215.10	232.32	-211.65	0.28	0.16	-6.27
5,874.56	2.10	260.32	5,855.16	-215.25	231.38	-211.81	0.25	0.04	-6.77
5,895.79	2.16	260.83	5,876.37	-215.38	230.60	-211.95	0.30	0.28	2.40
5,921.92	2.10	261.11	5,902.49	-215.53	229.64	-212.11	0.23	-0.23	1.07
5,947.93	2.17	261.33	5,928.48	-215.68	228.68	-212.28	0.27	0.27	0.85
5,973.42	2.12	262.58	5,953.95	-215.81	227.74	-212.42	0.27	-0.20	4.90
5,999.55	1.97	260.12	5,980.06	-215.95	226.82	-212.58	0.67	-0.57	-9.41
6,021.66	2.05	256.98	6,002.16	-216.10	226.06	-212.74	0.62	0.36	-14.20
6,046.78	1.75	255.37	6,027.27	-216.30	225.25	-212.95	1.21	-1.19	-6.41
6,072.79	1.65	255.66	6,053.26	-216.50	224.50	-213.16	0.39	-0.38	1.11
6,099.16	1.45	256.12	6,079.62	-216.67	223.81	-213.34	0.76	-0.76	1.74
6,124.41	1.36	255.22	6,104.87	-216.82	223.21	-213.50	0.37	-0.36	-3.56
6,146.51	1.39	253.09	6,126.96	-216.97	222.70	-213.65	0.27	0.14	-9.64
6,171.63	1.35	252.69	6,152.07	-217.14	222.13	-213.84	0.16	-0.16	-1.59
6,197.62	0.94	242.66	6,178.06	-217.33	221.64	-214.04	1.75	-1.58	-38.59
6,224.00	0.76	243.75	6,204.44	-217.51	221.30	-214.22	0.69	-0.68	4.13
6,249.25	0.59	231.34	6,229.68	-217.67	221.04	-214.38	0.88	-0.67	-49.15
6,271.37	0.57	232.32	6,251.80	-217.80	220.87	-214.52	0.10	-0.09	4.43
6,297.50	0.60	231.82	6,277.93	-217.97	220.66	-214.68	0.12	0.11	-1.91
6,322.76	0.56	232.85	6,303.19	-218.12	220.45	-214.84	0.16	-0.16	4.08
6,348.90	0.57	233.12	6,329.33	-218.28	220.25	-215.00	0.04	0.04	1.03
6,370.75	0.60	230.82	6,351.18	-218.42	220.07	-215.14	0.17	0.14	-10.53
6,400.07	0.54	226.92	6,380.50	-218.61	219.85	-215.34	0.24	-0.20	-13.30
6,421.53	0.60	235.45	6,401.95	-218.74	219.69	-215.47	0.48	0.28	39.75
6,446.86	0.61	231.73	6,427.28	-218.90	219.47	-215.63	0.16	0.04	-14.69
6,471.58	0.60	229.75	6,452.00	-219.07	219.27	-215.80	0.09	-0.04	-8.01
6,497.14	0.57	232.69	6,477.56	-219.23	219.07	-215.97	0.17	-0.12	11.50
6,522.46	0.61	228.51	6,502.88	-219.39	218.87	-216.14	0.23	0.16	-16.51
6,547.40	0.55	224.42	6,527.82	-219.57	218.68	-216.31	0.29	-0.24	-16.40
6,572.60	0.54	234.00	6,553.02	-219.72	218.50	-216.47	0.36	-0.04	38.02
6,598.03	0.65	231.72	6,578.45	-219.88	218.29	-216.63	0.44	0.43	-8.97
6,622.97	0.59	232.81	6,603.38	-220.05	218.08	-216.80	0.25	-0.24	4.37
6,648.27	0.62	229.44	6,628.68	-220.22	217.87	-216.97	0.18	0.12	-13.32
6,673.57	0.59	238.01	6,653.98	-220.37	217.66	-217.14	0.38	-0.12	33.87
6,698.50	0.64	233.47	6,678.91	-220.53	217.44	-217.29	0.28	0.20	-18.21
6,723.81	0.60	228.54	6,704.22	-220.70	217.22	-217.46	0.26	-0.16	-19.48
6,749.10	0.69	239.05	6,729.51	-220.86	216.99	-217.63	0.59	0.36	41.56
6,774.03	0.41	234.14	6,754.44	-220.99	216.79	-217.77	1.14	-1.12	-19.70
6,799.33	0.32	240.88	6,779.73	-221.08	216.66	-217.86	0.39	-0.36	26.64

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Site:	Fez Federal Com	MD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 64151	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 595)	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)
6,824.61	0.08	264.15	6,805.01	-221.12	216.58	-217.89	0.98	-0.95	92.05
6,849.53	0.08	237.99	6,829.93	-221.13	216.54	-217.90	0.15	0.00	-104.98
6,874.82	0.18	27.52	6,855.22	-221.10	216.55	-217.88	1.00	0.40	591.26
6,895.95	0.20	12.48	6,876.35	-221.04	216.57	-217.81	0.25	0.09	-71.18
6,925.03	0.17	354.79	6,905.43	-220.94	216.58	-217.72	0.22	-0.10	-60.83
6,946.17	0.08	341.31	6,926.57	-220.90	216.57	-217.67	0.44	-0.43	-63.77
6,971.71	0.19	15.49	6,952.11	-220.84	216.58	-217.62	0.52	0.43	133.83
6,999.73	0.24	1.15	6,980.13	-220.74	216.59	-217.51	0.26	0.18	-51.18
7,024.60	0.21	355.21	7,005.00	-220.64	216.59	-217.42	0.15	-0.12	-23.88
7,049.34	0.14	12.16	7,029.74	-220.56	216.59	-217.34	0.35	-0.28	68.51
7,073.48	0.18	24.87	7,053.88	-220.50	216.61	-217.28	0.22	0.17	52.65
7,097.99	0.23	7.19	7,078.39	-220.42	216.63	-217.19	0.33	0.20	-72.13
7,122.84	0.14	38.77	7,103.24	-220.34	216.66	-217.12	0.53	-0.36	127.08
7,146.98	0.23	30.06	7,127.38	-220.28	216.70	-217.05	0.39	0.37	-36.08
7,171.60	0.21	13.28	7,152.00	-220.19	216.74	-216.97	0.27	-0.08	-68.16
7,196.23	0.17	29.11	7,176.63	-220.12	216.77	-216.89	0.27	-0.16	64.27
7,224.42	0.21	17.94	7,204.82	-220.03	216.80	-216.80	0.19	0.14	-39.62
7,249.29	0.22	345.18	7,229.69	-219.94	216.80	-216.72	0.49	0.04	-131.72
7,273.92	0.10	358.18	7,254.32	-219.87	216.79	-216.65	0.51	-0.49	52.78
7,297.84	0.17	9.02	7,278.24	-219.82	216.80	-216.59	0.31	0.29	45.32
7,322.83	0.13	51.34	7,303.23	-219.76	216.82	-216.54	0.46	-0.16	169.35
7,347.46	0.23	28.03	7,327.86	-219.70	216.87	-216.48	0.50	0.41	-94.64
7,371.50	0.20	341.91	7,351.90	-219.62	216.88	-216.39	0.71	-0.12	-191.85
7,396.15	0.11	343.28	7,376.55	-219.56	216.86	-216.33	0.37	-0.37	5.56
7,425.07	0.27	356.55	7,405.47	-219.46	216.85	-216.24	0.57	0.55	45.89
7,449.00	0.23	338.51	7,429.40	-219.36	216.83	-216.13	0.37	-0.17	-75.39
7,473.88	0.21	339.42	7,454.28	-219.27	216.79	-216.05	0.08	-0.08	3.66
7,498.76	0.20	319.32	7,479.16	-219.20	216.75	-215.97	0.29	-0.04	-80.79
7,522.58	0.24	341.98	7,502.98	-219.12	216.70	-215.89	0.40	0.17	95.13
7,547.46	0.10	321.59	7,527.86	-219.05	216.67	-215.83	0.60	-0.56	-81.95
7,571.97	0.28	5.69	7,552.37	-218.98	216.67	-215.75	0.90	0.73	179.93
7,599.93	0.35	3.19	7,580.33	-218.82	216.68	-215.60	0.26	0.25	-8.94
7,623.22	0.41	354.97	7,603.62	-218.67	216.68	-215.44	0.35	0.26	-35.29
7,647.32	0.38	2.37	7,627.72	-218.50	216.67	-215.28	0.25	-0.12	30.71
7,671.41	0.49	7.86	7,651.81	-218.32	216.69	-215.10	0.49	0.46	22.79
7,698.75	0.43	353.06	7,679.15	-218.10	216.69	-214.88	0.48	-0.22	-54.13
7,722.73	0.46	2.47	7,703.13	-217.92	216.69	-214.69	0.33	0.13	39.24
7,746.93	0.47	6.82	7,727.33	-217.72	216.70	-214.50	0.15	0.04	17.98
7,774.97	0.47	10.31	7,755.37	-217.49	216.74	-214.27	0.10	0.00	12.45
7,798.37	0.40	359.03	7,778.76	-217.32	216.75	-214.09	0.47	-0.30	-48.21
7,822.22	0.60	7.12	7,802.61	-217.11	216.77	-213.89	0.89	0.84	33.92
7,846.53	0.54	359.82	7,826.92	-216.87	216.78	-213.64	0.39	-0.25	-30.03
7,873.86	0.51	7.86	7,854.25	-216.62	216.80	-213.39	0.29	-0.11	29.42

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Site:	Fez Federal Com	MD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 64151	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 595)	Database:	USA Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
7,897.94	0.50	8.66	7,878.33	-216.41	216.83	-213.18	0.05	-0.04	3.32
7,921.90	0.52	8.71	7,902.29	-216.20	216.86	-212.97	0.08	0.08	0.21
7,949.22	0.50	1.89	7,929.61	-215.96	216.88	-212.73	0.23	-0.07	-24.96
7,973.43	0.38	359.41	7,953.82	-215.77	216.89	-212.55	0.50	-0.50	-10.24
8,000.06	0.74	33.71	7,980.45	-215.54	216.98	-212.31	1.79	1.35	128.80
8,022.33	0.93	43.66	8,002.71	-215.29	217.18	-212.06	1.07	0.85	44.68
8,046.82	0.86	43.37	8,027.20	-215.01	217.45	-211.78	0.29	-0.29	-1.18
8,072.87	0.85	39.81	8,053.25	-214.72	217.71	-211.48	0.21	-0.04	-13.67
8,099.27	0.89	43.39	8,079.65	-214.42	217.97	-211.18	0.26	0.15	13.56
8,124.68	0.85	35.84	8,105.05	-214.13	218.22	-210.88	0.48	-0.16	-29.71
8,146.19	0.86	39.25	8,126.56	-213.87	218.41	-210.62	0.24	0.05	15.85
8,170.88	0.81	40.12	8,151.25	-213.60	218.64	-210.34	0.21	-0.20	3.52
8,196.43	0.86	43.19	8,176.79	-213.32	218.89	-210.06	0.26	0.20	12.02
8,222.11	0.83	40.30	8,202.47	-213.04	219.14	-209.78	0.20	-0.12	-11.25
8,246.81	0.86	43.90	8,227.17	-212.77	219.39	-209.50	0.25	0.12	14.57
8,272.37	0.87	40.41	8,252.73	-212.48	219.65	-209.21	0.21	0.04	-13.65
8,298.05	0.87	42.08	8,278.40	-212.19	219.90	-208.91	0.10	0.00	6.50
8,322.76	1.06	41.88	8,303.11	-211.88	220.18	-208.60	0.77	0.77	-0.81
8,348.32	0.91	37.34	8,328.67	-211.54	220.46	-208.26	0.66	-0.59	-17.76
8,374.01	0.99	36.82	8,354.35	-211.20	220.72	-207.92	0.31	0.31	-2.02
8,398.61	0.93	40.58	8,378.95	-210.88	220.98	-207.59	0.35	-0.24	15.28
8,424.30	0.91	42.23	8,404.64	-210.57	221.25	-207.28	0.13	-0.08	6.42
8,450.01	0.86	38.74	8,430.34	-210.27	221.51	-206.97	0.29	-0.19	-13.57
8,474.85	0.85	40.85	8,455.18	-209.98	221.74	-206.68	0.13	-0.04	8.49
8,496.26	0.86	44.10	8,476.59	-209.75	221.96	-206.45	0.23	0.05	15.18
8,521.98	0.93	44.95	8,502.30	-209.46	222.24	-206.15	0.28	0.27	3.30
8,546.59	0.98	32.88	8,526.91	-209.14	222.50	-205.83	0.84	0.20	-49.05
8,572.31	0.94	42.21	8,552.63	-208.80	222.76	-205.49	0.63	-0.16	36.28
8,598.03	0.91	39.37	8,578.34	-208.49	223.03	-205.17	0.21	-0.12	-11.04
8,622.53	0.88	43.13	8,602.84	-208.20	223.28	-204.88	0.27	-0.12	15.35
8,648.39	0.92	41.78	8,628.70	-207.90	223.56	-204.57	0.18	0.15	-5.22
8,674.05	0.75	38.42	8,654.36	-207.61	223.80	-204.29	0.69	-0.66	-13.09
8,698.04	0.75	43.61	8,678.34	-207.38	224.00	-204.05	0.28	0.00	21.63
8,722.83	0.81	41.15	8,703.13	-207.13	224.23	-203.79	0.28	0.24	-9.92
8,747.49	0.74	44.07	8,727.79	-206.88	224.46	-203.54	0.33	-0.28	11.84
8,774.24	0.78	44.40	8,754.54	-206.63	224.70	-203.29	0.15	0.15	1.23
8,799.94	0.53	87.16	8,780.23	-206.50	224.94	-203.15	2.07	-0.97	166.38
8,822.40	0.46	88.81	8,802.69	-206.49	225.14	-203.14	0.32	-0.31	7.35
8,847.92	0.53	110.59	8,828.21	-206.53	225.35	-203.18	0.78	0.27	85.34
8,874.59	0.50	125.72	8,854.88	-206.64	225.56	-203.29	0.52	-0.11	56.73
8,896.02	0.55	123.93	8,876.31	-206.75	225.72	-203.40	0.25	0.23	-8.35
8,922.56	0.55	124.40	8,902.85	-206.90	225.93	-203.54	0.02	0.00	1.77
8,949.23	0.53	135.96	8,929.52	-207.06	226.12	-203.69	0.41	-0.07	43.34



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH / 64151
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
8,974.88	0.60	147.44	8,955.17	-207.26	226.28	-203.89	0.52	0.27	44.76
8,997.07	0.56	139.98	8,977.36	-207.44	226.41	-204.07	0.38	-0.18	-33.62
9,023.73	0.59	158.59	9,004.01	-207.66	226.55	-204.30	0.71	0.11	69.80
9,049.50	0.60	176.15	9,029.78	-207.92	226.60	-204.55	0.71	0.04	68.14
9,071.69	0.70	176.65	9,051.97	-208.17	226.62	-204.80	0.45	0.45	2.25
9,098.23	0.82	190.31	9,078.51	-208.52	226.59	-205.15	0.82	0.45	51.47
9,123.87	0.89	191.88	9,104.15	-208.90	226.52	-205.53	0.29	0.27	6.12
9,146.20	0.94	202.46	9,126.47	-209.24	226.41	-205.87	0.79	0.22	47.38
9,172.87	1.04	203.65	9,153.14	-209.66	226.23	-206.30	0.38	0.37	4.46
9,198.67	1.38	212.15	9,178.93	-210.14	225.97	-206.78	1.49	1.32	32.95
9,224.59	1.47	211.60	9,204.85	-210.69	225.63	-207.33	0.35	0.35	-2.12
9,245.55	1.58	217.13	9,225.80	-211.15	225.32	-207.79	0.88	0.52	26.38
9,271.22	1.63	218.75	9,251.46	-211.71	224.88	-208.37	0.26	0.19	6.31
9,297.13	1.63	221.92	9,277.36	-212.27	224.40	-208.94	0.35	0.00	12.23
9,322.20	1.62	220.66	9,302.42	-212.81	223.93	-209.48	0.15	-0.04	-5.03
9,347.89	1.66	219.25	9,328.10	-213.37	223.46	-210.05	0.22	0.16	-5.49
9,373.82	1.70	223.63	9,354.02	-213.94	222.96	-210.62	0.52	0.15	16.89
9,398.89	1.69	220.10	9,379.08	-214.49	222.46	-211.18	0.42	-0.04	-14.08
9,424.58	1.72	221.70	9,404.75	-215.07	221.96	-211.77	0.22	0.12	6.23
9,446.43	1.75	221.99	9,426.59	-215.56	221.52	-212.27	0.14	0.14	1.33
9,471.39	1.80	220.26	9,451.54	-216.15	221.01	-212.86	0.29	0.20	-6.93
9,497.23	1.92	219.09	9,477.37	-216.79	220.48	-213.51	0.49	0.46	-4.53
9,523.19	1.99	219.40	9,503.31	-217.48	219.92	-214.20	0.27	0.27	1.19
9,548.16	2.10	218.82	9,528.27	-218.17	219.35	-214.90	0.45	0.44	-2.32
9,574.01	2.15	221.96	9,554.10	-218.90	218.73	-215.64	0.49	0.19	12.15
9,599.99	2.13	220.75	9,580.06	-219.63	218.09	-216.38	0.19	-0.08	-4.66
9,625.05	2.15	221.22	9,605.10	-220.33	217.48	-217.10	0.11	0.08	1.88
9,647.08	2.10	219.67	9,627.12	-220.95	216.95	-217.72	0.35	-0.23	-7.04
9,672.19	2.13	219.01	9,652.21	-221.67	216.36	-218.45	0.15	0.12	-2.63
9,698.78	2.12	219.23	9,678.78	-222.44	215.74	-219.22	0.05	-0.04	0.83
9,721.15	2.12	218.77	9,701.14	-223.08	215.22	-219.88	0.08	0.00	-2.06
9,746.67	2.06	217.47	9,726.64	-223.81	214.64	-220.62	0.30	-0.24	-5.09
9,772.79	1.67	206.49	9,752.75	-224.52	214.19	-221.34	2.02	-1.49	-42.04
9,798.61	1.49	190.86	9,778.56	-225.19	213.96	-222.01	1.80	-0.70	-60.53
9,823.79	1.33	191.52	9,803.73	-225.80	213.84	-222.61	0.64	-0.64	2.62
9,849.85	1.33	190.40	9,829.78	-226.39	213.72	-223.21	0.10	0.00	-4.30
9,871.31	1.40	190.26	9,851.24	-226.90	213.63	-223.71	0.33	0.33	-0.65
9,896.76	1.30	186.32	9,876.68	-227.49	213.54	-224.31	0.54	-0.39	-15.48
9,922.71	1.33	190.96	9,902.62	-228.08	213.45	-224.90	0.43	0.12	17.88
9,948.54	1.26	187.69	9,928.45	-228.65	213.36	-225.48	0.39	-0.27	-12.66
9,973.86	1.25	188.97	9,953.76	-229.20	213.28	-226.02	0.12	-0.04	5.06
9,999.80	1.18	192.16	9,979.69	-229.74	213.18	-226.57	0.38	-0.27	12.30
10,021.52	1.21	186.87	10,001.41	-230.19	213.10	-227.01	0.53	0.14	-24.36
10,046.72	0.95	184.73	10,026.61	-230.66	213.05	-227.49	1.04	-1.03	-8.49



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH / 64151
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
10,072.53	0.90	182.08	10,052.41	-231.08	213.03	-227.90	0.25	-0.19	-10.27
10,098.36	0.69	171.94	10,078.24	-231.43	213.04	-228.26	0.98	-0.81	-39.26
10,123.81	0.57	174.74	10,103.69	-231.71	213.08	-228.54	0.49	-0.47	11.00
10,149.64	0.45	162.48	10,129.52	-231.93	213.12	-228.76	0.63	-0.46	-47.46
10,170.73	0.41	133.35	10,150.61	-232.07	213.20	-228.89	1.04	-0.19	-138.12
10,196.68	0.33	76.90	10,176.56	-232.11	213.34	-228.94	1.38	-0.31	-217.53
10,222.89	0.93	20.32	10,202.76	-231.90	213.49	-228.72	3.04	2.29	-215.87
10,247.82	1.69	11.09	10,227.69	-231.35	213.63	-228.16	3.15	3.05	-37.02
10,273.01	2.27	8.46	10,252.86	-230.49	213.77	-227.30	2.33	2.30	-10.44
10,298.20	2.76	12.94	10,278.03	-229.40	213.98	-226.22	2.09	1.95	17.78
10,322.67	2.79	10.59	10,302.47	-228.24	214.22	-225.05	0.48	0.12	-9.60
10,347.86	2.98	15.84	10,327.63	-227.01	214.51	-223.82	1.29	0.75	20.84
10,373.05	3.07	17.75	10,352.78	-225.74	214.90	-222.54	0.54	0.36	7.58
10,397.52	3.05	21.23	10,377.22	-224.51	215.33	-221.30	0.76	-0.08	14.22
10,422.73	3.06	20.96	10,402.39	-223.25	215.82	-220.04	0.07	0.04	-1.07
10,448.06	3.01	26.35	10,427.69	-222.03	216.35	-218.81	1.14	-0.20	21.28
10,472.45	2.96	29.90	10,452.04	-220.91	216.95	-217.68	0.79	-0.21	14.56
10,497.68	2.71	36.44	10,477.24	-219.86	217.63	-216.62	1.62	-0.99	25.92
10,523.02	2.70	42.36	10,502.55	-218.94	218.39	-215.69	1.10	-0.04	23.36
10,547.41	2.52	48.48	10,526.92	-218.16	219.18	-214.90	1.36	-0.74	25.09
10,572.40	2.55	58.70	10,551.88	-217.51	220.06	-214.23	1.81	0.12	40.90
10,597.89	2.39	65.01	10,577.35	-216.99	221.03	-213.70	1.24	-0.63	24.75
10,622.42	2.47	64.41	10,601.86	-216.54	221.97	-213.24	0.34	0.33	-2.45
10,647.68	2.45	66.67	10,627.10	-216.09	222.96	-212.78	0.39	-0.08	8.95
10,673.08	2.30	73.22	10,652.47	-215.73	223.94	-212.40	1.22	-0.59	25.79
10,697.63	2.43	68.45	10,677.00	-215.40	224.90	-212.05	0.96	0.53	-19.43
10,722.79	2.36	68.62	10,702.14	-215.01	225.88	-211.65	0.28	-0.28	0.68
10,747.77	2.40	69.06	10,727.10	-214.64	226.85	-211.26	0.18	0.16	1.76
10,771.58	2.42	68.42	10,750.89	-214.28	227.78	-210.89	0.14	0.08	-2.69
10,799.97	2.49	68.80	10,779.25	-213.83	228.91	-210.43	0.25	0.25	1.34
10,824.47	2.48	68.92	10,803.73	-213.45	229.90	-210.03	0.05	-0.04	0.49
10,848.97	2.49	71.34	10,828.21	-213.09	230.90	-209.65	0.43	0.04	9.88
10,872.75	2.47	71.78	10,851.96	-212.76	231.88	-209.31	0.12	-0.08	1.85
10,897.26	2.35	71.22	10,876.45	-212.44	232.85	-208.97	0.50	-0.49	-2.28
10,921.75	2.24	82.17	10,900.92	-212.21	233.80	-208.73	1.84	-0.45	44.71
10,949.67	2.12	97.15	10,928.82	-212.20	234.86	-208.71	2.08	-0.43	53.65
10,974.12	2.21	100.70	10,953.26	-212.34	235.77	-208.84	0.66	0.37	14.52
10,999.87	2.23	108.02	10,978.99	-212.59	236.73	-209.07	1.10	0.08	28.43
11,020.89	2.33	111.27	10,999.99	-212.87	237.52	-209.34	0.78	0.48	15.46
11,046.75	2.26	115.33	11,025.83	-213.28	238.47	-209.73	0.68	-0.27	15.70
11,072.75	2.40	118.92	11,051.81	-213.76	239.41	-210.20	0.78	0.54	13.81
11,097.74	2.42	118.29	11,076.78	-214.27	240.33	-210.69	0.13	0.08	-2.52
11,123.61	2.10	126.67	11,102.63	-214.81	241.19	-211.22	1.78	-1.24	32.39



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH / 64151
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
11,149.61	1.82	132.86	11,128.61	-215.37	241.88	-211.78	1.35	-1.08	23.81
11,174.63	1.71	149.98	11,153.62	-215.97	242.36	-212.36	2.14	-0.44	68.43
11,196.42	1.49	172.56	11,175.40	-216.53	242.56	-212.92	3.04	-1.01	103.63
11,221.34	1.52	199.78	11,200.31	-217.16	242.49	-213.56	2.84	0.12	109.23
11,246.30	1.96	220.55	11,225.26	-217.80	242.10	-214.20	3.05	1.76	83.21
11,271.50	2.33	233.54	11,250.44	-218.43	241.40	-214.84	2.42	1.47	51.55
11,295.86	2.81	241.89	11,274.78	-219.01	240.48	-215.43	2.49	1.97	34.28
11,324.92	3.30	247.87	11,303.80	-219.66	239.08	-216.10	2.01	1.69	20.58
11,350.03	3.72	252.63	11,328.86	-220.17	237.63	-216.64	2.03	1.67	18.96
11,370.44	4.25	255.96	11,349.22	-220.55	236.26	-217.04	2.83	2.60	16.32
11,399.71	4.69	259.97	11,378.40	-221.02	234.03	-217.54	1.84	1.50	13.70
11,424.74	5.12	262.28	11,403.34	-221.35	231.92	-217.90	1.89	1.72	9.23
11,447.31	5.15	262.74	11,425.82	-221.62	229.92	-218.20	0.23	0.13	2.04
11,474.73	5.22	265.69	11,453.13	-221.87	227.45	-218.48	1.01	0.26	10.76
11,500.06	4.83	268.21	11,478.36	-221.98	225.24	-218.63	1.77	-1.54	9.95
Tie In									
11,692.00	4.49	263.11	11,669.67	-223.14	209.70	-220.02	0.28	-0.18	-2.66
First Phoenix MWD Survey									
11,781.00	3.82	261.73	11,758.43	-223.98	203.31	-220.96	0.76	-0.75	-1.55
11,871.00	3.06	260.19	11,848.27	-224.82	197.97	-221.87	0.85	-0.84	-1.71
11,895.00	2.88	261.20	11,872.24	-225.02	196.75	-222.09	0.78	-0.75	4.21
11,939.00	2.51	340.78	11,916.20	-224.28	195.34	-221.37	7.86	-0.84	180.86
11,984.00	9.52	9.30	11,960.93	-219.67	195.62	-216.76	16.47	15.58	63.38
12,029.00	15.14	11.36	12,004.88	-210.23	197.38	-207.29	12.53	12.49	4.58
12,073.00	20.52	5.78	12,046.75	-196.92	199.29	-193.95	12.82	12.23	-12.68
12,118.00	25.27	0.24	12,088.20	-179.45	200.12	-176.48	11.58	10.56	-12.31
12,163.00	29.01	357.41	12,128.24	-158.94	199.67	-155.97	8.79	8.31	-6.29
12,208.00	32.24	356.87	12,166.96	-136.05	198.52	-133.10	7.20	7.18	-1.20
12,253.00	34.18	358.80	12,204.61	-111.42	197.60	-108.49	4.91	4.31	4.29
12,298.00	35.19	1.82	12,241.61	-85.82	197.75	-82.89	4.43	2.24	6.71
12,342.00	35.34	1.84	12,277.54	-60.43	198.56	-57.49	0.34	0.34	0.05
12,387.00	40.99	1.50	12,312.90	-32.65	199.36	-29.70	12.56	12.56	-0.76
12,432.00	46.09	1.20	12,345.51	-1.67	200.09	1.29	11.34	11.33	-0.67
12,477.00	50.74	1.24	12,375.37	31.97	200.80	34.94	10.33	10.33	0.09
12,502.00	53.22	1.82	12,390.77	51.66	201.33	54.63	10.07	9.91	2.33
FTP: 12502' MD									
12,522.00	55.20	2.26	12,402.47	67.87	201.91	70.85	10.07	9.92	2.19
12,566.00	55.76	3.04	12,427.40	104.09	203.59	107.08	1.94	1.27	1.77
12,611.00	57.37	0.79	12,452.20	141.61	204.84	144.62	5.50	3.58	-5.00
12,656.00	63.68	358.47	12,474.33	180.76	204.56	183.77	14.72	14.02	-5.16
12,701.00	68.25	358.64	12,492.65	221.84	203.52	224.82	10.16	10.16	0.38
12,745.00	72.30	0.16	12,507.50	263.24	203.10	266.22	9.76	9.20	3.45
12,790.00	78.98	359.84	12,518.66	306.81	203.09	309.78	14.86	14.84	-0.71
12,835.00	86.58	2.18	12,524.31	351.41	203.89	354.39	17.66	16.89	5.20



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH / 64151
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
12,880.00	87.18	2.56	12,526.76	396.31	205.75	399.30	1.58	1.33	0.84
12,895.00	87.24	2.55	12,527.49	411.28	206.41	414.28	0.41	0.40	-0.07
12,985.00	87.61	1.79	12,531.53	501.12	209.82	504.16	0.94	0.41	-0.84
13,074.00	88.65	1.69	12,534.44	590.03	212.52	593.10	1.17	1.17	-0.11
13,164.00	88.98	2.28	12,536.30	679.96	215.64	683.07	0.75	0.37	0.66
13,254.00	91.05	2.18	12,536.27	769.88	219.14	773.04	2.30	2.30	-0.11
13,343.00	93.18	0.07	12,532.99	858.79	220.89	861.96	3.37	2.39	-2.37
13,433.00	90.45	358.66	12,530.14	948.73	219.89	951.88	3.41	-3.03	-1.57
13,522.00	89.27	357.84	12,530.36	1,037.69	217.17	1,040.78	1.61	-1.33	-0.92
13,612.00	89.04	357.68	12,531.68	1,127.61	213.65	1,130.64	0.31	-0.26	-0.18
13,701.00	89.81	357.91	12,532.58	1,216.54	210.23	1,219.51	0.90	0.87	0.26
13,790.00	90.68	358.69	12,532.20	1,305.50	207.59	1,308.42	1.31	0.98	0.88
13,880.00	92.78	0.67	12,529.48	1,395.45	207.09	1,398.35	3.21	2.33	2.20
13,970.00	92.64	0.25	12,525.22	1,485.34	207.81	1,488.25	0.49	-0.16	-0.47
14,059.00	91.85	0.67	12,521.74	1,574.27	208.52	1,577.18	1.01	-0.89	0.47
14,149.00	91.75	1.13	12,518.91	1,664.21	209.93	1,667.13	0.52	-0.11	0.51
14,238.00	90.67	0.03	12,517.03	1,753.19	210.83	1,756.11	1.73	-1.21	-1.24
14,328.00	91.24	0.19	12,515.53	1,843.17	211.01	1,846.09	0.66	0.63	0.18
14,417.00	90.04	359.08	12,514.54	1,932.16	210.44	1,935.06	1.84	-1.35	-1.25
14,507.00	89.70	358.69	12,514.74	2,022.15	208.69	2,025.01	0.57	-0.38	-0.43
14,596.00	89.61	358.32	12,515.28	2,111.11	206.37	2,113.93	0.43	-0.10	-0.42
14,686.00	90.53	357.73	12,515.17	2,201.06	203.27	2,203.82	1.21	1.02	-0.66
14,776.00	90.52	358.78	12,514.34	2,291.01	200.52	2,293.72	1.17	-0.01	1.17
14,866.00	89.13	359.58	12,514.62	2,381.00	199.24	2,383.68	1.78	-1.54	0.89
14,915.00	89.10	359.17	12,515.37	2,429.99	198.70	2,432.66	0.84	-0.06	-0.84
15,004.00	89.38	359.54	12,516.55	2,518.98	197.70	2,521.62	0.52	0.31	0.42
15,094.00	90.33	358.39	12,516.78	2,608.96	196.08	2,611.57	1.66	1.06	-1.28
15,183.00	89.39	357.90	12,517.00	2,697.91	193.19	2,700.47	1.19	-1.06	-0.55
15,273.00	90.49	358.50	12,517.09	2,787.87	190.37	2,790.37	1.39	1.22	0.67
15,362.00	90.58	0.34	12,516.26	2,876.85	189.47	2,879.34	2.07	0.10	2.07
15,452.00	91.78	1.62	12,514.41	2,966.82	191.01	2,969.32	1.95	1.33	1.42
15,542.00	91.55	2.13	12,511.79	3,056.73	193.95	3,059.26	0.62	-0.26	0.57
15,631.00	91.27	2.38	12,509.60	3,145.63	197.45	3,148.21	0.42	-0.31	0.28
15,721.00	91.46	1.65	12,507.46	3,235.55	200.61	3,238.16	0.84	0.21	-0.81
15,810.00	92.24	4.30	12,504.59	3,324.38	205.23	3,327.05	3.10	0.88	2.98
15,900.00	91.73	3.90	12,501.47	3,414.09	211.66	3,416.85	0.72	-0.57	-0.44
15,989.00	90.73	359.51	12,499.56	3,503.01	214.31	3,505.79	5.06	-1.12	-4.93
16,079.00	92.18	357.37	12,497.27	3,592.94	211.86	3,595.68	2.87	1.61	-2.38
16,168.00	93.15	357.72	12,493.13	3,681.76	208.05	3,684.43	1.16	1.09	0.39
16,258.00	92.72	358.44	12,488.53	3,771.59	205.04	3,774.21	0.93	-0.48	0.80
16,347.00	93.03	359.11	12,484.06	3,860.46	203.14	3,863.04	0.83	0.35	0.75
16,437.00	92.55	358.72	12,479.68	3,950.34	201.44	3,952.88	0.69	-0.53	-0.43
16,526.00	92.84	356.82	12,475.50	4,039.17	197.98	4,041.65	2.16	0.33	-2.13



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH / 64151
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
16,616.00	92.55	356.06	12,471.26	4,128.89	192.39	4,131.28	0.90	-0.32	-0.84
16,706.00	91.42	358.05	12,468.15	4,218.71	187.77	4,221.03	2.54	-1.26	2.21
16,795.00	91.27	359.53	12,466.06	4,307.67	185.89	4,309.94	1.67	-0.17	1.66
16,884.00	91.79	1.29	12,463.68	4,396.63	186.53	4,398.90	2.06	0.58	1.98
16,974.00	90.84	0.57	12,461.61	4,486.59	187.99	4,488.88	1.32	-1.06	-0.80
17,064.00	90.18	359.98	12,460.81	4,576.59	188.42	4,578.87	0.98	-0.73	-0.66
17,153.00	90.10	359.79	12,460.60	4,665.59	188.24	4,667.86	0.23	-0.09	-0.21
17,243.00	90.38	359.42	12,460.22	4,755.58	187.62	4,757.84	0.52	0.31	-0.41
17,332.00	90.15	358.40	12,459.81	4,844.56	185.93	4,846.78	1.17	-0.26	-1.15
17,422.00	90.19	358.37	12,459.54	4,934.53	183.39	4,936.70	0.06	0.04	-0.03
17,511.00	91.24	358.89	12,458.43	5,023.49	181.27	5,025.62	1.32	1.18	0.58
17,601.00	91.39	0.68	12,456.36	5,113.47	180.93	5,115.58	2.00	0.17	1.99
17,691.00	91.26	2.01	12,454.28	5,203.42	183.04	5,205.55	1.48	-0.14	1.48
17,780.00	90.35	1.99	12,453.03	5,292.35	186.15	5,294.52	1.02	-1.02	-0.02
17,870.00	90.21	1.52	12,452.59	5,382.31	188.90	5,384.51	0.54	-0.16	-0.52
17,959.00	90.39	0.47	12,452.13	5,471.29	190.45	5,473.51	1.20	0.20	-1.18
18,049.00	91.18	359.74	12,450.89	5,561.28	190.61	5,563.49	1.20	0.88	-0.81
18,139.00	91.56	0.34	12,448.74	5,651.26	190.68	5,653.46	0.79	0.42	0.67
18,228.00	91.56	359.19	12,446.32	5,740.22	190.31	5,742.41	1.29	0.00	-1.29
18,318.00	90.30	358.42	12,444.86	5,830.19	188.43	5,832.33	1.64	-1.40	-0.86
18,407.00	90.16	357.05	12,444.50	5,919.11	184.92	5,921.20	1.55	-0.16	-1.54
18,496.00	90.33	356.61	12,444.12	6,007.98	180.00	6,009.98	0.53	0.19	-0.49
18,586.00	90.16	357.25	12,443.74	6,097.85	175.18	6,099.77	0.74	-0.19	0.71
18,675.00	89.21	358.95	12,444.22	6,186.79	172.23	6,188.66	2.19	-1.07	1.91
18,765.00	89.42	359.80	12,445.30	6,276.78	171.24	6,278.62	0.97	0.23	0.94
18,855.00	90.13	359.73	12,445.65	6,366.78	170.87	6,368.61	0.79	0.79	-0.08
18,944.00	90.04	359.16	12,445.52	6,455.77	170.01	6,457.58	0.65	-0.10	-0.64
19,034.00	89.96	358.87	12,445.52	6,545.76	168.47	6,547.53	0.33	-0.09	-0.32
19,123.00	90.01	359.97	12,445.55	6,634.75	167.56	6,636.50	1.24	0.06	1.24
19,213.00	90.76	1.25	12,444.94	6,724.74	168.52	6,726.50	1.65	0.83	1.42
19,302.00	90.72	1.75	12,443.79	6,813.71	170.85	6,815.49	0.56	-0.04	0.56
19,392.00	90.39	1.87	12,442.92	6,903.66	173.69	6,905.47	0.39	-0.37	0.13
19,481.00	91.12	1.82	12,441.75	6,992.60	176.56	6,994.45	0.82	0.82	-0.06
19,571.00	92.23	1.52	12,439.12	7,082.52	179.18	7,084.40	1.28	1.23	-0.33
19,660.00	92.33	1.19	12,435.58	7,171.43	181.28	7,173.32	0.39	0.11	-0.37
19,750.00	92.01	0.68	12,432.17	7,261.35	182.75	7,263.26	0.67	-0.36	-0.57
19,839.00	88.13	0.06	12,432.06	7,350.33	183.33	7,352.24	4.41	-4.36	-0.70
19,929.00	87.80	0.91	12,435.25	7,440.27	184.09	7,442.18	1.01	-0.37	0.94
20,018.00	87.67	1.63	12,438.77	7,529.18	186.06	7,531.11	0.82	-0.15	0.81
20,110.00	87.22	0.58	12,442.87	7,621.07	187.83	7,623.01	1.24	-0.49	-1.14
20,199.00	89.04	356.73	12,445.78	7,709.98	185.74	7,711.88	4.78	2.04	-4.33
20,289.00	89.93	355.50	12,446.59	7,799.76	179.64	7,801.57	1.69	0.99	-1.37
20,378.00	90.33	354.66	12,446.39	7,888.43	172.01	7,890.11	1.05	0.45	-0.94

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 703H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Site:	Fez Federal Com	MD Reference:	RKB=25' @ 3275.60usft (Precision 595)
Well:	703H	North Reference:	Grid
Wellbore:	OH / 64151	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 595)	Database:	USA Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
20,468.00	90.33	354.92	12,445.87	7,978.06	163.84	7,979.61	0.29	0.00	0.29
20,557.00	90.42	355.58	12,445.28	8,066.75	156.47	8,068.18	0.75	0.10	0.74
20,647.00	90.19	356.17	12,444.81	8,156.52	150.00	8,157.84	0.70	-0.26	0.66
20,736.00	90.44	358.88	12,444.32	8,245.43	146.15	8,246.68	3.06	0.28	3.04
20,826.00	90.02	1.10	12,443.96	8,335.42	146.14	8,336.67	2.51	-0.47	2.47
20,915.00	89.39	2.61	12,444.41	8,424.37	149.02	8,425.65	1.84	-0.71	1.70
21,004.00	89.72	2.89	12,445.10	8,513.26	153.29	8,514.60	0.49	0.37	0.31
21,094.00	87.00	2.90	12,447.68	8,603.10	157.83	8,604.50	3.02	-3.02	0.01
21,183.00	88.39	3.38	12,451.26	8,691.89	162.70	8,693.35	1.65	1.56	0.54
21,273.00	87.99	2.60	12,454.10	8,781.73	167.39	8,783.24	0.97	-0.44	-0.87
21,362.00	87.90	0.09	12,457.29	8,870.64	169.48	8,872.17	2.82	-0.10	-2.82
21,452.00	88.25	359.94	12,460.32	8,960.59	169.51	8,962.11	0.42	0.39	-0.17
21,541.00	88.21	359.99	12,463.07	9,049.54	169.45	9,051.06	0.07	-0.04	0.06
21,630.00	88.01	358.66	12,466.00	9,138.49	168.40	9,139.98	1.51	-0.22	-1.49
21,720.00	87.97	358.07	12,469.16	9,228.39	165.84	9,229.84	0.66	-0.04	-0.66
21,809.00	89.18	357.77	12,471.37	9,317.31	162.61	9,318.69	1.40	1.36	-0.34
21,898.00	89.22	356.47	12,472.61	9,406.18	158.14	9,407.49	1.46	0.04	-1.46
21,988.00	89.38	355.30	12,473.71	9,495.94	151.68	9,497.15	1.31	0.18	-1.30
22,077.00	90.36	358.94	12,473.92	9,584.81	147.21	9,585.94	4.24	1.10	4.09
22,167.00	88.51	0.38	12,474.80	9,674.80	146.67	9,675.91	2.60	-2.06	1.60
22,256.00	88.31	1.72	12,477.27	9,763.75	148.30	9,764.88	1.52	-0.22	1.51
22,346.00	89.08	2.06	12,479.32	9,853.68	151.27	9,854.84	0.94	0.86	0.38
22,435.00	89.11	4.81	12,480.73	9,942.50	156.60	9,943.73	3.09	0.03	3.09
22,468.00	88.63	4.89	12,481.38	9,975.37	159.39	9,976.64	1.48	-1.46	0.24
LTP: 22468' MD									
22,515.00	87.94	5.00	12,482.79	10,022.18	163.44	10,023.50	1.48	-1.46	0.24
Final Phoenix MWD Survey									
22,595.00	87.94	5.00	12,485.66	10,101.82	170.41	10,103.24	0.00	0.00	0.00
Projection to TD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,500.06	11,478.36	-221.98	225.24	Tie In
11,692.00	11,669.67	-223.14	209.70	First Phoenix MWD Survey
12,502.00	12,390.77	51.66	201.33	FTP: 12502' MD
22,468.00	12,481.38	9,975.37	159.39	LTP: 22468' MD
22,515.00	12,482.79	10,022.18	163.44	Final Phoenix MWD Survey
22,595.00	12,485.66	10,101.82	170.41	Projection to TD